Form No. 3468-918 Rev B

Ultra Sonic Boom™ Leveling Kit

2013 and After Multi-Pro 5800, 1750 and WM Turf Sprayers and Workman® 200 Spray System

Model No. 41219—Serial No. 415400000 and Up

Installation Instructions

Introduction

This attachment maintains consistent distances from the boom nozzles to the ground when spraying over uneven surfaces and is intended to be used by professional, hired operators in commercial applications. It is primarily designed for spraying golf course applications, parks, sports fields, and on commercial grounds. It is designed to only be used in conjunction with machines designated by the manufacturer.

This product complies with all relevant European directives. For details, please see the separate product specific Declaration of Incorporation (DOI) sheet.

Installation

Loose Parts

Use the chart below to verify that all parts have been shipped.

Procedure	Description	Qty.	Use
1	No parts required	–	Prepare the machine.
2	Hinge	2	Assemble the sensor mounting hinge.
	Angled strap (machines without covered booms)	2	
	Angled strap (machines with covered booms)	2	
	Top or bottom strap	2	
	Compression spring	4	
	Bushing	8	
	Bolt (5/16 x 3-1/4 inches)	4	
	Flat washer	12	
	Locknut (5/16 inch)	4	
3	No parts required	–	Adjust the boom-hinge springs.
4	No parts required	–	Prepare the booms.
5	Hydraulic manifold block	1	Replace the lift-cylinder manifold.
	Straight-hydraulic fitting	4	

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Procedure	Description	Qty.	Use
6	Sonic-boom sensor Bracket Programming plug Sensor cover Lower sensor housing Cap tube Sensor-guard bracket Sensor cable (4 m) Large nut U-bolt Locknut (1/4 inch) Bolt (5/16 x 3/4 inch) Bolt (5/16 x 1-1/4 inches) Locknut (5/16 inch) Cable tie	2 2 2 2 2 2 2 2 4 6 8 8 4 12 12	Install the sonic-boom sensors.
7	No parts required	–	Connect the wire harness at the boom lift manifold.
8	Electronic controller Bolt (1/4 x 1-1/8 inch) Locknut (1/4 inch)	1 4 4	Mount the electronic controls.
9	Rocker switch (illuminated) Cable tie	1 12	Install the controls.
10	No parts required	–	Connect the boom-lift switches to the sonic-boom harness.
11	No parts required	–	Finish the installation of the ultra-sonic boom leveling kit.
12	No parts required	–	Calibrate the sonic booms.

Important: **To install of this kit, you must purchase and install the separate ultra sonic boom finishing kit. Order the following finishing kit for your machine:**

Multi Pro 1750 Machines—finishing kit Part No. 130-8227

Multi Pro 5800 Machines—finishing kit Part No. 130-8229

Multi Pro WM Machines—finishing kit Part No. 133-2808

Important: **For Multi Pro Machines Model Year 2023 and before, you must purchase and install the boom cradle kit 161-4170.**

Note: Determine the left and right sides of the machine from the normal operating position.

1

Preparing the Machine

No Parts Required

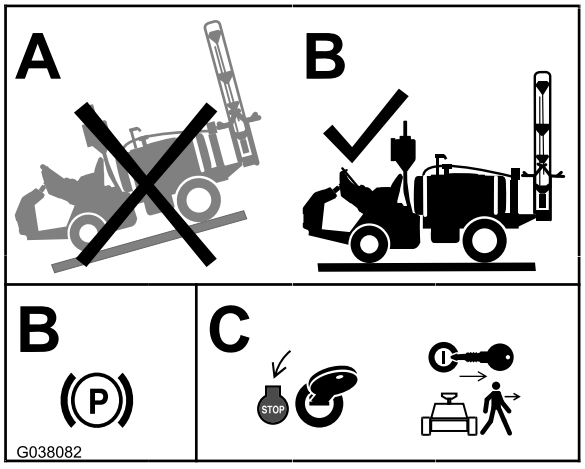
Procedure

1. Clean the exterior of the machine and sprayer; refer to the *Operator's Manual* for your machine.
2. Move the machine to a level surface, shut off the engine, set the parking brake, and remove the key.

⚠ CAUTION

If you leave the key in the ignition switch, someone could accidently start the engine and seriously injure you or other bystanders.

Remove the key from the ignition switch before you install the kit.



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Figure 1

3. Disconnect the negative-battery cable from the battery; refer to the *Operator's Manual* for your machine.

2

Assembling the Sensor Mounting Hinge

Parts needed for this procedure:

2	Hinge
2	Angled strap (machines without covered booms)
2	Angled strap (machines with covered booms)
2	Top or bottom strap
4	Compression spring
8	Bushing
4	Bolt (5/16 x 3-1/4 inches)
12	Flat washer
4	Locknut (5/16 inch)

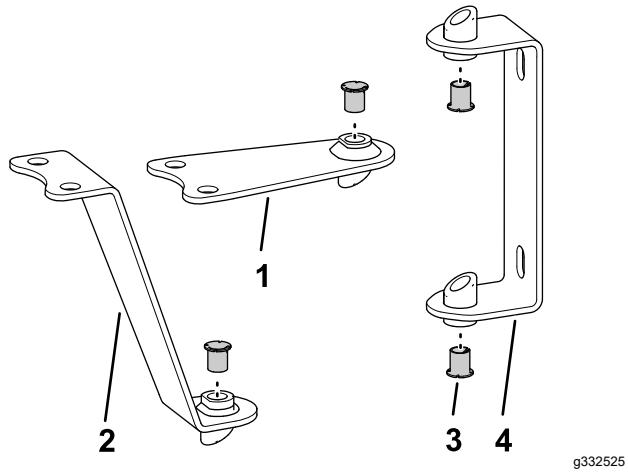
Procedure

Note: Assembly of the sensor mounting hardware depends upon whether the Covered Boom Kit (Model 41602) is installed.

1. Lay out the hinges and straps as shown in Figure 2 (for an uncovered boom) or Figure 3 (for a covered boom).

   Note: There are 2 sets of 2 angled straps in loose parts. One set is for an uncovered boom and the other set is for a covered boom. You will have one set of 2 angled straps (either for the covered boom or for the uncovered boom) that you will not use on the machine.

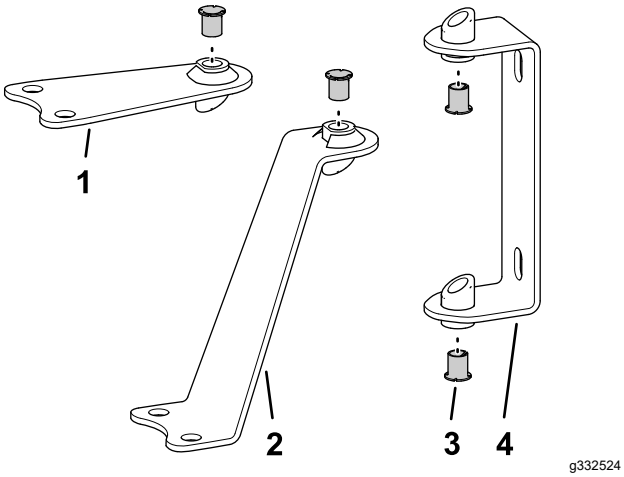
   Note: The top straps for the uncovered booms also serve as the bottom straps for the covered booms.



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Figure 2
Sprayers with uncovered booms

1. Top strap
2. Angled strap (2)
3. Bushings (8)
4. Hinge (2)

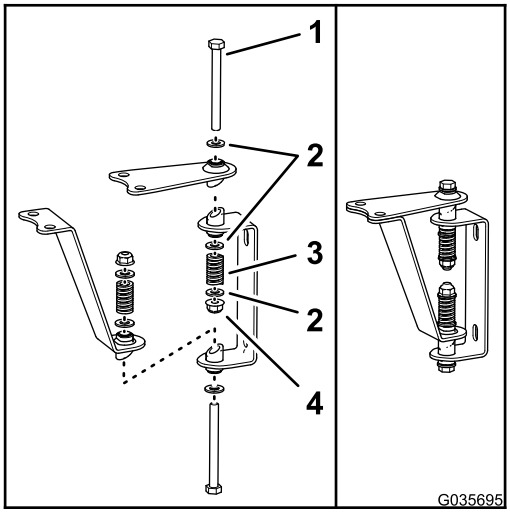


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Figure 3
Sprayers with covered booms

1. Bottom strap
2. Angled strap (2)
3. Bushing (8)
4. Hinge (2)

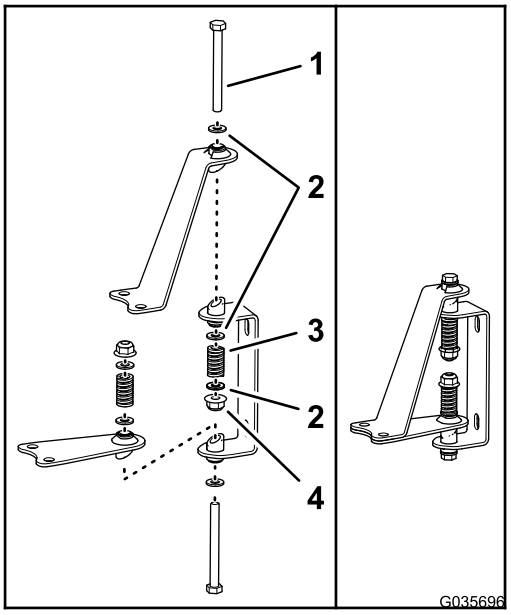
2. Insert the bushings into the welded tube openings in the hinges and straps as shown in Figure 2 or Figure 3.
3. Install a flat washer on each of the 2 bolts (5/16 x 3-1/4 inches).
4. Insert the bolts through the hinged welded tube openings, hinges, and straps as shown in Figure 4 or Figure 5.



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Figure 4
Assembly for uncovered boom

1. Bolt (5/16 x 3-1/4 inches)
2. Flat washer
3. Springs
4. Locknut (5/16 inch)



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Figure 5
Assembly for covered boom

1. Bolt (5/16 x 3-1/4 inches)
2. Flat washer
3. Springs
4. Locknut (5/16 inch)

5. Install a flat washer on the exposed end of each of the bolts (Figure 4 or Figure 5).
6. Install a spring on the end of each bolt (Figure 4 or Figure 5).
7. Install a flat washer and a locknut on the end of each bolt (Figure 4 or Figure 5), and tighten the locknuts until there is no slack in the spring.

Note: Check to ensure that the hinges are not so tight that the mounted sensors do not freely pivot on the hinges.

3

Adjusting the Boom-Hinge Springs

No Parts Required

Procedure

Important: **Operating the spray system with the boom-hinge springs under the incorrect compression could damage the boom assembly. Measure the springs and use the jam nut to compress the springs to 36 mm (1.40 inches), if necessary.**

Use another person or lifting equipment to support the boom while adjusting the spring height of the boom hinge.

1. Extend the outer booms to the spray position (horizontal).
2. Support the booms while you are adjusting the spring height.
3. At the pivot bracket and hinge for the outer boom, adjust the jam nut for the upper spring until the compressed spring height measures 36 mm (1.40 inches).
4. Adjust the jam nut for the lower spring until the compressed spring height measures 36 mm (1.40 inches).
5. Repeat steps 3 and 4 for the upper and lower springs at the other outer boom.
6. At the boom hinge, measure the compression of the upper and lower springs while the booms are in the extended position (Figure 6).
   A. Compress all springs until they measure 36 mm (1.40 inches).
   B. Use the jam nut to compress any spring that measures greater than 36 mm (1.40 inches).

