Owner's Manual

Electric Swivel

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Applicable Equipment Part Numbers
200-434-01
200-435-01
210-305-31

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RECORD OF REVISIONS

Revision	Date	Page(s)	Reason for Revision
0	07/25/23	All	Initial Release

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1.0 Introduction

1.1 Scope

This owner's manual contains instructions for installation and maintenance of the Electric Swivel Kits, P/N 200-434-01 and P/N 200-435-01, and Electric Swivel Assembly P/N 210-305-31.

Kit P/Ns 200-434-01 and 200-435-01 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 210-305-31 is included with kit P/Ns 200-434-01 and 200-435-01 but can be purchased separately for use with other remote cargo hooks and equipment.

Electric Swivel P/N 210-305-31 features several improvements over previous generation Electric Swivels.

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

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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.

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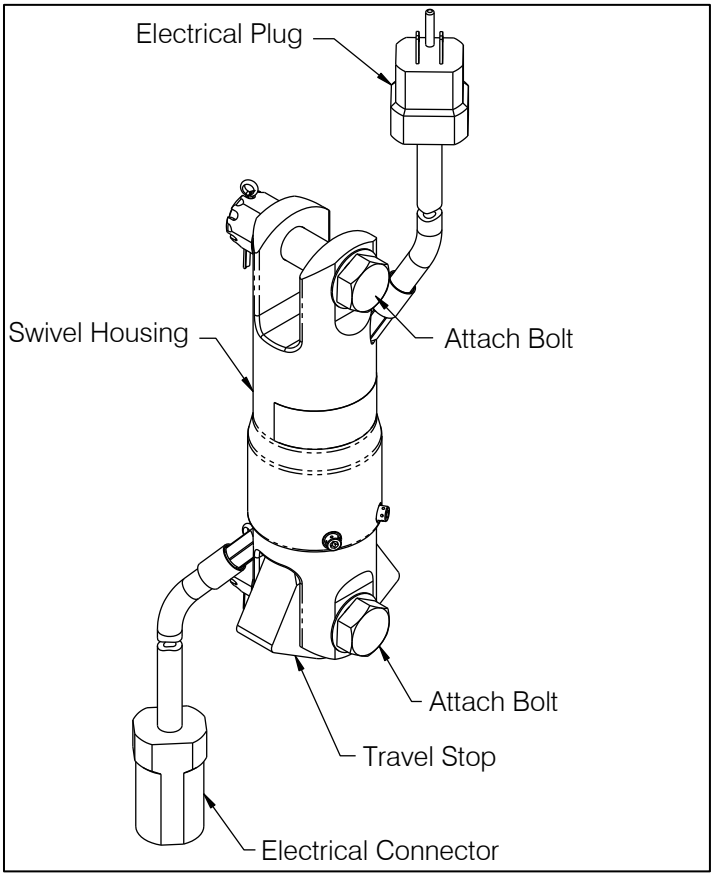
2.0 System Overview

2.1 Description

Electric Swivel Kit P/Ns 200-434-01 and 200-435-01 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 200-434-01 includes a Travel Stop to interface with the Onboard Systems 3300-lb Talon Remote Cargo Hook (528-018-XX series) and Kit P/N 200-435-01 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 2.1.1 shows the major components of the Electric Swivel Kits. Electric Swivel Assembly P/N 210-305-31 does not include the Travel Stop or attach hardware.

Figure 2.1.1 Electric Swivel Major Components



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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 200-434-01	Quantity 200-435-01
210-305-31	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
120-225-01	Owner's Manual	1	1

Kit P/N 200-434-01 can be converted to Kit P/N 200-435-01 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.

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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 200-434-01 Weight	5.62 lbs. (2.55 kg)
Kit P/N 200-435-01 Weight	5.50 lbs. (2.50 kg)
Assembly P/N 210-305-31 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 210-305-31)	See Figure 2.3.1

⚠ CAUTION

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.

