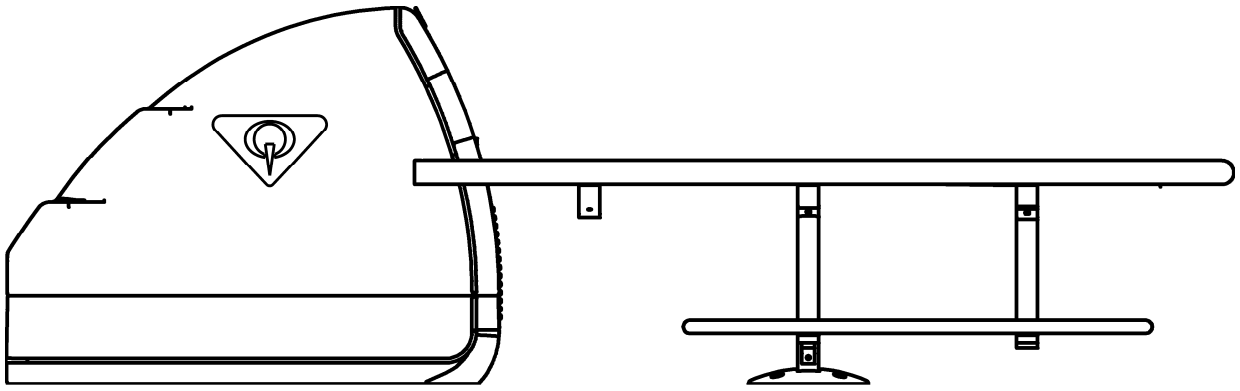
OPTIONS

BALL RETURN

With Optional Lower Rack

Installation, Operation, Service, and Parts Manual



These original Instructions Were Written in English.

Revised: 06/05/2012 **P/N: 612-860-010 Rev G**

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DOCUMENT UPDATES

QubicaAMF Bowling Products, Inc. reserves the right to revise and/or update this manual at any time without obligation to notify any person or entity of such revision. The document number, revision level, and date below indicate the edition of this manual.

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Options Ball Return with Optional Lower Rack
Installation, Operation, Service, & Parts Manual – 612-860-010 Rev. G

Summary of Changes

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HOW TO USE THIS MANUAL

This manual contains information needed to properly install, operate, and maintain the Options Ball Return. If any terms, concepts, or operations contained in this manual are not clear to you, consult an experienced professional or QubicaAMF Technical Support.

INTRODUCTION

Before you begin the installation, check your shipment against the packing list to ensure that all parts have been included. Report missing items to QubicaAMF at 1-866-460-7263 between the hours of 8:00 a.m. and 5:00 p.m. Eastern Time. After 5:00 p.m., you can leave a message on the voice mail system. The 24-hour fax line is 1-804-559-8650. Address all faxes to QubicaAMF ProductsTechnical Support.

WARNING!
Read This BEFORE Proceeding.

TO AVOID INJURY:

Read these safety precautions before attempting to install or modify any equipment.

Failure to follow these procedures may result in severe personal injury, fire, or permanent damage to property.

- **When you see this symbol** **associated with an instruction, a possible hazard is indicated. Follow these instructions carefully.**
- **Before installing, removing, or replacing electrical equipment, ensure that the supply power to the unit has been turned OFF at the main circuit breaker box in accordance with your center's lock out and tag out procedures.**
- **Verify that the power source matches that required by your Ball Return. The load rating is 10 amps for 120-volt units and 5 amps for 220-volt units. The circuit breaker should be sized according to applicable local and regional codes.**
- **Protect the approach and lane surfaces before you begin installation of the Ball Return unit.**
- **Before applying power to a Ball Return, be sure that all cables have been connected properly — especially the main power cables.**
- **Before operating a Ball Return, be sure that all GUARDS are in place.**
- **Do NOT pass anything other than 10-pin bowling balls through the unit.**
- **Do NOT place your hand or any other object into the Ball Lift.**
- **A bowling ball presents a pinching hazard as it exits the lift and when it comes into contact with another ball on the ball rack. Do NOT place your hand inside the ball lift exit opening, and exercise caution when removing a ball from the rack.**

PACKING LISTS AND TOOLS

If installing Part Number, 612-520-087, you should receive parts that include the following:

Part Number	Description	Quantity
612-860-010	Options Ball Return Installation Manual	1
252-002-138	Options Ball Lift Assembly	1
252-002-226	Options Base & Hood Assembly – Grey*	1
252-002-223	Options Base & Hood Assembly – Black*	1
259-001-054	Options 11-Ball Upper Rack Assembly	1
259-001-028	Options Leg Weldment	1
610-494-444	Underlane Track Shim Package	1
610-900-038	Ball Lift Installation Hardware	1

*one or the other depending on the order

If installing Part Number, 259-001-055, you should receive the following:

Part Number	Description	Quantity
259-001-056	Options Lower Ball Storage Rack	1
612-520-092	Options Lower Ball Rack Installation Hardware Kit	1

If installing Part Number, 252-002-147, you should receive the following:

Part Number	Description	Quantity
250-004-069	Options Ball Lift Hand Guard Assembly	1
948-722-111	5/16 Flat Washer	5
252-002-147P	Hand Guard Installation Drawing (Print)	1

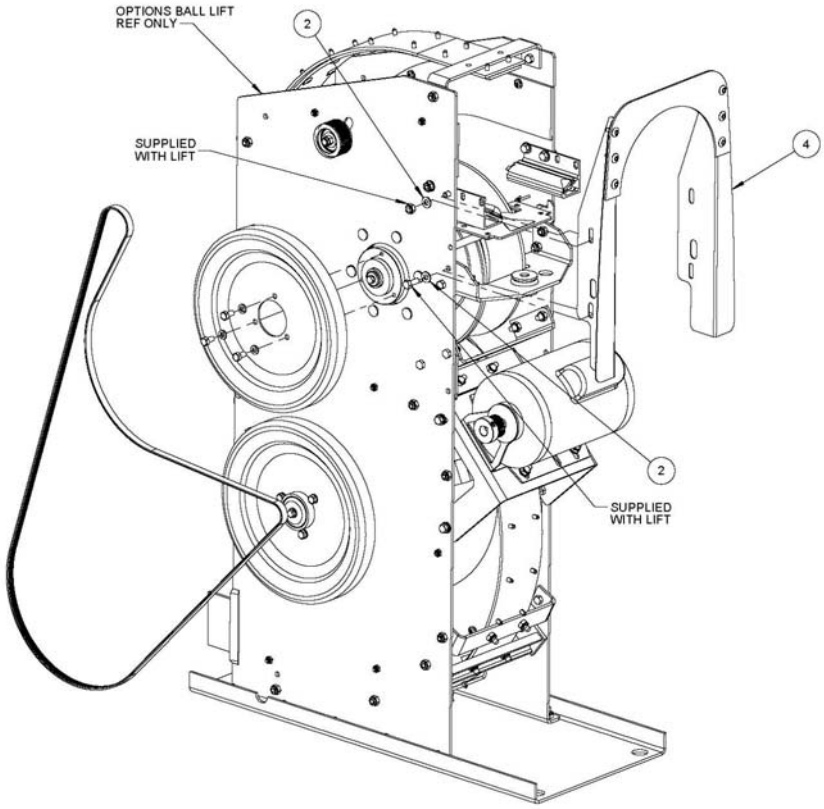
Installation Tools

The following is a list of tools needed for the installation of the Options Ball Return. Other tools may be required depending on whether you are installing the unit on a wood or synthetic approach.

Tape Measure	Straight Edge / Carpenter's Square
Hacksaw	3/8" Drive Ratchet
Hacksaw Blades	12-Inch, 3/8"-Drive Extension
Pencil / Marker	7/16", 1/2", & 12mm Sockets
Circular Saw	7/16", 1/2", 9/16", & 3/4" Combination Wrenches
Hammer Drill	#2 Phillips Screwdriver
Wire Strippers	Small Flat Blade Screwdriver
Wire Cutters	3/16", 7/32", 9/32", & 7/16" Drill Bits
Utility Knife	5/16" Masonry (carbide tipped) Bit
Crimpers	Level

HAND GUARD KIT

If upgrading your existing Options Ball Return with the 252-002-147 Hand Guard Kit, Install it as shown and described below. The guard reduces the likelihood of someone placing his or her hand inside the ball return in the area where the ball exits the lift or where there are moving parts. The installation utilizes much of the lift's existing hardware.



Hand Guard Installation

- **Turn OFF power to the two associated pinspotters and to the ball lift and remove the Hood before installing the hand guard.**
- **Secure the guard's side flanges to the outside of the lift's side plates as indicated above.**

Parts List

Item	Part Number	Description	Quantity
1	252-002-143	Options Ball Lift Hand Guard	1
2	948-722-111	Flat Washer, 5/16	5

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OPTIONS BALL LIFT INSTALLATION

The Options Ball Return consists of a Ball Lift, a Hood Assembly, and a Ball Rack. The foundation for the Ball Lift consists of two 2 x 6 x 18-inch boards over a concrete subfloor. While shims are provided to level and raise the Ball Lift to the required height, you might need to plane the boards and/or use additional materials to achieve the 14-7/16-inch (367mm) required distance from the **underside** of the Ball Lift base plate to the **top** surface of the approach.

Depending on the length of your approach, the ball rack might not overhang the end of the approach. To determine the overhang at your center, perform the computation below using the numbers from your center.

IMPORTANT!

The position of the ball lift on the approach in the following calculation is based on a standard QubicaAMF underlane track installation that results in the end of the track being 125-7/16 inches from the lane side of the foul line. If possible, check this distance, and if different, offset the installation (including the cutout) as needed. Minor differences (no more than ± 1 inch) do NOT require any offset. If an installation other than the standard installation is desired, the underlane track can be lengthened or shortened as needed.

BALL RACK OVERHANG CALCULATION (See Figure 1)	11 Ball Rack (in inches)
1. Distance from Lane Side of Foul Line to End of Underlane Track	125.4375
2. Overall length of ball return (including 11-Ball Rack and Hood)	103.5
3. **Subtotal A**	228.9375
4. Distance from End of Track to back of Hood (overlap of the two items above)	-21.285
5. **Subtotal B**	207.6525
6. Length of Approach (includes Foul Line, your approach could be different)	-192.00
7. **OVERHANG**	15.6525

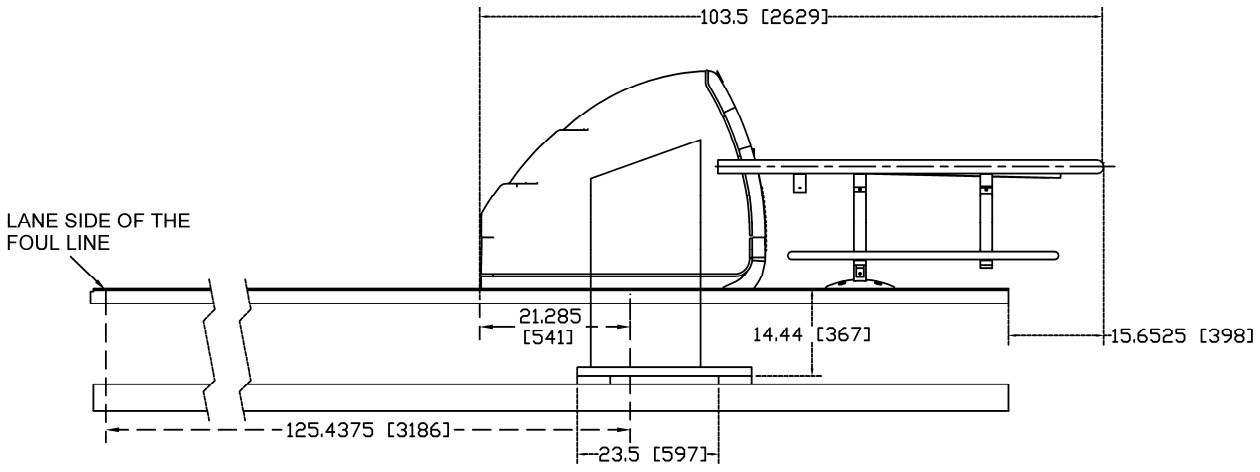


Figure 1, Standard Layout

The dimensions specified herein are for a typical installation and assume **an approach length of 16 ft. (487.7 cm)**. This typical installation will result in the ball rack overhanging the end of the approach approximately 15.65 inches (39.8 cm) with an 11-ball rack. The amount of overhang you will obtain will be determined by the length of the approach in your bowling center. If the approach is longer than that specified above, the overhang will be less by the same amount. If the approach is shorter, the overhang will be more.

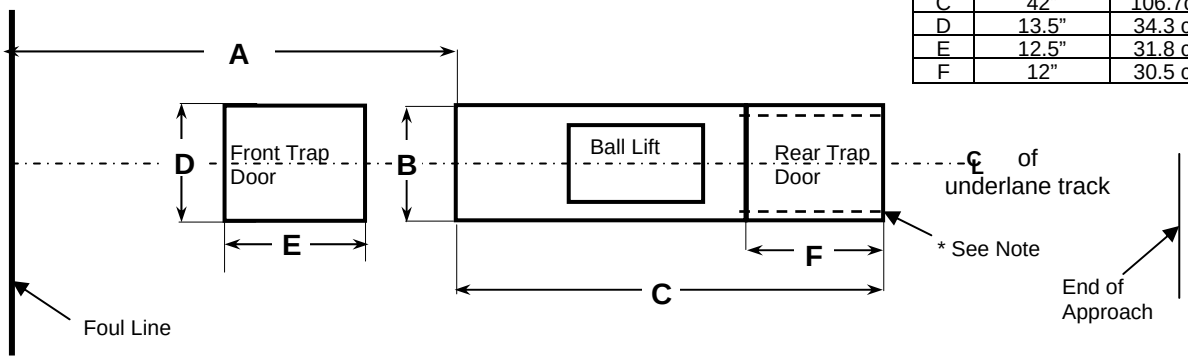
If the approach is less than 16 feet in length, or if more space is needed between the end of the ball rack and other installed equipment, then you will have to offset the installation closer to the foul line by the desired amount. **If the location of the Ball Lift is shifted, it may be necessary to cut and splice the underlane ball return track to accomplish the installation.**

APPROACH OPENING AND LIFT INSTALLATION

For replacing an existing installation, remove the old ball lift and fill in and/or cut out the approach opening, as necessary, to meet the specifications shown below.