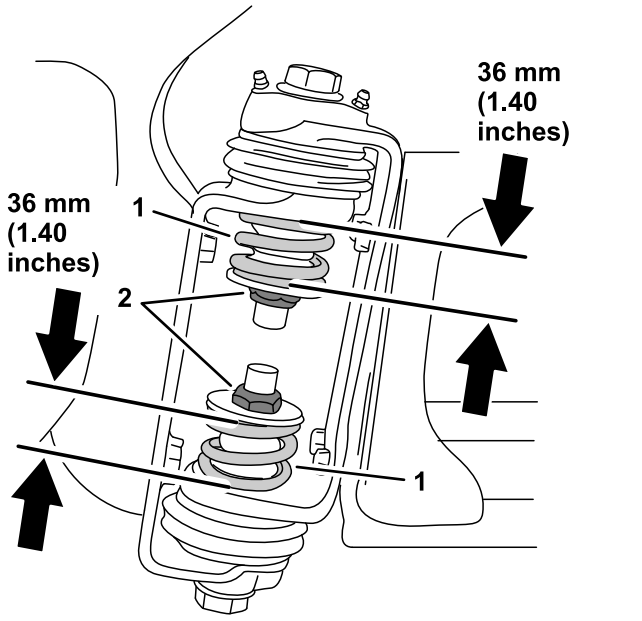


Figure 6

1. Boom-hinge spring
2. Jam nut

4

Adjusting the Booms

No Parts Required

Procedure

Note: You will need 2 wooden blocks about 10 cm (4 inches) in height for this procedure.

The booms are set at the factory to travel downward no farther than the horizontal position. To enable the ultrasonic boom kit to maintain a consistent distance between the nozzles and the ground when the ground slopes downward from the machine, you must adjust the boom support system to allow the booms to travel below the horizontal position to maintain a constant nozzle-to-ground distance.

1. Raise the booms and have them rest in the transport cradle.
2. At the pivot brackets of the outer-boom sections, remove the hairpin and clevis pin that secures the rod end for the lift cylinder to the pivot bracket (Figure 7).

   Note: There should be no more than 16 mm (5/8 inch) of exposed thread on the eyelet to prevent the engaged threads from stripping and the rod from pulling away.

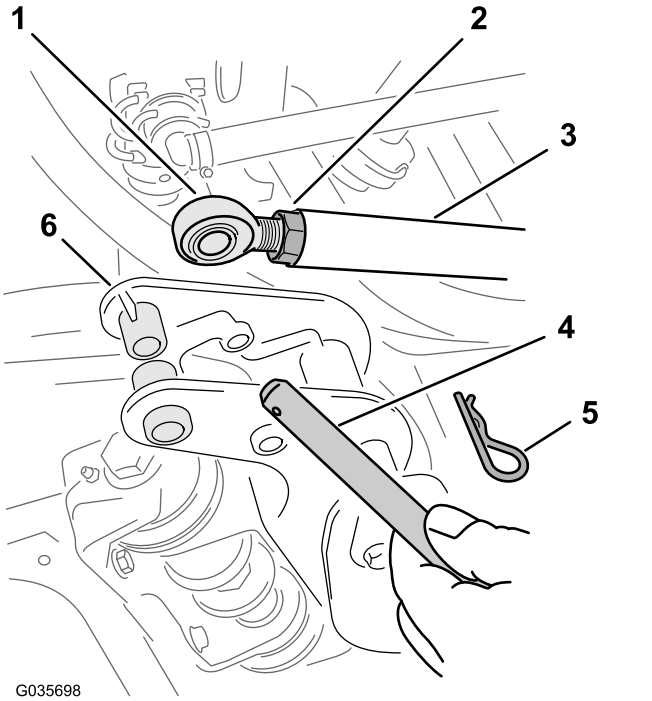


Figure 7

1. Rod end—16 mm (5/8 inch) or less of thread exposed
2. Jam nut
3. Lift cylinder
4. Clevis pin
5. Hairpin
6. Pivot bracket (outer-boom section)

3. Carefully lower the outer-boom sections onto wooden blocks about 10 cm (4 inches) high as shown in Figure 8.

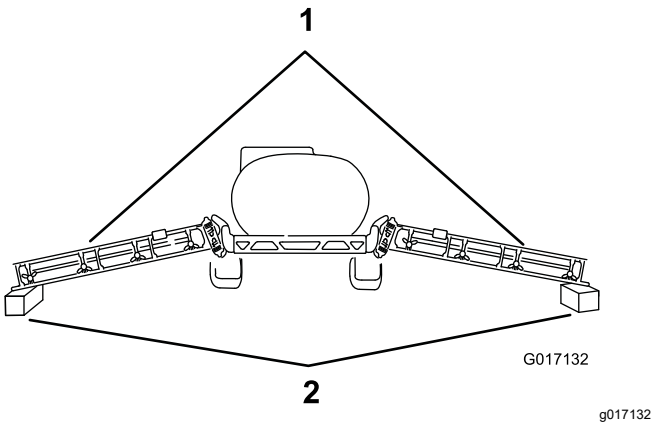


Figure 8

1. Outer-booms sections
2. Wooden blocks—10 cm (4 inches) high

4. Start the machine and fully extend the lift cylinders.
5. Loosen the jam nuts at the rod ends for each lift cylinder (Figure 7).
6. Adjust the rod end for the lift cylinders end until the hole in the rod ends align with the holes in the pivot brackets for the boom sections (Figure 7).
7. At each pivot bracket, secure the rod end to the bracket with the clevis pin that you removed in step 2.
8. Secure the cotter pins to the pivot brackets with the hairpin cotters (Figure 7) that you removed in step 2.
9. Tighten the jam nut at each rod until the nuts are snug (Figure 7).

5

Replacing the Lift-Cylinder Manifold

Parts needed for this procedure:

1	Hydraulic manifold block
4	Straight-hydraulic fitting

Assembling the Cylinder-Lift Manifold

1. At the back of the sprayer, label the hoses at port-P and port-T of the lift-cylinder manifold (Figure 9).

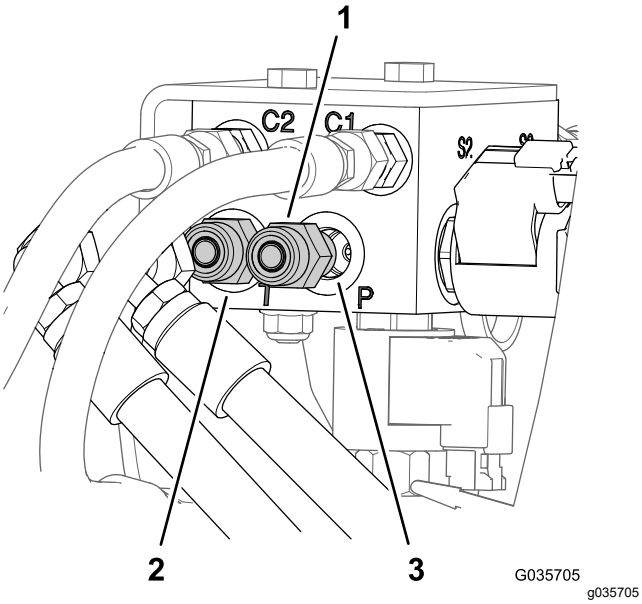


Figure 9

1. Port-T (lift-cylinder manifold)
2. Port P (lift-cylinder manifold)
3. Straight-hydraulic fitting (3/8 inch)

2. Remove the hoses from the straight-hydraulic fittings at port-P and port-T of the lift-cylinder manifold (Figure 9).
3. Remove the straight-hydraulic fittings from port-P and port-T of the old lift-cylinder manifold (Figure 9).
4. Remove the diagnostic fitting and cap from port-G of the old lift-cylinder manifold (Figure 10)

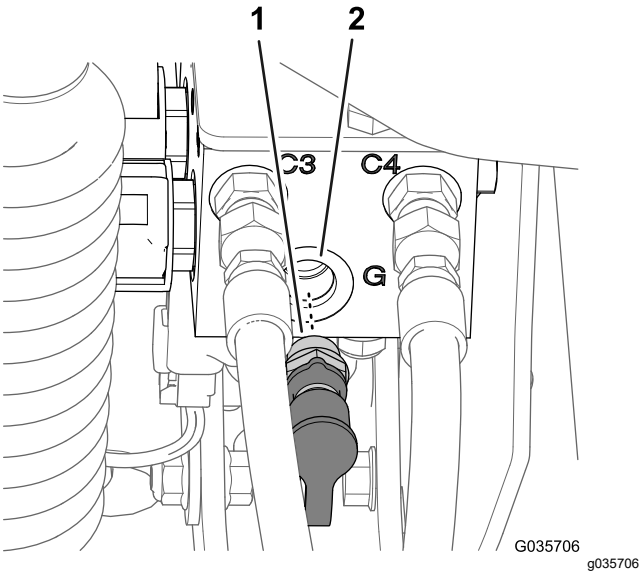


Figure 10

1. Diagnostic fitting and cap
2. Port-G (lift-cylinder manifold)

5. At the new lift-cylinder manifold, assemble the straight-hydraulic fittings (Figure 11) that you removed in step 3 into port-P and port-T.

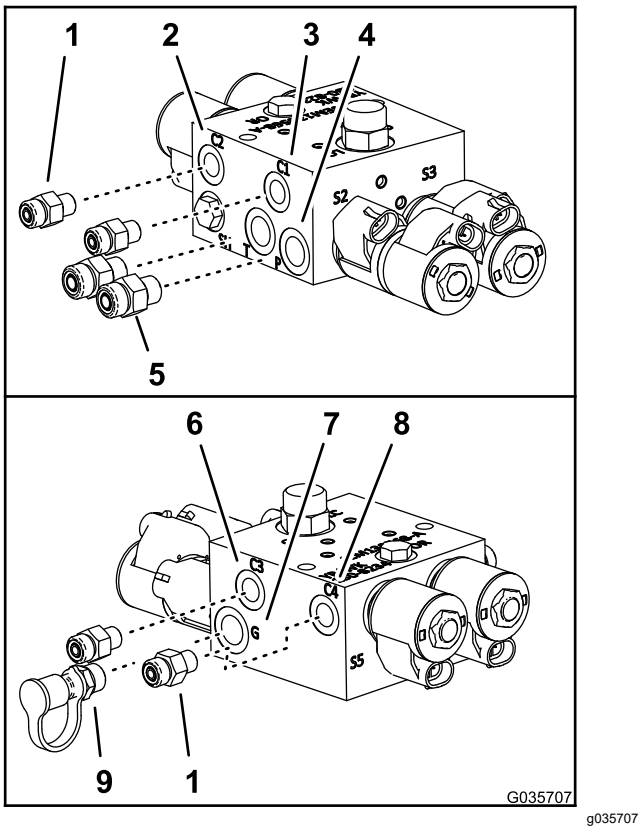


Figure 11

1. Straight-hydraulic fitting (1/2 inch)
2. Port-C1 (lift-cylinder manifold)
3. Port-C2 (lift-cylinder manifold)
4. Port-P (lift-cylinder manifold)
5. Straight-hydraulic fitting (3/8 inch)
6. Port-C3 (lift-cylinder manifold)
7. Port-G (lift-cylinder manifold)
8. Port-C4 (lift-cylinder manifold)
9. Diagnostic fitting and cap

6. Assemble the 4 straight-hydraulic fitting from the ultra sonic boom leveling kit into ports C1, C2, C3, and C4 of the new lift-cylinder manifold (Figure 11).
7. Assemble the diagnostic fitting and cap that you removed in step 4 into port-G of the new lift-cylinder manifold (Figure 11).

Replacing the Cylinder-Lift Manifold

1. If installed, remove the hydraulic block cover plate from the lift-cylinder manifold.
2. Label all the hoses connected to the lift-cylinder manifold (ports C1, C2, C3, and C4), and disconnect them from the cylinder manifold (Figure 12).

