



# Wheel Motor Kit

Reelmaster® 5410/5510/5610 and Groundsmaster® 4300-D Traction Unit

Model No. 125-8785

## Installation Instructions

### ⚠ WARNING

#### CALIFORNIA Proposition 65 Warning

This product contains a chemical or chemicals known to the State of California to cause cancer, birth defects, or reproductive harm.

**Important:** The Wheel Motor Kit Installation Instructions cover the removal and installation of new wheel motors, wheel motor components and hydraulic filters. If the original traction circuit components have been damaged, additional repairs and high pressure hydraulic system flushing must be performed prior to installing new wheel motors. Contact your local distributor for additional information

### ⚠ WARNING

Before disconnecting or performing any work on hydraulic system, relieve all pressure in system. Stop engine; lower or support all cutting units.

Keep body and hands away from pin hole leaks or nozzles that eject hydraulic fluid under high pressure. Use paper or cardboard, not hands, to search for leaks. Hydraulic fluid escaping under pressure can have sufficient force to penetrate the skin and cause serious injury. If fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type of injury. Gangrene may result from such an injury.

### ⚠ CAUTION

When changing attachments, tires or performing other service, use correct blocks, hoists and jacks. Make sure the machine is parked on a solid, level surface such as a concrete floor. Prior to raising the machine, remove any attachments that may interfere with the safe and proper raising of the machine. Always chock or block the wheels. Use jack stands or other appropriate load holding devices to support the raised machine. If the machine is not properly supported, the machine may move or fall, which may result in personal injury.



## Inspecting the Wheel Motors

1. Park the machine on a level surface, engage the parking brake, lower the cutting units and stop the engine. Remove the key from the ignition switch.
2. Refer to Toro Service Bulletins LR08–35 and R08–41 for the list of machines with affected motors.
3. Inspect the wheel motor serial plate (Figure 1). This can be viewed from beneath the machine.

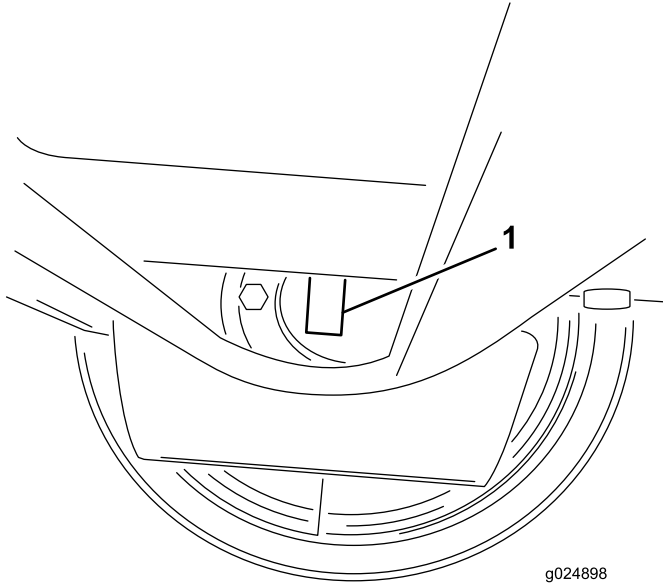


Figure 1

1. Wheel motor serial plate

4. The Julian date code (Figure 2) will confirm the motor is part of the affected lot. Affected motors will have a date code of 14311 to 19511.

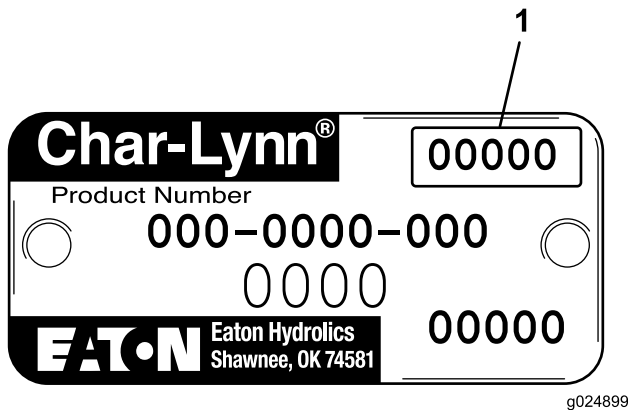


Figure 2

1. Julian date code

5. When an affected wheel motor is identified, photograph the serial plate. This will be submitted with the model and serial number information to TAC via PER case.