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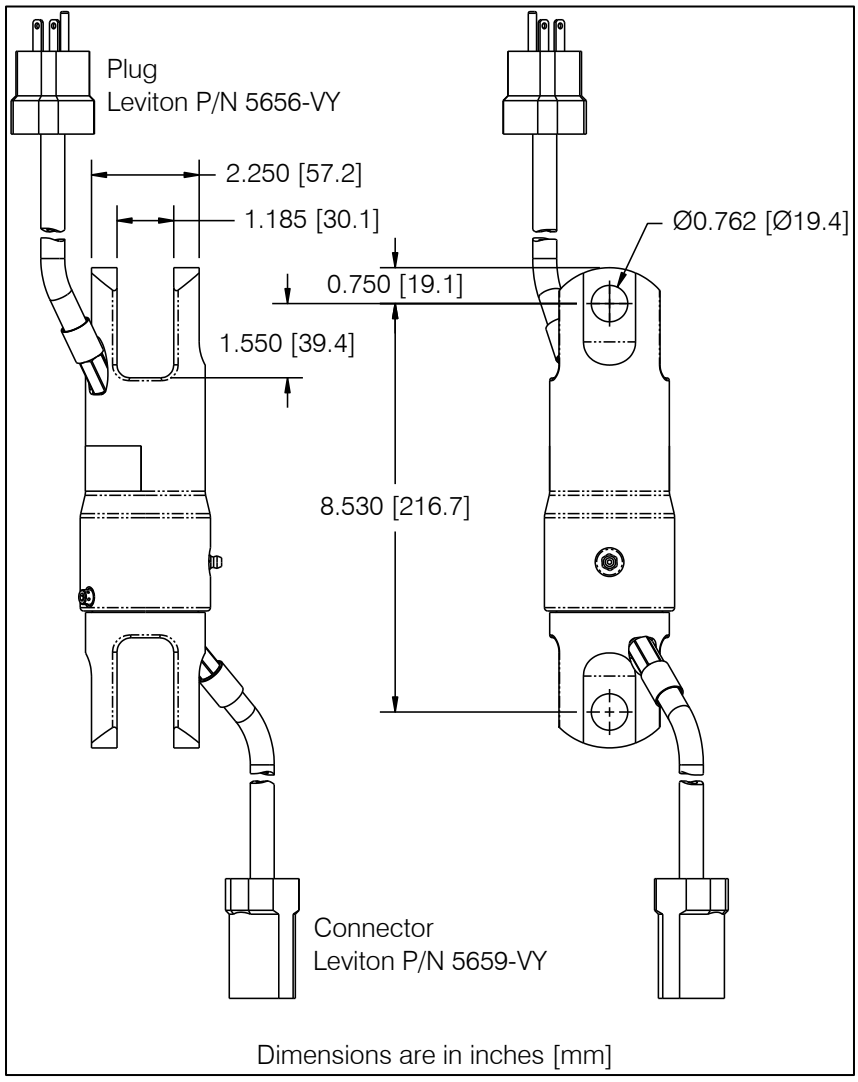
Figure 2.3.1 shows the dimensions of the Electric Swivel Assembly P/N 210-305-31 (the top clevis and the bottom clevis are identical in size). Travel Stop P/N 291-541-00 and P/N 291-654-00 are not shown, these are designed to interface with Onboard Systems 3300 lb and 6000 lb remote cargo hooks (P/N 528-018 series and 528-019 series) respectively.

Figure 2.3.1 Electric Swivel Dimensions



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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 2.3.1. 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 2.3.1.

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 200-435-01. 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 2.3.2. 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. NOTE: If the supplied Leviton plugs are replaced with a different model, trim the conduit hose back as needed to gain sufficient wire length to install alternate plugs rather than trying to stretch the wires out of the conduit to reach the plug terminals.

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.

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6. Verify that the swivel can move throughout its range of motion without pulling the cord tight.

