

# eDrive VSi Installation Guide

**Kit: eDXD VSi - AGCO WR**

**P/N 911-1030-000**

## Fits Combines/Swathers:

### Gleaner

<b>R66</b>	<b>R67</b>	<b>A86</b>
<b>S67</b>	<b>S77</b>	

### Challenger


<b>660B</b>	<b>670B</b>	<b>680B</b>
<b>9740</b>	<b>9760</b>	<b>9770</b>
<b>9840</b>	<b>9860</b>	<b>9870</b>

### Massey Ferguson

<b>9695</b>	<b>9795</b>	<b>9895</b>		
<b>7280</b>	<b>7282</b>			
<b>9280 Delta</b>				
<b>9725</b>	<b>9735</b>	<b>9740</b>	<b>9760</b>	<b>9770</b>
		<b>9840</b>	<b>9860</b>	<b>9870</b>



## 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 guide covers the installation of the VSi electric steering wheel and an eDriveXD system. Every effort has been made to verify the following installation procedure. However, due to the manufacturing process outside of AgJunction's control, the installation may need some adaptation.

The items in the kits are detailed in the tables that follow 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.

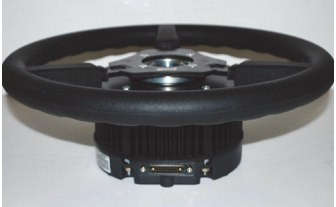
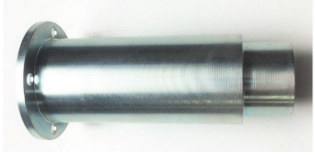

Before attempting to install any of the components:

- 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 - VSi and Parts

Unpack the supplied kit and identify the required parts as shown. Kit items 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	604-0065-000	1	Shaft adapter (Use in A)	
C	675-1300-000	4	Screw, M5 x 8 flat head socket cap screws (Attach B to A)	

**Kit Contents - VSi and parts (continued)**

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
D	640-1025-000	1	Anti-rotation bracket (Attach to A using E)	
E	675-1302-000	2	Bolt, M6 x14, ZP	
	678-1137-000	2	Split (spring) washer, M6 (see also I)	
	678-1136-000	2	Plain washer, M6 (Attach D to A)	
F			<b>Anti-rotation 'T' bar assembly</b>	
	640-1005-000	1	Anti-rotation (a/r) 'T' bar	
	676-1089-000	2	Nuts, M6 x 1.0 ZP (see also J) (Attach to D)	
G			<b>Saddle clamp assembly ('saddle clamp')</b>	
	675-2083-000	1	'U' bolt	
	675-0200-000	1	Saddle	
	676-1034-000	2	Nuts, [M6 x 1.0 ZP] (Attach to steering column)	
H	640-1040-000	1	Pillow block mounting bracket (Attach to G using I)	
I			<b>Pillow block bracket mounting hardware</b>	
	680-1141-000	2	Spacer	
	678-1137-000	2	Split (spring) washer, M6 (see also E)	
	675-1306-000	2	Bolt, M6 x 40 (Attach H to G - through column covers)	
J			<b>Pillow block assembly</b>	
	676-1089-000	2	Nuts, M6 x 1.0 ZP (see also F)	
	750-0169-000	1	Pillow block (Mount on H's studs)	
K	676-1093-000	1	Special nut, M18  (Attach A to steering shaft - replaces machine's steering wheel nut)	

## Kit Contents - VSi and parts *(continued)*

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
L	676-0037-000	1	Linchpin (Retains F)	
M	750-8049-000#	1	Steering wheel center cover	
N	750-8047-000#	1	Column telescoping actuator	
O	750-8050-000#	2	Column telescoping actuator plate (Place on steering shaft before and after N)	
P	750-8048-000#	1	Column telescoping actuator center cap	
Q	750-8003-000	1	VSi power cable	
R	750-8002-000	1	VSi junction box	
S		1	Junction box mounting bracket	
T	750-8005-000	1	CAN bus terminator	
U		1	Junction box comms cable clip	

## Kit Contents - eDriveXD

Unpack the supplied kit and identify the required parts as shown. Kit items, which are applicable to VSi/eDXD installations only, are referenced as EA, EG, EJ etc.

