eDrive VSi Installation Guide

Kit: eDTC / eDX VSi - JDR

P/Ns 911-1023-000 (TC), 911-4020-000 (eDX)

Fits John Deere ‘R’ and ‘RT’ Tractor Models:

7, 8 & 9 ‘R’			8 & 9 ‘RT’	
7200R	8225R	9360R	8295RT	9460RT
7215R	8235R	9410R	8310RT	9510RT
7230R	8245R	9460R	8320RT	9560RT
7260R	8260R	9510R	8335RT	
7280R	8270R	9560R	8345RT	
	8285R		8360RT	
	8295R			
	8310R			
	8320R			
	8335R			
	8345R			
	8360R			

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.

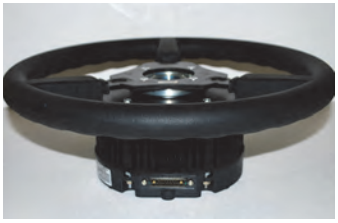
Before attempting to install any of the components:

- 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

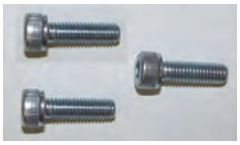
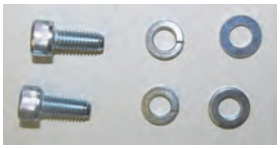
Before you perform any drilling, cutting or fastening, ensure that no other machine components, such as electrical wiring, will be damaged. Failure to follow this warning may cause physical injury and/or damage to the machine.

Kit Contents - eDriveTC and eDriveX

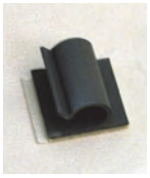
Unpack the supplied kit and identify the required parts as shown. Kit items, which are applicable to both VSi/eDriveTC and VSi/eDriveX installations, are referenced as A, B, C etc. with the item references being used in the step-by-step installation sections of this guide.

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 16 hex head (Attach D to B)	
F		1	Special nut, M20 (Attach VSi steering wheel A to steering shaft)	
G		1	Anti-rotation bracket	
H		2 2 2	Bolt, M6 x 16, hex head Washer, spring Washer, flat (Attach G to VSi steering wheel A)	
I		1	Steering wheel center cover	
J		1	Column telescoping actuator	
K		2	Column telescoping actuator plate (Place on machine's telescopic actuator shaft - before and after J)	
L		1	Column telescoping actuator center cap	

Kit Contents - eDriveTC and eDriveX *(continued)*

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
M	750-8003-000	1	VSi power cable	
N	750-8002-000	1	VSi junction box	
O		1	Junction box mounting bracket	
P	750-8005-000	1	CAN bus terminator	
Q		1	Junction box comms cable clip	

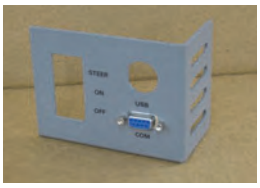
Kit Contents - eDriveTC Only

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	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 **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: Items EB to EF are not used in this installation				
EG	054-0117-000	1	Power switch (Mount using EGa if necessary)	
EGa	726-1093-000	1	Switch bracket (Mount EG, if necessary)	
EH	051-0166-000	1	CAN-PWR cable (Use 054-0123 to connect to battery)	
EI	054-0123-000	1	Battery terminal cable (Connect CAN-PWR cable 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) mount 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).

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

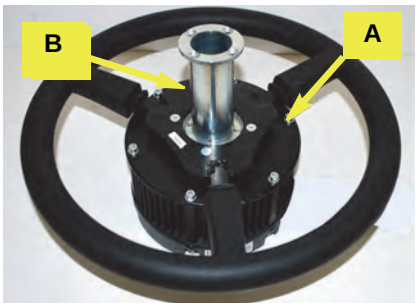


Figure 1a: Installing the shaft adapter

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).