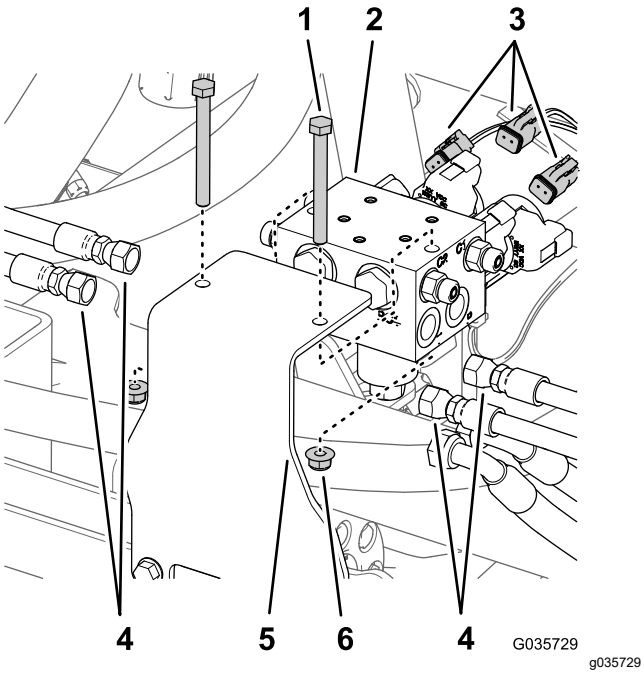


Figure 12

1. Bolt
2. Lift-cylinder manifold
3. Electrical connectors (rear-wire harness)
4. Lift-cylinder hoses
5. Mounting bracket
6. Locknut

3. Disconnect the rear-wire harness connectors from the solenoids of the lift-cylinder manifold (Figure 12).
4. Remove the lift-cylinder manifold from the mounting bracket by removing 2 bolts and 2 locknuts (Figure 12).

   Note: Save the 2 bolts and 2 locknuts.
5. Replace the mounting bracket for the lift-cylinder manifold; refer to the installation instructions for the ultra sonic boom finishing kit.
   - **Multi Pro 1750 models**—finishing kit Part No. 130-8227
   - **Multi Pro 5800 models**—finishing kit Part No. 130-8229
   - **Multi Pro WM models**—finishing kit Part No. 133-2808
6. Install the new lift-cylinder manifold onto the mounting bracket with the 2 bolts and 2 locknuts that you in step 4.

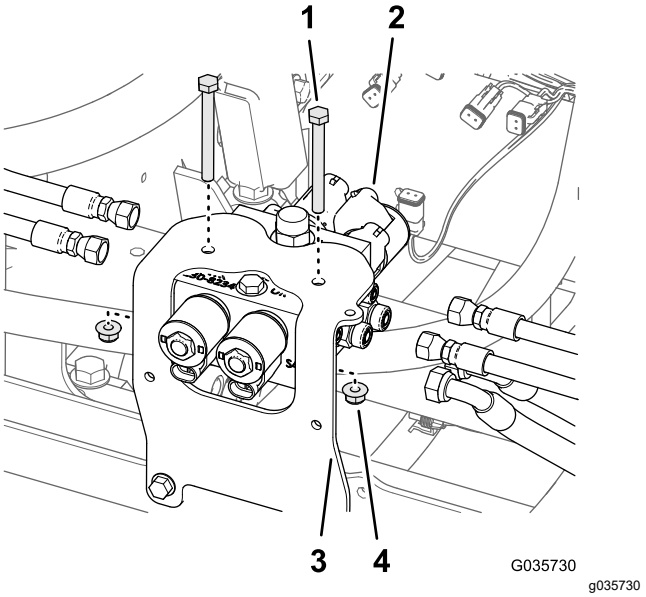


Figure 13

1. Bolt
2. Lift-cylinder manifold
3. Mounting bracket (ultra sonic boom finishing kit)
4. Locknut

7. Install all the hoses onto the fittings of the lift-cylinder manifold as follows:
   - The tank hose (3/8 inch) from the return filter connects to the “T” port
   - The pressure hose (3/8 inch) connects to the “P” port.
   - The hoses (1/4 inch) from the extend ports of the boom-lift cylinders connect to C1 and C3 ports of the lift-cylinder manifold.
   - The hoses (1/4 inch) from the retract ports of the boom-lift cylinders connect to C2 and C4 ports of the lift-cylinder manifold.

   Important: **Ensure that you install the hoses correctly.**
8. Purge the hydraulic system. Refer to the *Operator’s Manual*.

Note: You will connect the wire harness from the ultra sonic boom kit to the solenoids of the lift-cylinder manifold in 7 Connecting the Wire Harness at the Boom-Lift Manifold (page 13).

6

Installing the Sonic-Boom Sensors

Parts needed for this procedure:

2	Sonic-boom sensor
2	Bracket
2	Programming plug
2	Sensor cover
2	Lower sensor housing
2	Cap tube
2	Sensor-guard bracket
2	Sensor cable (4 m)
4	Large nut
6	U-bolt
8	Locknut (1/4 inch)
8	Bolt (5/16 x 3/4 inch)
4	Bolt (5/16 x 1-1/4 inches)
12	Locknut (5/16 inch)
12	Cable tie

Installing the Sensor Mount

1. Install a mounting bracket on the front side of each boom near the outermost nozzle (Figure 14 and Figure 15) with 3 U-bolts and 6 locknuts (1/4 inch) .

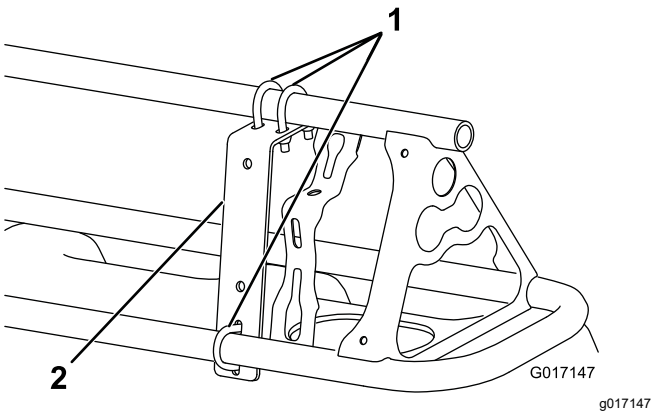


Figure 14
Front view

1. Mounting bracket (2) 2. U-bolt (6)

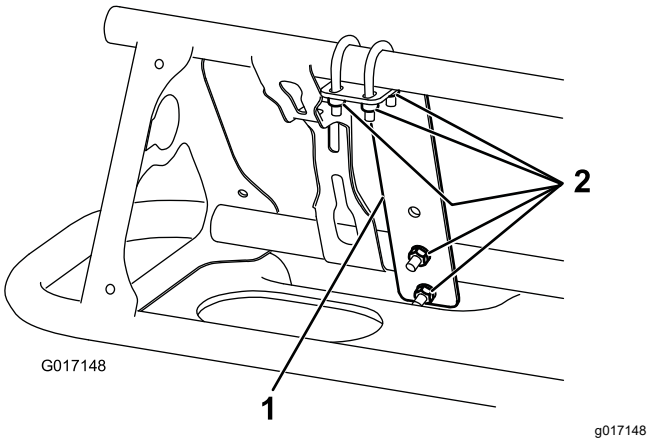


Figure 15
Rear view

1. Mounting bracket (2) 2. Locknuts (1/4 inch) (12)

2. Install the sensor guard bracket onto the mounting bracket with 2 bolts (5/16 x 3/4 inch) and 2 flange nuts (5/16 inch) as shown in Figure 16.

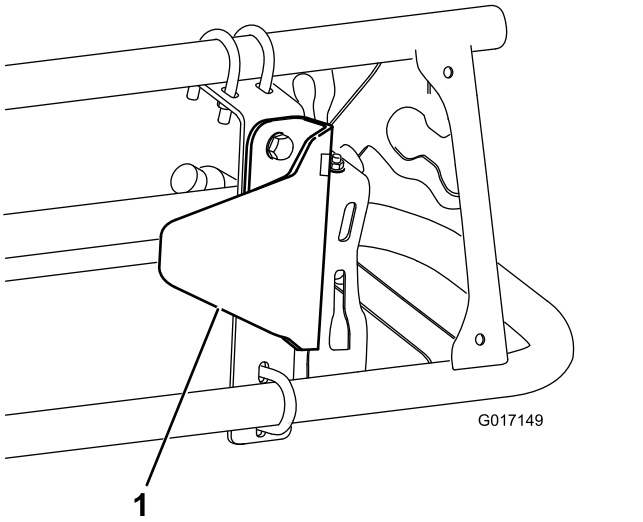


Figure 16

1. Sensor guard bracket

3. Install the sensor mounting hardware onto the sensor guard bracket with 2 bolts (5/16 x 3/4 inch) and 2 locknuts (5/16 inch) as shown in Figure 17 (for an uncovered boom) or Figure 18 (for a covered boom).

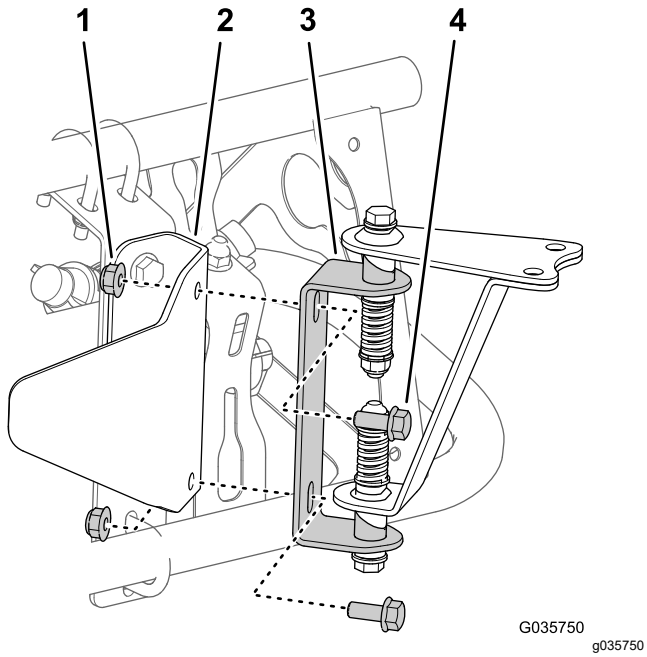


Figure 17

Assembly for machines without covered booms

1. Locknut (5/16 inch)
2. Sensor-guard bracket
3. Hinge (of sensor mounting hardware)
4. Bolt (5/16 x 3/4 inch)

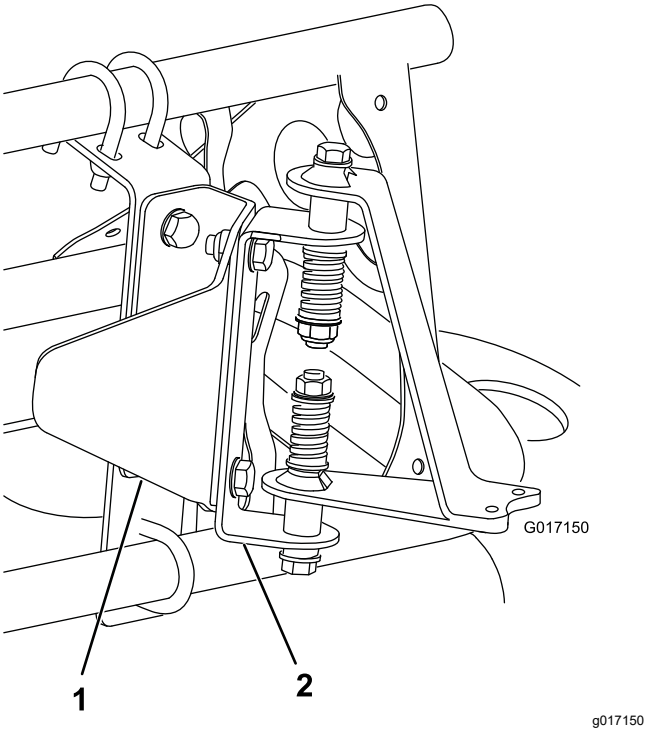


Figure 18

Assembly for machines with covered booms

1. Sensor-guard bracket
2. Hinge (of sensor mounting hardware)

4. Repeat steps 1 through 3 for the outer-boom section at the other side of the machine.

Installing the Sensor

Note: Refer to Storage (page 24) for installation of the dust cap.

