AutoSteer
Install Kit: 186-0078-02

Refer to this manual before installing the AutoSteer system

AutoTrac Ready Installation

Supported Models.

John Deere
S680
S690
S780
S790
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Introduction

This manual provides an overview of and basic information on the installation of an autosteer system (‘autosteer’) on John Deere machines (see front cover and Supported Models, page 7. Read this manual before beginning the installation as it provides the warnings and cautions that you need to recognize and understand before installing or operating autosteer.

The manual provides parts details and step-by-step installation instructions for the machine-specific kit and references to related sub-kits.

Before installing and operating autosteer, read and understand the operator’s manual that comes with your autosteering system. That manual provides autosteer operating instructions and safety information.

Legal Disclaimer

Notes:

(i) Read and follow ALL instructions in this manual carefully before installing or operating the autosteer system.

(ii) Heed all the safety information in the Safety Information section of this manual and the additional safety messages provided throughout this manual and any other supplemental material provided.

The manufacturer disclaims any liability for damage or injury that results from the failure to follow the instructions, cautions, and warnings set forth herein.

About Autosteering:

1. There is NO obstacle avoidance system included with the manufacturer’s product. There must always be a human in the operator’s seat of the vehicle when autosteer is in use to look for obstacles including people, animals, trees, ditches, buildings, and to take manual control of the vehicle to avoid them if necessary.

2. Autosteer does NOT control the speed of the vehicle. The operator must always adjust the speed of the vehicle manually so that it is operated at a safe speed that will not cause the vehicle to roll over or go out of control.

3. Autosteer will take control of the vehicle’s steering system when it is activated during testing, calibration, tuning, and automatic steering operations. The vehicle’s steering axles, tracks, articulation point, or wheels may move unpredictably when activated. Before starting the vehicle and/or activating autosteering, ensure that people and obstacles are clear of the vehicle to prevent death, injury, or damage to property.

4. Use of autosteering is NOT permitted while the vehicle is on public roads or in public areas (‘roading’). Ensure that the system is powered OFF before driving on roads or in public areas.
# Safety Information – Warnings and Cautions

The autosteer installer and manufacturer disclaim any responsibility for damage or physical harm caused by failure to adhere to the following safety requirements:

As the operator of the vehicle, you are responsible for its safe operation. The steering system is not designed to replace the vehicle’s operator.

*Note:* After the installation of autosteering, ensure that all the screws, bolts, nuts, and cable connections are tight. If any of the hydraulic lines or fittings were disconnected or loosened during the installation, ensure that they have been reattached and tightened to prevent oil leaks. Ensure that all the cables and hoses have been secured to prevent them from being damaged.

| ![WARNING Icon] | To understand the potential hazards associated with the operation of an autosteering equipped vehicle, read the provided documentation before installing or operating the autosteer system. |
| ![WARNING Icon] | To prevent accidental death or injury from being run over by the vehicle or automated motion of the steering system, never leave the vehicle’s operator seat with autosteering engaged. |
| ![WARNING Icon] | To prevent accidental death or injury from being run over by the vehicle verify that area around the vehicle is clear of people and obstacles before startup, calibration, tuning, or use of autosteering. |
| ![WARNING Icon] | To prevent the accidental engagement of autosteering and loss of vehicle control while driving on roads, shut down autosteering. Never drive on roads or in public areas with autosteering powered up. |
| ![WARNING Icon] | To prevent accidental falls, maintain a stable position on the vehicle’s platform or stairs when installing or removing the GPS antenna. If the vehicle does not provide a safe platform, use a ladder to safely access the vehicle’s roof. |
| ![WARNING Icon] | To avoid electrical shock hazards, remove the GPS antenna and/or other antennas from the vehicle before driving under low structures or low electrical power lines. |
| ![WARNING Icon] | If the installation requires work on the vehicle’s hydraulic system, read and understand the hydraulic sections of the vehicle manufacturer’s operator manual before starting the installation. Wear hand and eye protection while performing hydraulic system maintenance. Relieve hydraulic system pressure before servicing the hydraulic system. |
| ![WARNING Icon] | If the vehicle has a wheel angle sensor as part of the installation, because the steering mechanism could move suddenly and cause severe injury or death, always shut off the vehicle when working around the steering axle while installing, checking, and adjusting the wheel angle sensor and rod lengths. |
## CAUTION

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>![Warning Icon]</td>
<td>Because the GPS antenna could detach due to wind loads at higher speeds, it must be removed when transporting or driving the vehicle at speeds above 31 mph (50 km/h).</td>
</tr>
<tr>
<td>![Warning Icon]</td>
<td>The autosteer system does not detect obstacles in the vehicle’s path. The vehicle operator must observe the path being driven and take over steering manually if an obstacle must be avoided.</td>
</tr>
<tr>
<td>![Warning Icon]</td>
<td>The autosteer system does not control the speed of the vehicle. The operator must manually adjust the speed of the vehicle to keep the vehicle safely under control.</td>
</tr>
<tr>
<td>![Warning Icon]</td>
<td>The autosteer system must be powered OFF when installing or removing the GPS antenna, autosteer control unit (ECU), or any other part of the autosteer system.</td>
</tr>
<tr>
<td>![Warning Icon]</td>
<td>The GPS antenna must be firmly secured to the mounting plate via the magnet whenever the vehicle is in operation to prevent the GPS antenna from releasing from its bracket and falling and to ensure the GPS antenna is placed at the same point every time.</td>
</tr>
</tbody>
</table>
Installation Requirements

