	Owner's Manual	Document Number 120-225-00	Revision 0
		Date 11/06/17	Page 1 of 22

Owner's Manual

Electric Swivel


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Applicable Equipment Part Numbers

200-434-00
200-435-00
210-305-30

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	Owner's Manual	Document Number 120-225-00	Revision 0
		Date 11/06/17	Page 2 of 22


RECORD OF REVISIONS

Revision	Date	Page(s)	Reason for Revision
0	11/06/17	All	Initial Release

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	Owner's Manual	Document Number 120-225-00	Revision 0
		Date 11/06/17	Page 3 of 22

CONTENTS

1.0	Introduction	4
1.1	Scope.....	4
1.2	Safety labels	5
2.0	System Overview	6
2.1	Description.....	6
2.2	Bill of Materials	7
2.3	Specifications.....	8
3.0	Installation	10
4.0	Maintenance	14
4.1	Storage Instructions.....	14
4.2	Preventive Maintenance	14
4.3	Inspection	14
4.3.1	Pre-flight Check	14
4.3.2	Annual Inspection	15
4.3.3	5 year/1000 hour Inspection	15
5.0	Disassembly Instructions	16
6.0	Inspection Instructions.....	17
7.0	Re-assembly Instructions	17
8.0	Illustrated Parts List.....	20
9.0	Instructions for Returning Equipment to the Factory	22

	Owner's Manual	Document Number 120-225-00	Revision 0
		Date 11/06/17	Page 4 of 22

1.0 Introduction


1.1 Scope

This owner's manual contains instructions for installation and maintenance of the Electric Swivel Kits, P/N 200-434-00 and P/N 200-435-00, and Electric Swivel Assembly P/N 210-305-30.

Kit P/Ns 200-434-00 and 200-435-00 are intended specifically for use with an Onboard Systems Talon LC Remote Cargo Hook (P/N 528-018 series and P/N 528-019 series). The Electric Swivel Assembly P/N 210-305-30 is included with kit P/Ns 200-343-00 and 200-435-00 but can be purchased separately for use with other remote cargo hooks and equipment.

Electric Swivel P/N 210-305-30 features several improvements over previous generation Electric Swivels.

- Lower rotational friction under load
- Improved bearing design for longer service life
- Non-kinking electrical conduits

	Owner's Manual	Document Number 120-225-00	Revision 0
		Date 11/06/17	Page 5 of 22

1.2 Safety labels

The following definitions apply to safety labels used in this manual.



Indicates a hazardous situation which, if not avoided, will result in death or serious injury.



Indicates a hazardous situation which, if not avoided, could result in death or serious injury.




Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



Draws the reader's attention to important or unusual information not directly related to safety.



Used to address practices not related to personal injury.

	Owner's Manual	Document Number 120-225-00	Revision 0
		Date 11/06/17	Page 6 of 22