1. Install the lower sensor housing onto the sensor mounting hardware (Figure 19) with 2 bolts (5/16 x 1-1/4 inches) and 2 locknuts (5/16 inch).

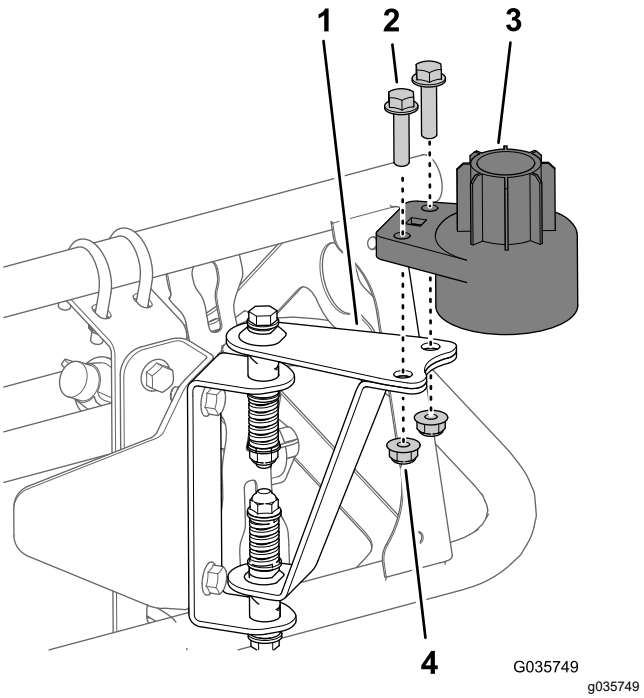


Figure 19

Assembly for machines without covered booms shown

1. Bottom strap
2. Lower sensor housing
3. Bolts (5/16 x 1-1/4 inches)
4. Locknuts (5/16 inch)

2. Install the sensor as follows:
   A. Assemble a large nut onto the sensor (Figure 20).
   B. Insert the sensor into the lower sensor housing (Figure 20).
   C. Adjust the nut until the sensor is flush with the bottom of the lower housing.
   D. Assemble the other large nut onto the sensor (Figure 20).
   E. Torque the nut to 18 to 22 N·m (13 to 16 ft-lb).

Note: Discard the lock washers that come with the sensors.

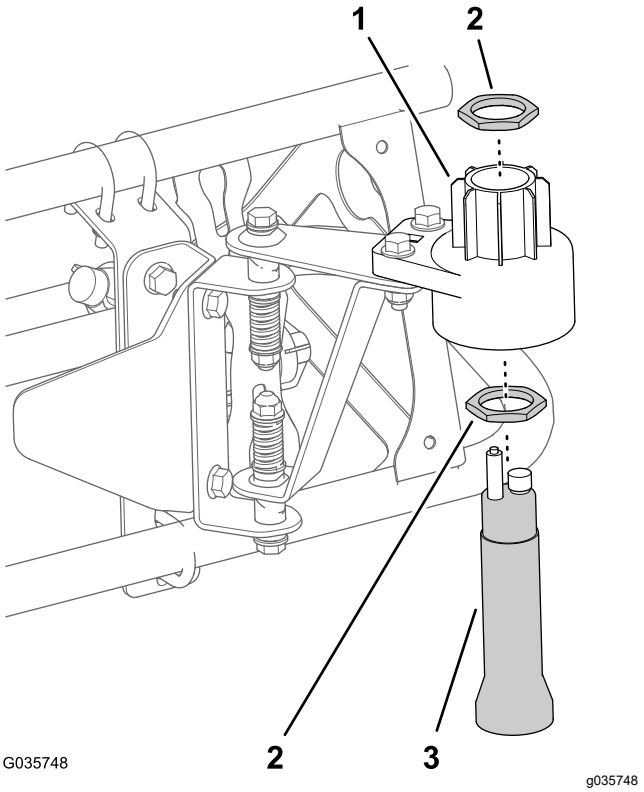


Figure 20

1. Lower sensor housing
2. Large nut
3. Sensor

3. Install the programming plug on the sensor (Figure 21).

   Important: **Ensure that you align the arrow below the sideways "T" with the notch on the top edge of the sensor (Figure 21).**

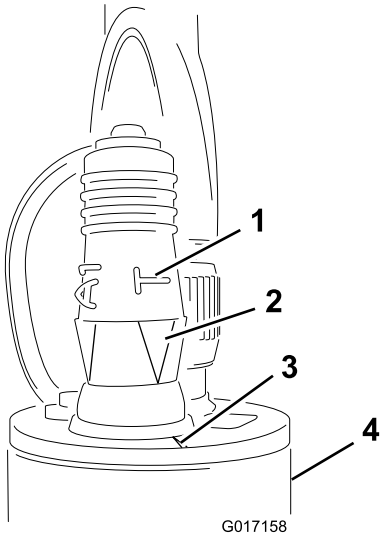


Figure 21

1. Sideways "T" (programming plug)
2. Arrows aligned (programming plug)
3. Notch (sensor)
4. Sensor

4. Repeat steps 1 through 3 for the outer-boom section at the other side of the machine.

Installing the Wire Harness and Upper Housing

1. Connect the round 4-socket connector of the sensor-wire harness for the 4-pin connector of the sensor (Figure 22).

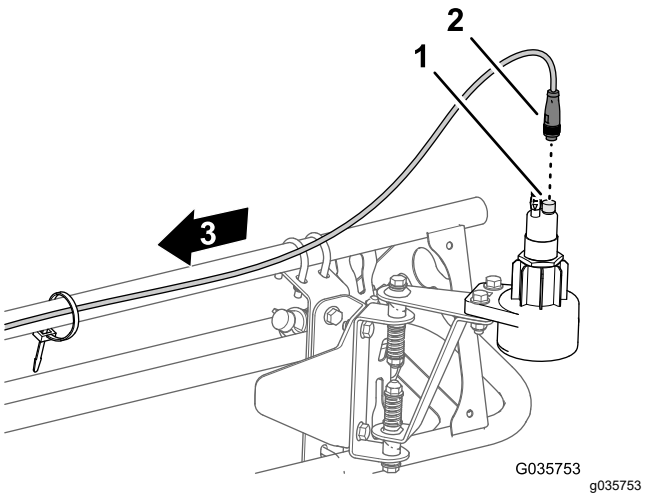


Figure 22

1. 4-pin connector (sensor)
2. Round 4-socket connector (sensor-wire harness)

2. Route the sensor-wire harness along the front of the outer-boom section, through the support clamp, and to the 4-socket connector of the wire harness from the ultra sonic boom finishing

kit—forward of the lift-cylinder manifold (Figure 23).

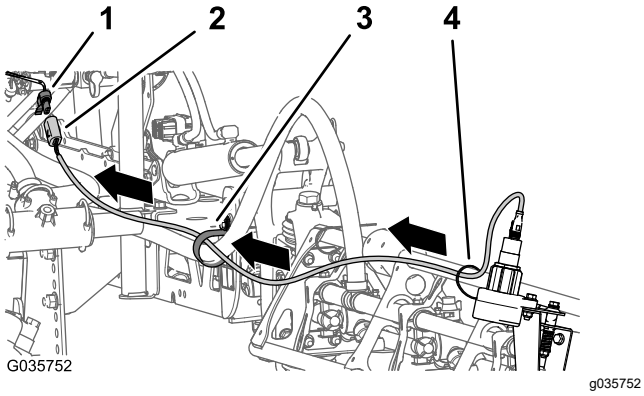


Figure 23

1. 4-socket connector (wire harness—ultra sonic boom finishing kit)
2. 4-pin sensor-wire harness
3. Support clamp
4. Cable tie

3. Connect the 4-pin connectors for the left and right sensor-wire harnesses to the 4-socket connector of the wire harness for the ultra sonic boom finishing kit (Figure 23) labeled LEFT SONIC SENSOR and RIGHT SONIC SENSOR.
4. Install the upper housing over the sensor and onto the lower housing (Figure 24).

   Note: Ensure that the sensor wire is routed through the small opening in the cover before seating the upper housing.

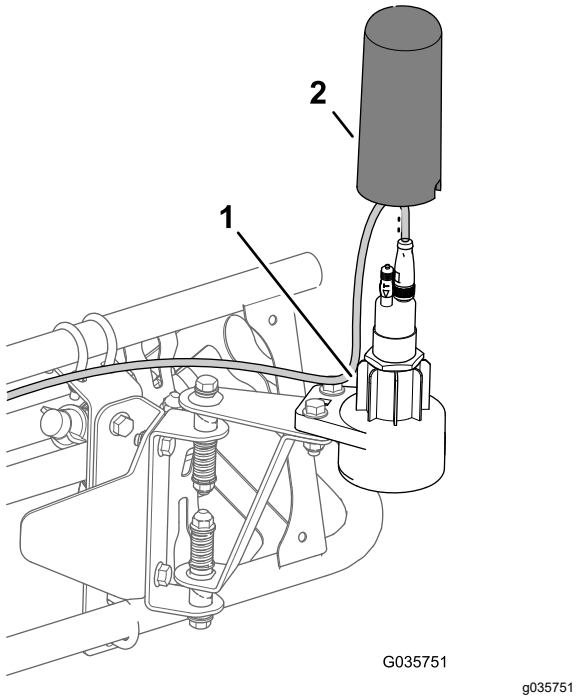


Figure 24

1. Lower housing
2. Upper housing

5. Secure the wire coming from the sensor to the boom with cable ties (Figure 23).

   Important: **Allow enough slack in the wire around the sensor so that the sensor can freely pivot on the hinge without pulling on the wire.**
6. Repeat steps 1 through 5 for the outer-boom section at the other side of the machine.

Note: **For covered booms only:** The sensors should not detect the boom cover as this may interfere with the signal. If you experience any difficulties during the calibration process, check the sensors to ensure that their signals do not detect the boom cover.

7

Connecting the Wire Harness at the Boom-Lift Manifold

No Parts Required

Procedure

1. At the front of the lift-cylinder manifold, connect the 4 electrical connectors of the wire harness for the sonic boom to the solenoids for controlling boom lift as shown in Figure 25.

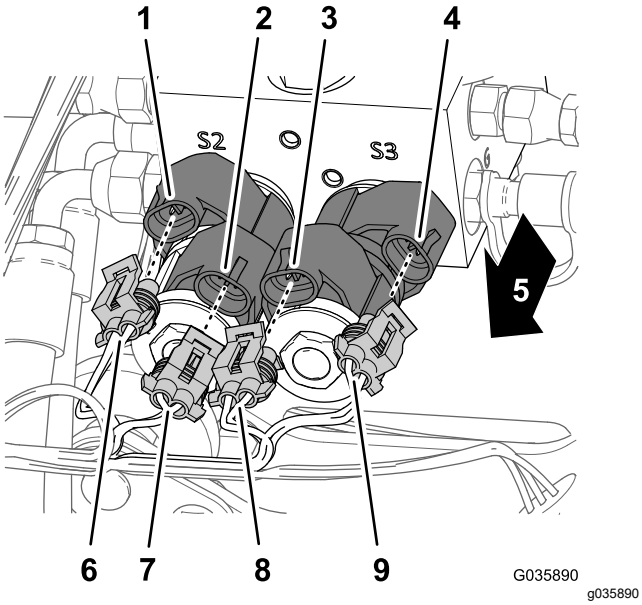


Figure 25

1. 2-pin connector—right boom down (solenoid S2)
2. 2-pin connector—right boom up (solenoid S2)
3. 2-pin connector—right boom up (solenoid S3)
4. 2-pin connector—right boom down (solenoid S3)
5. Front of the machine
6. 2-socket connector—RIGHT BOOM DOWN (sonic boom wire harness)
7. 2-socket connector—RIGHT BOOM UP (sonic boom wire harness)
8. 2-socket connector—LEFT BOOM UP (sonic boom wire harness)
9. 2-socket connector—LEFT BOOM DOWN (sonic boom wire harness)

2. At the back of the lift-cylinder manifold, connect the 2 electrical connectors of the wire harness for the sonic boom to the solenoids for controlling sonic enable as shown in Figure 26.