**Note:** If the wheel motor is not within the affected range no further action is required.

## Special Tools Required

**Note:** The following special tools (or equivalent) will be required to diagnose and repair affected units:

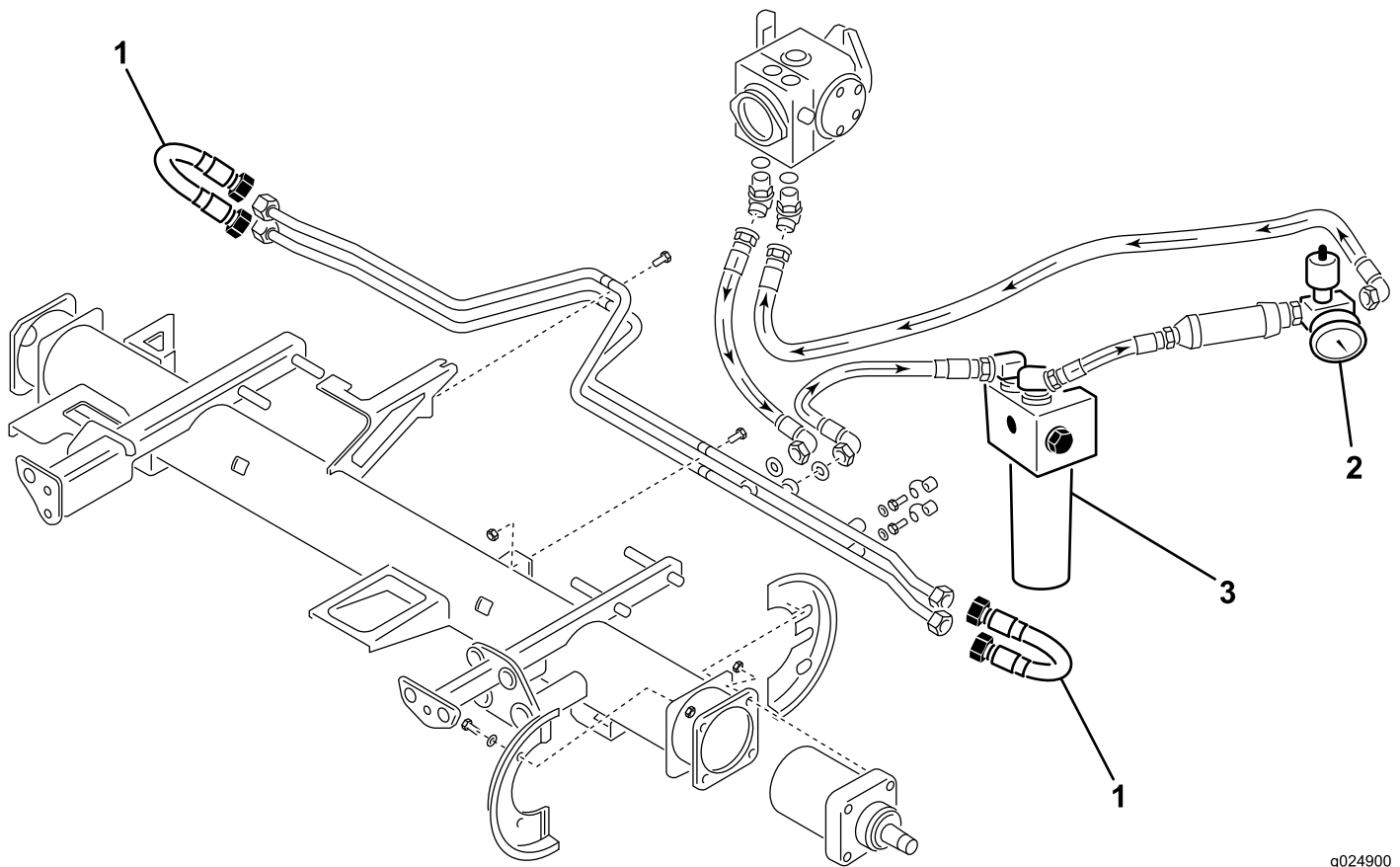
- TOR6004 - Wheel Hub Puller
- TOR6011 - High Pressure Filter Kit
- TOR6007 - Hydraulic Hose Kit
- 0 - 500 psi Hydraulic Pressure Gauge
- 0 - 5000 psi Hydraulic Pressure Gauge
- 400 ft. lb. Torque Wrench (or Torque Multiplier)
- Flow meter capable of measuring 30 Gallons Per Minute (K-Line part number AT40004)
- Wheel Motor Bypass Components for repair: The following components are used in place of the wheel motors so the circuits can be flushed without damaging the new wheel motor assemblies. The hydraulic hoses can be fabricated locally or Toro hydraulic lines can be purchased. Refer to the Hydraulic System Flush Procedure in these instructions for additional details. Components required:

Toro Part Number	Description	Quantity
93-6834	Straight Fitting	4
108-1686	Hydraulic Hose Assembly	2

## Testing the Machine

1. Remove the front wheels from the machine as follows:
  - Chock the rear wheels to prevent the machine from shifting.
  - Loosen the lug nuts on the front wheels.
  - Using a jack, raise the machine so the wheel is off the ground. Support the machine with jack stands. Refer to your Operators Manual for the proper jacking instructions.
  - Release the parking brake.
  - Remove the lug nuts and then remove the wheels and brake drums from the machine.
2. Remove the front wheel motors from the traction circuit by attaching a bypass hose at each wheel motor, positioning as shown in the Figure 3. The bypass loop hose needs to be capable of handling 3625 psi.

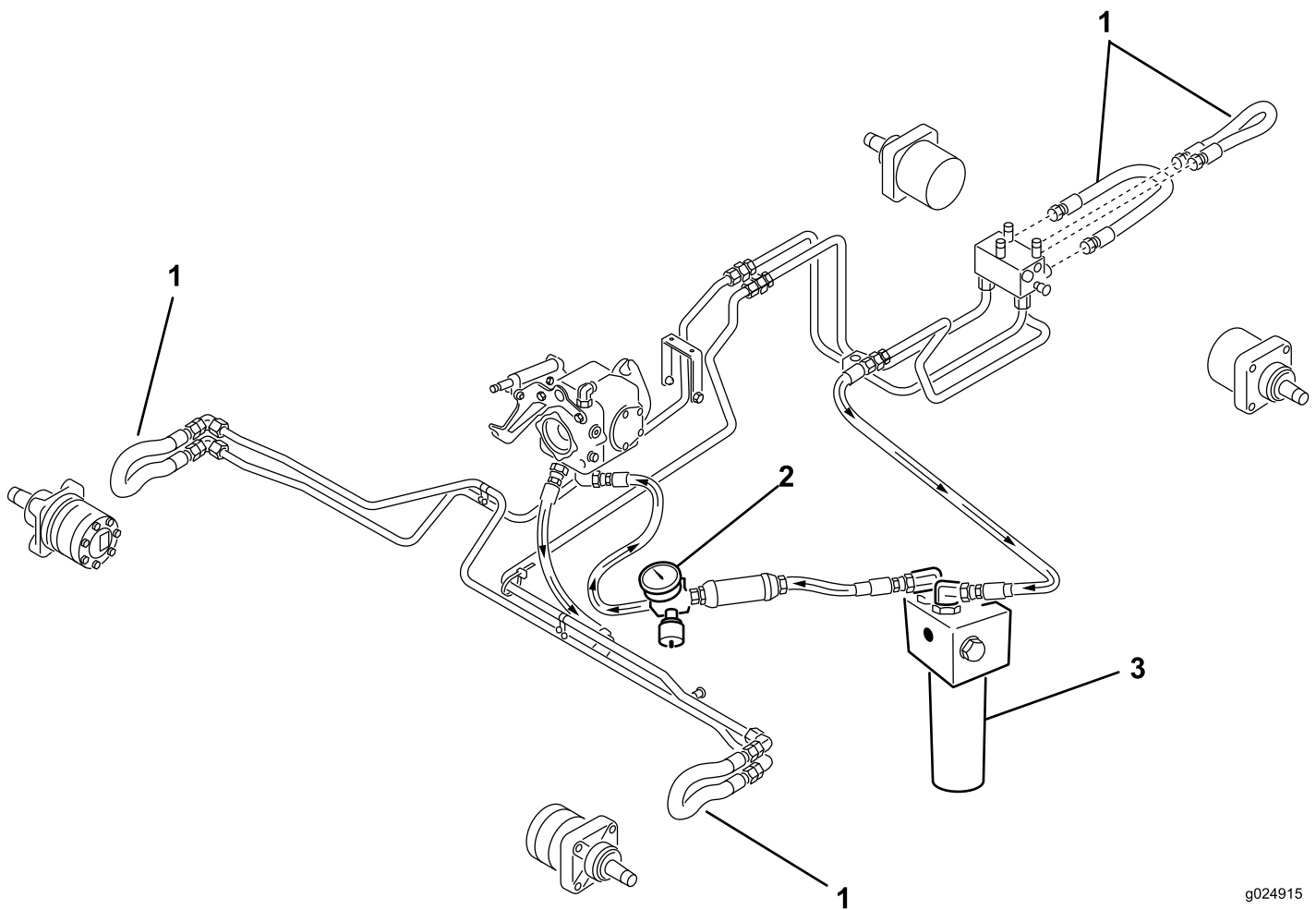
**Note:** If the machine is equipped with CrossTrax (4 wheel drive), install two additional bypass hoses to the rear manifold, as shown in Figure 4