Standard Tool Requirements

The installer is assumed to have a complete set of common installation tools that includes:

- Imperial and metric open-end wrenches (both standard size and stubby lengths for tight fits)
- Imperial and metric sockets, extensions, and ratchet
- Imperial and metric Allen wrenches
- Flat and Philips screwdrivers
- Torx drivers
- 1/4" nut driver
- 2 mm Allen wrench
- Metal hack saw
- Side cutters
- Step ladder, 10 ft (3 m)
- Tape measure, 13 ft (4 m) minimum

The installer will also need the following supplies and additional tools to complete the installation:

- Cleaning rags, abrasive cleaning pads and brushes
- Alcohol pads or other cleaning solution to ensure oil and dirt are removed from surfaces before gluing them
- Oil pan or bucket when working with hydraulic lines
- Spill absorbent to contain any spills

Special Tool Requirements

The following special additional tools may be required for this vehicle installation:

- Drill
- Silicone sealant
**Vehicle Requirements**

Before installing the autosteer system, ensure the following:

- If the vehicle is equipped with a factory-installed steering system (ex. AutoTrac Ready\(^1\), AccuGuide Ready\(^2\), IntelliSteer Ready\(^3\), AutoGuide\(^4\) Ready\(^4\), VarioGuide Ready\(^5\), Agrosky Ready\(^6\)), verify with the vehicle manufacturer’s service representative that the factory-installed components (for example, steering valve, steering wheel encoder, wheel angle sensor) have been installed on the vehicle.

(i) Verify that the factory-supplied components have been calibrated and set up by the vehicle manufacturer’s service provider before installing autosteer.

(ii) A poor calibration will result in poor autosteering performance. The steering valve and wheel angle sensor, in particular, must be fully calibrated either at the factory or by the John Deere dealer. Consult your vehicle dealer on any issues relating to the servicing and calibration of factory steering components. If you have any doubts or performance issues, following the procedure recommended by your vehicle manufacturer, complete your own full steering component calibration.

- The vehicle’s steering system is in good working order. Drive the vehicle to verify that there is no play in the steering and that the vehicle turns proportionally the same to the left and right.

- The vehicle’s electrical system and battery are in good working order.

- The vehicle has been fully cleaned. A clean vehicle will improve the overall installation and cable routing and reduce the chance for oil contamination if hydraulic connections are opened. If installing hydraulic components, it is essential to clean the area around the steering unit (Orbitrol), under the cab, behind the rear cab cover, and at all the hydraulic connections.

Any defects with the vehicle must be repaired by a qualified service person before the autosteer system installation is begun.

**Notes:**

(i) This installation manual, vehicle-specific installation manuals, and sub-kit manuals contain valuable information for servicing the autosteer system. After the installation is complete, store all these manuals in a safe place for future reference.

(ii) When the installation is completed, complete the Final Hardware Installation Checklist and save the checklist with the installation manuals for future reference.

**Technical Support and Contact Information**

For technical support and contact information, refer to your display’s operator manual.

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\(^1\)AutoTrac is a registered trademark of John Deere

\(^2\)AccuGuide is a registered trademark of Case IH

\(^3\)IntelliSteer is a registered trademark of New Holland

\(^4\)AutoGuide\(^2\) is a registered trademark of AGCO

\(^5\)VarioGuide is a registered trademark of Challenger

\(^6\)Agrosky is a registered trademark of Same DeutzFahr
Vehicle Inspection

Before installing the autosteer system, confirm that the vehicle and its steering system are in good working order by driving it. In addition:

- Verify that you can turn the steered wheels from lock to lock.
- Record the time it takes to manually turn the vehicle’s steering mechanism (for example, steering axle, articulation point) from lock to lock (both directions) as fast as you can. This will be used later to ensure steering performance is satisfactory.
- Verify the vehicle steers straight and does not pull to one side when driving in a straight line.
- Check that there are no oil leaks.
- Check for loose or worn steering components.

Any defects with the vehicle must be repaired by a qualified service person before the autosteer system installation is begun.
Installation Overview

Supported Models

The autosteer installation kit (part number 186-0078-02) provides instructions on the installation of autosteer—on the specified vehicles—for the easiest installation and best performance. The vehicles covered by this manual are John Deere combines with the factory installed AutoTrac Ready steering system installed (S6X0 Series Large Frame S680 and S690 model year starting 2012, see also front cover).

