Please refer to this manual prior to beginning the installation of the GeoSteer® system

Factory Steer Ready Installation

Supported Models.

Miller
Nitro 5215
Nitro 5240
Nitro 5275
Nitro 5333
Nitro 5345
Nitro 5365
Nitro 5400

New Holland
SP.240F
SP.240FXP
SP.275F
SP.333F
SP.365F
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Introduction

This manual provides the basic information and overview of the installation procedure for installing a GeoSteer system on a vehicle. The GeoSteer system can be installed on many makes, models, and types of vehicles. Read this manual prior to beginning the installation as this manual provides the cautions and warnings that need to be recognized and understood prior to installing or operating a GeoSteer system.

This manual provides the instructions for the installation of the components that come with this GeoSteer installation kit. The installation is broken down into specific sections that may refer to sub-kit assemblies that are part of this kit. These sub-kits will come with their own instructions so refer to those when directed for information on installing the sub-kit parts.

Prior to operating and installing the GeoSteer system, be sure to read and understand the GeoSteer Operator’s Manual that comes with the GeoSteer system. That manual provides the instructions on how to operate the GeoSteer system as well as additional safety information.

Legal Disclaimer

Note: Read and follow ALL instructions in this manual carefully before installing or operating the GeoSteer system.

Note: Take careful note of 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.

Please take special note of the following warnings:

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

2. The GeoSteer system 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. The GeoSteer system will take over control of the vehicle’s steering system when the GeoSteer system 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. Prior to starting the vehicle and/or activating the GeoSteer system, verify that all people and obstacles are clear of the vehicle to prevent death, injury, or damage to property.

4. Use of the GeoSteer system is NOT permitted while the vehicle is on public roads or in public areas. Verify that the system is powered OFF before driving on roads or in public areas.

---

1 GeoSteer is a registered trademark of Novariant, Inc.
Safety Information

Warning Alerts

The GeoSteer system installer and manufacturer disclaim any responsibility for damage or physical harm caused by the 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 the GeoSteer system, verify that all the screws, bolts, nuts, and cable connections are tight. If any of the hydraulic lines or fittings were loosened during the installation, verify that they have been reattached and tightened to prevent oil leaks. Verify that all the cables and hoses have been secured to prevent them from being damaged.

---

⚠️ WARNING

To understand the potential hazards associated with the operation of a GeoSteer equipped vehicle, read the provided documentation prior to installing or operating the GeoSteer system.

⚠️ WARNING

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 the GeoSteer system engaged.

⚠️ WARNING

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 the GeoSteer system.
**WARNING**

To prevent the accidental engagement of the GeoSteer system and loss of vehicle control while driving on roads, shut down the GeoSteer system. Never drive on roads or in public areas with the GeoSteer system powered up.

**WARNING**

Verify that you are in a stable position on the vehicle’s platform or stairs when installing or removing the GeoDock so you do not fall. If the vehicle does not provide a safe platform, use a ladder to safely access the vehicle’s roof.

**WARNING**

To avoid electrical shock hazards, remove the GeoDock and/or other antennas from the vehicle before driving under low structures or low electrical power lines.

**WARNING**

*High-Pressure Fluid Hazard*

If the installation requires working on the hydraulic system on the vehicle, read and understand the hydraulic sections of the vehicle manufacturer’s operators manual before starting the installation. Wear hand and eye protection while performing hydraulic system maintenance. Relieve hydraulic system pressure before servicing the hydraulic system.
Safety Information

**WARNING**

If the vehicle has a Wheel Angle Sensor as part of the installation, always shut off the vehicle when working around the steering axle while installing, checking, and adjusting the Wheel Angle Sensor and rod lengths. The steering mechanism could move suddenly and cause severe injury or death.

---

**Caution Alerts**

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

**CAUTION**

The GeoDock must be removed when transporting or driving the vehicle at speeds above 31 mph (50 km/h). The GeoDock can possibly detach due to wind loads at higher speeds.

