

# CASE IH PATRIOT STEERING-READY WHEEL ANGLE SENSOR (WAS) INSTALLATION

**NOTE:** The SmarTrax node must be loaded with software version 6.2.XX or newer. The latest version of software can be found at:

<https://portal.ravenprecision.com/>

Once the installation is complete and the latest software version is downloaded, a complete system recalibration is required in order to enable the WAS functionality.

## KIT CONTENTS

**TABLE 1. Wheel Angle Sensor Installation Kit (P/N 117-0192-047)**

Item Description	Part Number	Qty.
Installation Sheet - Wheel Angle Sensor	016-0191-005	1
Sensor - 300 mm Non-Contact Linear	416-0001-052	1
Bracket - Large WAS Rod Mounting Bracket	107-0172-366	1
Bracket - Small WAS Rod Mounting Bracket	107-0172-030	1
Cable - Steering Node to WAS Adapter	115-0172-465	1
Cable - 4-Pin Deutsch to 12-Volt Linear WAS	115-4010-032	1
Cable - 4-Pin DTM Extension	115-0172-464	1
Mount - M10 Ball	103-0001-029	2
Clamp - 1-1/4" ID x 5/16"-18 Thread U-bolt Muffler	435-3003-056	1
Clamp - 3" OD x 3/8"-16 Thread U-Bolt Muffler	435-3003-063	1
Spacer - 0.406" ID x 0.750" OD x 0.75" Long Steel	107-0172-037	2

TABLE 1. Wheel Angle Sensor Installation Kit (P/N 117-0192-047)

Item Description	Part Number	Qty.
Bolt - M10 x 1.5 x 60 mm Hex	311-0070-025	2
Nut - M10 x 1.5 x 5 mm Thick Jam	312-1002-035	2
Nut - 5/16"-18 Nylon Insert Lock	312-4000-059	2
Nut - 3/8"-16 Nylon Insert Lock	312-4000-061	2
Nut - M10 x 1.5 Nylon Insert Lock	312-4000-208	2
Washer - 3/8" Flat	313-2300-043	4
Washer - Modular Flat	313-2301-005	4

## ASSEMBLE THE (WAS)

FIGURE 1. WAS Assembly

Rod-End of  
Sensor



Base-End  
of Sensor

1. Install the M10 universal ball mounts (P/N 103-0001-029) and M10 jam nuts (P/N 312-1002-035) on both ends of the linear WAS (P/N 416-0001-052).
2. Leave the nuts and ball mounts loose until the sensor is installed later in the procedure.

## INSTALL THE WAS

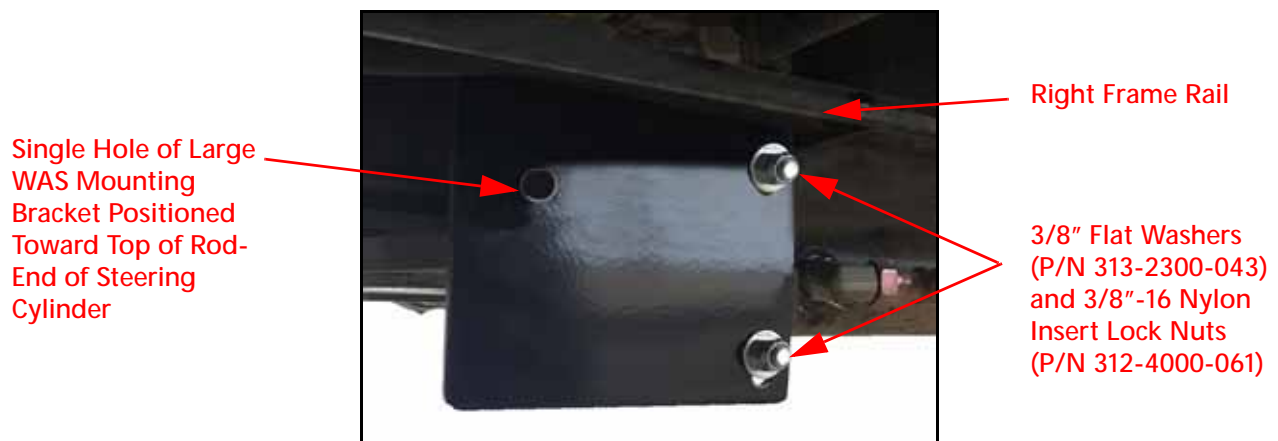
1. Park the machine on a level surface with the wheels pointing straight ahead.