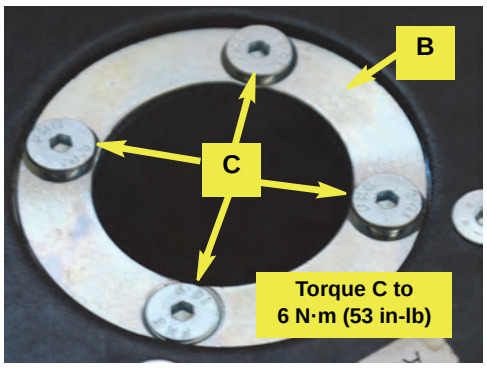


Figure 1b: Shaft adapter secured

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).

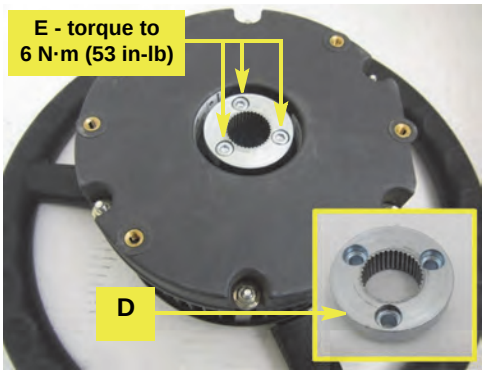


Figure 1c with inset: Spline adapter installed on shaft adapter

2. Install the anti-rotation bracket.

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

With the communications (comms) port toward you (at the 7 o'clock position as viewed), use hardware **H** (do not tighten yet) to attach anti-rotation bracket **G** to the steering wheel assembly at the 12 o'clock position. Mount **G** with its padded tabs upward and inward (so bending away from the center of the wheel assembly - Figure 2 and inset).

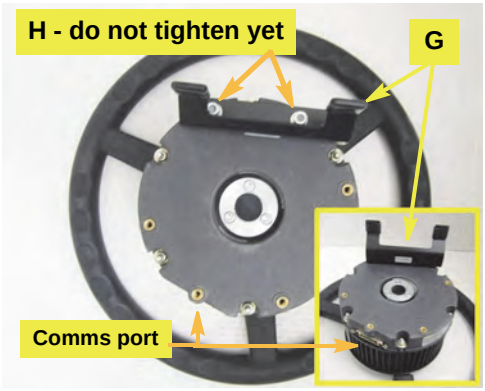


Figure 2 with inset: Anti-rotation bracket installed

3. Remove the machine's steering wheel.

Remove:

- The steering wheel center cap (Figure 3-a inset) and the actuator assembly retaining nut (you will reuse this - Figure 3-a).
- The upper telescoping actuator plate and the telescoping actuator (3-b).
- The lower telescoping actuator plate (3-c inset) and the steering wheel retaining nut (you will not reuse this - 3-c).
- The steering wheel (3-d).

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

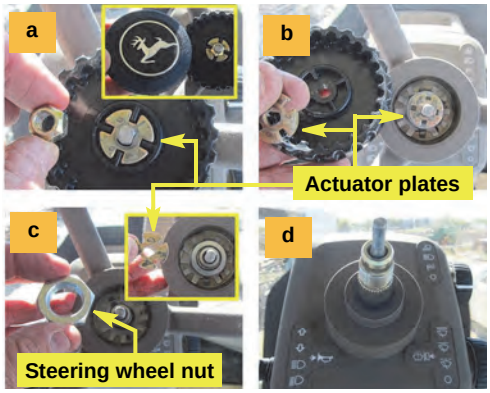


Figure 3 (a-d): Removing the steering wheel

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

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

b. Install steering wheel center cover **I** then, using special nut **F**, secure the steering wheel (Figure 4, right inset).