**CAUTION**

The GeoSteer 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.

**CAUTION**

The GeoSteer 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.
Installation Requirements

Standard Tool Requirements

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

- 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
- 2mm Allen wrench
- Side cutters
- Step ladder, 10 ft (3 m)
- Tape measure, 13 ft (4 m) minimum

The installer is also assumed to have the following supplies and additional tools to complete the installation:

- Cleaning rags, abrasive cleaning pads and brushes
- Alcohol pads or other cleaning solution to verify oil and dirt is removed from surfaces prior to gluing them
- Oil pan or bucket when working with hydraulic lines
- Floor Dry to contain any spills

Special Tool Requirements

Some special additional tools may be required for this vehicle installations.

- Silicone sealant (for Cable Access Hole sealing)
Vehicle Requirements

Prior to installing the GeoSteer system, verify the following items on the vehicle:

- If the vehicle is equipped with a factory installed steering system (ex. AutoTrac Ready\(^2\), AccuGuide Ready\(^3\), IntelliSteer Ready\(^4\), AutoGuide\(^2\) Ready\(^5\), VarioGuide Ready\(^6\), Agrosky Ready\(^7\)), verify with the vehicle manufacture’s service representative that the factory installed components (ex. Steering Valve, Steering Wheel Encoder, Wheel Angle Sensor, etc.) have been installed on the vehicle.

  **Note:** Verify that the factory supplied components have been calibrated and set up by the vehicle manufacture’s service provider prior to installing the GeoSteer System.

- The vehicle’s steering system is in good working order. Drive the vehicle to verify this prior to beginning the installation. There should be no play in the steering and the vehicle should turn proportionally the same to the left and right.

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

- The vehicle should be fully cleaned before installing the GeoSteer system. A clean vehicle will improve the overall installation and cable routing and will also reduce the chance for oil contamination if the hydraulic connections are opened. If installing any hydraulic components, it is important to clean the area around the steering unit (Orbitrol), under the cab, behind the rear cab cover, and all the hydraulic connection points.

If any issues are discovered with the vehicle, they must be repaired prior to beginning the GeoSteer installation by a qualified service person for the vehicle.

**Note:** This installation manual, vehicle specific installation manuals, and sub-kit manuals contains valuable information for servicing the GeoSteer system. After the installation is complete, store all of these manuals in a safe place for future reference.

**Note:** After the installation is completed, be sure to complete the Final Hardware Installation Checklist and save this sheet with the installation manuals. The values recorded on these sheets can be referred to in the future when servicing the system.

Technical Support

Refer to your Display Operator’s Manual for technical support information.

Contact Information

Refer to your Display Operator’s Manual for contact information.

\(^2\) AutoTrac is a registered trademark of John Deere  
\(^3\) AccuGuide is a registered trademark of Case IH  
\(^4\) IntelliSteer is a registered trademark of New Holland  
\(^5\) AutoGuide\(^2\) is a registered trademark of AGCO  
\(^6\) VarioGuide is a registered trademark of Fendt  
\(^7\) Agrosky is a registered trademark of Same Deutz Fahr
Vehicle Inspection

Prior to installing the GeoSteer system, confirm that the vehicle and the vehicle’s steering system are in good working order by driving it around. In addition, verify the following items:

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

If any part of the vehicle is not in working order, have the system serviced by a qualified technician prior to beginning the GeoSteer installation procedure.
Installation Overview

Supported Models

These instructions provide the suggestion procedure for installing the AutoSteer system on qualified vehicles for the easiest installation and best performance. The vehicles covered by this manual are the Miller self propelled sprayers with the factory installed AutoSteer components including a factory steering valve and wheel angle sensor.

The AutoSteer installation kit PN: 186-0088-01 is used on the following vehicle series:

- **Miller Nitro 5XXX Series (5215, 5240, 5275, 5333, 5345, 5365, and 5400) model year start 2012, steer-ready.**

- **New Holland SP.240F, SP.240FXP, SP.275F, SP.333F, SP.365F, steer ready**

**Note:** This kit is compatible with vehicles that have the four wheel steering option and also those that do not have the four wheel steering option.