FIGURE 2. Muffler Clamp Installed on Steering Cylinder



2. Remove the nuts and clamp from the 3" U-bolt muffler clamp (P/N 435-3003-063).
3. Install the U-bolt muffler clamp on the cap-end of the right steering cylinder, positioning the U-bolt so that the threaded ends point straight toward the rear of the machine.
4. Reinstall the clamp and nuts on the U-bolt.
5. Tighten the nuts to secure the U-bolt muffler clamp in place.
6. Install 3/8" flat washers (P/N 313-2300-043) on the ends of the U-bolt clamp.

FIGURE 3. Large WAS Mounting Bracket Installed on Base-End of the Steering Cylinder



7. Position the large WAS mounting bracket (P/N 107-0172-366) over the U-bolt muffler clamp so that the single hole in the bracket is located to the left of the threaded ends of the U-bolt muffler clamp and up.
8. Secure the WAS mounting bracket on the U-bolt muffler clamp using two 3/8" flat washers (P/N 313-2300-043) and two 3/8"-16 nylon insert lock nuts (P/N 312-4000-061).
9. Verify that the top of the large WAS mounting bracket is mounted low enough to clear the right frame rail, allowing the machine's wheels to be extended without interference.
10. Tighten the nuts to secure the large WAS mounting bracket.

FIGURE 4. Small WAS Mounting Bracket Installed on Rod-End of Steering Cylinder



11. Remove the nuts and clamp from the 1-1/2" U-bolt muffler clamp (P/N 435-3003-056).
12. Install the U-bolt muffler clamp on the threaded rod-end of the right steering cylinder adjacent to the existing jam nut, positioning the U-bolt so that the threaded ends point approximately 45° toward the rear of the machine.
13. Reinstall the clamp and nuts on the U-bolt.
14. Tighten the nuts to secure the U-bolt muffler clamp in place.
15. Install 5/16" washers (P/N 313-2301-005) on the ends of the U-bolt clamp.
16. Insert one of the M10 x 1.5 x 60 metric hex bolts (P/N 312-1002-035) through the center hole of the small WAS mounting bracket (P/N 107-0172-030).
17. Install the small WAS mounting bracket on the ends of the U-bolt clamp so that the installed hex bolt points outward.
18. Install one 5/16" flat washer (P/N 313-2301-005) and one 5/16"-18 nylon insert lock nut (P/N 312-4000-059) on the each end of the U-bolt clamp to secure the small WAS mounting bracket.
19. Tighten the nuts to ensure the small WAS mounting bracket is installed securely.
20. Install a 0.406" ID x 0.750" OD x 0.75" long spacer (P/N 107-0172-037) on the end of the protruding hex bolt.

FIGURE 5. Rod-End of WAS Installed on Rod-End of Steering Cylinder



21. Install the ball mount on the rod-end of the WAS assembly on the installed hex bolt and secure it using an M10 x 1.5 lock nut (P/N 312-4000-208).

FIGURE 6. Base-End of WAS Installed on Base-End of Steering Cylinder



22. Insert an M10 x 1.5 x 60 hex bolt (P/N 311-0070-025) through the back of the remaining hole in the large WAS mounting bracket.
23. Install a 0.406" ID x 0.750" OD x 0.75" long spacer (P/N 107-0172-037) on the protruding end of the installed hex bolt.
24. Install the base-end of the WAS assembly on the hex bolt and secure it using an M10 x 1.5 nylon insert lock nut (P/N 312-4000-208).
25. Orient the WAS so the cable plug is oriented as shown in Figure 6 on page 5.
26. Tighten the M10 universal ball mounts and M10 jam nuts to each other on the WAS assembly to ensure they are installed securely.

