

**PLEASE CHECK WEB SITE AT WWW.ONBOARDSYSTEMS.COM FOR
THE LATEST REVISION OF THIS MANUAL**

Electric Swivels

Applicable Part Numbers:

200-372-00

200-373-00

200-402-00

Owner's Manual

Document number 120-205-00

Revision 7

11/13/20



13915 N. W. 3rd Court Vancouver Washington 98685 USA
Phone: 360-546-3072 Fax: 360-546-3073 Toll Free: 800-275-0883
www.OnboardSystems.com

(Page intentionally left blank)

RECORD OF REVISIONS

<i>Revision</i>	<i>Date</i>	<i>Page(s)</i>	<i>Reason for Revision</i>
0	09/27/10	All	First Issue
1	07/14/11	3-8	Replaced wire P/N 420-026-00 with P/N 420-082-00.
2	11/07/11	All	Added description of operation for 3-Channel Electric Swivel Kit P/N 200-402-00.
3	04/24/12	3-8, 3-11	Replaced 291-538-00 and 291-539-00 with 291-538-01 and 291-539-01.
4	10/17/13	1-4, 1-5	Added figure showing swivel dimensions.
5	08/04/15	3-1, 3-3, 3-4, 3-7, 3-8, 3-10, 3-11	Added lubrication instructions. Added grease fitting.
6	10/10/18	3-8, 3-11	Replaced 232-448-00 with 232-767-00. Corrected qty. of 232-767-00 in table 3-4.
7	11/13/20	3-1	Updated Daily Check within Table 3-1 to include additional detail on swivel rotation check.

Register Your Products for Automatic Notifications

Onboard Systems offers a free notification service via fax or email for product alerts and documentation updates. By registering your Onboard Systems products at our website, we will be able to contact you if a service bulletin is issued, or if the documentation is updated.

You can choose to receive notices on an immediate, weekly, or monthly schedule via fax, email or both methods. There is no charge for this service. Please visit our website at www.onboardsystems.com/notify.php to get started.

(Page intentionally left blank)

CONTENTS

***Section 1* General Information**

Introduction, 1-1
Explanation of Signal Words and Symbols, 1-1
Bill of Materials, 1-2
Specifications, 1-3
Theory of Operation, 1-5

***Section 2* Installation Instructions**

Electric Swivel Installation, 2-1
3-Channel Electric Swivel Installation, 2-4

***Section 3* Maintenance**

Storage Instructions, 3-1
Preventive Maintenance, 3-1
Inspection Schedule, 3-1
Electric Swivel Disassembly, 3-2
Five Year/1000 hour Inspection, 3-3
Electric Swivel Assembly Procedures, 3-3
2-Channel Electric Swivel Exploded View, 3-5
2-Channel Electric Swivel Parts, 3-8
3-Channel Electric Swivel Exploded View, 3-9
3-Channel Electric Swivel Parts, 3-11
Instructions for Returning a System to the Factory, 3-12

(Page intentionally left blank)

Section 1

General Information

Introduction

This Owner's Manual contains instructions for installation and maintenance of the Electric Swivel kits, P/N 200-372-00, P/N 200-373-00, and P/N 200-402-00. P/N 200-372-00 is designed to interface with the Onboard Systems 3000 lb Talon LC Long Line Cargo Hook and Kit P/N 200-373-00 is designed to interface with the 6000 lb Talon LC Long Line Cargo Hook. P/N 200-402-00 is a 3-Channel Electric Swivel rated to 6,000 lb, and is designed to provide a 3-Channel connection, where needed, for long line applications, such as carousel systems.

The Electric Swivel kits, P/N 200-372-00 and 200-373-00 are designed to be installed on an Onboard Systems long line cargo hook and connect to the helicopter long line. The principal function of the Electric Swivels is to provide an electrical connection with the remote cargo hook while allowing the cargo hook to spin to accommodate external load movement.

Explanation of Signal Words and Symbols

The following definitions apply to the symbols used throughout this manual to draw the reader's attention to safety instructions as well as other important messages.



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.

