

# Wheelman Flex Installation Guide

Fit Kit: 810-0037-01

## Fits the Following Vehicles

<u>Buhler Genesis</u>	<u>New Holland</u>
2145	8670
2160	8770
2180	8870
2210	8970

## How to Use This Guide

This installation guide lists all the parts and provides instructions on how to install Wheelman Flex on the above vehicles. Read this manual thoroughly before beginning the installation.

- 1** Read and understand all safety warnings - page 2
- 2** Review the list of tools/items you may need to install Wheelman Flex - page 2
- 3** Review how your Wheelman Flex parts fit together - starting on page 3
- 4** Install Wheelman Flex - starting on page 7

# 1 Safety Information

As the operator of the vehicle, you are responsible for its safe operation. The autosteering system is not designed to replace the vehicle's operator. After installation, ensure all screws, bolts, nuts, and cable connections are tight and all cables have been secured to prevent them from being damaged.

The warnings starting below and those throughout this manual (indicated by either graphic at right) provide information to identify hazards associated with potential injury or death and tell you how to avoid them.



Read and understand this manual and all the warnings below before installing, operating, or performing maintenance or service. **FAILURE TO DO SO MAY CAUSE IRREVERSIBLE DAMAGE TO YOUR SYSTEM.** Keep this manual and all related safety information with the manuals for your vehicle. For questions or further assistance, contact Customer Support.

## Safety Information and Warnings



To understand the potential hazards associated with the operation of an autosteer equipped vehicle, read the provided documentation before installing or operating the autosteering system.



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.



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.



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.



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.



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.

# 2 Tools/Items Needed for Installation

Make sure you have the right tools, such as:

- Wrenches, socket set, and screwdrivers
- Hex keys (3/16")
- Torque wrench (in-lb)
- Cutting tools (for example, you may need to cut away part of the plastic console)
- Tape measure (for vehicle measurements)

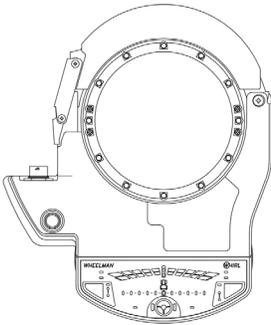
### 3 Parts for Your Installation

Use the diagrams that follow to:

- Below (steering column parts) and on page 4 (other parts) - verify you have all Wheelman Flex parts
- Page 5 - see an overview of cable connections
- Page 6 - see how the parts fit together around your steering column

#### Steering Column Parts

The parts shown below comprise the Wheelman unit that fits around your steering column.



Wheelman Flex



Main gear



1/8" thick



1/4" thick

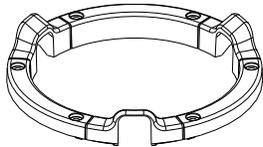


1/2" thick

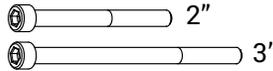
Spacers (if needed, use the one that suits your installation)



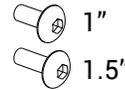
Universal (flat) top ring



Custom top ring (2)

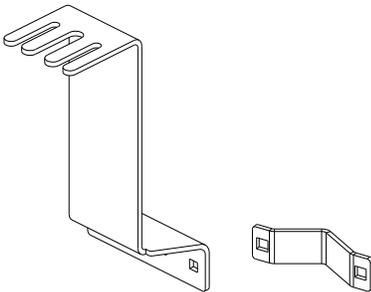


Socket head cap screws (6 each)

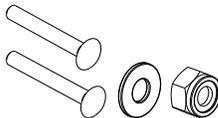


Button head screws (6 each)

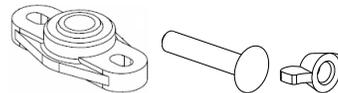
See "Wheelman Flex Assembly for Installation on Steering Column" on page 6 for an exploded view drawing of how these parts fit together on the steering column.