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
EA	051-0377-000#	1	eDXD main cable	
EB	051-0364-000#	1	Power cable Connects EA to battery	
EC	051-0397-000#	1	Steering remote engage cable Engages auto-steering system by button push	
ED	054-0168-000#	1	Three-position power switch Install appropriately using EE if required	
EE	640-0180-000#	1	Switch mounting bracket Mount ED if applicable/required	
EF	054-0204-000#	1	Plus+1/eDXD adapter cable	
EG	051-0316-000	1	CAN bus harness (The 'CAN cable')	

## Kit Contents - eDriveXD (continued)

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
EH	640-0091-000	1	ECU (EI) mounting bracket	
EI	806-1046-000	1	ECU, eDXD	
<b>Bag E1 of 1 contains EJ and EK</b>				
EJ1	675-1197-000	4	Screw, self-drilling, #10-16 x 2-1/2", hex, ZP (Attach EH to cab floor - or use EJ2)	
EJ2	675-1192-000	4	Screw, self-drilling, #10-16 x 3", hex, ZP (Attach EH to cab floor - or use EJ1)	
EK	675-1188-000	4	Screw, mach, M6 x 12mm, PPH, ZP (Attach EI to EH)	
EL	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 - VSi and Parts” 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 - eDXD VSi Connections” on page 14).

**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 step 1b, 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 steering wheel **A**. Torque the screws to **6 N·m (53 in-lb)** (Figure 1b).

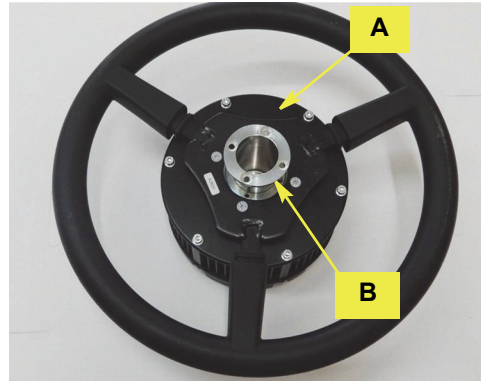


Figure 1a: Installing the shaft adapter

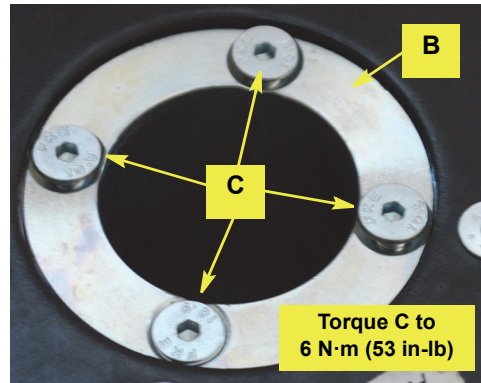


Figure 1b: Securing the shaft adapter

**2. Install the anti-rotation bracket and T bar.**



When completing this step, ensure that you (i) use only the bolts (E) provided, (ii) use the washers provided and (iii) tighten the bolts only until the spring washers are compressed, that is, to no more than the specified torque. **DO NOT OVERTIGHTEN OR OMIT WASHERS - DAMAGE WILL OCCUR.**

- a. Turn the steering wheel assembly over. Set bracket **D** on the base of **A**, its studs upward and outward (to the left in Figure 2), so that its ‘**V**’ aligns with the center of the comms port/socket. Secure **D** with bolts **E** (with washers); torque **E** to **8 N·m (71 in-lb)** (Figure 2, left image).
- b. Mount the a/r ‘**T**’ bar **F** on the studs of **D** (Figure 2, right image).

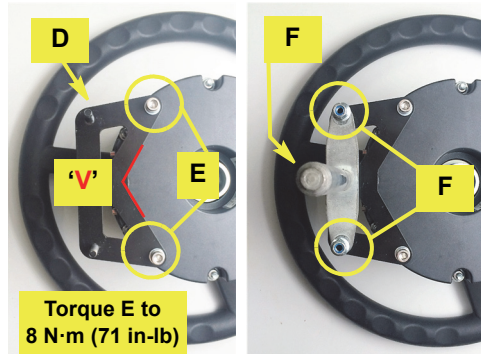


Figure 2: Anti-rotation bracket and ‘T’ bar installed. Comms port/socket is in line with bracket’s ‘V’.

3. **Remove the telescoping actuator and steering wheel, access the steering column.**

- a. Carefully lever the steering wheel center cap from the telescoping actuator, then remove the retaining nut (which you will reuse) and the actuator (Figure 3a, left).