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 1-1 Bill of Materials

Part Number	Description	Quantity 200-372-00	Quantity 200-373-00	Quantity 200-402-00
120-205-00	Owner's Manual	1	1	1
232-457-00	Swivel Assembly	1	1	-
232-457-30	3-Channel Electric Swivel Assembly	-	-	1
291-541-00	Travel Stop	1	-	-
291-564-00	Travel Stop	-	1	-
291-565-00	Sleeve	-	1	-
510-605-00	Cotter Pin	2	2	2
510-729-00	Nut	2	2	2
510-897-00	Washer	4	4	4
510-899-00*	Bolt	2	2	2

*Optional P/N: 291-540-00

Kit P/N 200-372-00 can be converted to Kit P/N 200-373-00 for use with a 6000 lb long line cargo hook (P/N 528-019 series of cargo hooks) by swapping out the Travel Stop and incorporating Sleeve P/N 291-565-00. See Section 3 for assembly instructions.

CAUTION

The Swivel Assemblies include a swivel contactor which contains a small amount of liquid mercury. The mercury is sealed against leakage but because of environmental concerns it should not be disposed of in the trash. Dispose of through a qualified recycler.

Specifications

Table 1.1 3,000 lb. Electric Swivel Kit (P/N 200-372-00) Specifications

Design Load	3,000 lbs. (1361 kg)
Limit Load	7,500 lbs. (3,402 kg)
Design Ultimate Strength	11,250 lbs. (5103 kg)
Unit weight	6.6 lbs. (3.0 kg)
Conductors	2
Electrical Rating	0-250 volts, 30 amps
Compatible Electrical	Leviton 5259-VY

Table 1.2 6,000 lb. Electric Swivel Kit (P/N 200-373-00) Specifications

Design Load	6,000 lbs. (2722 kg)
Limit Load	15,000 lbs. (6,804 kg)
Design Ultimate Strength	22,500 lbs. (10,206 kg)
Unit weight	6.5 lbs. (2.9 kg)
Conductors	2
Electrical Rating	0-250 volts, 30 amps
Compatible Electrical	Leviton 5259-VY

Table 1.3 3-Channel Electric Swivel Kit (P/N 200-402-00) Specifications

Design Load	6,000 lbs. (2722 kg)
Limit Load	15,000 lbs. (6,804 kg)
Design Ultimate Strength	22,500 lbs. (10,206 kg)
Unit weight	6.2 lbs. (2.9 kg)
Conductors	3
Electrical Rating	0-250 volts, 30 amps
Compatible Electrical	Leviton 5259-VY