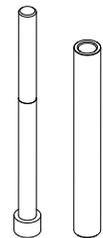
Anti-rotation bracket



Bracket hardware (2 each)  
L-to-R: bolts, washers, nuts



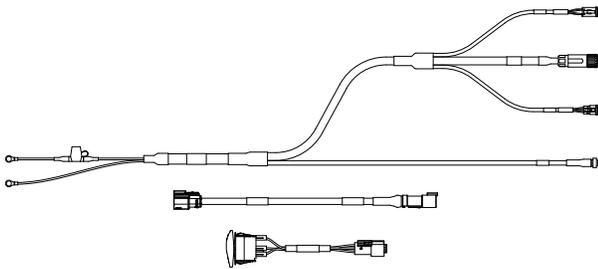
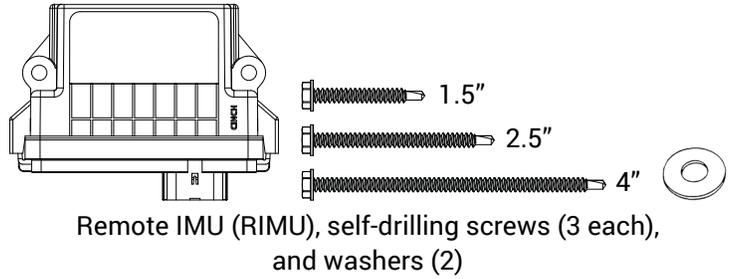
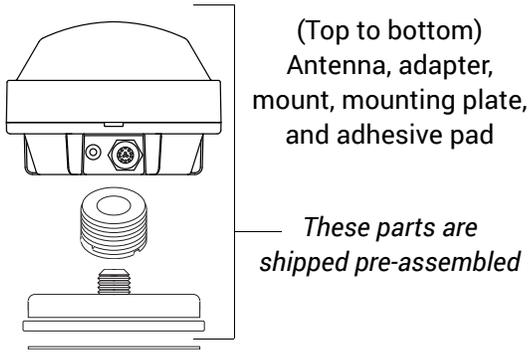
Flange, carriage bolts (2),  
and wing nuts (2)



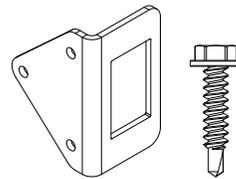
Anti-rotation pin and sleeve

# Non-Steering Column Parts

The parts diagram below shows the Wheelman parts not installed at the steering column—they are installed elsewhere in and out of the vehicle cab.



(Top to bottom) Main power cable, RIMU cable,  
and power switch cable



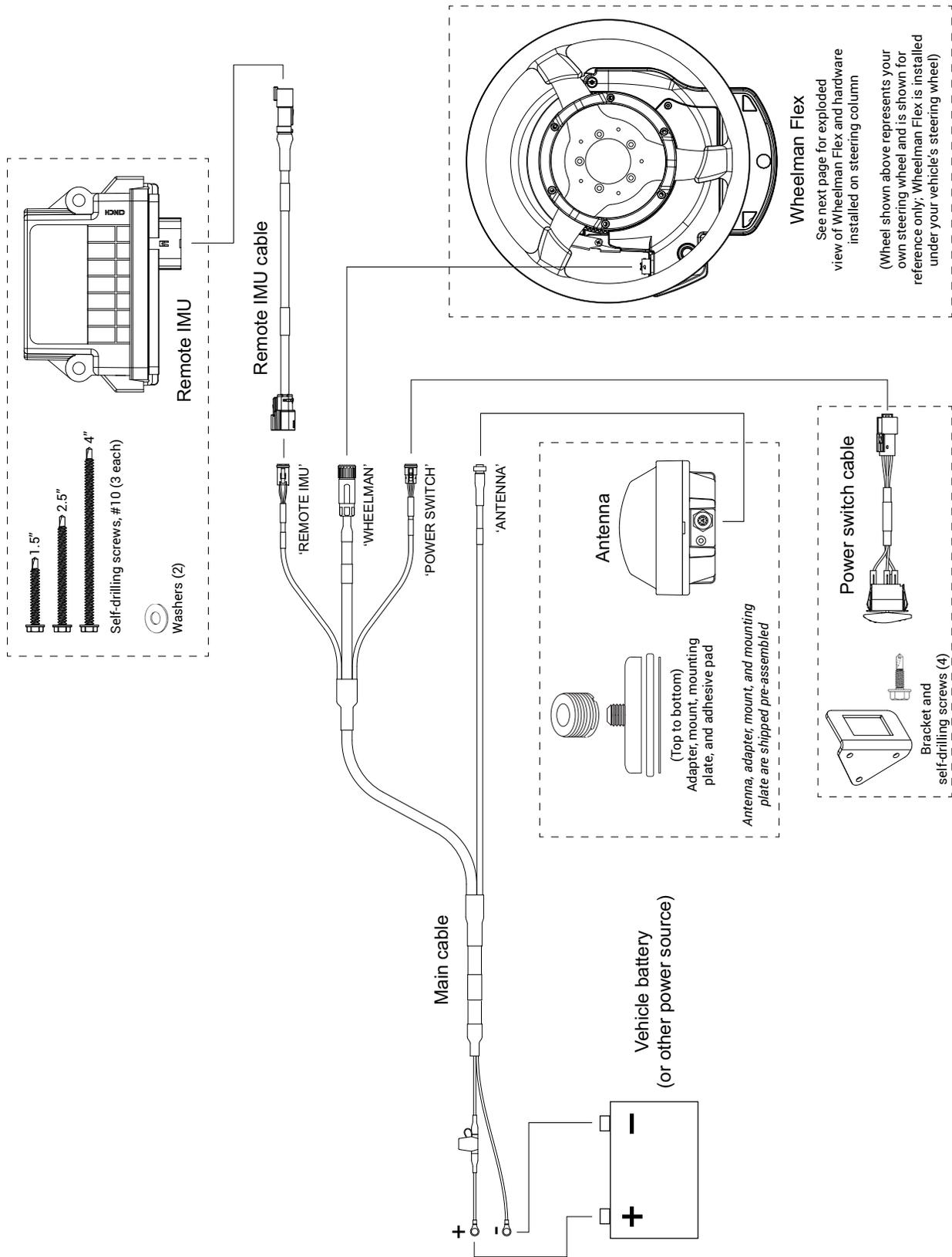
Power switch bracket and  
self-drilling screws (4)



