

# eDrive VSi Installation Guide

**Kit: eDTC / eDX VSi - L700**

**P/Ns 911-1028-000 (TC), 911-4025-000 (eDX)**

## Fits Lexion Combine Models:

|     |     |     |     |
|-----|-----|-----|-----|
| 460 | 510 | 670 | 730 |
| 470 | 520 |     | 740 |
| 480 | 530 |     | 750 |
|     | 540 |     | 760 |
|     | 550 |     | 770 |
|     | 560 |     |     |
|     | 570 |     |     |
|     | 580 |     |     |
|     | 600 |     |     |



**Note:** The ECU installation for 700 models is slightly different from that for all the other models. The guide makes it clear which instructions to follow (on pages 15 and 16).

## 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 AgJunction's 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.

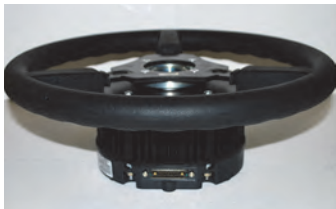
Before attempting to install any of the components:

- 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

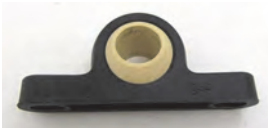
Before you perform any drilling, cutting or fastening, ensure that no other machine components, such as electrical wiring, will be damaged. Failure to follow this warning may cause physical injury and/or damage to the machine.

### Kit Contents - eDriveTC and eDriveX

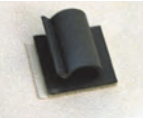
Unpack the supplied kit and identify the required parts as shown. Kit items, which are applicable to both VSi/eDriveTC and VSi/eDriveX installations, are referenced as A, B, C etc. with the item references being used in the step-by-step installation sections of this guide.

| REF | PART NUMBER  | QTY | DESCRIPTION                                                    | PHOTOGRAPH                                                                            |
|-----|--------------|-----|----------------------------------------------------------------|---------------------------------------------------------------------------------------|
| A   | 750-8001-000 | 1   | VSi steering wheel                                             |  |
| B   |              | 1   | Shaft adapter<br>(Use in A)                                    |  |
| C   |              | 4   | Screw, M5 x 10 flat head socket cap screws<br>(Attach B to A)  |  |
| D   |              | 1   | Anti-rotation (a/r) bracket<br>(Attach to A using E, mounts F) |  |

## Kit Contents - eDriveTC and eDriveX *(continued)*

| REF | PART NUMBER | QTY      | DESCRIPTION                                                                                  | PHOTOGRAPH                                                                            |
|-----|-------------|----------|----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| E   |             | 2        | Bolt                                                                                         |    |
|     |             | 2        | Washer, spring                                                                               |                                                                                       |
|     |             | 2        | Washer, flat                                                                                 |                                                                                       |
|     |             |          | (Mount D on A)                                                                               |                                                                                       |
| F   |             | 1        | Anti-rotation (a/r) T-bar<br><br>(Attach to D using G)                                       |    |
| G   |             | 2 (of 7) | Nut, M6 nylock, flanged, ZP<br><br>(Attach F to D)                                           |    |
| H   |             | 1        | Linchpin<br><br>(Retain F)                                                                   |    |
| I   |             | 1        | Anti-rotation (a/r) bracket<br><br>(Mount K)                                                 |   |
| J   |             | 3        | Screw, M6 x 70, ZP                                                                           |  |
|     |             | 3        | Washer, flat, ZP                                                                             |                                                                                       |
|     |             | 3 (of 7) | Nut, M6 nylock, flanged, ZP                                                                  |                                                                                       |
|     |             |          | (Mount I on column, and K on I)                                                              |                                                                                       |
| K   |             | 1        | Anti-rotation (a/r) bracket<br><br>(Mount on I, mounts L)                                    |  |
| L   |             | 1        | Pillow block assembly<br><br>(Attach to K using M)                                           |  |
| M   |             | 2 (of 7) | Nut, M6 nylock, flanged, ZP<br><br>(Attach L to K)                                           |  |
| N   |             | 1        | Special nut, M18<br><br>(Attach A to steering shaft - replaces machine's steering wheel nut) |  |