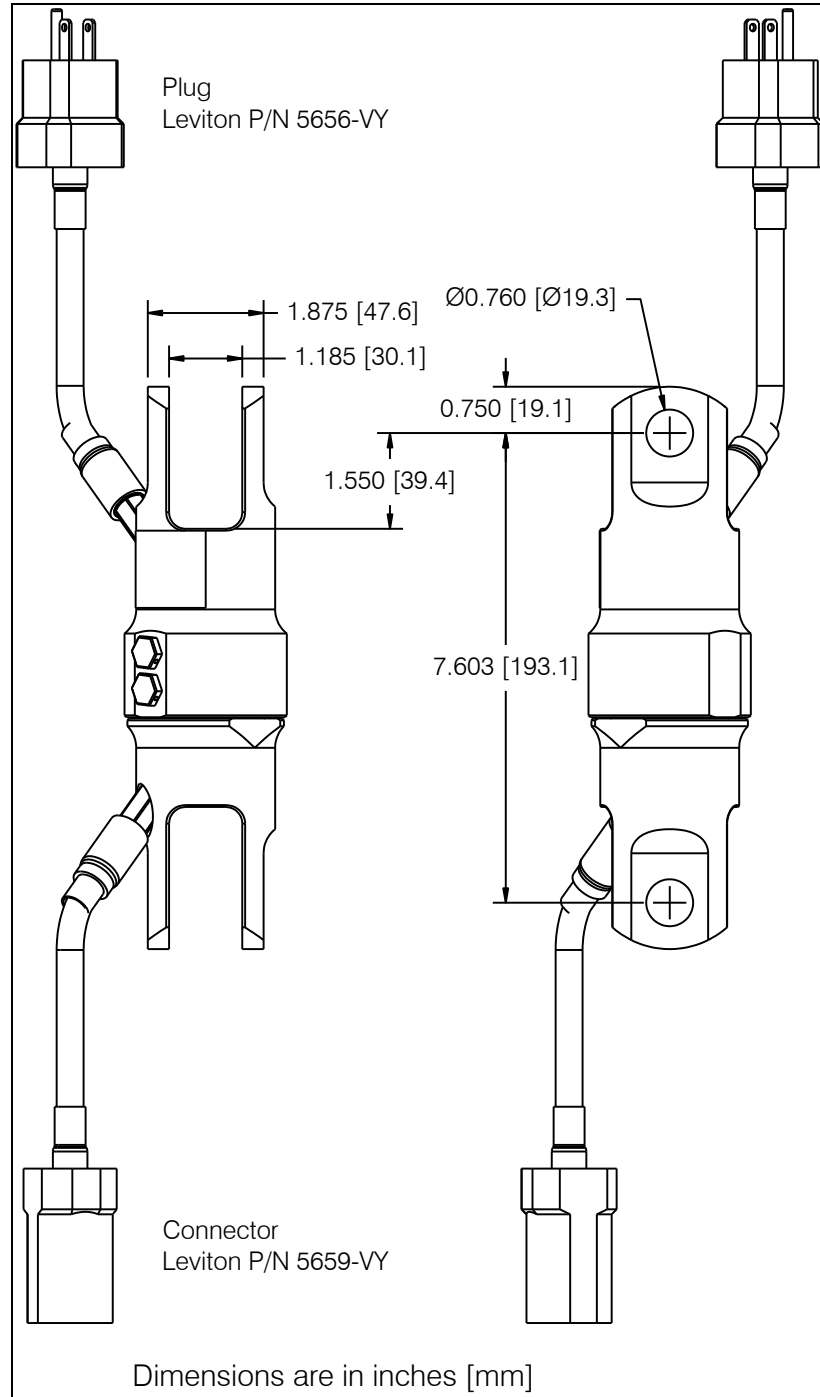


Load capacities given are for the equipment described only. Load limits for the remainder of the external load lifting system and your particular helicopter model still apply. Consult your flight manual for helicopter load limits.

Specifications continued

Figure 1.1 shows dimensions of the electric swivel assembly P/N 232-457-00 (the top clevis and the bottom clevis are identical in size). The travel stops (P/N 291-541-00 or 291-564-00) are not shown in Figure 1.1, they are designed to interface with Onboard Systems 3K and 6K Long Line Cargo Hooks (528-018 series and 528-019 series).