g024900

**Figure 3**  
2 Wheel Drive Shown

- |                    |               |           |
|--------------------|---------------|-----------|
| 1. Bypass loop (2) | 2. Flow meter | 3. Filter |
|--------------------|---------------|-----------|
- 
3. After all the loops are installed, install a high pressure filter and flow meter capable of measuring 30 gallons per minute into the return line of the traction circuit as shown in Figure 3 and Figure 4.



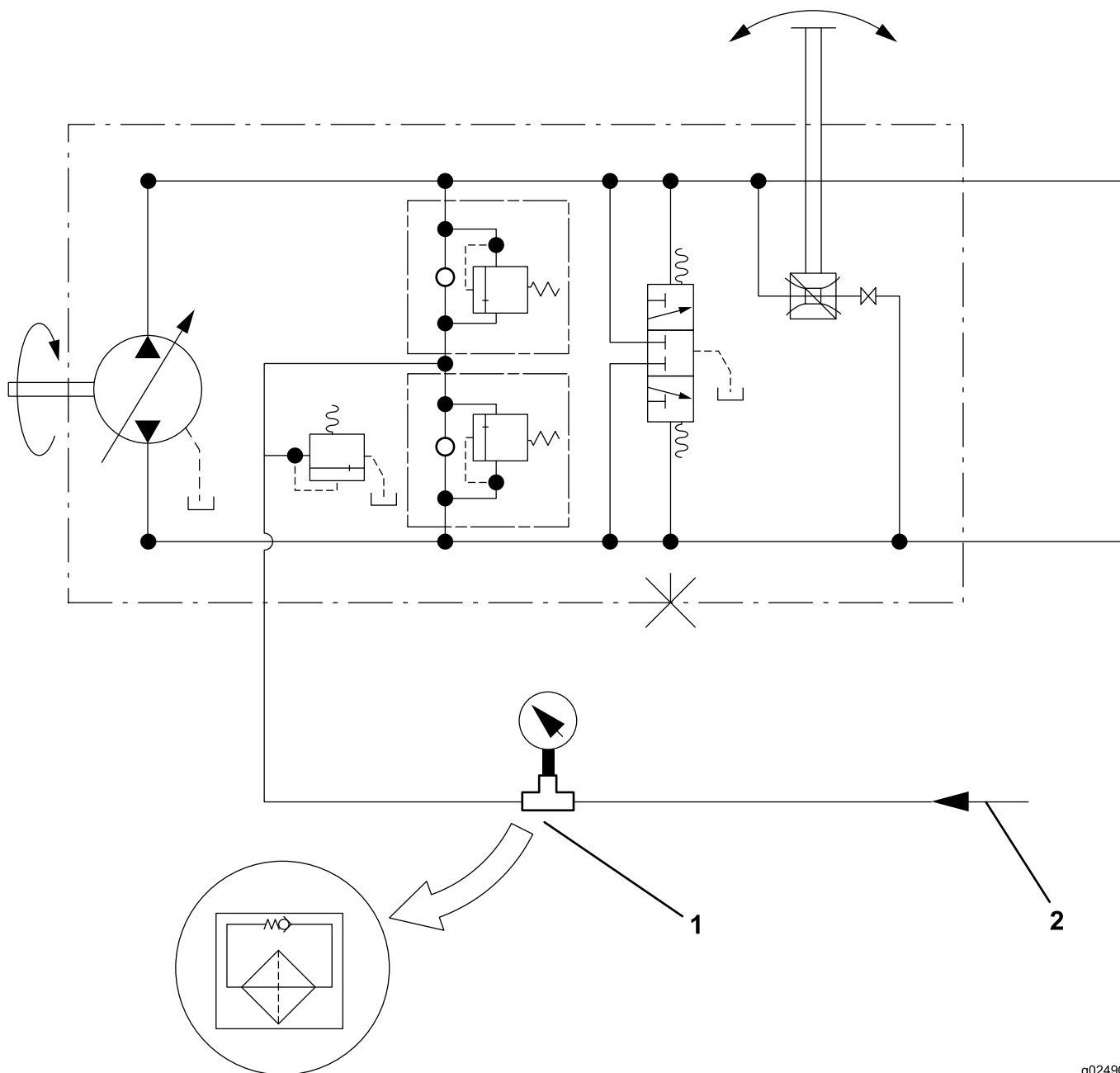
g024915

**Figure 4**  
4 Wheel Drive Shown

- |                    |               |           |
|--------------------|---------------|-----------|
| 1. Bypass loop (4) | 2. Flow meter | 3. Filter |
|--------------------|---------------|-----------|

**Important:** When performing tests, do not operate the traction circuit in reverse.

4. Remove the smaller charge hydraulic filter head assembly and install a 500 psi pressure gauge in-line with the charge supply tube as shown in Figure 5. If the pressure gauge is part of a flow meter assembly, ensure the flow meter is unrestricted before performing the following tests.



**Figure 5**

1. Pressure gauge (Oil filter removed)

2. Flow from steering valve

**Perform the following tests and record the results in the blank fields on this form. All hydraulic test results must be submitted to TAC when seeking approval for repairing any components in addition to the affected wheel motors.**

5. With the machine securely on jack stands or a lift, ensure all the wheels of the machine are off the ground, start the engine and increase the engine RPM to full throttle. Allow the machine to reach operating temperature.