Figure 2.3.1 Electric Swivel Installation on Long Line Cargo Hook

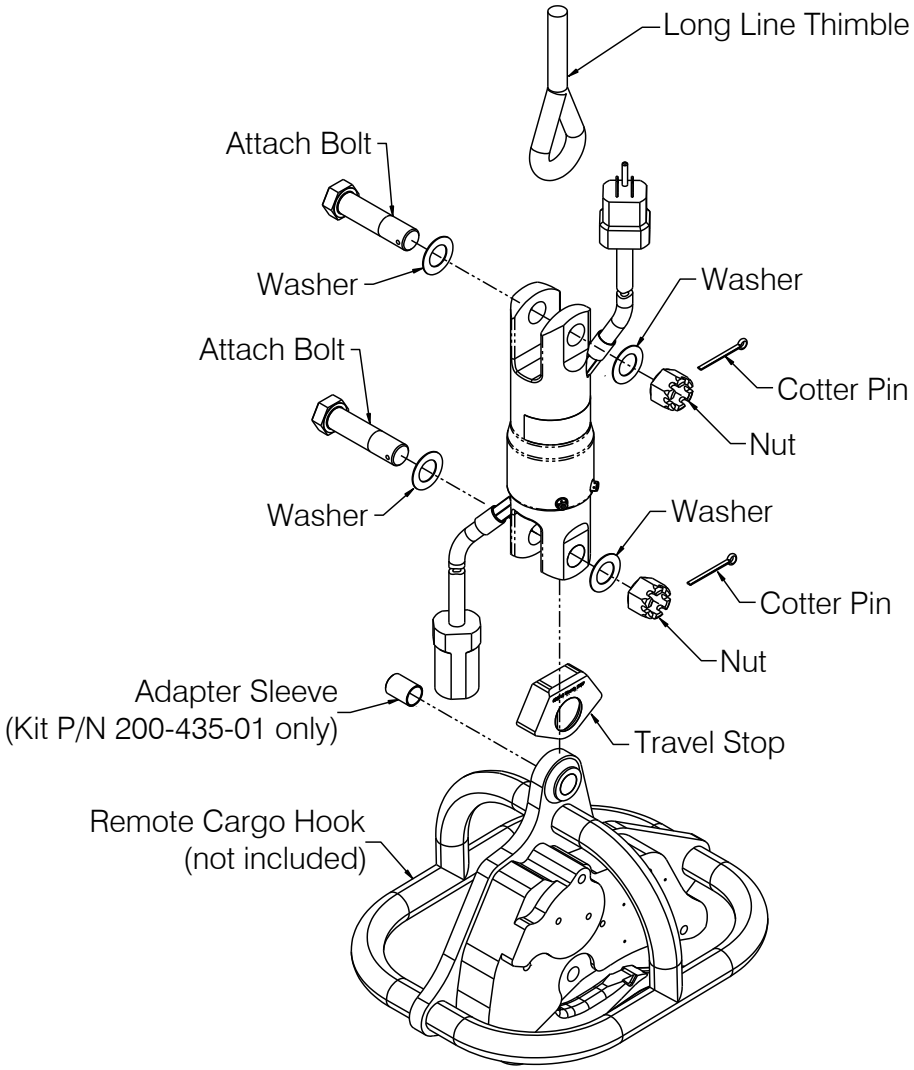

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Figure 2.3.2 Recommended Electrical Cord Routing