Cable ties (20)  
677-2010

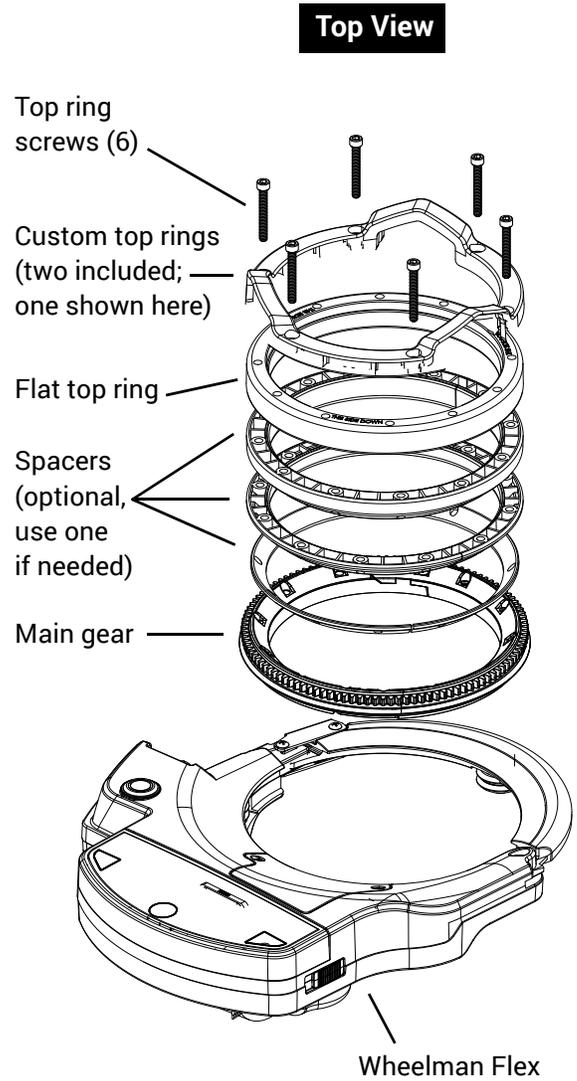
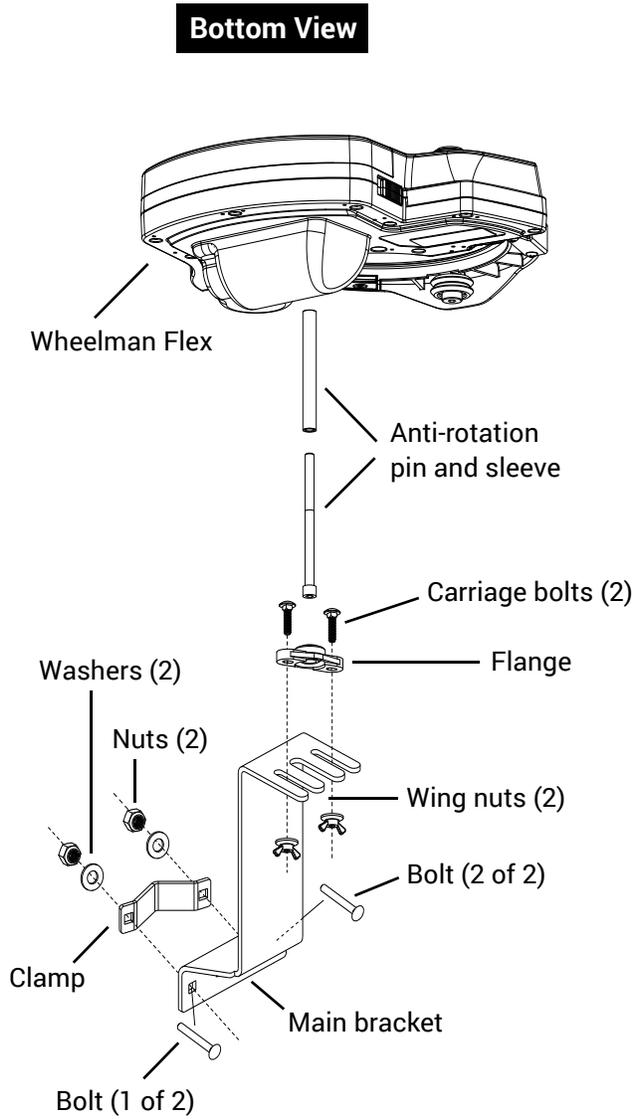
# Wheelman Flex Connection Diagram