6. Record the charge pressure reading with the machine in neutral. The charge pressure is \_\_\_\_\_ psi.

7. Step on the traction pedal in the forward direction. With the flow meter unrestricted there should be very little load on the hydrostat. Record the gallons per minute being pumped from the hydrostat, record the pressure on the traction loop flow meter and record the charge pressure.

The hydrostat output is \_\_\_\_\_ GPM at \_\_\_\_\_ psi and charge pressure is \_\_\_\_\_ psi.

8. With the traction pedal fully depressed in the forward direction slowly restrict the flow meter in the traction loop until the pressure gauge on the flow meter reaches 1000psi. Record the output of the hydrostat and charge pressure.

- The hydrostat output is \_\_\_\_\_ GPM at 1000 psi and charge pressure is \_\_\_\_\_ psi.
9. Continue to restrict the flow meter in the traction loop until the gauge on the flow meter reads 2000 psi. Record the output of the hydrostat and charge pressure.

The hydrostat output is \_\_\_\_\_ GPM at 2000 psi and charge pressure is \_\_\_\_\_ psi.

10. Continue to restrict the traction loop flow meter until the traction pressure reaches relief, stops increasing or the engine stalls. Record the pressure reading on the flow meter gauge.

The hydrostat is capable of producing \_\_\_\_\_ psi of pressure.

