

# **M1 Series Windrowers**

Wheel Motor Service Kit (MD #306170)  
Installation Instructions

214895 Revision B

Original Instruction

M1240 Windrower, featuring Dual Direction™ and Crossflex™ suspension



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## Introduction

This document explains how to install the Wheel Motor Service kit. A list of parts included in the kit is provided in Chapter *2 Parts List, page 5*.

### ***Installation time***

This kit will take approximately 5 hours to install.

### ***Conventions***

The following conventions are used in this document:

- Right and left are determined from the operator's position, facing forward with the windrower in cab-forward position.
- Unless otherwise noted, use the standard torque values provided in the windrower operator's manual and technical manual.

### **NOTE:**

Keep your MacDon publications up-to-date. The most current version of this instruction can be downloaded from our Dealer-only site (<https://portal.macdon.com>) (login required).

### **NOTE:**

This document is currently available in English only.

## Summary of Changes

At MacDon, we're continuously making improvements, and occasionally these improvements affect product documentation. The following list provides an account of major changes from the previous version of this document.

Section	Summary of Change	Internal Use Only
<i>Inside Front Cover, page 2</i>	Added copyright and disclaimer statements.	Tech Pubs
<i>2 Parts List, page 5</i>	Removed part number of motor. It is not sold separately.	Tech Pubs
<i>3.3 Installing Wheel Drive Motor, page 13</i>	Removed part number of motor. It is not sold separately.	Tech Pubs
<i>3.3 Installing Wheel Drive Motor, page 13</i>	Updated torque values for split flange bolts.	ECN 58596
<i>3.4 Calibrating Wheel Drive Motor, page 17</i>	Added warning that drive tires must be off the ground.	Product Support

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# Chapter 1: Safety

## 1.1 Signal Words

Three signal words, **DANGER**, **WARNING**, and **CAUTION**, are used to alert you to hazardous situations. Two signal words, **IMPORTANT** and **NOTE**, identify non-safety related information. Signal words are selected using the following guidelines:

### **DANGER**

Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.

### **WARNING**

Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury. It may also be used to alert against unsafe practices.

### **CAUTION**

Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may be used to alert against unsafe practices.

### **IMPORTANT:**

Indicates a situation that, if not avoided, could result in a malfunction or damage to the machine.

### **NOTE:**

Provides additional information or advice.

## 1.2 General Safety

### CAUTION

The following general farm safety precautions should be part of your operating procedure for all types of machinery.

Protect yourself.

- When assembling, operating, and servicing machinery, wear all protective clothing and personal safety devices that could be necessary for the job at hand. Do **NOT** take chances. You may need the following:
  - Hard hat
  - Protective footwear with slip-resistant soles
  - Protective glasses or goggles
  - Heavy gloves
  - Wet weather gear
  - Respirator or filter mask
- Be aware that exposure to loud noises can cause hearing impairment or loss. Wear suitable hearing protection devices such as earmuffs or earplugs to help protect against loud noises.



Figure 1.1: Safety Equipment



Figure 1.2: Safety Equipment

- Provide a first aid kit in case of emergencies.
- Keep a properly maintained fire extinguisher on the machine. Be familiar with its proper use.
- Keep young children away from machinery at all times.
- Be aware that accidents often happen when the Operator is tired or in a hurry. Take time to consider safest way. **NEVER** ignore warning signs of fatigue.

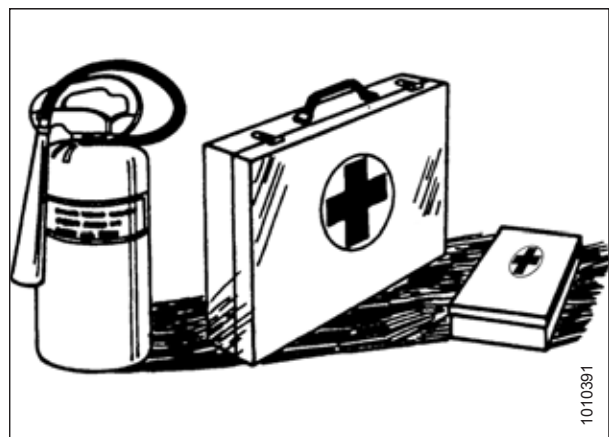


Figure 1.3: Safety Equipment



## SAFETY

- Wear close-fitting clothing and cover long hair. **NEVER** wear dangling items such as scarves or bracelets.
- Keep all shields in place. **NEVER** alter or remove safety equipment. Make sure driveline guards can rotate independently of shaft and can telescope freely.
- Use only service and repair parts made or approved by equipment manufacturer. Substituted parts may not meet strength, design, or safety requirements.



Figure 1.4: Safety around Equipment

- Keep hands, feet, clothing, and hair away from moving parts. **NEVER** attempt to clear obstructions or objects from a machine while the engine is running.
- Do **NOT** modify the machine. Unauthorized modifications may impair machine function and/or safety. It may also shorten the machine's life.
- To avoid injury or death from unexpected startup of the machine, **ALWAYS** stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

