

MacDon Windrower SmarTrax™ MD Installation Manual

P/N 016-5030-080 Rev. A

11/15

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CHAPTER

1

*Important Safety
Information*

NOTICE

Read this manual and the operation and safety instructions included with your implement and/or controller carefully before installing the SmarTrax™ MD system.

- Follow all safety information presented within this manual.
- If you require assistance with any portion of the installation or service of your Raven equipment, contact your local Raven dealer for support.
- Follow all safety labels affixed to the SmarTrax MD system components. Be sure to keep safety labels in good condition and replace any missing or damaged labels. To obtain replacements for missing or damaged safety labels, contact your local Raven dealer.

When operating the machine after installing SmarTrax MD, observe the following safety measures:

- Be alert and aware of surroundings.
- Do not operate SmarTrax MD or any agricultural equipment while under the influence of alcohol or an illegal substance.
- Remain in the operator's position in the machine at all times when SmarTrax MD is engaged.
- Disable SmarTrax MD when exiting the operator's seat and machine.
- Do not drive the machine with SmarTrax MD enabled on any public road.
- Determine and remain a safe working distance from other individuals. The operator is responsible for disabling SmarTrax MD when the safe working distance has diminished.
- Ensure SmarTrax MD is disabled prior to starting any maintenance work on SmarTrax MD or the machine.

 **WARNING**

- The machine must remain stationary and switched off during SmarTrax MD installation or maintenance.



Electrical Safety

- Always verify that the power leads are connected to the correct polarity as marked. Reversing the power leads could cause severe damage to the equipment.
- Ensure that the power cable is the last cable to be connected.

Congratulations on your purchase of the SmarTrax™ MD system!

SmarTrax MD-assisted steering takes the stress out of driving and makes it quick and easy for you to improve your operating efficiency and performance. SmarTrax MD is compatible with Cruizer II™ and Cruizer II™ RTK, Envizio Pro™, Envizio Pro®, Envizio Pro XL™, and Viper Pro™ systems.

The following instructions are designed to assist with the proper installation of the SmarTrax MD system. Refer to the SmarTrax MD Calibration & Operation Manual (P/N 016-5030-020) for assistance with calibrating the software and using the SmarTrax MD system.

This manual applies to the following machines:

MAKE: MacDon Windrower
MODEL: M150, M155, M200, and M205

Preparing for Installation

Before installing the SmarTrax MD system, park the machine where the ground is level, clean, and dry. Turn off the machine and leave it turned off for the duration of the installation process.

During the installation process, follow good safety practices. Be sure to carefully read the instructions in this manual as you complete the installation process.

Recommendations

Raven Industries recommends the following best practices when installing or operating the SmarTrax MD system for the first time, at the start of the season, or when moving the SmarTrax MD system to another machine:

- Use part numbers to identify the parts.
- Do not remove the plastic wrap from a part until it is necessary for installation.
- Do not remove plastic caps from a part until it is necessary for installation.

Point of Reference

The instructions in this manual assume that you are standing behind the machine, looking toward the cab.

Updates

Software and manual updates are available on the Raven Applied Technology website:

<http://www.ravenhelp.com>

At Raven Industries, we strive to make your experience with our products as rewarding as possible. One way to improve this experience is to provide us with feedback on this manual.

Your feedback will help shape the future of our product documentation and the overall service we provide. We appreciate the opportunity to see ourselves as our customers see us and are eager to gather ideas on how we have been helping or how we can do better.

To serve you best, please send an email with the following information to

techwriting@ravenind.com

-MacDon Windrower SmarTrax™ MD Installation Manual

-P/N 016-5030-080 Rev. A

-Any comments or feedback (include chapter or page numbers if applicable).

-Let us know how long have you been using this or other Raven products.

We will not share your email or any information you provide with anyone else. Your feedback is valued and extremely important to us.

Thank you for your time.

Kit Contents

This section contains a list of the components that are included in the SmarTrax MD kit. Before beginning the system installation, compare the items in the kit with the components on this list. If you have questions about the kit, contact your Raven dealer.

