

eDrive VSi Installation Guide

Kit: eDTC / eDX VSi - MF6400

P/Ns 911-1020-000 (TC), 911-4017-000 (eDX)

Fits Massey Ferguson, AGCO and Challenger Tractor Models*:

Massey Ferguson

5425 †	6465	7465	8220	8450
5445 †	6475	7475	8240	8460
5455 †	6480	7480	8245	8470
5460 †	6485	7485	8250	8480
5465 †	6490	7490	8260	
5470 †	6495	7495	8270	
5475 †	6497	7497	8280	
5480 †	6499	7499		



AGCO DT & RT

Challenger MT


425B	525B	635B
445B	535B	645B
455B	545B	655B
465B	555B	665B
475B	565B	685B

<u>DT</u>	<u>RT</u>	<u>RT</u>
180A	100	135
200A	100A	140A
220A	110A	150
240A	120	155A
180A	120A	180A

* Kit is for machines that have the control assembly shown (inset) at far right

† Cab models 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 kits are detailed in the tables that follow the safety warnings on the next page. 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



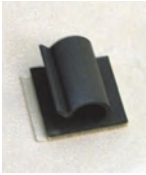
Unpack the supplied kit and identify the required parts as shown. Kit items, which are applicable to both VSi/eDriveTC and VSi/eDriveX installations, are referenced as A, B, C etc. with the item references being used in the step-by-step installation sections of this guide.

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, ZP (Attach B to A)	

Kit Contents - eDriveTC and eDriveX (continued)

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
D		1	Spline adaptor (Use with B)	
E		3	Screw, M5 x 25 hex head, ZP (Attach D to B)	
F		1	Anti-rotation bracket (front - windscreen side)	
G		1	Anti-rotation bracket (rear - driver's side)	
H		4	Bolt, M6 x 16, hex head, ZP	
		4	Washer, spring	
		4	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	







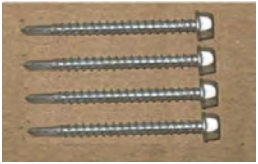
Kit Contents - eDriveTC Only

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 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 - but 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: Items 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 EI to connect to battery)	
EI	054-0123-000	1	Battery terminal cable (Connect EH to battery)	
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)	

Kit Contents - eDriveX only (continued)

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
EL	675-1188-000	4	Screw, mach, M6 x 12mm, PPH, ZP (Attach EN to EM)	
EM	640-0091-000	1	ECU (EN) mounting bracket	
EN	806-1031-000	1	ECU, eDriveX	
EO	051-0316-000	1	CAN bus harness, eDriveX	
EP	677-2002	20	Tie straps, 7" releasable	

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).

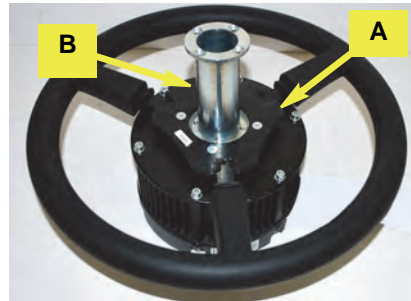


Figure 1a: Shaft adapter installation



At steps 1b and 1c following, tighten the screws to the specified torque only. **DO NOT OVERTIGHTEN - 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).

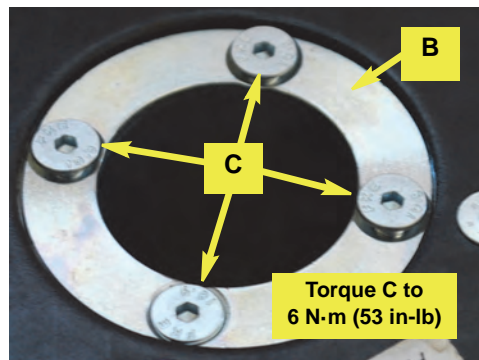


Figure 1b: Shaft adapter installed

- 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).

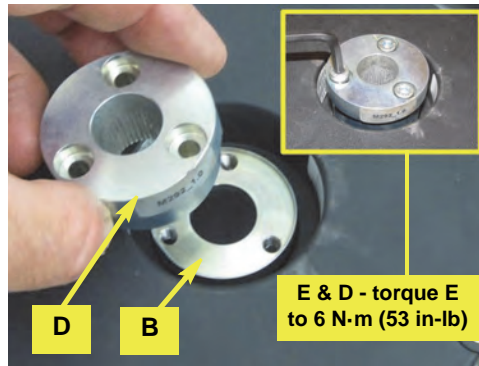


Figure 1c with inset: Spline adapter installation

2. Install the anti-rotation brackets.



When completing this step, ensure that you (i) use only the bolts (**H**) provided, (ii) use all the washers provided and (iii) leave the bolts loose enough to allow you to push brackets **F** and **G** firmly against the steering console once installed.