11. If the hydrostat produced 20 gallons per minutes or more at 1000 psi, and the charge pressure was 150 psi or higher with a constant traction circuit pressure greater than 1000 psi, proceed to **Flushing and Filtering the Machine**, as no further diagnostics are required.
12. If the Hydrostat produced less than 20 gallons per minute at 1000 psi or, if charge pressure dropped below 75 psi with traction pressures greater than 1000 psi, the hydro will need a rebuild, but additional testing is required first. **Do not rebuild hydro at this time.**

Remove the flow meter from the traction circuit and install it onto the gear pump section P1 outlet. Measure gear pump section P1 flow at 2000 psi.

The gallons per minute output of gear pump section P1 at 2000 psi is \_\_\_\_\_.

If the gear pump flow is less than 5.4 GPM on the Reelmaster 5410, less than 7.1 GPM on the Reelmaster 5510/5610 or less than 11.0 GPM on the Groundsmaster 4300, the gear pump will need to be replaced, but additional steps to flush the system are required first. **Do not replace the gear pump at this time.**

13. If the machine is configured with CrossTrax (4 wheel drive) and the hydrostat produced less than 20 gallons per minute at 1000 psi or if charge pressure dropped below 75 psi with traction pressures greater than 1000 psi, the rear wheel motors will also need to be replaced. **Do not replace at this time.**

## Flushing and Filtering the Machine

1. If the high pressure filter and flow meter assembly was moved to the gear pump for testing in step 13 in **Testing the Machine**, return it to the hydrostat loop as installed in step 4.
2. Remove the cutting unit motors or back off the reel to bedknife adjustment on each reel to eliminate light contact. Lower cutting unit arms to allow circuit engagement.

3. With the wheels of the machine off the ground, start the engine and increase the engine RPM to full throttle.
4. Slowly depress the traction pedal until fully depressed. Slowly close the flow meter until the pressure gauge reads 1000 psi. Allow the tractor to run in this condition for 10 minutes. This will remove any remaining debris from the traction circuit.
5. Disengage the traction circuit and then engage the reel drive to clean the oil in that circuitry. Allow it to run/filter for 10 minutes. After that time, stop the engine
6. Drain the hydraulic reservoir but leave the tank in place. Remove the large metal hydraulic tank cap that is retained by screws onto the top of the tank. Siphon or draw the remaining oil from the tank. Use either a clean shop towel and/or wet vacuum to remove any metal debris from the bottom of the tank. Also, be sure the surface of the suction screen is clean and free of debris. For severe contamination, the tank and strainer may have to be removed for cleaning and rinsing
7. Disconnect the traction circuit lines at fittings and blow through the individual lines with compressed air to clear any remaining debris. Use shop towels to catch oil and debris at the ends of the lines. 4 wheel drive units will require the removal of the relief valve and check valves within the 4 wheel drive manifold in order to thoroughly clean the system.

## Removing the Test Equipment

Remove high pressure filter, flow meter assembly and the charge pressure gauge.

