

# Installation Instructions

## EZ-Pilot™ Steering System

### Case IH Tractors

- MXM 120, MXM 130, MXM 140, MXM 155, MXM 175, MXM 190
- Farmall: 85U, 95U, 105U
- JX 80U, JX 90U, JX 100U
- JX 1080U, JX 1090U, JX 1110U

### New Holland Tractors

- TM 120, TM 130, TM 140, TM 155, TM 175, TM 190
- T5040, T5050, T5060, T5070
- TL70, TL80, TL90, TL100
- TL70A, TL80A, TL90A, TL100A
- TS90, TS100, TS110, TS115

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- a description of the nonconforming Product including the model number

- an explanation of the problem.

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Trimble Europe BV  
c/o Menlo Worldwide Logistics  
Meerheide 45  
5521 DZ Eersel, NL



# Safety Information

Always follow the instructions that accompany a Warning or Caution. The information they provide is intended to minimize the risk of personal injury and/or damage to property. In particular, observe safety instructions that are presented in the following format:



**WARNING** – This alert warns of a potential hazard, which, if not avoided, can cause severe injury.

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**CAUTION** – This alert warns of a hazard or unsafe practice which, if not avoided, can cause injury or damage.

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**Note** – An absence of specific alerts does not mean that there are no safety risks involved.

## Warnings



**WARNING** – When you are working on the vehicle’s hydraulic systems, vehicle attachments that are suspended can drop. If you are working around the vehicle, you could suffer serious injury if an attachment dropped on you. To avoid this risk, lower all vehicle attachments to the ground before you begin work.

---



**WARNING** – If someone else attempts to drive the vehicle while you are working on or under it, you can suffer serious or fatal injuries. To avoid this possibility, install a lockout box on the battery terminal to prevent the battery from being reconnected, remove the key from the vehicle’s ignition switch, and attach a “Do not operate” tag in the cab.

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**WARNING** – Agricultural chemicals can pose serious health risks. If the vehicle has been used to apply agricultural chemicals, steam clean the vehicle to remove any chemical residue from the areas of the vehicle where you will be working.

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**WARNING** – Vehicle cabs can be quite high in the air. To avoid potentially serious injury through falling from this height, always use the steps and handrails, and face the vehicle, when you enter or exit it. Add the following warnings.

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**WARNING** – THE EZ-Pilot ASSISTED STEERING SYSTEM IS SOLELY INTENDED FOR AGRICULTURAL USE IN AN OPEN FIELD ENVIRONMENT WITH AGRICULTURAL VEHICLES APPROVED BY THE MANUFACTURER FOR USE WITH THE EZ-PILOT SYSTEM, AND SHOULD NOT BE USED WITH ANY OTHER TYPE OF VEHICLE OR FOR ANY OTHER PURPOSE.

Contact your local EZ-Pilot system reseller or check [www.trimble.com](http://www.trimble.com) to confirm that the EZ-Pilot system has been tested and approved by the manufacturer for use with your vehicle make and model. The EZ-Pilot system should not be installed on a vehicle not approved by the manufacturer for such use. Installation of the EZ-Pilot system on an unapproved vehicle will invalidate the product warranty.

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## Cautions



**CAUTION** – When the vehicle has been running, parts of the vehicle, including the engine and exhaust, can become extremely hot and can cause serious burns. To avoid burns, allow hot machine parts to cool before you begin working on them.

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**CAUTION** – The system installation may bring you into contact with chemical substances, such as oil, which can cause poisoning. Wash your hands thoroughly after you finish working on the system.

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**CAUTION** – Battery posts, terminals, and related accessories contain lead and lead compounds, which can cause serious illness. To avoid ingesting lead, wash your hands thoroughly after touching the battery.

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**CAUTION** – Always wear protective equipment appropriate to the job conditions and the nature of the vehicle. This includes wearing protective glasses when you use pressurized air or water, and correct protective welder's clothing when welding. Avoid wearing loose clothing or jewelry that can catch on machine parts or tools.

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**CAUTION** – Parts of the vehicle may be under pressure. To avoid injury from pressurized parts, relieve all pressure in oil, air, and water systems before you disconnect any lines, fittings, or related items. To avoid being sprayed by pressurized liquids, hold a rag over fill caps, breathers, or hose connections when you remove them. Do not use your bare hands to check for hydraulic leaks. Use a board or cardboard instead.

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- CAUTION** – Do not direct pressurized water at:
- electronic or electrical components or connectors
  - bearings
  - hydraulic seals
  - fuel injection pumps
  - any other sensitive parts or components



Set the hose pressure as low as practicable, and spray at a 45° to 90° angle. Keep the nozzle of the power washer away from the machine at the distance recommended by the manufacturer.

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- CAUTION** – To avoid malfunctions, or damage to cables:
- route cables away from areas where they may be pinched or rubbed.
  - do not alter cable lengths and connections. If you must alter the length of the power cable do not remove the fuse or fuse holder from the cable.
-



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# Introduction

## In this chapter:

- [Technical assistance](#)
- [Required components](#)
- [EZ-Pilot platform kit components](#)

This manual describes how to install the Trimble® EZ-Pilot™ assisted steering system.

Even if you have used another Global Navigation Satellite System (GNSS), such as the United States' Global Positioning System (GPS) products before, Trimble recommends that you spend some time reading this manual to learn about the special features of this product. If you are not familiar with GNSS, visit the Trimble website ([www.trimble.com](http://www.trimble.com)) for an interactive look at Trimble and GNSS.

## Technical assistance

If you have a problem and cannot find the information you need in the product documentation, contact Trimble technical support:

1. Go to the Trimble website ([www.trimble.com](http://www.trimble.com)).
2. Click the **Support & Training** link at the top of the screen, select *Support* and then select *Support A–Z list of products*.
3. Scroll to the bottom of the list.
4. Click the *submit an inquiry* link. A form appears.
5. Complete the form and then click **Send**.

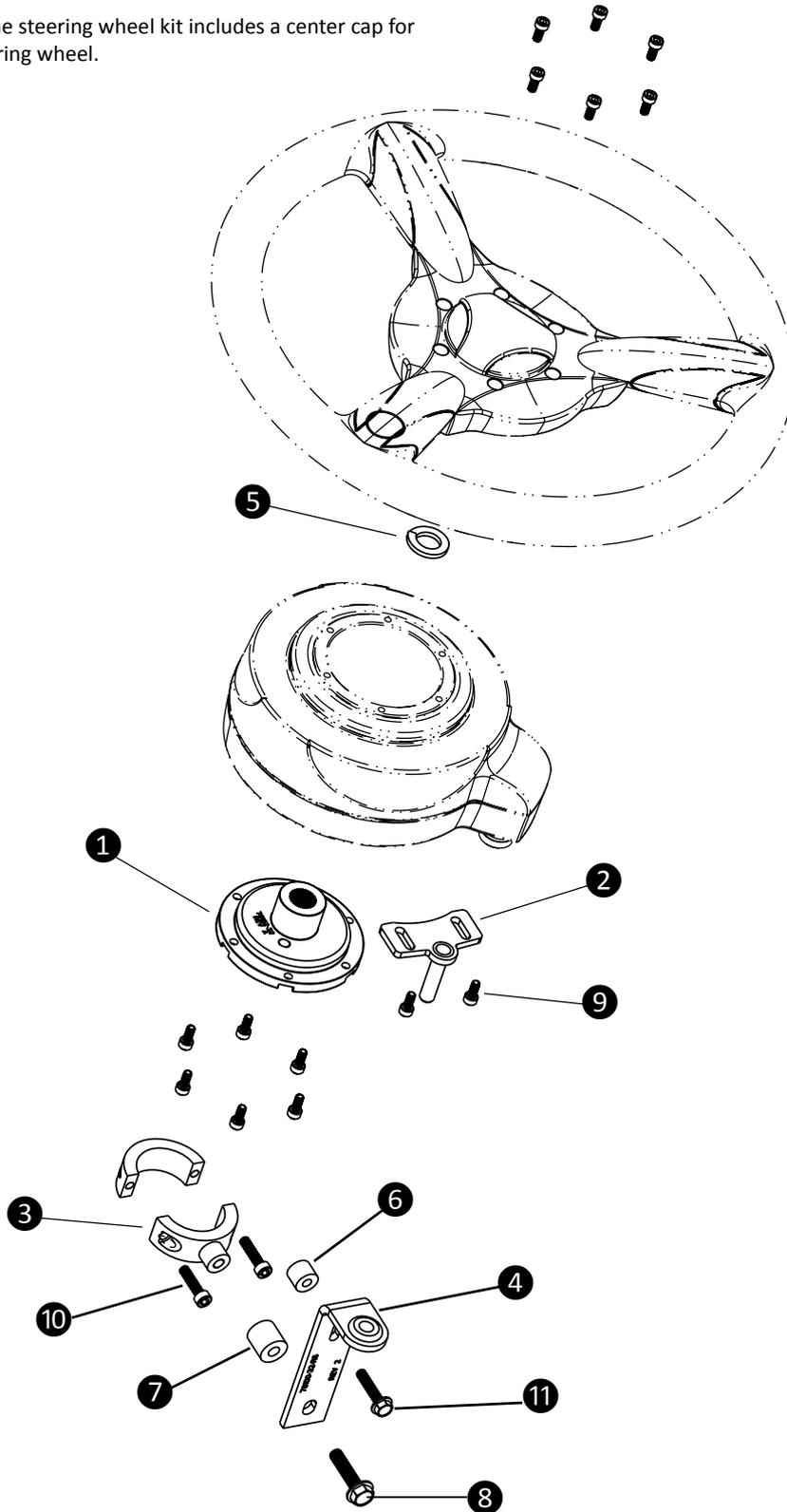
## Required components

Kits required	Tools
<b>EZ-Pilot platform kit:</b> P/N 78100-32-RS	24 mm deep socket
<b>Trimble steering wheel kit:</b> P/N 78200-00	#2 Phillips screw driver
<b>Note</b> – The Trimble steering wheel must be purchased separately.	#3 Phillips screw driver
	3mm L-shaped hex key
	13 mm wrench
	10 mm wrench
	4 mm hex T-handle hex wrench
	5 mm T-handle hex wrench
	#1 step drill, $\frac{1}{8}$ " – $\frac{1}{2}$ " increments
	#20 step drill, $\frac{1}{2}$ " – 1" increments