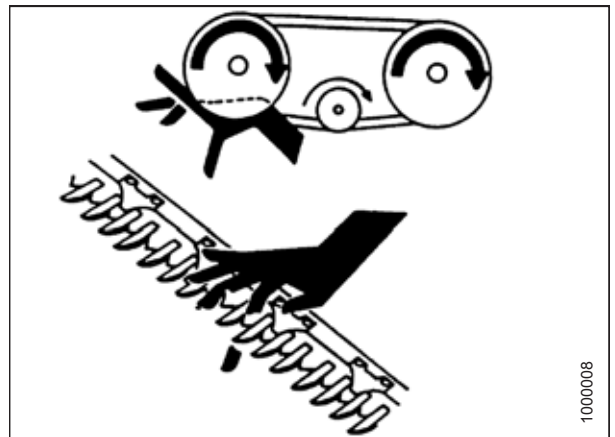


Figure 1.5: Safety around Equipment

- Keep service area clean and dry. Wet and/or oily floors are slippery. Wet spots can be dangerous when working with electrical equipment. Be sure all electrical outlets and tools are properly grounded.
- Keep work area well lit.
- Keep machinery clean. Straw and chaff on a hot engine are fire hazards. Do **NOT** allow oil or grease to accumulate on service platforms, ladders, or controls. Clean machines before storage.
- **NEVER** use gasoline, naphtha, or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.
- When storing machinery, cover sharp or extending components to prevent injury from accidental contact.

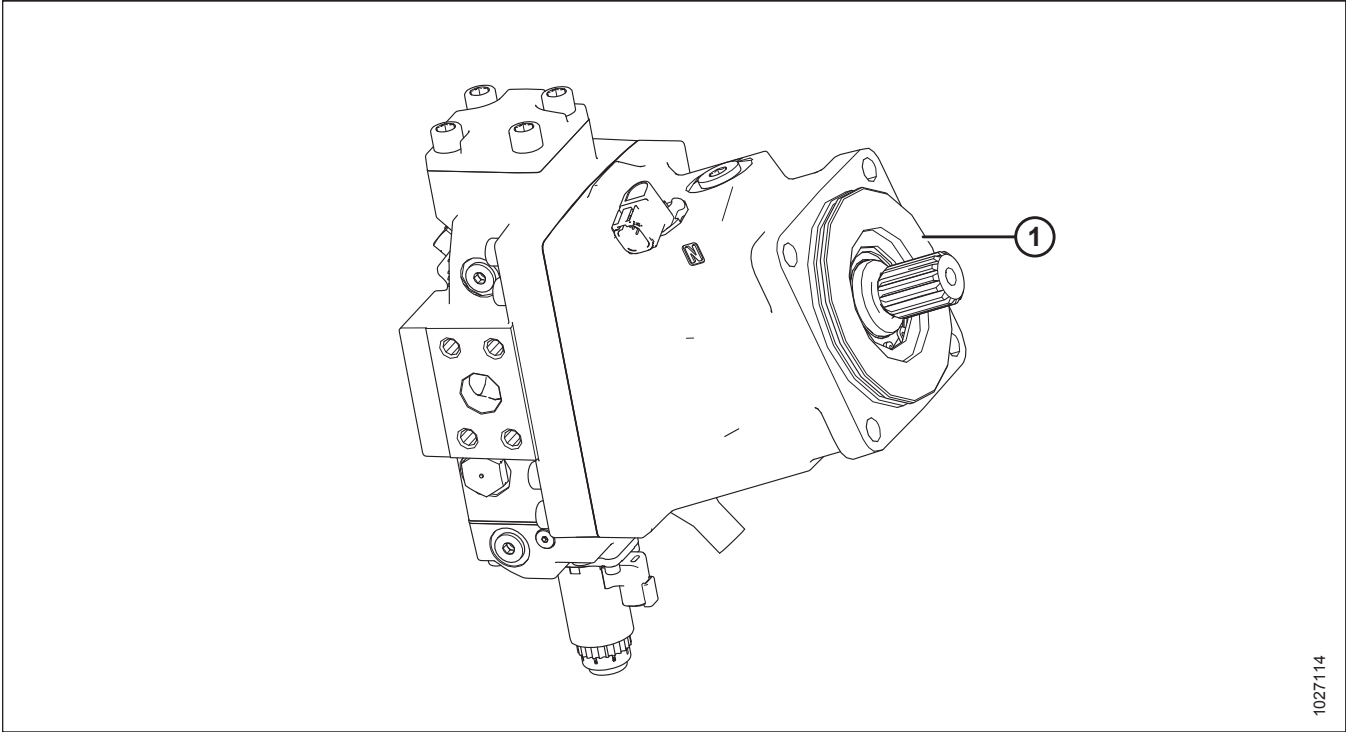


Figure 1.6: Safety around Equipment



# Chapter 2: Parts List

Figure 2.1: Parts Included in Kit



1027114

Ref	Part Number	Description	Quantity
1	NSS <sup>1</sup>	MOTOR – HYDRAULIC	1

1. Not sold separately. Refer to the windrower parts catalog for service parts.



## Chapter 3: Installation Instructions

Wheel drive motors are located inside each drive wheel leg. To install a new wheel drive motor, follow these procedures:

### 3.1 Removing Drive Wheels

#### CAUTION

Header **MUST** be removed and **NO** weight box installed. Use a hydraulic jack with minimum lifting capacity of 2268 kg (5000 lb.) to provide adequate support for the machine.

#### CAUTION

Use a suitable lifting device capable of supporting a minimum of 907 kg (2000 lb.) to lift the wheel assembly away from the windrower.

1. Disconnect the header. Refer to the windrower operator's manual or technical manual.
2. Park the windrower on level ground.
3. Place ground speed lever (GSL) (A) in PARK.
4. Shut down the engine, and remove the key from the ignition.