Figure 1.1 Electric Swivel Assembly Dimensions



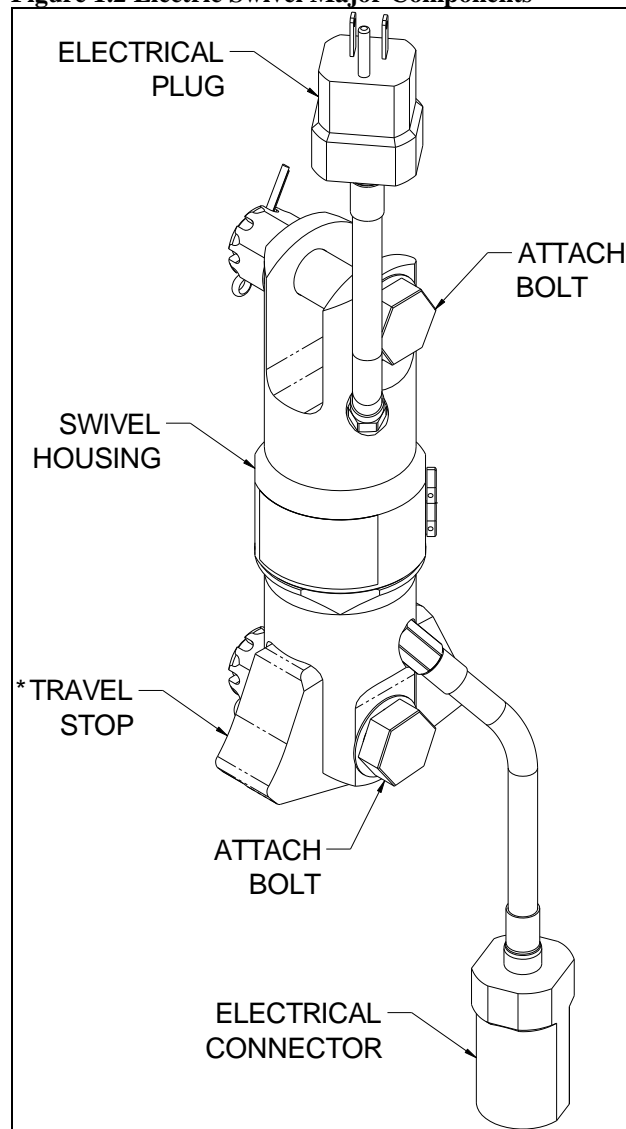
Theory of Operation

The Electric Swivel is designed to be placed between an Onboard Systems long line cargo hook and the helicopter long line. The principal function is to provide an electrical connection with the cargo hook while allowing the cargo hook to spin to accommodate the external load movement.

The Electric Swivel Kit includes a travel stop to prevent binding of the electrical cables and potential damage to the unit or remote cargo hook. Figure 1.2 details the major components of the Electric Swivel.

The 3-Channel Electric Swivel, P/N 232-457-30, is designed to be placed between a helicopter cargo long line and remote equipment requiring a 3-channel connection, such as a carousel system.

Figure 1.2 Electric Swivel Major Components



* Not included with P/N 200-402-00.

This page intentionally left blank.

Section 2

Installation Instructions

Electric Swivel Installation

Attach the Electric Swivel to the long line by placing the long line's thimble directly into the top clevis of the swivel housing—an anchor shackle or other attachment hardware is not recommended. Secure the thimble with the attach bolt, washers, and castellated nut as shown in Figure 2.1. Tighten the nut and install cotter pin.