NOTE: *Torque special nut F to the machine manufacturer's specification.*

***1.** At step c, set anti-rotation bracket G in the center of the near face of the steering column, that is, with the maximum space between the outer edge of each padded tab and its adjacent column corner.*

***2.** 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).

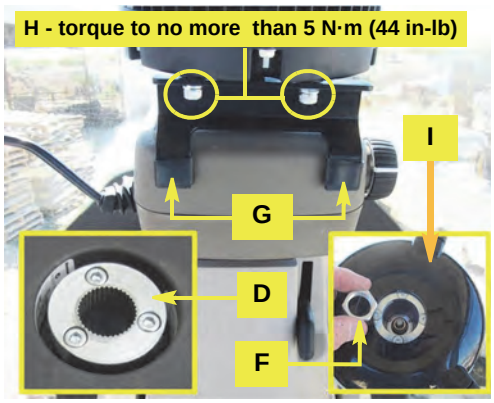


Figure 4 with insets: Installing the steering wheel and anti-rotation bracket

c. Push anti-rotation bracket **G**—centered—firmly against the steering column and secure it. Torque **H** to **5 N·m (44 in-lb)** (Figure 4).

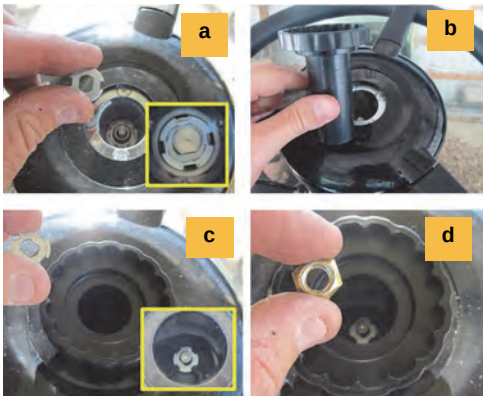


Figure 5a (a-d): Installing the column telescoping acutator

5. Install the column telescoping actuator.

a. Install (Figure 5a):

- One of the actuator plates **K** on the actuator extension of the steering shaft (5a-a).
- The column telescoping actuator **J** (5a-b).
- The second actuator plate **K** (5a-c).
- The original actuator assembly retaining nut you removed at step 3 (5a-d and Figure 5b inset).

b. Install the column telescoping actuator center cap **L** (Figure 5b). Telescoping is now enabled.

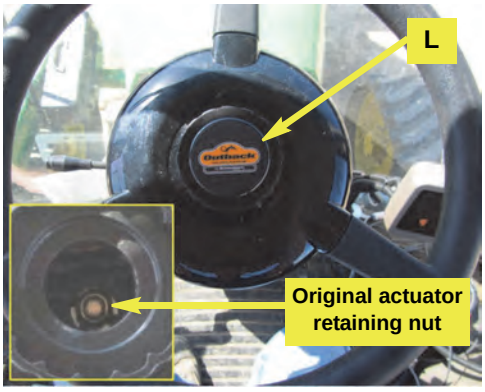


Figure 5b with inset: Actuator retaining nut and center cap installed

6. 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 **M** from the battery into the cab to where you will mount the junction box **N** at steps 6b and 6c. Ensure the cable will not be a trip hazard. Connect the ring terminals to the battery (not shown).

When mounting junction box N in the following steps, ensure that its ON/OFF switch is within easy reach of the operator. See Figure 6a. 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 **O** (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 **N** into place on its bracket **O** (neither shown) then connect **N**'s 15-pin connector cable to the communications port on the steering wheel assembly (Figure 6b). Use clip **Q** suitably (not shown).

d. Connect the gray connector of the power cable **M** **(**routed into the cab at step 6a) to the gray cable from the junction box **N** (Figure 6c).