TABLE 1. SmarTrax MD Installation Kit (P/N 117-5030-080)









Picture	Item Description	Part Number	Qty.
Not Pictured	Manual - MacDon Windrower SmarTrax MD Installation	016-5030-080	1
	Assembly - Ring Gear	063-4001-011	1
	Assembly - Spline Adapter	063-4001-018	1
	Trim - Ring Gear Protective	019-0159-590	1
	Bracket - Node Mounting	107-0172-084	1
	Bracket - 2-1/4" Collar Weldment	116-0159-782	1
	Bearing - 1/2" Plastic Flanged	325-0000-036	1
	Screw - #10-16 x 3/4" Zinc Self-Tapping	310-1002-073	2
	Bolt - #10-24 x 3/4" UNC Zinc Carriage	311-0069-082	2

TABLE 1. SmarTrax MD Installation Kit (P/N 117-5030-080)

Picture	Item Description	Part Number	Qty.
	Nut - 3/8"-16 Zinc Flanged Lock	312-1001-167	3
	Nut - #10-24 Wing	312-3000-013	2
	Nut - 5/16"-18 Zinc Flanged Lock	312-1001-184	2
	Washer - 0.265" ID x 0.505" OD x 0.060" Thick	313-2300-120	2
	Tape - 3" Double-Sided	332-0000-019	6

TABLE 2. SmarTrax MD Controller Kit (P/N 117-5030-020)







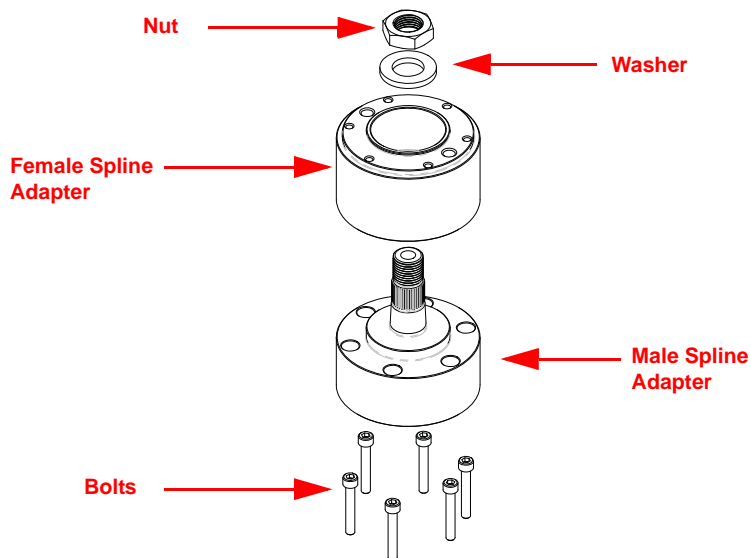
Picture	Item Description	Part Number	Qty.
Not Pictured	Manual - SmarTrax MD Calibration & Operation	016-5030-020	1
	Assembly - SmarTrax MD Mechanical Drive Unit	063-4001-010	1
	Node - SmarTrax MD	063-4001-013	1
	Pin - Anti-Rotation	107-4001-004	1
	Cable - SmarTrax MD Node Harness	115-4001-157	1

TABLE 2. SmarTrax MD Controller Kit (P/N 117-5030-020)

Picture	Item Description	Part Number	Qty.
	Switch - Foot	063-0173-593	1
	Drive - USB Flash	063-4001-020	1

Disassemble the Mechanical Drive Spline Assembly

FIGURE 1. Spline Assembly Disassembled



1. Locate the 17.5 mm 40 tooth spline adapter assembly (P/N 063-4001-018).
2. Disassemble the spline adapter assembly as shown in Figure 1 above.

Remove the Steering Wheel

Note: The steps in this section require use of a steering wheel puller (not supplied). For questions on the proper procedure for removing the steering wheel, contact your local equipment dealer.

FIGURE 2. Steering Wheel Cap



1. Remove the cap from the center of the steering wheel.

FIGURE 3. Steering Wheel Removal Tool



2. Remove the screws and steering wheel removal tool from the steering wheel hub.

FIGURE 4. Steering Wheel Nut to be Removed



3. Remove the nut used to secure the steering wheel to the steering column.

FIGURE 5. Steering Wheel Removed



4. Use the steering wheel puller to remove the steering wheel from the steering column.

Install the Spline and Ring Gear Assemblies

FIGURE 6. Female Spline installed on Machine's Steering Column



1. Install the female spline on the machine's steering column.
2. Install the machine's steering wheel nut that was removed in step 3 of *Remove the Steering Wheel* section on page 9.