**NOTE:** *The steering wheel is mounted on the tapered steering shaft over a single-cut key/keyway and will need to be removed using a suitable puller. Consult your equipment dealer if you are unsure of the correct procedure for removing the steering wheel at the next step.*

- b. Remove the steering wheel nut and, using a suitable puller, remove the steering wheel (Figure 3a, right).
- c. Remove the four screws on the ignition key side of the steering column cover and, *taking particular care of the released center switches panel*, separate the two halves of the column cover (Figure 3b).

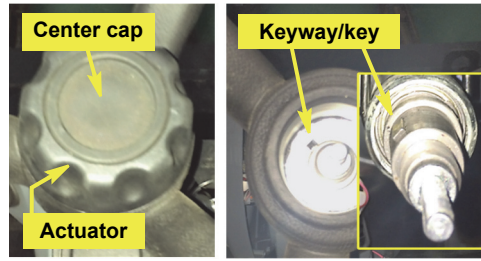


Figure 3a with inset: Removing the actuator and steering wheel

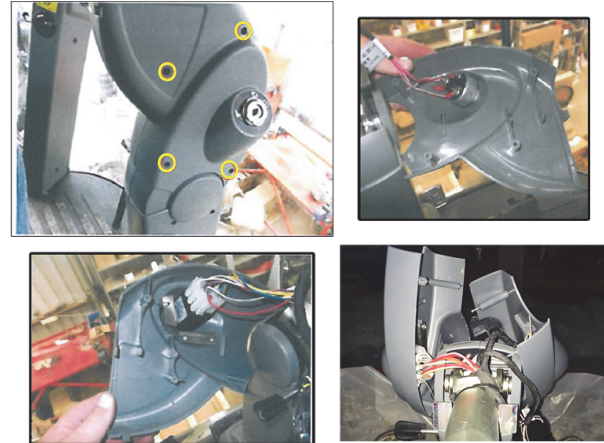


Figure 3b: Accessing the steering column

4. **Install the anti-rotation devices.**

**NOTE:** *Important: In the following steps you will install the saddle clamp on the steering column (Figure 4a) and cut an opening in the steering column covers (Figure 4b). You need to ensure that:*

- (i) *The saddle clamp does not foul any part of the inside of the covers when they are refitted.*
- (ii) *The opening you cut out in the covers will enable the 'external' anti-rotation bracket to be bolted to the 'internal' saddle clamp. In other words, the horizontal centerline of the cut opening needs to be at (or close to) the horizontal centerline of the saddle clamp.*

*Although exact measurements are given, you need to ensure conditions (i) and (ii) above are met.*

- a. Install the saddle clamp **G** on the exposed steering shaft with the U-bolt/saddle nuts at the front. Set the assembly with the horizontal center of the U-bolt 55mm from the top of the steering column. Use each column cover to ensure the assembly will not foul any part of the covers when they are refitted.
- b. Temporarily refit (to mark) then remove (to cut) the covers as required for the next step.
- c. (Figure 4b). Mark and cut a rectangular opening in the front of the two covers. The opening needs to be 40mm wide (20mm from each cover, that is 20mm to each side of the covers' inner front edges) and 20mm deep. The top edge should be 45mm from the top of the covers and the bottom edge 65mm from the top of the covers.
- d. Permanently refit the covers.

