

# eDrive VSi Installation Guide

**Kit: eDTC / eDX VSi - JD7010**

**P/Ns 911-1016-000 (TC), 911-4013-000 (eDX)**

## Fits John Deere Tractor Models:


6100	6110	6120	6130 *
6200	6210	6220	6230 *
6300	6310	6320	6330 *
6400	6410	6420	6430 *
		6520	
6600	6610	6620	
6800	6810	6820	
	6910	6920	
			7130 *
7200	7210 †	7220	7230 *
		7320	7330 *
7400	7410 †	7420	7430 *
	7510 †		
7600	7610 †		
7700	7710 †		
7800	7810 †		

*\* Standard cab models only*

*† Side (fender well) mounted ECU (all others are floor mounted ECU - see steps starting on page 12)*



## 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 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.

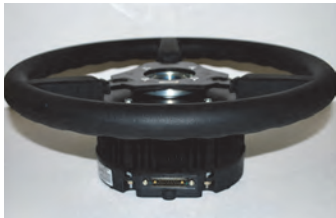

Before attempting to install any of the components:

- 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)	

## Kit Contents - eDriveTC and eDriveX (continued)

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
C		4	Screw, M5 x 10 flat head socket cap screws  (Attach B to A)	
D		1	Spline adaptor  (Use with B)	
E		3	Screw, M5 x 16 hex head  (Attach D to B)	
F		1	Special nut, M20  (Attach A to steering shaft - replaces machine's steering wheel nut)	
G		1	Anti-rotation bracket  (Attach to A using H)	
H		2	Bolt, M6 x 16, hex head	
		2	Washer, spring	
		2	Washer, flat	
			(Attach G to 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)	

## Kit Contents - eDriveTC and eDriveX (continued)

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
L		1	Column telescoping actuator center cap	
M	750-8003-000	1	VSi power cable	
N	750-8002-000	1	VSi junction box	
O		1	Junction box (N) 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**.






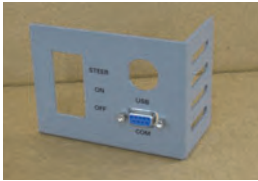

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
	051-0166-000	1	CAN-PWR cable  (Use 054-0123 to connect to battery)	
	054-0123-000	1	Battery terminal cable  (Connect CAN-PWR cable to battery)	
	806-1007-03A	1	eDriveTC ECU	
	054-0044-003	1	TC Power cable	
TC	051-0259-000	1	CAN bus harness - TC	

## 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 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	
<b>Note: Cables EB to EF are not used in this installation</b>				
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  (Use ER to mount if necessary)	
<b>Bag E1 of 1 contains EJ, EK, EL and EM</b>				
EJ	675-1197-000	4	Screw, self-drilling, #10-16 x 2-1/2", Hex, ZP  (Attach EN to cab floor - or use EK)	
EK	675-1192-000	4	Screw, self-drilling, #10-16 x 3", Hex, ZP  (Attach EN to cab floor - or use EJ)	
EL	675-2020-000	4	Bolt, 1/4NC x 2", Gr5, ZP	
	676-1053-000	4	Washer, flat - 1/4NC, ZP	
	678-1034-000	4	Nut, lock - 1/4NC, ZP  (Attach EO to machine)	

## Kit Contents - eDriveX only (continued)

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
EM	675-1188-000	4	Screw, mach, M6 x 12mm, PPH, ZP  (Attach EP to EN or EO)	
EN	640-0091-000	1	ECU (EP) mounting bracket (floor mounting)  (All models except 7n10 models - see EO)	
EO	640-0090-000	1	ECU (EP) mounting bracket (side mounting)  (7n10 models - see EN)	
EP	806-1031-000	1	eDriveX ECU	
EQ	051-0316-000	1	CAN bus harness - eDX	
ER	726-1093-000	1	Switch bracket  (Mount EI, if necessary)	
ES	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 15 or “Appendix B - eDriveX VSi Connections” on page 16).

