Form No. 3366-227 Rev B

2 and 4 Wheel Brake Kit

MH-400 Material Delivery Unit

Model No. 44942

Model No. 44943

Installation Instructions

Installation

Assembly Options

2 Wheel Brakes (Inner)

- Use this procedure if 4 Wheel Brakes will be installed at a later time.
- Use this procedure if 4 Wheel Brakes will be installed at this time.

2 Wheel Brakes (Outer)

Use this procedure if 4 Wheel Brakes will **not** be installed at a later time.

4 Wheel Brakes

Use this procedure to install 4 Wheel Brakes.

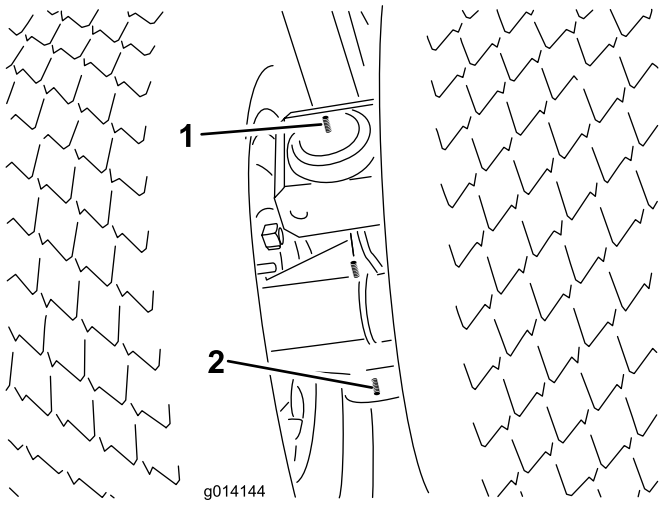

Figure 1

1. 1/4 inch bolt welded on the mounting shaft
2. 1/4 inch bolt welded on the bottom of the main axle

Installing the Electric Brakes

Before installing the electric brakes, remove the protective coating that is applied at the factory to protect the drums from corrosion.

1. Remove all of the brake shoes and brake drums from the kit and place them in a well-ventilated area.
2. Use an automotive brake cleaner to spray the brake drums until the protective coating is completely removed. You may need to spray twice for best results.

   Important: Do not mix up the brake shoe assemblies. To ensure correct placement on the axle assembly, check that the 1/4 inch bolt welded on the bottom of the main axle assembly faces down, and that the 1/4 inch bolt welded on the mounting shaft faces the front of the machine (Figure 1). If any assistance is required, call an authorized Toro distributor.

Installing the Two Wheel Brake Kit (Inner)

1. The machine must be stable. Start by carefully raising and safely supporting the machine off of the ground, so that the four tires are off of the ground by about 2 inches.
2. Loosen the lug nuts on the outside tires, one-half to three-quarters of the way off. This allows you to undo the bolts holding the suspension, while leaving room to remove the tires and axles from under the machine.
3. Remove the four nuts and bolts that go through the yellow bearing blocks and hold the axles onto the suspension on each side (Figure 2).

8111 Lyndale Avenue South
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CE

Original Instructions (EN)
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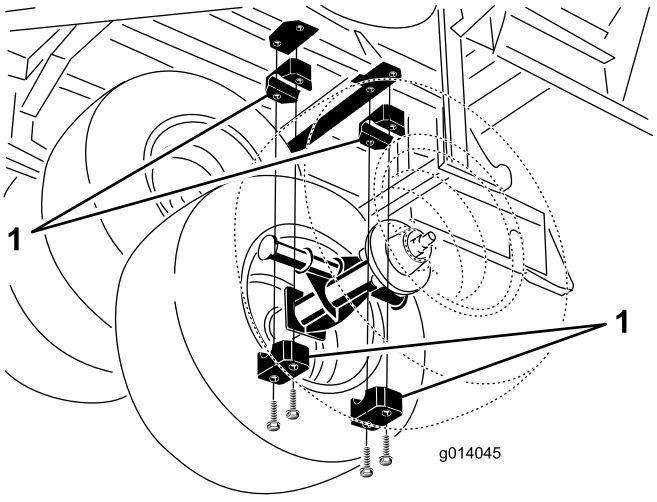

Figure 2

1. Yellow bearing blocks

4. Remove the yellow bearing blocks and set them aside.
5. Roll out the tire and axle assemblies as a unit (two tires each) from under the machine.
6. Flip the tire and axle assemblies on end with inner tire up. Remove the inner tire from each assembly (Figure 3).