## Kit Contents - eDriveTC and eDriveX (continued)

| REF | PART NUMBER  | QTY | DESCRIPTION                                                                       | PHOTOGRAPH                                                                            |
|-----|--------------|-----|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| O   |              | 1   | Steering wheel center cover                                                       |    |
| P   |              | 1   | Column telescoping actuator                                                       |    |
| Q   |              | 2   | Column telescoping actuator plate<br>(Place on steering shaft before and after P) |    |
| R   |              | 1   | Column telescoping actuator center cap                                            |    |
| S   | 750-8003-000 | 1   | VSi power cable                                                                   |   |
| T   | 750-8002-000 | 1   | VSi junction box                                                                  |  |
| U   |              | 1   | Junction box mounting bracket                                                     |  |
| V   | 750-8005-000 | 1   | CAN bus terminator                                                                |  |
| W   |              | 1   | Junction box comms cable clip                                                     |  |

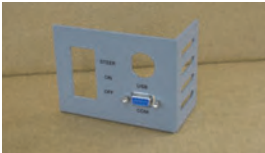
## Kit Contents - eDriveTC Only

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 on the installation of the other items, refer to “Installing the eDriveTC” in Chapter 2 of the **Outback eDrive User Guide**.

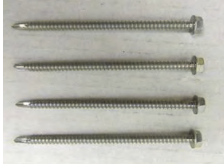
| REF | PART NUMBER  | QTY | DESCRIPTION                                                 | PHOTOGRAPH                                                                            |
|-----|--------------|-----|-------------------------------------------------------------|---------------------------------------------------------------------------------------|
|     | 051-0166-000 | 1   | CAN-PWR cable<br><br>(Use 054-0123 to connect to battery)   |    |
|     | 054-0123-000 | 1   | Battery terminal cable<br><br>(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 - 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: Items EB to EF are not used in this installation</b> |               |     |                                                          |                                                                                       |
| EG                                                            | 054-0117-000  | 1   | Power switch<br><br>(Use EGa to mount if necessary)      |    |
| EGa                                                           | 726-1093-000  | 1   | Switch bracket<br><br>(Mount EG, if necessary)           |   |
| EH                                                            | 051-0166-000  | 1   | CAN-PWR cable<br><br>(Use with EI to connect to battery) |  |
| EI                                                            | 054-0123-000  | 1   | Battery terminal cable<br><br>(Connect EH to battery)    |  |
| EJ                                                            | 640-0091-000  | 1   | Mounting bracket<br><br>(Mount EK)                       |  |
| EK                                                            | 806-1031-000  | 1   | ECU, eDriveX                                             |  |

## Kit Contents - eDriveX only (*continued*)

| REF                                       | PART NUMBER  | QTY | DESCRIPTION                                                                                       | PHOTOGRAPH                                                                            |
|-------------------------------------------|--------------|-----|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>Bag E1 of 1 contains EL, EM and EN</b> |              |     |                                                                                                   |                                                                                       |
| EL                                        | 675-1286-000 | 4   | Screw, self-drilling, #10-16 x 3", hex, ZP<br><br>(Attach EJ to cab floor, all except 700 models) |    |
| EM                                        | 675-1192-000 | 4   | Screw, self-drilling, #10-16 x 4", hex, ZP<br><br>(Attach EJ to cab floor, 700 models)            |    |
| EN                                        | 675-1188-000 | 4   | Screw, mach, M6 x 12mm, PPH, ZP<br><br>(Attach EK to EJ)                                          |    |
| EO                                        | 051-0316-000 | 1   | CAN bus harness, eDriveX                                                                          |   |
| EP                                        | 677-2002     | 20  | Tie straps, 7" 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.

- 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, tighten the screws to the specified torque only. **DO NOT OVERTIGHTEN - DAMAGE MAY OCCUR.**

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



When completing step c, ensure that you (i) use only the bolts provided and (ii) use the washers provided.

- Turn the steering wheel assembly over and set the comms port toward you. Using bolts **E**, attach anti-rotation bracket **D**, studs outward, to the steering wheel assembly, parallel to the comms port. Torque the screws to **8 N·m (71 in-lb)** (Figure 1c).
- Using nuts **G**, loosely attach T-bar **F** to bracket **D** (Figure 1d).

