Installation Instructions

EZ-Pilot® Steering System

Case IH Floater
- Titan 3020 / 3520 / 4020 / 4520
- FLX 3010 / 3510 / 4010 / 4510

Case IH Tractor

Case IH Articulated Tracked Tractor
- Quadtrac 385 / 435 / 450 / 485 / 500 / 535 / 550 / 600
- STX Quadtrac 375 / 425 / 450 / 500

Case IH Sprayer
- Patriot 3230 / 3330 / 4420
- SPX 4260 (Serial # JFG0004860 & above) / 4410 / 3230 / 3320 / 3330 / 4420

Case IH Articulated Tractor
- Steiger 330 / 335 / 350 / 385 / 400 / 435 / 450 / 485 / 500 / 535 / 550 / 600
- STX 275 / 280 / 325 / 330 / 375 / 380 / 425 / 430 / 440 / 450 / 480 / 500 / 530

New Holland Tractor
- T8010 / T8020 / T8030 / T8040 / T8050

New Holland Articulated Tractor
- T9020 / T9030 / T9040 / T9050 / T9060
- TJ 275 / 325 / 440 / 375 / 425 / 450 / 500 / 530
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- your name, address, and telephone numbers
- proof of purchase
- this Trimble warranty card

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- an explanation of the problem.

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C/o Menlo Worldwide Logistics
Meerheide 45
5521 DZ Eersel, NL
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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.

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

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.

⚠️ 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.

⚠️ 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.

⚠️ 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 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.
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.

⚠️ **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.

⚠️ **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.

⚠️ **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.

⚠️ **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.

⚠️ **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.

⚠️ **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.
CHAPTER 1

Introduction

In this chapter:
- Technical assistance
- Required components
- Hardware organization
- Vehicle measurements

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) 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).
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

<table>
<thead>
<tr>
<th>Kits required</th>
<th>Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>EZ-Pilot platform kit: P/N 78100-02</td>
<td>1/8” flat blade screwdriver</td>
</tr>
<tr>
<td></td>
<td>22 mm deep socket</td>
</tr>
<tr>
<td></td>
<td>steering wheel puller (Greatneck tools P/N 27017)</td>
</tr>
<tr>
<td></td>
<td>5 mm hex wrench</td>
</tr>
<tr>
<td></td>
<td>4 mm hex wrench</td>
</tr>
<tr>
<td></td>
<td>8mm or 5/16” deep socket</td>
</tr>
<tr>
<td></td>
<td>5/16”-24 blind hole thread tap</td>
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</table>

Hardware

<table>
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<tr>
<th>Component</th>
<th>Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Anti-rotation bracket</td>
<td>Platform kit (P/N 78100-02)</td>
</tr>
<tr>
<td>2 Anti-rotation pin</td>
<td></td>
</tr>
<tr>
<td>3 Anti-rotation tube</td>
<td></td>
</tr>
<tr>
<td>4 Lower shaft adaptor</td>
<td></td>
</tr>
<tr>
<td>5 Upper motor adaptor</td>
<td></td>
</tr>
<tr>
<td>6 Steering spud shaft adapter</td>
<td></td>
</tr>
<tr>
<td>7 6mm hex socket head bolts</td>
<td></td>
</tr>
<tr>
<td>8 14 mm hex nut</td>
<td></td>
</tr>
<tr>
<td>9 14 mm flat washer</td>
<td></td>
</tr>
<tr>
<td>10 8 mm flange bolt</td>
<td></td>
</tr>
<tr>
<td>11 5 mm hex socket head bolts</td>
<td></td>
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</table>
Hardware organization
# Vehicle measurements

## CaseIH

<table>
<thead>
<tr>
<th>Model</th>
<th>Full Wheel Base</th>
<th>Antenna Height</th>
<th>Antenna/Axle Offset</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnum</td>
<td>305 cm (120&quot;)</td>
<td>330.2 cm (130&quot;)</td>
<td>145 cm (57&quot;) ahead</td>
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<tr>
<td>MX</td>
<td>305 cm (120&quot;)</td>
<td>330.2 cm (130&quot;)</td>
<td>145 cm (57&quot;) ahead</td>
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<tr>
<td>Steiger</td>
<td>356 cm (140&quot;)</td>
<td>348 cm (137&quot;)</td>
<td>41 cm (16&quot;) behind</td>
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<tr>
<td>STX</td>
<td>356 cm (140&quot;)</td>
<td>348 cm (137&quot;)</td>
<td>406 cm (16&quot;) behind</td>
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<tr>
<td>Quadtrac</td>
<td>373.4 cm (147&quot;)</td>
<td>353.1 cm (139&quot;)</td>
<td>76.2 cm (30&quot;) behind</td>
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<td>STX Quadtrac</td>
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<td>353.1 cm (139&quot;)</td>
<td>76.2 cm (30&quot;) behind</td>
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<td>Patriot</td>
<td>381 cm (150&quot;)</td>
<td>350.5 cm (138&quot;)</td>
<td>508 cm (200&quot;) ahead</td>
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<td>SPX</td>
<td>381 cm (150&quot;)</td>
<td>350.5 cm (138&quot;)</td>
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<tr>
<td>Titan 3020/3520</td>
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<td>361 cm (142&quot;)</td>
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<tr>
<td>Titan 4020/4520</td>
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<td>361 cm (142&quot;)</td>
<td>483 cm (190&quot;) ahead</td>
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<tr>
<td>FLX</td>
<td>457.2 cm (180&quot;) 3</td>
<td>361 cm (142&quot;)</td>
<td>483 cm (190&quot;) ahead</td>
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## New Holland