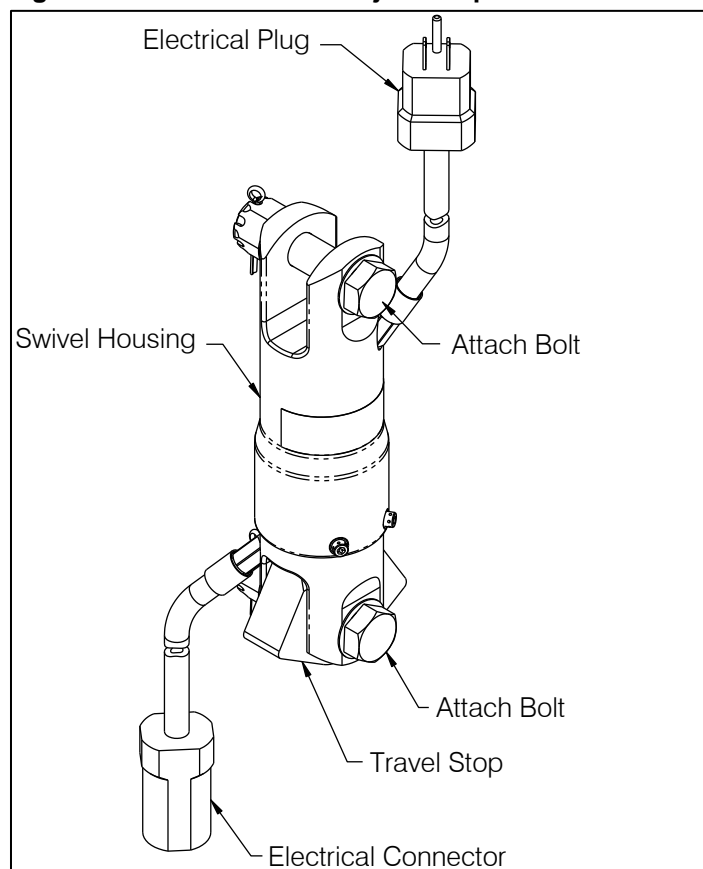
2.0 System Overview


2.1 Description

Electric Swivel Kit P/N 200-434-00 and P/N 200-435-00 are designed to be installed on an Onboard Systems remote cargo hook and interface with the helicopter long line. The primary function of the electric swivel is to provide an electrical connection with the remote cargo hook while allowing the cargo hook to spin to accommodate external load movement.

Kit P/N 200-434-00 includes a Travel Stop to interface with the Onboard Systems 3300-lb Talon Remote Cargo Hook (528-018-XX series) and Kit P/N 200-435-00 includes a Travel Stop and Sleeve to interface with the 6000-lb Talon Remote Cargo Hook (528-019-XX series). The Travel Stop limits the range of movement of the Electric Swivel on the Remote Cargo Hook to prevent binding of the electrical cord and potential damage to the Electric Swivel or Remote Cargo Hook. Figure 2.1 shows the major components of the Electric Swivel Kits. Electric Swivel Assembly P/N 210-305-30 does not include the Travel Stop or attach hardware.

Figure 2.1 Electric Swivel Major Components



	Owner's Manual	Document Number 120-225-00	Revision 0
		Date 11/06/17	Page 7 of 22

2.2 Bill of Materials

The following items are included with the Electric Swivel Kits. If shortages are found contact the company from whom the system was purchased.


Table 2.1 Bill of Materials

Part Number	Description	Quantity 200-434-00	Quantity 200-435-00
210-305-30	Electric Swivel Assembly	1	1
291-541-00	Travel Stop (3K Remote Hook)	1	-
291-564-00	Travel Stop (6K Remote Hook)	-	1
291-565-00	Sleeve	-	1
510-605-00	Cotter Pin	2	2
510-729-00	Nut	2	2
510-897-00	Washer	4	4
511-166-00	Bolt	2	2
512-011-00	Cable Tie	3	3
120-225-00	Owner's Manual	1	1

Kit P/N 200-434-00 can be converted to Kit P/N 200-435-00 for use with an Onboard Systems 6000-lb Remote Cargo Hook (P/N 528-019-XX series of cargo hooks) by swapping out the Travel Stop and incorporating the Sleeve (P/N 291-565-00). See Section 3.0 for assembly instructions.

NOTICE

The Electric Swivel Assembly includes a swivel contactor which contains a small amount of liquid mercury. The mercury is sealed against leakage but it should not be disposed of in the trash.

	Owner's Manual	Document Number 120-225-00	Revision 0
		Date 11/06/17	Page 8 of 22