1. Cut an opening in the approach floor 42 inches by 13.5 inches (106.7 cm x 34.3 cm) starting 116-15/16 inches (298 cm) from the lane side of the foul line. Include the two trap doors as shown in figure 2. Center the opening(s) over the underlane track. The front trap door is required to retrieve the ball if it is not handled properly by the Ball Lift.

Cutout Specifications		
A	116 15/16”	298 cm
B	13.5”	34.3 cm
C	42”	106.7cm
D	13.5”	34.3 cm
E	12.5”	31.8 cm
F	12”	30.5 cm



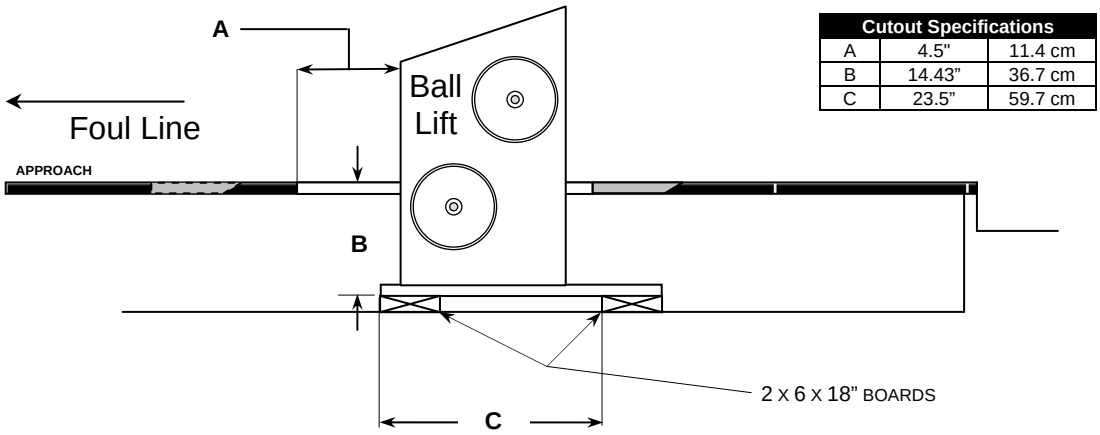
* Underlayment should be cut narrower in area of the rear trap door.

Figure 2, Approach Opening Layout – Top View

2. If not installed earlier, attach the rail adapter plate (049-006-349), which is included with the underlane track, to the end of the underlane track using two 1/4 lock washers (951-148-002) and ¼-20 x ½ hex screws (809-849-085) (see Figure 5) Tighten securely.

3. Place the first 2 x 6 board on the subfloor so that it is positioned perpendicular to the underlane track under the rail adapter plate. This is just an approximate location.

4. Place the other 2 x 6 x 18-inch board on the subfloor parallel to the first board with its front edge 23.5 inches (59.7 cm) from the first board's front edge (see Figure 3).



Cutout Specifications		
A	4.5"	11.4 cm
B	14.43"	36.7 cm
C	23.5"	59.7 cm

Figure 3, Ball Lift Installation – Side View

5. The Ball Lift assembly is shipped configured for 230-volt operation and, if necessary, must be reconfigured for 115-volt operation. To configure the Ball Lift motor for 115-volt operation, remove the motor's electrical cover plate and reconnect the wiring for low voltage operation as shown in the wiring diagram on the tag attached to the motor's power cord. Reinstall the cover plate. Instructions for configuring the controller and the ball rack blower motor for 115 volts are provided on Page 19.

6. Lower the Ball Lift mechanism into the opening and onto the two 2 x 6's. Position the Ball Lift in line with the underlane track so that the holes in the adapter plate on the end of the underlane track align with the four studs on the Ball Lift base plate.

7. Center the 2 x 6 boards under the bolt holes in the Ball Lift base plate and check the Ball Lift for level side to side and front to back. Use shims from the shim pack (610-494-444), as necessary.

8. Measure the distance from the underside of the Ball Lift base plate to the top surface of the approach. This distance should be 14-7/16 inches (36.7 cm). If necessary, add or remove shims, plane the 2 x 6 boards, etc. Maintain the unit level side to side and front to back.

9. Drill four 7/16-inch (11-mm) clearance holes through the shims and 2 x 6 boards using the base plate mounting holes as a guide.

10. Drill four 5/16-inch (8-mm) holes in the concrete subfloor to a depth that is at least 5/8-inch (16-mm) deeper than the estimated screwbolt embedment using the previously drilled clearance holes as a guide. Clean out loose material from the holes.

11. Anchor the Ball Lift to the subfloor using four 8-mm x 100-mm screwbolts (709-013-060), 7/8-inch o.d. flat washers (948-964-142), and 1½-inch o.d. flat washers (945-867-242). Apply moderate downward pressure to the screwbolts and do NOT exceed 50 ft-lbs. (68 newton-meters) torque. See Figure 4.

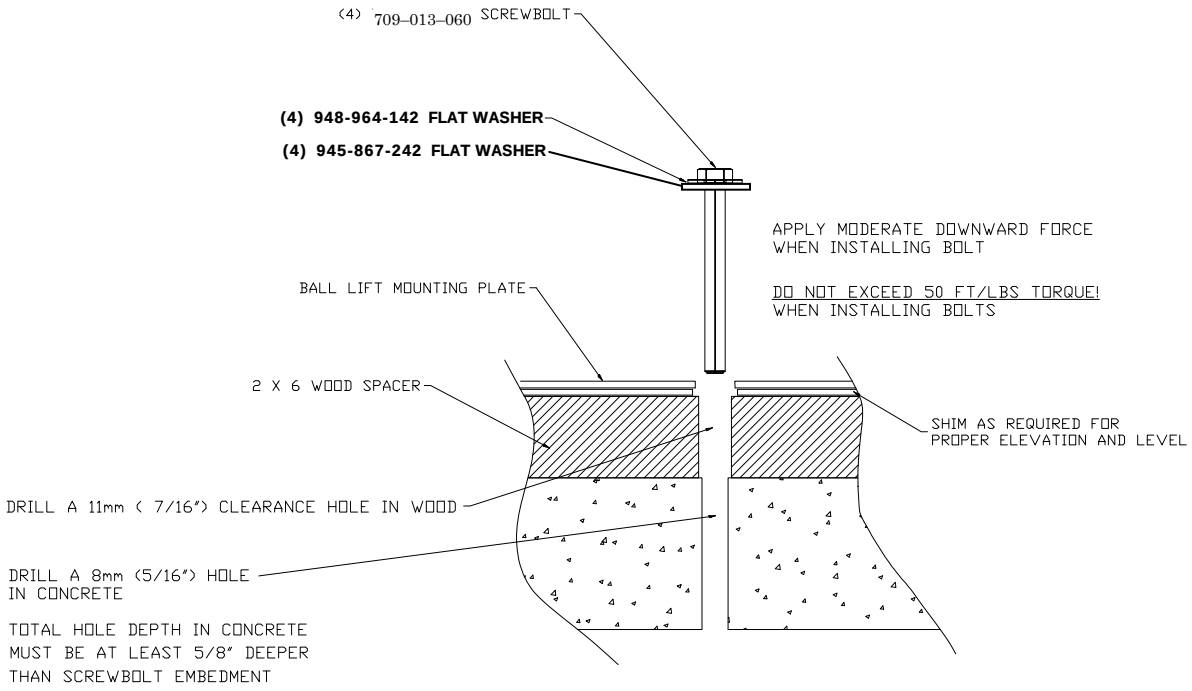


Figure 4, Ball Lift Mounting Requirements

12. Secure the adapter plate to the Ball Lift base plate studs using four 11/32 washers (948-722-111) and 5/16-18 nylon insert lock nuts (839-057-002) as shown in Figure 5. Track alignment is critical for the smooth transition of the ball to the Lift. Adjust the track as necessary to ensure that the track is centered between the Ball Lift side plates. Shim the adapter plate as needed to obtain a smooth, level track joint.

13. If necessary, trim off any excess plastic track using a utility knife.

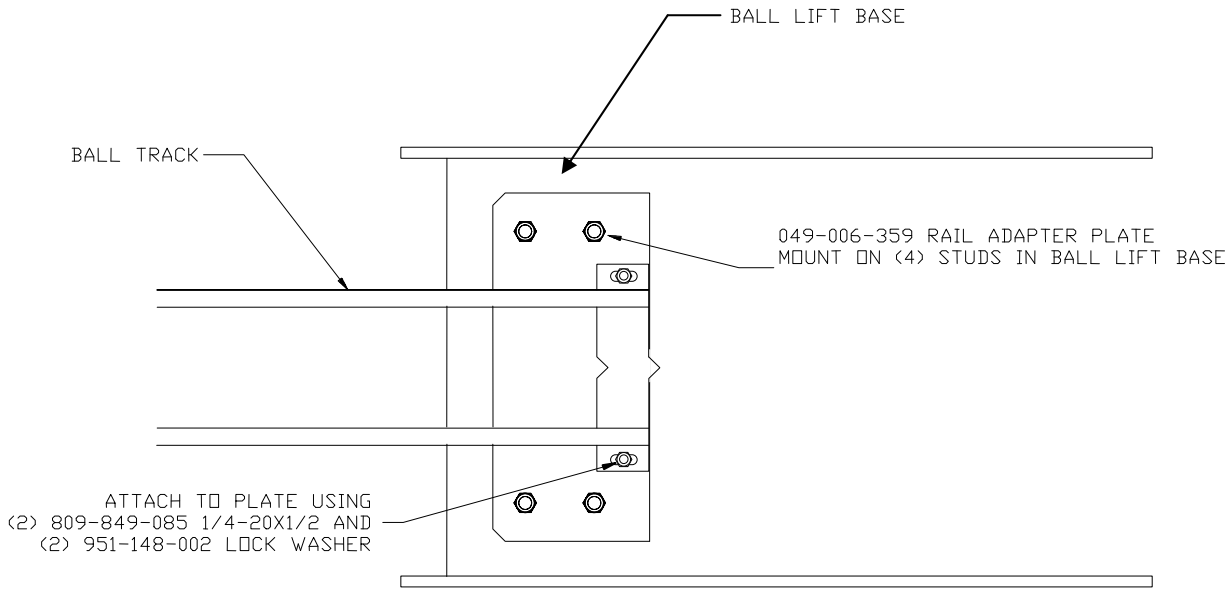


Figure 5, Track to Lift Connection

INSTALLING THE BALL STOP

The ball stop allows the ball to move down the track to the Ball Lift, but prevents the ball from moving backwards past the ball stop should the ball fail to be handled properly by the Ball Lift. The ball stop should be placed in alignment with the front trap door as shown in figure 2.

1. Assemble the ball stop as shown in Figure 6. Place the tube through the hole in the plastic stop and then position the stop between the ears of the metal bracket. Secure the plastic stop using the 5/16-18 x 2¼-inch bolt (809-857-365) and lock nut (844-057-002). The longest side of the plastic stop must be placed against the metal bracket and should hang down as shown in Figure 6.

2. Mount the Ball Stop to the first leveling strip forward of the Ball Lift as follows:

   a) Center the plastic stop over the ball track with the centerline of the 2¼-inch bolt exactly 10 inches (25.4 cm) above the track's mounting plate.

   b) Mark the leveling strip through the holes in the ball stop bracket, and drill two 7/32-inch pilot holes for mounting the Ball Stop at the marks on the leveling strip.

   c) Mount the Ball Stop to the leveling strip using 5/16 x 1½-inch lag screws (810-556-240) and flat washers (948-761-112).

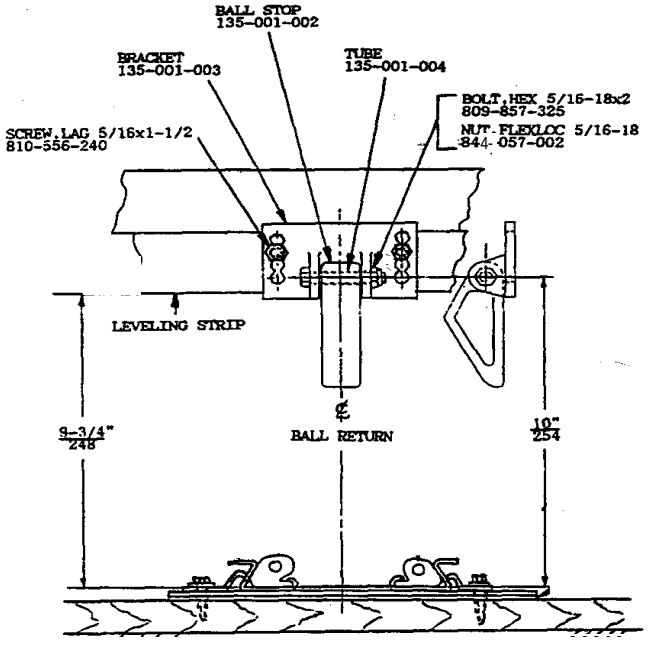


Figure 6, Ball Stop Installation

INSTALLING THE HOOD ASSEMBLY

The Options Hood Assembly, 252-002-223 [black] or 252-002-226 [grey], is a made up of a base, a hood, a mounting bracket, and an access panel, as shown in Figure 7.

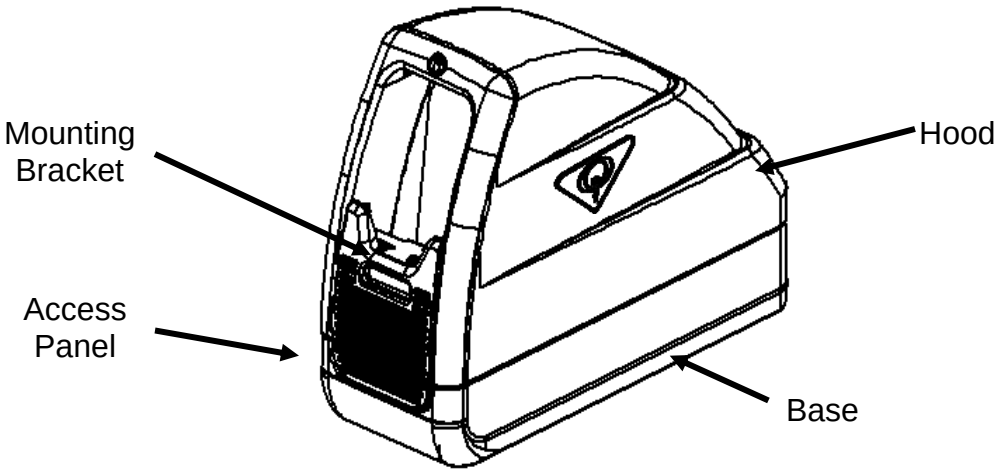


Figure 7, Options Hood Assembly

NOTE: The components come assembled and must be separated for installation. Before separating the components, mark the foul-line end of the base. DO NOT remove the mounting bracket from the access panel.