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<th>Model</th>
<th>Full Wheel Base</th>
<th>Antenna Height</th>
<th>Antenna/Axle Offset</th>
</tr>
</thead>
<tbody>
<tr>
<td>TG</td>
<td>356 cm (140&quot;)</td>
<td>330.2 cm (130&quot;)</td>
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<tr>
<td>TJ</td>
<td>363.2 cm (143&quot;)</td>
<td>381 cm (150&quot;)</td>
<td>51 cm (20&quot;) ahead</td>
</tr>
<tr>
<td>T8</td>
<td>330.2 cm (130&quot;)</td>
<td>330.2 cm (130&quot;)</td>
<td>152.4 cm (60&quot;) ahead</td>
</tr>
<tr>
<td>T9</td>
<td>363.2 cm (143&quot;)</td>
<td>381 cm (150&quot;)</td>
<td>51 cm (20&quot;) behind</td>
</tr>
<tr>
<td>T80x0</td>
<td>330.2 cm (130&quot;)</td>
<td>330.2 cm (130&quot;)</td>
<td>152.4 cm (60&quot;) ahead</td>
</tr>
<tr>
<td>T90x0</td>
<td>363.2 cm (143&quot;)</td>
<td>381 cm (150&quot;)</td>
<td>51 cm (20&quot;) behind</td>
</tr>
</tbody>
</table>
Installing the EZ-Pilot Steering System

**In this chapter:**
- Preparing the vehicle
- Removing the steering wheel
- Installing the anti-rotation bracket
- Assembling the SAM-200 EZ-Pilot drive motor
- Installing the SAM-200 EZ-Pilot drive motor
- Reinstalling the steering wheel
- Removing the SAM-200 motor
- Additional information

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

**Step 1**

Use a $\frac{1}{8}$" flat blade screwdriver to remove the center cap from the steering wheel.
Step 2
Use a 22 mm deep socket to remove the hex nut and flat washer. Use an electric or air impact tool.

Step 3
Soak the steering wheel splines with a spray penetrant. Trimble recommends PB Blaster, available at www.pbblaster.com or from a local automotive parts company.

Step 4 Optional
The threaded holes in the steering wheel hub might be covered with residual rubber mold material. Clean out the threads using a 5/16”-24 thread tap.
**Step 5**


Alternatively, you can purchase the steering wheel puller from AutoZone (United States), P/N 27017.

You will need Grade 8, 5/16"-24 x 3" long bolts. Apply a small amount of anti-seize to the bolt threads.

**Step 6**

Remove the steering wheel.
Installing the anti-rotation bracket

**Step 1**
Press the middle foot pedal to tilt the steering wheel half down. Telescope the steering wheel fully inward.

**Step 2**
Pull down on the rubber boot below the steering wheel to expose the steering shaft tube.
**Step 3**

Attach the anti-rotation clamp bracket to the steering column tube at a 3 o’clock position, with the flat side of the bracket arm facing upward. Use the supplied 6 mm cap head bolts.

Tighten the bolts evenly using a 5 mm hex wrench with a ball end.
Assembling the SAM-200 EZ-Pilot drive motor

**Step 1**
Flip the motor upside-down with the motor’s electrical connector pointed upward at a 12 o’clock position.

**Step 2**
Fasten the lower spline adapter to the bottom of the motor. Use the supplied 5 mm cap head bolts. Tighten bolts using a 4 mm hex wrench.

**Step 3**
Bolt the anti-rotation pin to the motor at a 11 o’clock position. Use the supplied 5 mm hex socket screws. Slide the pin fully inward and tighten the screws using a 4 mm hex wrench.
Installing the SAM-200 EZ-Pilot drive motor

**Step 1**

Apply anti-seize to the steering shaft spline, threads, and taper.

**Step 2**

⚠️ **CAUTION** – The splines of the motor adapter and steering shaft must align. Do not force the motor onto the steering shaft. Wiggle the motor while gently pushing downward.

Set the SAM-200 motor assembly onto the steering shaft with the motor’s electrical connector at a 1 o’clock position.
Step 3
Install the supplied 14 mm flat washer and nylock nut. Use a 22 mm deep socket and torque the nut to 33-40 ft-lbs (44-54 Newton-meters).