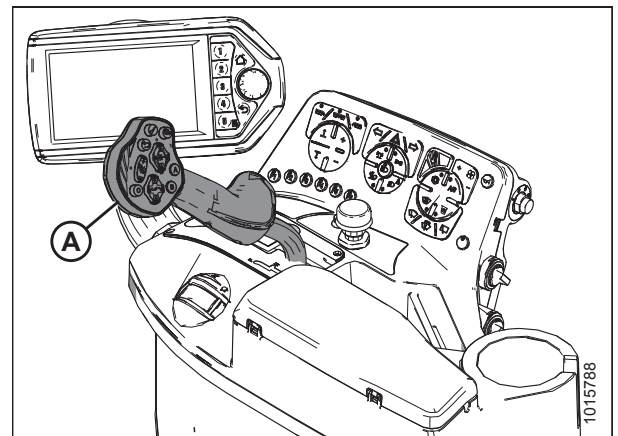


Figure 3.1: Ground Speed Lever

5. Using a forklift, raise the windrower approximately 130 cm (51 in.) off the ground. Place a stand (A) under each side of the windrower frame.



Figure 3.2: Windrower on Stand

## INSTALLATION INSTRUCTIONS

6. Remove and retain wheel nuts (B).
7. Using a suitable lifting device, remove drive wheel (A).

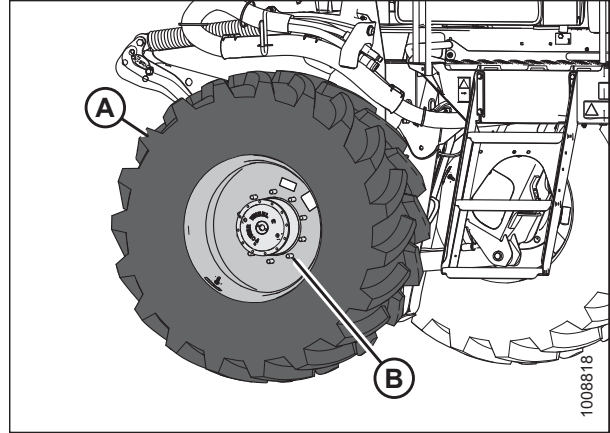


Figure 3.3: Drive Wheel Assembly

### 3.2 Removing Wheel Drive Motor

#### CAUTION

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key from ignition before leaving operator's seat for any reason.

1. Remove and retain bolt (A), and inner leg cover (B).
2. Remove and retain bolt (C), and forward facing cover (D).

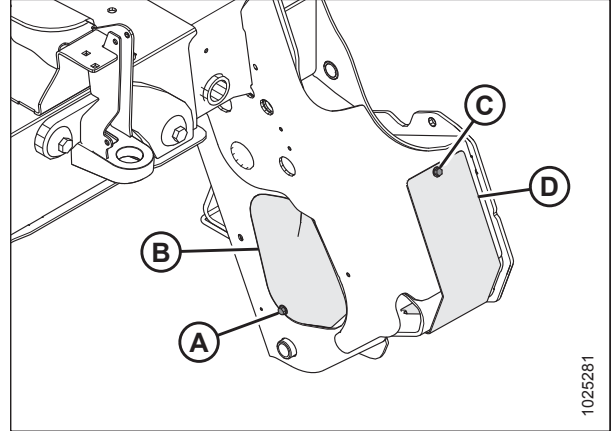


Figure 3.4: Left Leg Access Covers

3. Press tab (A) and disconnect the wheel motor electrical connector.
4. Press tab (B) and disconnect the wheel speed sensor connector.

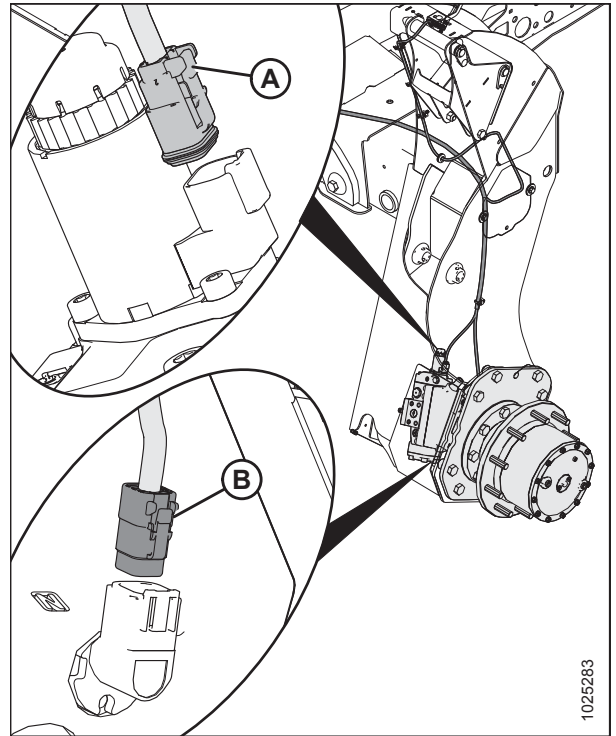


Figure 3.5: Left Wheel Motor Electrical Connectors

## INSTALLATION INSTRUCTIONS

5. Mark the hydraulic hoses for ease of reinstallation later.
6. Disconnect system pressure hose (A) by removing four bolts and washers (C), split flange (D), and O-ring (E). Repeat for hose (B).
7. Disconnect and cap case drain hose (F).