FIGURE 7. Ring Gear Assembly Installed



3. Place the ring gear assembly (P/N 063-4001-011) over the female spline adapter with the V-ring facing down and the holes in the ring gear aligned with the holes in the female spline adapter.

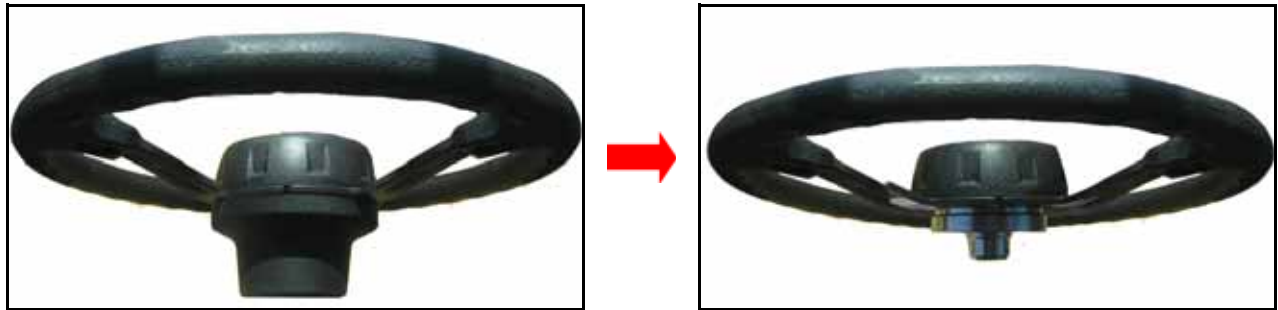
FIGURE 8. Male Spline Assembly Installed



4. Align the bolt holes in the male spline assembly with the holes in the ring gear assembly.
5. Install and tighten the spline assembly bolts to secure the male spline adapter to the ring gear and female spline adapter.

Reinstall the Steering Wheel

FIGURE 9. Plastic Cover Removed from Steering Wheel



1. Remove the lower plastic cover from the steering wheel.

Note: Removing the plastic cover allows the steering wheel to fit properly on the male spline adapter assembly.

FIGURE 10. Steering Wheel Installed on Ring Gear Assembly



2. Align the spokes of the machine's steering wheel with the spokes on the installed ring gear assembly.
3. Install the steering wheel on the male spline adapter.
4. Install the washer and nut from the spline assembly on the male spline adapter.

FIGURE 11. Steering Wheel Removal Tool Reinstalled



5. Reinstall the machine's steering wheel removal tool and bolts.

FIGURE 12. Machine's Steering Wheel Cap Reinstalled



6. Reinstall the machine's steering wheel cap.

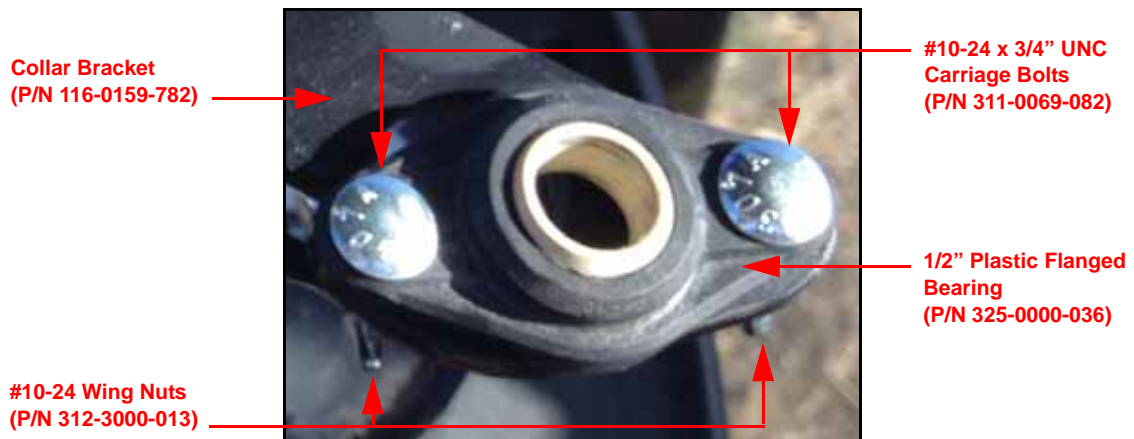
Install the Anti-Rotation Bracket

FIGURE 13. Anti-Rotation Bracket Installed



1. Locate the lower portion of the steering column that does not move.
2. Install the anti-rotation collar bracket (P/N 116-0159-782) on the upper portion of the steering column as shown in Figure 13 above..
3. Tighten the anti-rotation collar bracket bolts to secure it on the steering column.