## EZ-Pilot platform kit components

Component	
❶ Steering shaft lower adapter	❷ Spacer, $\frac{5}{16}$ " ID x $\frac{3}{4}$ " OD x $\frac{3}{4}$ " long
❸ Anti-rotation pin, 45mm	❹ 8 mm x 1.25 x 40 mm, serrated flange head bolt
❺ Anti-rotation column clamp bracket	❻ 4 mm x 12 mm socket head screw
❽ Anti-rotation L-bracket	❼ 6 mm x 25 mm socket head bolt
❾ Split lock washer, 16mm	❽ 6 mm x 35mm serrated flange head bolt
❿	
<ul style="list-style-type: none"> <li>• Spacer, <math>\frac{1}{4}</math>" ID x <math>\frac{5}{8}</math>" x <math>\frac{1}{2}</math>" long</li> <li>• Spacer, <math>\frac{1}{4}</math>" ID x <math>\frac{5}{8}</math>" x <math>\frac{11}{16}</math>" long</li> </ul>	

**Note:** The steering wheel kit includes a center cap for the steering wheel.





## EZ-Pilot System Installation

### In this chapter:

- Preparing the vehicle
- Removing the steering wheel
- Modifying the plastic cover
- Installing the anti-rotation clamp
- Reassembling the steering column
- Assembling the SAM-200 EZ-Pilot drive motor
- Installing the SAM-200 EZ-Pilot drive motor
- Installing the Trimble steering wheel
- Removing the SAM-200 motor
- Additional information

This chapter describes how to how to install the anti-rotation bracket and drive motor for the EZ-Pilot steering system.

## Preparing the vehicle

1. Park the vehicle on a hard, level surface.
2. Engage the park brake and then remove the ignition key.
3. On an articulated vehicle, install the articulation locks.
4. Remove all dirt and debris from the areas of the vehicle where the system is to be installed.
5. Open all kit boxes and lay all of the parts out on a clean workbench.
6. Check the contents of the boxes against the packing lists.

**Note** – The left and right sides of the vehicle are referenced while standing behind the vehicle, facing the normal direction of travel.

## Removing the steering wheel



**WARNING** – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the [Safety Information](#) chapter.

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### Step 1

Telescope the steering column fully outward and then lock the column into place.



**Step 2**

To remove the steering wheel center cap, pull it upwards by hand, or, use a  $\frac{1}{8}$ " flat blade screwdriver to push it up.

**MXM / TM series tractors****T50x0 / Farmall U series tractors****Step 3**

Use a 24 mm deep socket to remove the large hex nut. Use an air or electric impact tool.



#### Step 4

Soak the steering shaft splines with a spray penetrant or catalyst. Trimble recommends PB Blaster, available at [www.pbblaster.com](http://www.pbblaster.com) or your local automotive parts company.



#### Step 5

Remove the steering wheel. Use a power steering pulley puller.

Example tool:

<http://www.napaonline.com>,  
Part number (P/N) BK 7769073



NAPA Balkamp puller 7769073

 **Tip** – Insert the puller's legs first then assemble the tool.



NAPA Balkamp puller 7769073

For early TM/TS series tractors:

Use the steering wheel puller. You will need 6mm x 70mm, grade 8.8 bolts available from: [www.mcmaster.com](http://www.mcmaster.com), part number 91280A366.

Example tool:

<http://www.otctools.com>, P/N 7403



OTC Tools 7403 puller



Steering wheel removed

**Step 6**

Use a #3 Phillips screw driver to remove the three M6 screws on the left, right, and top sides of the steering column housing.



**Step 7**

Remove the transmission forward/reverse lever.

Use a 3 mm L-shaped hex key to remove the hex socket screw.

**For early TM/TS series tractors:**  
Skip this step.

**Step 8**

Remove the top cover to expose the steering column.



T50x0 / Farmall U series tractors



T50x0 / Farmall U series tractors



Early TM / TS series tractors



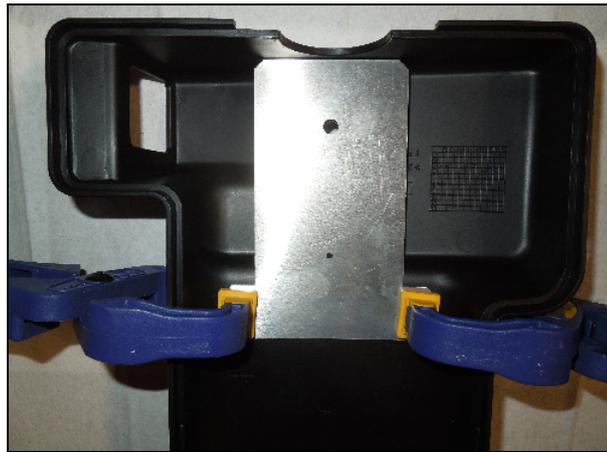
Early TM / TS series tractors

## Modifying the plastic cover

### Step 1

Match the template's top edge and large hole to the inside of the plastic cover.

Secure the template to the cover with clamps.



**Step 2**

Drill a  $\frac{1}{8}$ " pilot hole into the plastic cover. Use the lower hole as a guide.



**Pilot hole**



**Pilot hole**

**Step 3**

Use a #1 and #20 step drill bit to create a 1" smooth vertical hole through the cover.

Example tool:

<http://www.irwin.com>

Unibit P/N 10231, #1 step drill,  $\frac{1}{8}$ " –  $\frac{1}{2}$ "

Unibit P/N 10220CB, #20 step drill,  $\frac{9}{16}$ "-1"



Unibit #1 step drill



Unibit #20 step drill

The following images show the finished cover.



T50x0 / Farmall U series tractors



T50x0 / Farmall U series tractors

The following images show the finished cover.



MXM / TM / TS / TL series tractors

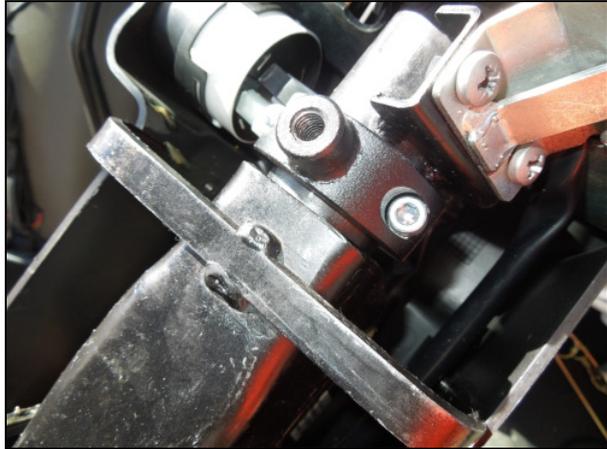


MXM / TM / TS / TL series tractors

## Installing the anti-rotation clamp

### Step 1

Assemble the anti-rotation split clamp onto the steering column tube. Use the supplied 6 mm hex socket head bolts. Rotate the bolts until they stop, **do not** tighten.



Spilt clamp installed

### Step 2

Install the modified plastic cover. Slide the split clamp up or down to align the threaded boss with the large hole in the plastic cover. Rotate the split clamp; use a hex wrench for leverage.

When alignment is finished, remove the cover and then use a 5mm T-handle hex wrench to tighten the socket head bolts.

Example tool: [www.bondhus.com](http://www.bondhus.com),  
P/N 15264



Split clamp's threaded boss centered with hole in top cover

### Step 3

Install the anti-rotation bracket, spacer and bolts.

The **top hole** uses the supplied 6 mm x 35 mm bolt.

The **bottom hole** uses the supplied  $\frac{3}{4}$ " O.D. x  $\frac{3}{4}$ " long spacer and 8 mm x 35 mm bolt.

Align the split clamp's flange head bolt on center line with the top flange head bolt. Use a 5mm T-handle hex wrench to loosen and retighten the split clamp if necessary.

When alignment is finished, remove the L-bracket and flange head bolts in preparation for the next step.



Bottom bolt aligned on centerline

## Reassembling the steering column

### Step 1

Reinstall the modified top column cover.

#### For T50x0/ Farmall U series tractors

Slide the reverser handle over the switch shaft.

Use a #3 Phillips screw driver to replace the M6 pan head screws on the right and left sides of the steering column.