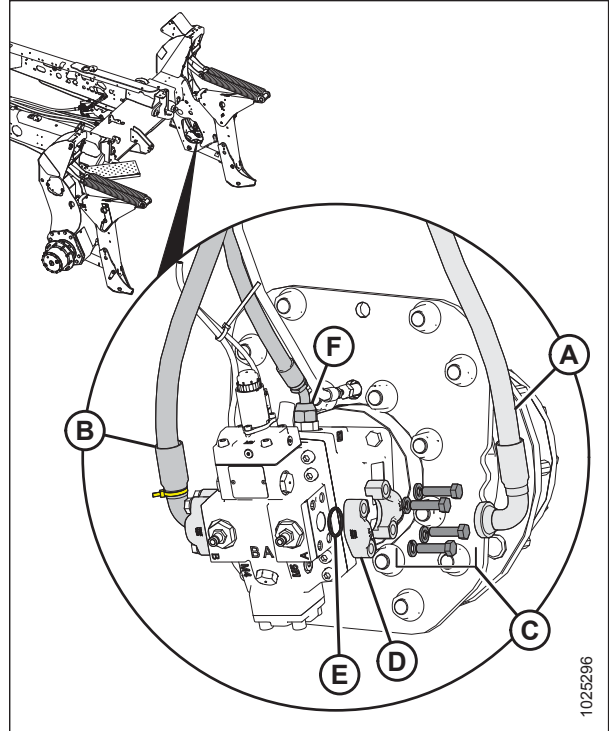


Figure 3.6: Left Wheel Motor Hydraulic Hoses

8. Disconnect hydraulic brake hose (A).

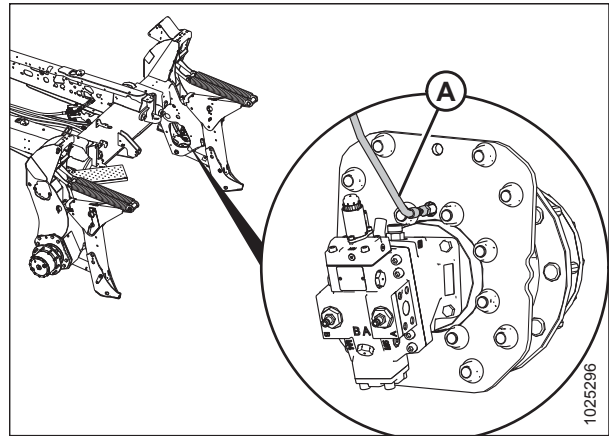


Figure 3.7: Left Wheel Motor Hydraulic Brake Hose



## INSTALLATION INSTRUCTIONS

- Secure lifting chain (A) to the wheel drive with a wheel bolt and nut.

**NOTE:**

The wheel drive weighs approximately 150 kg (330 lb.).

- Remove six lower bolts (B) followed by the top two bolts (C). Retain bolts.

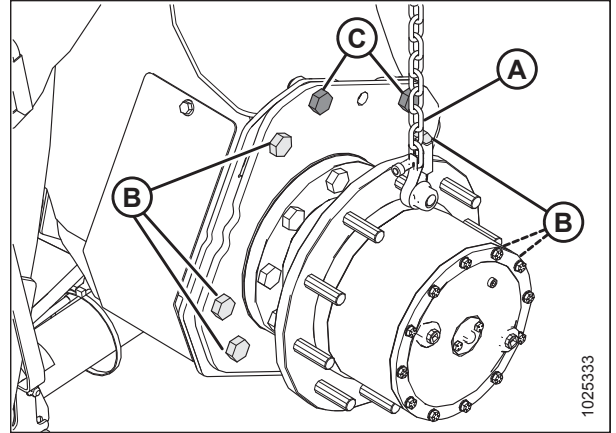


Figure 3.8: Left Wheel Drive Assembly

- Slowly move the wheel drive away from the wheel leg. Be careful not to damage solenoid valve (A) or speed sensor (B).

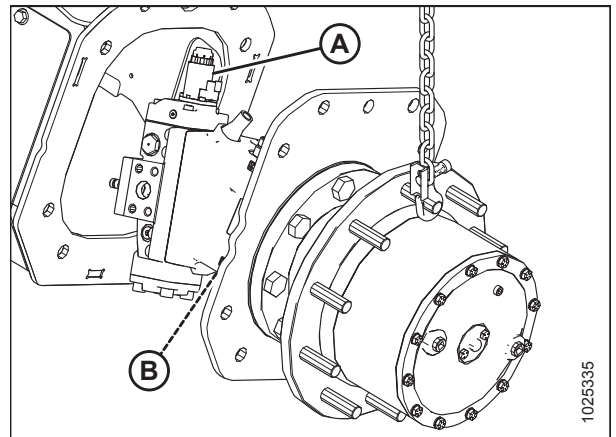


Figure 3.9: Left Wheel Drive Assembly

- Remove four bolts (A) and separate motor (B) from wheel drive (C). Retain bolts.