FIGURE 14. Bearing Installed



4. Install the 1/2" plastic flanged bearing (P/N 325-0000-036) on the short leg of the collar bracket (P/N 116-0159-732) using two #10-24 x 3/4" carriage bolts (P/N 311-0069-082) and two #10-24 wing nuts (P/N 312-3000-013).

Install the Mechanical Drive

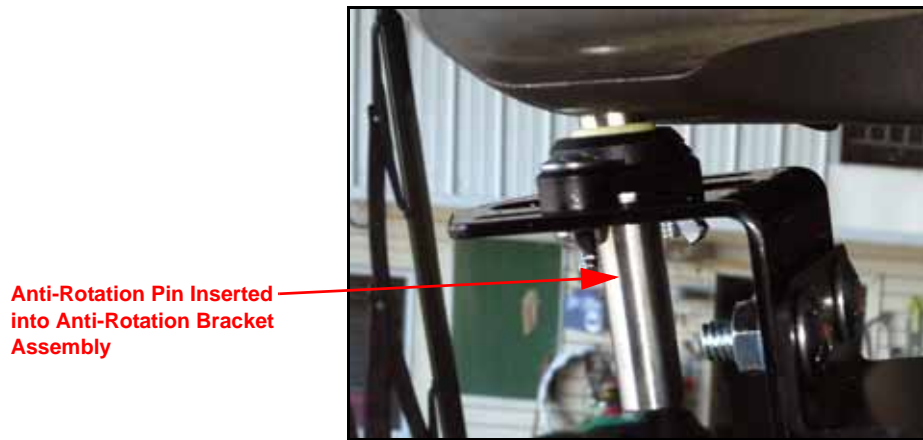
Note: Depending on the machine's configuration, it may be necessary to install the anti-rotation pin in the mechanical drive's casing after the mechanical drive is installed instead of before as indicated in the instructions below.

FIGURE 15. Anti-Rotation Pin Installation Locations



1. Determine the anti-rotation pin (P/N 107-4001-004) installation location on the mechanical drive (P/N 063-4001-010) based on the anti-rotation bracket installation location.
2. Screw the anti-rotation pin into the mechanical drive's casing.

FIGURE 16. Anti-Rotation Pin Installed in Bracket Assembly



3. Insert the anti-rotation pin into the installed flanged bearing (P/N 325-0000-036) on the anti-rotation bracket assembly.

FIGURE 17. Mechanical Drive Installed

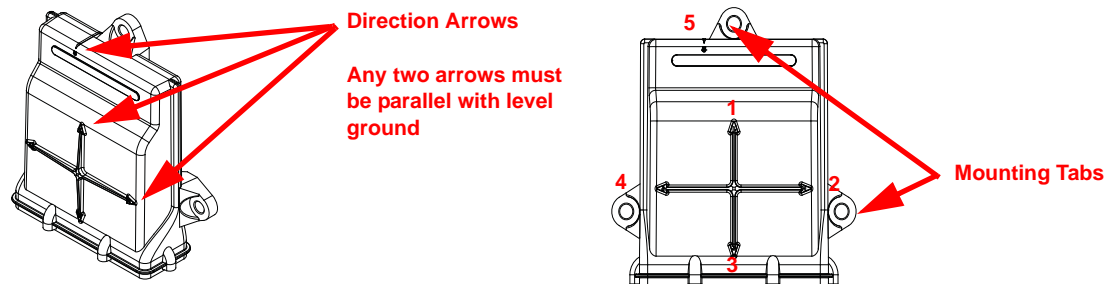


4. Install the mechanical drive around the installed ring gear assembly, closing it firmly until the latch on the casing is securely locked.
5. Tighten all nuts to ensure the anti-rotation bracket assembly is installed securely.