Note: The installer can install autosteer differently than how the manufacturer suggests; however, the components that are called out in this manual may not fit properly or cables and hoses may not be long enough with alternative mounting solutions. If the installer modifies the installation procedure, it is the responsibility of the installer to ensure that specific orientation and mounting requirements of all components are met.
Kits Overview

The kits/components required to complete the autosteer installation are described below. Use this section to check that you have all the kits/components required.

Note: Part numbers provided in this manual are subject to change without notice. They are provided as a reference at the time of writing. If spare parts are needed, check with your autosteer dealer that part numbers are still valid.

The following items are assumed to be available for the installation from an autosteer kit that has been purchased separately and are not part of the autosteer vehicle-specific kit. This information is provided here for reference only.

**GPS receiver with antenna**
A GPS receiver and a matching antenna provide the longitude and latitude position of the vehicle.

**Steering electronic control unit (ECU)**
The steering controller, using the position information from the GPS receiver, steers the vehicle on the desired path, using terrain compensation and other sensors for higher steering accuracy. This manual includes the installation of the ECU mounting bracket, the installation of the ECU on its bracket and sections on cabling connections.

**Display kit**
Autosteer is compatible with multiple models of displays. The display power and communication cables are supplied with the display’s installation kit. Autosteer gets its power and activation signal from these cables as well. It is assumed that these parts are available for the installation.

Note: If the display kit components have been installed on another vehicle and this kit is being installed as a switch kit, a display harness and display power harness, additional to those in the vehicle-specific kit, should be ordered so they can be left on the vehicle to allow easier switching of components from vehicle to vehicle.

**Vehicle install kit**
The autosteer vehicle install kit (part number 186-0078-02) provides all the components required to install autosteer on the specified vehicles. It provides parts details and step-by-step installation instructions for the machine-specific kit and references to any related sub-kits. The additional sub-kits referenced provide their own parts list and installation instructions that should be referenced when installing those components. This manual will indicate when to refer to those sub-kits during the installation overview.

<table>
<thead>
<tr>
<th>Item</th>
<th>Sub-Kit Identification</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Autosteer vehicle-specific kit</td>
<td>151-0060-02</td>
</tr>
<tr>
<td>2</td>
<td>Wheel angle sensor kit</td>
<td>200-0720-01</td>
</tr>
</tbody>
</table>
Table 1-2  Autosteer vehicle-specific kit components descriptions

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Common parts</td>
<td>200-0647-03</td>
</tr>
<tr>
<td>2</td>
<td>Termination kit</td>
<td>200-0715-02</td>
</tr>
<tr>
<td>3</td>
<td>Harness, JD S6X0</td>
<td>201-0565-02</td>
</tr>
<tr>
<td>4</td>
<td>Installation manual (this manual)</td>
<td>602-0370-02</td>
</tr>
<tr>
<td>5</td>
<td>Bracket, ECU mounting kit</td>
<td>200-0697-01</td>
</tr>
<tr>
<td>6</td>
<td>Grommet, 1-3/4 OD 1-1/2 ID</td>
<td>508-0001-01</td>
</tr>
<tr>
<td>7</td>
<td>Hole saw, 1-3/4”</td>
<td>808-0041-01</td>
</tr>
<tr>
<td>8</td>
<td>Drill bit, 1/4”</td>
<td>500-0338-01</td>
</tr>
</tbody>
</table>
Cable Connection Diagram with AutoTrac Adapter Harness

- Foot switch (PN 201-0376-01) is an optional accessory.
- Refer to the display operator’s manual for more detailed instructions on how to connect the autosteer to the display data and power ports.
- Component definitions:
  - DISPLAY – Display that is connected to the autosteer system (not shown).
  - BATTERY – Battery terminals for the power source for the autosteer system and display (not shown).
  - AUTOSTEER CONTROL UNIT – Autosteer ECU.
  - FOOT SWITCH* – Optional foot switch that can be used for remote engagement (not required for installation).
  - AUTOTRAC STEERING VALVE – Factory-supplied steering valve.
  - ENCODER – Encoder on the steering wheel that enables system to detect when user turns steering wheel manually.
  - WHEEL ANGLE SENSOR - Factory wheel angle sensor is not used for this installation. A secondary one is added and connected to the autosteer system while the factory one is left connected to that AutoTrac system.
  - AUTOTRAC HARNESS – Factory-supplied harness that runs among the various factory installed autosteer components.

Figure 1-2  Autosteer cable connections overview
Installation Procedure Overview

This section provides an overview of all the steps that are required to complete autosteer installation. For more detailed instructions of each step, follow the procedures provided in the subsequent chapters of this installation manual or instructions provided with the referred to. Install the components in the order provided in this section for best results.

1. Kit verification – Verify that the installation kit ordered matches the vehicle that it is being installed on and that all the parts have been shipped.

2. Wheel angle sensor – Follow the instructions provided in the Wheel Angle Sensor Installation Manual provided with the Wheel Angle Sensor kit.
   a. Install the wheel angle sensor brackets.
   b. Install the wheel angle sensor.