## 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).

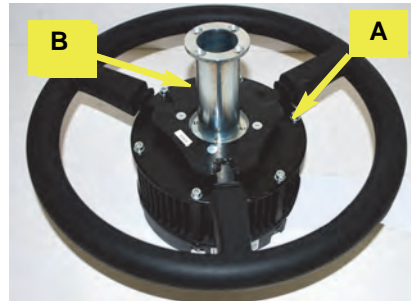


Figure 1a: Installing the shaft adapter



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

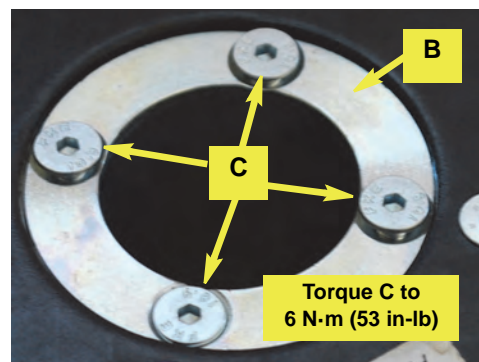


Figure 1b: Securing the shaft adapter

- 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).

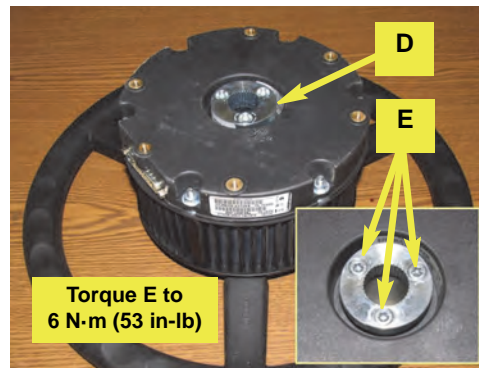


Figure 1c with inset: Spline adapter installed on shaft adapter

## 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 (**G**) firmly against the steering column once installed.

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

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

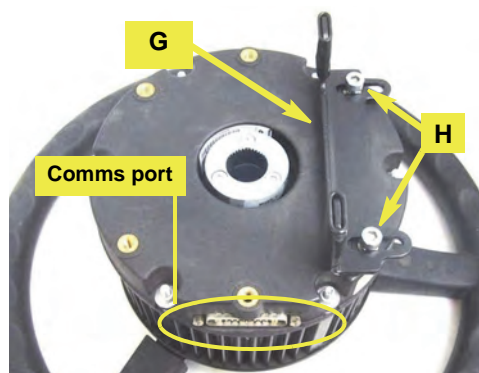


Figure 2: Anti-rotation bracket installed



### 3. Remove the machine's steering wheel.

Remove:

- The steering wheel center cap (Figure 3-a) and the telescopic actuator nut (you will reuse this - Figure 3-a, inset).
- The upper telescopic actuator plate and actuator (3-b) and the lower actuator plate (3-b and inset).
- The steering wheel retaining nut and lock tab ring (you will not reuse these - 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.*

### 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 top inset), then, carefully aligning the splines with those on the steering shaft, slide the steering wheel assembly onto the shaft—anti-rotation bracket to the rear, comms port to the right (Figure 4).

**NOTE:**

*At the next step, torque special nut **F** to the machine manufacturer's specification.*

- b. Using special nut **F**, secure the steering wheel (Figure 4, bottom inset).

**NOTE:**

*At the next step, tighten hardware **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).*

- c. Press anti-rotation bracket **G** firmly against the back of the steering column and tighten hardware **H** (Figure 4).

### 5. Install the column telescoping actuator.

a. Install:

- The steering wheel center cover **I** over the steering wheel hub (Figure 5a-a).
- One of the actuator plates **K** on the actuator extension of the steering shaft (5a-b).
- The column telescoping actuator **J** (5a-c).
- The second actuator plate **K** (5a-d).