T50x0 / Farmall U series tractors



Early TM / TS series tractors





**Step 2**

Use a 3mm L-shaped hex key to tighten the handle's set screw.

**For early TM/TS series tractors:**  
Skip this step.



**Modified top cover reinstalled**

**Step 3**

Use the supplied spacers and serrated flange head bolts to attach the bracket to the steering column. Slide the L-bracket fully upwards. Use a 10mm and 13mm ratchet combination wrench to tighten the bolts.

 **Tip** – Do not overtighten the top bolt as the threads will strip out.

**For all tractor models:**

The **bottom hole** uses the supplied  $\frac{3}{4}$ " O.D. x  $\frac{3}{4}$ " long spacer and 8mm x 35mm bolt.

**For Farmall U and T50x0 series tractors:**

The **top hole** requires the supplied  $\frac{1}{2}$ " OD x  $\frac{11}{16}$ " long spacer and 6mm x 35mm bolt.

**For MXM / TM / TL / TS series tractors:**

The **top hole** requires the  $\frac{5}{8}$ " OD x  $\frac{1}{2}$ " long spacer and 6mm x 35mm bolt.



MXM / TM series tractors



T5000 / Farmall U series tractors

**Step 4**

Insert the provided anti-rotation pin into the anti-rotation bracket's grommet.



## Assembling the SAM-200 EZ-Pilot drive motor

Flip the motor upside-down with the motor's electrical connector pointed upward at a 12 o'clock position.

Fasten the lower spline adapter to the bottom of the motor. Use the supplied 5 mm socket head screws.

Tighten bolts using a 4 mm T-handle hex wrench.

Example tool:

[www.bondhus.com](http://www.bondhus.com), P/N 15260



## Installing the SAM-200 EZ-Pilot drive motor

### Step 1

Apply a very small amount of anti-seize lubricant to the steering shaft, splines and taper.



### Step 2



**CAUTION** – Do not force the spline adapter onto the steering shaft. If the splines do not mate together, **stop** and recheck that the spline teeth are aligned and that you have the correct lower adapter for your machine

Set the SAM-200 motor assembly onto the steering shaft with the motor's electrical connector at the 1 o'clock position. The lower adapter spline is a tight fit.



Align the spline teeth of the steering shaft and lower adapter by hand.

Gently push downward on the motor *or* lightly tap the motor's rotor (the circular ring with 6 threaded holes) with a rubber dead blow hammer to begin mating the spline teeth together.

When the hex nut is installed and tightened, the motor's spline adapter will slide downward and seat onto the steering shaft.



### Step 3

Install the provided 16mm split lock washer and original hex nut. Use a 24 mm deep socket to tighten the nut.

Torque the nut to 33-40 ft-lbs (44-54 Newton- meters).



#### Step 4

Rotate the motor's electrical connector to a 1:30 position.

Slide the anti-rotation pin fully upward. Align the slots in the pin with the threaded holes in the bottom of the motor.

Install the supplied 5 mm x 12 mm hex socket screws. Use a 4 mm ball drive hex socket bit or 4 mm L-shaped hex key to tighten the screws.

Example tool:

[www.snapon.com](http://www.snapon.com), P/N TMABM4E

[www.cornwelltools.com](http://www.cornwelltools.com), P/N CBSMB40



4mm ball drive socket bit

## Installing the Trimble steering wheel

### Step 1

Install the cap into the center of the Trimble steering wheel. Use the provided #6 sheet metal screws.

Tighten the screws using a #2 Phillips screwdriver.

 **Tip** – The screws are included with the Trimble steering wheel.



### Step 2

Use the supplied 5 mm hex socket screws to fasten the Trimble steering wheel to the top of the motor.

Use a 4 mm T-handle hex wrench to tighten the screws.



The figures show the installed SAM-200 motor, Trimble steering wheel, and anti-rotation bracket.



MXM / TM series tractors



MXM / TM series tractors



T50x0 / Farmall U series tractors



T50x0 / Farmall U series tractors

**Step 3**

Find the supplied cable, P/N 76351. Plug connector P1 into the motor.



## Removing the SAM-200 motor

If you need to, use a steering wheel puller to remove the SAM-200 motor from the steering shaft.

Example tool:

[www.oem-tools.com](http://www.oem-tools.com), P/N 27017

[www.otctools.com](http://www.otctools.com), P/N 7403

You will need 8mm x 1.25 x 120mm bolts, P/N 91280A567, available from [www.mcmaster.com](http://www.mcmaster.com).



OEM Tools 27017 puller



OEM Tools 27017 puller



OEM Tools 7403 puller



OEM Tools 7403 puller

## Additional information

Refer to the documentation on [www.trimble.com](http://www.trimble.com).



## IMD-600 Unit Installation

### In this chapter:

- Preparing the IMD-600 unit for installation
- Mounting the IMD-600 unit in the cab

This chapter describes how to install the IMD-600 unit in the vehicle.

## Preparing the IMD-600 unit for installation



**WARNING** – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the [Safety Information](#) chapter.

---

### Step 1

Fasten the provided sub plate to the IMD-600 unit (as shown) using the supplied #8-32 screws.

Tighten the screws using a #2 Phillips screwdriver.



### Step 2

Fasten the IMD-600 assembly to the mounting plate using the supplied 5 mm screws.

Tighten the screws using a #2 Phillips screwdriver.



## Mounting the IMD-600 unit in the cab

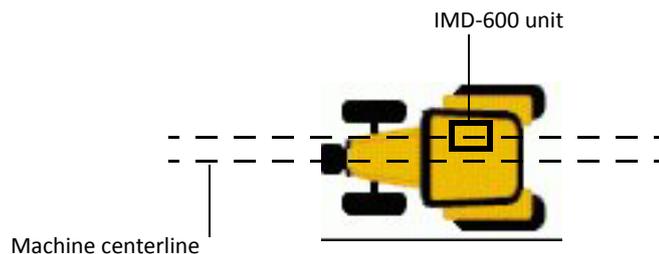


**CAUTION** – Do not mount the IMD-600 unit outside the cab.

Mount the IMD-600 unit inside the cab:

- where it will not be covered by hand tools, tool boxes, chains, tow ropes, food or drink coolers, and so on. Objects placed on top of the unit may cause vibration, which will degrade the steering accuracy.
- where the electrical connector and cable will not be stepped on. If the unit is pushed out of alignment from its original mounting orientation, steering accuracy will be degraded.
- either in-line with or at 90° angles to the vehicle's forward travel direction. Nonorthogonal angles will cause performance degradation.

**Note** – For best accuracy, mount the IMD-600 unit level and parallel to the machine's center line:



To mount the IMD-600 unit inside the operator's cab, use the following method:

### Step 1

Look under the floor mat for any cab wiring. Check under the cab floor for any obstructions, such as hydraulic lines/hoses, air ducts, A/C evaporators, diesel fuel tanks, hydraulic fluid tanks, and so on.



Behind the operator 's seat: MXM / TM series tractors



Behind the operator's seat: T50x0 / Farmall U series tractors



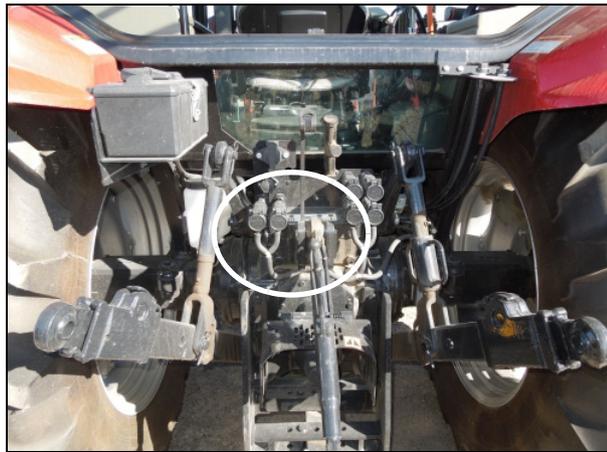
Under the floormat: MXM / TM series tractors



Under the floormat: T50x0 / Farmall U series tractors



Under the cab: MXM / TM series tractors



Under the cab: T50x0 / Farmall U series tractors

### Step 2

Use a  $\frac{1}{4}$ " bit to drill four holes through the floormat.

Use the IMD600 mounting plate as a guide for positioning the holes.



Example floormat

Do not drill into the metal cab floor.



Example floormat

**Step 3**

Use a ¼" pilot bit and ¾" hole saw. Drill four holes through the floor mat at the same locations previously drilled.



Example floor mat



Example floormat

**Step 4**



**CAUTION** – To avoid injury, handle sharp knives with care.

Use a very sharp box knife to cut away the floor mat webbing from around each newly created hole.



Example floormat



Example floormat

**Step 5**

Place the floormat back onto the cab floor and then insert the provided standoff spacers into the newly created holes.



Example floormat

**Step 6**

Place the IMD-600 unit on top of the spacers.

Fasten the IMD-600 unit to the floor using the provided  $\frac{1}{4}$ " x 2.5" long self tapping bolts. Use an 8 mm or  $\frac{5}{16}$ " deep socket.

Check under the cab floor to make sure that no obstructions were pierced or damaged by the self-tapping screws.



**Example: Mounting in the operator's cab**



**Example: Under in the operator's cab**

**Step 7**

Make sure that the bolts are tight.  
Mount the IMD-600 unit solidly so  
that it does not vibrate.