3. GPS antenna – Install the GPS antenna mounting bracket and GPS antenna on top of the vehicle’s cab roof. See the Install the GPS Antenna Mounting chapter in this manual.

4. Display RAM mount – Install the display RAM mount inside the cab. See the Install the Display Mounting Bracket chapter in this manual.

5. Display – Follow the instructions provided with display operator’s and installation manual that comes with the display kit.
   Note: Autosteer can be matched with multiple display options. Follow the instructions that come with your display for the procedures to install the display and to connect the display harnesses to vehicle for power and autosteer.
   a. Install the display using the RAM mount.
   b. Install the display harness.
   c. Install the power harness for the display.
   Note: Refer to the Install and Connect the Autosteer Harnesses chapter in this manual for information about locating and accessing the battery or other power source.

6. Autosteer control unit – Follow the instructions provided in the ECU Mounting Bracket Install Kit (200-0697-01).
   For the S780 and S790 models, follow the instructions in the mounting bracket install kit manual but at steps 6 and 7, install the ECU bracket with it stepping up from its fixing point, not stepping down. This requires some compression of the molded rubber fitting next to the seat. See S780/790 mounting at right.
   Note: The autosteer ECU must be mounted in a place that is solid to the frame or cab of the vehicle. It must not move independently of the vehicle (cannot be sitting on the floor of the cab loose). The mounting point must be vibration free. Use the bracket(s) provided with the installation kit to mount the ECU when provided.

7. Autosteer main harness – See the Install and Connect the Autosteer Harnesses chapter in this manual. Route the harness connections between the autosteer ECU’s left connector to each of the following (see display operator’s manual for instructions):
   a. The display or display harnesses.
   b. The power activation connection.
   c. The power supply.
8. **Autosteer vehicle-specific harness** – See the Install and Connect the Autosteer Harnesses chapter in this manual.
   a. Install the AutoTrac ECU harness (PN 201-0565-02).
   b. Install the wheel angle sensor terminator harness (PN 201-0581-01).
   c. Install the wheel angle sensor terminator (PN 201-0460-01).
   d. Install solenoid terminators and adapter harnesses (PN 201-0580-01 and 201-0582-01).
   e. Install the steering wheel encoder adapter harness (PN 201-0506-01).
   f. Connect the AutoTrac ECU harness (PN 201-0513-01) to the:
      i. Wheel angle sensor
      ii. Steering wheel encoder
      iii. Steering valve

9. **GPS antenna cables** – Route the following cables from the autosteer ECU to the GPS antenna.
   
   *Note: Depending on options ordered, not all the following connections are required for all installations.*
   a. Attach the GPS coax cable.
   b. Attach the cell modem coax cable (if required).
   c. Attach the radio modem data/power harnesses (if required).
   d. Attach the serial NMEA harness (if required)

10. **Final hardware verification** – Verify that all the bolts have been tightened, electrical and hydraulic connections are securely connected, and that all hoses and cables have been routed safely and secured to the frame of the vehicle away from moving parts with cable ties.
    a. Fill out the Vehicle Profile Worksheet provided at the end of this manual.
    b. Power ON autosteer.
    c. Create a new vehicle profile.

11. **Final vehicle setup** – See the Post-Installation Procedures and Information chapter.
    a. Calibrate the vehicle.
    b. If necessary, tune the vehicle to improve performance.
    c. Verify the system has been installed properly and operates satisfactorily.

12. **Final information recording and checklists** – Fill out the information sheet and two checklists at the end of this manual (pages 43 and 44).
Install the GPS Antenna Mounting Plate

⚠️ WARNING

To prevent accidental falls, maintain a stable position on the vehicle’s platform or stairs when installing or removing the GPS antenna. If the vehicle does not provide a safe platform, use a ladder to safely access the vehicle’s roof.

Overview

The GPS antenna is the removable assembly that includes the GPS antenna and, if the installation requires, cell modem antenna that is mounted on top of the roof of the vehicle. The GPS antenna assembly is also the location where the optional radio modem antenna and radio modem or OmniSTAR demodulator accessory kits are installed. The GPS antenna is attached magnetically to a GPS antenna mounting plate that is permanently attached to the roof of the vehicle. This enables the GPS Antenna to be quickly removed and reattached in the same location on the vehicle.

Installation Procedure

This GPS antenna mounting plate is designed to fit any vehicle installation using the tape on the bottom of the bracket. Predrilled holes are also provided to enable the installer to bolt the bracket to existing structures on the vehicle. The GPS antenna mounting plate needs to be mounted flat, on the top of the vehicle in a stable location.

Note: The GPS antenna mounting plate can vary, depending upon the exact model of GPS antenna used. Although this manual shows one particular model of mounting plate, the same general procedure applies to all mounting plates that use adhesive tape to secure the antenna to the cab roof. If your GPS antenna was provided with specific mounting plate installation instructions, follow those instructions.
1. Remove the GPS antenna mounting plate from the installation kit.

*Note:* Notice the three tab slots on the GPS antenna mounting plate. They are used to center the GPS antenna when it is attached to the plate.