- b. Using the original actuator assembly retaining nut you removed at step 3 (Figure 3-a), secure the column telescoping actuator assembly (Figure 5b inset).

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

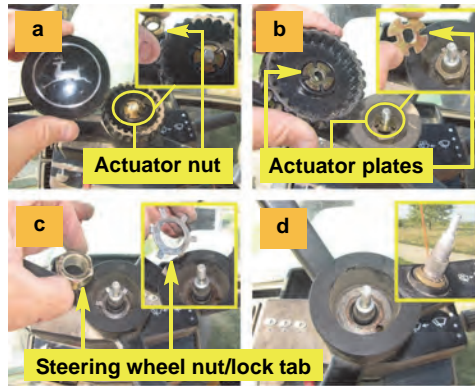


Figure 3 (a-d): Removing the steering wheel

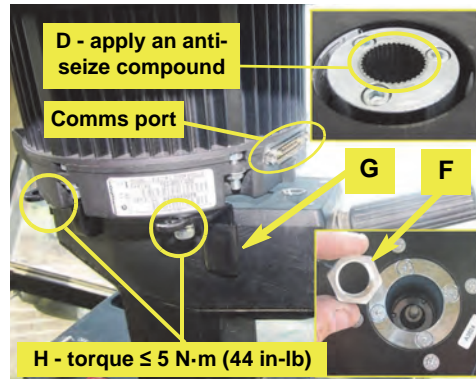


Figure 4 with insets: Steering wheel and anti-rotation bracket installation

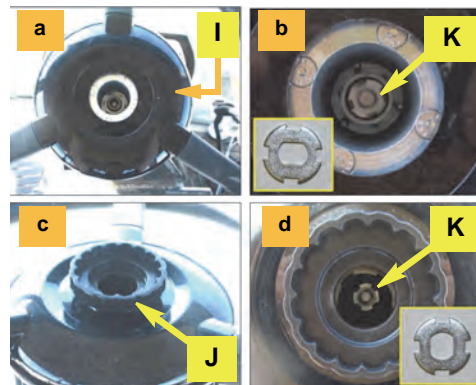


Figure 5a (a-d): Column telescoping actuator installation

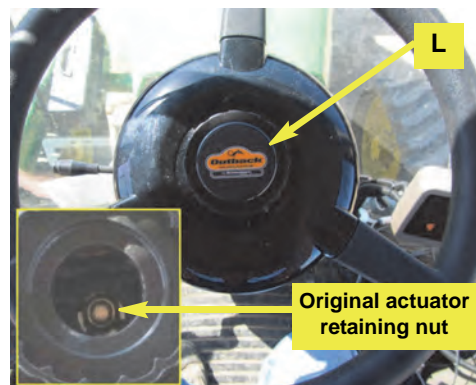


Figure 5b with inset: Actuator retaining nut and center cap installed

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

**NOTE:** Before continuing, refer again to “Appendix A - eDriveTC VSi Connections” on page 15 or “Appendix B - eDriveX VSi Connections” on page 16.

- 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 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 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).

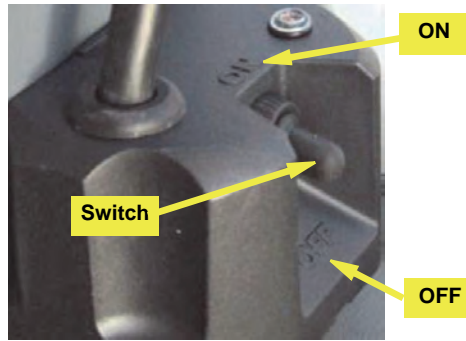


Figure 6a: Junction box ON/OFF switch - within easy reach of the operator

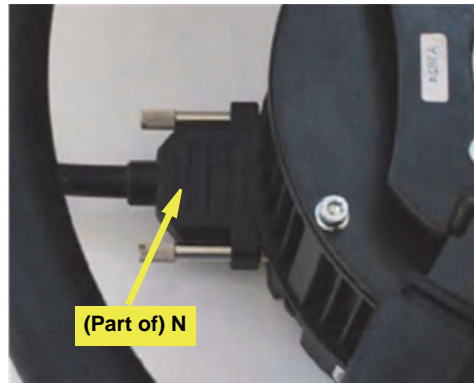


Figure 6b: Junction box comms cable connected to steering wheel assembly



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 **EQ** (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).