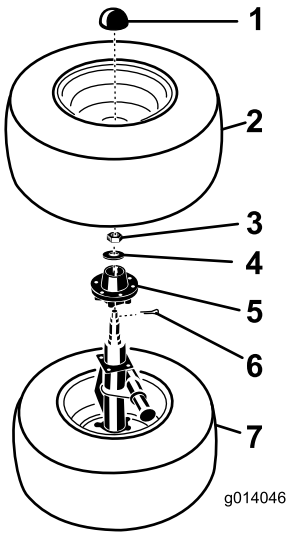

Figure 3

1. Dust cap
2. Inner tire
3. Bearing tension nut
4. Washer
5. Hub assembly
6. Cotter pin
7. Outer tire

7. Remove the dust cap, cotter pin, bearing tension nut and washer (Figure 3).
8. Lastly, remove the hub assembly (Figure 3). The spindle and a fastening plate will be left.
9. Check all bearings and races. Replace them if necessary.
10. Ensure that the hubs are free of moisture and dirt. Repack components with grease before reinstalling.
11. Mount the hub assembly to the drum assembly using six 1/2 x 1–1/4 inch socket head bolts. Apply Blue Loctite to the bolt threads prior installation. Thread the bolts by hand from the inside of the drum before using an impact tool.
12. Torque in a crossover pattern (same as a tire) to 50–60 ft-lb (6.9–8.2 kg/m).
13. Install the brake shoe studs onto the axle. Ensure that the magnet arm faces the front of the machine and the magnet is on the bottom. Remember that the 1/4 inch bolt welded on the mounting shaft faces the front of the machine. The arrow on the backing plate should also point forward.

    Note: The left hand brake assembly will mount to the right hand axle assembly.
14. Secure the brake shoe assembly to the axle with four 1/2 inch locknuts. Torque the locknuts to 67–83 ft-lbs (9.3– 11.5 kg/m) in a crossover pattern.

    Note: Do not use air tools when tightening the backing plate and shoe assembly.
15. Install the hub and drum assembly onto the spindle.
16. Adjust the wheel bearings as follows:
    - Tighten the jam nut while turning the hub to seat the bearings to remove all end play. The necessary torque should be a minimum of 75 in-lbs to a maximum of 180 in-lbs.
    - Loosen the jam nut until it is away from the washer. Tighten the jam nut to 15 - 20 in-lbs while rotating the hub.

      Note: If the cotter pin hole is not aligned with the nut retainer's slot, tighten the nut until alignment occurs.
17. Insert the cotter pin. Bend both legs of the cotter pin and tap out of the way. Position and secure the new hub cap.
18. Remount the tire. Remember to leave the outside tire loose for reinstallation.
19. Torque the inside tire assemblies to 100 ft-lb (13.8 kg/m) and leave the outer tire assemblies loose for installation.

    Note: If mounting the 2–4 Wheel Brake Kit at this time, flip the entire assembly (Figure 3) and install the remaining brake and drum assemblies the same way. Make sure to use the correct brake assembly

(opposite of the brake assembly used on the inside tire).

20. Set the brakes on the inside tire assemblies to slightly drag on the drum. Refer to Adjusting the Electric Brakes in the Maintenance Section.
21. Repeat this procedure on the other side of machine.
22. Roll both the axles back under the machine. Ensure that the bolt welded on the mounting shaft faces the front of the machine and the other bolt on the axle assembly faces down.

    Note: The tire with the loose lug nuts must be on the outside of the machine.
23. Line up all the holes and set the yellow block (the one without the grease nipple) on top of the mounting shaft.
24. Lower the bolts into the block and lower the machine onto the block.
25. Add the other yellow block (the one with the grease nipple) to the bottom side. Install the nuts and torque to 67–83 ft-lbs (9.3– 11.5 kg/m).
26. Mount the socket bracket to the bottom left edge of the front panel with two 1/4 x 3/4 inch screws and nuts (Figure 4).