Review the diagram below to see how the Wheelman Flex parts are connected using the cables. The diagrams on the next page show how the Wheelman Flex is assembled on the steering column.



# Wheelman Flex Assembly for Installation on Steering Column

Use the figures below to help you assemble Wheelman Flex as described in the instructions starting on the next page.



## 4 Install Wheelman Flex

Using the diagrams on the previous pages as a reference, complete the following sections to install Wheelman Flex on your vehicle.

### NOTE:

*Before beginning the installation:*

- *On a clean surface lay out all the components and check them against the diagram on the previous pages.*
- *Become familiar with the components and where they are to be installed.*
- *Work out how the harness is to be routed into/out of the cab (typically, through the rear window for closed cabs) to the battery and antenna. It is recommended to start at the battery and work back into the cab.*

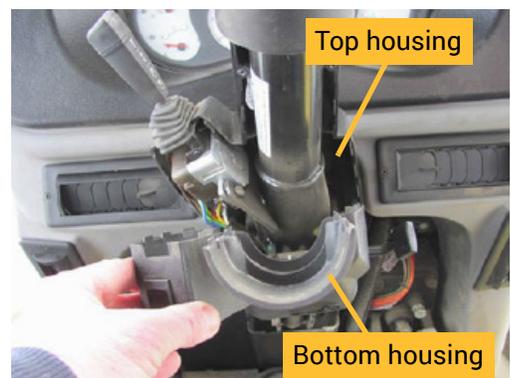
### a Modify the steering column plastic console cover

Before installing the anti-rotation bracket on the steering column, complete the following steps to modify (shorten) the plastic console cover on the steering column.

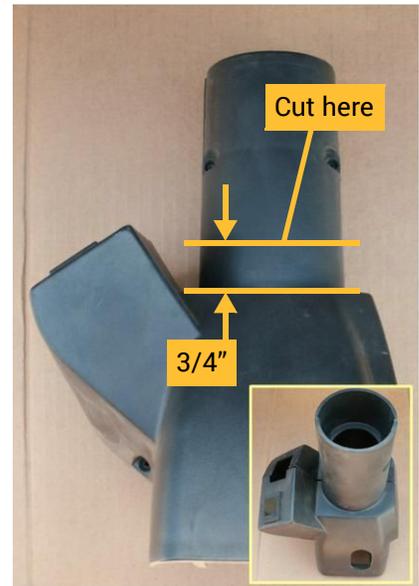
1. Extend the telescoping steering column fully outward, then lock it in place (see your manufacturer's documentation for instructions).
2. Remove and discard the column cover (left photo) to provide access to the steering column upper console (right photo).



3. Remove the upper console (comprised of two sections—top housing and bottom housing):
  - a. Remove the four screws from the bottom housing.
  - b. Remove the two prong connector from the ether switch, if equipped.
  - c. Remove the bottom housing, then tilt the steering column down and remove the top housing.



4. Rejoin the top and bottom housings.
5. Mark a line 3/4" from the base of the conical part of the reassembled console.
6. Using a hacksaw or other cutting tool, cut the top of the console off. You may want to file or sand the cut edge before reinstalling the console.



7. Separate the two housings then reinstall the modified console around the steering column:
  - a. Reinstall the upper plastic housing.
  - b. Tilt the steering column up and insert the ether switch (if equipped) into the lower housing.
  - c. Reinstall the lower plastic housing and then reattach the ether switch (if equipped) two prong connector.
  - d. Reinstall the two lower screws in the plastic housings. Discard 2 screws.
  - e. Install the provided hose clamp around the cut portion of the plastic housings and secure.