The two tab slots should always be on the left side of the vehicle.
Install the GPS Antenna Mounting Plate

2. Locate a flat area at least 10 inches side to side by 20 inches front to back (25 cm by 50 cm) along the centerline of the vehicle. This is not the centerline of the cab roof if the cab is offset.

   Note: It may be necessary to build a mounting bracket to allow the GPS antenna mounting plate to be mounted firmly. The plate has mounting holes for securing it to the vehicle or another bracket if necessary.

3. Thoroughly clean the area on the roof with soap and water to remove ALL dirt.

   Note: Cabs with a great deal of oxidation or texture may require more abrasive cleaning methods to achieve a clean surface. When necessary, use a scour pad such as Scotch-Brite™ to thoroughly clean the surface until it is smooth and free of contaminants.
4. Use alcohol wipes provided to finish cleaning the area to verify that all oil and grease is removed.

5. Let the area dry.

   Note: It is very important that all dirt and oil have been removed from the mounting point on the cab so that the high bond strips will hold the mounting plate to the roof.

6. Use fixed points on the roof and a tape measure to find the exact centerline of the vehicle and mark that position on the area that has been cleaned with a marking device.

   Note: The center line of the cab may not be the centerline of the vehicle if the cab is offset.

   Always verify that the centerline used is the centerline of the vehicle and not necessarily the cab.
7. Remove the four adhesive backings from the mounting plate.
8. Use the two notches on the mounting plate to center it over the marks that show the centerline of the vehicle. Carefully place the mounting plate on the clean area.

*Note:* The mounting plate is orientation dependent. Verify that the two tabs are on the left side of the vehicle and the single tab is on the right side. The front of the mounting plate is marked **FRONT** and should be oriented toward the front of the vehicle.

*Note:* Verify that the mounting plate is square with the vehicle prior to letting the adhesive stick to the roof.

*Note:* The ideal temperature for applying the mounting plate using high bond tape is 70°F to 100°F (21°C to 38°C). Do not apply the high bond tape at temperatures below 60°F (15°C).

9. Once the mounting plate is in the proper location, firmly press the adhesive areas to ensure a good contact is made with the roof. Apply pressure for a few seconds to all four corners of the plate.

*Note:* The high bond tape uses a permanent adhesive. Verify and confirm the correct position and orientation of the mounting plate before applying it to the vehicle roof.
10. Refer to your autosteer operator’s manual for instructions on installing and removing your GPS antenna.
install the display mounting bracket

overview
this guide provides instructions for installing the display mounting bracket. these instructions assume a ram ball will be used for the final mounting solution. however, it is possible to attach the display with some other display mounting solutions if desired.

note: refer to your display operator’s manual for instructions on installing the display itself.

installation procedure
the installation kit provides a flat-plate ram mount ball that can be bolted to any flat surface. locate a position in the cab that will allow the ram mount ball to be attached. the location should allow the display to be positioned close enough for the driver to comfortably press the autosteer engage button on the screen (the lower, right hand corner). it should also be positioned so that the display does not block the operator’s field of view.

figure 3-1 flat-plate ram mount ball

once the ram mount has been installed, follow the instructions in the display operator’s manual to install the display in the vehicle.
Install and Connect the Autosteer Harnesses

Overview

The final step of the hardware installation is to connect all the components installed with the various harnesses that come with the system. Refer to the cable connections overview (Figure 1-2, page 10) that shows all the necessary cable connections on the vehicle. Also refer to the display operator’s manual for additional instructions on how to connect autosteer to the display.

Note: When routing harnesses, verify that all harnesses are routed away from moving parts and sharp objects. Secure the harnesses with cable ties to ensure they are not damaged.

Locate Cab Cable Access Point

The autosteer system has components installed both inside and outside the cab. To connect these components, some cables need to be run between the inside and outside areas. To make this easy, there is a cab cable access point through which cables can be passed in and out of the cab. This section provides the location of this cab cable access point and the procedure for opening the ports. Use this point to run any cables in and out of the cab for the installation.

Note: It is the responsibility of the installer to ensure that the cab cable access point is sealed properly after the final installation has been completed. If required, use a sealant to verify that the hole has been completely sealed.

Locate the Cab Cable Access Point

1. Open the right side main shield door by turning the latch and pulling the door out.
2. Locate the cab cable access point plate at the right, rear part of the cab.

3. Remove six hex bolts with a 10 mm socket and ratchet.

4. Use a flat screwdriver to pry the access plate from the side of the cab.

5. Locate the open area on the access panel (see cross hatch) where there are currently no connectors going through.

6. Move the cables on both sides of the plate. Disconnect the connectors on the outside to make this easier.

7. Drill a 1-3/4" hole through the plate.

   **Note:** Verify that the drill bit will not damage anything on either side of the plate and that the hole will fit inside the lip that holds the plate to the cab.

8. Pass all cables and harnesses that need to go between the inside and outside of the cab through this port.
9. Locate the cable cab access point inside the cab under the rubber mat on the right side of the driver's seat.