**Note:** The installer can install the AutoSteer system differently than how the manufacturer suggests; however the components that are called out in this manual may not fit properly or the lengths of 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 all the components will work and that any component with specific orientation and mounting requirements are met.
Kit Overview

The sub-kits that are required for the installation of the GeoSteer system are provided in this section. Use this section to verify that all the sub-kits and parts required for the installation are available.

Note: All part numbers provided in this manual are subject to change without notice. They are provided as a reference at the time of this writing. Always verify that the part numbers are still valid from your AutoSteer dealer if spare parts need to be ordered.

GeoSteer System Kit

The following parts are assumed to be available for the installation from a GeoSteer System Kit that has been purchased separately and are not part of the GeoSteer Vehicle Specific Kit. This information is provided here for reference only.

Note: If the GeoSteer System Kit components have been installed on another vehicle and this kit is being installed as a switch kit, additional cables and harnesses (Items 2, 3, and 4) provided in this section should be ordered in addition to the Vehicle Specific Kit so they can be left on the vehicle to allow easier switching of components from vehicle to vehicle.

Table 1 GeoSteer System Kit Components Descriptions

<table>
<thead>
<tr>
<th>Item</th>
<th>Component</th>
<th>Part Number</th>
<th>Notes</th>
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<tbody>
<tr>
<td>1.</td>
<td>GeoSteer Control Unit Assembly</td>
<td>200-XXXX-XX</td>
<td>GeoSteer Control Unit and part number are different depending on geographic region system is used</td>
</tr>
<tr>
<td>2.</td>
<td>Cable, GPS Coax</td>
<td>201-0516-XX</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Cable, Cell Modem Coax</td>
<td>201-0539-XX</td>
<td>Required if GeoSteer has a Cell Modem</td>
</tr>
<tr>
<td>4.</td>
<td>Harness, Main GeoSteer</td>
<td>201-0530-XX</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>GeoDock</td>
<td>200-XXXX-XX</td>
<td>GeoDock and part number are different depending on options</td>
</tr>
</tbody>
</table>

Figure 1   GeoSteer System Kit Components
**Display Kit**

The GeoSteer system is compatible with multiple models of Displays. The Display power and communication cables are supplied with the Display Kit. The GeoSteer system 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, an additional Display Harness and Display Power Harness should be ordered in addition to the Vehicle Specific Kit so they can be left on the vehicle to allow easier switching of components from vehicle to vehicle.
Kit Overview

Vehicle Install Kit

The GeoSteer Vehicle Install Kit provides all the components required to install a GeoSteer system on the vehicle. The Vehicle Kit is separated into individual sub-kits. This manual provides the parts list and instructions for installing the components from the GeoSteer Vehicle Specific Kit. 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 2  Vehicle Install Kit for 186-0088-01

<table>
<thead>
<tr>
<th>Item</th>
<th>Kit Identification</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>GeoSteer Vehicle Installation Kit</td>
<td>186-0088-01</td>
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</tbody>
</table>

GeoSteer Vehicle Specific Kit

Figure 2  GeoSteer Vehicle Specific Kit Components
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<tr>
<th>Item</th>
<th>Component</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
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<td>1.</td>
<td>Bracket, ECU Mounting Kit</td>
<td>200-0707-02</td>
</tr>
<tr>
<td>2.</td>
<td>Bracket Base Roof</td>
<td>200-0612-01</td>
</tr>
<tr>
<td>3.</td>
<td>Cable Routing Hardware</td>
<td>200-0076-01</td>
</tr>
<tr>
<td>4.</td>
<td>Safety Labels</td>
<td>603-0074-01</td>
</tr>
<tr>
<td>5.</td>
<td>RAM Mount, U-Bolt</td>
<td>207-0010-01</td>
</tr>
<tr>
<td>6.</td>
<td>Harness Miller 5000 SR</td>
<td>201-0608-01</td>
</tr>
<tr>
<td>7.</td>
<td>Install Guide</td>
<td>602-0557-01</td>
</tr>
</tbody>
</table>
Cable Connection Diagram with AutoSteer Valve