With the comms port to your right, use hardware **H** to attach anti-rotation brackets **F** and **G** to the top half of the steering wheel assembly (as viewed). Do not tighten **H** yet. With each bracket's padded tab inward and upward, mount **F** on the right side, **G** on the left side (as viewed - Figure 2 and inset).

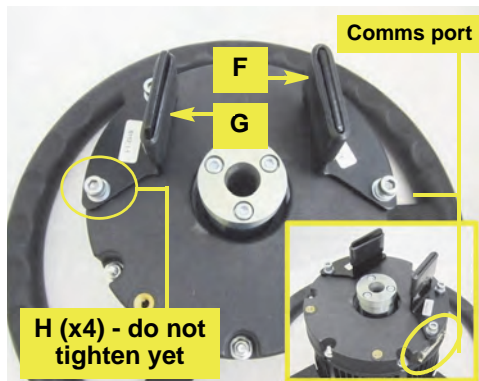


Figure 2 with inset: Anti-rotation brackets installed

3. Remove the machine's steering wheel.

Remove the machine's steering wheel as follows:

- Remove 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.

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, lower 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 and washer (see Figure 3-c), secure the steering wheel (Figure 4a, upper inset).

NOTE:

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



*At the next step, tighten bolts **H** 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 brackets **F** and **G** firmly against the steering console and secure them (Figure 4b, left and right images). Torque bolts **H** to no more than 5 N·m (44 in-lb) - see warning above.

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

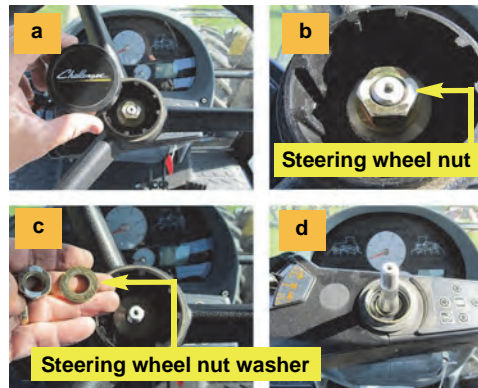


Figure 3 (a-d): Steering wheel removal

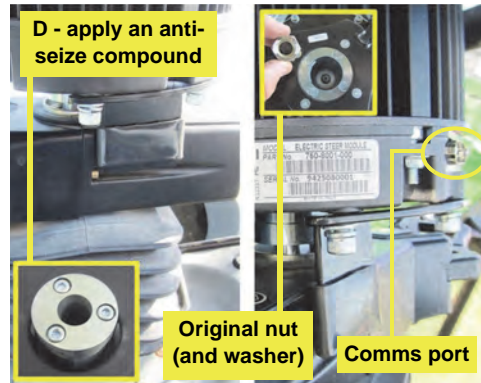


Figure 4a with insets: Steering wheel and anti-rotation brackets installation

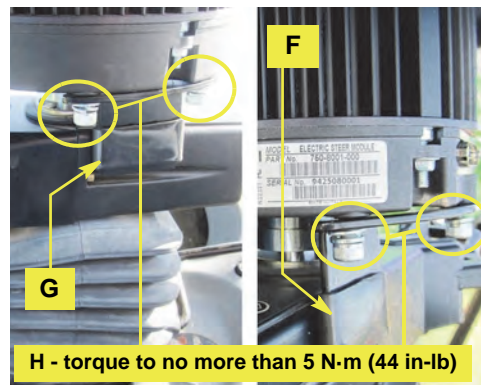


Figure 4b (left and right): Anti-rotation brackets secured



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 **K** 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).