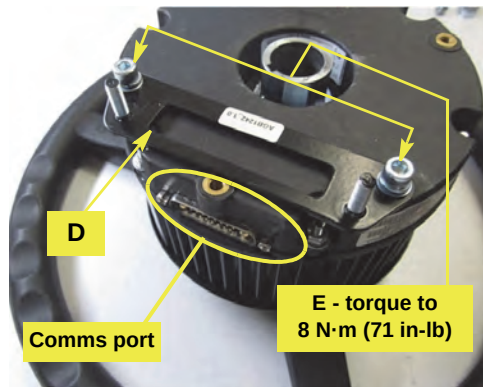


Figure 1c: Anti-rotation T-bar bracket installed

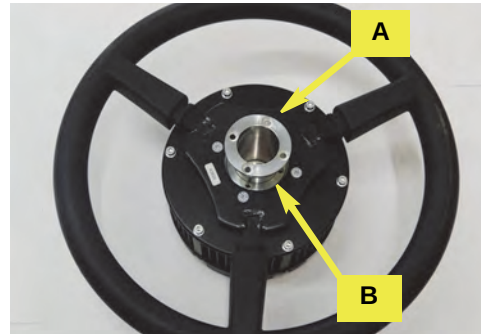


Figure 1a: Installing the shaft adapter

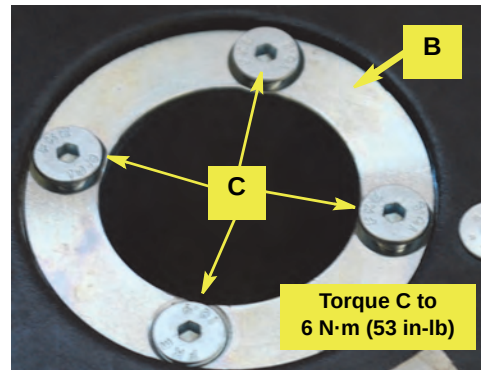


Figure 1b: Securing the shaft adapter

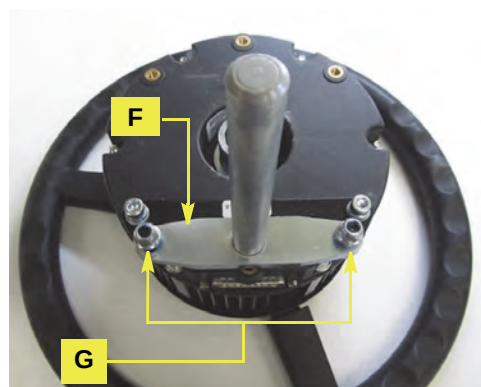


Figure 1d: Anti-rotation T-bar installed

## 2. Prepare the anti-rotation bracket assembly.

Install hardware **J** through anti-rotation (a/r) bracket **I**, mounting a/r bracket **K** at the closed end of **I**. **Do not tighten yet** (Figure 2).

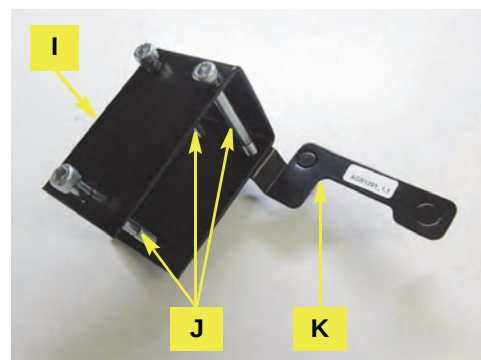


Figure 2: Anti-rotation brackets assembled



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

Remove:

- The center cap from the telescoping actuator (Figure 3-a).
- The actuator nut (you will reuse this) and washer (3-b inset) and the telescoping actuator (3-b).
- The steering wheel nut and washer (you will not reuse these).
- The steering wheel (3-c and 3-d). Remove the rubber boot (refitting the boot is optional).

**NOTE:**

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

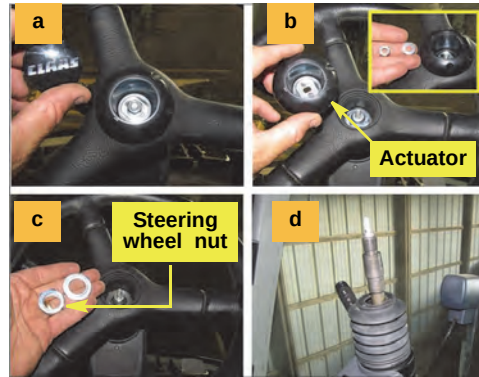


Figure 3 (a-d): Preparing the steering column

### 4. Install the anti-rotation bracket assembly.

- Slide the anti-rotation bracket assembly **I/K** from step 2 over the turn signal lever, set it on the square section of the console and secure it (Figure 4a).
- Using nuts **M**, loosely install pillow block **L** on bracket **K** (Figure 4b).