2.3 Specifications

Table 2.2 Electric Swivel Specifications

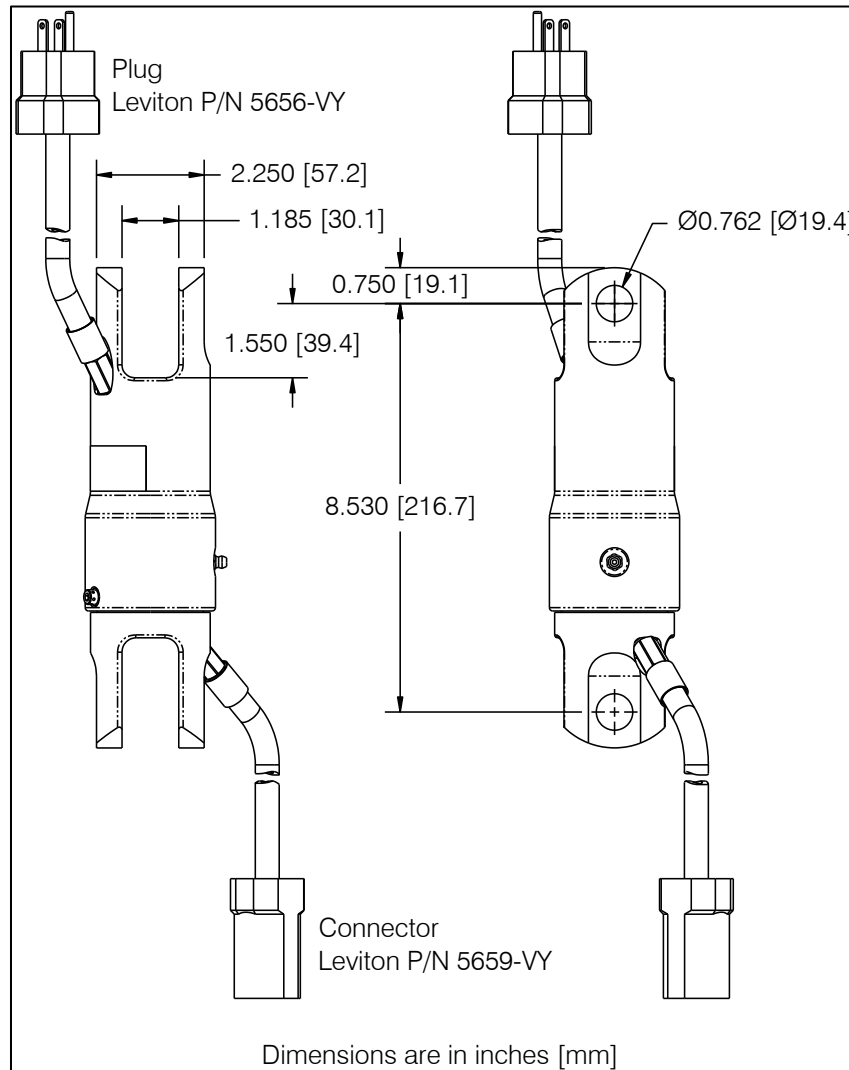
Design Load	6,000 lbs. (2,722 kg)
Limit Load	15,000 lbs. (6,804 kg)
Design Ultimate Strength	22,500 lbs. (10,206 kg)
Kit P/N 200-434-00 Weight	5.62 lbs. (2.55 kg)
Kit P/N 200-435-00 Weight	5.50 lbs. (2.50 kg)
Assembly P/N 210-305-30 Weight	4.00 lbs. (1.81 kg)
Conductors	3
Electrical Rating	0-250 volts, 30 amps
Compatible Electrical Connector (long line side)	Leviton 5259-VY
Interface Dimensions (P/N 210-305-30)	See Figure 2.2




Load capacities given are for the equipment described only. Load limits for the remainder of the external load lifting system and the helicopter still apply. Consult the flight manual for helicopter load limits.

Figure 2.2 shows the dimensions of the Electric Swivel Assembly P/N 210-305-30 (the top clevis and the bottom clevis are identical in size). Travel Stop P/N 291-541-00 and P/N 291-654-00 are not shown, they are designed to interface with Onboard Systems 3300 lb and 6000 lb remote cargo hooks (P/N 528-018 series and 528-019 series) respectively.

Figure 2.2 Electric Swivel Dimensions



	Owner's Manual	Document Number 120-225-00	Revision 0
		Date 11/06/17	Page 10 of 22

3.0 Installation

Install the Electric Swivel to a remote cargo hook and long line per the following instructions. The Electric Swivel Kit are designed to fit the Onboard Systems remote cargo hooks (528-018 and 528-019 series) but can be adapted to fit another remote accessory or another manufacturer's remote cargo hook.

1. Attach the Electric Swivel to the long line by placing the long line's thimble directly into the top clevis of the swivel; an anchor shackle or other attachment hardware is not recommended. Secure the thimble with bolt, washers, and nut as illustrated in Figure 3.1. Tighten the nut finger tight until seated and then rotate to previous castellation if necessary to insert cotter pin. Install and secure cotter pin.