10. Pull the rubber mat/cup holder up.

11. Locate the four plastic retainer buttons that hold the metal plate in place.
12. Use a flat screwdriver to pull the center, top part of the retaining buttons up.

13. Use the flat screwdriver to put the retaining button out of the hole.

14. When all four retaining buttons have been removed, pull the metal plate out of the way.

15. Locate the hole at the back of the cable area. This hole leads to the cab cable access point outside plate where cables can be run in and out of the cab.

*Note:* When all cables have been routed replace the covers inside the cab. Reattach the cab cable access plate on the outside and seal the space around the cables using a rubber grommet and/or silicone sealant so that dirt, rodents, etc. cannot gain access to the cab.
Attach Harnesses to Autosteer Control Unit

The autosteer ECU has two main connectors. These connectors are keyed so that the connector can be attached in the proper port and orientation. The connectors on the ECU and the cables also have a colored dot to aid attaching the cables properly. The autosteer main cable harness is represented by a yellow dot and the vehicle-specific ECU harness is represented by a white dot. Always verify that the colored dots match before attaching the harnesses.

Never force the connectors; the connectors should easily slide into place. Forcing the connector may damage them.

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Vehicle-Specific ECU Harness

The installation kit comes with an AutoTrac ECU harness that is used to connect the vehicle components to the autosteer ECU. Attach the 30-pin connector of the harness to the right side connector on the autosteer ECU with a 1/4” nut driver. The cable connector is keyed and has a white dot that needs to be matched to the port on the autosteer ECU. Never force the connector, see CAUTION, page 26.

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The AutoTrac ECU harness has three cables that need to be connected to the wheel angle sensor, steering valve, and steering wheel encoder. This harness also provides a 4-pin connector to attach to the optional remote engage foot switch. Carefully route these cables from the autosteer ECU to each of the components making sure that the cables will not be damaged by moving parts or sharp edges. After the cables have been run, secure them with cable ties.
Wheel Angle Sensor (WAS) Connection

**Note:** The John Deere AutoTrac system comes equipped with a factory installed wheel angle sensor. This sensor is used by other John Deere systems on the vehicle and therefore cannot be disconnected. Do not disconnect or attempt to use the factory wheel angle sensor with autosteer.

**Connect the WAS**

1. Route the WAS cable toward the back of the vehicle where the wheel angle sensor is located.
2. Connect the 3-pin connector to the WAS connector.
3. Secure the cables to the bracket using a cable tie so that the connector is NOT being stressed.
   **Note:** The WAS harness should be attached to the vehicle or bracket as close to the connector with a cable tie as possible to reduce strain on the connector.
4. Attach the WAS shield to the front of the wheel angle sensor with two 3/8” x 3/4” hex bolts. Tighten with a 9/16” socket and ratchet.
Wheel Angle Sensor (WAS) Terminator Harness and Steering Valve

1. Route the steering valve cable toward the front of the vehicle under the cab where the steering valve is located.

2. Route the wiring harness down the left side of the vehicle to this point.

3. Locate the connector at this position.
4. Use a small, flat screwdriver to move the small, red locking tab to the open position.

5. Press the release button and then separate the connectors.

6. Attach the WAS terminator harness between the two connectors.
   
   *Note: Ensure the locking tabs are slid back to the locked positions after reconnecting the connectors.*
7. Attach the WAS terminator to the wheel angle sensor terminator harness connector.

8. Secure the two relays to the back of the support beam with an M6 x 25 mm bolt, two M6 flat washers, and an M6 nyloc nut.

9. Locate the steering valve under the cab on the left side of the machine.
10. Remove the three connectors from the bottom of the valve.

*Note:* Mark which connector is which prior to removing them. The two valve harnesses are labeled RED and WHITE with a small, colored tag. The enabler harness is not labeled.

11. Attach the three jumper cables to the solenoids.

*Note:* Two of the jumper cables are the same part number and have the same connector on the opposite side. It does not matter which jumper cable is plugged into which solenoid at this point.

12. Assemble the two solenoids with the same connectors as shown with the M12 x 1.75 x 110mm bolt and two M12 flat washers.
13. Locate the two holes on the left side of the machine on the cross beam in front of the steering valve.

14. Attach the two solenoids assembled earlier to the back hole with an M12 flat washer and M12 nyloc nut.

15. Attach the other solenoid to the front hole with an M12 x 1.75 x 70 mm bolt, two flat washers, and M12 nyloc nut.

16. Tighten the bolts with an 18 mm socket and ratchet and 19 mm wrench.

   **Note:** DO NOT OVERTIGHTEN. The bolts just need to be just snug enough so they do not rattle. Overtightening the bolts may damage the solenoids.

   **Note:** Torque to 4-6 lb-ft (5-8 Nm).

17. Attach the other end of the adapter cables going from the solenoids to the original steering valve connectors.

   **Note:** The ENABER connector will be unique. The WHITE and RED connectors will be the same. It does not matter which solenoid is plugged into either of the WHITE or RED connectors. They are interchangeable.
18. Attach the steering valve connectors of the ECU harness provided to the bottom of the steering valve.  