Figure 4a: Anti-rotation assembly installed

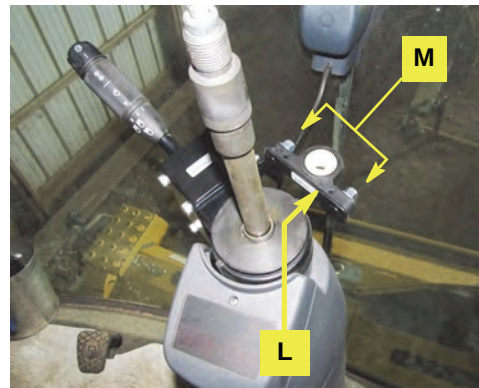


Figure 4b: Pillow block installed

### 5. Install the steering wheel assembly.

- Apply a small amount of an anti-seize compound (not supplied) to the inner surface of shaft adapter **B** (Figure 5, top inset), then, carefully aligning its keyway with the key in the steering shaft, slide the steering wheel assembly onto the shaft while guiding T-bar **F** through the pillow block bushing. Insert and lock linchpin **H** (Figure 5 bottom right inset).

Using special nut **N**, secure the steering wheel (Figure 5 bottom left inset).

**NOTE:**

*Torque special nut **N** to the machine manufacturer's specification.*

- Center the shaft of T-bar **F** and pillow block **L** for smooth operation then tighten nuts **G** and **M** (torque **M** to 8 N·m [71 in-lb]) (Figure 5).

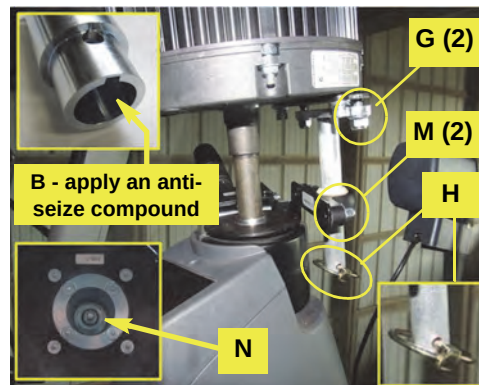


Figure 5 with insets: Steering wheel assembly installed

## 6. Install the column telescoping actuator.

Install:

- One of the actuator plates **Q** on the actuator extension of the steering shaft (Figure 6-a).
- The steering wheel center cover **O** over the steering wheel hub and the column telescopic actuator **P** in the wheel assembly (6-b).
- The second actuator plate **Q** (6-c, left) and the original actuator retaining nut you removed at step 3-a (6-c, right).
- The column telescoping actuator center cap **R** (6-d). Telescoping movement is now enabled.

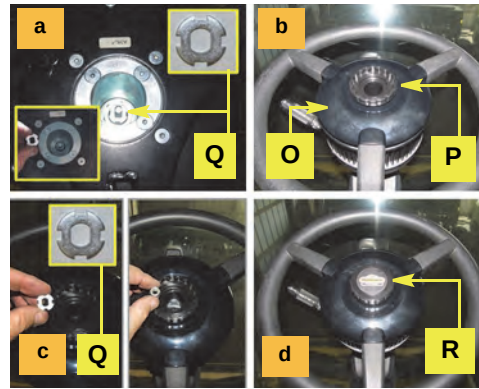


Figure 6 (a-d): Column telescoping actuator installation

## 7. 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 **S** from the battery into the cab to where you will mount the junction box **T** at steps 7b and 7c. Ensure the cable will not be a trip hazard. Connect the ring terminals to the battery (not shown).



When mounting junction box **T** in the following steps, ensure that the ON/OFF switch on the junction box is within easy reach of the operator. See Figure 7a. 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 **U** (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 **T** into place on its bracket **U** (neither shown) then connect **T**'s 15-pin connector cable to the communications port on the steering wheel assembly (Figure 7b). Use clip **W** suitably (not shown).