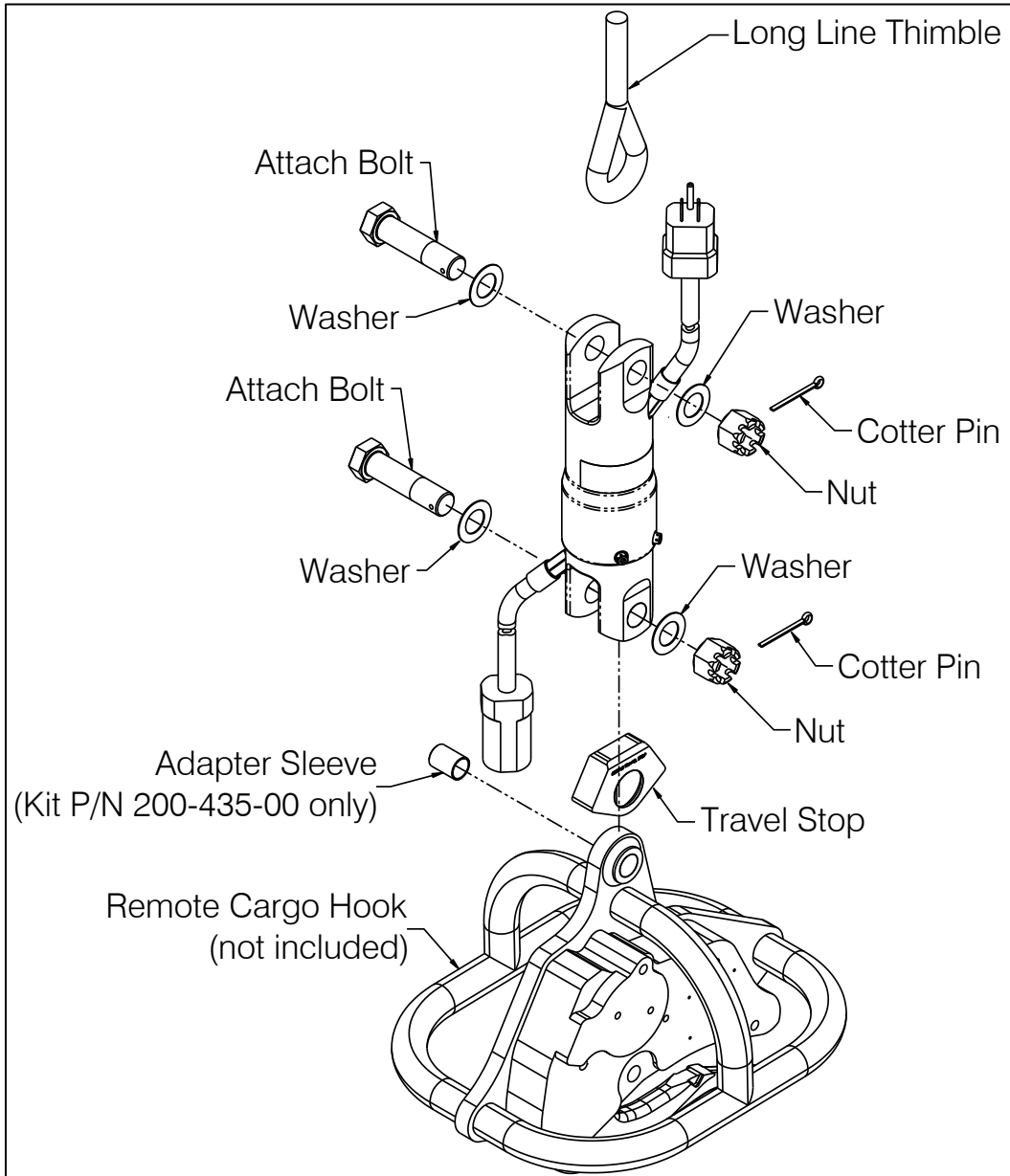
NOTICE

Note the proper orientation of the swivel by referencing the "UP" arrow on the decal. Orientation can also be identified by the electrical plug and geometry as shown in Figure 3.1.

Installation of both kits is the same with the exception of an adapter Sleeve (P/N 291-566-00) provided with the Electric Swivel Kit P/N 200-435-00. The purpose of this Sleeve is to reduce the diameter of the attach hole on the 6K Remote Cargo Hook.

2. To install the Sleeve, simply slide it into the attach hole prior to installation of the Travel Stop.
3. Attach the Electric Swivel to the remote cargo hook by placing the Travel Stop over the attach lug of the cargo hook. Line up the lower clevis of the swivel housing with the attach lug and Travel Stop and insert the bolt and secure with the washers and nut. Tighten the nut finger tight until seated and then rotate to previous castellation if necessary to insert cotter pin. Install and secure cotter pin.
4. Connect each electrical connector of the electric swivel to the respective connectors from the long line and the cargo hook. The recommended electrical cord routing at the cargo hook is shown in Figure 3.2. This routing follows the inside of the cargo hook's welded cage tubing as close as possible to minimize the potential of the cable being snagged or otherwise damaged.
5. Secure the cord to the inside of the welded cage (as shown) in several locations with the provided cable ties. If necessary shorten the electrical cord from the cargo hook.
6. Verify that the swivel can move throughout its range of motion without pulling the cord tight.