- Cell Antenna Coax Cable (PN 201-0539-02) is not required if not using a Cell Modem.
- Foot Switch (PN 201-0376-01) is an optional accessory component.
- Refer to the Display Operator’s Manual for more detailed instructions on how to connect the GeoSteer to the Display data and power ports.
- Component definitions
  - DISPLAY – The Display that is connected to the GeoSteer system
  - BATTERY – The battery terminals for the power source for the GeoSteer system and Display
  - GEOSTEER CONTROL UNIT – The GeoSteer Control Unit
  - GEODOCK – The GPS antenna and optional cell modem antenna and/or radio modem kits mounted on the roof
  - FOOT SWITCH* – The optional Foot Switch that can be used for Remote Engage (not required for installation)
  - STEERING VALVE – The Steering Valve used to control the vehicle’s steering system
  - WHEEL ANGLE SENSOR – The device used to measure the angle of the wheel position

Figure 3 GeoSteer to Vehicle Cable Connections
Installation Procedure Overview

This section provides an overview of all the steps that are required to complete the GeoSteer system 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. **GeoDock** – Install the GeoDock Mounting Bracket and GeoDock on top of the vehicle’s cab roof. See the Install GeoDock Mounting Bracket chapter in this manual.

3. **Display RAM Mount** – Install the Display RAM Mount inside the cab. See the Install Display Mounting Bracket chapter in this manual.

4. **Display** – Follow the instructions provided with Display Operator’s and Installation Manual that comes with the Display Kit.

   **Note:** GeoSteer 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 the GeoSteer system.

   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 GeoSteer Harnesses chapter in this manual for information about locating and accessing the battery or other power source.

5. **GeoSteer Control Unit** – Follow the instructions provided in the ECU Mounting Bracket Install Kit.

   **Note:** The GeoSteer Control Unit 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 GeoSteer Control Unit when provided.

6. **GeoSteer Main Harness** – See the Install GeoSteer Harnesses chapter in this manual. Route the harness connections between the GeoSteer Control Unit’s left connector to each of the following:

   a. The Display and/or Display Harness (see Display Operator’s Manual for instructions)
   b. The Power Activation connection (see Display Operator’s Manual for instructions)
   c. Power Supply (see Display Operator’s Manual for instructions)
Installation Procedure Overview

7. **GeoSteer Vehicle-Specific Harness** – See the *Install GeoSteer Harnesses* chapter in this manual. Route the harness connections between the GeoSteer Control Unit’s right connector to each of the following:
   a. Vehicle AutoSteer interface connector
   b. Vehicle all-wheel-steer connector.

8. **GeoDock Cables** – Route the following cables from the GeoSteer Control Unit to the GeoDock.
   
   Note: Depending on options ordered, not all of the following connections are required for all installations.
   
   a. GPS Coax Cable
   b. Cell Modem Coax Cable (if required)
   c. Radio Modem Data/Power Harnesses (if required)

9. **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 the GeoSteer system.
   c. Create a new vehicle profile.

10. **Final Vehicle Set Up** – See *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.

11. **Vehicle Checklist** – Fill out the *Installation Checklist* at the end of this manual.
Install GeoDock Mounting Bracket

WARNING
Verify that you are in a stable position on the vehicle’s platform or stairs when installing or removing the GeoDock so you do not fall. If the vehicle does not provide a safe platform, use a ladder to safely access the vehicle’s roof.