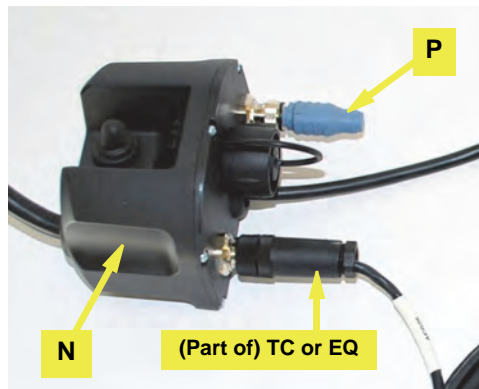


Figure 6d: CAN harness and terminator connected to junction box

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 **EQ** to the eDriveX main cable's (EA) branch cable labelled '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 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:**

(i) Although measurements and floor mat references provide an accurate guide to locating the ECU mounting bracket, ensure that when installed it will be perpendicular to the front of the machine (that is, parallel to the machine’s fore/aft center-line). Also, use a small level to set the bracket as level as possible - see steps following.

(ii) The 7n10 models require a different ECU installation from the other models. Follow steps a-c for non-7n10 models, steps d-i (on page 13) for 7n10 models.

a. **Non-7n10 models:** Place ECU mounting bracket **EN** on the cab floor to the left of the driver’s seat. Facing the one-inch tabs of bracket **EN** away from the seat, place the bracket with (Figure 1a):

- 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.

Using hardware **EJ** or **EK** (depending on the thickness of the floor - 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 (Figure 1a).

b. Using hardware **EM** (two visible) attach the ECU **EP** to the inner face of bracket **EN**. Have the wire connections toward the rear, the power and communications indicators at the top (Figure 1b- left image).

c. Connect main cable **EA** to the ECU **EP** 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 upper socket in this installation (Figure 1b - right image).



Figure 1: Example pre-drilling check

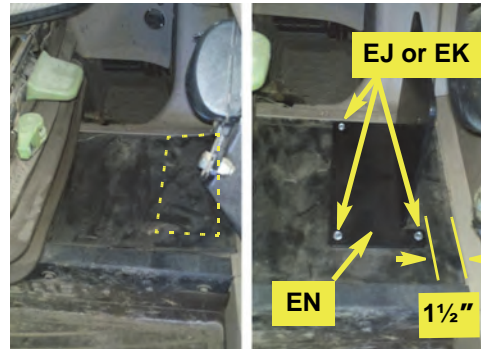


Figure 1a: ECU mounting bracket location (left) and installed (right)

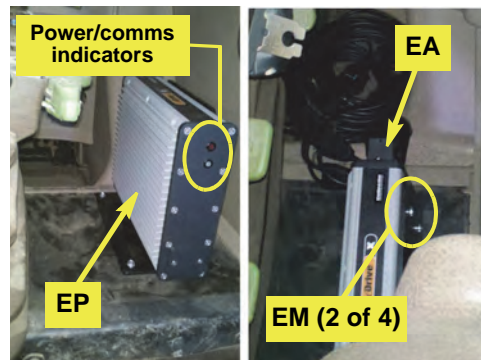


Figure 1b: ECU installed (left), main cable connected (right)

1. **Install the ECU (continued).**

- d. **7n10 models:** You measure, mark and drill the ECU bracket mounting holes from inside the left rear fender well using the ECU mounting bracket as a template after measuring and drilling the first hole.
- e. On the inner wall of the left rear fender well, measure and mark a point 11" from the bottom of the cab frame and 26" from the rear of the fender well (X). (Note: You can use a square or two vertical lines to get a 90° angle for the 26" measurement - Figure 1c). Drill a 1/4" hole.
- f. Temporarily hold the bottom left hole of ECU bracket **EO** at the hole you just made (X) and mark and drill three more holes at bottom right, top center and top right of **EO** (Figure 1d).
- g. Using hardware **EM** (not visible) attach the ECU **EP** to **EO**.