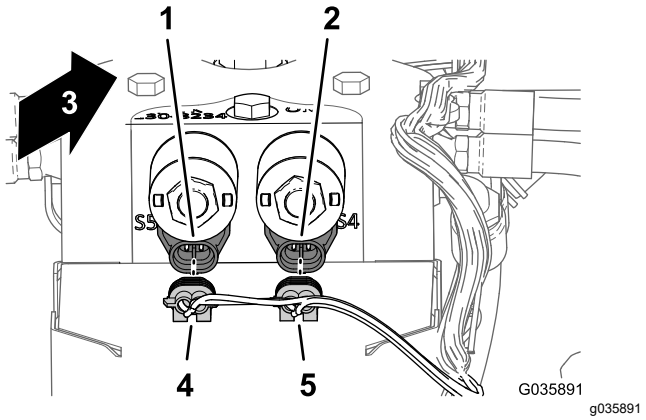


Figure 26

1. 2-pin connector (solenoid S5)
2. 2-pin connector (solenoid S4)
3. Front of the machine
4. 2-socket connector—LEFT ENABLE (sonic boom wire harness)
5. 2-socket connector—RIGHT ENABLE (sonic boom wire harness)

8

Mounting the Electronic Control

Parts needed for this procedure:

1	Electronic controller
4	Bolt (1/4 x 1-1/8 inch)
4	Locknut (1/4 inch)

Connecting the Wire Harness to the Electronic Controller

Multi Pro 1750 and Multi Pro WM Machines

1. Route the wire harness for the sonic boom to the hydraulic manifold.
2. Connect the 50-socket connector of the wire harness for the sonic boom to the 50-pin connector of the electronic controller, and secure the connectors with the socket-head screw (Figure 27).

   Note: The controller electrical connection is keyed and can be connected only 1 way.

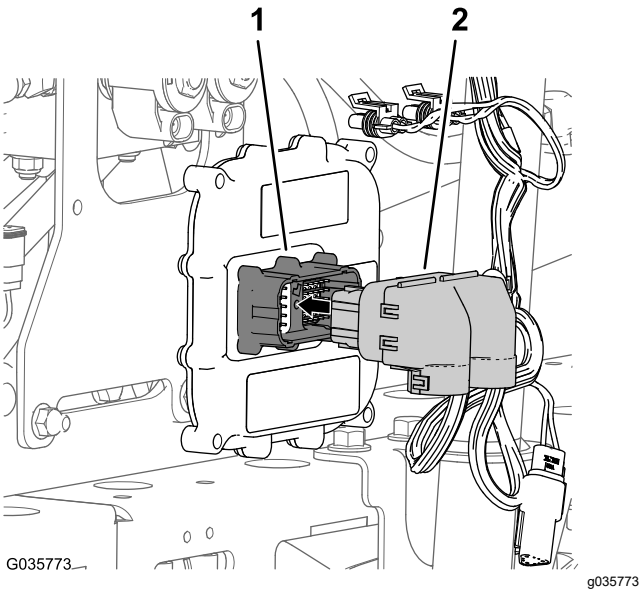


Figure 27

1. 50-pin connector (electronic controller)
2. 50-socket connector (sonic boom-wire harness)

3. Torque the socket-head screw to 2.7 to 3.2 N-m (24 to 28 in-lb).

Installing the Controller to the Machine

Multi Pro 1750 and Multi Pro WM Machines

1. Align the electronic controller to the interior of the controller cover with the lower outboard mounting holes of the controller aligned with the holes in the lower rear flange of the cover (Figure 28)

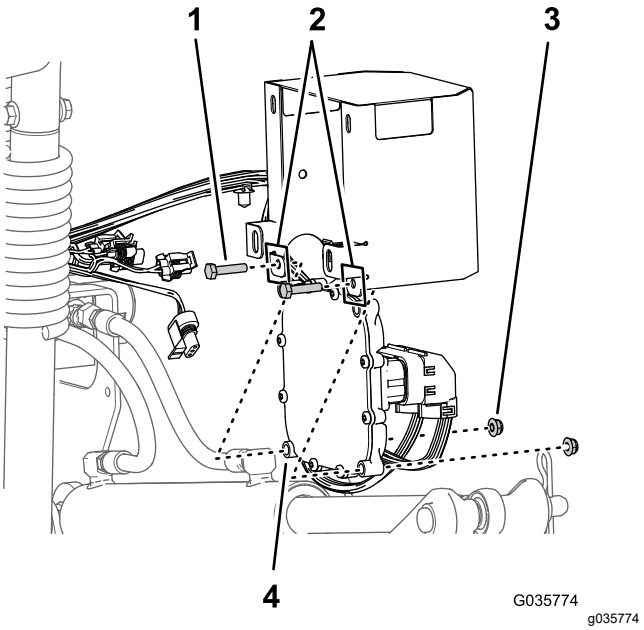


Figure 28

1. Bolt (1/4 x 1-1/8 inches)
2. Lower rear flanges (controller cover)
3. Flange locknut (1/4 inch)
4. Electronic controller

2. Assemble the controller to the cover with 2 bolts (1/4 x 1-1/8 inches) and 2 flange locknuts (1/4 inch) as shown in Figure 28.
3. Remove the 2 flange locknuts (5/16 inch) that secure the mounting bracket of the ultra sonic boom finishing kit from the cylinder mount (Figure 29).

   Note: Leave the mounting bracket assembled to the cylinder mount.

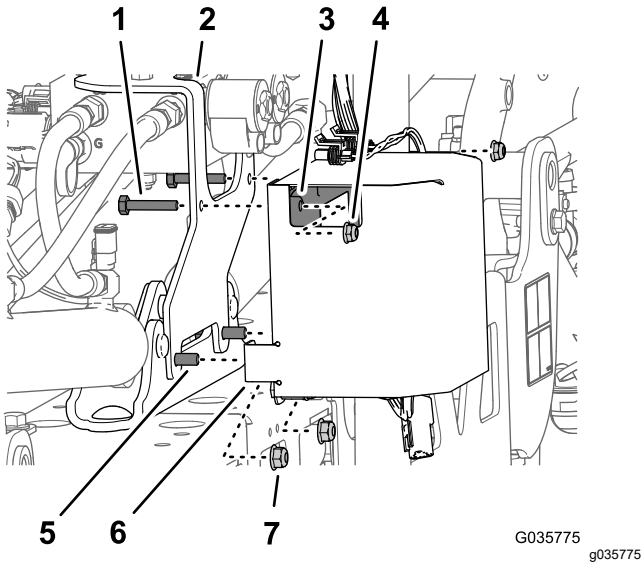


Figure 29

1. Bolt (1/4 x 1-3/8 inches)
2. Mounting bracket (ultra sonic boom finishing kit)
3. Electronic controller
4. Flange locknut (1/4 inch)
5. Flange-head bolt (5/16 x 1 inch)
6. Lower forward flange (controller cover)
7. Flange locknut (5/16 inch)

4. Assemble the controller cover (Figure 29) onto the flange-head bolt (5/16 x 1 inch) at the lower forward holes in the cover, and loosely secure the cover, bracket and mount with the 2 flange locknuts (5/16 inch) that you removed in 3.
5. Assemble the 2 bolts (1/4 x 1-3/8 inches) through the upper holes in the mounting bracket (ultra sonic boom finishing kit), rear flange (controller cover), and controller (Figure 29) with the 2 flange locknuts (1/4 inch).
6. Torque the 5/16 flange-head bolt and flange nuts to 1978 to 1243 N·cm (175 to 225 in-lb).
7. Torque the 1/4 flange-head bolt and flange nuts to 1017 to 2542 N·cm (90 to 110 in-lb).

Installing the Controller to the Machine

Multi Pro 5800 Machines

1. Rotate the operator and passenger seats forward and secure the seats with the prop rods.
2. **For 2015 and before machines**—locate the knockout plug between the inboard operator and passenger seat-belt halves, and remove the knockout plug from the console base (Figure 31).

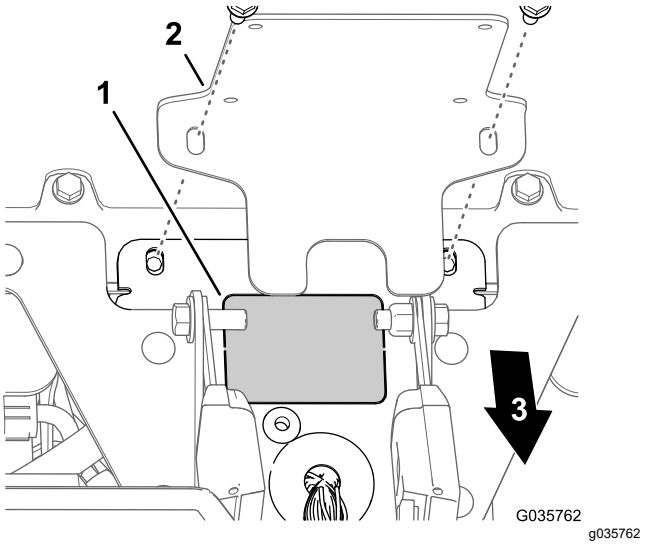


Figure 30

1. Knockout plug (console base)
2. Electronic controller mount (ultra sonic boom finishing kit)
3. Front of the machine

3. Assemble the electronic controller to the mounting bracket (Figure 31) with the 4 bolts (1/4 x 1-1/8 inch) and 4 locknuts (1/4 inch).

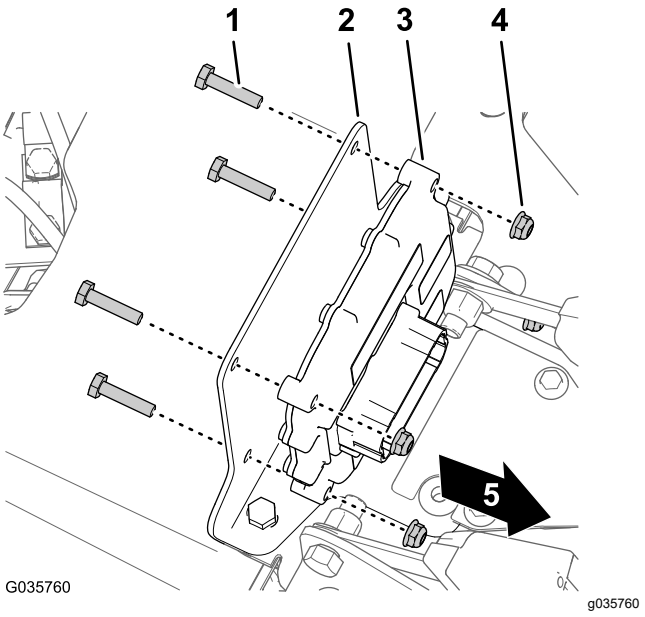


Figure 31

1. Bolt (1/4 x 1-1/8 inch)
2. Mounting bracket
3. Electronic controller
4. Locknut (1/4 inch)

4. Torque the nuts and bolts to 1017 to 1243 N·cm (90 to 110 in-lb)

Connecting the Wire Harness to the Electronic Controller

Multi Pro 5800 Machines

1. Route the 50-socket connector of the wire harness for the sonic boom as follows:
   - **For 2015 and before machines**—the branch of the wiring harness with the 50-socket connector is routed through the opening in the console base that you made in step 2; refer to the installation instructions for the ultra sonic boom finishing kit.
   - **For 2015 and after machines**—the branch of the wiring harness with the 50-socket connector is routed through the large grommet in the console base; refer to the installation instructions for the ultra sonic boom finishing kit.
2. Connect the 50-socket connector of the wire harness for the sonic boom to the 50-pin connector of the electronic controller, and secure the connectors with the socket-head screw (Figure 32).