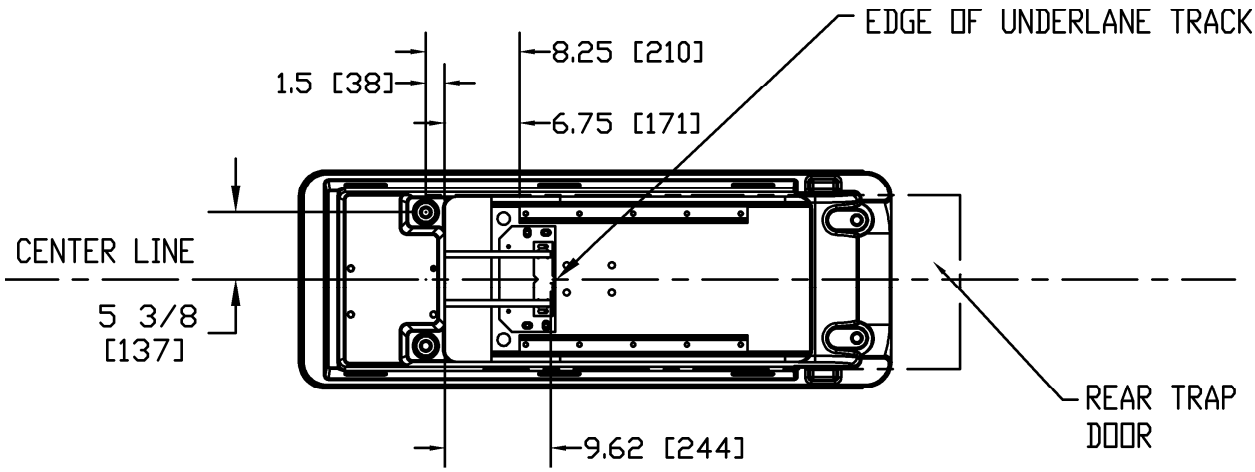


Figure 8, Options Base Installation

INSTALLING THE BASE

1. To install the base, measure 8.25” from the side plate of the ball lift towards foul line and draw a line perpendicular to the centerline. Mark 5-3/8” as shown in figure 8 on either side of the centerline on the line, and drill 5/16-inch pilot holes at the two locations.
2. Position the base (with the foul-line end toward the foul line) over the cutout so the centerline of the base aligns with the centerline you drew on the approach.
3. Ensure the base is parallel to the Ball Lift and secure the base to the approach using 2 of the 4 lag screws (810-564-480) and washers (945-867-242) provided.
4. Mark the locations for the back holes, and drill 5/16-inch pilot holes in the rear trap door at the marked locations. Secure the base with the remaining lag screws and washers.
5. The hood is secured to the base by tabs on the base that snap into slots on the hood. The hood is attached to the access panel which, in turn, is held in place by a three-way bracket that connects the ball rack, ball lift, and hood together. Wait until after the control box and ball rack are installed to complete the hood installation.

INSTALLING THE BALL LIFT CONTROL BOX

1. The control box is to be installed inside the base. To install the control box, remove the screws that secure the cover of the control box and remove the cover.
2. Position the control box on the base as shown in figure 9 and fasten it with the four screws (809-849-165) and washers (951-148-008) provided.
3. Connect the cables to the control box as indicated in the drawing inside the control box cover. Refer to the **“Connecting the Wiring”** section of this manual.
4. Reinstall the control box cover.
5. Route all wires along the inside of the hood base away from any moving parts and install the hood.

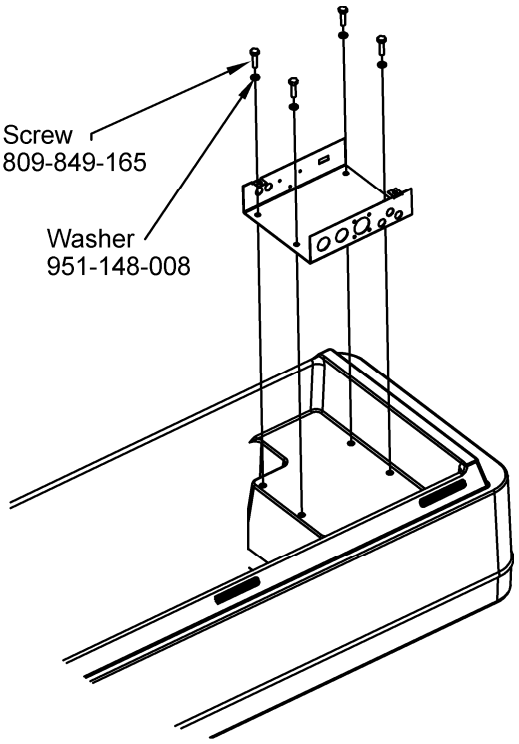


Figure 9,
Control Box Installation

INSTALLING THE BALL RACK AND OPTIONAL LOWER RACK

NOTE: The Ball Rack and Pedestal Leg are shipped in separate boxes.

1. Attach the pedestal leg (259-001-028) to the underside of the Ball Rack's center cross member using two 5/16-18 x 3/4 hex screws (7010-003118-075) and lock washers (951-156-002). See Figure 10.

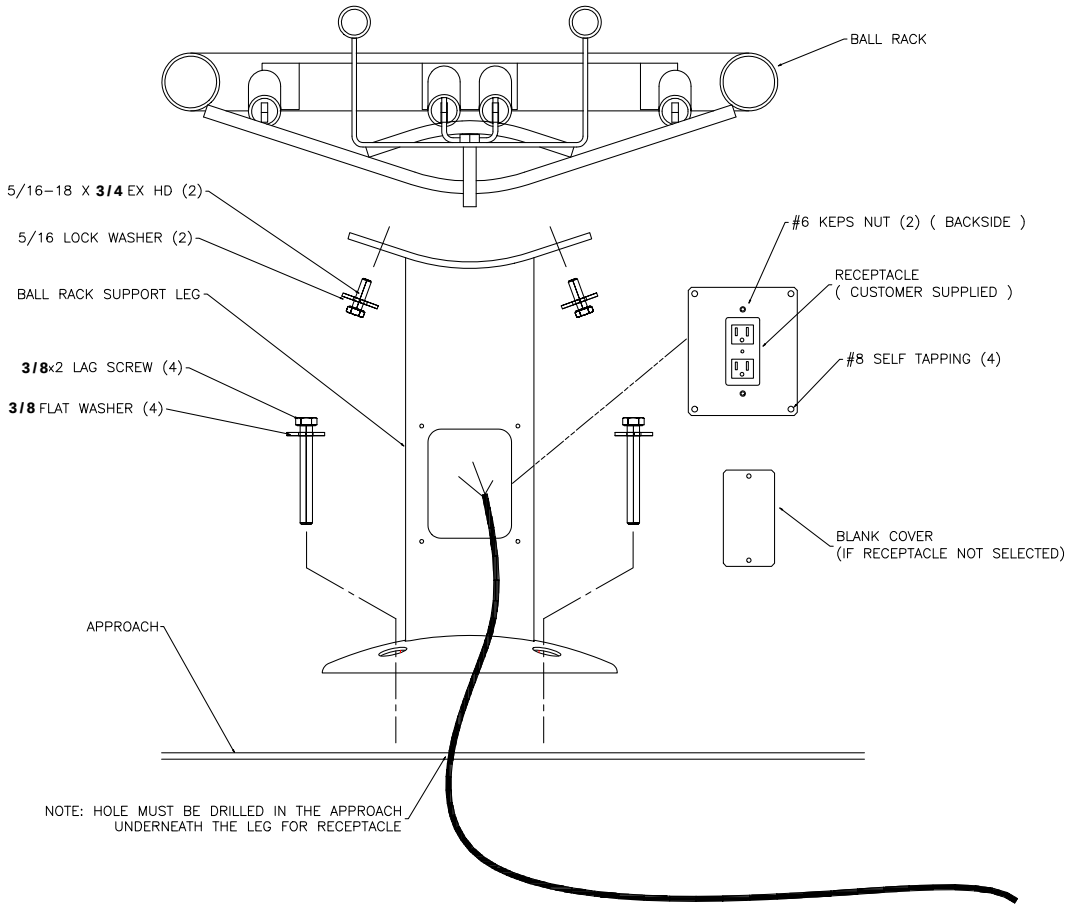


Figure 10, Leg Assembly to Rack Installation

2. The optional lower rack can be installed now or purchased and installed later. The lower rack is available as follows:

   259-001-055, Options Lower Rack & Brace, with hardware

   259-001-056, Options Lower Rack & Brace, without hardware

   612-520-092, Options Lower Rack Hardware Kit

3. Install the lower rack brace (259-001-038) to the underside of the ball rack's cross member that is closest to the blower using 5/16-18 x 1 button head cap screws (808-557-160) and split lock washers (951-156-002).

4. Install the lower rack (259-001-052) so that the lower rack straddles the pedestal and mounts to the underside of the lower rack brace (see Figure 11).
   a. Attach the lower rack to the pedestal leg using a 5/16-18 x 6-1/2 hex screw (810-157-001), two flat washers (948-722-111), one per side, and a 5/16-18 hex lock nut (844-057-002).
   b. Attach the lower rack to the lower rack brace using 5/16 -18 x 1-1/4 hex screws (809-857-205) and split lock washers (951-156-002).

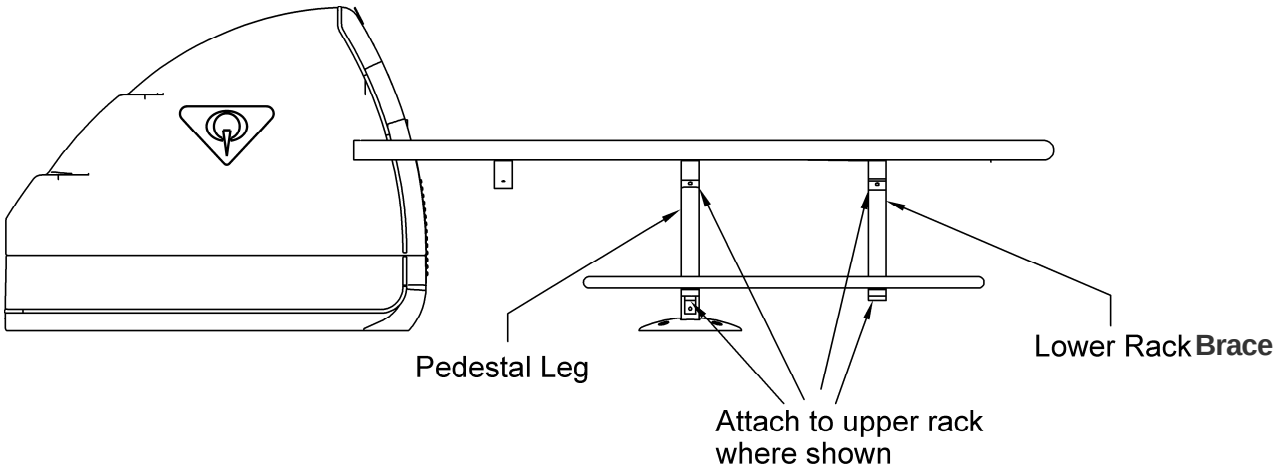


Figure 11, Assembled Ball Rack

5. Install the rack to the Ball Lift by completing the following steps and referring to Figure 12.
   a) Install the grommet and bushing from the hardware bag in the hole in the Ball Lift's ball rack mounting bracket.
   b) Insert the hex cap screw through the 1/8-inch thick washer, through the hole in the ball rack's mounting bracket, and through the grommet bushing in the Ball Lift's rack mounting bracket. Add the ¼-inch thick washer and secure with the ½-13 hex lock nut just enough to stay on the screw.
6. Align the centerline of the rack assembly with that of the Ball Lift and mark the locations for drilling the four pilot holes for securing the rack assembly to the approach. Use the holes in the base of the pedestal as a template.

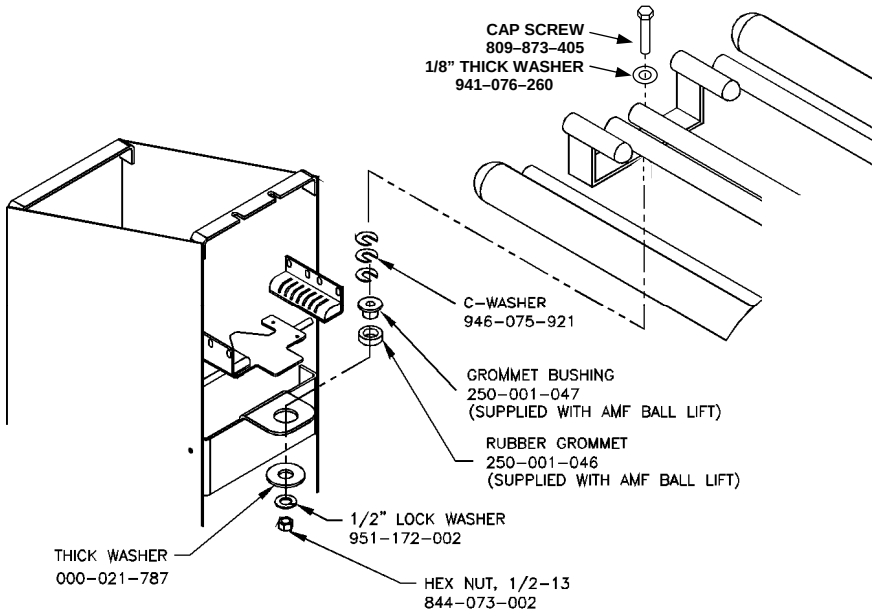


Figure 12, Rack to Ball Lift Attachment

7. Slide the rack assembly to one side and drill four 9/32-inch pilot holes on the marks made in the previous step.
   a. This is also the time to drill a hole for the power cable to the duplex receptacle on the pedestal if that option is being installed. Drill a hole of the appropriate diameter in the approximate center of the hole pattern drilled in step 7.
   b. Route the electrical cable from under the approach and out the hole that was drilled in step 7a.
8. Slide the rack assembly into place and secure it to the approach using four 3/8 x 2-inch lag screws (810-556-420), lock washers (951-164-002), and flat washers (948-964-142). If an electrical cable is present, route it up into the pedestal leg.
9. Cover the four openings in the base of the pedestal using the black button plugs (248-001-509) provided.
10. Install the duplex receptacle in the opening provided on the pedestal in accordance with local electrical codes. (Refer to Figure 10.)
11. Place a level along the length of the top rail of the ball rack (either side) and check for level. If low at the Ball Lift, add C-washers (965-075-921).
12. Verify that the rack is leveled correctly by placing a bowling ball with no initial speed onto the center rails approximately mid way along the rack. The ball should move toward the end of the rack and pick up enough speed to fall onto the side track.