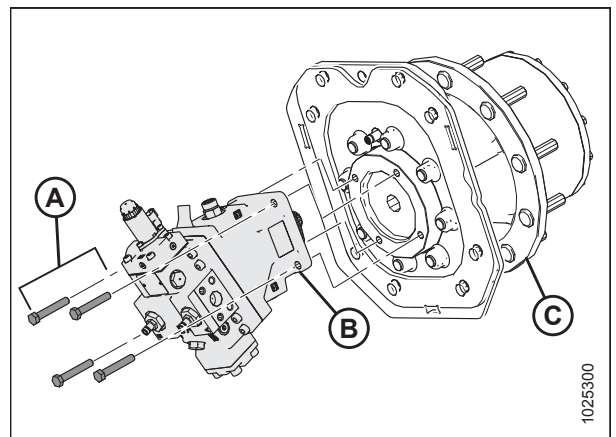


Figure 3.10: Left Wheel Motor

## INSTALLATION INSTRUCTIONS

13. Remove O-ring (A) from the wheel drive motor.
14. Inspect O-ring, and replace if necessary.

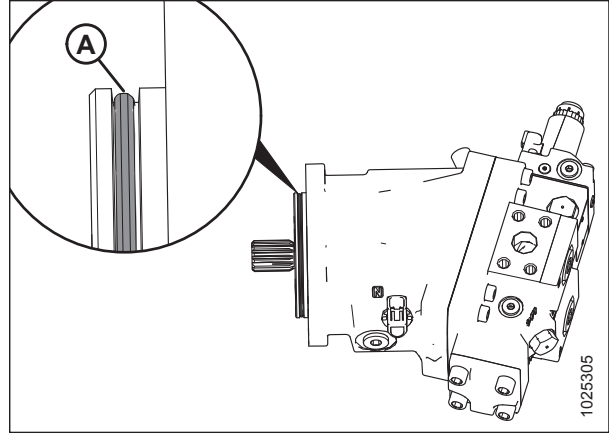


Figure 3.11: Left Wheel Motor

### 3.3 Installing Wheel Drive Motor

**⚠ WARNING**

To avoid potentially erratic handling, perform wheel motor calibration every time a wheel motor is replaced. If the calibration routine is not followed, the windrower may not track straight when it is driven at maximum ground speed and the GSL is pulled back rapidly to decelerate.

**⚠ CAUTION**

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key from ignition before leaving operator's seat for any reason.

1. Install O-ring (A) into groove on new motor.

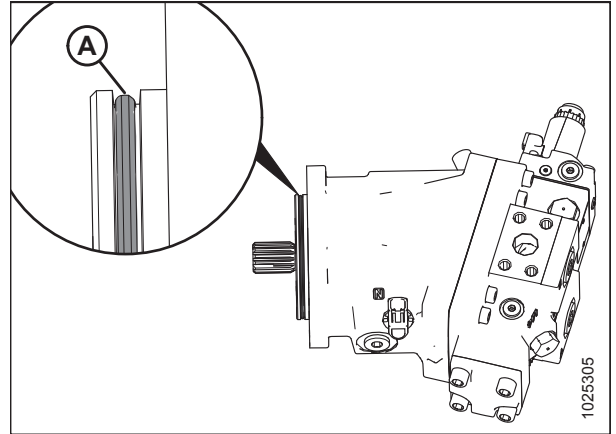


Figure 3.12: O-Ring on Wheel Motor

2. Secure motor (B) to wheel drive (C) with four bolts (A).
3. Torque bolts to 91 Nm (67 lbf·ft).

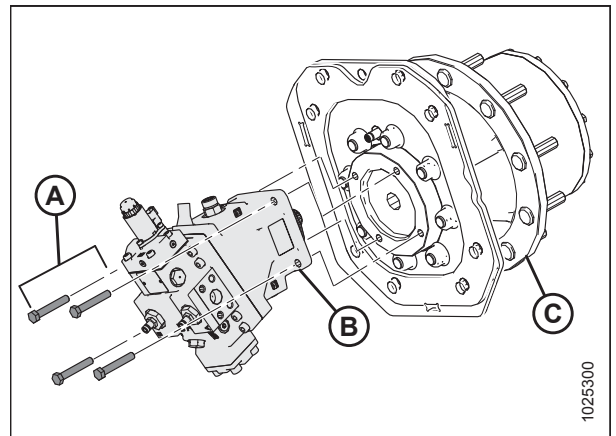


Figure 3.13: Left Wheel Motor

## INSTALLATION INSTRUCTIONS

- Secure lifting chain (A) to the wheel drive with a wheel bolt and nut.

**NOTE:**

The wheel drive weighs approximately 150 kg (330 lb.).

- Slowly move the wheel drive into the wheel leg. Be careful not to damage speed sensor (B) or solenoid valve (C).

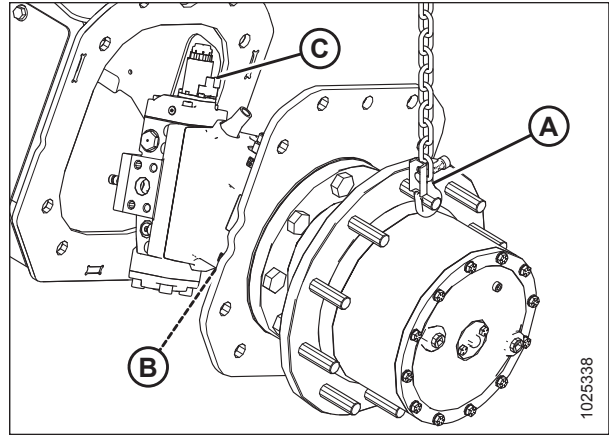


Figure 3.14: Left Wheel Drive Assembly

- Reinstall two bolts (A) at the top and then six bolts (B).
- Torque bolts to 434–480 Nm (322–356 lbf-ft).