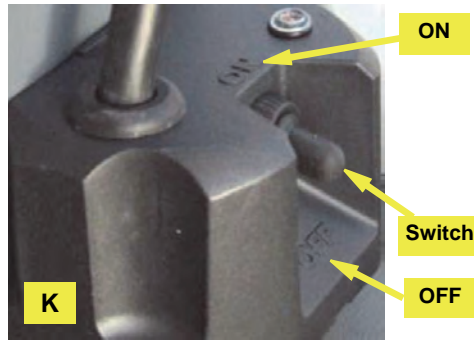


Figure 5a: Junction box ON/OFF switch - within easy reach of the operator

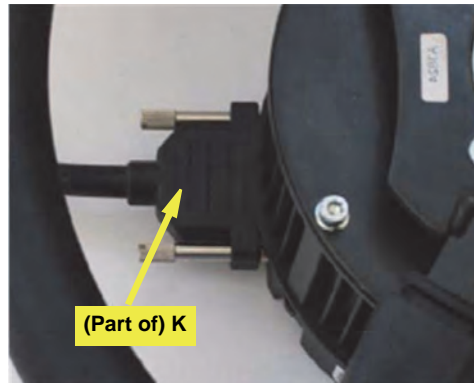


Figure 5b: Junction box comms cable connected to steering wheel assembly

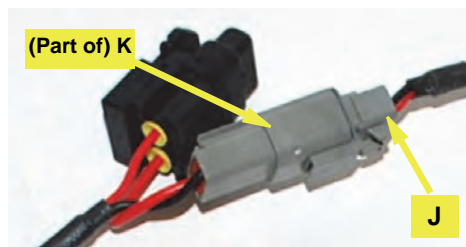


Figure 5c: Power cable connected to junction box cable

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).

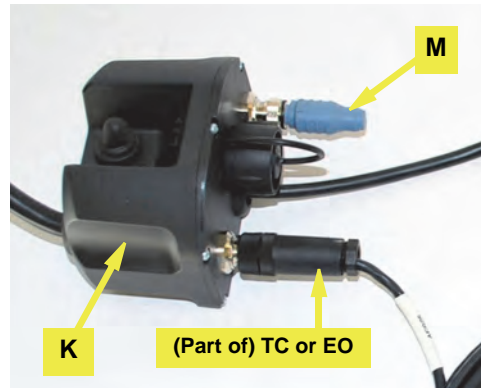


Figure 5d: CAN harness and terminator connected to junction box

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 labeled '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 under-floor 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. Identify the ECU mounting location to the right and forward of the driver’s seat.

Set the bracket with its front edge 9" from the front glass and perpendicular to the front of the cab (so with its front and rear one-inch tabs 3" and 4" from the edge of the floor mat respectively - Figure 1a).

NOTE:

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

Using self-drilling screws **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 screws **EL** attach ECU **EN** to the inner face of bracket **EM**. Have the wire connections to the rear of the machine (Figure 1b).



Figure 1: Example pre-drilling check

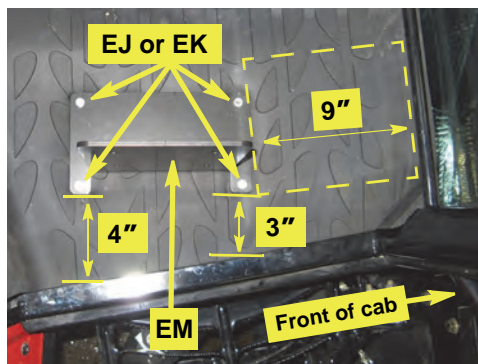


Figure 1a: ECU mounting bracket installed

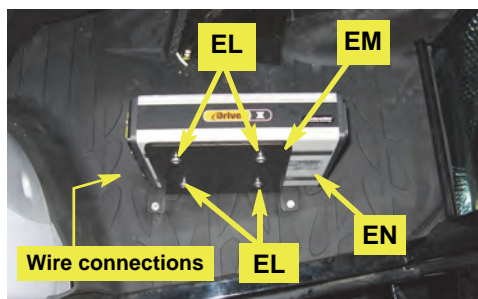


Figure 1b: ECU installed on mounting bracket

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 **EP** 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).