Install the SmarTrax MD Node

Node Mounting Locations

FIGURE 1. Node Mounting



When choosing the location for the SmarTrax node, consider the following points:

- Mount the SmarTrax node inside the machine's cab on a flat, level surface for proper performance and cable connection.
- One of the six numbered direction arrows on the node must be oriented in the direction of forward vehicle travel, one arrow pointing straight up, and two of the arrows parallel to the ground.

Note: *Make a note of the number of the arrow that is oriented in the direction of forward vehicle travel. This number will be needed during the SmarTrax calibration process.*

- The node mounting location must not create tripping hazards.
- Mount the node in a location where it will not be kicked or jarred during normal equipment operation.
- The location must allow cable routing to avoid crimping or damaging the cables or the node connections.
- Securely fasten the node using bolts or screws through at least two of the three mounting holes. When mounted properly, the node should not become loose or rotate.

Mount the SmarTrax MD Node

FIGURE 2. SmarTrax MD Node Installed



1. Install the SmarTrax MD node (P/N 063-4001-013) on the node mounting bracket (P/N 107-0172-084) using three 3/8"-16 zinc flanged lock nuts (P/N 312-1001-167).
2. Secure the node mounting bracket to the floor to the right of the operator's seat using four #10-24 x 3/4" self-tapping screws (P/N 310-1002-073) and 0.265" ID x 0.505" OD x 0.060" thick washers (P/N 313-2300-120) or 3" double-sided tape (P/N 332-0000-019).

Install the Foot Switch

FIGURE 3. Foot Switch Installed



1. Select a suitable location for the foot switch (P/N 063-0173-593) to be installed.

Note: *The foot switch should be installed in a location where the operator has easy access to it and is able to fully press the pedal.*

2. Using the holes in the foot switch as a template, drill holes in the floor of the cab.
3. Secure the foot switch to the floor by installing the supplied screws in each of the mounting holes.
4. Route the foot switch cable to the node mounting location.

Install the Node Harness

FIGURE 4. Node Harness Installed on SmarTrax Node



1. Install the two large, rectangular connectors of the node harness (P/N 115-4001-157) into the correct ports of the node (P/N 063-4001-013), tightening the bolts on the connectors to secure the connections.
2. Tighten the bolts on the harness connectors to secure the connections.
3. Connect the female 4-pin Deutsch connector to the cable of the installed foot switch (P/N 063-0173-593).
4. Connect the node harness to the operator presence switch, if applicable.
 - a. Locate and disconnect the machine's existing OPERATOR PRESENCE connection behind the operator's seat, if applicable.
 - b. Connect the round 4-pin connector from the node harness to the machine's mating OPERATOR PRESENCE connector.

FIGURE 5. Mechanical Drive Connection



5. Connect the 8-pin Deutsch connector from the node harness into the 8-pin port of the mechanical drive (P/N 063-4001-010).
6. Ensure the terminator (P/N 063-0172-369) supplied with the node harness is securely installed in the remaining 4-pin Deutsch connector.

Install the Chassis Cable

If the machine does not contain an existing chassis power system (such as AutoBoom, product control, etc.), it is necessary to install the chassis power cable to operate the SmarTrax system.

Note: *The chassis cable is sold separately. Contact your local Raven dealer for ordering information.*

1. Locate the SmarTrax chassis cable (P/N 115-4001-085).
2. Connect the TO SMARTRAX NODE connector from the chassis cable to the round 16-pin connector on the node harness (P/N 115-4001-157).
3. Connect the TO CONSOLE CABLE connector to the Raven console cable.
4. Install a terminator (P/N 063-0172-369) on the CAN cable connector.
5. Loop and tie-off the REMOTE SWITCH cable connection, securing it with plastic cable ties as necessary.

Note: *The REMOTE SWITCH connector is not used in the SmarTrax MD system. Ensure the cable is secured away from moving parts and heat sources.*

6. Connect the ring terminals to the battery.

Note: *The positive connectors are fused.*

Calibrate the SmarTrax MD System

Refer to the SmarTrax MD Calibration & Operation Manual (P/N 016-5030-020) for instructions on calibrating the SmarTrax MD system, adjusting system settings, and system operation.

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