*Note: Verify that the RED, WHITE, and ENABLER labeled connectors are plugged into the correct port.*

19. Attach the ‘Relay’ connector from the ECU harness to the tee cable on the wheel angle sensor terminator harness.

20. Attach the dummy connector to the other end of the tee cable of the wheel angle sensor terminator harness to protect it.

21. Secure all the cables with cable ties so they are out of the way and will not be damaged by moving parts.
Steering Wheel Encoder

1. Route the encoder cable toward the front of the vehicle under the cab where the steering valve is located.

2. Locate the encoder harness connector on the left side of the orbitrol near the floor of the cab.
3. Separate the connectors the same way as the wheel angle sensor harness connectors were disconnected.

4. Attach the steering wheel encoder adapter harness in between the two connectors that were just separated.
5. Verify the locking tabs have been set.
6. Attach the encoder cable from the ECU harness to the end of the steering wheel encoder adapter harness.

7. Secure all the cables with cable ties so they are out of the way and will not be damaged by moving parts.

**Other Autosteer Harnesses**

Refer to the manuals and documentation provided with the other components of your autosteer system to complete all necessary cable connections. Typically, a display and a steering controller are required to complete the autosteer installation, and they each have their own specific cables and installation instructions.

**Route Cables to Top of Cab**

1. Route the coax cable(s) and radio power/data (if applicable) out of the cab through the cab cable access point.

2. Route the cable forward to the right, front corner post of the cab on the outside.

3. Route the cable up the front, right corner post of the cab

4. Secure the cable with cable ties to existing structures after the cable has been run the entire distance.

**Power Supply for Autosteer System**

The autosteer ECU must be connected to a 12 V uninterrupted power supply. In most situations, the display kit will provide a harness that provides power directly from the battery to the display and autosteer system. The autosteer ECU must also be connected to a power activation signal from the display. This connector provides a signal to the autosteer ECU to command it to power up when the display is powered up. Refer to your display operator’s manual for instructions on connecting autosteer to power and the power activation signal. *Figure 4-3* (next page) shows an example of a typical power connection scenario.
Figure 4-3  Typical battery cable connection diagram
Post-Installation Procedures and Information

Once the entire autosteer system, including the display and display harnesses, has been installed on the vehicle, the procedures and notes provided in this chapter must be followed to complete the installation and prepare the vehicle for full autosteer capabilities.

Install Warning Label

Install the warning label on the cab window in a position that is easy to read and does not obstruct the driver’s view of the road or surrounding obstacles.

*Note:* Install the warning label with the language that best matches the operator’s language. If necessary, install labels in multiple languages. Warning labels are provided in the following languages: English, French, German, and Spanish.

Verify Vehicle's AutoTrac Ready System is Ready

The autosteer system performance and functionality depends on the factory installed AutoTrac Ready system being installed correctly and setup and calibrated by a factory representative. Failure to verify the above may cause the system to not perform properly in the field while autosteering. Before setting the vehicle up with autosteer, verify that:

- AutoTrac Ready components have been installed
- AutoTrac Ready components have been calibrated by vehicle service representative
Create New Vehicle

**AutoTrac Ready Installed on Vehicle**

The AutoTrac Ready must have the steering valve and all the sensors (wheel angle sensor, steering wheel encoder, etc.) installed on the vehicle from the factory. This must be confirmed by the vehicle manufacturer service representative. If any of the components are missing, the vehicle manufacturer service representative will have to have them installed prior to continuing with the autosteer setup.

**AutoTrac Ready System Calibrated**

The AutoTrac Ready system on the vehicle itself must be calibrated by the vehicle manufacturer service representative. This should have been performed at the factory. However, it may be necessary for the vehicle manufacturer service representative to repeat this process to ensure adequate performance. It is always best to verify these steps have been performed before continuing with the autosteer setup.

**Create New Vehicle**

The operator must first create a new vehicle profile. This configures the steering system hardware so the display can properly communicate with the various sensors and components on the vehicle. Enter all the appropriate information for setting up the vehicle.

1. Verify that the vehicle is in Park and/or the park brake is set to prevent the vehicle from moving.
2. Verify the vehicle is off. Do not start the vehicle yet.
3. Power on autosteer (turn the key to the Run position if necessary but do not start the engine).
4. Follow the instructions provided in the display operator’s manual to create a new vehicle using the Setup Wizard.
   
   *Note: Select AutoTrac Ready as the controller for the specific vehicle model when setting up your vehicle on the autosteer display.*

5. When the system reaches the Auto Calibrate screen, press the Exit Screen Arrow to exit the procedure and save the vehicle information.
6. Power off autosteer.