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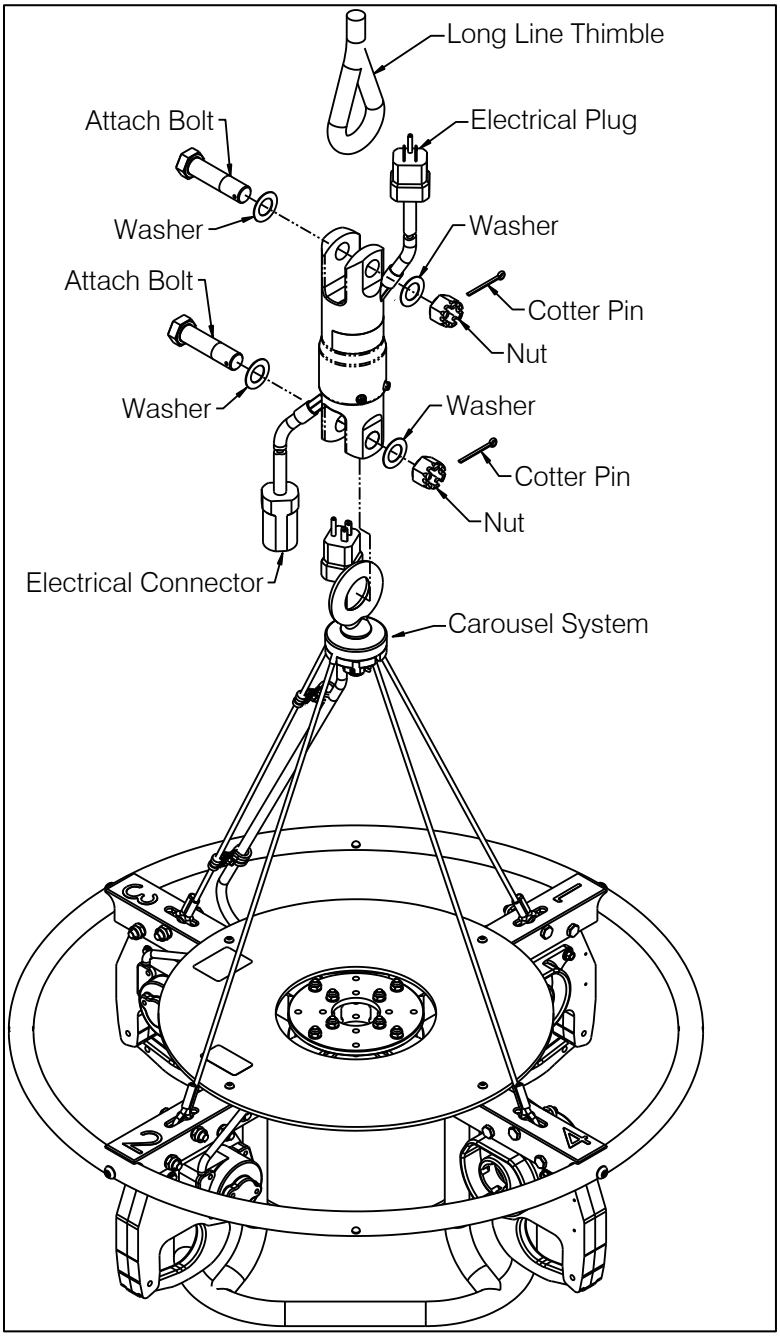
The Electric Swivel can also be installed with an Onboard Systems' Carousel System (shown in Figure 2.3.3) or other remote equipment including another manufacturer's remote cargo hook. If necessary an appropriately sized anchor shackle or load ring may be used to attach remote accessories to the lower end of the swivel.

Figure 2.3.3 Electric Swivel with Carousel System



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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

If the rotation of the swivel does not feel smooth or rotate as freely as it once did, follow the instructions in section 5, 6, and 7 to disassemble, inspect, and re-assemble the swivel.

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 (angular play is normal, reference Figure 4.3.1.)
5. Cycle the cargo hook electrical release, or operate remote accessory, to verify electrical continuity.

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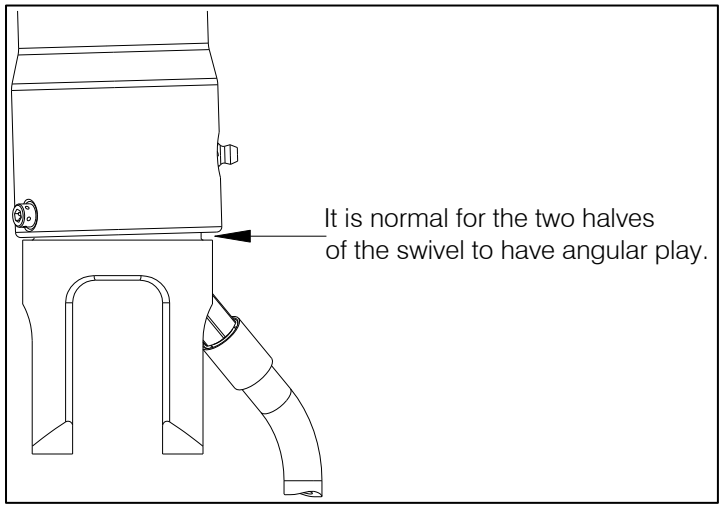
Figure 4.3.1 Swivel Free Play



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.

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5.0 Disassembly Instructions

Reference numbers throughout this manual shown in parentheses ( ) refer to Table 8.1 and Figure 4.3.1.

1. Separate the Electric Swivel from the long line and remote cargo hook by removing the cotter pins (30) from the nuts (29) and then removing the nuts, bolts (27) and washers (28). Separate the electrical connections.
2. Remove the Travel Stop (31 or 32) and the Adapter Sleeve (33) (if present) from the cargo hook.
3. Open the electrical plug (12) and electrical connector (11) and disconnect the internal wires from their terminations.
4. Remove the heat shrink tubing and hose clamps from the conduit and pull the conduit hose off the conduit fittings. Leave the conduit fittings in place.
5. Remove the safety wire connecting the screws (17) 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 (4) and rotate the Swivel Top (3) 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. Carefully pull the swivel apart. If the wires disconnect from the contactor and don't pull through the conduit fitting, then reach into the swivel top with long nose pliers and pull them through with the pliers.
8. Remove the retaining ring (23) from the groove in the Top Nut (6).
9. Remove the two set screws (17) securing the contactor (13) in position and pull the contactor out with the wires.
10. Unthread the Top Nut and remove the ball bearing (24) and Bottom Nut.
11. Remove the felt washer (8) if damaged.