FRONT ACCESS COVER INSTALLATION

1. Insert the access panel so that the slot of its mounting bracket (252-002-133) straddles the hex cap screw and is positioned between the rack and lift mounting brackets, under any washers, and is resting on the grommet bushing as shown in Figure 13.

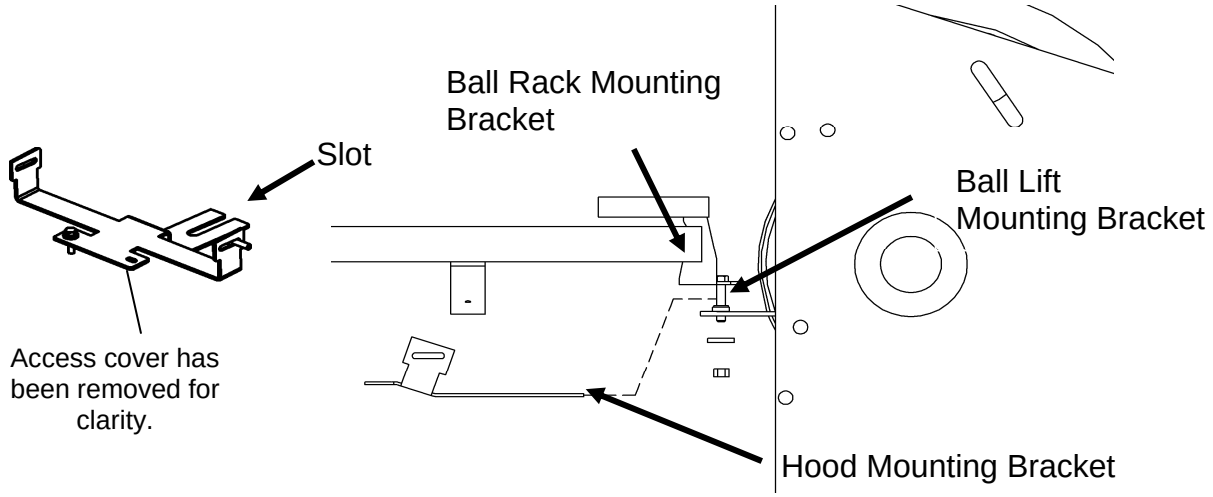


Figure 13, Ball Lift to Ball Rack to Hood Attachment

2. Align the holes in the mounting bracket with the holes in the side of the hood, as shown in Figure 14.

3. Secure the bracket to the hood with the screws (809-849-165), split washers (951-148-008), and flat washers (948-753-102). Firmly tighten the screws.

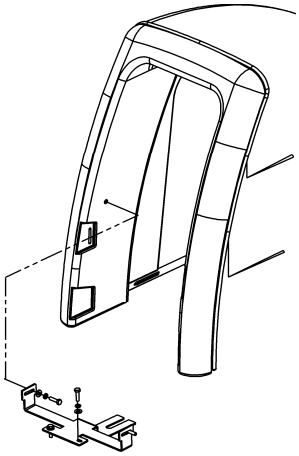


Figure 14, Mounting Bracket to Hood Attachment

4. Remove the access cover from the mounting bracket. Set aside the screws (809-849-165), split washers (951-148-008), and flat washers (948-753-102).

5. Reach through the opening under the mounting brackets and firmly tighten the 1/2-13 hex nut onto the hex cap screw.

6. Reattach the access cover to the mounting bracket with the hardware that was set aside.

7. Firmly tighten the nuts and screws for all connections and attachments.

8. Remove any installation markings that remain on the approach surface.

Connecting the Wiring

WARNING

Before wiring the Options Ball Return, all power to the unit must be locked out and tagged out at the main breaker box or serious injury could result.

CAUTION

To avoid equipment malfunction or damage, the power supply must be rated for the appropriate voltage and current.

1. Verify that the power to the unit and the associated pinspotters is turned **OFF** at the main circuit breaker.

2. Verify that the circuit voltage and current ratings correspond to those of the Ball Lift. All Ball Lift assemblies are shipped configured for 230-volt operation and, as necessary, must be reconfigured for 115-volt operation as described in this section. (Reconfiguring the motor for 115-volt operation is discussed on Page 7.)

3. Attach the flexible conduit of the power supply cable (234-001-330), which is supplied with the Ball Lift, to the applicable distribution box. Connect the wires in accordance with local electrical codes. For electrical systems containing a neutral wire, such as 115-volt systems in the United States, connect the green and yellow wire to ground, the blue wire to neutral, and the brown wire to line.

4. Remove hood and the cover from the Ball Lift control box, and then remove a lock nut from the center and left grounding (earthing) lugs in the control box.

5. Route the power supply cable's flexible conduit up through the base to the control box at the "AC IN" location (see Figure 15).

6. Attach the ring terminal on the green and yellow ground wire of the power supply cable to the leftmost grounding (earthing) lug inside the control box using one of the lock nuts that was removed in Step 4.

7. Cut off the two spade terminals from the brown and blue power supply wires, and strip approximately 1/4-inch of insulation from the ends of these wires.

8. Connect the blue wire (neutral) to terminal #6 on junction block **J3** and the brown wire (line) to terminal #1 on **J3** (see Figure 15).

9. Strip approximately 1/4-inch of insulation from the ends of the brown and blue blower wires (the blower wires exit the end of a ball rack's rail assembly). Route this cable into the control box (see Figure 15). Tighten the cable clamp to secure the cable to the box.

10. Connect the blower's green and yellow ground wire to the center grounding (earthing) lug inside the control box. Secure it using the remaining lock nut that was removed earlier.

11. Connect the blue blower wire to terminal #5 on junction block **J3** and the brown blower wire to terminal #3 on **J3**.

12. Depending on the specific pinspotters in your bowling center, connect the pinspotter's control wires to junction block **J1** as shown in Figure 15.

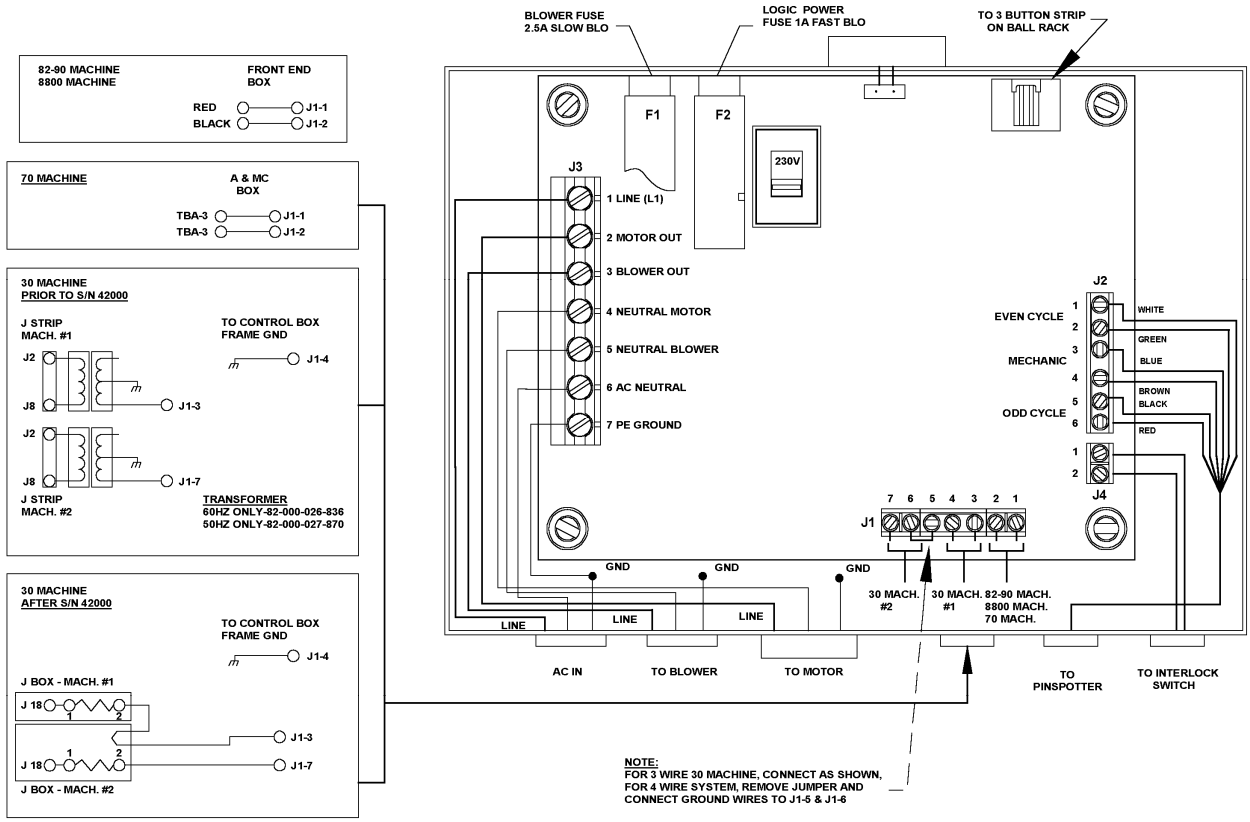


Figure 15, Electrical Connections

13. Plug the connector on the wire harness coming from the 10th frame pushbuttons and the mechanic call pushbutton on the ball rack into the six-pin connector on top of the control box. When replacing an older style control box (250-001-014) with the new enhanced control box (250-001-850), it is necessary to install a short adapter cable (282-000-064) between the control box and the wire harness.

14. Route the wires for the mechanic call and pinspotter cycle control (10th frame) circuits coming from the pinspotters into the control box, and connect them to junction block **J2** as follows:

a. Connect the **even** pinspotter's cycle control (10th frame) wires to terminals #**1** & #**2**.

b. Connect the mechanic call control wires to terminals #**3** & #**4**.

c. Connect the **odd** pinspotter's cycle control (10th frame) wires to terminals #**5** & #**6**.

15. Secure all of the wires connected to junction blocks J1 and J2 to the inside of the control box using the cable clamps provided.

16. Verify that the voltage selector switch on the control board in the Ball Lift control box is selected to the correct voltage – down for 230 volts and up for 115 volts – and install the control box cover.

17. Remove the five screws from the underside of the blower cover, remove the cover, and verify that the blower is wired for the voltage of the circuit connected to the ball lift. There are two 5-pin connectors on the wire harness leading to the blower. One connector is wired for 115-volt power and the other for 230-volt power. Check the tag by each connector and, if necessary, change the connector that is plugged into the blower to match the voltage of the power supply.

18. Reinstall the blower cover and the ball lift hood.

Electrical Ratings

The Options Ball Lift controller, motor, and blower can be configured for 230-volt or 120-volt operation at either 50 or 60 hertz, as described elsewhere in this manual. Always configure all ball lift electrical components to match the voltage supplied to the machine. Power to the lift must be installed in accordance with local electrical codes and must be capable of meeting the following requirements. This unit is designed for indoor use only.

230-Volt operation: single phase, 50 or 60 Hertz, 5 Amps
120-Volt operation: single phase, 50 or 60 Hertz, 10 Amps

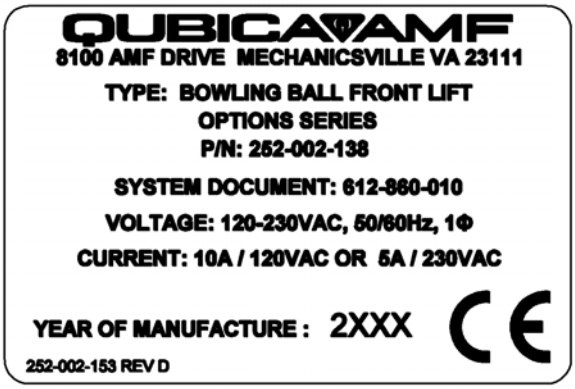


Figure 16, Nameplate Data

SETUP AND TESTING

After completing the installation, perform the following steps to ensure proper operation.

1. Turn on power at the main circuit breaker. Turn on one of the associated pinspotters, and verify that the beeper on the ball lift control box emits three one-second beeps before the Ball Lift starts.

CAUTION

The Ball Lift contains belts, pulleys, and other moving parts that can present a grabbing and pinching hazard. Keep hands, loose clothing, and jewelry away from moving parts.

2. Check the operation of the Ball Lift's safety switch by carefully depressing the V-wheel guard assembly. The Ball Lift motor should immediately stop and the control box beeper should sound an alarm by emitting a continual beeping sound**. NOTE: on Model 8800 pinspotters equipped with the horizontal ball return (HBR), any time the Ball Lift turns off, the horizontal ball return's motor will also turn off. On XL*i* pinspotters, the back end motors will turn off.**

3. Reset the V-wheel guard so that the wheel on the safety switch fits into the detent in the actuator on the end of the guard's pivot rod. The Ball Lift should not restart.

4. To silence the audible alarm, SIMULTANEOUSLY press all three buttons (the two 10th frame buttons and the mechanic call button) on the end of the ball rack. The beeping should stop, but the Ball Lift should not restart. Approximately every 30 seconds the beeper will emit a single beep as a reminder that the Ball Lift is not in the NORMAL Mode.