## **b** Install the anti-rotation bracket

The anti-rotation bracket in your kit is specific to your vehicle. Using the parts diagram on page 3, the assembly diagram on page 6, and the photos that follow as reference, complete the following steps to install the bracket on the console below the steering wheel.

1. Make sure the telescoping steering column is still extended fully outward.
2. Assemble the anti-rotation bracket and clamp using the bracket hardware (bolts, washers, nuts):
  - a. The clamp and bracket bottom should be just above the modified plastic upper console, as shown at top right (photo shows the bracket installed so the fingers are in the 6 o'clock position).
  - b. The fingers on the bracket should be approximately at the 3 o'clock position.



Clamp just above modified plastic upper console

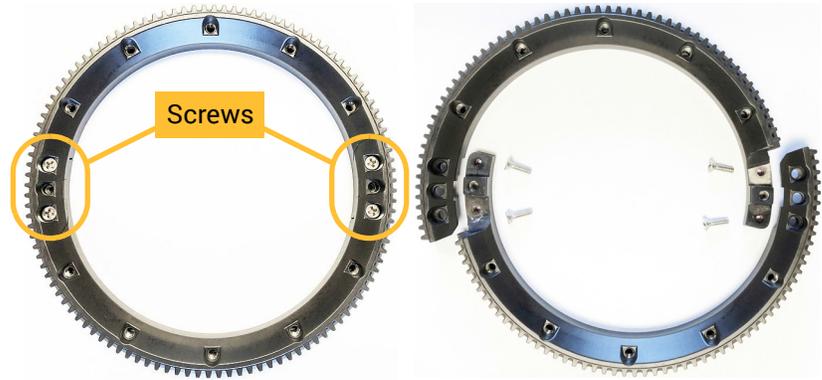
*Note: You will install the flange and pin/sleeve later.*



Different vehicle/bracket shown here, but 3 o'clock position of fingers shown for reference.

## **c** Install the main gear

1. Remove the four screws from the top side of the main gear, separate the two main gear halves, and retain the screws.



2. With the tops of the gear halves facing upward, place the two halves around the steering column below the wheel. Reconnect and the two halves and secure them together with the four screws you removed in the previous step.



## **d** Partially install the top ring

Upon installing the top ring, you may need to install the Wheelman Flex on the main gear to determine if one of the spacers is required. Thus, install/tighten only three of the six top ring screws because you will remove/reinstall the top ring if a space is required.



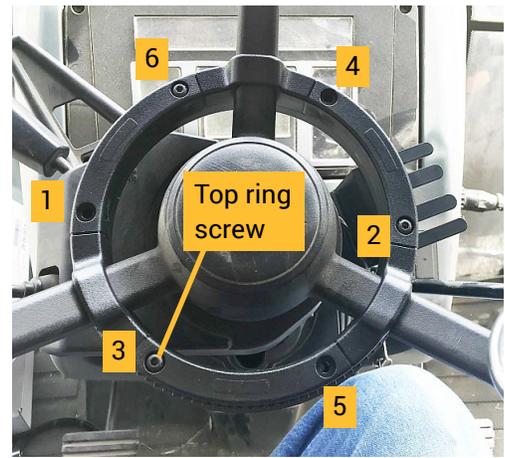
Your kit includes:

- *Three top rings—two fitted rings (with humps that fit over the steering wheel spokes) and a universal ring (flat on both top and bottom). One of the fitted rings should work with most installations; however, you may need to use the universal ring if neither fitted ring correctly fits your wheel.*
- *Four sets of top ring screws—each set is a different length. Use the set that is long enough to secure the ring to the main gear. For example, if you use a spacer, you may need to use longer screws.*
- *Three spacers - each spacer is a different height. If one is needed, use the one that suits your installation. For example, a steering wheel with a soft covering material or a flat steering wheel may require installation of a spacer to avoid interference with the Wheelman Flex. See section f on page 13.*

1. Place the top ring on top of the steering wheel. Use one of the fitted top rings first; if you feel neither properly fits your vehicle, use the universal top ring instead.

**NOTE:** *The steering wheel shown in the photos at right and below may be slightly different than your model, but the procedure still apply.*

2. Rotate the main gear so the holes in the top ring align with the holes in the main gear.
3. Loosely install three of the socket head cap screws:
  - a. Install the screws in an alternating pattern (1, 4, and 5; or 2, 3, and 6) to evenly attach the top ring to the main gear (the top ring should be parallel to the main gear—the same distance from the main gear at all points).
  - b. Make sure the top ring is centered on the wheel. For example, make sure the outer edge of the ring is the same distance (along the wheel spokes) to the steering wheel cap (example installation at right).
  - c. Torque screws to 6 in-lb. **DO NOT OVERTIGHTEN.**
4. Slightly rotate the steering wheel and watch for off-center movement of the main gear. Retighten screws as necessary.