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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 4.3.1.

1. Ensure the swivel bottom is clean and free from grease or oil prior to applying felt washer. Remove adhesive backing from felt washer (8) and apply to swivel bottom (4), adhesive side down. Center the felt washer about the post on the swivel bottom. Press down on the felt washer all around to secure it. Install the spacer (7) at the same time and ensure alignment.
2. Slide the bottom nut (5) and ball bearing (24) over the swivel bottom against the felt washer. Place the castellations on the nut downwards, towards the felt washer.
3. Lubricate the balls and inner races of the ball bearing (24) lightly with Mobil grease 28. One race of the ball bearing has a larger inside diameter than the other. Locate this race closest to the bottom nut.
4. Spin the top nut (6) onto the swivel bottom until it just meets the ball bearing and snugs the assembly. Back the nut off until slots align with the threaded holes. Rotate the bottom nut and make sure that it turns easily. Try to move the bottom nut up and down axially and ensure a minimum of play is present.
5. Secure the nut and contactor by installing two set screws (19) with Loctite 262 and then retaining ring (23). Make sure contactor is fully seated before screws are tightened. Make sure the contactor is firmly secured by the set screws.
6. Mark the remaining three wires 7.75" from the end of the flag connectors (10).

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7. Clean out the RTV residue in the conduit fittings and the top of the swivel top cavity, enough to provide clearance when re-installing the wiring.

8. Plug the flag connectors into the upper terminals, all in the same direction. Knot the wires around the flag connectors. Ensure that the wires do not contact the black non-rotating part of the housing. Encapsulate the knot with White RTV and allow to cure for 12 hours.

9. After the initial coating of RTV has cured, apply additional RTV on top of the flag connectors to form a ¼" mound.

10. Feed the wires through the conduit fitting taking care they are parallel, not crossed. Assemble the lower housing assembly to the upper housing before the RTV gels. Pull the wires the rest of the way through the conduit fitting as you thread the bottom nut into the housing, until the marks on the wire are even with the end of the fitting and any slack is taken out of the wires.

11. From fully seated, back off the swivel bottom slowly until castellations on the bottom nut align with the screw holes on the swivel top. There should be a very small perceptible amount of axial play between the swivel bottom and swivel top.

12. Install two screws (17) with Loctite 262 to secure the assembly. Install safety wire using .020" safety wire.

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.

13. Install the wires from the Swivel Top through the other Conduit Assembly using the same procedure as the lower wires.

14. Trim the conduit length as needed to ensure that there is sufficient wire to attach to the electrical plugs.

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15. Re-install the electrical connectors (11 and 12) 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