Behind the operator's seat: MXM / TM series tractors



Behind the operator's seat: T50x0 / Farmall U series tractors

**Step 8**

Find the supplied cable P/N 76351.

Plug connector P3 into the IMD-600 unit.



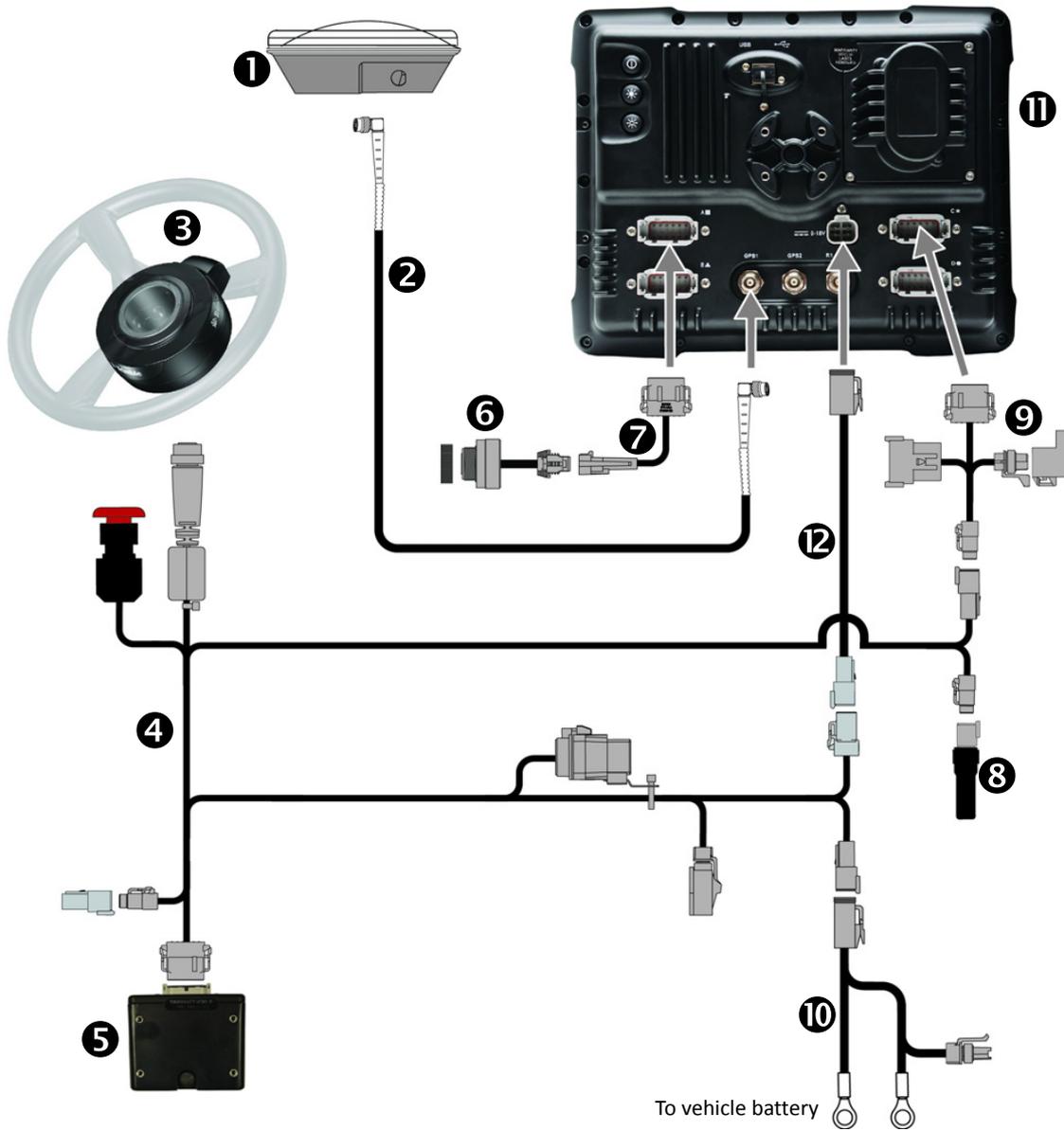
## Display Connections

### In this chapter:

- FmX integrated display
- CFX-750 display
- Connecting the EZ-Pilot system
- Installing the emergency stop switch
- CFX-750 and FmX displays: Installing the GNSS antenna and mounting plate
- CFX-750 and FmX displays: Installing the RTK radio antenna

This chapter describes the cabling connections for the Trimble display.

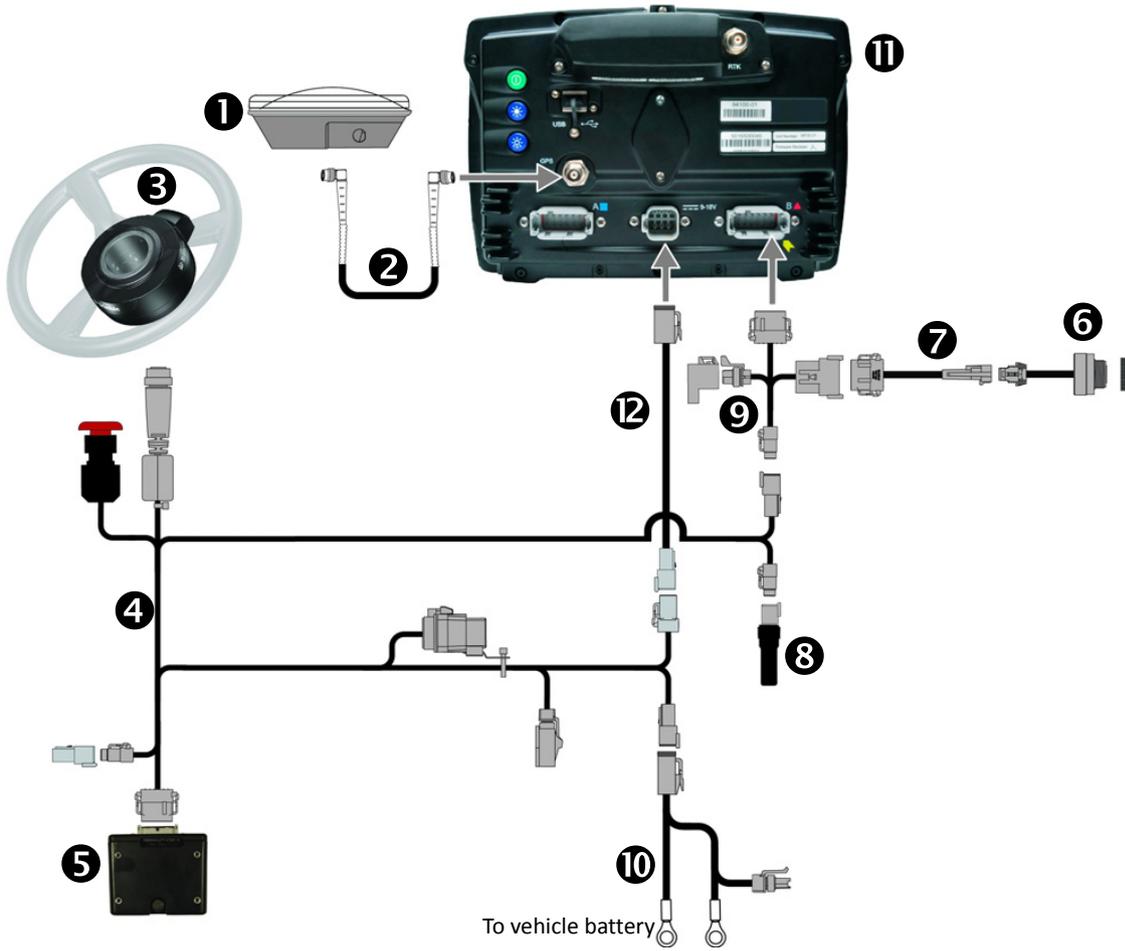
## FmX integrated display



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Item	Description	P/N
①	Antenna	77038-00
②	Antenna cable	50449
③	SAM-200 steering motor	83382-xx
④	IMD-600 to SAM-200 to CAN power cable	76351
⑤	IMD-600 unit	83390-xx
⑥	Sonalert device	43104
⑦	Display to Sonalert cable	84668
⑧	CAN terminator	59783
⑨	Display to Field-IQ™ cable	75834
⑩	Basic power cable	67258
⑪	FmX® integrated display	93100-xx
⑫	Display power cable	66694

## CFX-750 display



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Item	Description	P/N
①	Antenna	77038-00
②	Antenna cable	50449
③	SAM-200 steering motor	83382-xx
④	IMD-600 to SAM-200 to CAN power cable	76351
⑤	IMD-600 unit	83390-xx
⑥	Sonalert device	43104
⑦	Display to Sonalert cable	84668
⑧	CAN terminator	59783
⑨	Display to Field-IQ cable	75834
⑩	Basic power cable	67258
⑪	CFX-750™ display	94100-xx
⑫	Display power cable	77282

## Connecting the EZ-Pilot system

### Step 1

Connect the power cable to the battery.