Figure 3.1 Electric Swivel Installation on Long Line Cargo Hook




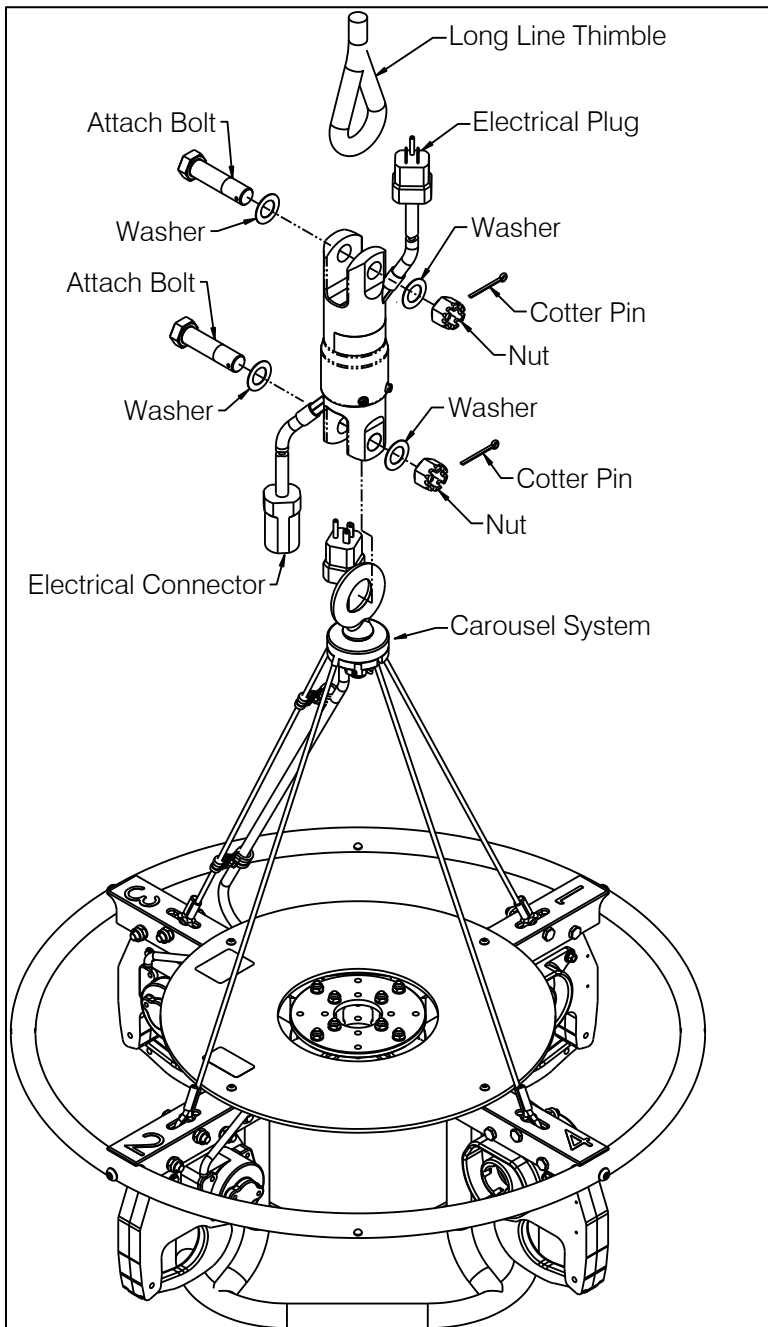
	Owner's Manual	Document Number 120-225-00	Revision 0
		Date 11/06/17	Page 12 of 22


Figure 3.2 Recommended Electrical Cord Routing



The Electric Swivel can also be installed with an Onboard Systems' Carousel System (shown in Figure 3.3) or other remote equipment including another manufacturer's remote cargo hook. If necessary an appropriately sized anchor shackle or load ring may be used to attach remote accessories to the lower end of the swivel.

Figure 3.3 Electric Swivel with Carousel System



	Owner's Manual	Document Number 120-225-00	Revision 0
		Date 11/06/17	Page 14 of 22

4.0 Maintenance

4.1 Storage Instructions

Clean the Electric Swivel thoroughly before packaging. Pack the unit in a sealable package such that the UP arrow does not point below horizontal.

Place the sealed package upright in a suitable fiberboard box and cushion the unit to prevent shifting. Seal the fiberboard box with tape and mark the box with the contents and date of packaging.

If the unit is to be stored for long periods in a tropical climate it should be packed in a reliable manner to suit local conditions.

4.2 Preventive Maintenance


The Electric Swivel will benefit from periodic lubrication of the ball bearings. If the rotation of the swivel does not feel smooth or rotate as freely as it once did, replenish the grease to maintain low-torque rotation. Use Mobilgrease 28 or similar grease. Rotate the swivel while injecting grease through the grease fitting.