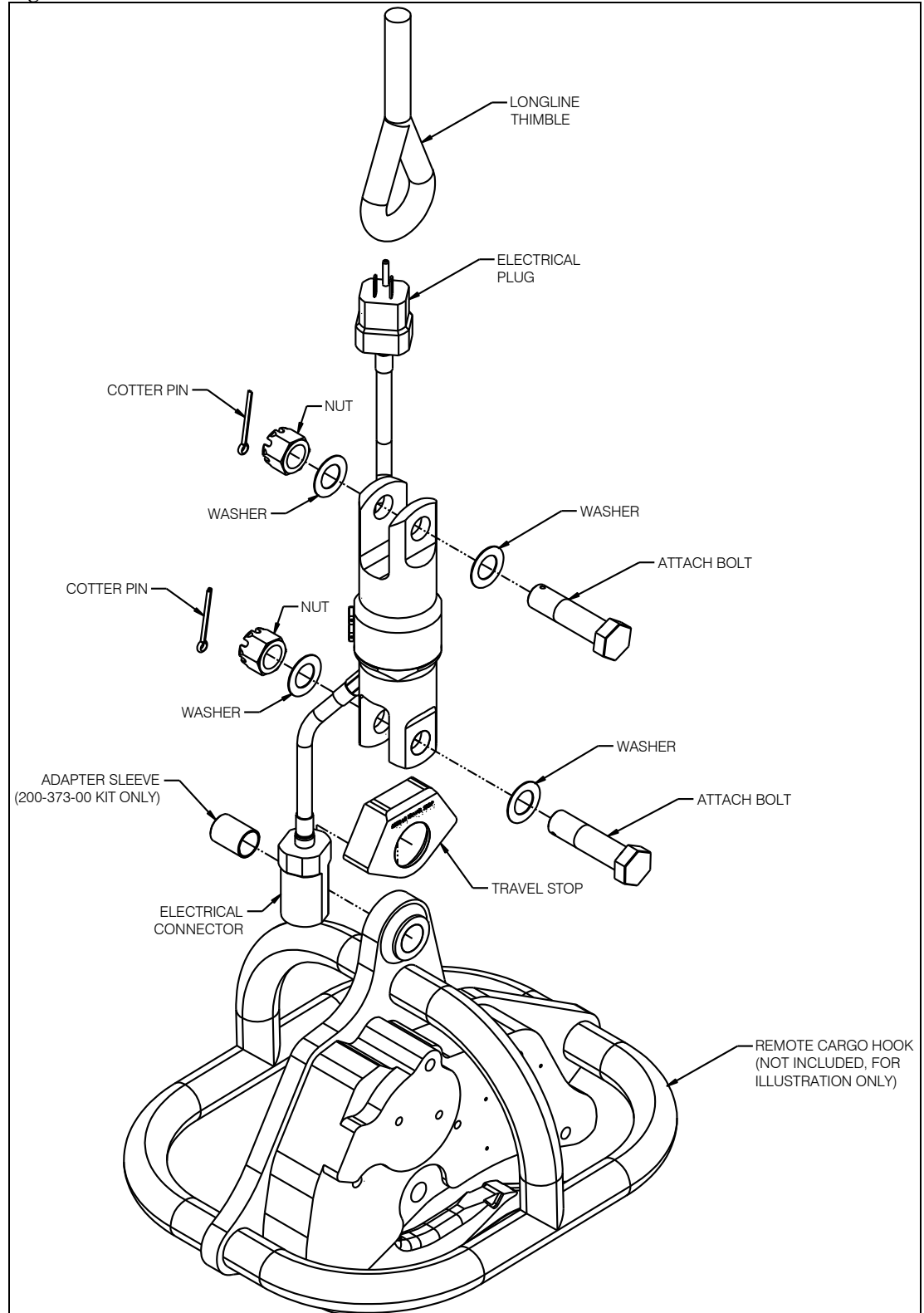
Note the proper orientation of the swivel by referencing the “UP” arrow on the serial number decal. Orientation can also be identified by the electrical plug and swivel geometry as shown in Figure 2.1.

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 lower attach bolt and secure with the provided washers, and castellated nut. Tighten the nut finger tight, then rotate to next castellation and install cotter pin.

Installation of both kits is the same with the exception of the adapter sleeve (P/N 291-565-00) provided with the 6,000 lb Electric Swivel (P/N 200-373-00). The purpose of this sleeve is to reduce the diameter of the attach hole on the Talon 6K Long Line Cargo Hook. To install the sleeve, simply slide it into the attach hole prior to installation of the travel stop.

Electric Swivel Installation continued

Figure 2.1 Installation



Electric Swivel Installation continued

The recommended electrical cable routing at the cargo hook is shown below. 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. Secure the cable to the inside of the welded cage (as shown) in several locations with the provided ty-wraps. If necessary cut the electrical cable from the cargo hook to shorten its length. Verify that the swivel can move throughout its range of motion without pulling the cable tight.