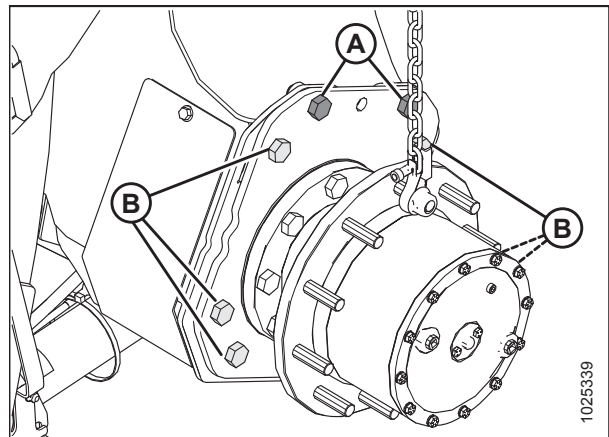


Figure 3.15: Left Wheel Drive Assembly

- Connect hydraulic brake hose (A).

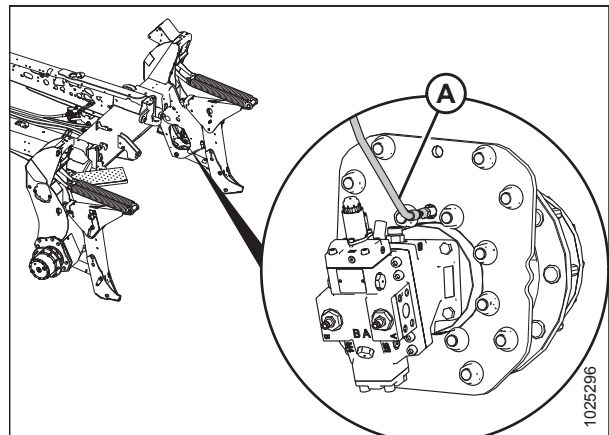


Figure 3.16: Left Wheel Drive Assembly

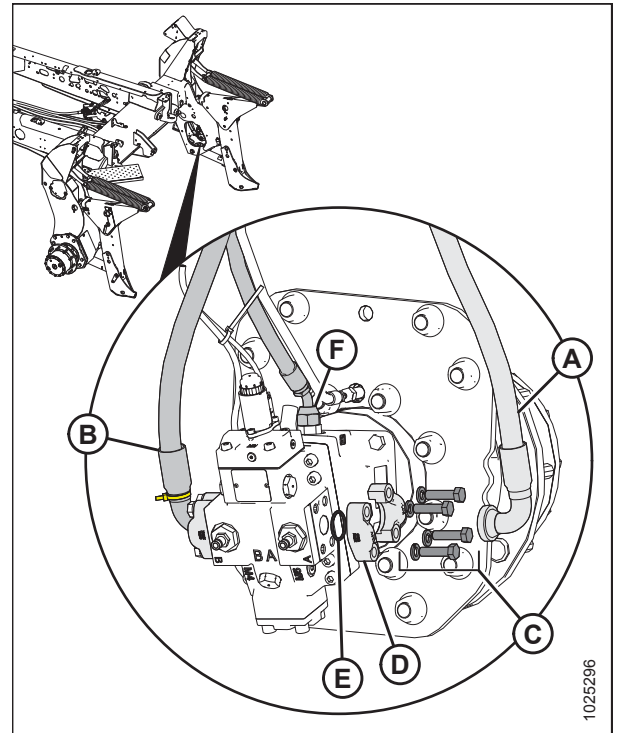
## INSTALLATION INSTRUCTIONS

9. If necessary, refer to the table at right to confirm hydraulic hose locations.

**Table 3.1 Traction Drive Hydraulic Connections**

Location	Wheel Motor	Drive Pump
Right	Port A	Port B
	Port B	Port A
Left	Port A	Port D
	Port B	Port C

10. Install O-ring (E) into pressure hose (A).
11. Install hose (A) onto wheel motor with split flange (D), and secure using washers and bolts (C).
12. Tighten split flange bolts in a cross pattern and torque bolts to 78 Nm (57.5 lbf-ft).
13. Repeat Steps 10, page 15 and 11, page 15 for pressure hose (B).
14. Remove the cap from case drain hose (F), and install the hose on the motor. Torque to 85 Nm (63 lbf-ft).