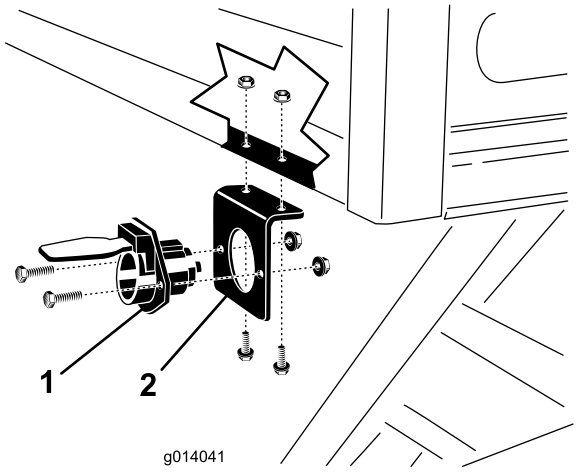

Figure 4

1. Socket
2. Socket bracket

27. Route the wire harness connector through the hole to the socket. Slide the boot down the harness if the connector does not go through the hole.
28. Bolt the socket to the front of the socket bracket with two 5/16 x 1 inch screws and nuts (Figure 4).
29. Route the wire harness to the right and left sides of the machine. The right side of the harness is the longer length.
30. Connect the wire harness ring terminals to the brake shoe studs with 2 nuts (Figure 5). The black goes to the top and the white wire goes to the bottom. Use a back-up wrench when tightening the nuts.

    Note: If mounting the 2–4 Wheel Brake Kit at this time, install the 4 wheel kit harness to each of the brake shoe studs (matching the colors).

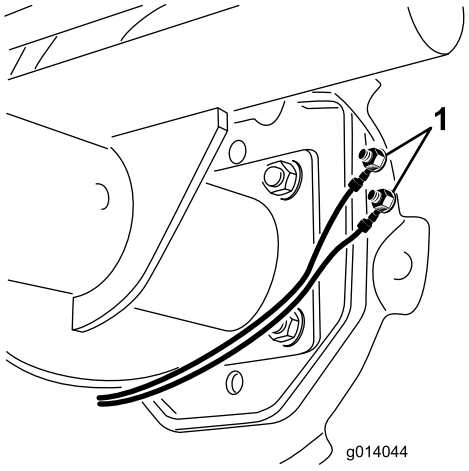

Figure 5

1. Wire harness ring terminals

31. Secure the wire harness to the (3) studs on each side of the axle with R-clamps and lock nuts (Figure 6).

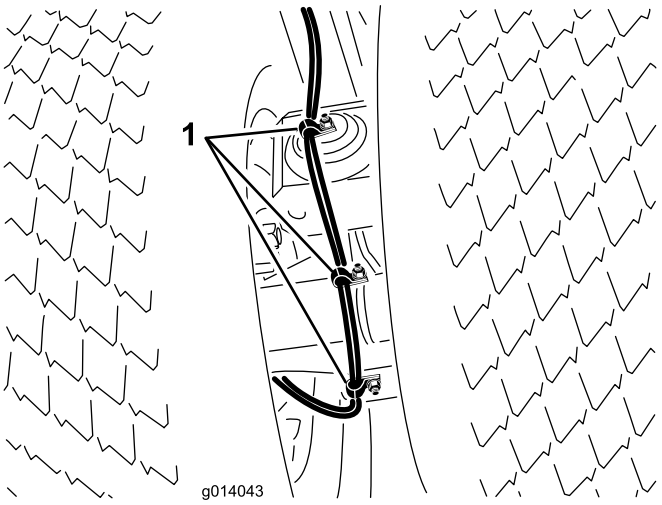

Figure 6

1. R-clamps and lock nuts

32. Tighten the outside tires. Torque to 100 ft-lb (13.8 kg/m).
33. Before lowering the machine, if a brake was assembled to the to the outside wheels, set the brakes on the outside tire assemblies to slightly drag on the drum. Refer to Adjusting the Electric Brakes in the Maintenance Section.

34. Secure the rubber boot to the connector and the wire harness with a cable tie.
35. Secure the harness by plugging the harness clips into the frame mounting holes (Figure 7).

    Note: If the mounting holes for the harness clips are not on the machine, drill (9) .266 in diameter holes at the harness clip locations shown in Figure 7.