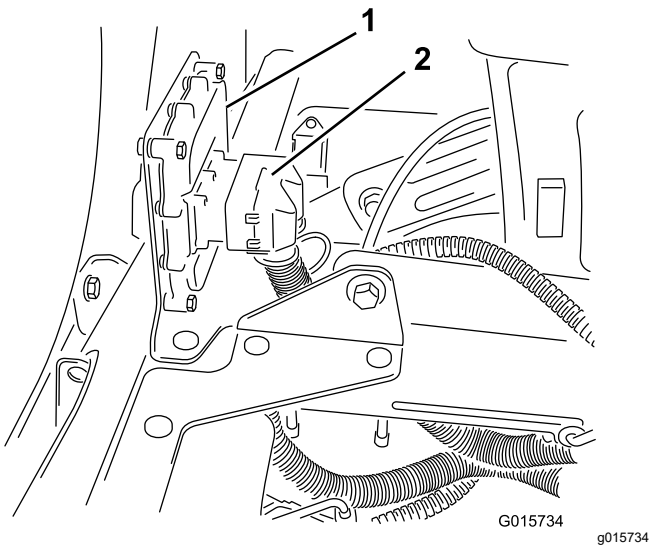


Figure 32

1. Electronic controller
2. Terminal

Note: The electrical connection for the controller is keyed and can be connected only 1 way.

3. Torque the socket-head screw to 2.7 to 3.2 N-m (24 to 28 in-lb).

9

Connecting the Wiring Harness and Switches

Parts needed for this procedure:

1	Rocker switch (illuminated)
12	Cable tie

Installing the Ultra Sonic-Mode Switch

Multi Pro 1750 Machines

1. If installed, remove the 4 flange-head bolts (1/4 x 1/2 inch) that secure the panel cover to the top of the console as shown in Figure 33.

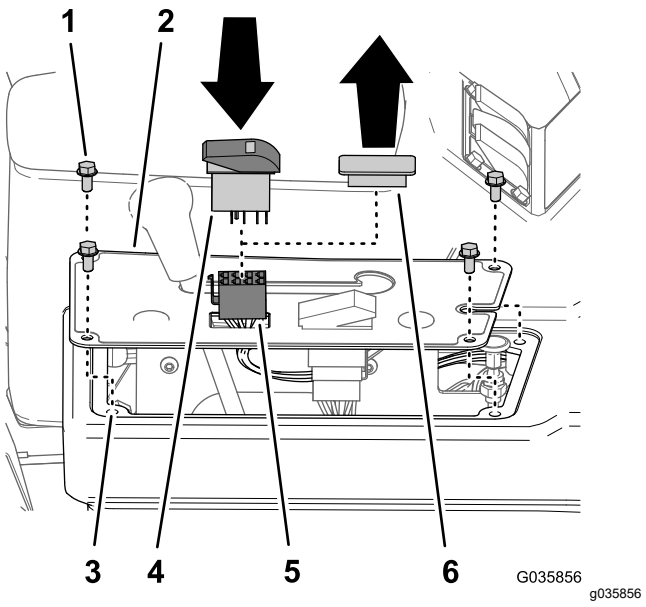


Figure 33

1. Flange-head bolts (1/4 x 1/2 inch)
2. Panel cover
3. Console
4. Rocker switch (8 pin)
5. 8-socket connector (wire harness—ultra sonic boom finishing kit)
6. Switch plug (panel cover)

2. Remove the switch plug from the panel cover of the console (Figure 33).
3. Align the Connect the 8-socket connector of the wiring harness of the ultra sonic boom finishing kit through the opening in panel cover (Figure 33).

4. Connect the 8-socket connector of the wiring harness of the ultra sonic boom finishing kit labeled SONIC MODE MANUAL VS. AUTO to the rocker switch (Figure 33).
5. Insert the rocker switch in the dash panel opening until the switch snaps securely (Figure 33).
6. Align the holes in the panel cover to the holes in the top of the console (Figure 33).
7. Secure the panel to the console with the bolts (Figure 33) that you removed in step 1.

Installing the Ultra Sonic-Mode Switch

Multi Pro 5800 Machines

1. Remove the switch plug in the dash panel at the location shown in Figure 34.

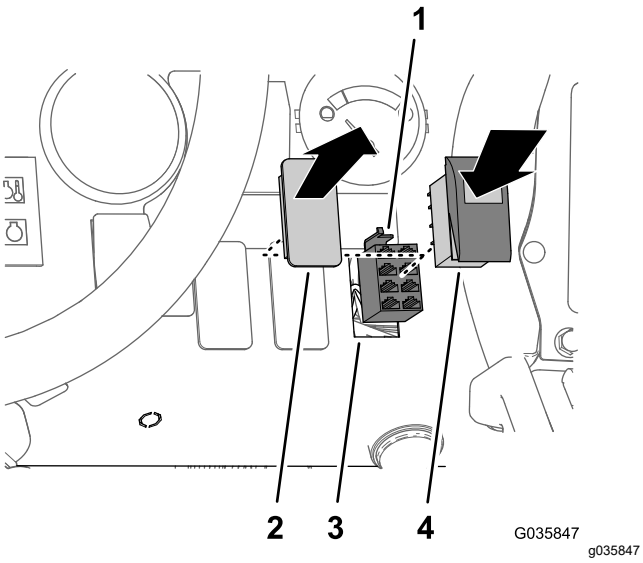


Figure 34

1. 8-socket connector (wire harness—ultra sonic boom finishing kit)
2. Switch plug (dash panel)
3. Opening (dash panel)
4. Rocker switch (8 pin)

2. Connect the 8-socket connector of the wiring harness of the ultra sonic boom finishing kit labeled SONIC MODE MANUAL VS. AUTO to the rocker switch (Figure 34).
3. Insert the rocker switch in the dash panel opening until the switch snaps securely (Figure 34).

   Note: Align the tail of the switch down.

Installing the Ultra Sonic-Mode Switch

Multi Pro WM Machines

1. If installed, remove the 4 flange-head bolts (1/4 x 1/2 inch) that secure the control panel to the console as shown in Figure 35.

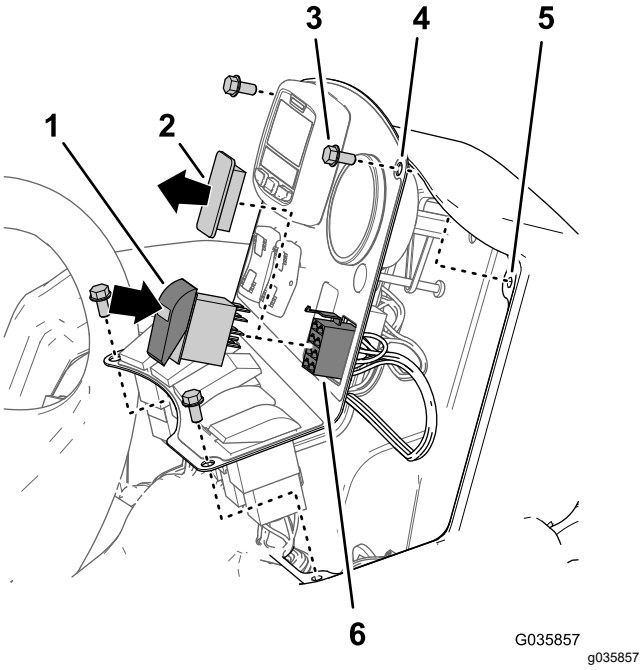


Figure 35

1. Rocker switch (8 pin)
2. Switch plug (control panel)
3. Flange-head bolts (1/4 x 1/2 inch)
4. Control panel
5. Console
6. 8-socket connector (wire harness—ultra sonic boom finishing kit_

2. Remove the switch plug from the control panel of the console (Figure 35).
3. Align the Connect the 8-socket connector of the wiring harness of the ultra sonic boom finishing kit through the opening in control panel (Figure 35).
4. Connect the 8-socket connector of the wiring harness of the ultra sonic boom finishing kit labeled SONIC MODE MANUAL VS. AUTO to the rocker switch (Figure 35).
5. Insert the rocker switch in the control panel opening until the switch snaps securely (Figure 35).

   Note: Align the tail of the switch down.
6. Align the holes in the control panel to the holes in the top of the console (Figure 35).
7. Secure the panel to the console with the bolts (Figure 35) that you removed in step 1.

10

Connecting the Boom-Lift Switches to the Sonic-Boom Harness

No Parts Required

Connecting the Switches to the Harness

Multi Pro 1750 or Multi Pro WM Machines

1. Remove the 4 flange-head bolts (1/4 x 1/2 inch) that secure the switch panel to the center console, and lift the panel (Figure 36 or Figure 27).

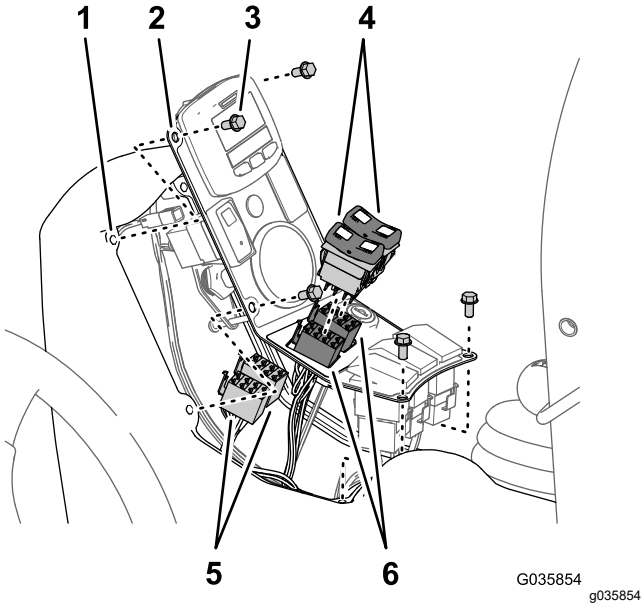


Figure 36

Multi Pro 1750 machines

1. Console
2. Switch panel
3. Flange-head bolt (1/4 x 1/2 inch)
4. Boom-lift switches (8-pin—machine component)
5. 8-socket connectors (sonic boom-wire harness)
6. 8-socket connectors (machine-wire harness)

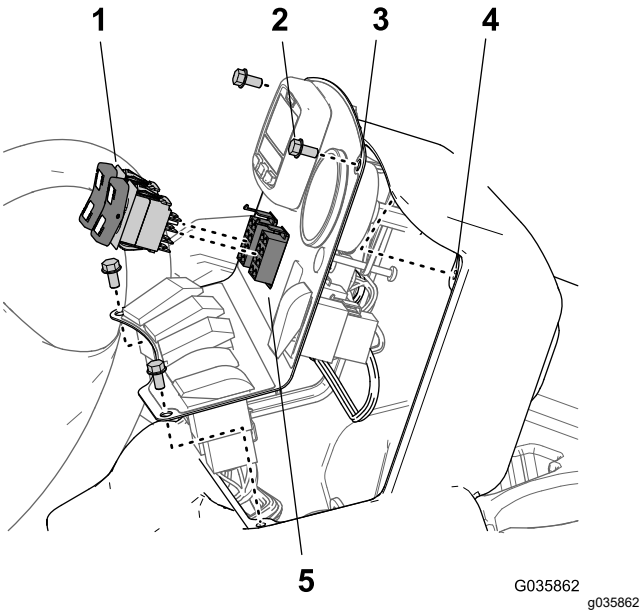


Figure 37

Multi Pro WM machines

1. Boom-lift switch (8-pin—machine component)
2. Flange-head bolts (1/4 x 1/2 inch)
3. Control panel
4. Console
5. 8-socket connector (wire harness—ultra sonic boom finishing kit)

2. Disconnect the 8-socket connectors of the machine-wire harness from the boom-lift switches (Figure 36 or Figure 37).

   Note: If additional clearance is needed, remove the boom-lift switches from the switch panel.

3. Connect the rocker switches into the 8-socket connectors of the wiring harness for the ultra sonic boom finishing kit (Figure 36 or Figure 37).

   Note: Ensure that the sonic-boom harness connector labeled LEFT ACTUATOR SWITCH is aligned with the left switch opening in the switch panel.