**Calibration and Tuning Guidelines**

*Note: For optimal steering performance, the autosteer system must be fully calibrated and then tuned.*

1. Start the vehicle and move it to an open area.
2. Power on autosteer.
3. Follow the instructions in the display operator’s manual to navigate to the Vehicle tab from the AutoSteer Setup screen. The current vehicle should have already been set up and selected during the Create New Vehicle section, if not, select the current vehicle profile in the Manage Vehicle screen.
4. From the Vehicle tab of the AutoSteer Setup screen, press the Auto Calibrate button. Follow the onscreen procedure to calibrate the vehicle.
5. If additional performance is required, follow the instructions provided by the Display Operator’s Manual to Tune the vehicle after the calibration has completed. Under normal circumstances this should not be necessary.
# Vehicle Profile Worksheet

## Wheel Base

<table>
<thead>
<tr>
<th>Wheel Base</th>
<th>Length</th>
<th>Units Used</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Wheel Base Image" /></td>
<td></td>
<td><img src="checkboxes.png" alt="Checkboxes for Units" /></td>
</tr>
</tbody>
</table>

- Inches
- Feet
- Centimeters
- Meters

## GPS Antenna Location

<table>
<thead>
<tr>
<th>GPS Antenna Location</th>
<th>Fore/Aft</th>
<th>Left/Right</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image2.png" alt="GPS Antenna Image" /></td>
<td><img src="measurement1.png" alt="Fore/Aft Measurement" /></td>
<td><img src="measurement2.png" alt="Left/Right Measurement" /></td>
<td><img src="measurement3.png" alt="Height Measurement" /></td>
</tr>
</tbody>
</table>

**Measurements:**

- Fore
- Aft
- Left
- Right

## GeoSteer Control Unit Location

<table>
<thead>
<tr>
<th>GeoSteer Control Unit Location</th>
<th>Fore/Aft</th>
<th>Left/Right</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image3.png" alt="GeoSteer Image" /></td>
<td><img src="measurement1.png" alt="Fore/Aft Measurement" /></td>
<td><img src="measurement2.png" alt="Left/Right Measurement" /></td>
<td><img src="measurement3.png" alt="Height Measurement" /></td>
</tr>
</tbody>
</table>

**Measurements:**

- Fore
- Aft
- Left
- Right

## Direction of Arrows

<table>
<thead>
<tr>
<th>Direction of Arrows (Front, Back, Left, Right, Up, Down)</th>
<th>X Arrow</th>
<th>Y Arrow</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image4.png" alt="Direction of Arrows Image" /></td>
<td><img src="image5.png" alt="X Arrow Image" /></td>
<td><img src="image6.png" alt="Y Arrow Image" /></td>
</tr>
</tbody>
</table>

## GeoSteer Control Unit Orientation

<table>
<thead>
<tr>
<th>GeoSteer Control Unit Orientation</th>
<th>X Axis</th>
<th>Y Axis</th>
<th>Z Axis</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image7.png" alt="Orientation Image" /></td>
<td><img src="image8.png" alt="X Axis Image" /></td>
<td><img src="image9.png" alt="Y Axis Image" /></td>
<td><img src="image10.png" alt="Z Axis Image" /></td>
</tr>
</tbody>
</table>

## Draw Orientation of GeoSteer Control Unit for all Three Directions and Angle Measured

![Orientation Drawing](image11.png)

## Measured Angle (Degrees):

| Measured Angle (Degrees): | |
|---------------------------| |
| ![Angle Measurement](image12.png) | |

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*Autosteer Installation Manual*
Final Checklists - Hardware and Performance

After the completion of the autosteer installation, enter the required information below then complete the Final Hardware Installation Checklist and the Final Autosteer Performance Checklist. Use the checklists to confirm that all the steps have been completed and create a record of important system information.

Machine Model: _______________________________  Year: ________  Serial #: ______________________________

Customer Name: ______________________________________________________________________________________

Location/Address: ______________________________________________________________________________________

Autosteer Installation Kit Part Number: _____________________________________________________________________

Notes;
_____________________________________________________________________________________________________
_____________________________________________________________________________________________________
_____________________________________________________________________________________________________
_____________________________________________________________________________________________________
_____________________________________________________________________________________________________
_____________________________________________________________________________________________________
_____________________________________________________________________________________________________
_____________________________________________________________________________________________________

Name of Installer: ____________________________________________   Date: ____________________________________
Final Hardware Installation Checklist

1. Display bracket and display installed and all fasteners are tight.

2. GPS antenna is installed.

3. Autosteer ECU installed firmly to frame and all fasteners are tight.

4. All cable ends and terminations are connected.

5. All cables are secured with cable ties.

Final Autosteer Performance Checklist

1. Manual steering speed from lock to lock is satisfactory. Value _____ sec

2. Autosteer steering speed from lock to lock is satisfactory. Value _____ sec

3. Wheel angle sensor counts recorded.
   - Left
   - Center
   - Right

4. Manual kick-out is working when the steering wheel is turned.

5. Autosteer system calibration completed.

6. Autosteer system tuning completed (if necessary).

7. Line acquisition steering performance is satisfactory.

8. On-line steering performance is satisfactory.