Example battery location: MXM / TM series tractors



Example battery connection: MXM / TM series tractors



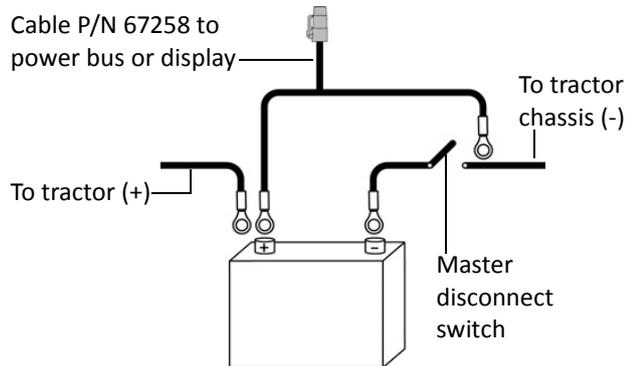
Example battery location: T50x0 / Farmall U series tractors



Example battery connection: T50x0 / Farmall U series tractors



**CAUTION** – If the vehicle has a master electrical disconnect, make sure the basic power cable (P/N 67258) is **not** directly attached to the battery terminal that is disconnected by the master switch - the negative pole in this example. Attach this terminal side just past the main disconnect so that it is as close as possible to the battery but still gets disconnected when the master disconnect is turned off. Failure to do so can result in damaging the display.

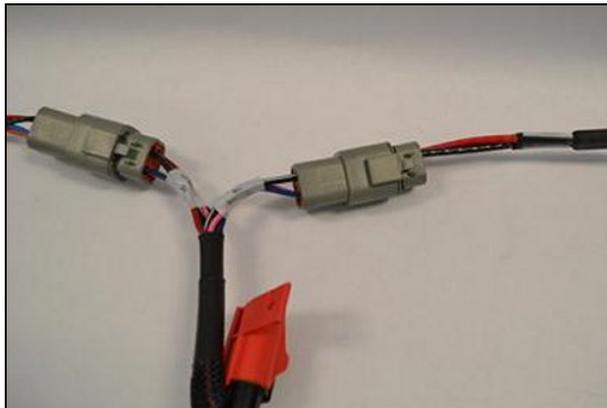


## Step 2

Connect the basic power cable to the cable P/N 76351.

Also connect one of the following:

- FmX display power cable (P/N 66694)
- CFX-750 display power cable (P/N 77282)



## Step 3

Connect the power cable to the display.

*FmX integrated display*



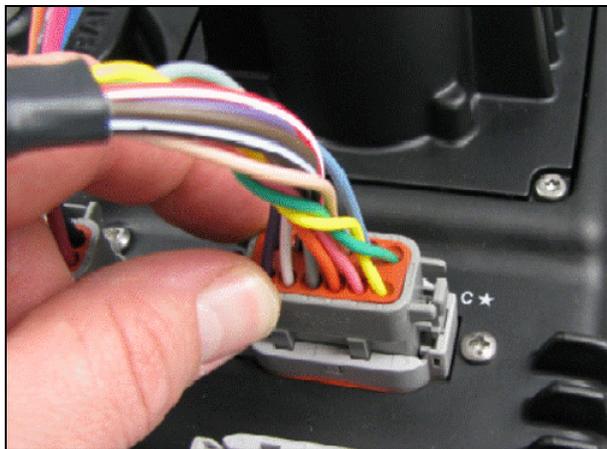
*CFX-750 display*



**Step 4**

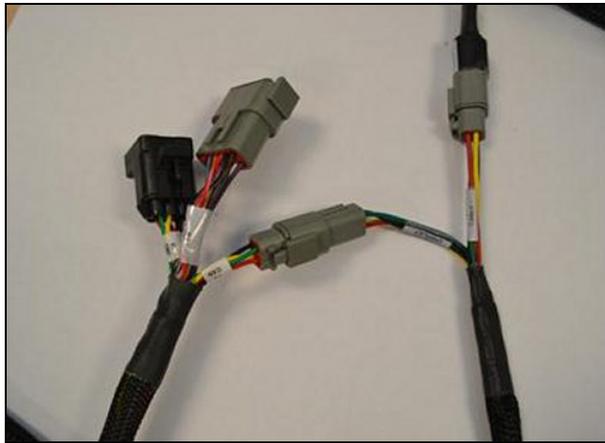
Plug in the 12-pin CAN connection on P/N 75834.

*FmX display: Port C or D*

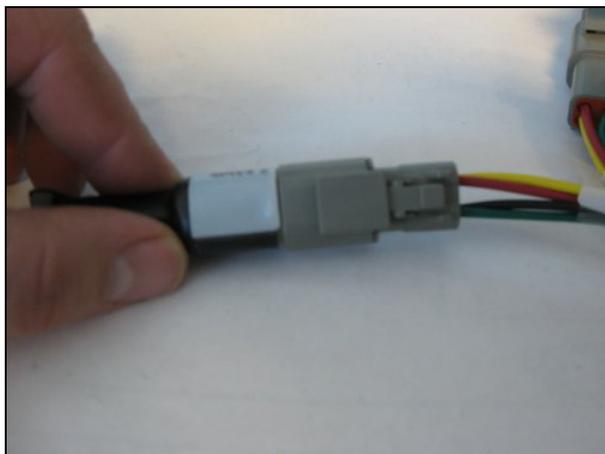


*CFX-750 display: Port B***Step 5**

Connect the 4-pin CAN plug on P/N 75834 to the 4-pin CAN receptacle on P/N 76351.

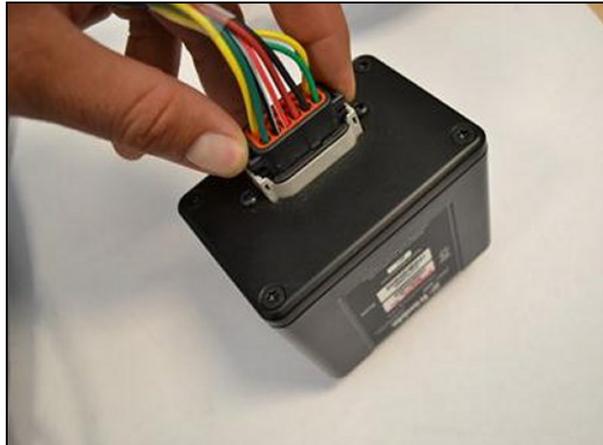
**Step 6**

Connect the CAN terminator P/N 59783 to the cable P/N 76351.



**Step 7**

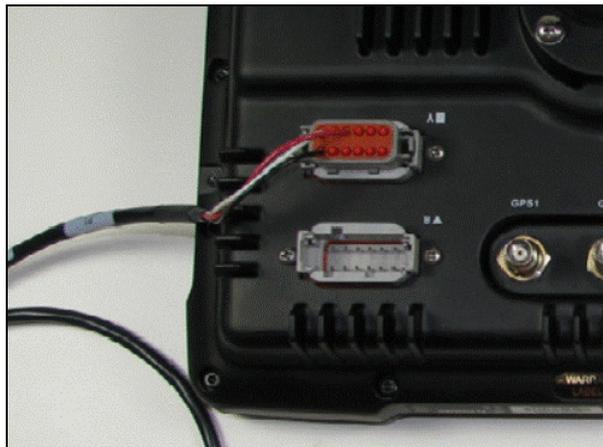
Connect the black 12-pin plug to the IMD-600 unit.



**Step 8 Connecting the Sonalert device**

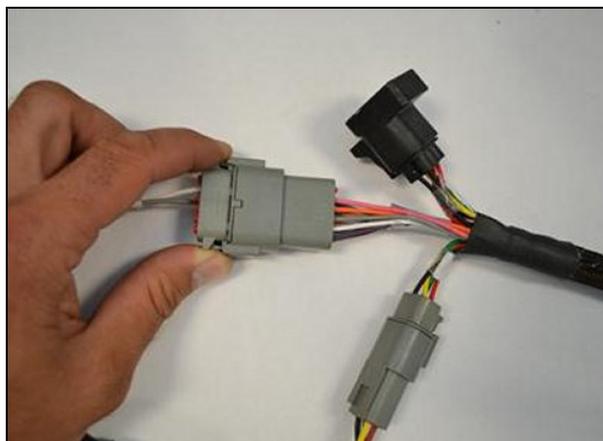
*FmX display*

Plug the Sonalert adapter into port A.



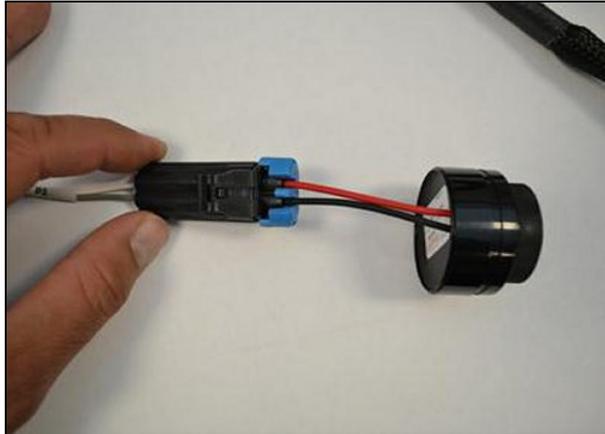
*CFX-750 display*

Connect the Sonalert adapter 12-pin plug to the cable (P/N 75834).



*Both displays*

Connect the Sonalert device to the adapter cable.



**Step 9**

Plug the round SAM-200 connector into the SAM-200 motor.