## Removing the Old Components

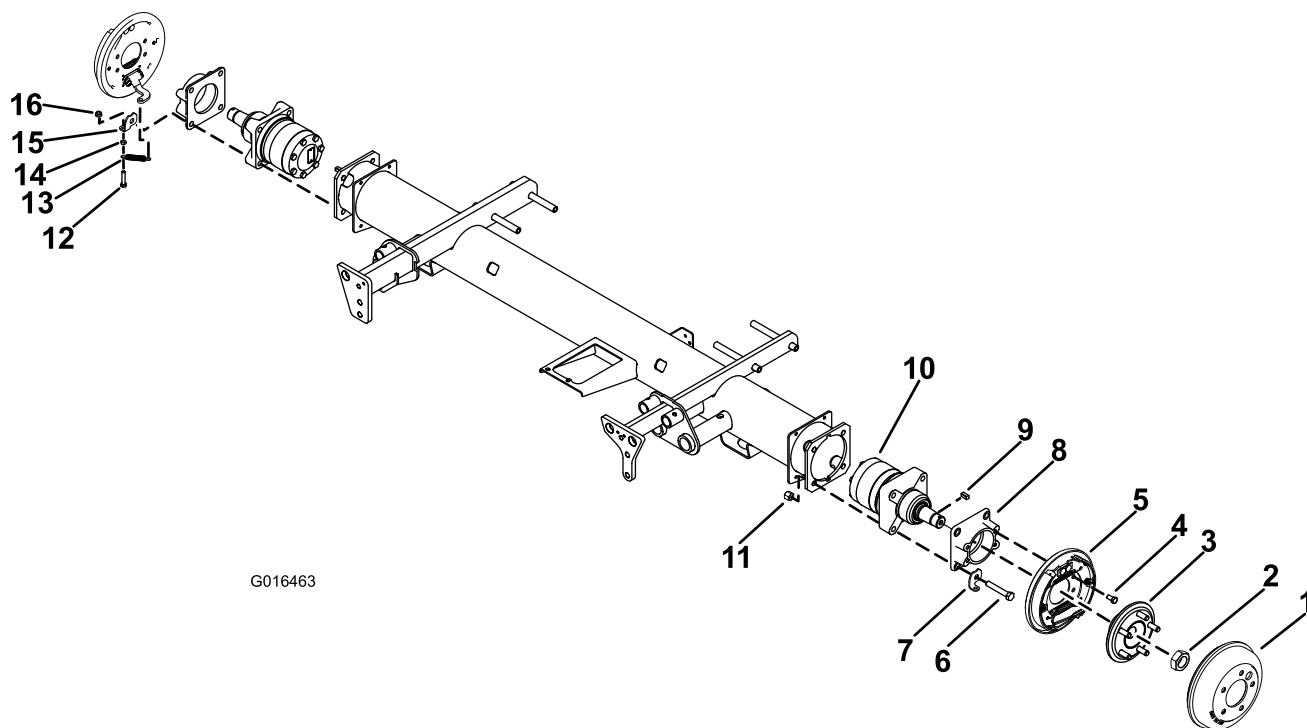
1. Loosen, but do not fully remove, the lock nut that secures the wheel hub to the wheel motor. Loosen the lock nut at least two turns. This will prevent the hub from flying off as the taper releases.

**Important: DO NOT hit the wheel hub, puller or wheel motor with a hammer during the wheel hub removal or installation. Hammering may cause damage to the wheel motor.**

2. Use a appropriate puller (TOR6004) to loosen the wheel hub from the wheel motor.
3. Remove the lock nut and wheel hub from the motor shaft.
4. Remove the (4) screws securing the brake assembly to the brake adapter. Remove the brake assembly.

**Note:** There is no need to remove the brake cable from the brake assembly.

5. Thoroughly clean the hydraulic line ends and fittings on the wheel motor to prevent contaminating the hydraulic system.
6. Label the hydraulic connections at the wheel motor for assembly purposes.
7. Disconnect the hydraulic lines from the fittings on the wheel motors. Allow the lines to drain into a suitable container.
8. Put caps or plugs on the disconnected lines and fittings to prevent contamination.
9. Support each wheel motor to prevent them from falling.
10. Remove the (4) locknuts securing the brake adapter, wheel motor and spring clip to the frame.
11. Remove the brake adapter, wheel motor and brake spring bracket from the machine.
12. Note the orientation of the fittings to simplify the installation on the new motor assemblies. Remove the fittings from the motor and discard the O-rings.



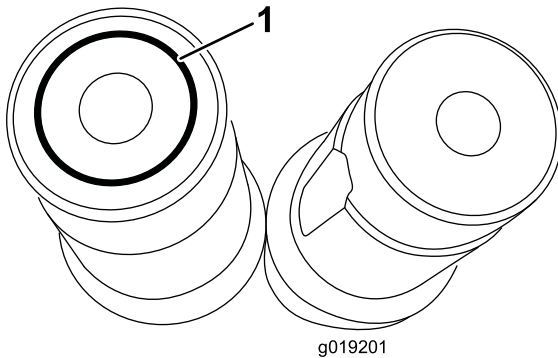
**Figure 6**

- |                          |  |                              |   |
|--------------------------|--|------------------------------|---|
| 1. Brake drum            | 5. Brake assembly, L.H.                      | 9. Square key                | 13. Extension spring                          |
| 2. Hex nut               | 6. Screw, 1/2 x 3 inch                       | 10. Wheel motor, L.H.        | 14. Jam nut, 5/16 inch                        |
| 3. Hub assembly          | 7. Brake spring bracket or Spring clip, L.H. | 11. Lock nut, 1/2 inch       | 15. Brake spring bracket or Spring clip, R.H. |
| 4. Screw, 3/8 x 3/4 inch | 8. Brake adapter                             | 12. Screw, 5/16 x 1-1/2 inch | 16. Flange nut, 5/16 inch                     |

# Installing the New Components

1. Lubricate and install the new O-rings onto the fittings previously removed from the wheel motors.
2. Install the fittings into the wheel motor ports, orientating them as noted in the removal process.