Overview
The GeoDock 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 GeoDock assembly is also the location where the optional radio modem antenna and radio modem or OmniSTAR demodulator accessory kits are installed. The GeoDock is attached magnetically to a GeoDock Mounting Plate that is permanently attached to the roof of the vehicle. This allows the GeoDock to be quickly removed and reattached in the same location on the vehicle.

Installation Procedure
This GeoDock Mounting Plate is designed to fit any vehicle installation using the tape on the bottom of the bracket. Predrilled holes are also provided to allow the installer to bolt the bracket to existing structures on the vehicle. The GeoDock Mounting Plate needs to be mounted flat, on the top of the vehicle in a stable location.
Installation Procedure

Install GeoDock Mounting Plate

1. Remove the GeoDock Mounting Plate from the installation kit.

   **Note:** Notice the three tabs on the GeoDock Mounting Plate. They are used to center the GeoDock when it is attached to the plate.

   The two tabs should always be on the left side of the vehicle.

2. Locate a flat area at least 10 inches by 20 inches (25 cm by 50 cm) along the center line of the cab roof.

   **Note:** It may be necessary to build a mounting bracket to allow the GeoDock 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 GeoDock 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:** On some vehicles the center of the cab may not be the center of the vehicle as the cab could be offset. Always verify that the centerline marked is the centerline of the vehicle not just the cab.

7. Remove the four adhesive backings on the GeoDock Mounting Plate.
8. Use the two notches on the GeoDock Mounting Plate to center it over the marks that show the centerline of the vehicle. Carefully place the GeoDock Mounting Plate on the clean area.

Note: The GeoDock 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 GeoDock Mounting Plate is marked **FRONT** and should be oriented towards the front of the vehicle.

Note: Verify that the GeoDock 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 GeoDock 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 *GeoSteer Operator’s Manual* for instructions on installing and removing your GeoDock.
Install 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 U-bolt RAM mount ball that can be attached to a round bar or a Flat Plate RAM mount ball that can be bolted to a 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 4  U-Bolt RAM Mount Ball

Note: If necessary, the U-Bolts can be trimmed with a hacksaw to shorten them. This may allow more mounting positions for the RAM arm.

Once the RAM mount has been installed, follow the instructions in the Display Operator’s Manual to install the Display in the vehicle.
Install GeoSteer 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 Diagram, which shows all the necessary cable connections on the vehicle. Also refer to the Display Operator’s Manual for additional instructions on how to connect the GeoSteer system 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 GeoSteer 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 that allows cables to 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 Cab Cable Access Point

1. Locate the Cab Cable Access Point on the right side of the cab along the lower, rear area.
2. Remove the three screws holding the Cab Cable Access Panel with a T-30 Torx Driver.

3. Locate the square cover and remove the four nuts holding the cover on with a #2 Phillips screwdriver.

   **Note:** The plate that is removed will need to be modified by drilling a hole. After the final installation, the space around the cables that have been run through the hole will need to be resealed with a rubber grommet (not included with kit) or silicone to keep the cab pressurized and prevent air from getting into the cab.

4. Pass the cables in and out of the cab through the hole that is now available.
5. The cables can be accessed inside the cab at the opening shown at the right.

Attach Harnesses to GeoSteer Control Unit

The GeoSteer Control Unit has two 30 port connectors. These connectors are keyed so that the connector can be attached in the proper port and orientation. The connectors on the GeoSteer Control Unit and the cables also have a colored dot to aid attaching the cables properly. The GeoSteer 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.

Note: Never force the connectors, the connectors should easily slide into place. Forcing the connector may damage the system.

Figure 5 GeoSteer Control Unit Cable Identifying Dots
Attach Harnesses to GeoSteer Control Unit

**Vehicle-Specific ECU Harness**

The installation kit comes with a custom ECU Harness that is used to connect the vehicle steering components to the GeoSteer Control Unit. Attach the 30-pin connector of the harness to the right side connector on the GeoSteer Control Unit 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 GeoSteer Control Unit.