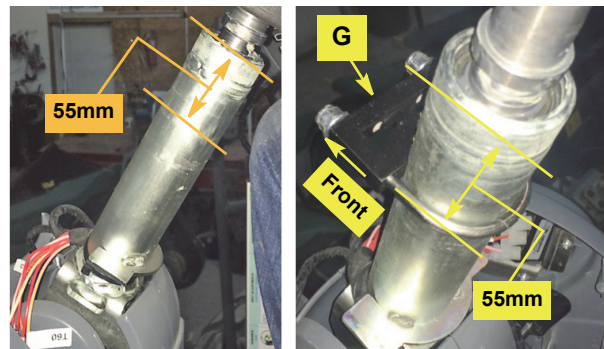


Figure 4a: Installing the saddle clamp

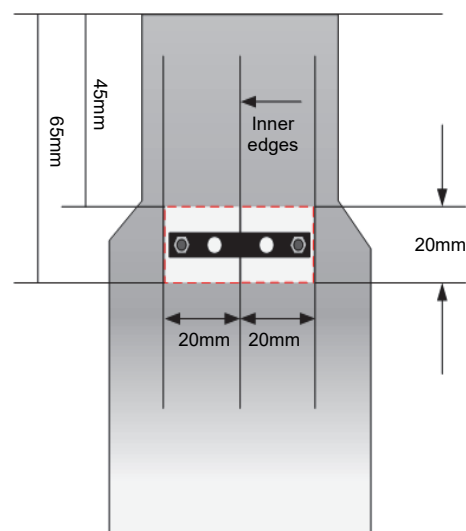


Figure 4b: Marking and cutting the steering column covers



4. **Install the anti-rotation devices (continued).**

**NOTE:**

*At the next step—fastening the anti-rotation bracket through the cut opening in the covers—take care not to drop the spacers inside the covers.*

- e. Using hardware **I**, attach **H** to the saddle of the saddle clamp **G** inside the covers. Tighten the bolts to **8 N·m (71 in-lb)** (Figure 4c).
- f. Using the nuts provided, loosely attach pillow block **J** to the studs on bracket **H** (Figure 5a, left images).

5. **Install the VSi steering wheel assembly.**

- a. Apply a small amount of an anti-seize compound (not supplied) to the inside of shaft adapter **B** then, aligning (i) the adapter's keyway with the key in the steering shaft, and (ii) the shaft of the 'T' bar with the pillow block bushing, slide the steering wheel assembly onto the shaft. Insert and lock linchpin **L** (Figure 5a, right image - note that the assembly is shown without the column covers refitted).
- b. Center the pillow block bushing on the 'T' bar shaft and secure the pillow block assembly.
- c. Using special nut **K**, secure the steering wheel (not shown).

**NOTE:**

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

6. **Install the column telescoping actuator.**

- a. Install:
  - The steering wheel center cover **M** over the steering wheel hub (Figure 6a-a)
  - One of the actuator plates **O** on the actuator extension of the steering shaft (6a-b)
  - The column telescoping actuator **N** (6a-c)
  - The second actuator plate **O** (6a-d)
- b. Using the original actuator assembly retaining nut you removed at step 3a, secure the column telescoping actuator assembly (Figure 6b inset).
- c. Install the column telescoping actuator center cap **P** (Figure 6b). Telescoping movement is now enabled.

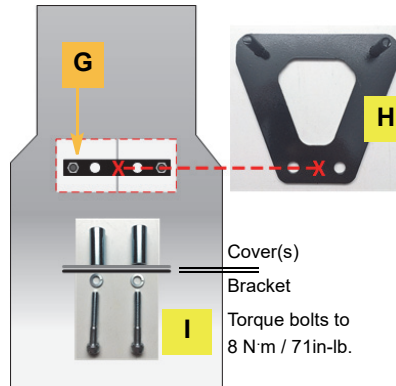


Figure 4c: Anti-rotation bracket installation

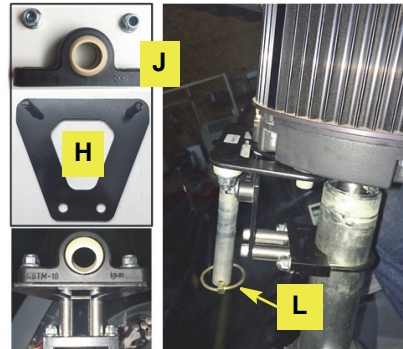


Figure 5a: Installing the pillow block and steering wheel with anti-rotation 'T' bar