5. To reset the emergency stop condition and restart the Ball Lift, SIMULTANEOUSLY press both 10th frame pushbuttons on the end of the ball rack. The beeper should emit three beeps and the Ball Lift should restart. (The HBR motor, as applicable, should also restart.)

6. The Ball Lift can be placed in a "Forced-OFF" condition. This will turn off the Ball Lift even though one (or both) associated pinspotters is (are) operating. To place the Ball Lift in a "Forced-off" condition, SIMULTANEOUSLY press the mechanic call button and the EVEN lane's 10th frame pushbutton on the end of the ball rack. The Ball Lift should stop without delay. The beeper will emit a beep every 30 seconds as a reminder that the Ball Lift is not in the NORMAL Mode.

7. To return the Ball Lift to normal from a "Forced-OFF" condition, SIMULTANEOUSLY press both of the 10th frame pushbuttons on the end of the ball rack. The Ball Lift's beeper should emit three beeps and the motor should restart.

8. Turn off the pinspotters and wait for the Ball Lift to turn off. **There is a built-in time delay of 30 seconds between the time the pinspotter back ends turn off and the Ball Lift turns off. This allows any bowling balls in the system to return through the Ball Lift to the ball rack.**

9. The Ball Lift can be placed in a "Forced-ON" condition allowing the Ball Lift to operate even when both pinspotters are off. To place the Ball Lift in the "Forced-ON" condition, SIMULTANEOUSLY press the mechanic call button and the ODD lane's 10th frame pushbutton on the end of the ball rack. The Ball Lift's beeper will emit a single beep and the ball lift will start. The beeper will emit a beep every 30 seconds as a reminder that the Ball Lift is not in the NORMAL Mode.

10. To return the Ball Lift to normal from a "Forced-ON" condition, SIMULTANEOUSLY press both of the 10th frame pushbuttons on the end of the ball rack. The Ball Lift should turn off.

11. Turn on the pinspotters and return a few balls through the Ball Lift. Adjust the transition brackets, as needed, to obtain a smooth transfer of the ball to the ball rack.

12. Press each 10th frame (cycle) pushbutton on the ball rack and verify that the corresponding pinspotter cycles properly.

13. Verify that the blower is functioning properly (The blower turns on and off together with the Ball Lift motor).

14. Press the mechanic call button and verify a signal is received at the back of the pinspotter. If pit signal kit is installed, light will come on. If the new XL*i* chassis are used in the center, stack light will alternately flash green and red.

15. If not done previously, install the hood and access cover assembly. When these tests are satisfactory, the Ball Lift may be placed into service.

OPERATION

The Operation of the Options Ball Lift is very simple. The Ball Lift starts when you start either of the two associated pinspotters, and will continue to run for 30 seconds after both pinspotters are turned off to allow any bowling balls in transit to pass through the lift and return to the ball rack.

OPERATIONAL SAFETY

There is a safety switch built into the Ball Lift to protect against someone placing a hand inside the lift and having it grabbed by the V-wheel and pulled further into the machinery. The switch is actuated by a guard that when moved from its normal position will actuate the safety switch stopping the Ball Lift. **EVEN THOUGH THIS SAFETY SWITCH IS DESIGNED TO PREVENT INJURY, NEVER PLACE A HAND INSIDE THE MECHANISM WHILE IT IS IN OPERATION.**

A moving bowling ball contains a considerable amount of energy and can appear at the outlet opening of the Ball Lift with little or no warning. Keep hands away from the exit opening to prevent injury.

There are two urethane transition pads at the mouth of the Ball Lift's exit opening. When adjusted properly, these pads reduce the forward momentum and rotation of the ball so that it enters the rack section with minimal energy. The task that these pads must perform has been compounded by the advent of new bowling ball materials and technology. These pads must be adjusted to assure that the lightest bowling balls as well as the new "reactive" bowling balls exit the lift satisfactorily. A slick, oil coated, heavy bowling ball may still have significant momentum after exiting the Ball Lift. For this reason, **a pinching hazard can exist when two bowling balls come together on the rack. KEEP HANDS CLEAR OF THE BALL RACK UNTIL THE RETURNING BALL COMES TO REST.**

BALL LIFT CONTROLS

Ball Lift operation is normally controlled by the operation of its associated pinspotters. Whenever either pinspotter is in operation, the Ball Lift is in operation. When both pinspotters are turned off, the Ball Lift turns off after a 30-second time delay, which allows any bowling balls that have been played to return to the ball rack.

The Ball Lift can also be controlled manually through the operation of the two 10th frame pushbuttons and the mechanic call pushbutton on the end of the ball rack. Normally, when any one of these buttons is pressed, it initiates the operation of the associated equipment; that is, the 10th frame switches cause the associated pinspotter to spot or respot pins, and the mechanic call button turns on a light, (optional pit signal or XLi chassis is needed) alerting the center mechanic to an equipment problem. Operating the three pushbuttons simultaneously in various combinations, however, causes the Ball Lift to function in a different manner as described below and summarized in Table 1.

The Ball Lift has several different modes of operation: **NORMAL**, **FORCED-ON**, **FORCED OFF**, and **EMERGENCY**.

NORMAL Mode allows Ball Lift Operation to be controlled by the pinspotters as discussed above. When a pinspotter is turned on, the Ball Lift beeper will emit three one-second warning beeps before starting. The Ball Lift normally starts in this mode.

FORCED-ON Operation allows the Ball Lift to be operated even though both associated pinspotters are turned off. To place the Ball Lift in the FORCED-ON condition, SIMULTANEOUSLY press the mechanic call button and the ODD lane's 10th frame pushbutton. The Ball Lift will beep once and then start. The Ball Lift will continue to emit a beep at 30-second intervals as a reminder that the Ball Lift is not in the NORMAL Mode.

To return Ball Lift operation to normal, SIMULTANEOUSLY press both of the 10th frame pushbuttons.

FORCED-OFF Operation allows the Ball Lift to be turned off without turning off the associated pinspotters. To place the Ball Lift in a FORCED-OFF condition, SIMULTANEOUSLY press the mechanic call button and the EVEN lane's 10th frame pushbutton. The Ball Lift will turn off without delay. On pinspotters equipped with the horizontal ball return (HBR), the HBR motor will turn off whenever the Ball Lift turns off. On XL*i* pinspotters, the back end motors will turn off. All these will restart when the Ball Lift restarts. While in the FORCED-OFF condition, the Ball Lift will beep once every 30 seconds as a reminder that the Ball Lift is not in the NORMAL Mode.

NOTE: The Ball Lift can be placed in the FORCED-OFF condition even if it is not currently operating, as long as control power is available. When an associated pinspotter is subsequently turned on, the Ball Lift will not start, but will continue to emit a beep every 30 seconds as a reminder that the Ball Lift is not in the NORMAL Mode.

To return Ball Lift operation to normal, SIMULTANEOUSLY press both 10th frame pushbuttons. If a pinspotter is in operation, the Ball Lift will beep three times before starting.

EMERGENCY Mode is activated by the operation of the safety interlock, which is designed to minimize injury should someone place a hand in the Ball Lift's outlet opening during operation. When the Ball Lift's safety interlock is actuated, the Ball Lift immediately turns off and emits a continual beeping alarm (the back end motors on XL*i* pinspotters, as well as the HBR motor on 8800 pinspotters, also turn off). Removing the hand and resetting the interlock's V-wheel guard will not reset the Ball Lift's operation to normal. This is to prevent the Ball Lift from inadvertently restarting should the V-wheel guard be reset while removing the hand from the machine.

To silence the audible alarm, SIMULTANEOUSLY press all three pushbuttons on the end of the ball rack. The Ball Lift will beep at 30-second intervals as a reminder that the Ball Lift is not in the NORMAL Mode.

To return the Ball Lift to normal operation, verify that the outlet opening has been cleared, reset the V-wheel guard, and then SIMULTANEOUSLY press both of the 10th frame pushbuttons.

Table 1, **Ball Lift Operation**

Pushbutton Designation

ODD Lane's 10th Frame Button = 1
Mechanic Call Button = 2
EVEN Lane's 10th Frame Button = 3

***Pushbuttons must be pressed simultaneously; otherwise, the normal function of the button will be executed.**

Mode	To Initiate	Audible Warning	To Return to Normal Operation
Normal	Startup Default	3 one-second beeps	N/A
Forced-ON	Press 1 & 2*	1 one-second beep plus beep every 30 seconds	Press 1 & 3*
Forced-OFF	Press 2 & 3*	beep every 30 seconds	Press 1 & 3*
Emergency	Actuate Safety Interlock Switch	continual beeping or 1 beep every 30 seconds when silenced	To Silence Alarm: Press 1, 2, & 3* To Return to Normal: Press 1 & 3*

OTHER FEATURES

The ball rack is designed to stagger the balls as they return, first to the left, or odd, lane and then to the right, or even, lane. This arrangement allows more bowling balls to be accommodated on the rack when compared to a single, straight-line design while still allowing easy access from either side of the rack. This is accomplished by having the ball exit the Ball Lift on the center two rails of the ball rack and then deflecting the ball to the left set of rails when it touches the semicircular deflector that is molded into the blower housing at the end of the rack. Subsequent balls are deflected to the opposite side of the rack when they contact an existing ball since contact is made "off center" due to the position of the existing ball. The rails have a slight downward slope to help maintain the momentum of the ball and assure adequate deflection energy. There are optional storage racks below the main ball rack for the storage of additional bowling balls.

There is also a blower built into the end of the ball rack that operates continuously when the Ball Lift is in operation.

SERVICE

Whenever Ball Lift repair or maintenance is needed, check for any applicable Service Bulletins at www.Qubicaamf.com. Click on the *Support* tab, and then select the *Tech Support Customer Portal* window.

The Ball Lift requires very little maintenance. All of the ball bearings on the lift and in the motor are sealed and lubricated for life. There are several wear items described below that should be monitored periodically and replaced as necessary. The most critical factor in assuring long and trouble-free operation is the transition between the underlane track and the Ball Lift. The better the alignment of these components, the smoother the handoff is. Whenever banging is heard as a ball enters a lift, it is a sign that the alignment is out of adjustment and should be corrected.

The Ball Lift mounting hardware can become loose either where the track joins the lift or where the lift is secured to the subfloor. If the screwbolts that mount the lift to the subfloor are loose, tighten them, but do not exceed 50 ft-lbs. of torque. It is a good idea to inspect these attachments periodically especially for the first few months following lift installation. When the alignment is correct, the Ball Lift will be centered along a continuation of the centerline of the underlane track, and when a bowling ball is placed on the track where it joins the lift, there will be equal clearance between the ball and side plates.

WEEKLY

- Observe the operation of each of the lifts. Wipe down the hood, ball rack, and transition blocks to remove oil and handprints. Make any necessary adjustments.

- Press the 10th frame pushbuttons and verify proper response from the pinspotters. Verify the operation of the mechanic call button. The three pushbuttons can be replaced individually. The blower housing can be disassembled for this purpose.

- With the Ball Lift running, verify that the blower is operating. If not, check the fuse located on the top of the Ball Lift control box. If the fuse is bad and blows again after being replaced, replace the blower.

MONTHLY

- Inspect the belt. Some cracks may appear after moderate use. If the cracks are very deep or the belt starts to split or delaminate, replace the belt. Each bowling center should develop a belt replacement schedule based on lineage rather than on the calendar. This method maximizes useful belt life while minimizing inconvenience to the bowler due to belt failure during play.

- With the Ball Lift OFF, check the belt tension. Using a spring gauge, you should be able to deflect the belt approximately 1/3 inch at 3.5 pounds of spring tension when pulled in the middle of the longest unsupported span. To adjust the tension, loosen the nut on the idler pulley. Slide the idler assembly along its mounting slot to either

increase or decrease belt tension. When the tension is correct, tighten the nut. During operation the belt should not slip or flap.

- Return a ball through the ball lift and observe the braking action of the transition blocks. The momentum of the ball should be significantly reduced, and the ball should not jump or bounce. Inspect the urethane transition pads. Replace them before they become so worn that they allow the bowling ball to contact metal, or if they are badly gouged or no longer function adequately to slow the ball as it exits the Ball Lift.

QUARTERLY

- Inspect the Ball Lift's upper and lower guide strips as well as the left and right side wear strips for excessive wear, especially where the ball enters the lift and where the ball transitions onto the upper guide strip. These are very long-wearing components, but occasionally one may need to be replaced. Also, replace any missing plastic rivets (938-101-005) and tighten any loose hardware.

- Inspect the upper and lower V-wheels. These items are very tough and should provide a very long life, but can be damaged from use. To replace a V-wheel, remove the three bolts that secure it to the upper or lower shaft assembly and install a new wheel in its place. Tighten the three bolts securely.

- Check the operation of the safety switch. The guard should pivot freely, and when actuated, the Ball Lift should turn off immediately and sound an audible alarm. Lubricate the pivot shaft sparingly as needed where it passes through the side plates. Reset the switch actuator and return the Ball Lift to the NORMAL Mode.

- Wipe up or vacuum out any accumulated debris. Inspect the brackets for damage and check for the smooth operation of the pulleys, bearings, etc. With the belt removed, the lower large pulley wheel should be capable of rotating independently of its associated V-wheel when turned in the clockwise direction, but should immediately lock up and rotate as a unit with the V-wheel when rotated in the counterclockwise direction. This arrangement allows the V-wheel to momentarily rotate faster than the pulley without causing stress to the drive components when a ball first enters the Ball Lift.

  For replacement part numbers, refer to the Drawings and Part Numbers section at the back of this manual.