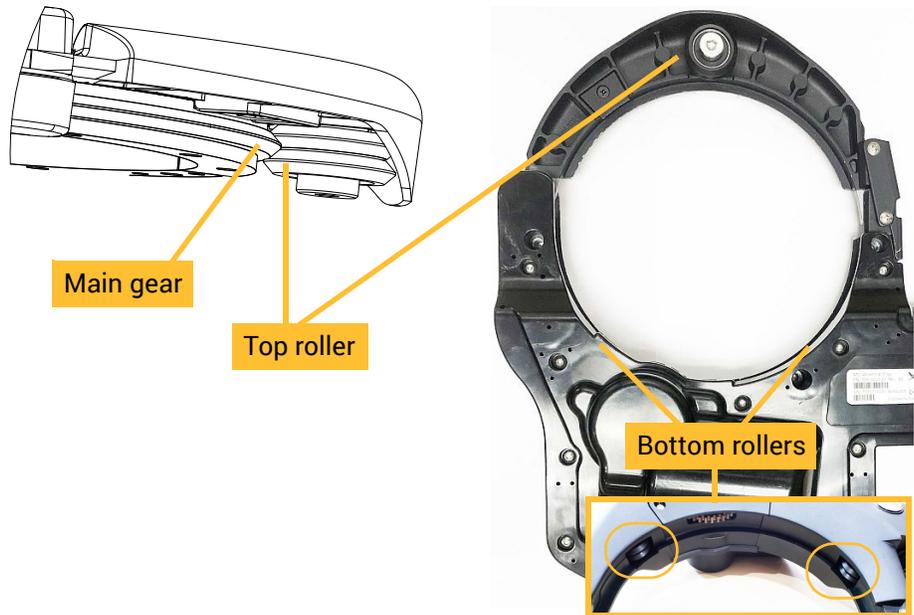
## e Install the Wheelman Flex onto the main gear

1. Open the Wheelman Flex latch as shown at right.



2. Fully open the Wheelman Flex then fit it around the main gear, such that:

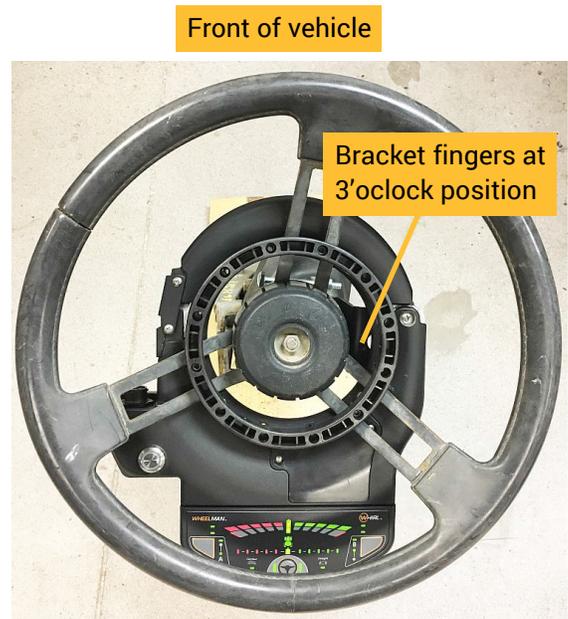
- a. The beveled edge of the gear fits into the three Wheelman Flex rollers.



- b. The Wheelman Flex will be oriented similar to shown at right (different steering wheel shown, but orientation is similar). Close the latch. You will rotate the Wheelman Flex in section f on the next page when installing the anti-rotation pin/sleeve, so having the Wheelman Flex in the position shown at right will require only a minor adjustment to its position.
- c. There is clearance above and below the Wheelman—make sure the Wheelman Flex does not contact the steering wheel or push against the console.

**If there is not enough clearance between the Wheelman Flex and the steering wheel, install one of the spacers. Go to section f on the next page.**

**If you have sufficient clearance, install the remaining three top ring screws until snug (DO NOT OVERTIGHTEN) per step 3 on the previous page, then go to section g on the next page.**



## f (Optional) Install a spacer

If a spacer is needed, determine which included spacer is suitable for your vehicle, then install the spacer around the steering column between the steering wheel and the main gear. Each spacer has a slit that enables you to flex it as needed to open it and fit it around the steering column. Make sure the beveled (angled) side of the spacer is facing downward/inward so it rests easily in the main gear. The photos below show how each spacer fits into the main gear.