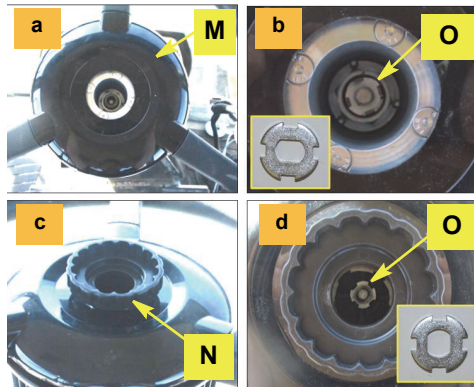


Figure 6a (a-d): Column telescoping actuator installation

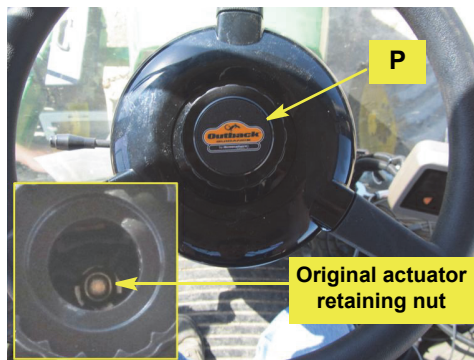


Figure 6b with inset: Actuator retaining nut and center cap installed

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

**NOTE:** Before continuing, refer again to “Appendix - eDXD VSi Connections” on page 14.

- a. Route the power supply cable **Q** from the battery into the cab to where you will mount the junction box **R** 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 **R** in the following steps, ensure that its ON/OFF switch 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 **S** (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 **R** into place on its bracket **S** (neither shown) then connect **R**’s 15-pin connector cable to the communications port on the steering wheel assembly (Figure 7b). Use clip **U** suitably (not shown).

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

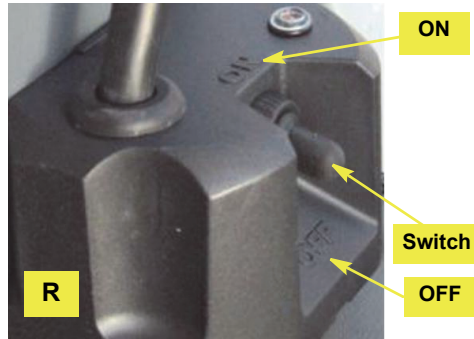


Figure 7a: Junction box ON/OFF switch - within easy reach of the operator

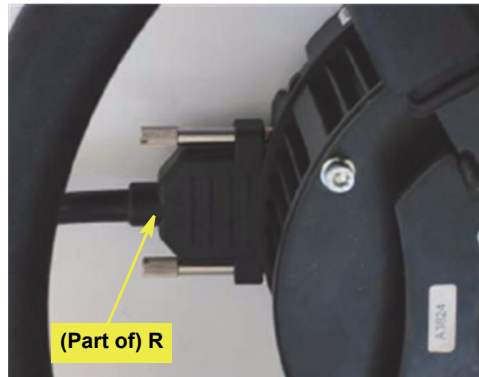


Figure 7b: Junction box comms cable connected to steering wheel assembly

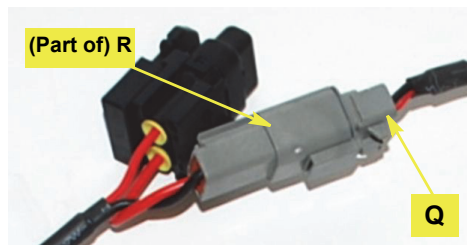


Figure 7c: Power cable to junction box cable

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

e. Connect the threaded 5-pin connector on the CAN cable **EG** to either of the threaded connectors on the junction box **R**. Connect the CAN bus terminator **T** to the other threaded connector on the junction box (Figure 7d).

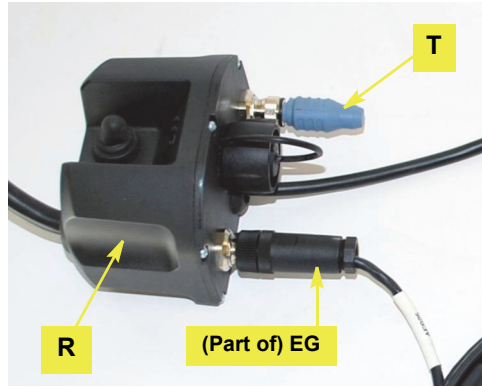


Figure 7d: CAN harness and terminator connected to junction box

f. Route CAN cable **EG** to the ECU (eDXD) in the cab (Figure 7e).

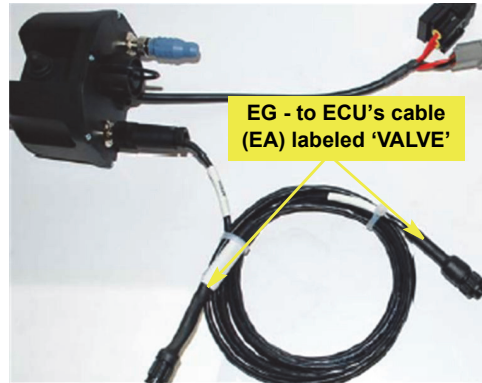


Figure 7e: CAN cable to eDXD and terminal/receiver

# Installation - Electronic Control Unit (ECU) - eDriveXD

**NOTE:**

The guidance capability of eDXD depends, in part, on the exact installation of the ECU as detailed in this section.