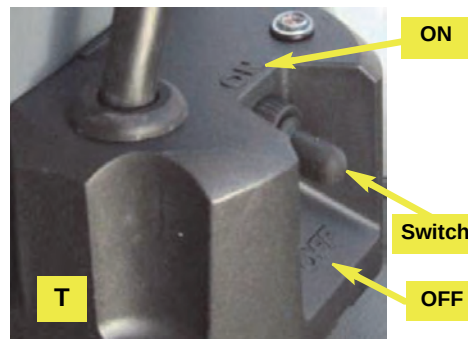


Figure 7a: Junction box ON/OFF switch - within easy reach of the operator

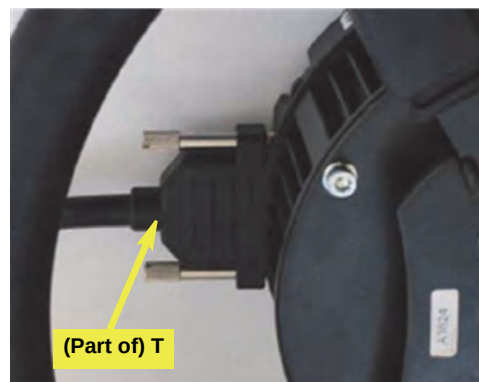


Figure 7b: Junction box comms cable connected to steering wheel assembly

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

- d. Connect the gray connector of the power cable **S** (routed into the cab at step 7a) to the gray cable from the junction box **T** (Figure 7c).

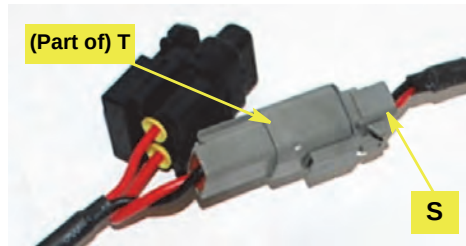


Figure 7c: Power cable to junction box cable

- 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 **T**. Connect the CAN bus terminator **V** to the other threaded connector on the junction box (Figure 7d).

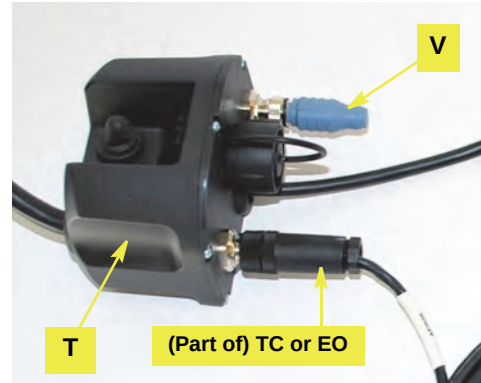


Figure 7d: CAN harness and terminator connected to junction box

- f. **eDriveTC:** Connect the two other connectors on CAN cable **TC** to the 'eDrive TC' (as labeled) and the terminal/receiver (Figure 7e-i).



Figure 7e-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 7e-ii - you will install EA in the next section).



Figure 7e-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 under-floor cabling compartment.

## 1. Install the ECU.

## NOTE:

Ensure that when installed, the bracket will be, for 400, 500 and 600 models, perpendicular to the front of the machine (so parallel to the machine's fore/aft centerline). For 700 models, set the bracket parallel to the front of the machine (so perpendicular to the fore/aft centerline). Use a small level to set the bracket as level as possible - see steps following.

- a. Identify the ECU mounting location to the right of the driver's seat on the cab floor (Figure 1a).

**4, 5 and 600 models:** Facing the one-inch tabs of bracket **EJ** toward the right side, place the bracket parallel with the machine's fore/aft centerline and with (Figure 1a):

- The rear edge of the bracket 5" from the raised rear edge of the floor mat.
- The outside edge of the front tab  $1\frac{3}{4}$ " from the right edge of the ribbed area of the floor mat.
- The outside edge of the rear tab  $5\frac{1}{2}$ " from the raised right edge of the floor mat (inset).

**700 models:** Facing the one-inch tabs of bracket **EJ** toward the front, place the bracket perpendicular to the machine's fore/aft centerline and with (Figure 1b):

- The front edge of the inner and outer one-inch tab  $8\frac{1}{2}$ " and  $6\frac{1}{2}$ " from the front glass respectively.
- The outer edge of the bracket  $6\frac{1}{2}$ " from the side glass (so the back edge of the bracket 2" from the front edge of the box compartment).