Gear with 1/8" spacer



Gear with 1/4" spacer



Gear with 1/2" spacer

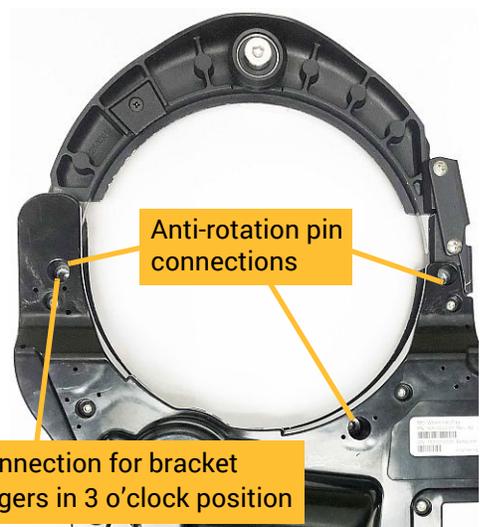
1. If you installed the Wheelman Flex to determine if you need a spacer, remove the Flex by undoing the latch (left side of Flex), opening the Flex, then gently pulling it away from the main gear (the reverse of the steps in section d on the previous page).
2. Remove the top ring screws (the reverse of the steps in section d on page 10).
3. At the slit in the spacer, grab both sides and gently twist them in opposite directions to create enough of an opening to place the spacer around the steering column and (as shown in the above photos) on top of the main gear.
4. Reinstall the top ring and Wheelman Flex per the steps in previous sections d and e. Remember to tighten the top ring screws until snug - **DO NOT OVERTIGHTEN**.

## g Install the anti-rotation assembly

1. Insert the carriage bolts into the left and right holes of the top of the flange, screw the wing nuts onto the bolts just enough so they stay on the bolts, then slide the flange assembly onto the bracket as shown at right. Loosely tighten the wing nuts. You will fully tighten them later.
2. Insert the anti-rotation pin into the sleeve (if not pre-assembled), slide them through the flange from the bottom, then screw the pin into the Wheelman Flex (see at right).
3. Ensure the pin/sleeve assembly moves smoothly through the flange as the steering column is extended and retracted, then tighten the three bracket-retaining screws and the flange wing nuts.



Pin through flange then into Flex



Anti-rotation pin connections

Connection for bracket fingers in 3 o'clock position

## **h** Install the Remote IMU (RIMU)

The Remote IMU (sometimes referred to as a gyro, but actually contains a set of gyros and accelerometers) measures your vehicle's movement in all directions to enable Wheelman to more precisely autosteer your vehicle.

**⚠ WARNING:** Before drilling (or using self-drilling screws) in the cab, make sure there is nothing that can be damaged by the drilling or by any self-drilling screws used to secure the RIMU. Secure anything that could be damaged away from where the screws come through. The photo at right is an example of a pre-drilling check; it shows an under-floor cabling compartment.



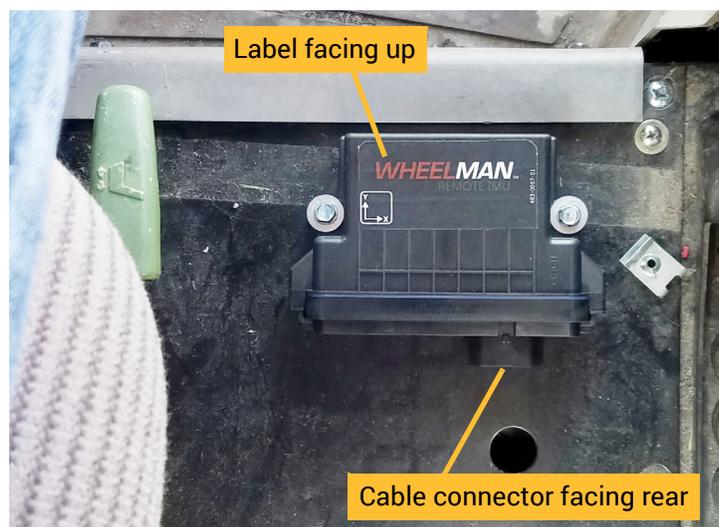
When installing the Remote IMU (RIMU):

- The mounting location must be solid to the vehicle frame or cab and be vibration-free.
- The RIMU must not move independently of the vehicle (not loose on the cab floor).
- The RIMU must be square to the floor and to the centerline of the vehicle.
- There must be sufficient clearance around the seat to accommodate the RIMU as the seat suspension moves up and down even with the seat at its lowest level (for example, with all the air removed).
- There must be sufficient clearance to rotate the seat without interfering with the RIMU.
- Do not mount the RIMU where it can:
  - Interfere with any of the vehicle's seat or other control levers and knobs.
  - Interfere with the operator's visibility while operating the vehicle.
  - Do not mount the RIMU where it can be damaged by falling objects or where other materials can be piled on it.