**WARNING:**

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.



Figure 1: Example pre-drilling check

## 1. Install the ECU.

**NOTE:**

(i) Although measurements or mat rib references provide an accurate guide, ensure that when installed, the ECU mounting bracket will be parallel to the machine's fore/aft centerline. Also, use a small level to set the bracket as level as possible - see steps following. (ii) At step 1a, use EJ1 or EJ2 according to the thickness of the mat/floor

- a. Using hardware **EJ1** or **EJ2**, install bracket **EH** to the right of the operator's seat, parallel with the machine's fore/aft centerline and with:

- Its one-inch tabs pointing away from the seat.
- Its seat-side edge 2" from the base of the seat.
- Its rear edge 1 1/2" from the front edge of the cables' connections cutout in the mat.

- b. With **EI**'s wire connector socket toward the rear, using screws **EK**, attach **EI** to **EH**.

## 2. Connect and route the cables.

- a. On a clean surface lay out all the cables and become familiar with the connections. See "Appendix - eDXD VSi Connections" on page 14. Use cable ties **EL** as required.
- b. Connect cable **EA** to the ECU **EI** (Figure 2a).
- c. Routing suitably, attach cable **EA**'s connector labeled 'VALVES' to cable **EG** (connected to the VSi junction box at step 7e, page 11) (Not shown).

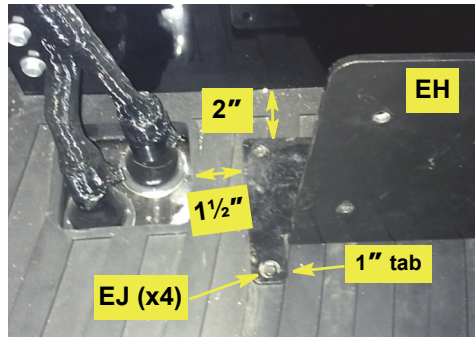


Figure 1a: Installing the ECU bracket

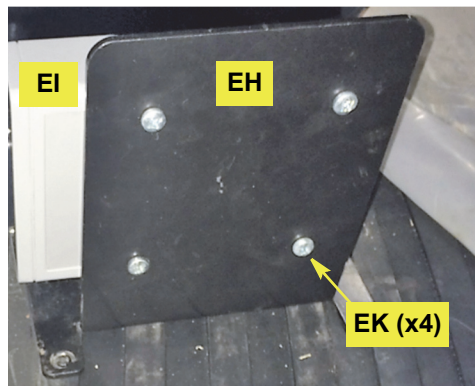


Figure 1b: Installing the ECU

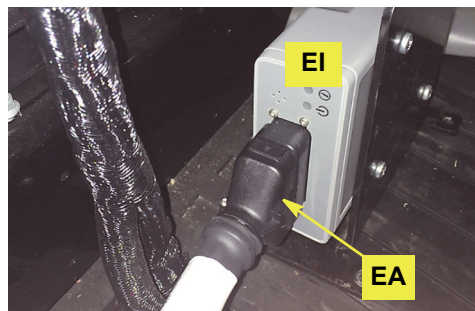


Figure 2a: Connecting ECU main cable

- d. Attach power switch **ED** to **EA**'s connector labeled 'PWR\_SWITCH'. If your machine has pop out tabs remove one and install **ED**; otherwise, use bracket **EE**, mounting it in the cab in a suitable location.

**NOTE:**

*Set switch ED to OFF before connecting EA to the battery at step g below.*

- e. On your terminal (MAX/STX) cabling, locate the connector labeled 'eDriveX' (MAX) or 'EDRIVE' (STX). Connect (either) to **EA**'s connection labeled 'TERMINAL'. Route cables in the cab so that they are clear of machine operation controls.
- f. Connect **EA**'s cable labeled 'RMT\_ENGAGE' to cable **EC**.



*Ensure you have connected main cable EA to the ECU (EI, step 2b, 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.*

- g. Connect **EA**'s cable labeled 'EXT\_POWER' to cable **EB** and **EB** to the machine's 12V battery and connect it.

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# Appendix - eDXD VSi Connections

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