4. If you removed the switch(es) from the switch panel, insert the boom-lift switch(es) into the openings in the center-console panel until the switch(es) snaps securely.

5. Align the holes in the switch panel with the frame of the console (Figure 36 or Figure 37).

6. Secure the side cover on the center console with the 4 flange-head bolts (1/4 x 1/2 inch) (Figure 36 or Figure 37) that you removed in step 1.

Connecting the Switches to the Harness

Multi Pro 5800 Machines

1. Remove the 5 flange-head bolts (1/4 x 3/4 inch) that secure the right-side cover to the center console (Figure 38).

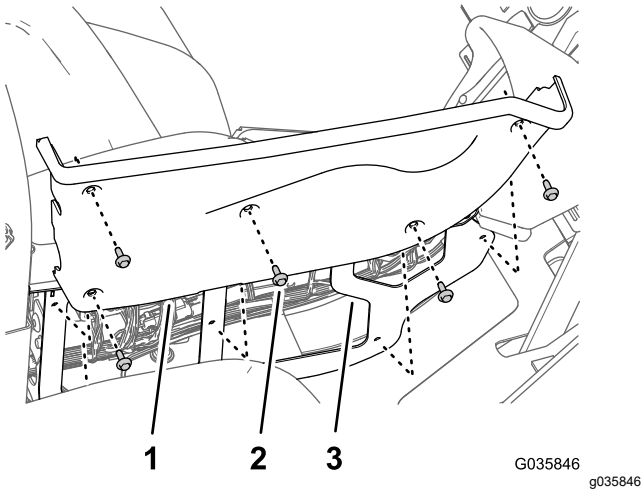


Figure 38

1. Right-side cover (center console)
2. Flange-head bolt (1/4 x 3/4 inch)
3. Frame (center console)

2. Remove the rocker switches for the left and right boom-lift controls from the center-console panel (Figure 38).

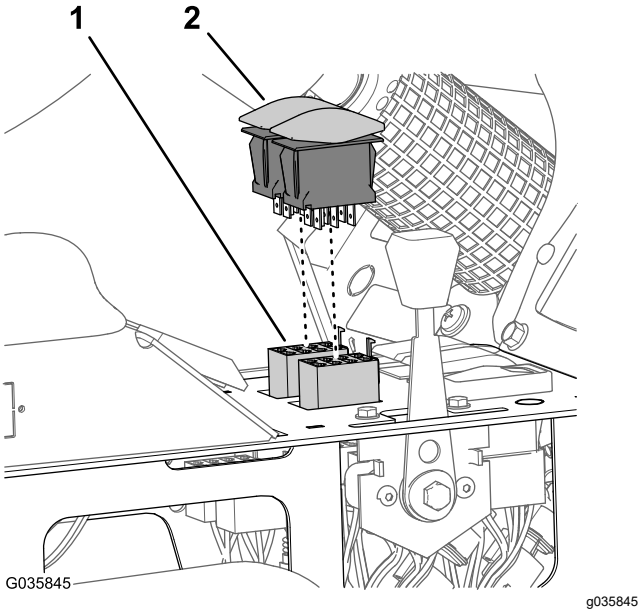


Figure 39

1. 8-socket connector (wire harness)
2. Boom-lift switches (8-pin—machine component)

3. Disconnect the 8-socket connectors of the wiring harness for the machine from the boom-lift switches for the left and right boom-lift control circuits (Figure 39).

   Note: Tuck the connectors for the wire harness for the machine alongside the harness.

4. Connect the rocker switches into the 8-socket connectors of the wiring harness for the ultra sonic boom finishing kit (Figure 39).

   Note: Ensure that the sonic-boom harness connector labeled LEFT ACTUATOR SWITCH is aligned with the left switch opening in the center-console panel.

5. Insert the boom-lift switches in the openings in the center-console panel until the switches snap securely (Figure 39).
6. Align the holes in the right-side cover with the frame of the center console (Figure 38).
7. Secure the side cover on the center console (Figure 38) with the 5 flange-head bolts (1/4 x 3/4 inch) that you removed in step 1.

11

Finishing Installation of the Ultra Sonic Boom Leveling Kit

No Parts Required

Procedure

1. Connect the negative-battery cable to the battery; refer to the *Operator's Manual* for your machine.
2. For Multi Pro 1750 and Multi Pro 5800 machines, rotate down the seats.

12

Calibrating the Sonic Booms

No Parts Required

Procedure

Once you initiate the controller processor for calibration, you will have 20-seconds to calibrate the sensors on the booms. The distance you set between the sensor on each boom and the ground after the 20-second calibration period is the boom height setting in automatic mode until the next time you calibrate the sensor.

Note: For uncovered booms: The default height setting is 51 cm (20 inches) from the nozzle to the ground. If, after setting a boom to a height different from that of the factory default setting, you wish to restore the calibration to the factory-default setting, calibrate the boom with the boom in the cradle. **For covered booms:** The default height setting of 51 cm (20 inches) is for uncovered booms only. You must calibrate the sensors on covered booms.

1. Ensure that the turf sprayer is parked and away from any trees, buildings, vehicles, debris, and underground utilities and plumbing.
2. Lower the booms to the horizontal position.
3. Turn off the ignition key.
4. Press the sonic-boom switch to the ON position (Figure 40, Figure 41, or Figure 42).

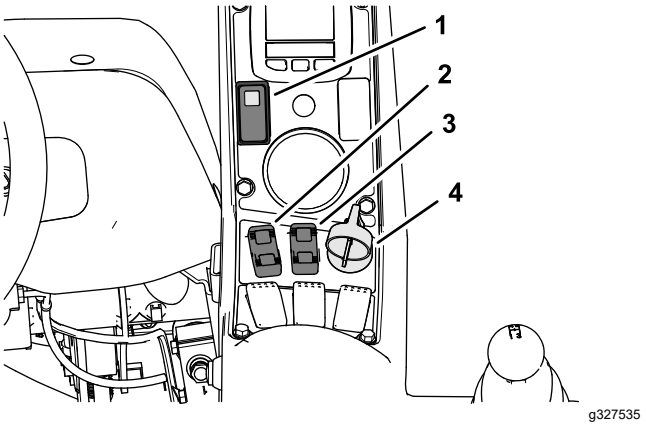


Figure 40
Multi Pro 1750 Machines

1. Sonic-boom switch (with indicator light)
2. Left boom-lift control switch
3. Right boom-lift control switch
4. Ignition key

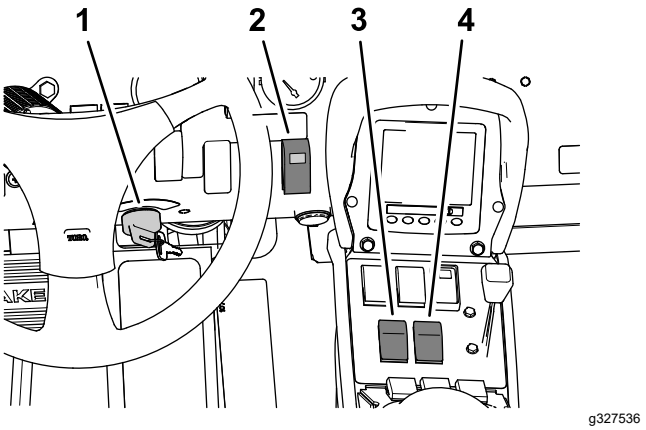


Figure 41
Multi Pro 5800 Machines

1. Ignition key
2. Sonic-boom switch (with indicator light)
3. Left boom-lift control switch
4. Right boom-lift control switch

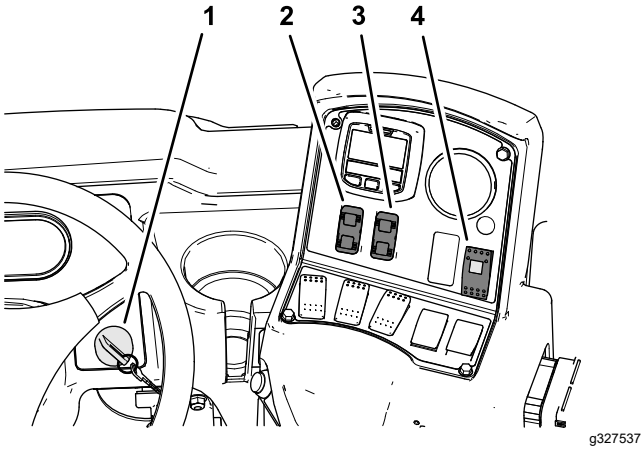


Figure 42
Multi Pro WM Machines

1. Ignition key
2. Left boom-lift control switch
3. Right boom-lift control switch
4. Sonic-boom switch (with indicator light)

5. While pressing and holding both the left boom-lift control switch to the LOWER position and the right boom-lift control switch to the RAISE position, turn the ignition key and start the machine.
6. Release the boom switches.

   Note: The indicator light on the sonic-boom switch will flash rapidly, indicating that the sonic boom system is in calibration mode. You now have 20 seconds to use the Raise and Lower boom switches to set the desired distance between the booms to the ground. After the 20 seconds, the indicator light flashes slowly.
7. Raise and lower the outer-boom sections using the boom-lift control switches to adjust the height of each boom until you achieve the desired distance between the tip of the boom and the ground.

Operation

Important: **Raise the booms one at a time. This prevents the booms contacting each other preventing any possible damage to the sensors mounted on the booms.**

Important: **When the booms are stowed in the cradle for extended periods of time, cover each sensor (aligned upward) with a dust cap to prevent ultraviolet light from damaging the sensors. Prevent the bottom of the sensors from being exposed to direct sunlight whenever possible; refer to Storage (page 24).**

Using the Controls

The sonic-boom switch is located on the dashboard and has 2 settings: automatic mode and manual mode.

- The automatic mode enables the machine to control the outer boom position, thereby continually positioning the boom-tip height at the desired distance from the ground.
- The manual mode turns off the automatic boom-position adjustment, and allows you to change the booms boom height manually.

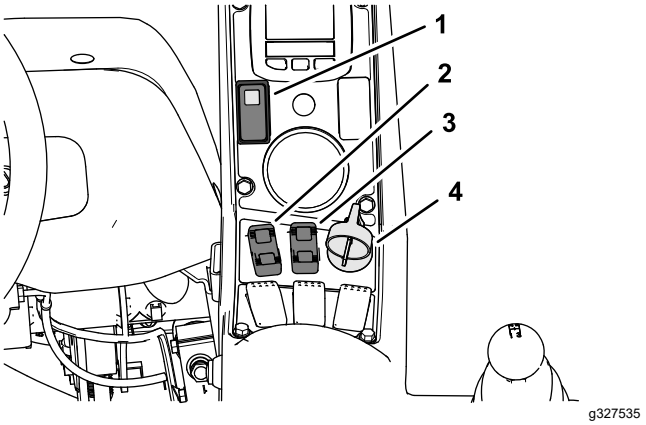


Figure 43
Multi Pro 1750 Machines

1. Sonic-boom switch (with indicator light)
2. Left boom-lift control switch
3. Right boom-lift control switch
4. Ignition key

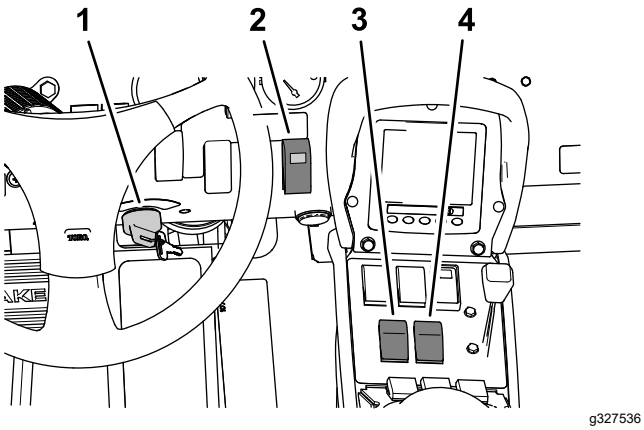


Figure 44

Multi Pro 5800 Machines

1. Ignition key
2. Sonic-boom switch (with indicator light)
3. Left boom-lift control switch
4. Right boom-lift control switch

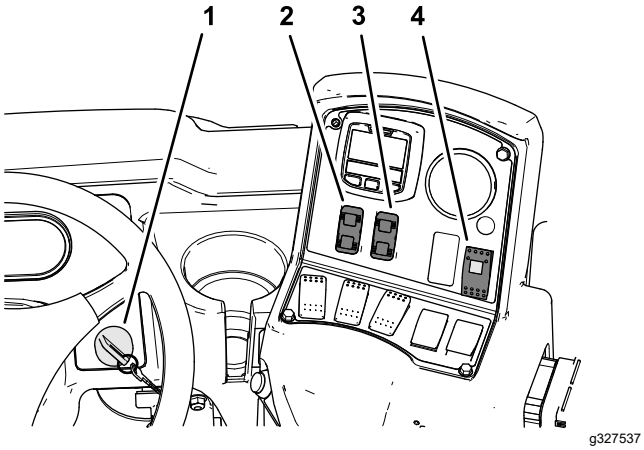


Figure 45

Multi Pro WM Machines

1. Ignition key
2. Left boom-lift control switch
3. Right boom-lift control switch
4. Sonic-boom switch (with indicator light)

The Sonic Boom Indicator Light

Note: The sonic boom indicator light (Figure 43, Figure 44, or Figure 45) illuminates on the sonic-boom switch, and indicates the status of the sonic boom system as follows:

- **On continuously:** The sonic boom system is active and operating normally.
- **Flashing quickly:** The system is in calibration mode, which lasts for 20 seconds.
- **Flashing slowly:** There is either an error in the system or you have overridden the automatic mode by operating a boom or both booms manually while the system is in automatic mode.