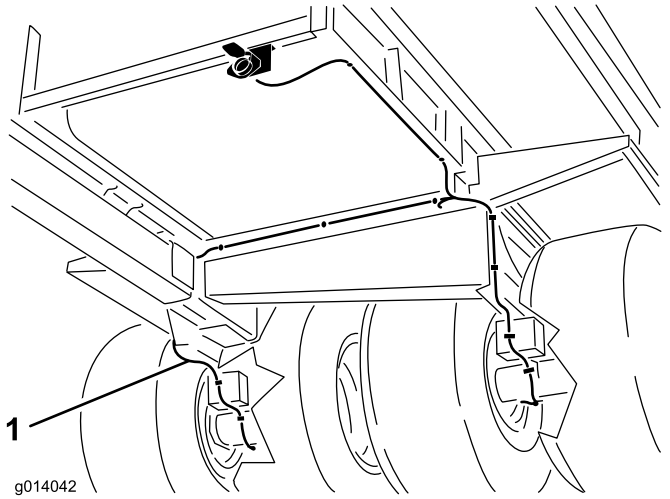

Figure 7

1. Wire harness

Installing the Two Wheel Brake Kit (Outer Brakes)

1. The machine must be stable. Start by carefully raising and safely supporting the machine off the ground, so that the four tires are off the ground by about 2 inches (5 cm).
2. Remove outside wheel on the left side of the unit.
3. Remove the dust cap, cotter pin, bearing tension nut, and washer.
4. Lastly, remove the hub assembly. The spindle and a fastening plate will be left.
5. Check all bearings and races. Replace them if necessary.
6. Ensure that the hubs are free of moisture and dirt. Repack components with grease before reinstalling.
7. Mount the hub assembly onto the outside of the drum using six 1/2 x 1–1/4 inch socket head bolts. Apply Blue Loctite to the bolt threads prior installation. Thread the bolts by hand from the inside of the drum before using an impact tool.
8. Torque in a crossover pattern (same as a tire) to 50–60 ft-lb (6.9–8.2 kg/m).
9. Install the brake shoe studs onto the axle. Ensure that the magnet arm faces the front of the machine and the magnet is on the bottom. Remember that the 1/4 inch bolt welded on the mounting shaft faces the front of the machine. The arrow on the backing plate should also point forward.
10. Secure the brake shoe assembly to the axle with four 1/2 inch locknuts. Torque the locknuts to 67–83 ft-lbs (9.3– 11.5 kg/m) in a crossover pattern.

    Note: Do not use air tools when tightening the backing plate and shoe assembly.

11. Install the hub and drum assembly onto the spindle.
12. Adjust the wheel bearings as follows:
    - Tighten the am nut while turning the hub to seat the bearings to remove all end play. The necessary torque should be a minimum of 75 in-lbs to a maximum of 180 in-lbs.
    - Loosen the jam nut until it is away from the tab washer and the hub has end play. Tighten the jam nut to 15 - 20 in-lbs while rotating the hub.
    - Place the nut retainer over the jam nut. If the cotter pin hole is not aligned with the nut retainer's slot, remove the nut retainer and reorient it until alignment occurs.
13. Insert the cotter pin. Bend both legs of the cotter pin and tap out of the way. Position and secure the new hub cap.

    Note: If installing a 2–4 wheel brake kit, proceed to step 2 of the 4 wheel brake kit section.

14. Mount the socket bracket to the bottom left edge of the front panel with two 1/4 x 3/4 inch screws and nuts (Figure 8).

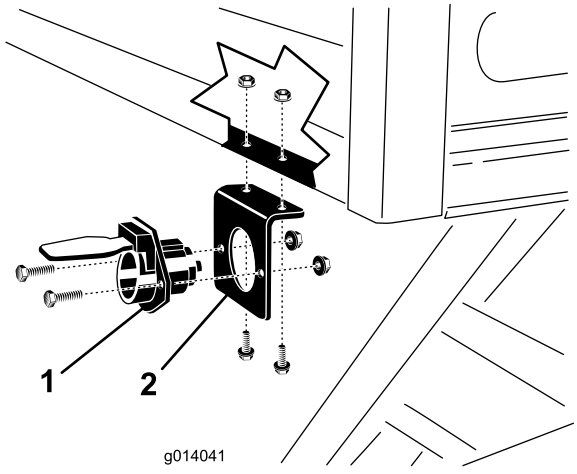

Figure 8

1. Socket
2. Socket bracket

15. Route the wire harness connector through the hole to the socket. Slide the boot down the harness if the connector does not go through the hole.