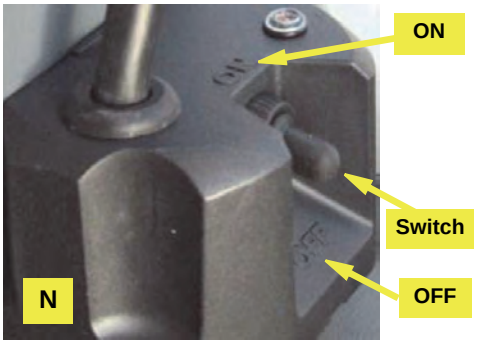


Figure 6a: Junction box ON/OFF switch - within easy reach of the operator

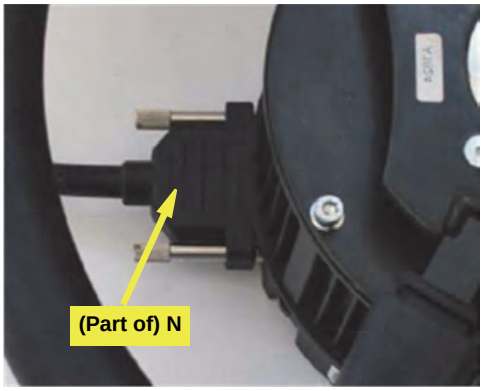


Figure 6b: Junction box comms cable connected to steering wheel assembly

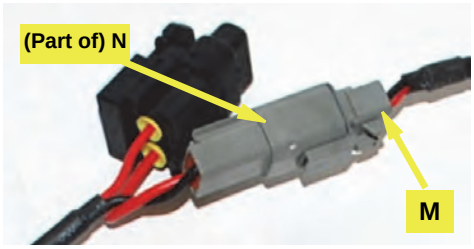


Figure 6c: Power cable to junction box cable

6. 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 **N**. Connect the CAN bus terminator **P** to the other threaded connector on the junction box (Figure 6d).

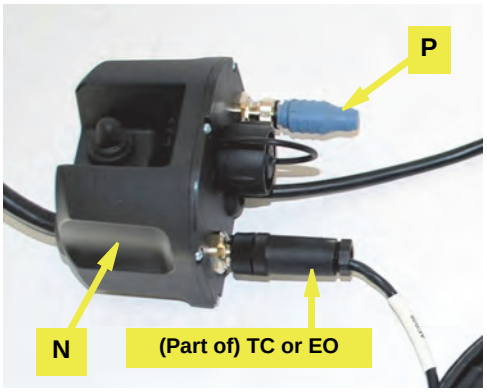


Figure 6d: CAN harness and terminator connected to junction box

f. ***eDriveTC:*** Connect, according to the cable labeling, the two other connectors on CAN cable **TC** to the EDRIVETC and the TERMINAL/RECEIVER (Figure 6e-i).

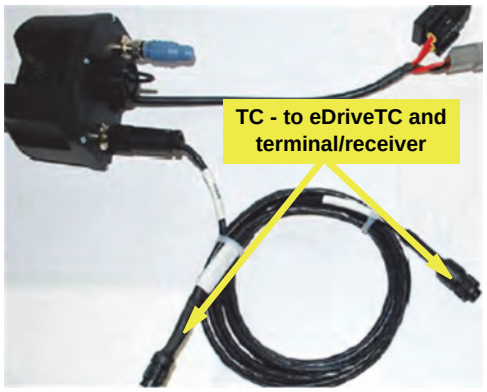


Figure 6e-i: CAN cables to eDriveTC and terminal/receiver

eDriveX: Connect CAN cable **EO** to the eDriveX main cable's (EA) branch cable labeled 'STEERING CONTROLLER' (Figure 6e-ii).

Figure 6e-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.

NOTE: *1. Although measurements and floor mat references provide an accurate guide, ensure that when installed, the ECU 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.*

2. The ECU, for all models, will be located on the left side of the cab between the driver's seat and the jump seat. The exact location, though, varies slightly for row crop models and 4WD, articulated models. Install your ECU appropriately.

a. Locate the ECU mounting location to the left of the driver's seat on the cab floor (Figures 1a to 1c).

Facing the one-inch tabs of bracket **EM** toward the driver's seat, align the bracket parallel to the machine's fore/aft centerline as follows:

Row crop models: With the outer edges of the one-inch tabs 3″ from the base of the seat frame *(*Figure 1a)

4WD, articulated models: With the outer edges of the one-inch tabs 1″ from the base of the seat frame *(*Figure 1b).