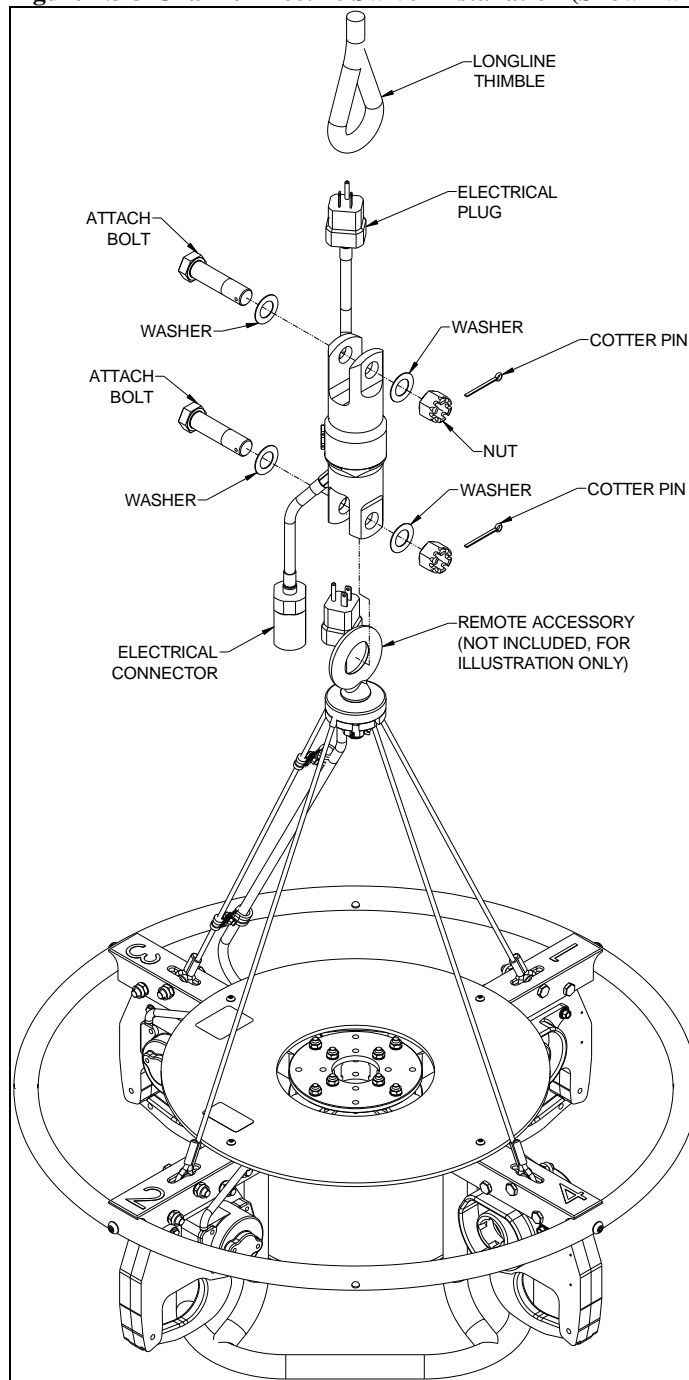
Figure 2.2 Recommended Cable Routing



3-Channel Electric Swivel Installation

The 3-Channel Electric Swivel is attached to the helicopter long line by placing the long line thimble directly into the top clevis of the swivel housing. If needed, an appropriately sized anchor shackle or load ring may be used to attach remote accessories to the bottom half of the swivel. Secure the thimble and other attach hardware with the provided washers, castellated nuts, and attach bolts. Tighten the nuts and install the cotter pin.

Figure 2.3 3-Channel Electric Swivel Installation (Shown with Carousel System)



Section 3

Maintenance

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.

Preventive Maintenance

The swivel will benefit from periodic lubrication of the ball bearings and races. 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.

- Later swivels are equipped with a grease fitting (serial numbers 00400 and above). Rotate the swivel while injecting grease to spread it to both races and all bearing surfaces.
- Earlier swivels do not have a grease fitting. Remove bolts (item 1.6) and inject grease into each bearing race while rotating the swivel. Re-install bolts and replace safety wire.

Inspection Schedule

Inspection of the Electric Swivel is in accordance with the table below.

Table 3-1 Inspection

Part Number(s)	Daily Check	Inspection – Annually or 100 hours of external load operations, whichever comes first.	Inspection – 5 years or 1000 hours of external load operations, whichever comes first.
200-372-00, 200-373-00, 200-402-00	1. Check all fasteners to ensure they are in place and secure. 2. Check the housing for cracks and damage. 3. Check the electrical cable housing for damage and security. 4. Pull on the swivel and rotate it 360°. The swivel should rotate perfectly smoothly. If there is any binding or roughness, disassemble and inspect the bearings per this section. 5. Cycle cargo hook release, or operate remote accessory, to verify electrical continuity through the swivel assembly.	Same as daily check.	Disassemble, clean, inspect, lubricate, and re-assemble per the procedures in this section.