**Note:** Never force the connector.

![GeoSteer Control Unit Vehicle-Specific ECU Harness Connector](image)

This harness also provides a 4 pin connector to attach to the optional remote engage foot switch. Carefully route these cables from the GeoSteer Control Unit 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.
Connect ECU Vehicle Harness

ECU Vehicle Harness

1. The ECU vehicle harness connects the ECU to the vehicle AutoSteer harness that is connected to the factory steering valve, pressure transducer, wheel angle sensor and all-wheel-steer disengage system.

2. Rout the ECU vehicle harness towards the cab cable entry point where the factory AutoSteer interface connector is located.

3. Identify the large round 19-pin factory connector.

   Note: Refer to the cable diagram in this manual to understand the cable connections to the vehicle.

4. Connect the large circular connector from the ECU harness to the factory AutoSteer circular connector. Rotate the connector clockwise to engage and counterclockwise to disengage.

5. Rout the cables in a protected position and secure with cable ties.

6. Route the small connector identified as “AWS Disable” to the left side on the vehicle next to the frame. Identify a bundle of hoses and cables that run along the inside of the frame.
Attach Harnesses to GeoSteer Control Unit

ECU Vehicle Harness

7. Identify the small 2-pin grey connector.
8. Connect the 2-pin “AWS Disable” connector from the ECU harness to this connector. To disengage this connector, press down on the latch tab and pull.
9. This completes the ECU vehicle harness installation.

GeoSteer Main Harness

The GeoSteer Main Cable Harness provides power to the GeoSteer Control Unit and communications to the Display and other accessories. This harness is connected to GeoSteer Control Unit’s Left 30-pin port with a 1/4” nut driver. The cable connector is keyed and has a Yellow dot that needs to be matched on the correct connector on the GeoSteer Control Unit.

Note: Never force the connector.

Figure 7  GeoSteer Main Harness Connector

Figure 8 shows the GeoSteer Main Harness and the labels that are on each connector. Table 4 shows the functions of each the GeoSteer Main Harness cab connectors. Refer to your Display Operator’s Manual for instructions on connecting the GeoSteer Main Harness connections (Ethernet to Display, Power Activation, and Unswitched Power) to the correct ports and harnesses on the Display and Display harnesses.
Table 4  GeoSteer Main Harness Connections

<table>
<thead>
<tr>
<th>GeoSteer Main Cable Harness Connector</th>
<th>Connected to</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECU</td>
<td>GeoSteer Control Unit left side 30-Pin connector</td>
</tr>
<tr>
<td>ETHERNET TO DISPLAY</td>
<td>Ethernet Port (RJ-45) connected to the Display or Display Harness</td>
</tr>
<tr>
<td>UNSWITCHED POWER</td>
<td>12 Volt Power Source from Battery Harness</td>
</tr>
<tr>
<td>POWER ACTIVATION</td>
<td>Power activation signal from the Display or Display Harness</td>
</tr>
<tr>
<td>EXPANSION</td>
<td>Used to communicate and power optional accessories such as GeoDock Radio Modems or OmniSTAR demodulator</td>
</tr>
<tr>
<td>CAN</td>
<td>Not used on this installation</td>
</tr>
<tr>
<td>NMEA-A &amp; RADIO</td>
<td>Provides NMEA out and/or correction input from optional Third Party External Radio Modems</td>
</tr>
<tr>
<td>NMEA-B</td>
<td>Provides NMEA out to optional Third Party Devices</td>
</tr>
</tbody>
</table>

**Coax Cables**

The GeoSteer Control Unit is connected to the GeoDock with one or two coax cables, depending on the options that have been ordered. One of the coax cables connects the TNC connector on the GeoDock GPS antenna to the TNC connector on the GeoSteer Control Unit. If a cell modem is installed in the GeoSteer Control Unit, the second coax cable connects the Reverse TNC connector from the Cell Modem Antenna on the GeoDock to the SMA connector on the GeoSteer Control Unit. *Figure 9* and *Figure 10* show the connectors on the GeoSteer Control Unit and GeoDock that need to be connected.