## Installing the emergency stop switch

Mount the stop switch in a prominent location in the cab, where it is easily accessible in case of an emergency.

### Step 1

Locate the emergency stop switch.



### Step 2

Push the white release button to remove the top half of the switch.



**Step 3**

Remove the nut and washer.

**Step 4**

In the selected prominent location, drill a  $\frac{7}{8}$ " hole and then mount the switch with the washer and nut.



Example stop switch installation

**Step 5**

Route the switch wires and then reattach the lower housing.

## CFX-750 and FmX displays: Installing the GNSS antenna and mounting plate

### Step 1

Pick a location on the cab roof where the GNSS antenna **will be mounted level**. Push down on the roof to find a firm location.

Placing the GNSS antenna as far forward as possible on top of the cab can improve steering performance. **Keep the antenna mounted level.**

Clean the antenna's mounting location on the roof of the cab with denatured alcohol to remove oil and dust.

Use an adhesive promoter to increase the bonding between the foam tape and the plastic cab roof.

Any surface with adhesive promotor applied will attract dirt. Apply the chemical to a very small area.

Example adhesive:

<http://www.3m.com>, 3M tape primer 94, P/N 24216



**Step 2**

Allow the adhesive promoter to dry. Remove the backing tape from the foam strips and then apply the plate to the cab roof ***exactly on the centerline of the machine***. Ensure that the foam strips make even contact with the surface. Apply pressure to adhere.



Example antenna mount



MXM / TM series tractors

**Step 3**

Attach the GNSS antenna to the center of the 5" x 5" plate (P/N 62034).



Example antenna mount



MXM / TM series tractors

**Step 4**

Attach the Trimble display's coaxial cable to the antenna and then route the cable into the cab. Secure the cable along the route.



T50x0 / Farmall U series tractors

## CFX-750 and FmX displays: Installing the RTK radio antenna

### Step 1

Connect the RTK radio antenna to the magnetic antenna base



### Step 2

Pick a location on the cab roof where the RTK antenna will be a minimum of 3 feet (1 m) from the GNSS antenna. Push down on the roof to find a firm location.

Clean the antenna's mounting location on the roof of the cab with denatured alcohol to remove oil and dust.

Use an adhesive promoter to increase the bonding between the foam tape and the plastic cab roof.

Any surface with adhesive promotor applied will attract dirt. Apply the chemical to a very small area.

Example adhesive:

<http://www.3m.com>, 3M tape primer 94, P/N 24216



**Step 3**

Allow the adhesive promoter to dry. Remove the backing tape from the foam strips and then apply the plate to the cab roof. Ensure that the foam strips make even contact with the surface. Apply pressure to adhere.



Example antenna mount

**Step 4**

Attach the magnetic radio antenna base to a 5" x 5" plate (P/N 62034).

**Step 5**

Route the RTK antenna's coaxial cable into the cab, and connect the cable to the Trimble display. Secure the cable along the route.



Example antenna mount

## Remote Engage

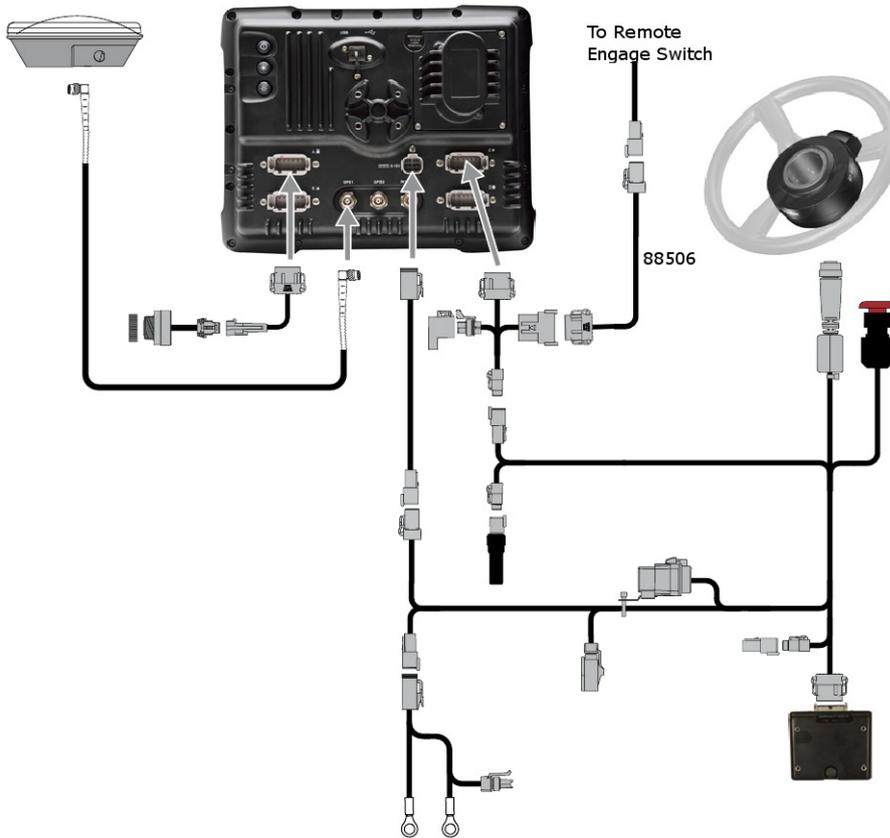
### In this chapter:

- Installing the remote engage switch
- Setting up the CFX-750 display
- Setting up the FmX integrated display

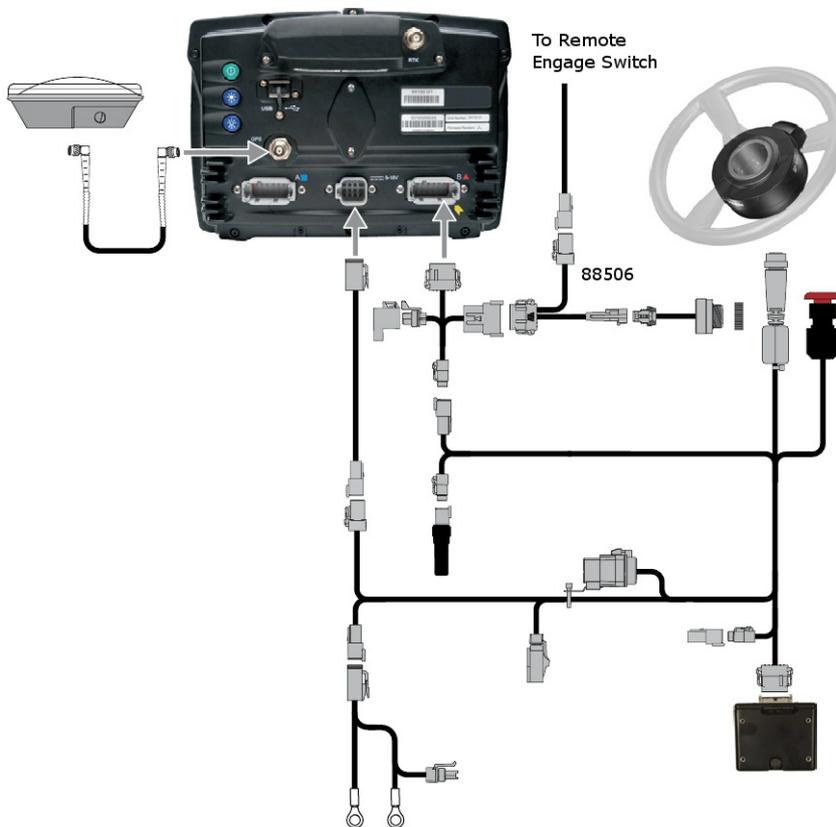
This chapter describes how to install and set up remote engage for the EZ-Pilot system on FmX and CFX-750 displays.

## Installing the remote engage switch

### FmX integrated display



## CFX-750 display



To engage the EZ-pilot system, you can use one of these methods:

- Press the engage button on the screen
- Press the EZ-Remote Engage button
- Press an external foot or rocker switch

These instructions cover the method for the foot or rocker switch.

### Step 1

Locate the foot or momentary rocker switch that will be used.

Locate the remote engage adapter cable (P/N 88506), which is included with the Foot switch kit (P/N 78150-00) or purchased separately.

### Step 2

Remove the wedge from the receptacle 3-pin Deutsch DTM.



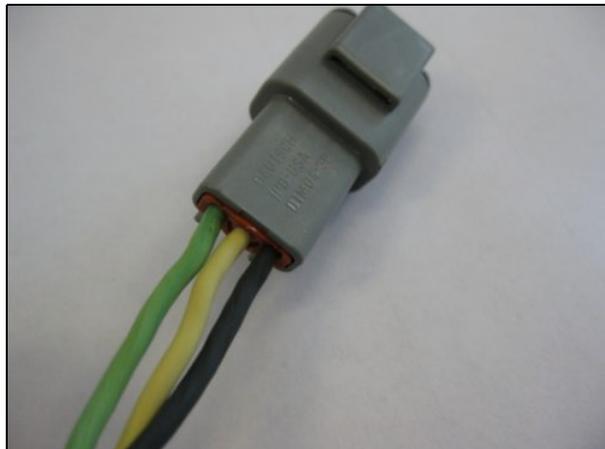
### Step 3

#### *Foot switch*

Hold the receptacle with the lock facing upward.