4.3 Inspection

4.3.1 Pre-flight Check

Prior to a flight involving use of the Electric Swivel as part of external load operations perform the following.

1. Check all fasteners to ensure that they are in place and secure.
2. Check the electrical cords and connections for damage and security.
3. Check the swivel housing for cracks and damage.
4. Swivel assembly 360° to ensure proper operation. The rotation should feel smooth.
5. Cycle the cargo hook electrical release, or operate remote accessory, to verify electrical continuity.

	Owner's Manual	Document Number 120-225-00	Revision 0
		Date 11/06/17	Page 15 of 22

4.3.2 Annual Inspection


Annually or 100 hours of external load operations, whichever comes first, perform the following.

1. Thoroughly clean the exterior with a soft bristle brush and mild solvent/cleaner and visually inspect for cracks, gouges, dents, nicks, corrosion, and missing or loose fasteners.

Hours of external load operations should be interpreted to be (1) anything is attached to the electric swivel (whether or not a useful load is being transported) and (2) the aircraft is flying. If these conditions are not met, time does not need to be tracked.

4.3.3 5 year/1000 hour Inspection


Every 5 years or 1000 hours of external load operations, whichever comes first, disassemble and inspect the electric swivel in accordance with the instructions contained here-in.

	Owner's Manual	Document Number 120-225-00	Revision 0
		Date 11/06/17	Page 16 of 22

5.0 Disassembly Instructions

Reference numbers throughout this manual shown in parentheses () refer to Table 8.1 and Figure 8.1.

1. Separate the Electric Swivel from the long line and remote cargo hook by removing the cotter pins (24) from the nuts (23) and then removing the nuts, bolts (21) and washers (22). Separate the electrical connections.
2. Remove the Travel Stop (25 or 26) and the Adapter Sleeve (27) (if present) from the cargo hook.
3. Open the electrical plug (10) and electrical connector (9) and disconnect the internal wires from their terminations.
4. Unthread electrical conduit assemblies (2) from the Swivel Top (3) and Swivel Bottom (4) and remove.
5. Remove the safety wire connecting the screws (15) on the Swivel Top and remove the screws.
6. Insert a drill bit, small screwdriver, or similar device through the .161" diameter hole in the underside of Swivel Bottom and rotate the Swivel Top until the device engages a recess within the internal Bottom Nut (5). This prevents the Bottom Nut from rotating, allowing the Swivel Top to be unthreaded. Unthread the Swivel Top.
7. Remove the retaining ring (18) from the groove in the Top Nut (6).
8. Remove the two set screws (16) securing the contactor (12) in position and pull the contactor out with the wires.
9. Unthread the Top Nut and remove the ball bearing (19) and Bottom Nut.
10. Remove the felt washer (7) if damaged.

	Owner's Manual	Document Number 120-225-00	Revision 0
		Date 11/06/17	Page 17 of 22

6.0 Inspection Instructions


Clean the parts with a mild solvent and carefully inspect the parts in accordance with the instructions below. Inspect the parts in a clean, well-lit room.

1. Visually inspect Swivel Top and Swivel Bottom for cracks, paying close attention to the attach lug areas.
2. Inspect for wear on inside diameter of the attach lug holes in the Swivel Top and Swivel Bottom. Replace parts if diameter exceeds .790 in. (20.0 mm) in any direction.
3. Visually inspect ball bearing and races for damage including wear, denting, and corrosion. Replace the ball bearing if any signs of corrosion are seen.
4. Visually inspect Travel Stop (if being used) for cracks and damage.
5. Visually inspect wires for damaged or worn insulation which exposes internal conductors.

7.0 Re-assembly Instructions

Reference numbers throughout this manual shown in parentheses () refer to Table 8.1 and Figure 8.1.

1. If removed, install a new felt washer (7), adhesive side towards the Swivel Bottom (4). Align the notch in the felt washer with the hole in the Bottom Nut.
2. Orient the Bottom Nut (5) with the slots towards the felt washer and slide it over the Swivel Bottom (4).
3. Lubricate the balls and inner races of the ball bearing (19), orient it so that the inner race with the slightly larger inside diameter is towards the Bottom Nut, and position it over the Bottom Nut.
4. Spin the Top Nut (6) onto the Swivel Bottom until it just meets the ball bearing and snugs the assembly. Then back the Top Nut off until its slots align with the threaded holes in the Swivel Bottom. Rotate the Bottom Nut and make sure its turns easily.
5. Orient the contactor (12) with wires so that the UP indication points away from the Swivel Bottom. Route the wires through the Swivel Bottom and out the threaded hole. While gently pulling the wires through, seat the contactor into the Top Nut.
6. Secure the Top Nut and contactor by installing two set screws (16) with Loctite 262 Threadlocker.
7. Install retaining ring (18) into groove of top nut.