**Figure 3.17: Left Wheel Motor Hydraulic Hoses**

## INSTALLATION INSTRUCTIONS

15. Connect wheel motor electrical connector (A) and speed sensor connector (B).

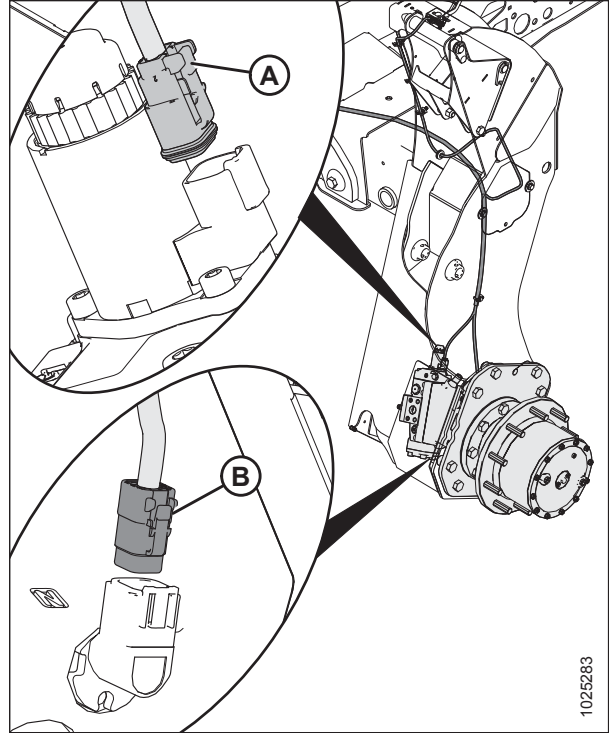


Figure 3.18: Left Wheel Motor Electrical Connectors

16. Install inner leg cover (B) with bolt (A).
17. Install forward facing cover (D) with bolt (C).

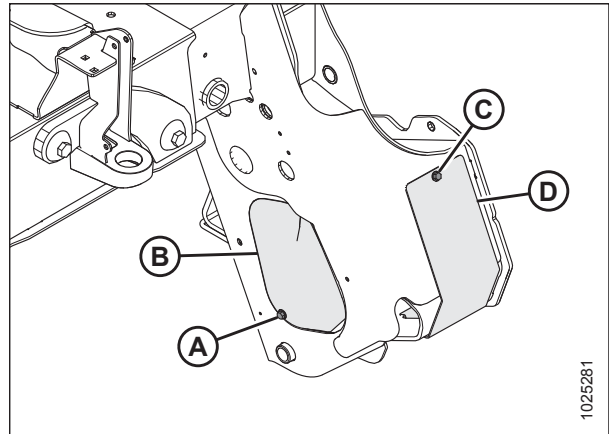


Figure 3.19: Left Leg Access Covers

### 3.4 Calibrating Wheel Drive Motor

The electrical current required for the wheel motors to reach minimum displacement can vary from motor to motor; therefore, the maximum current applied to each wheel motor must be calibrated.

**⚠ WARNING**

This procedure **MUST** be performed with the drive tires off the ground. Calibration requires the ground speed lever (GSL) to be out of park and stroked fully forward.

**⚠ WARNING**

To avoid potentially erratic handling, perform wheel motor calibration every time a wheel motor is replaced. If the calibration routine is not followed, the windrower may not track straight when it is driven at maximum ground speed and the GSL is pulled back rapidly to decelerate.

**⚠ CAUTION**

Before starting the machine, check to be sure all bystanders have cleared the area.

1. With the windrower engine running, press soft key 5 (A) to open the main menu.

**NOTE:**

Calibrations **MUST** be performed with the engine running. Some calibrations will **NOT** be available with the engine off.

2. Use HPT scroll knob (B) or the ground speed lever (GSL) scroll wheel (not shown) to place the red cursor over SETTINGS icon (C).
3. Press HPT scroll knob (B) or the GSL SELECT button (not shown) to activate the settings menu options.

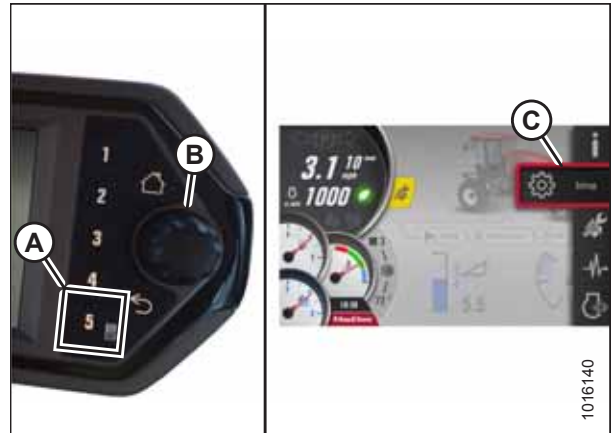


Figure 3.20: Opening the Main Menu

5. Scroll to the WINDROWER SETTINGS icon (A) and press SELECT.
6. Scroll to the CALIBRATION icon (B), and press SELECT to open the adjustment page.

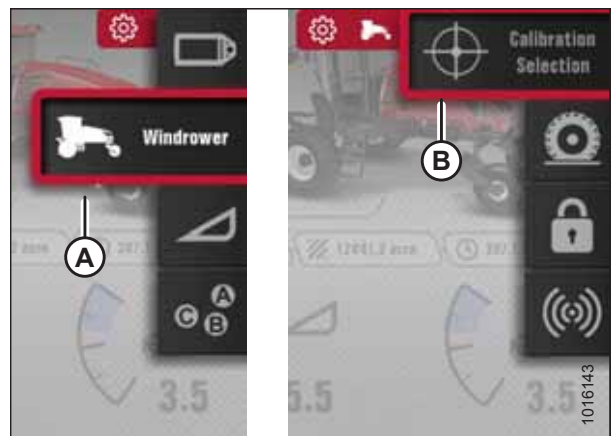


Figure 3.21: Calibration Submenu Icon

## INSTALLATION INSTRUCTIONS

7. Press and hold the ECO ENGINE CONTROL button (A) for 5 seconds until the WHEEL MOTOR selection appears in the list.

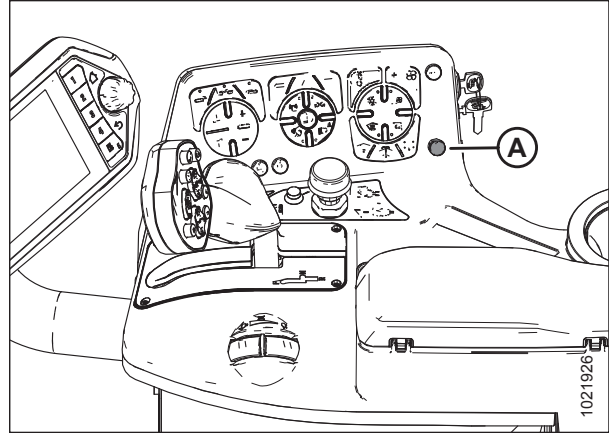


Figure 3.22: M1 Series Console

8. Select WHEEL MOTOR and a warning message (A) appears. With the engine running, move GSL fully forward. PLAY button (B) will appear next to soft key 3.
9. Select PLAY to start the calibration; the engine will lock to low idle (1000 rpm).