ANNUALLY

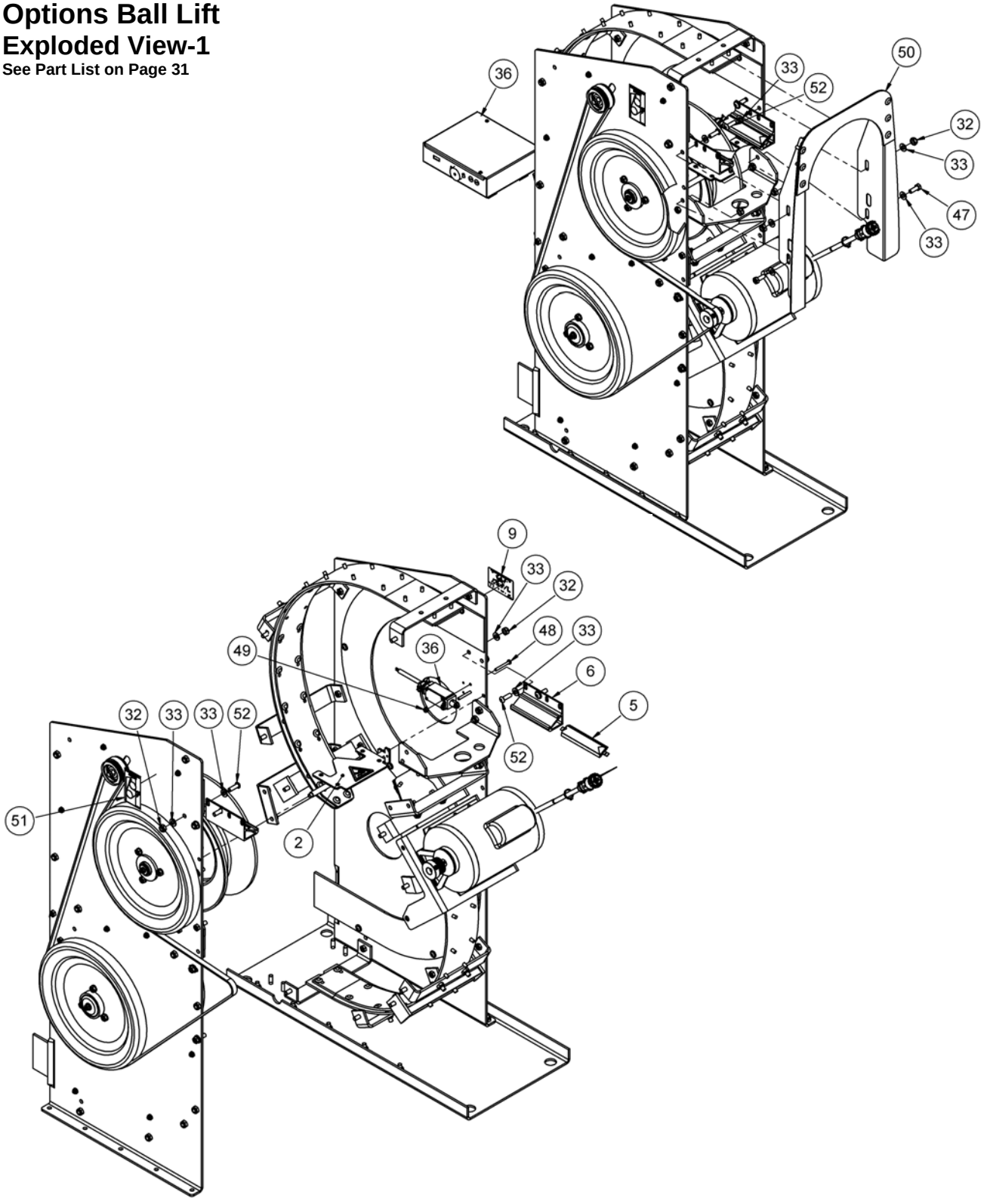
- Lock out and tag out each ball lift, remove the control box cover, and tighten the wire clamping screws on terminals J1, J2, & J4 to 2.0 in-lbs (0.23 Nm) and on J3 to 4.5 in-lbs (0.51 Nm) using a small flat-blade precision screwdriver.

Options Ball Lift

Drawings & Parts Lists

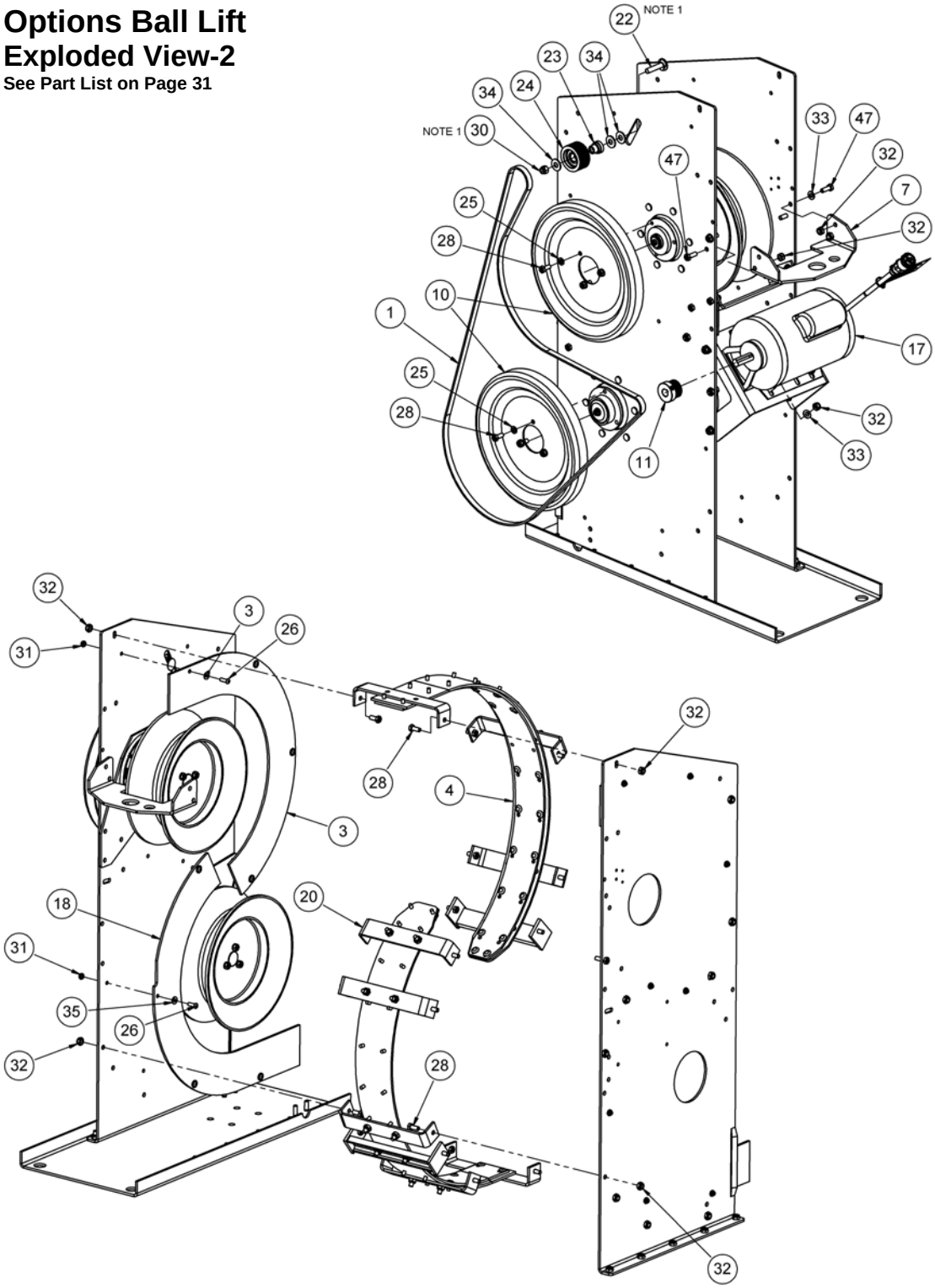
A bold item in a parts list indicates an exploded view drawing for that item is included.