Note: If there is a fault in the sonic boom system (e.g., there is no signal coming from a sensor), the boom raises for a few seconds and then stops, and the light on the boom switch (located on the dashboard) flashes slowly—indicating that control of a boom or both booms has stopped.

Controlling the Outer Booms using the Automatic Mode

1. Press the sonic-boom switch (Figure 43, Figure 44, or Figure 45) to the ON position.

   Note: The light on the sonic-boom switch illuminates.

2. Use the boom-lift control switch (Figure 43, Figure 44, or Figure 45) to lower boom to the desired distance from the ground.

3. To override the automatic mode boom position, perform the following:

   Note: You can temporarily override the automatic operation of the booms using the boom-lift control switches (Figure 43, Figure 44, or Figure 45) to raise or lower a boom or both booms.

   - Lower the boom(s) manually, by pressing and holding the boom-lift control switch(s) to the LOWER position until the outer boom(s) lowers to the desired height.
   - Raise the boom(s) manually by pressing and holding the boom-lift control switch(s) to the RAISE position until the outer boom(s) raises to the desired height.

     Note: If you adjust only 1 boom, the other boom continues to function in the automatic mode.

4. To resume the automatic mode, momentarily press the boom-lift control switch(s) to the LOWER position (Figure 43, Figure 44, or Figure 45) to allow the sonic-boom controller to position the boom-tip height at the desired distance from the ground.

Controlling the Outer Booms while using the Manual Mode

1. Press the sonic-boom switch (Figure 43, Figure 44, or Figure 45) to the OFF position.

   Note: The light on the sonic-boom switch shuts off.

2. Use the left and right boom-lift control switches to change the height of the outer booms (Figure 43, Figure 44, or Figure 45).

Operating the Sprayer

Important: **When operating the machine over especially uneven terrain, reduce the ground speed to prevent the booms from striking the ground.**

Maintenance

Cleaning

Clean the sensors periodically with a damp cloth. If a sensor is damaged or excessively dirty, replace it.

Important: **Do not spray water at or on the sensors. Water sprayed under even household pressure can damage the sensor. Always cover the sensors completely before washing the sprayer.**

Storage

Whenever you are not using the ultra sonic boom system for an extended period, cover the sensors with the dust caps to protect them from the outdoor elements.

1. Install the cap onto the bottom of the lower housing (Figure 46).

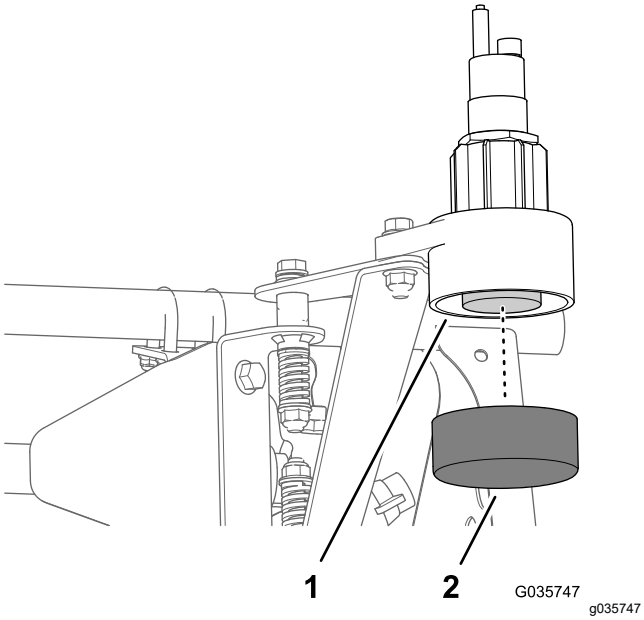


Figure 46

1. Lower sensor housing
2. Cap

2. Repeat step 1 for the sensor at the other outer-boom section.

Troubleshooting

Note: Refer to the service manual for additional diagnostic information. Product electrical schematics may be found at www.Toro.com.

Problem	Possible Cause	Corrective Action
1 or both boom(s) are malfunctioning, and the sonic boom light is off.	1. A fuse is blown. 2. The light is burned out. 3. The electronic controller or wiring is damaged.	1. Replace the fuse. 2. Replace the light. 3. Contact an authorized Toro distributor.
1 or both boom(s) are malfunctioning, and the sonic boom light flashes slowly.	1. There is a minor system error. 2. There is a system error that repeats after clearing the error. 3. There is a hydraulic or mechanical failure.	1. Lower the affected boom(s) using the boom switch(es) to clear the error. 2. If the error repeats, contact an authorized Toro distributor. 3. Repair the hydraulic or mechanical problem.
1 or both boom(s) are malfunctioning, and the sonic boom light is on.	1. The sensor covers are blocking or swinging into the sensor path	1. Remove the cover(s) from the lower sensor housing. Install cover to the top side of the sensor.

Notes:

The Toro Warranty

Two-Year or 1,500 Hours Limited Warranty

Conditions and Products Covered

The Toro Company and its affiliate, Toro Warranty Company, pursuant to an agreement between them, jointly warrant your Toro Commercial product ("Product") to be free from defects in materials or workmanship for 2 years or 1,500 operational hours*, whichever occurs first. This warranty is applicable to all products with the exception of Aerators (refer to separate warranty statements for these products). Where a warrantable condition exists, we will repair the Product at no cost to you including diagnostics, labor, parts, and transportation. This warranty begins on the date the Product is delivered to the original retail purchaser.
* Product equipped with an hour meter.

Instructions for Obtaining Warranty Service

You are responsible for notifying the Commercial Products Distributor or Authorized Commercial Products Dealer from whom you purchased the Product as soon as you believe a warrantable condition exists. If you need help locating a Commercial Products Distributor or Authorized Dealer, or if you have questions regarding your warranty rights or responsibilities, you may contact us at:

Toro Commercial Products Service Department
Toro Warranty Company
8111 Lyndale Avenue South
Bloomington, MN 55420-1196

952–888–8801 or 800–952–2740
E-mail: commercial.warranty@toro.com

Owner Responsibilities

As the product owner, you are responsible for required maintenance and adjustments stated in your *Operator's Manual*. Repairs for product issues caused by failure to perform required maintenance and adjustments are not covered under this warranty.

Items and Conditions Not Covered

Not all product failures or malfunctions that occur during the warranty period are defects in materials or workmanship. This warranty does not cover the following:

- Product failures which result from the use of non-Toro replacement parts, or from installation and use of add-on, or modified non-Toro branded accessories and products.
- Product failures which result from failure to perform recommended maintenance and/or adjustments.
- Product failures which result from operating the Product in an abusive, negligent, or reckless manner.
- Parts consumed through use that are not defective. Examples of parts which are consumed, or used up, during normal Product operation include, but are not limited to, brake pads and linings, clutch linings, blades, reels, rollers and bearings (sealed or greasable), bed knives, spark plugs, castor wheels and bearings, tires, filters, belts, and certain sprayer components such as diaphragms, nozzles, flow meters, and check valves.
- Failures caused by outside influence, including, but not limited to, weather, storage practices, contamination, use of unapproved fuels, coolants, lubricants, additives, fertilizers, water, or chemicals.
- Failure or performance issues due to the use of fuels (e.g. gasoline, diesel, or biodiesel) that do not conform to their respective industry standards.
- Normal noise, vibration, wear and tear, and deterioration. Normal "wear and tear" includes, but is not limited to, damage to seats due to wear or abrasion, worn painted surfaces, scratched decals or windows.

Parts

Parts scheduled for replacement as required maintenance are warranted for the period of time up to the scheduled replacement time for that part. Parts replaced under this warranty are covered for the duration of the original product warranty and become the property of Toro. Toro will make the final decision whether to repair any existing part or assembly or replace it. Toro may use remanufactured parts for warranty repairs.

Deep Cycle and Lithium-Ion Battery Warranty

Deep cycle and Lithium-Ion batteries have a specified total number of kilowatt-hours they can deliver during their lifetime. Operating, recharging, and maintenance techniques can extend or reduce total battery life. As the batteries in this product are consumed, the amount of useful work between charging intervals will slowly decrease until the battery is completely worn out. Replacement of worn out batteries, due to normal consumption, is the responsibility of the product owner.
Note: (Lithium-Ion battery only): Refer to the battery warranty for additional information.

Lifetime Crankshaft Warranty (ProStripe 02657 Model Only)

The Prostripe which is fitted with a genuine Toro Friction Disc and Crank-Safe Blade Brake Clutch (integrated Blade Brake Clutch (BBC) + Friction Disc assembly) as original equipment and used by the original purchaser in accordance with recommended operating and maintenance procedures, are covered by a Lifetime Warranty against engine crankshaft bending. Machines fitted with friction washers, Blade Brake Clutch (BBC) units and other such devices are not covered by the Lifetime Crankshaft Warranty.

Maintenance is at Owner's Expense

Engine tune-up, lubrication, cleaning and polishing, replacement of filters, coolant, and completing recommended maintenance are some of the normal services Toro products require that are at the owner's expense.

General Conditions

Repair by an Authorized Toro Distributor or Dealer is your sole remedy under this warranty.

Neither The Toro Company nor Toro Warranty Company is liable for indirect, incidental or consequential damages in connection with the use of the Toro Products covered by this warranty, including any cost or expense of providing substitute equipment or service during reasonable periods of malfunction or non-use pending completion of repairs under this warranty. Except for the Emissions warranty referenced below, if applicable, there is no other express warranty. All implied warranties of merchantability and fitness for use are limited to the duration of this express warranty.

Some states do not allow exclusions of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above exclusions and limitations may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Note Regarding Emissions Warranty

The Emissions Control System on your Product may be covered by a separate warranty meeting requirements established by the U.S. Environmental Protection Agency (EPA) and/or the California Air Resources Board (CARB). The hour limitations set forth above do not apply to the Emissions Control System Warranty. Refer to the Engine Emission Control Warranty Statement supplied with your product or contained in the engine manufacturer's documentation.

Countries Other than the United States or Canada

Customers who have purchased Toro products exported from the United States or Canada should contact their Toro Distributor (Dealer) to obtain guarantee policies for your country, province, or state. If for any reason you are dissatisfied with your Distributor's service or have difficulty obtaining guarantee information, contact your Authorized Toro Service Center.



Count on it.