Figure 3.23: Warning Message

### NOTE:

During calibration, the system automatically steps through six stages; the display shows calibration progress. An average of the maximum current readings for each wheel motor displays at the bottom right corner (A).



Figure 3.24: Calibration Progress



## INSTALLATION INSTRUCTIONS

- When calibration is successful, CALIBRATION COMPLETE (A) is displayed, and the maximum current (C) for each wheel motor is updated.

If calibration fails, COULD NOT CALIBRATE (B) is displayed, and the maximum current readings (C) are not changed. Press the X button or use the BACK or HOME button to close the CALIBRATION WHEEL MOTOR menu.

**NOTE:**

Calibration can fail if the wheel speed sensor(s) are inoperable.



Figure 3.25: Calibration Display

**NOTE:**

If the operator strokes the GSL below 90% or activates any of the positional switches at any point during the calibration, CALIBRATION CANCELED is displayed and the maximum current readings (A) are not changed. Press the X button at any point during the calibration to stop the calibration, and exit out of the CALIBRATION WHEEL MOTOR menu.

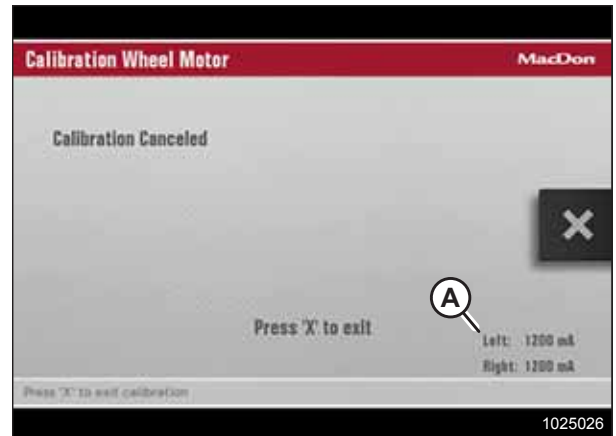


Figure 3.26: Canceled Calibration Progress

### 3.5 Installing Drive Wheels

#### CAUTION

Use a lifting device capable of supporting a minimum of 907 kg (2000 lb.) to lift the wheel assembly.

1. Clean the mounting surface on the wheel drive and rim.
2. Position pallet jack (A) or equivalent under the tire and raise slightly.
3. Position the wheel against the wheel drive hub so air valve (B) is on the outside and tread (C) points forward (cab-forward orientation).

**NOTE:**

For turf tires (diamond tread pattern), be sure the arrow on the sidewall points in forward rotation (cab-forward).

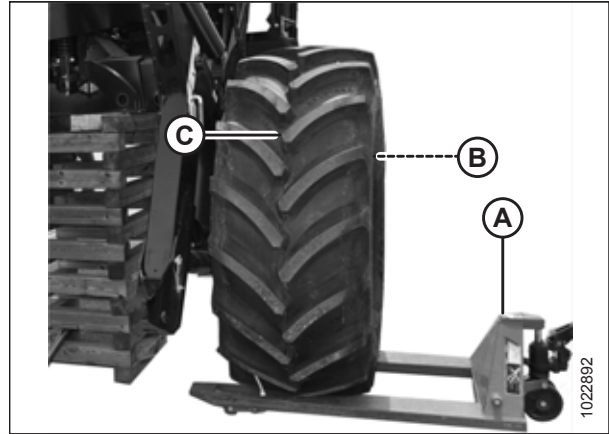


Figure 3.27: Drive Wheel

4. Align the rim with the studs on the hub, and then push the wheel onto the hub.
5. Install and torque each wheel nut (A) to 510 Nm (375 lbf-ft) using the tightening sequence shown at right.

**IMPORTANT:**

To avoid damage to wheel rims and studs, do **NOT** use an impact wrench. Threads must be clean and dry. Do **NOT** apply lubricant or anti-seize compound. Do **NOT** overtighten wheel nuts.

6. Repeat tightening sequence two additional times, ensuring the specified torque is achieved each time.
7. Lower the pallet jack and move it away from the work area.

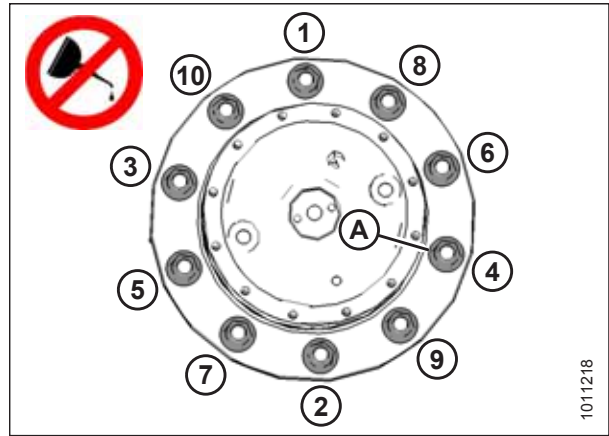


Figure 3.28: Tightening Sequence

### 3.6 Lowering Drive Wheels

1. Shut down the engine, and remove the key from the ignition.
2. Using a forklift, raise the windrower and remove stands (A) supporting the windrower.
3. Lower the windrower to the ground.



Figure 3.29: Windrower on Stand





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