252-002-138
Options Ball Lift
Exploded View-1
See Part List on Page 31

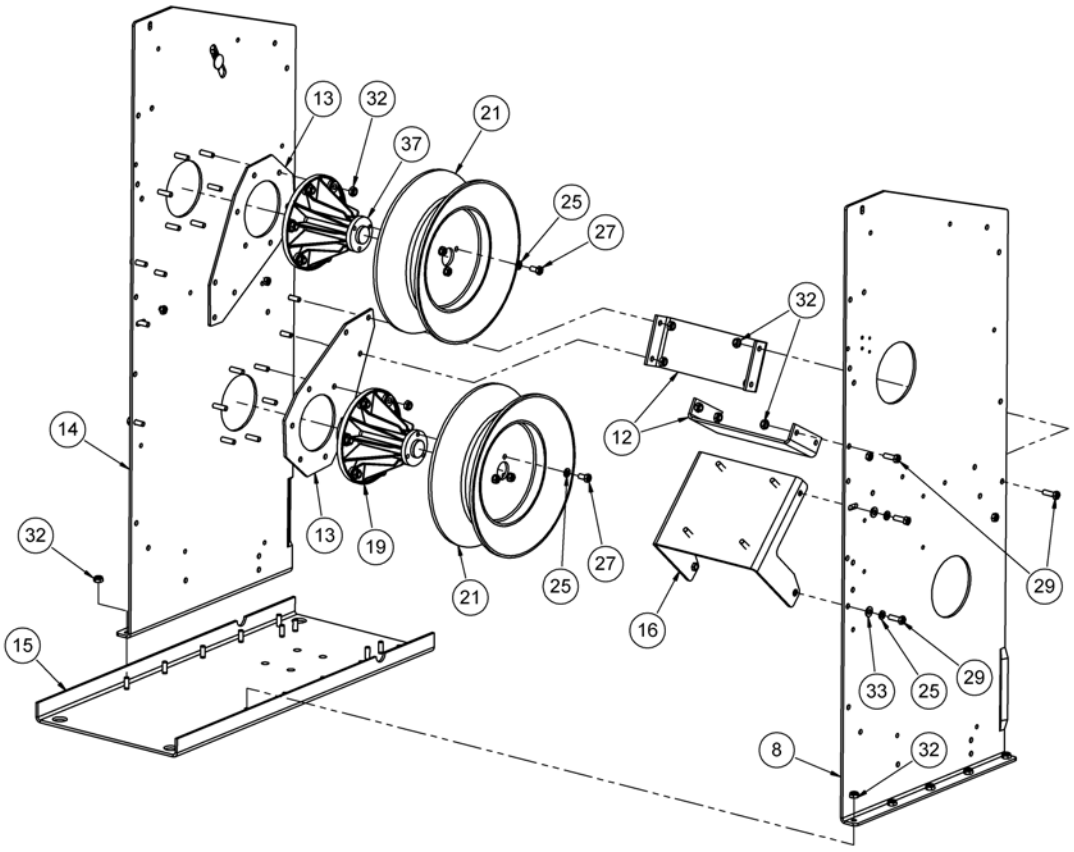


252-002-138
Options Ball Lift
Exploded View-2

See Part List on Page 31

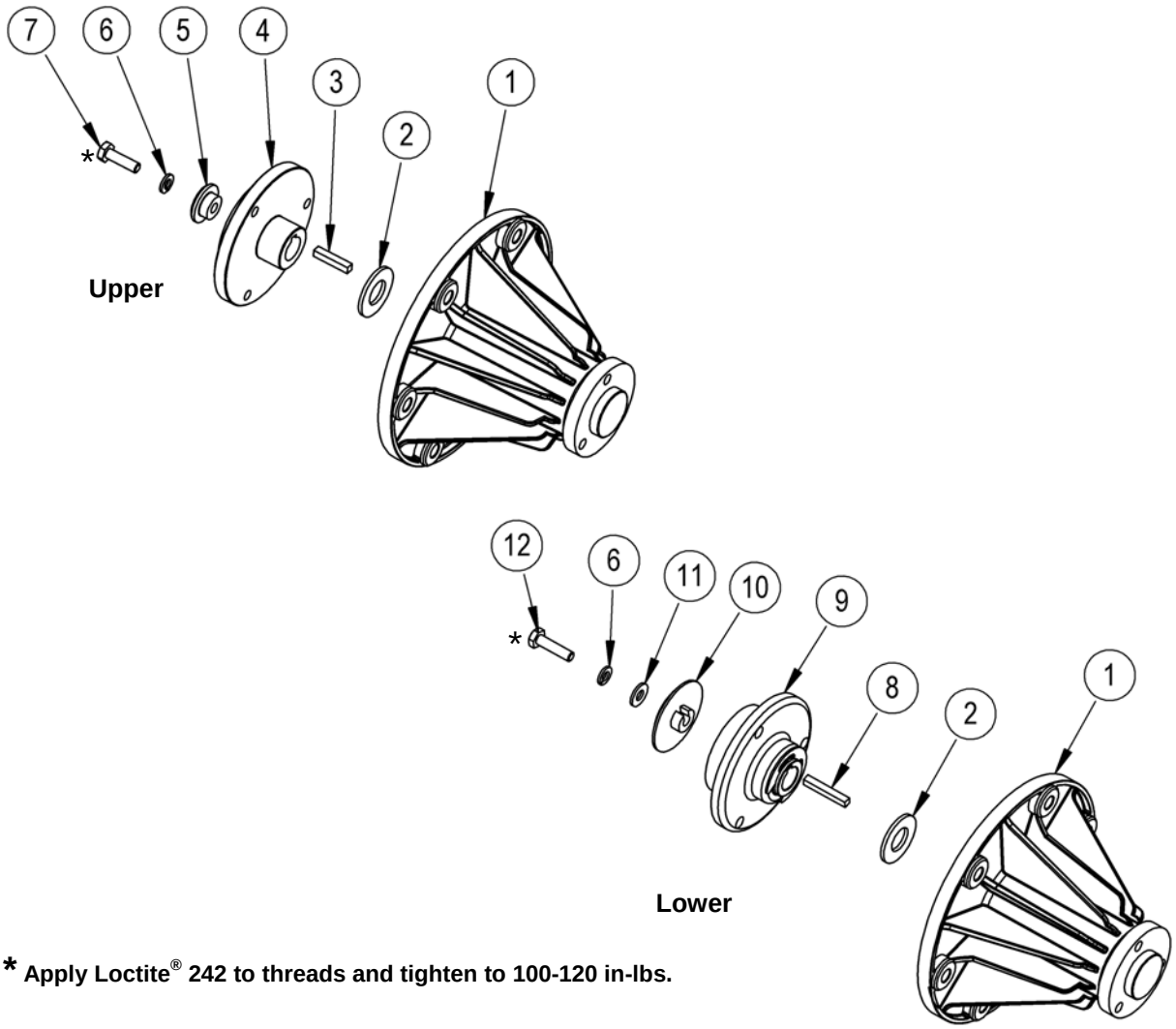


252-002-138
Options Ball Lift
Exploded View-3
See Part List on Page 31



252-002-138
Options Ball Lift

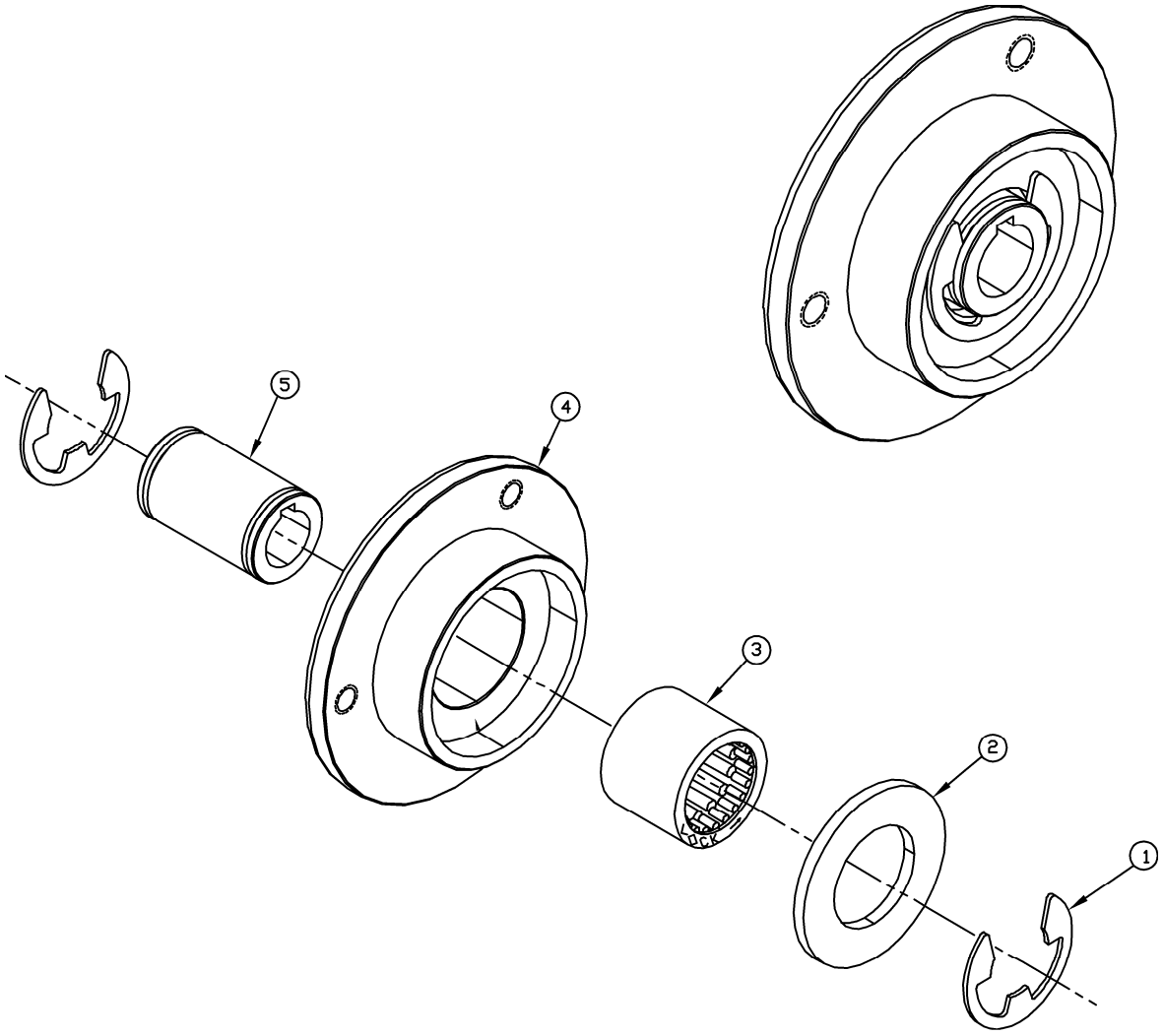
Item	Part No.	Description	Qty	Exploded View
1	250-001-131	Flat Belt	1	2
2	250-004-056	V-Wheel Guard Assembly	1	1
3	250-004-039	Upper Side Wear Strip	2	2
4	250-004-012	Upper Guide Support Assembly	1	2
5	250-001-109	Transition Pad Urethane Assembly	2	1
6	250-001-107	Transition Pad Mount	2	1
7	250-004-018	Support Bracket	1	2
8	250-004-010	Side Plate Assembly R.H.	1	3
9	252-002-153	Options Lift ID Label	1	1
10	250-001-133	Pulley Wheel, 11.75”	2	2
11	250-001-130	Pulley Assembly, Motor	1	2
12	250-004-063	Bracket	2	3
13	250-004-022	Stiffener Plate	2	3
14	250-004-024	Side Plate Assembly L.H.	1	3
15	250-004-011	Base Plate Assembly	1	3
16	250-004-058	Options Motor Mounting Bracket Assembly	1	3
17	250-001-161	Options Ball Lift Motor and Cord Assembly	1	2
18	250-004-019	Lower Side Wear Strip	2	2
19	**250-001-127**	**Lower Shaft Assembly**	**1**	**3**
20	250-004-021	Lower Guide Support Assembly	1	2
21	250-001-236	V-Wheel	2	3
22	250-001-129	Idler Stud, 1.62”	1	2
23	250-001-102	Idler Shaft	1	2
24	250-001-134	Pulley/Bearing Assembly	1	2
25	951-156-002	Washer, Split Lock, 5/16	16	2,3
26	808-549-120	Screw, Hex, 1/4 -20 x 3/4	16	2
27	809-857-100	Screw, Hex, 5/16-18 x 5/8	12	3
28	809-857-125	Screw, Hex, 5/16-18 x 3/4	28	2
29	809-857-165	Screw, Hex, 5/16-18 x 1	8	3
30	839-665-002	Nut, 3/8 -16, Flex Lock	1	2
31	838-849-007	Nut, ¼-20, Nylon Lock, Thin	18	2
32	839-057-002	Nut, 5/16-18 Flex Lock	62	1,2,3
33	948-722-111	Washer, 5/16, Flat	18	1,2,3
34	049-006-944	Washer, 3/8, Flat	3	2
35	948-648-092	Washer, .251 X .597 X .072, Flat	16	2
36	**252-002-161**	**Control Box with Safety Switch**	**1**	**1**
37	**250-001-126**	**Upper Shaft Assembly**	**1**	**3**
38-46	N/A			n/a
47	809-857-145	Screw, Hex, 5/16-18 x 7/8	4	1,2
48	812-540-267	Screw, Pan Head, 1-32 x 1-5/8	2	1
49	838-740-002	Lock Nut, Hex, 10-32	2	1
50	250-004-069	Hand Guard Assembly, Options	1	1
51	252-001-185	Label, Belt Layout Diagram	1	1
52	808-557-160	Screw, Hex Socket Button Head, 5/16-18 x 1	4	1



*** Apply Loctite® 242 to threads and tighten to 100-120 in-lbs.**

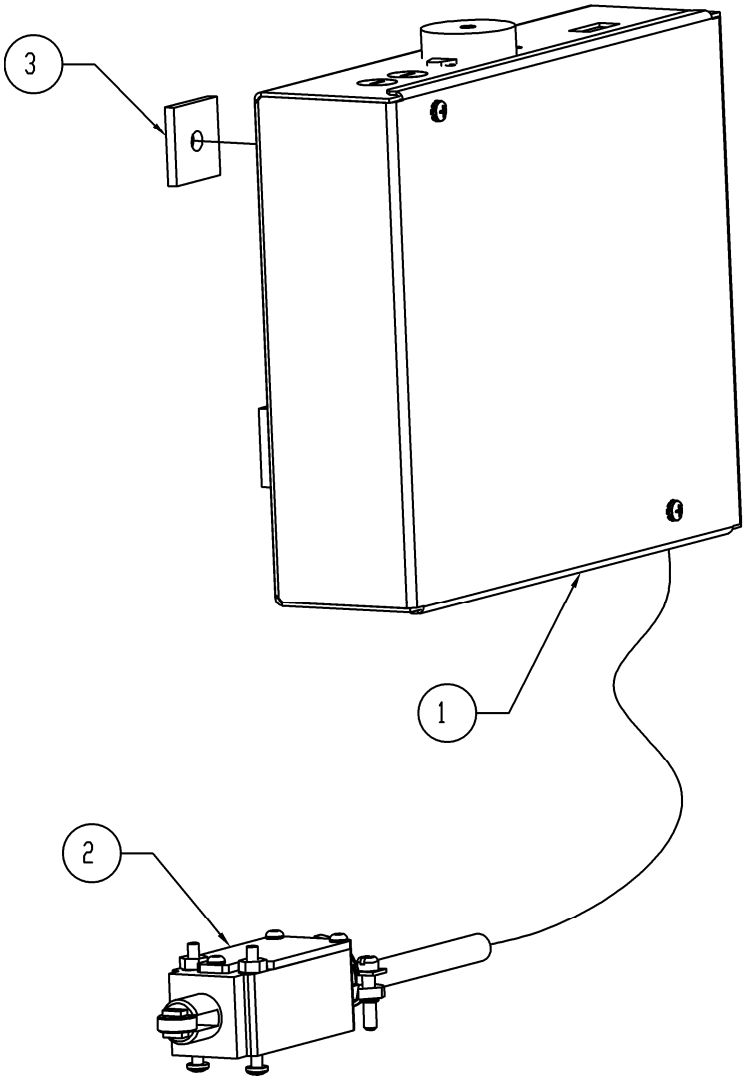
250-001-126, Upper Shaft Assembly
250-001-127, Lower Shaft Assembly

	Part No.	Description	Qty
1	250-001-128	Plastic Bell Housing	1
2	948-983-212	Flat Washer, 21/32 x 1-5/16	1
3	250-001-233	Shaft Key, 3/16 x 3/16 x 1.00	1
4	250-001-060	Hub	1
5	250-001-226	Pulley Washer	1
6	951-148-002	Washer, ¼, Split, Zinc	1
7	809-849-145	Screw, Hex, 1/4 -20 X 7/8	1
8	250-001-244	Shaft Key, 3/16 x 3/16 x 1.28	1
9	**250-001-008**	**Clutch Housing Assembly**	**1**
10	250-001-231	Clutch Cover	1
11	948-753-101	Flat Washer, ¼, Black	1
12	809-849-165	Screw, Hex, ¼-20 x 1	1



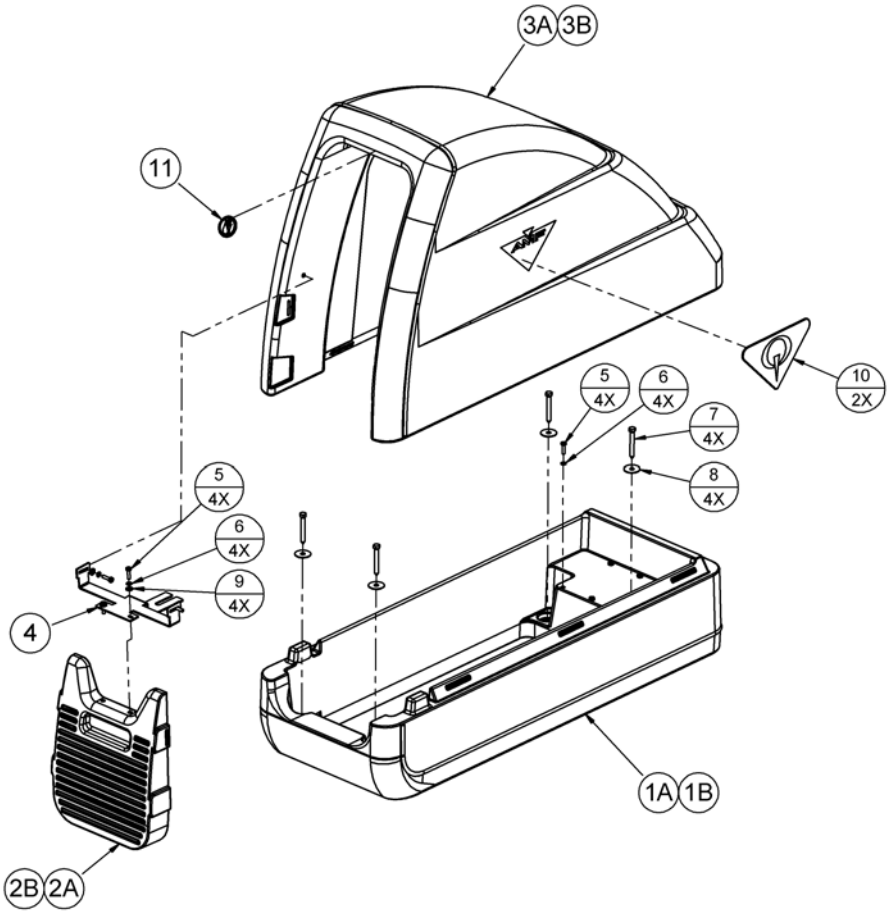
250-001-008
Clutch Housing Assembly

	Part No.	Description	Qty
1	919-010-910	Retaining ring	2
2	941-092-320	1” Wrought washer	1
3	070-007-291	Roller clutch	1
4	250-001-053	Clutch housing	1
5	250-001-234	Clutch sleeve	1
6	700-112-830	RTV Silicone gasket (not shown)	A/R