	Owner's Manual	Document Number 120-225-00	Revision 0
		Date 11/06/17	Page 18 of 22

8. Gather the wires coming out of the Swivel Bottom and tape the ends together with one wire slightly extending past the others to facilitate insertion. Route the wire bundle through the threaded end of one of the Conduit Assemblies (2).
9. Apply a very small drop of Loctite 262 Threadlocker to the conduit fitting threads and thread into the Swivel Bottom.
10. Route the upper wires into the Swivel Top (3) and out the threaded hole.
11. Apply two drops of Loctite 242 Threadlocker to the threads of the Bottom Nut. Use care to not get the Threadlocker in the ball bearing.
12. Align a slot on the Bottom Nut with the hole in the Swivel Bottom. Insert a screwdriver, hex wrench, or similar device through the Swivel Bottom into the Bottom Nut. Hold the Swivel Top and rotate the Swivel Bottom into the Swivel Top until it is fully seated.
13. From fully seated, back off the Swivel Bottom slowly until the slots in the Bottom Nut align with the screw holes in the Swivel Top. There should be a very small perceptible amount of play between the Swivel Bottom and Swivel Top.

CAUTION

Use care to ensure the slotted holes in the Bottom Nut are aligned with the two threaded holes in the Swivel Top. If the screws are tightened against the threads of the Bottom Nut, the threads will be damaged.

14. Install two screws (15) with Loctite 262 Threadlocker to secure the assembly.
15. Rotate the swivel 360° to check for smooth and free operation.
16. Secure the screws (15) with .020" safety wire.
17. Install the wires from the Swivel Top through the other Conduit Assembly using the same procedure as was done for the lower wires.

	Owner's Manual	Document Number 120-225-00	Revision 0
		Date 11/06/17	Page 19 of 22

18. Re-install the electrical connectors (9 and 10) onto the ends of the conduits using a multi-meter to match the silver to silver contacts, brass to brass contacts, and green to green contacts.