To install the Remote IMU:

1. Review the requirements above.
2. Using the two self tapping hex screws and washers, install the RIMU in your preferred location. Do not overtighten.

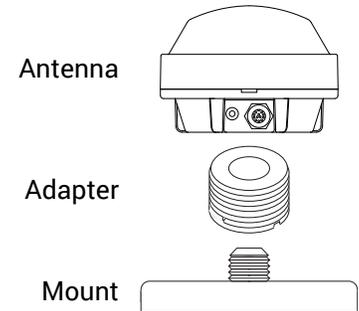
The photo at right shows the RIMU installed on the cab floor, to the right of the operator's seat, with the X-Y label pointing up, and with the connector pointing toward the rear. **You will enter the label and cable directions during vehicle setup in the Whirl app.**



## **i** Mount the antenna on the vehicle roof

The antenna, adapter, and mount (at right) are shipped pre-assembled.

Once you place the mounting plate on the vehicle roof, you will not be able to move it. Therefore, plan your antenna location carefully.



To mount the antenna on the vehicle roof:

1. Clean and dry the vehicle surface where you will attach the antenna mounting plate.
2. Remove the paper backing from the adhesive on the back of the mounting plate (see photo at right).

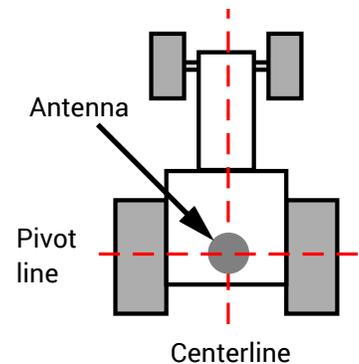


3. Position the mounting plate and press down hard for proper adhesion. When determining the location of the mounting plate, ensure that when you mount the antenna on the plate (next step) the antenna will be on the vehicle's centerline and pivot line.

**NOTE:**

*Depending on your vehicle, if you cannot place the antenna on the centerline and/or pivot line, place the antenna as close as possible to these lines.*

*Measure the antenna left/right offset (distance left or right of centerline of antenna center) and the antenna pivot (distance front or rear of pivot line of antenna center). You will enter these values in the Whirl app during vehicle setup.*



4. Ensure the antenna assembly (antenna, adapter, mount) is securely tightened, then place the assembly on the mounting plate (see photo at right).

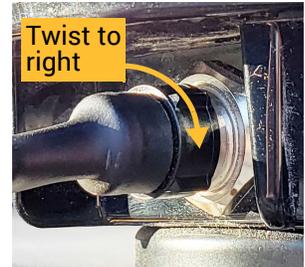
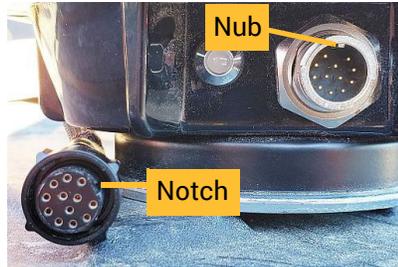


## **j** Route and connect the cables

Using the “Wheelman Flex Connection Diagram” on page 5 as a guide, connect the cables included in your kit (main cable, Remote IMU cable, power switch cable) to the appropriate parts.

When routing cables:

- Stow cabling under carpets and at the edges of the cab.
- Store excess cable lengths with a minimum six-inch bend radius.
- Avoid high-temperature exposure (for example the exhaust, exhaust manifold).
- Hand tighten cables only—do not use tools.
- When connecting the main cable to the antenna, note the nub on the antenna’s connector and the notch on the cable end (see near right). To connect the cable, align the notch with the nub, push the cable onto the antenna connector, then twist to the right to lock it in place (see far right).



### **NOTE:**

*Some machines are equipped with pop out tabs that you can remove and replace with the power switch (left photo). If no tab is available, you can use the power switch bracket (right photo), mounting it in the cab in your preferred location. Turn the power switch off before connecting the main cable to the battery.*



**Congratulations on successfully installing your Wheelman Flex. Return to the Quick Start Guide to finish setup.**