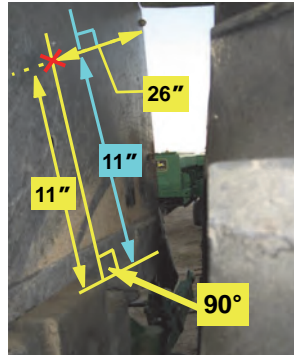


Figure 1c: Marking and drilling for the ECU mounting bracket in the fender well

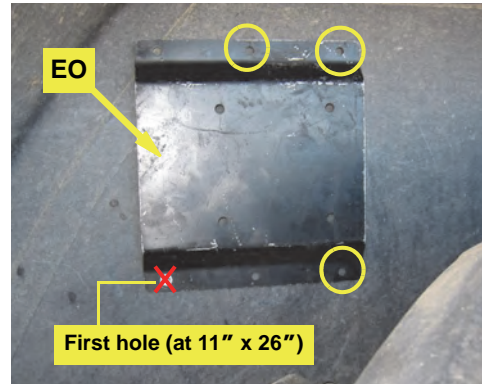


Figure 1d: Using ECU bracket as template

- h. Using hardware **EL** attach the ECU/bracket assembly to the right fender well inside the cab. Have the wire connections toward the rear, the power/communications indicators at the top (Figure 1e).

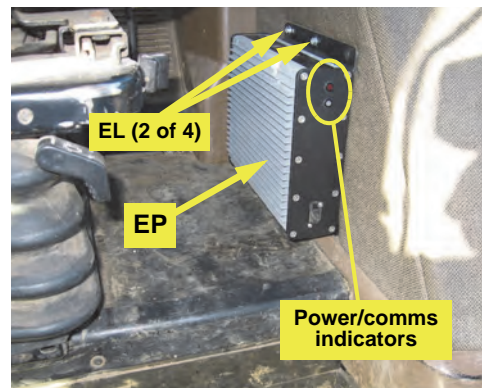


Figure 1e: Installed ECU/bracket

- i. Connect main cable **EA** to the ECU **EP** 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 upper socket in this installation (Figure 1f).

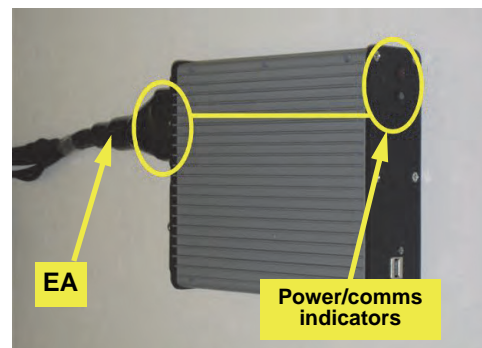


Figure 1f: ECU main cable connected

2. **Assemble and install the cables (all models).**

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 16. Use cable ties **ES** as required.

- a. Attach cable **EA**'s connector labeled ‘STEERING CONTROLLER’ to cable **EQ** connected to the VSi junction box **N** (see *eDriveX*, step 6f, page 11).
- b. 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 **ER** 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 d below.*

- c. 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.