## WIRING INSTALLATION

1. Connect the WAS adapter cable (P/N 115-4010-032) to the linear sensor and tighten the retaining nut.
2. Route the other end of the WAS adapter cable into the sprayer cab.
  - 3XXX series sprayers will have a provision for cables at the lower-right corner of the rear window.
  - 4XXX series sprayers will have a provision for cables along the right side of the cab floor below the convenience tray.

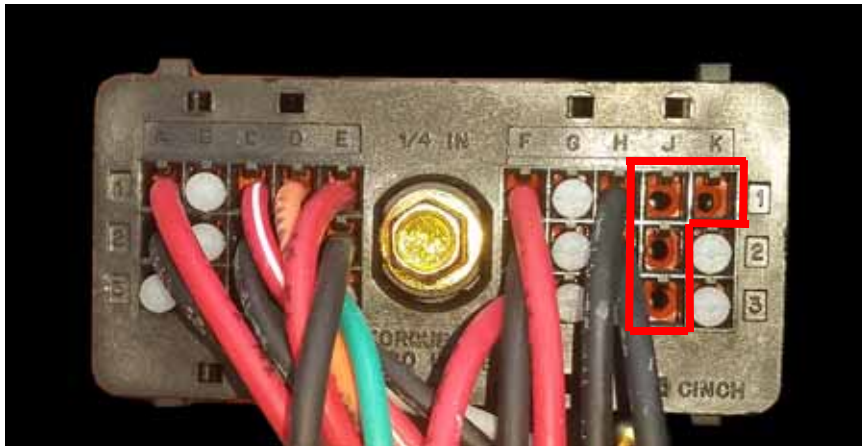
FIGURE 7. 4XXX Series Cable Provision



3. Locate the 4-pin connector on the WAS adapter cable and connect it to the mating connector on the 4-pin DTM extension cable (P/N 115-0172-464).

4. Route the extension cable to the SmarTrax node.
  - 3XXX series sprayers will have the node mounted along the back wall of the cab below the window.
  - 4XXX series sprayers will have the node mounted below the instructor seat or beside the operator seat. If the node is mounted below the instructor seat, remove the shroud surrounding the operator seat compartment to expose the node. It may be useful to refer to the SmarTrax installation manual for more information on locating the node.
5. Connect the node harness to the WAS extension cable.
  - Node Harness with 4-pin WAS Connector:
    - a. Connect the OPTIONAL WAS connector of the node harness to the WAS extension cable.
    - b. Proceed to step 6.
  - Node Harness without 4-pin WAS Connector:
    - a. Remove the connectors from the node by unscrewing the center bolt with a 1/4" driver or socket.
    - b. While looking at the back of the connectors, find the connector with the letters A - K along the top.

FIGURE 8. Cavity Plugs Removed



- c. Use a small screwdriver or fingernail to pry the cavity plugs from pins J1, J2, J3, and K1.
- d. Turn the connector around to look at the front.

FIGURE 9. Cap On and Off



- e. Press in the tabs and remove the corresponding white cap from the side of the plug where J1, J2, J3, and K1 cavity plugs were removed.

- f. Insert the following pins from the steering node to WAS adapter cable (P/N 115-0172-465) into the corresponding cavities on the node plug.

Pin Wire Color	Node Plug Cavity
Red/White	J1
Black	J2
Gray	J3
Red	K1

**NOTE:** Ensure that the two barbs on each pin straddle the center plastic guide on each plug cavity and that the pins click into place and cannot be pulled back out.

- g. Replace the white cap on the front of the plug.
  - h. Reconnect the connectors to the SmarTrax node and reassemble the cab components if necessary.
6. If it has not already been completed, perform a software update. The latest available updates are located at:  
<https://portal.ravenprecision.com/>
7. Perform a full calibration of SmarTrax to enable use of the WAS.

**NOTE:** If necessary, refer to the SmarTrax Calibration and Operation Manual (P/N 016-0171-277) for calibration information.