**Note:** Do not use a tool to tighten the coax connectors on either end of the coax cable. Hand tighten only or the connectors could be damaged.
Attach Harnesses to GeoSteer Control Unit

**Figure 9  GeoSteer Control Unit Coax Connectors**

![GeoSteer Control Unit Coax Connectors Diagram](image)

- GeoSteer Control Unit GPS TNC Coax Connector
- GeoSteer Control Unit Cell Modem SMA Coax Connector (if applicable)

**Figure 10  GeoDock Coax Connections**

![GeoDock Coax Connections Diagram](image)

- GeoDock GPS TNC Coax Connector (Marked with Blue Band)
- GeoDock Cell Modem Reverse TNC Connector (if applicable) (Marked with Orange Band)

**Note:** If the installation requires connecting to a GS-900, GS-450, or OmniSTAR Accessory in the GeoDock, a power and communication harness will be routed from the GeoDock to the GeoSteer Control Unit as well as the coax cables. Refer to the instructions that come with the optional accessory for connection information. Route the harness the same way as the coax cables.
Routing Cables to the Top of Cab

1. Route the coax cable(s) and Radio Power/Data (if applicable) from the ECU towards the rear right side of the cab.
2. Route the cables up towards the cab roof.
3. Secure the cables with cable ties to existing structures after the cable has been run the entire distance.

Power Supply for AutoSteer System

The GeoSteer Control Unit must be connected to a 12 volt uninterrupted power supply. In most situations, the Display kit will provide a harness that provides power directly from the battery to the Display and GeoSteer system. The GeoSteer Control Unit must also be connected to a power activation signal from the Display. This connector provides a signal to the GeoSteer Control Unit to command it to power up when the Display is powered up. Refer to your Display Operator’s Manual for instructions on connecting the GeoSteer system to power and the power activation signal. Figure 11 shows an example of a typical power connection scenario.

Figure 11  Typical Battery Cable Connection Diagram
Power Supply for AutoSteer System

**Accessing Vehicle Battery**

1. Locate the battery compartment hatch on the bottom of the machine near the rear under the engine compartment.

2. Turn latch and pull battery compartment hatch down and to open.

3. Locate the batteries.
4. Attach Display power cable to the positive and negative terminals of the battery.

**Alternative Power Connection**

This vehicle has power junction posts that can simplify connecting auxiliary power cables. These posts will allow enough current to be supplied to the AutoSteer system, however it is not fused near the battery. If these connectors are used, the installer must disconnect battery power to the supply cables prior to connecting the AutoSteer battery supply cable to the terminals.

**Note:** Failure to disconnect the battery prior to connecting the AutoSteer battery supply cable may cause a short and damage to the vehicle if a live wire touches a ground when the nuts are removed from the terminal. Always disconnect the battery connection prior connecting the battery cable.

1. Locate the battery compartment hatch on the bottom of the machine near the rear under the engine compartment.
2. Turn latch and pull battery compartment hatch down and to open.

3. Locate the power junction area towards the front, left side of the battery compartment.

4. Attach Display power cable to the positive and negative posts.
Cab 12-Volt Accessory Port

Some installations may allow the use of the Cab Accessory Port to provide power. Use this port only if the Display Operator’s Manual directs you to do this.

1. The Cab Accessory Port is located at the right, rear part of the cab.

2. Cab Accessory Port shown.

Note: Use this port only if the Display Operator’s Manual directs you to connect here.
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.
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 up the AutoSteer system (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.
5. When the system reaches the Manual Steering Override screen, press the Right Arrow to skip on to the next screen.
6. When the system reaches the Auto Calibrate screen, press the Exit Screen Arrow to exit the procedure and save the vehicle information.
7. Power down the AutoSteer System.