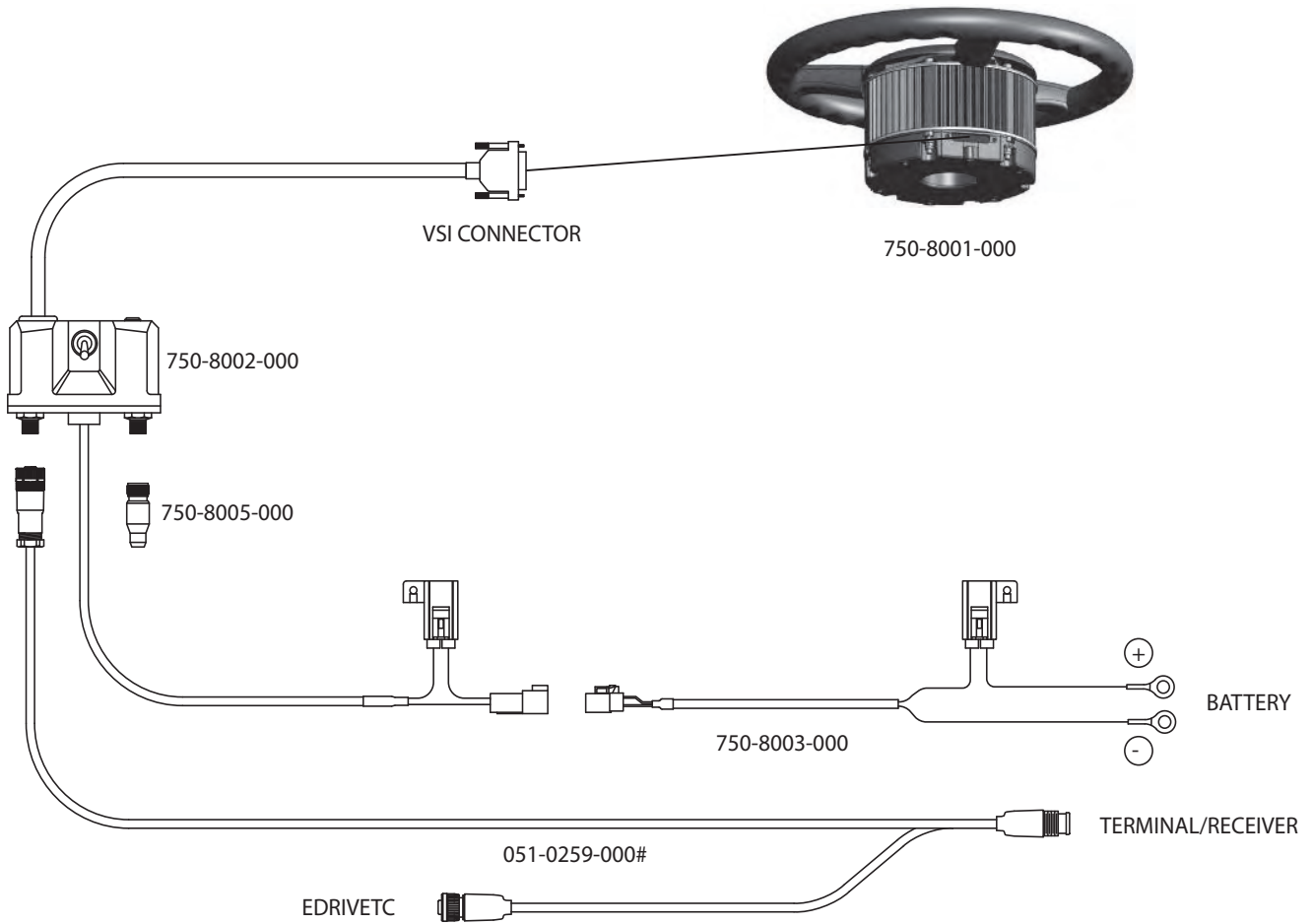
**⚠ WARNING:**

*Ensure you have connected main cable EA to the ECU (step 1c, page 12 or 6i, page 13) 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.*

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

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# Appendix A - eDriveTC VSi Connections



# Appendix B - eDriveX VSi Connections

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