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

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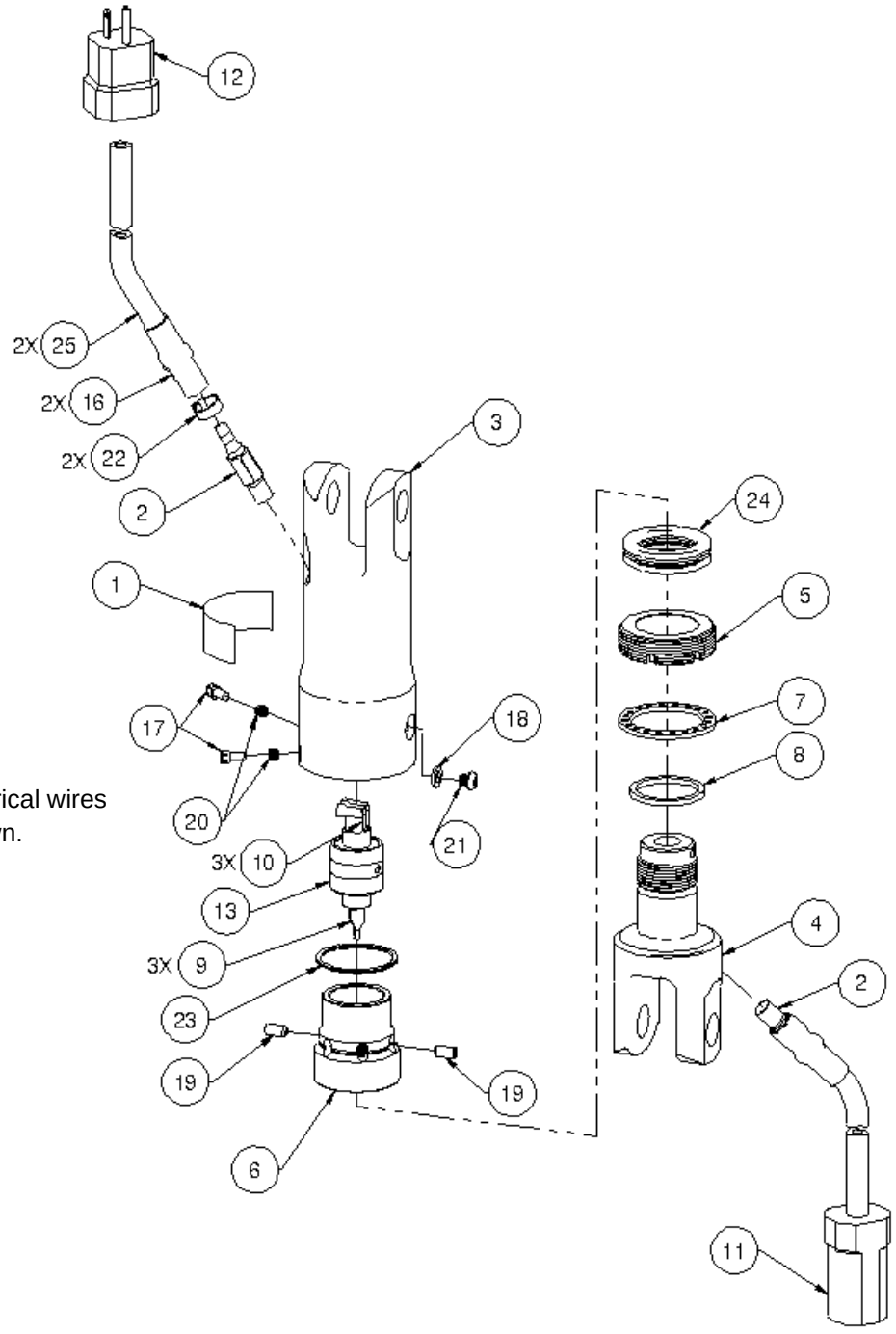
8.0 Illustrated Parts List

Figure 4.3.1 Electric Swivel Parts



Internal electrical wires (14) not shown.

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Figure 4.3.2 Electric Swivel Parts