## NOTE:

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

- b. Using self-drilling screws **EL** (**EM** for 700s) fasten the bracket to the cab floor. Use a small level (not shown) to check the level of the bracket. Adjust accordingly (Figure 1c - 4/5/600s shown).



Figure 1: Example pre-drilling check

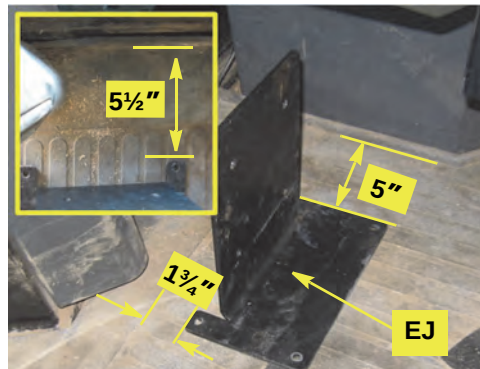


Figure 1a: (4/5/600s) ECU mounting bracket location

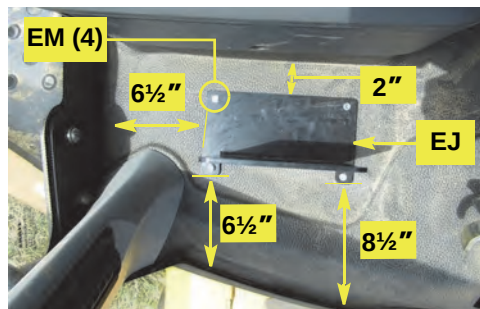


Figure 1b: (700s) ECU mounting bracket location (note bracket already screwed down [using EM]—see next step).

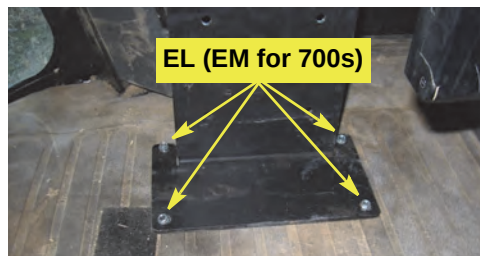


Figure 1c: (4/5/600s) ECU bracket and ECU installed (see Figure 1b for 700s)

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

- c. Using screws **EN** attach ECU **EK** to bracket **EJ**:

**400, 500 and 600 models:** Install **EK** on the inner face of bracket **EJ** (driver's side). Have the wire connections toward the rear (so the power and communications indicators at the front/bottom - Figure 1d, top pictures).

**700 models:** Install **EK** on the rear face of **EJ**. Have the wire connections outward toward the right side (so the power and communications indicators inward at the bottom - Figure 1d, bottom picture).

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 ECU **EK** using an Allen wrench to secure the cable. The **EA** connector will fit only the ECU socket that is in line with the power and communications indicators at the opposite end of the ECU—the bottom socket in both these installations (Figure 2a).
- b. Routing cables suitably, attach cable **EA**'s connector labeled 'STEERING CONTROLLER' to cable **EO** connected to the VSi junction box **T** (see **eDriveX**, step 7f, 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) 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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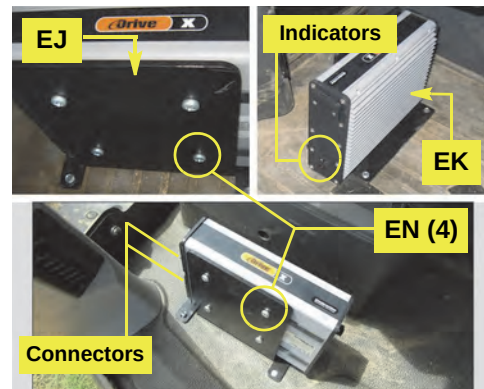
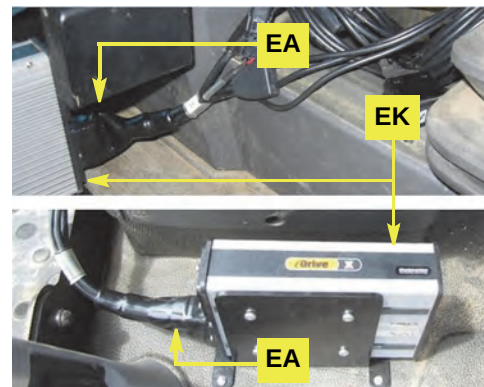