Electric Swivel Disassembly

See Figure 3-1 for illustration and item numbers for P/N 200-372-00, Figure 3-2 for P/N 200-373-00, and Figure 3-3 for 232-457-00. See Table 3-3 for parts list. See Figure 3-4 and Figure 3-5 for illustrated parts breakdown for P/N 200-402-00 and P/N 232-457-30 and Table 3-4 for parts list for these.

1. Separate the Electric Swivel from the long line and cargo hook by removing the cotter pins (4) from the nuts (5). Remove the bolts (7) and washers (17).
2. Remove travel stop (5) and adapter sleeve (Item 6 on P/N 200-373-00 only) from the cargo hook.
3. Disassemble the electrical plug (1.10) and electrical connector (1.9) and disconnect the internal wires from their terminations.
4. Unthread conduit assemblies (1.2) from swivel top (1.3) and swivel bottom (1.4).
5. Remove the safety wire connecting the bolts (1.6) on the swivel top (1.3).
6. Remove the bolts (1.6) and then remove the ball bearings (1.13) from the swivel assembly by orienting the open holes downward and rotating the swivel top with respect to the swivel bottom.
7. Carefully separate the swivel top and swivel bottom while threading the wires through their respective holes.
8. Loosen the set screw and remove the swivel contactor (1.7) and adapter (1.5) assembly from the swivel bottom.
9. Remove the o-ring (1.14) from the swivel top.



The swivel contactor (1.7) contains a small amount of liquid mercury, which is sealed against leakage but because of environmental concerns it should not be disposed of in the trash. Dispose of through a qualified recycler.

5 Year/1000 hour Inspection

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.

- Visually inspect Swivel Top and Swivel Bottom for cracks paying close attention to the attach lug areas.
- Inspect for wear on inside diameter of attach lug holes in the Swivel Top and Swivel Bottom. Replace parts if diameter exceeds .790" in any directions.
- Visually inspect ball bearings and races for damage, including wear, denting, and corrosion. Replace the ball bearings if any signs of corrosion are seen.
- Visually inspect travel stop for cracks and damage.
- Visually inspect wires for damaged or worn insulation which exposes internal conductors.

Electric Swivel Assembly Procedures

1. Replace all parts found to be damaged with serviceable parts.
2. If replacing swivel contactor (1.7) and adapter (1.5), apply Loctite 392 structural adhesive with Loctite 7387 activator to outside of swivel contactor and slide into adapter and re-install electrical wire flag connectors onto contactor.
3. If removed, install grease fitting (1.15) into swivel top (1.3) using Loctite Threadlocker.
4. Install o-ring (1.7) using Mobilgrease 28 or equivalent into swivel top (1.3).
5. Carefully route electrical wires (1.11) through the swivel top (1.3) and swivel bottom (1.4).
6. Seat the swivel contactor (1.7) and adapter (1.5) into the swivel bottom.



The swivel must be oriented so the unit will face the swivel top when installed.

7. Using Loctite Threadlocker, install and tighten set screw (1.12) to retain the adapter (1.5).
8. Apply Mobilgrease 28 or equivalent grease to the bearing races of the swivel top (1.3) and swivel bottom (1.4).
9. Carefully insert the swivel bottom (1.4) into swivel top (1.3)
10. Hold assembly together and insert ball bearings (1.13). Insert 23 bearings into each hole of the swivel top (1.3) rotating the swivel top periodically to disperse the bearings around the bearing races.

Electric Swivel Assembly Procedures continued

11. Inject Mobilgrease 28 or equivalent into each hole of the swivel top.
12. Install bolts (1.6) to secure bearings.
13. Rotate the swivel assembly 360° to check for smooth operation.
14. Safety wire bolts (1.6).
15. Connect male electrical plug (1.10) and female electrical connector (1.9) to wires (1.11). Connect the male end to the swivel top and the female end to the swivel bottom.