Calibration and Tuning Guidelines

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

Note: For optimum steering performance, the front wheels must be aligned with the correct toe-in adjustment (1/4”-1/2”) and the steering cylinders must be phased per the manufacturer’s recommendations. Measure and confirm the correct toe-in of the front wheels. Refer to your machine owner’s manual or contact your dealer for details.

1. Start the vehicle and move it to an open area.
2. Power up the AutoSteer system.
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 Steering Components button, select Manual Steering Override and then press the Autocal button. Follow the on screen procedure to calibrate the manual steering override for the vehicle.
5. From the Vehicle tab of the AutoSteer Setup screen, press the Auto Calibrate button. Follow the on screen procedure to calibrate the vehicle.
6. 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

<table>
<thead>
<tr>
<th></th>
<th>Wheel Base</th>
<th>Length</th>
<th>Units Used</th>
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</thead>
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| ![Wheel Base](image) | ![Length](image) | | Inches  
Feet  
Centimeters  
Meters |

<table>
<thead>
<tr>
<th></th>
<th>GPS Antenna Location</th>
<th>Fore/Aft</th>
<th>Left/Right</th>
<th>Height</th>
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<td><img src="image" alt="Fore/Aft" /></td>
<td><img src="image" alt="Left/Right" /></td>
<td><img src="image" alt="Height" /></td>
<td></td>
</tr>
</tbody>
</table>
| Measurements: | Fore  
Aft  
Left  
Right |

<table>
<thead>
<tr>
<th></th>
<th>GeoSteer Control Unit Location</th>
<th>Fore/Aft</th>
<th>Left/Right</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="GeoSteer Control Unit Location" /></td>
<td><img src="image" alt="Fore/Aft" /></td>
<td><img src="image" alt="Left/Right" /></td>
<td><img src="image" alt="Height" /></td>
<td></td>
</tr>
</tbody>
</table>
| Measurements: | Fore  
Aft  
Left  
Right |

<table>
<thead>
<tr>
<th></th>
<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="image" alt="Direction of Arrows (Front, Back, Left, Right, Up, Down)" /></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>GeoSteer Control Unit Orientation</th>
<th>X Axis</th>
<th>Y Axis</th>
<th>Z Axis</th>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Draw Orientation of GeoSteer Control Unit for all Three Directions and Angle Measured</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Draw Orientation of GeoSteer Control Unit for all Three Directions and Angle Measured" /></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Measured Angle (Degrees):</th>
</tr>
</thead>
</table>
Final Hardware Installation Checklist

After the completion of the GeoSteer installation, fill out this Final Hardware Installation Checklist. The checklist allows the installer to verify that all the steps have been performed and allows a place to record important system information for future reference.

Machine Model: ____________________________ Year: _______ Serial #: ____________________________

Customer Name: ________________________________________________________________

Location/Address: ________________________________________________________________

GeoSteer Installation Kit Part Number: ________________________________________

NOTES
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Name of Installer: ____________________________ Date: ____________________________
Final Hardware Installation Checklist

1. Assisted Steering Unit installed and all fasteners and brackets are tight. □ □
2. ECU vehicle harness is connected to the vehicle □ □
3. Display Bracket and Display installed and all fasteners are tight. □
4. GeoDock is installed. □
5. ECU Control Unit is installed firmly to frame and all fasteners are tight. □
6. All cable ends and terminations are connected. □
7. All cables are secured with cable ties. □

GeoSteer Performance Checklist

1. Verified manual steering speed from lock to lock is satisfactory. □ Value ________ Sec
2. Verified GeoSteer steering speed from lock to lock is satisfactory. □ Value ________ Sec
3. Checked the total Wheel Angle Sensor Counts. □ □ Left ________
   □ □ Center ________
   □ □ Right ________
4. Verified that manual kick-out is working when turn the steering wheel. □ Value ________
5. Completed the GeoSteer system calibration. □
6. Completed the GeoSteer system tuning (if necessary). □
7. Verified Line acquisition performance is satisfactory. □
8. Verified On-line steering performance is satisfactory. □