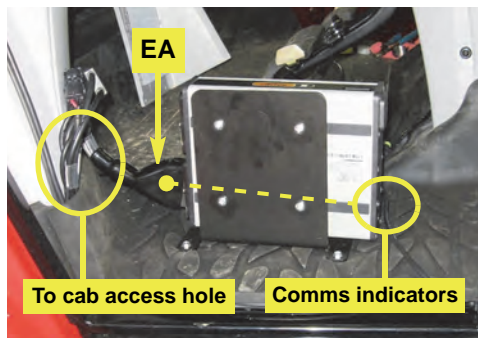


Figure 2a: Main cable connected to ECU

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 **K** (see *eDriveX*, step 5f, page 11).
- c. 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 switch EG to OFF before connecting EA to the battery at step f below.*

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

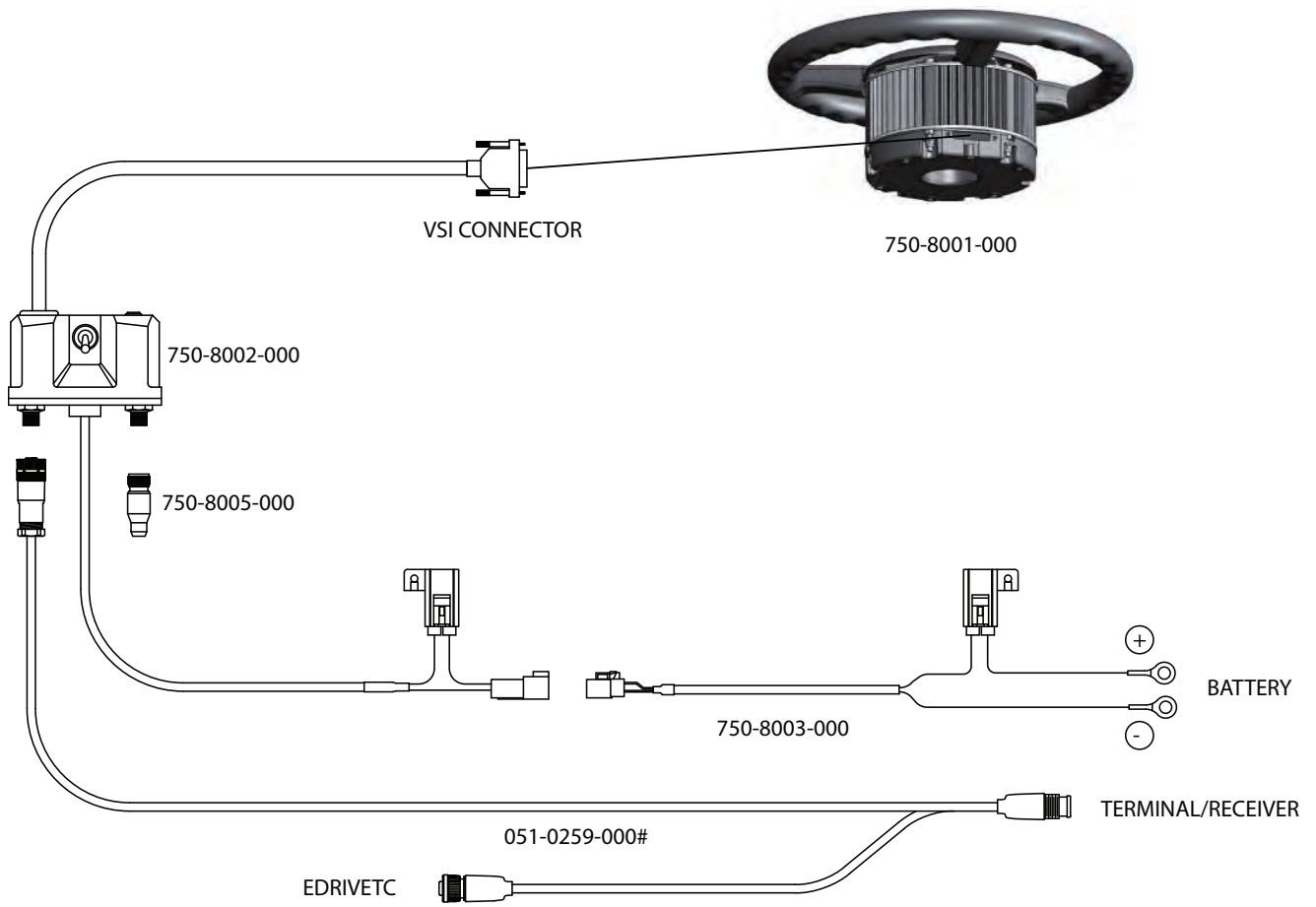
⚠ WARNING:

Ensure you have connected main cable EA to the ECU (step 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.

- f. Route **EA**'s power cable to the machine's 12V battery and connect it.

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Appendix A - eDriveTC VSi Connections



Appendix B - eDriveX VSi Connections