All models: With **EM**'s front edge 3″ from the floor's 'stop block' (Figures 1a and 1b).

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

b. Using self-drilling screws **EJ (**or **EK)** (depending on the thickness of the floor—see warning above) fasten bracket **EM** to the cab floor (Figure 1b). Use a small level (not shown) to check the level of the

bracket and adjust accordingly.

c. Using screws **EL,** attach ECU **EN** to the outer face of bracket **EM**. Face the wire connections to the rear of the machine (so power and comms indicators at the bottom - Figure 1c, 4WD installation shown).

Figure 1: Example pre-drilling check

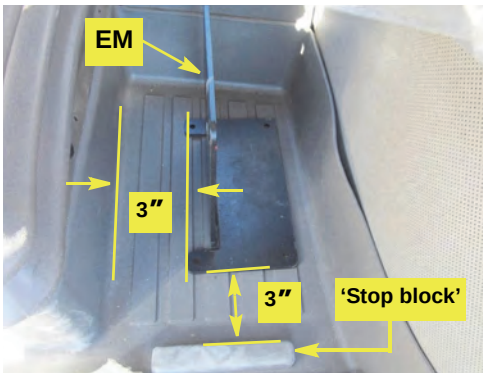


Figure 1a: ECU bracket installation (row crop)

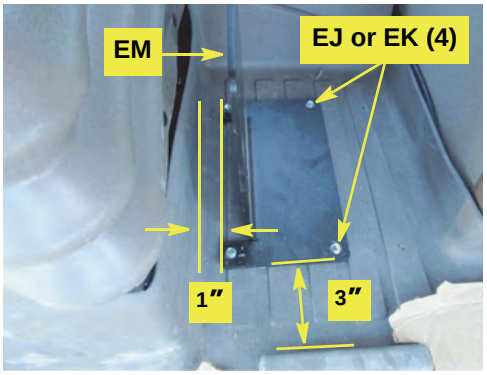


Figure 1b: ECU bracket installed (4WD)

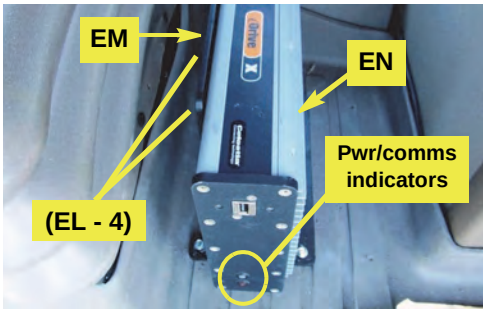


Figure 1c: ECU installed (4WD)

2. Assemble and install the cables.

a. 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.

b. Connect cable **EA** to 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 lower socket in this installation (Figure 2 - 4WD installation shown).

c. Attach cable **EA**’s connector labeled ‘STEERING CONTROLLER’ to cable **EO** connected to the VSi junction box **N** (see ***eDriveX*** step 6f, page 11).

d. 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 g below.*

e. 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.

f. 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) 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.