16. Bolt the socket to the front of the socket bracket with two 5/16 x 1 inch screws and nuts (Figure 8).
17. Route the wire harness to the right and left sides of the machine. The right side of the harness is the longer length.
18. Connect the wire harness ring terminals to the brake shoe studs with 2 nuts (Figure 9). The black goes to the top and the white wire goes to the bottom. Use a back-up wrench when tightening the nuts.

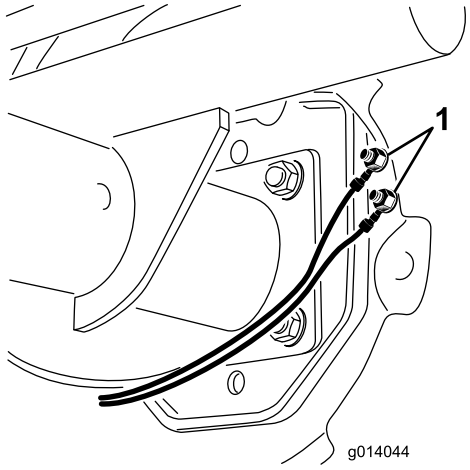

Figure 9

1. Wire harness ring terminals

19. Secure the wire harness to the (3) studs on each side of the axle with R-clamps and lock nuts (Figure 10).

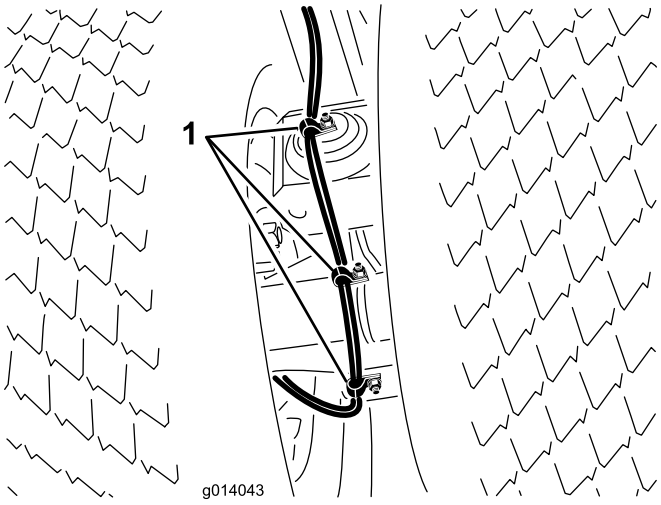

Figure 10

1. R-clamps and lock nuts

20. Remount the tire.
21. Torque the tire assemblies to 100 ft-lb (13.8 kg/m).
22. Repeat the above steps for the tire and brake assembly on the other side of the unit.
23. Before lowering the machine, set the brakes on the outside tire assemblies to slightly drag on the drum. Refer to Adjusting the Electric Brakes in the Maintenance Section.
24. Secure the rubber boot to the connector and the wire harness with cable ties.
25. Secure the harness by plugging the harness clips into the frame mounting holes (Figure 11).

    Note: If the mounting holes for the harness clips are not on the machine, drill (9) .266 in diameter holes at the harness clip locations shown in Figure 11.