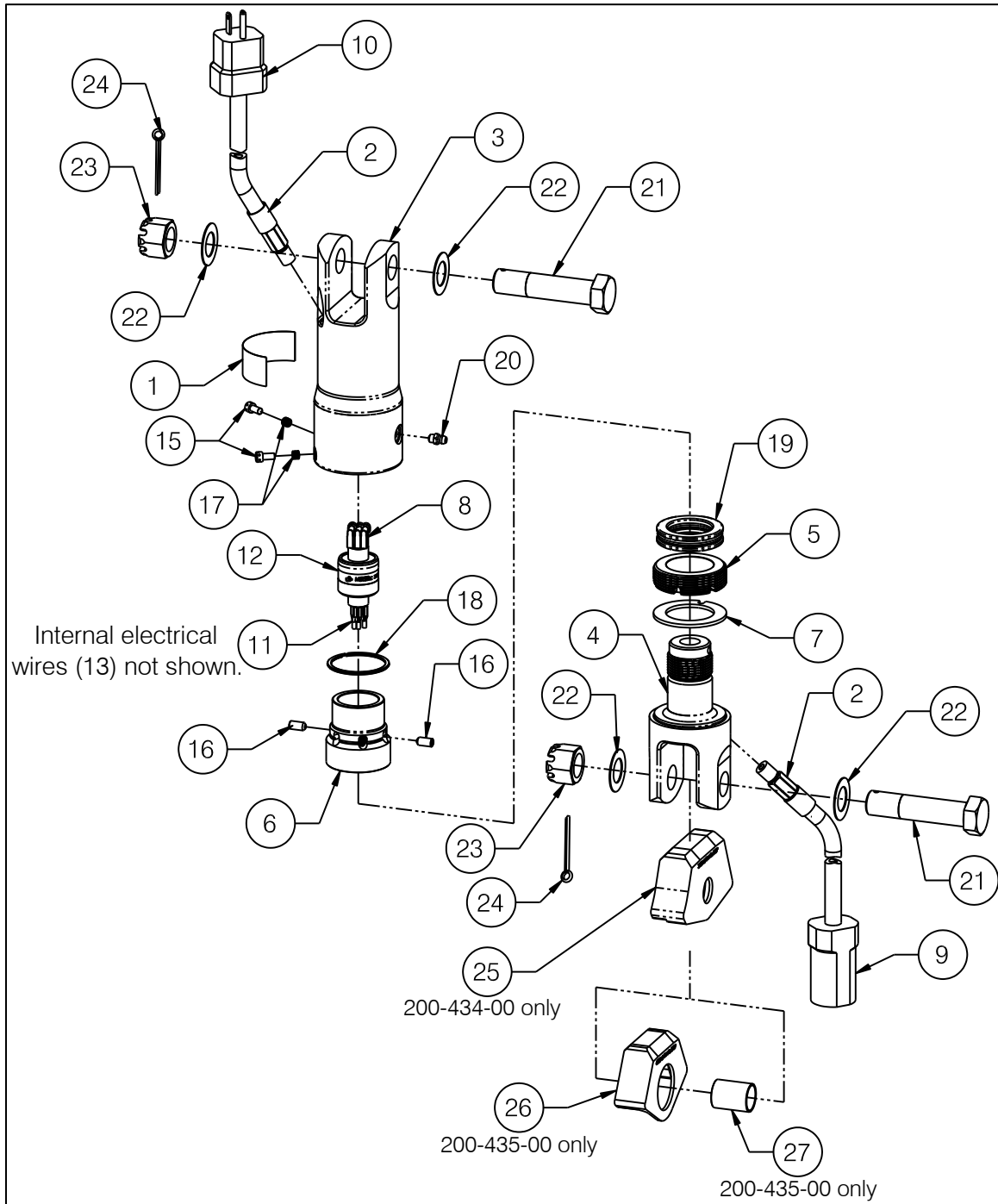
Table 7.1 Connector Pinout

Screw	Function
Green	Ground
Silver	Neutral
Brass	Power

19. Upon completion of the assembly, verify continuity across connectors.

8.0 Illustrated Parts List

Figure 8.1 Electric Swivel Parts





	Owner's Manual	Document Number 120-225-00	Revision 0
		Date 11/06/17	Page 21 of 22

Table 8.1 Electric Swivel Parts List

Item*	Part No.	Description	Quantity	
			200-434-00	200-435-00
1	215-361-00	Serial Number Decal	1	1
2	232-767-00	Conduit Assembly	2	2
3	291-966-00	Swivel Top	1	1
4	291-967-00	Swivel Bottom	1	1
5	291-968-00	Bearing - Bottom Nut	1	1
6	291-969-00	Nut - Top Bearing	1	1
7	291-970-00	Felt Washer	1	1
8	410-283-00	Flag Connector	3	3
9	410-299-00	Electrical Connector	1	1
10	410-300-00	Electrical Plug	1	1
11	410-251-00	Spade Connector	3	3
12	410-360-00	3-channel Contactor	1	1
13	420-082-00	Wire, 26" Long	6	6
14**	450-005-00	Heat Shrink, 1" Long	3	3
15	510-156-00	Screw	2	2
16	511-165-00	Set Screw	2	2
17	511-167-00	Helicoil	2	2
18	515-021-00	Retaining Ring	1	1
19	517-132-00	Ball Bearing	1	1
20	518-004-00	Grease Fitting	1	1
21	511-166-00	Bolt	2	2
22	510-897-00	Washer	4	4
23	510-729-00	Nut	2	2
24	510-605-00	Cotter Pin	2	2
25	291-541-00	3K Travel Stop	1	-
26	291-564-00	6K Travel Stop	-	1
27	291-565-00	Sleeve	-	1

*Items 1 through 20 comprise Electric Swivel Assembly P/N 210-305-30.

**Not shown in Figure 8.1. Installed over Spade Connectors.

	Owner's Manual	Document Number 120-225-00	Revision 0
		Date 11/06/17	Page 22 of 22

9.0 Instructions for Returning Equipment to the Factory

If an Onboard Systems product must be returned to the factory for any reason (including returns, service, repairs, overhaul, etc.) obtain an RMA number before shipping your return.



An RMA number is required for all equipment returns.

To obtain an RMA, please use one of the listed methods.

- Contact Technical Support by phone or e-mail (Techhelp@OnboardSystems.com).
- Generate an RMA number at our website: <http://www.onboardsystems.com/rma.php>

After you have obtained the RMA number, please be sure to:

- Package the component carefully to ensure safe transit.
- Write the RMA number on the outside of the box or on the mailing label.
- Include the RMA number and reason for the return on your purchase or work order.
- Include your name, address, phone and fax number and email (as applicable).
- Return the components freight, cartage, insurance and customs prepaid to:

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