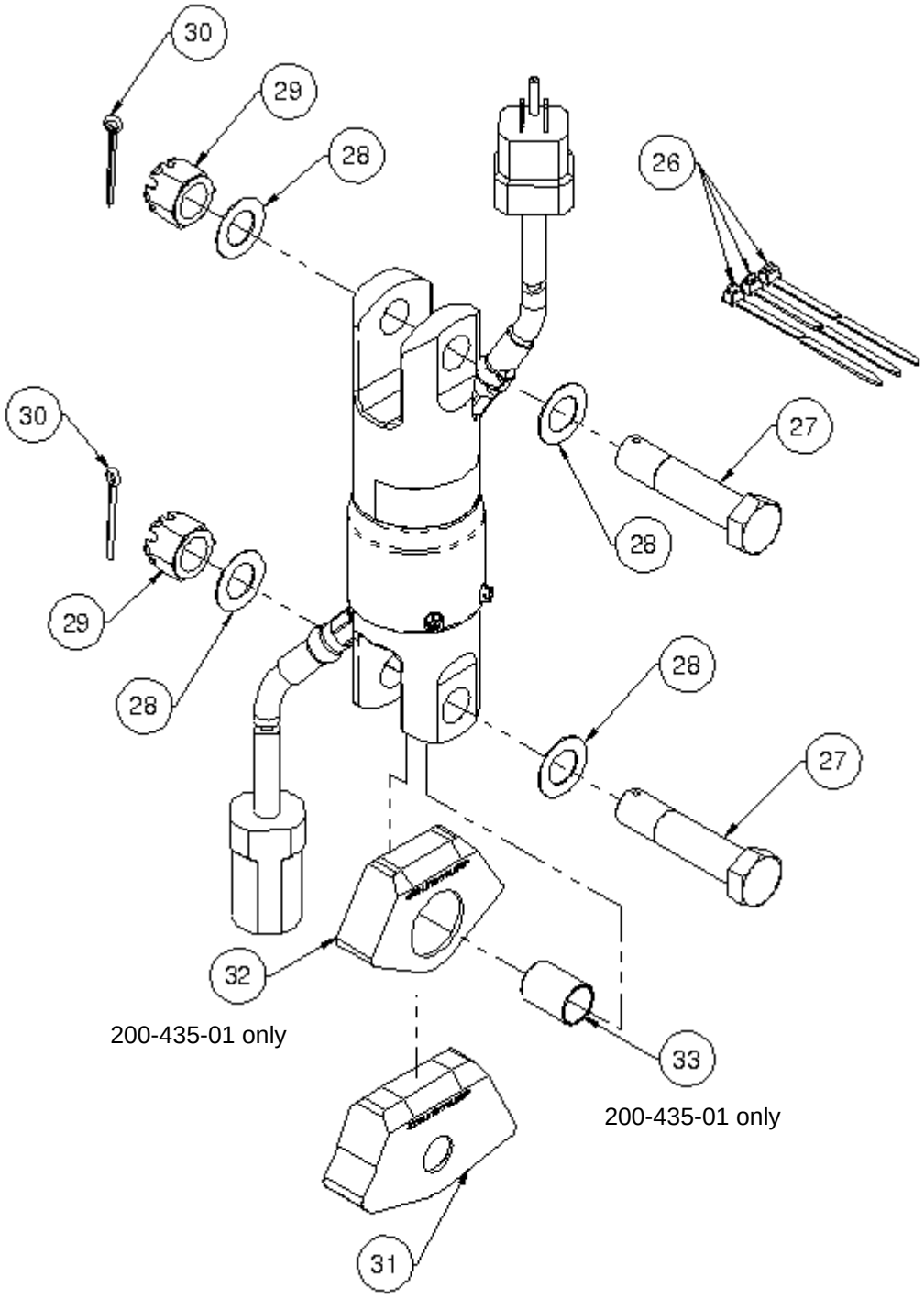

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Table 8.1 Electric Swivel Parts List

Item*	Part No.	Description	Quantity	
			200-434-01	200-435-01
1	215-361-00	Serial Number Decal	1	1
2	291-543-00	Conduit Fitting	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	292-143-00	Spacer	1	1
8	292-144-00	Felt Washer	1	1
9	410-251-00	Spade Connector	3	3
10	410-283-00	Flag Connector	3	3
11	410-299-00	Electrical Connector	1	1
12	410-300-00	Electrical Plug	1	1
13	410-360-00	3-channel Contactor	1	1
14	420-082-00	Wire, 26" Long	6	6
15**	450-005-00	Heat Shrink, 1" Long	3	3
16	450-021-00	Adhesive Heat Shrink Tubing	2	2
17	510-156-00	Screw	2	2
18	510-778-00	Washer	1	1
19	511-165-00	Set Screw	2	2
20	511-167-00	Helicoil	2	2
21	511-271-00	Button Head Cap Screw	1	1
22	512-036-00	Band Clamp	2	2
23	515-021-00	Retaining Ring	1	1
24	517-132-00	Ball Bearing	1	1
25	550-011-00	Hose	1	1
26	512-011-00	Cable Tie - Black	3	3
27	511-166-00	Bolt	2	2
28	510-897-00	Washer	4	4
29	510-729-00	Nut	2	2
30	510-605-00	Cotter Pin	2	2
31	291-541-00	3K Travel Stop	1	-
32	291-564-00	6K Travel Stop	-	1
33	291-565-00	Sleeve	-	1

*Items 1 through 25 comprise Electric Swivel Assembly P/N 210-305-31.

**Not shown in Figure 4.3.1. Installed over Spade Connectors.

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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.

NOTICE

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:

  Onboard Systems
  13915 NW 3rd Court
  Vancouver, Washington 98685
  USA
  Phone: 360-546-3072

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