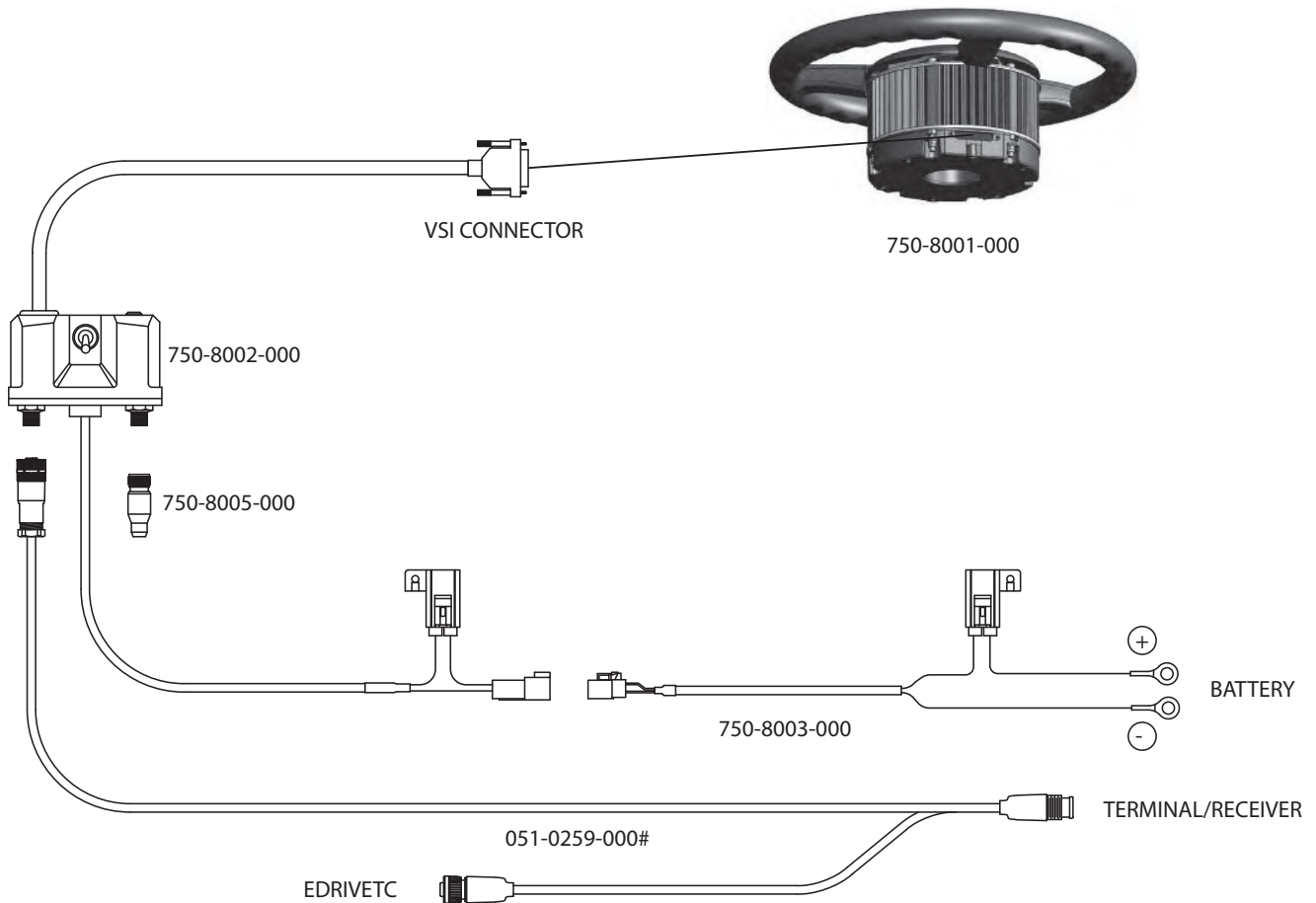
Figure 1d: Installed ECU - 4/5/600s top, 700s bottom.



Figures 2a: Main cable to ECU—4/5/600s top, 700s bottom.

## Appendix A - eDriveTC VSi Connections

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## Appendix B - eDriveX VSi Connections

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