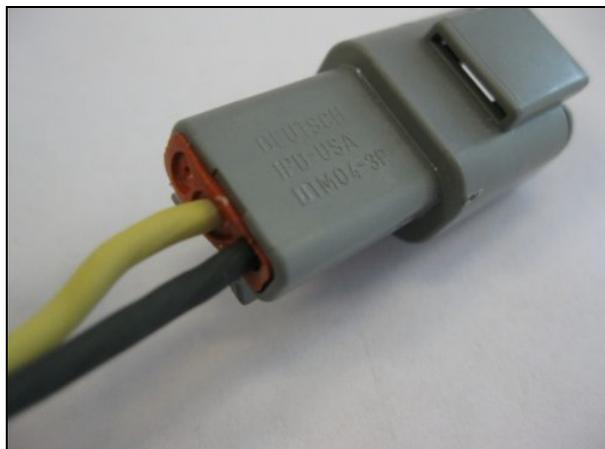
Insert the black wire on the right side, the white wire in the middle, and the green wire on the left.

**Note** – If you purchased P/N 78150, the correct connector is already attached.



#### *Rocker switch*

Insert the wires into the right and middle sockets. Orientation does not matter.

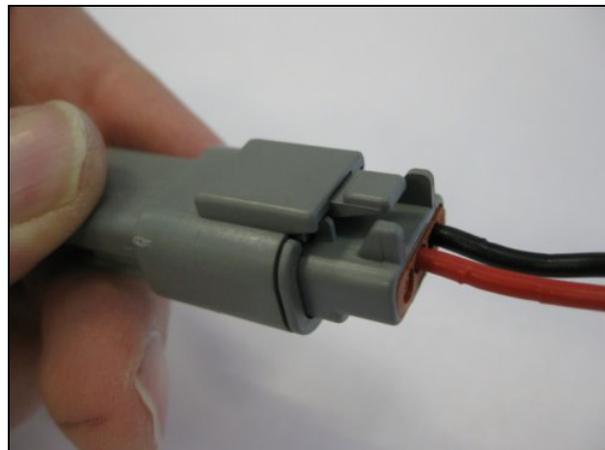


**Step 4**

Re-insert the wedge into the receptacle.

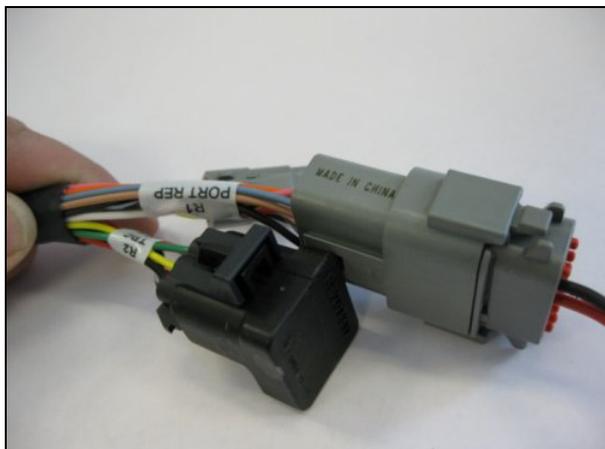
**Step 5**

Connect the attached receptacle to the 3-pin DTM plug on the remote engage adapter cable.

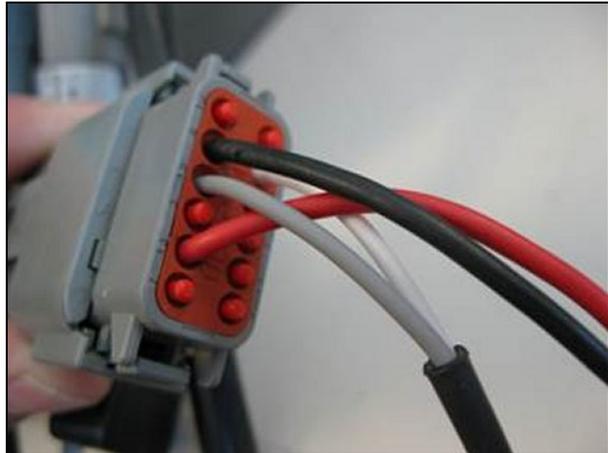
**Step 6**

Plug the other end of the remote engage adapter cable into the port replicator (pins 10 and 11) on the EZ-Pilot cable connected to one of the following:

- CFX-750 display: Port B
- FmX display: Port C



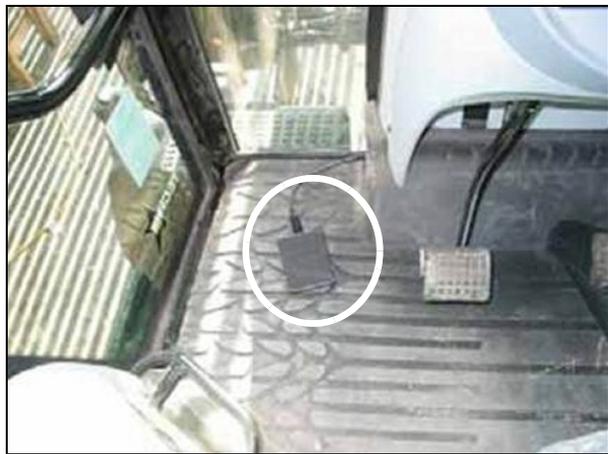
**Note** – For the CFX-750 display installations with a Sonalert, you must plug the ground wire from pin 10 into pin 8 (the red wire in this example).



**Step 7**

Route the cables to the required location.

*Foot switch*



Example installation

*Rocker switch*



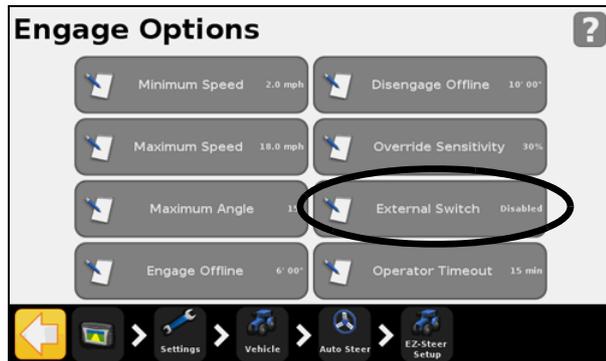
Example installation

## Setting up the CFX-750 display

### Step 1

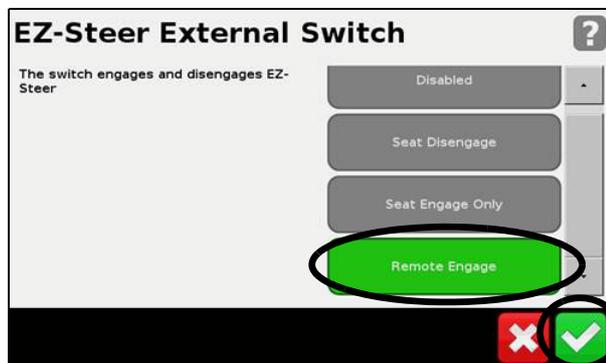
On the display, go to Settings / Vehicle / Auto Steer / EZ-Pilot Setup.

Press **External Switch**.

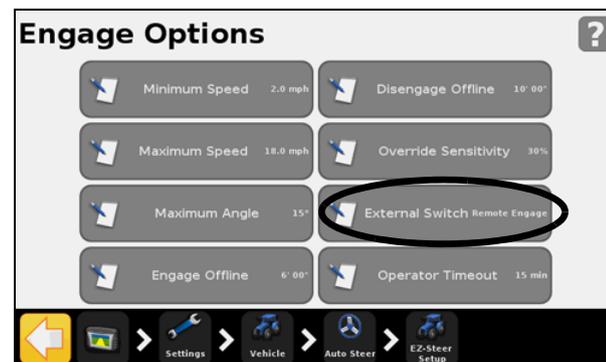


### Step 2

Select **Remote engage** and then press the **Checkmark**.



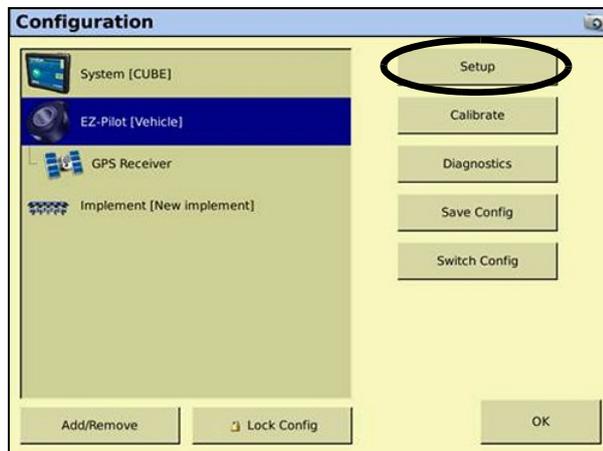
The **External Switch** now shows *Remote Engage*, and is ready to use.