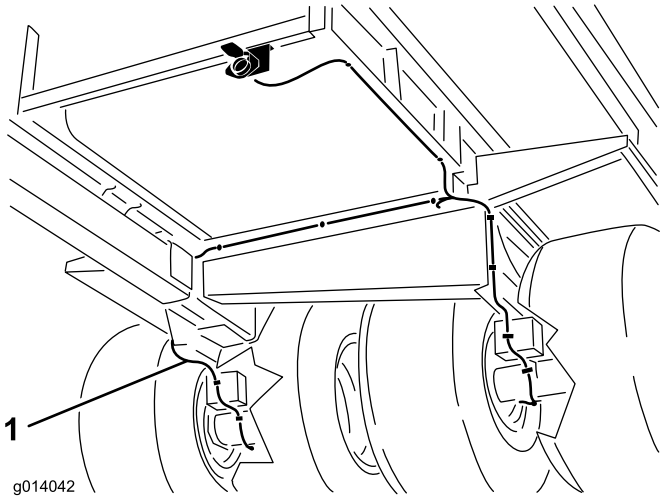

Figure 11

1. Wire harness

Installing the Four Wheel Brake Kit

1. Follow the procedure for the outer wheel brake kit installation steps 1-13.
2. Install the 4 wheel kit harness to each of the brake shoe studs.
3. Using the short black and white jumper wires, connect the outer wheel brake shoe studs to the inner wheel brake shoe studs (black to black and white to white). Use a back-up wrench when tightening the nuts.
4. Remount the tire.
5. Torque the tire assemblies to 100 ft-lb (13.8 kg/m).
6. Repeat the procedure on the other side of the unit.
7. Before lowering the machine, set the brakes on the outside tire assemblies to slightly drag on the drum. Refer to Adjusting the Electric Brakes in the Maintenance Section.

Installing the Tow Vehicle Brake Components

Note: Lay out the harness on the tractor to determine the mounting locations of the harness components. Cable ties are supplied to retain any surplus cable lengths. Also, wire splices are provided if the length of the harness has to be altered (shortened or lengthened). Heat the shrink connectors until they shrink tight onto the wires.

Important: If length is added to the harness, make sure to use the proper gauge wire.

1. Mount the socket bracket to the rear of the tow vehicle with two 5/16 x 1 inch screws and nuts.
2. Route the wire harness connector through the hole to the socket. Slide the boot down the harness if the connector does not go through the hole.
3. Bolt the wire harness with the socket connector to the rear of the socket bracket with two 5/16 x 1 inch screws and nuts.
4. Mount the load controller bracket to an accessible location on the dash or fender. Do not mount the load controller to the bracket at this time as the harness will be connected to the controller at a later time. After the harness is attached to the load controller , refer to the manufacturers instructions for installation and operating instructions.
5. Clamp the foot controller to the tow vehicle brake pedal. Refer to the manufacturers instructions for installation and operating instructions.
6. Mount the harness to the components as follows (Figure 12):
   - Connect the ring terminal of the shorter wire from the socket connector to the load controller
   - Connect the ring terminal of the short (loose) wire to the load controller.
   - Plug the short wire into the foot controller wire connector.
   - Connect the wire with the fuse to the foot controller wire connector.
   - Connect the other wire from the socket connector to the negative (-) battery terminal.
   - Connect the other end of the wire with the fuse to the positive (+) battery terminal.
7. Mount the load controller to the load controller bracket with the (2) screws and Tinnerman nuts included.

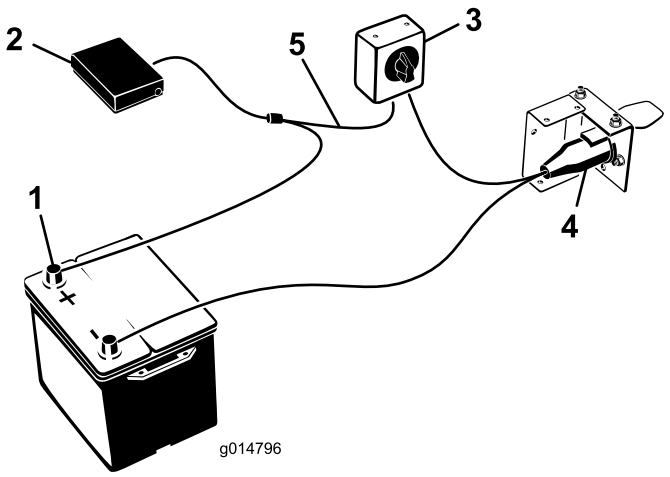

Figure 12

1. Positive battery terminal (+)
2. Foot controller
3. Load controller
4. Socket connector
5. Short wire (loose)

8. Secure the rubber boot to the connector and wire the harness with a cable tie.
9. Secure all loose harness wires with cable ties.
10. A 10 amp fuse is included in the harness. If using a 4 wheel brake kit, replace the 10 amp fuse with the provided 15 amp fuse.

Setting the Electric Brake Adjustments

Before operating the machine for the first time, the electric brakes must be synchronized to the tow vehicle's brakes (so that they operate at the same time).