Step 4
Rotate the motor and then slide the square anti-rotation tube onto the pin.
Step 5

Rotate the motor and then fit the square post onto the anti-rotation bracket using the supplied M8 x 20 mm flange head bolt.

Tighten the M8 bolt using a 13 mm ratchet combination wrench or socket.
Step 6
Bolt the upper adapter to the top of the motor. Use the supplied 5 mm hex cap head bolts and a 4 mm hex wrench.

Reinstalling the steering wheel

Step 1
Fasten the steering spud shaft to the upper adapter. Use the supplied 5 mm hex socket screws. Tighten the bolts using a 4 mm hex wrench.
Step 2
Apply anti-seize to the steering shaft spline, threads, and taper.

Step 3

CAUTION – The splines of the steering shaft and steering wheel hub must align. Do not force the steering wheel onto the steering shaft. Wiggle the wheel while gently pushing downward.

Place the steering wheel onto the shaft. Reinstall the original 14mm flat washer and hex nut.

Tighten the large nut using a 22mm deep socket. Torque the nut to 33-40 ft-lbs (44-54 newton-meters).
Step 4
Install the steering wheel cap.

The figures show the installed SAM-200 motor and anti-rotation bracket.
Step 5
Find the supplied cable P/N 76351.
Plug connector P1 into the motor.
Removing the SAM-200 motor

If you need to remove the SAM-200 motor from the steering shaft, do the following.


Alternatively, you can purchase the steering wheel puller from AutoZone (United States), P/N 27017.

You will need grade 8.8, 8mm x 120mm hex bolts, available from www.mcmaster.com, P/N 91280A567

Apply a small amount of anti-seize to the bolt threads.

Additional information

Refer to the documentation on www.trimble.com.
IMD-600 Unit Installation

In this chapter:
- Installing the IMD-600 unit

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

**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 4 mm 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.
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

Step 3

Place the IMD-600 unit in the right front corner of the operator's cab.
The unit must be placed parallel to the centerline of the tractor.
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.
**Step 4**

Use a 1/4” bit. Drill 4 holes through the floormat.

Do not drill into the metal cab floor.
**Step 5**

Use a 1/4” pilot bit and 3/4” hole saw. Drill 4 holes through the floormat at the same locations previously drilled.
Step 6
Use a very sharp box knife to cut away the floor mat webbing from around each newly created hole.

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

Step 7
Place the floor mat back onto the cab floor and then insert the provided standoff spacers into the newly created holes.
Step 8
Place the IMD-600 unit on top of the spacers. Fasten the IMD-600 unit to the floor using the provided 1/4” x 2.5” long self tapping bolts. Use an 8 mm or 5/16” deep socket.

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

Step 9
Make sure that the bolts are tight. Mount the IMD-600 unit solidly so that it does not vibrate.

Find the supplied cable 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

This chapter describes the cabling connections for the Trimble display.
FmX integrated display
# Display Connections

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>P/N</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Antenna</td>
<td>77038-00</td>
</tr>
<tr>
<td>2</td>
<td>Antenna cable</td>
<td>50449</td>
</tr>
<tr>
<td>3</td>
<td>SAM-200 steering motor</td>
<td>83382-xx</td>
</tr>
<tr>
<td>4</td>
<td>IMD-600 to SAM-200 to CAN power cable</td>
<td>76351</td>
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<td>5</td>
<td>IMD-600 unit</td>
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<tr>
<td>6</td>
<td>Sonalert device</td>
<td>43104</td>
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<tr>
<td>7</td>
<td>Display to Sonalert cable</td>
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<tr>
<td>8</td>
<td>CAN terminator</td>
<td>59783</td>
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<tr>
<td>9</td>
<td>Display to Field-IQ™ cable</td>
<td>75834</td>
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<tr>
<td>10</td>
<td>Basic power cable</td>
<td>67528</td>
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<tr>
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<td>FmX® integrated display</td>
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<td>Display power cable</td>
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CFX-750 display
## Display Connections

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<tr>
<td>12</td>
<td>Display power cable</td>
<td>77282</td>
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</tbody>
</table>
Connecting the EZ-Pilot system

**Step 1**
Connect the power cable to the battery

**Step 2**
Connect the basic power cable to the cable P/N 76351.

Also connect one of the following:
- FmX power cable (P/N 66694)
- CFX-750 power cable (P/N 77282)

**Step 3**
Connect the power cable to the display.

*FmX integrated 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 black 12-pin plug to the IMD-600 unit.

Step 7  Connecting the Sonalert device

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 8**

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 7/8” hole and then mount the switch with the washer and nut.

**Step 5**
Route the switch wires and then reattach the lower housing.
Final Machine Check

In this chapter:

- Performing the final machine check

This chapter describes how to perform a final check of the vehicle.
Performing the final machine check

**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.

1. Connect the battery.


3. 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 axle offset, and Roll offset
   - Machine type, Machine Wheelbase
   - Angle per Turn left, Angle per Turn right
   - Motor Speed, Override Sensitivity