**Note:** The left wheel motor is identified with either a yellow dot or with a ring machined into the shaft of the motor, shown in Figure 7.



**Figure 7**

1. Machined ring in shaft

3. Position the wheel motor to frame. Mount the spring clip, brake adapter and the wheel motor to the frame with (4) 1/2 x 3 inch capscrews.
4. Install and tighten the (4) 1/2 inch lock nuts onto the capscrews to secure the motor, brake adapter and spring clip to the frame. Torque the screws to 91 to 113 N-m (67 to 83 ft-lb). Make sure spring clip is positioned as shown in figure Figure 6.
5. Mount the brake assembly to the brake adapter with (4) 3/8 x 3/4 inch capscrews. Torque the capscrews to 27 to 45 N-m (27 to 33 ft-lb).
6. Thoroughly clean the wheel motor shaft and wheel hub taper. **Do not apply anti-seize or grease to the hub or wheel motor shaft.**
7. Install the square key into the wheel motor shaft key slot. Align the wheel hub with the square key and slide the wheel hub onto the motor shaft. Secure the hub with the locknut. Torque the locknut to 549 to 671 N-m (405 to 495 ft-lb).

**Important:** Use of a torque multiplier with a standard torque wrench is not recommended, but is a possible alternative to having a torque wrench capable of 678 N-m (500 ft-lbs).

8. Remove the caps or plugs from the disconnected hydraulic lines and fittings.
9. Secure the brake cable clevis to the brake actuator lever with a clevis pin and cotter pin, if previously removed.

10. Install the brake drum, front wheel and extension spring to the machine. Torque the lug nuts to 95 to 122 N-m (70 to 90 ft-lb).
11. Repeat the procedure on the opposite wheel motor.

## Updating the Components

(as required)

- Rebuild the Hydrostat. Use kit 120-6285 (Kit – Repair, Hydrostat). Upon disassembly of the hydrostat, photograph damage and submit with hydraulic test results. Refer to the Service Manual for hydrostat rebuild instructions.
- If the gear pump failed the hydraulic tests, disassemble and photograph the components shown on the following page and submit them with the test results. Replace Gear pump. Refer to the Service Manual for gear pump replacement instructions.
- If testing on a CrossTrax (4 wheel drive) machine indicated the rear motors need to be replaced, do so at this time. To replace the rear motors, follow the procedure for replacing the front wheel motors, which is very similar.

## Replacing the Hydraulic Filters

Replace the hydraulic filters as follows:

- Clean the area around the charge circuit/steering filter (86–3010) mounting area and place a drain pan under filter.
- Remove the filter.
- Lubricate the gasket on the new filter with hydraulic oil.
- Ensure that the filter mounting area is clean.
- Install the filter by hand until the gasket contacts the mounting surface, then rotate it an additional 1/2 turn.
- Repeat the procedure on the reservoir filter (94–2621).
- Start the engine and let it run for about two minutes to purge air from the system.
- Stop the engine and check for leaks.

## Rebuilding the Hydraulic Reservoir

- Reassemble components to the hydraulic reservoir.
- Ensure all hydraulic lines have been reassembled and tightened.
- Refill the hydraulic reservoir with new oil.

## Final Checks

1. Check the hydraulic system oil level and replenish as needed.
2. Test run the machine for a short period to check all connections for leaks prior to installing the wheels.



3. Recheck the hydraulic system oil level and replenish as needed.
4. Install the wheels.
5. Remove the jack stands and test drive the machine to check performance.

## Submitting Information

Via PER case, submit the following items

- Model and serial number
- Legible, clear photos of the previously removed wheel motor serial tags
- All hydraulic pressure and flow measurements logged in steps 7 through 13 in **Testing the Machine**.
- Photographs of damaged components (if needed)

**Notes:**

**Notes:**



**Count on it.**