252-002-161
Control Box with Safety Switch

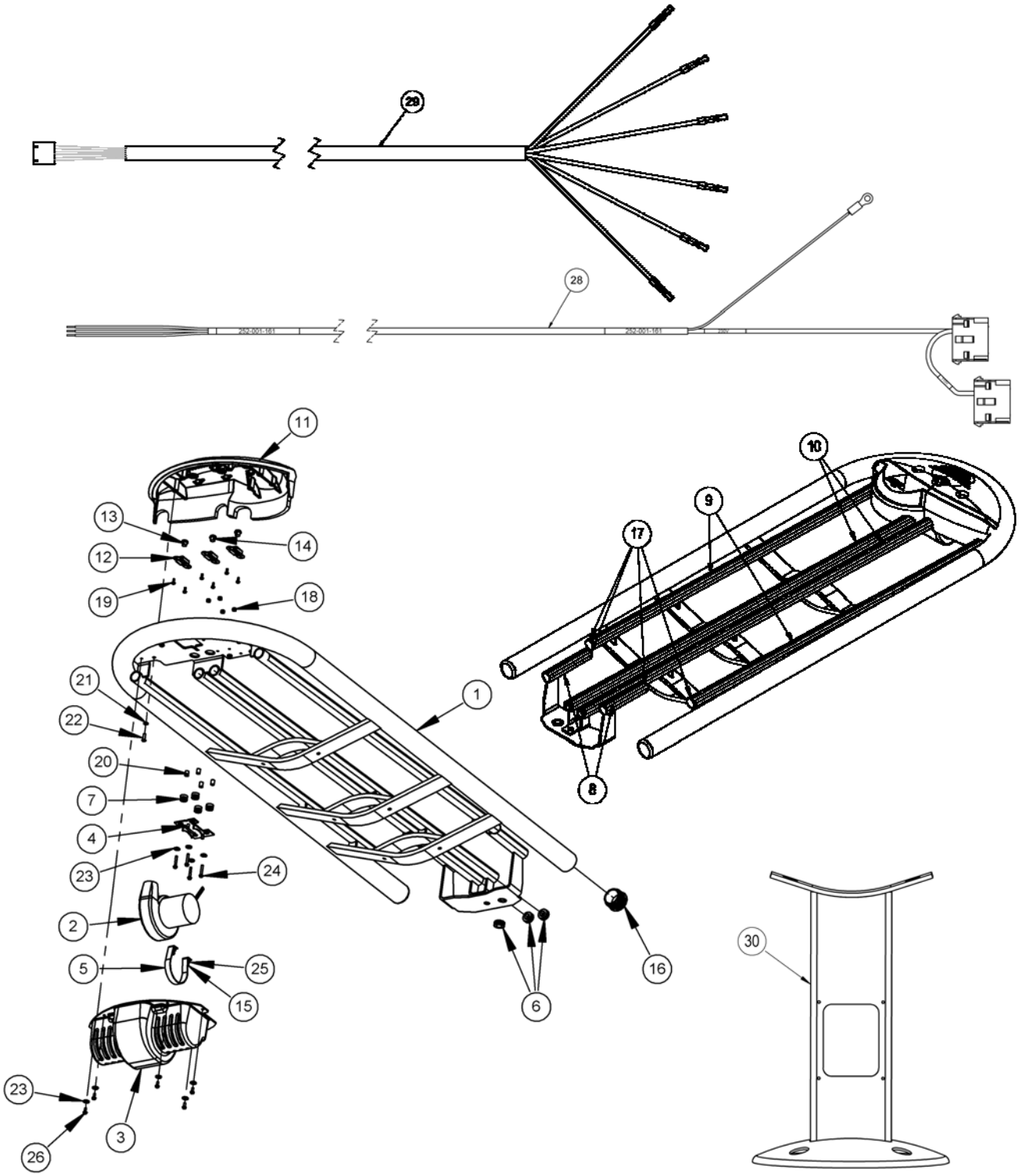
	Part No.	Description	Qty
1	250-001-850	Enhanced Control Box w/circuit board	1
2	252-002-160	Safety Switch Assembly	1
3	250-001-673	Dampener Base	4
4	250-001-853	Circuit Board (not shown)	1
5	748-591-152	Fuse, Logic Power (F2), 1A, Fast-Blo (not shown)	1
6	748-511-353	Fuse, Blower Motor (F1), 2.5A, Slow-Blo (not shown)	1



252-002-223, Hood Assembly – Black
252-002-226, Hood Assembly – Grey

	Part No.	Description	Qty
1A	252-002-220*	Options Base, Black	1
1B	252-002-224*	Options Base, Grey	1
2A	252-002-221*	Options Door, Black	1
2B	252-002-221*	Options Door, Grey	1
3A	252-002-222*	Ball Lift Hood, Black	1
3B	252-002-182*	Ball Lift Hood, Grey	1
4	252-002-133	Options Mounting bracket -access door	1
5	809-849-165	Screw: 1/4-20x1, hex head, GR 8, Black	8
6	951-148-008	Washer: 1/4, split, Black	8
7	810-564-480	Screw, lag Hex Head, 3/8 X 3, Bright Zinc	4
8	945-867-242	Washer: 406 I.D X 1.5 O.D X 0.063	4
9	948-753-102	Washer, 1/4 , A-N, Flat, Black	4
10	252-001-160	Dometag-Urethane QubicaAMF Logo	2
11	252-002-175	Stay Clear Warning Label	1

* Generally not individually available



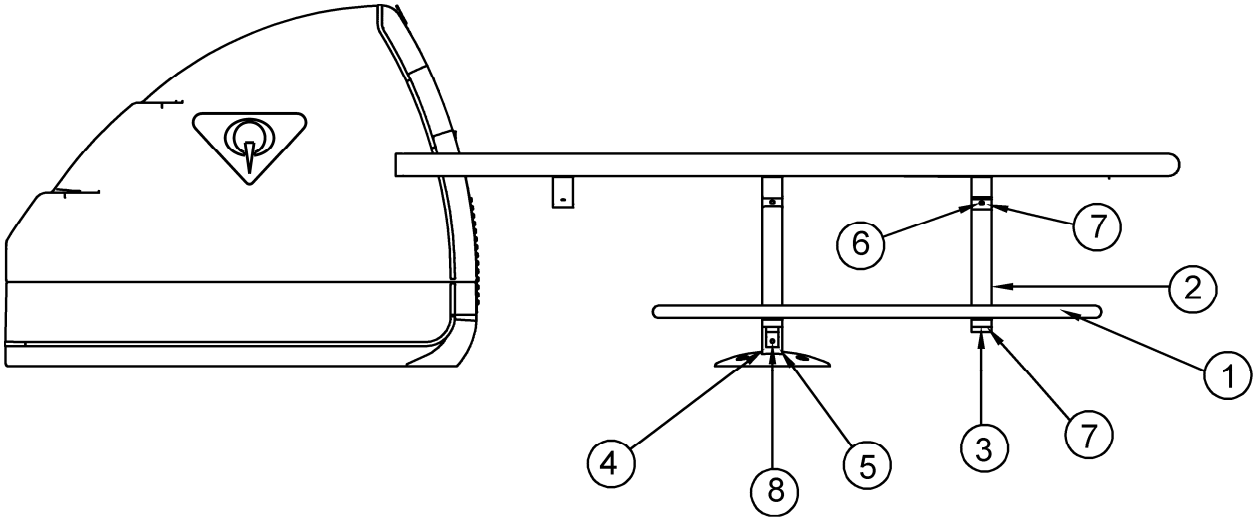
Options Ball Rack Assembly
259-001-054 – 11 Ball Rack Assembly
259-001-028 – Leg Assembly

259-001-054, 11-Ball Rack Assembly

	Part No.	Description	Qty
1	259-001-051	Upper Rack Weldment (11 Ball)	1
2	252-001-066	Blower Fan Assembly	1
3	252-001-027	Blower Cover	1
4	252-001-088	Blower Bracket	1
5	252-001-089	Blower Strap	1
6	711-520-017	Grommet, Rubber	3
7	711-564-728	Grommet, Rubber	4
8	252-001-125	Cover Guide Tube Glow Strip	2
9	252-001-155	Inner Rail Cover W/Stripes	2
10	252-001-154	Center Rail Cover, Glow Stripes	2
11	252-001-086	Upper Blower Housing	1
12	252-001-090	Button Bracket	3
13	252-001-097	Blue Pushbutton	2
14	252-001-096	Black Pushbutton	1
15	839-249-007	Nut, Hex Heavy 1/4-20 w/Nylon Insert	2
16	259-001-035	End Cap, 2.25 DIA (Flat)	2
17	259-001-036	End Cap, 1.25 DIA (Flat)	4
18	838-740-002	Nut, Hex Locknut, #10-32	4
19	818-233-082	Screw, #8-32 x .500, Phillips, Pan Head, Sems	6
20	722-564-720	Spacer, 3/8 x 1/2 x #10 Nylon	4
21	951-148-002	Lock Washer, 1/4 split	6
22	808-549-120	Screw, Hex 1/4-20 x 3/4	6
23	941-137-102	Flat washer, 3/8 x 5/8 x 1/16	9
24	814-638-207	Screw, #10-32 x 1-1/4 Slot HD, M/S, Zinc	4
25	948-746-810	Flat washer, 1/4	2
26	818-740-082	Screw, #10-32 x 1/2 Hex Washer	5
27	822-626-081	Screw: #6 x 1/2 Phillips, Pan Head (Not Shown)	2
28	252-001-161	Blower Cable	1
29	252-002-184	Cable, Ball Tray Tenth Frame Switch	1

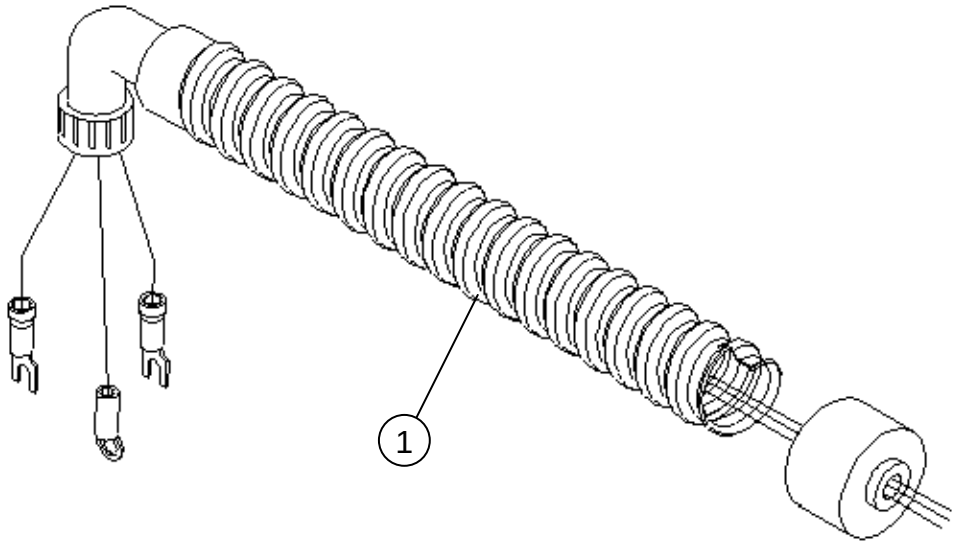
259-001-028, Leg Assembly

	Part No.	Description	Qty
30	259-001-028	Leg Assembly	1



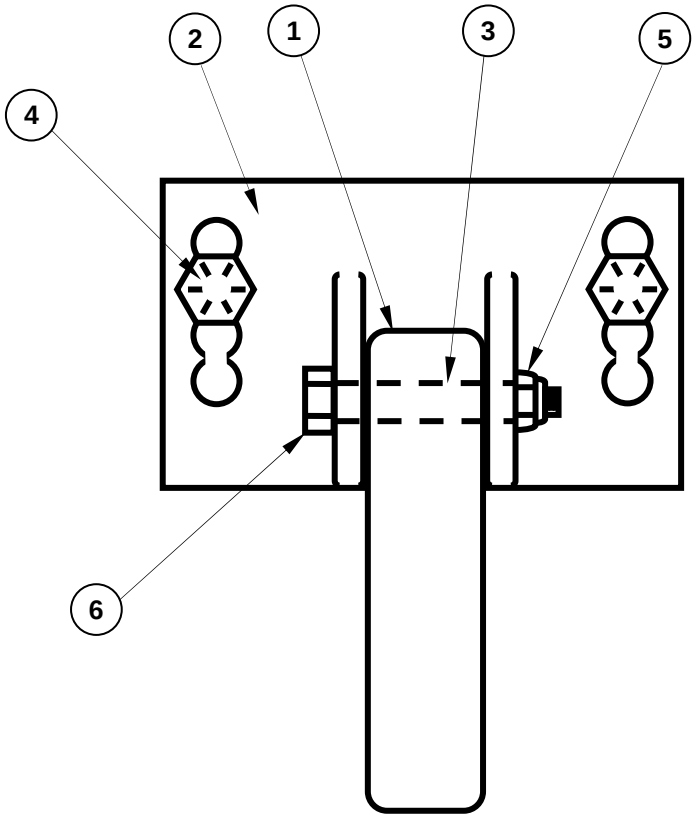
259-001-055
Lower Ball Rack Assembly

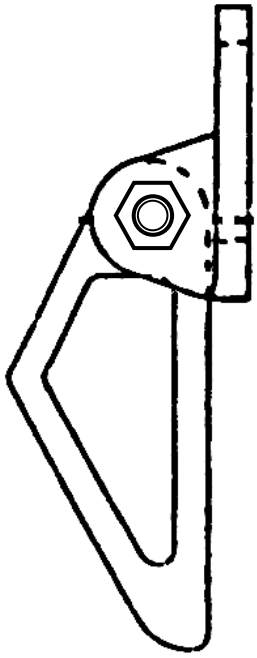
	Part No.	Description	Qty
1	259-001-056	Ball Return Lower Rack, includes item 2	1
2	259-001-038	Lower Rack Brace	1
3	809-857-205	Screw, hex, 5/16 -18 x 1.25	2
4	948-722-111	Washer, 5/16, SAE, Flat, Black Oxide	2
5	844-057-002	Nut, Stover Lock, 5/16 – 18, Zinc	1
6	808-557-160	Screw, 5/16-18 x 1, Button Head, Black	2
7	951-156-002	Washer, Split Lock, 5/16	4
8	810-157-001	Screw, 5/16-18 x 6.5, Hex	1



234-001-003
Main Power Cable Assembly

	Part No.	Description	Qty
1	234-001-003	Main Power Cable Assembly	1





Side View

611-353-105
Underlane Return Ball Stop

	Part No.	Description	Qty
1	135-001-002	Ball stop	1
2	135-001-003	Ball stop bracket	1
3	135-001-004	Tube	1
4	810-556-240	5/16 x 1-1/2 lag screw	2
5	844-057-002	5/16-18 stover lock nut	1
6	809-857-365	5/16-18 x 2-1/4 hex screw	1