## Setting up the FmX integrated display

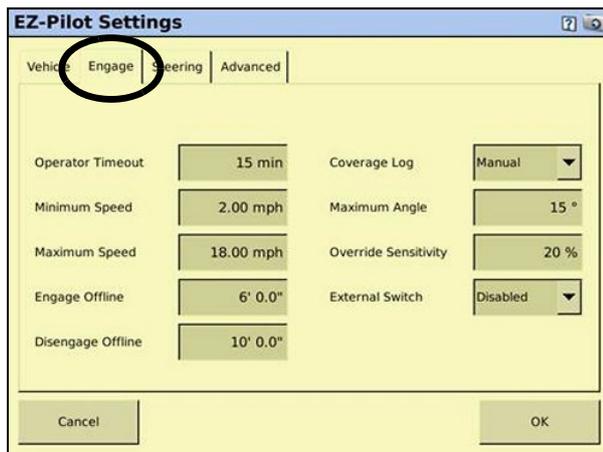
### Step 1

On the display, select *EZ-Pilot* and then press **Setup**.



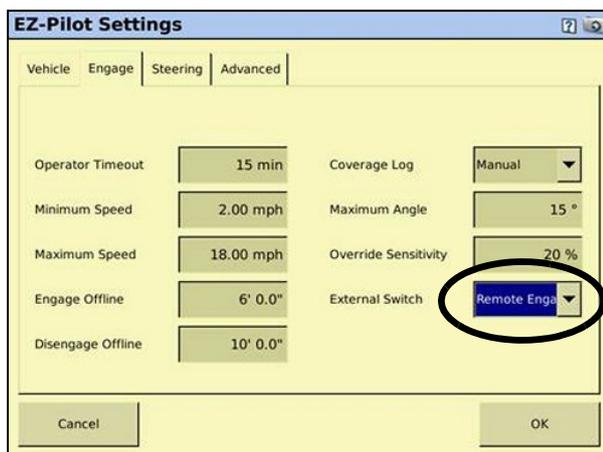
### Step 2

Select the *Engage* tab.



### Step 3

From the *External Switch* drop down menu, select *Remote Engage*.



## Final Machine Check

### In this chapter:

- [Performing the final machine check](#)
- [Calibration values](#)
- [Vehicle measurements](#)

This chapter describes how to perform a final check of the vehicle. It also shows vehicle measurements.

## Performing the final machine check



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**WARNING** – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the [Safety Information](#) chapter.

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1. Make sure the emergency stop switch **is not depressed**. If the switch is depressed, the SAM-200 motor **will not communicate** with the Trimble display and the EZ-Pilot system will not engage for auto steering.
2. Make sure that the IMD-600 unit is solidly mounted. If the IMD-600 unit vibrates, the SAM-200 drive motor will oscillate when engaged, causing the anti-rotation pin to damage the rubber grommet.
3. Update the Trimble display, IMD-600 unit, and SAM-200 motor to the latest firmware from <http://www.agpartners.trimble.com> or from [www.trimble.com](http://www.trimble.com) (*Support and Training / Support A-Z*).
4. Configure the EZ-Pilot system through the Trimble display. Depending on your machine type, the following items must be calibrated **before** you can use the EZ-Pilot system for autosteering:
  - IMD-600 unit mounting orientation
  - Antenna height, Antenna to axle offset, and Roll offset
  - Machine type, Machine Wheelbase
  - Angle per Turn left, Angle per Turn right
  - Motor Speed, Override Sensitivity

## Calibration values



### Tips:

- Configure the Trimble display to show travel speed on the map view screen.
- Adjust the Angle per Turn value within  $\pm 5$  degrees of the calculated calibration value for your machine may make a subtle improvement in steering accuracy.
- If the EZ-Pilot system consistently steers to one side on an AB line, adjust the left or right side freeplay individually. Use values of 0.1 - 0.2 to balance the steering accuracy either side of the AB line you are following.
- If the EZ-Pilot system exhibits a swimming motion while engaged, the IMD-600 unit may be experiencing subtle vibration. Pick a different mounting location and/or hard mount the IMD-600 unit using the screws and spacers provided and then check if the IMD-600 mounting calibration that is selected in the Trimble display is correct. You may need to recalibrate the IMD-600 roll offset.
- If the anti-rotation pin is bouncing against the rubber grommet or if the steering column is shaking, **reduce the motor speed and/or the approach aggressiveness.**

### Front wheel steer tractors

The following EZ-Pilot calibration values are from a MXM190 tractor traveling in actual field conditions. The tractor had a suspension cab. The front axle was engaged. Travel speeds were 2-7 mph. The FMX display was running software version 6.5.

Item	Value
Vehicle Type	2WD/MFWD tractor
Motor Speed	High or Medium
Angle Per Turn Left or Right	12 or 12.5
Online Aggressiveness	130%
Approach Aggressiveness	140%
Override Sensitivity	20%

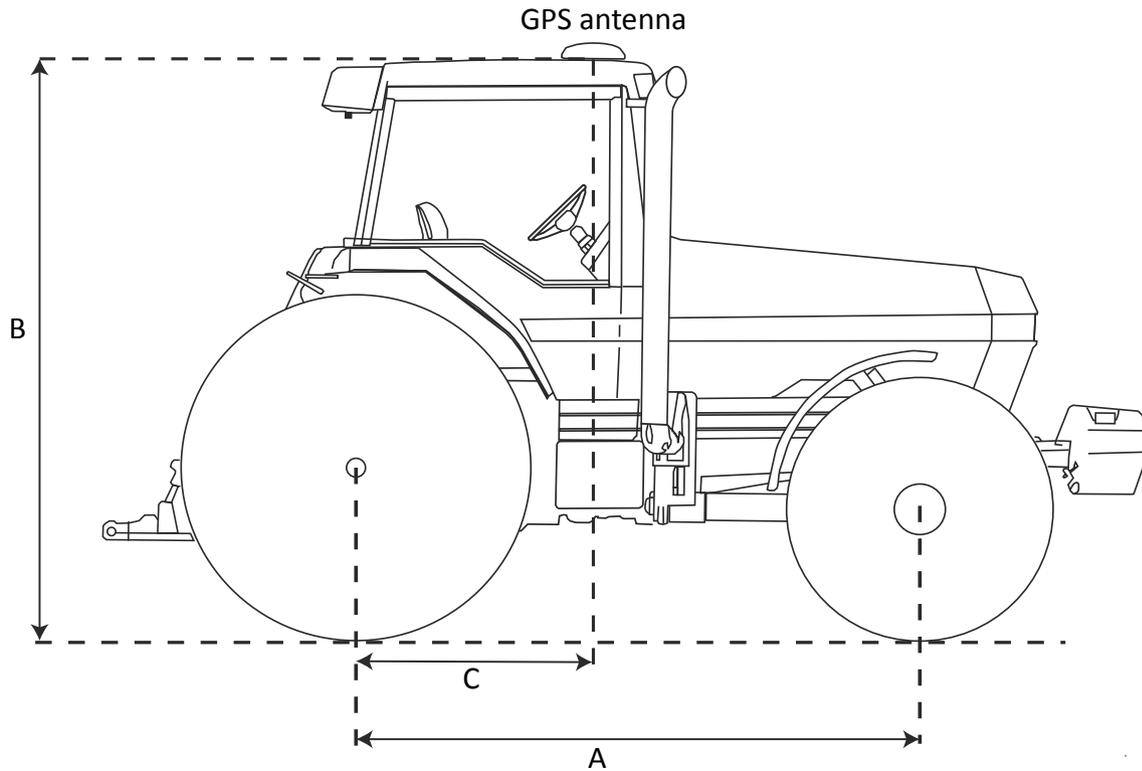
The following EZ-Pilot calibration values are from a Farmall 105U tractor traveling on a gravel road. The travel speeds were 2-9 mph. The CFX display was running software version 2.0.

Item	Value
Vehicle Type	2WD/MFWD tractor
Motor Speed	Medium
Angle Per Turn Left or Right	16.5
Online Aggressiveness	122%
Approach Aggressiveness	135%
Override Sensitivity	20%

## Vehicle measurements



**CAUTION** – These measurements are provided as an example only. You must check the dimensions against your machine.



### New Holland tractors

Models: **T5040; T5050; T5060; T5070**

Model	Wheel Base (A)	Antenna Height (B)	Antenna/Axle Offset (C)
All models	233 cm (92")	266 cm (105")	102 cm (40") forward

Models: **TM 120; TM 130; TM 140; TM 155; TM 175; TM 190**

Model	Wheel Base (A)	Antenna Height (B)	Antenna/Axle Offset (C)
All models	284 cm (112")	305 cm (120")	142 cm (56") forward

Models: **TL70; TL80; TL90; TL100; TL70A; TL80A; TL90A; TL100A; TS90; TS100; TS110**

Model	Wheel Base (A)	Antenna Height (B)	Antenna/Axle Offset (C)
All models	233 cm (92")	266 cm (105")	102 cm (40") forward

### CaselH tractors

Models: **MXM 120; MXM 130; MXM 140; MXM 155; MXM 175; MXM 190**

Model	Wheel Base (A)	Antenna Height (B)	Antenna/Axle Offset (C)
All models	284 cm (112")	305 cm (120")	142 cm (56") forward

Models: **JX 80U; JX 90U; JX 100U; JX 1080U; JX 1090U; JX 1110U**

Model	Wheel Base (A)	Antenna Height (B)	Antenna/Axle Offset (C)
All models	233 cm (92")	266 cm (105")	102 cm (40") forward

Models: **Farmall 85U; 95U; 105U**

Model	Wheel Base (A)	Antenna Height (B)	Antenna/Axle Offset (C)
All models	233 cm (92")	266 cm (105")	102 cm (40") forward