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

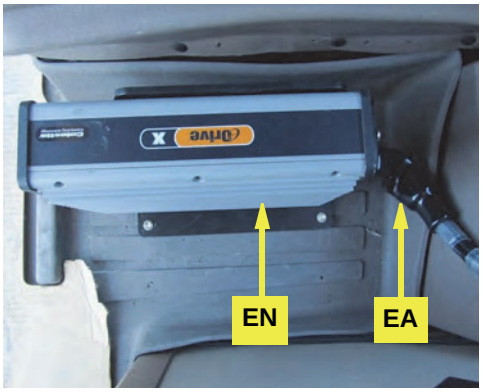
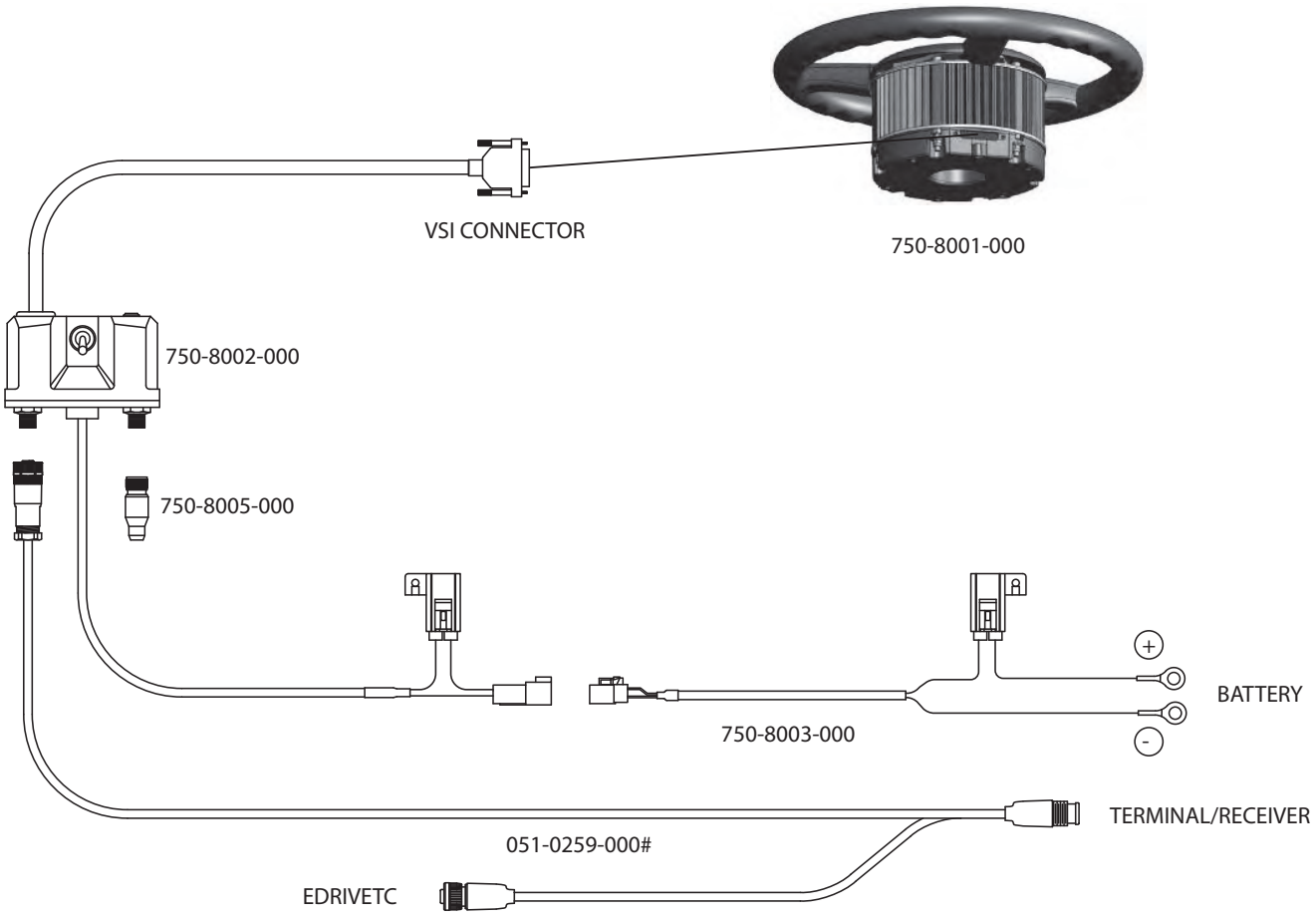


Figure 2: Main cable connected to ECU (4WD)

Appendix A - eDriveTC VSi Connections



Appendix B - eDriveX VSi Connections