The machine and the tow vehicle will seldom have the correct amperage flow to the brake magnets to provide comfortable, safe braking. Changing the load weight, as well as uneven alternator and battery output, can result in unstable current flow to the brake magnets.

The Load Control compensates for trailer load variations by limiting the maximum torque output of the brakes by adding dropping resistance in the electrical control line. When towing a trailer loaded to brake rated capacity, the Load Control must be set at maximum braking. When pulling an empty or partially loaded trailer, the Load Control must be set between maximum and minimum braking at a position just before the point at which trailer tire skidding occurs when actuating the hand control fully on. Failure to install and use the Electric Load Control will result in excessive brake torque when stopping a trailer loaded to less than brake capacity.

Maintenance

Maintaining the Electric Brakes

Inspecting the Electric Brakes

Once a month, conduct a simple visual inspection of your brake shoes and linings.

Inspect and service your electric brakes once a year.

Adjusting the Electric Brakes

Adjust the electric brakes after the first three months of operation, or sooner depending on use or performance.

1. Jack up the machine securely.
2. Ensure that the wheel and drum rotate freely.
3. Remove the adjusting hole cover from the slot on the bottom of the brake backing plate.
4. With a screwdriver, rotate the star wheel of the adjuster assembly to expand the brake shoes (Figure 13).

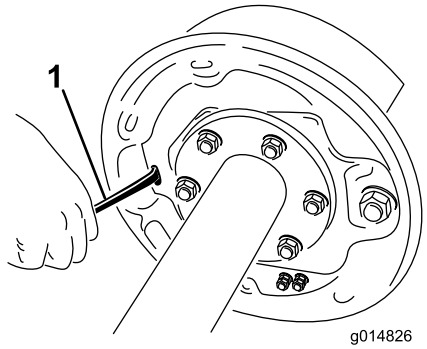

Figure 13

1. Screwdriver

5. Adjust the brake shoes out until the pressure of the linings against the drum makes the wheel difficult to turn.
6. Rotate the star wheel in the opposite direction until the wheel turns freely with a slight drag on the lining.
7. Replace the adjusting hole cover.
8. Repeat the above procedure on each brake.

Inspecting the Brake Shoes and Linings

Once a month, conduct a simple visual inspection of your brake shoes and linings.

When a brake shoe becomes worn, replace both shoes on each brake, and both brakes on the same axle. This ensures that the brakes remain balanced.

Replace the brake linings when they are

- worn to 1/16 inch (1.6 mm) or less remaining thickness
- contaminated with grease or oil
- abnormally scored or gouged

Note: Hairline heat cracks are normal in the brake linings and should not cause concern.

Yearly Brake Cleaning and Inspection

Inspect and service your electric brakes once a year or more often with heavy use or declining performance

- Change magnets and shoes when they become worn or scored.
- Clean the backing plate, magnet arm, magnet, and brake shoes with an automotive brake cleaner.
- Ensure that all parts removed are replaced in the same brake and drum assembly that they were removed from.
- Inspect the magnet arm for any loose or worn parts.
- Check the shoe return springs, the hold-down springs, and the adjuster springs for stretch or deformation and replace them if required.

⚠ CAUTION

Brake dust can be hazardous to your health if inhaled, take precautions when servicing brakes:

- **Do not create or breathe dust.**
- **Do not machine, file, or grind the brake linings**
- **Do not use compressed air or dry brushing for cleaning.**

Lubrication

Before reassembling the electric brakes, apply a light film of anti-seize compound, or grease such as "Lubriplate," on the:

- brake anchor pin
- actuating arm bushing and pin
- areas on the backing plate that are in contact with the brake shoes and magnet lever arm
- actuating block on the actuating arm

Important: Do not allow grease to contact the brake linings, drums, or magnets.

Inspecting the Magnets

The brakes' electromagnets are designed to provide the proper input force and friction.

Inspect the magnets regularly, and replace if they become unevenly worn. Use a tool with a straight edge to check wear.

Even if the wear is normal, you should replace the magnets if any part of the magnet coil is visible through the friction material on the magnet face. Replace the magnets in pairs (both sides of an axle).

When replacing the magnets, also resurface the drum armature surface.