Table 3-2 Electrical Pinout (P/N 200-372-00 and 200-373-00)

Connector Pinout		
Wire	Screw	Function
N/A	Green	Not Used
Neutral	Silver	Neutral
Power	Brass	Power

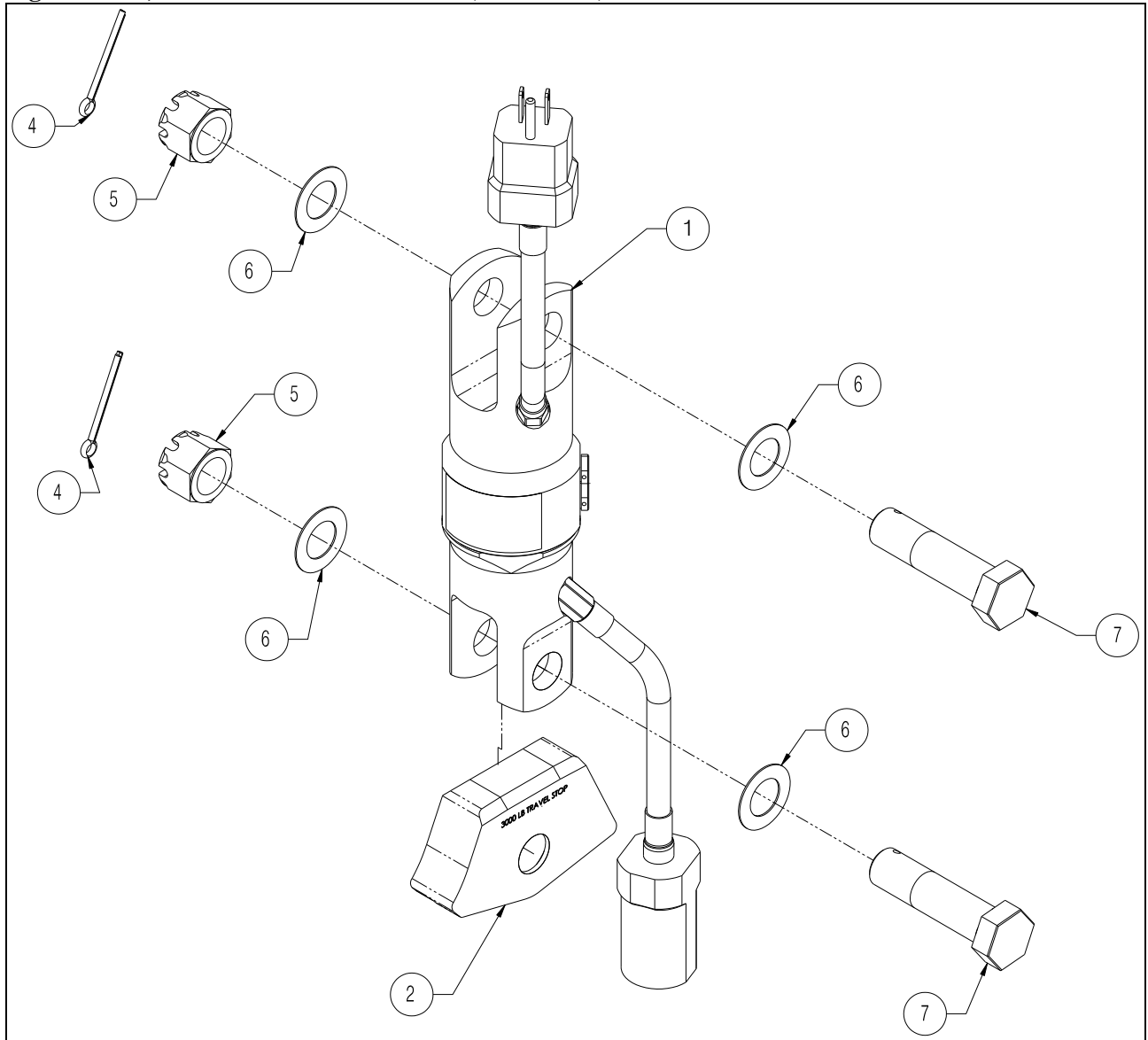
Table 3-3 Electrical Pinout (P/N 200-402-00)

Connector Pinout		
Wire	Screw	Function
Ground	Green	Ground
Neutral	Silver	Neutral
Power	Brass	Power

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

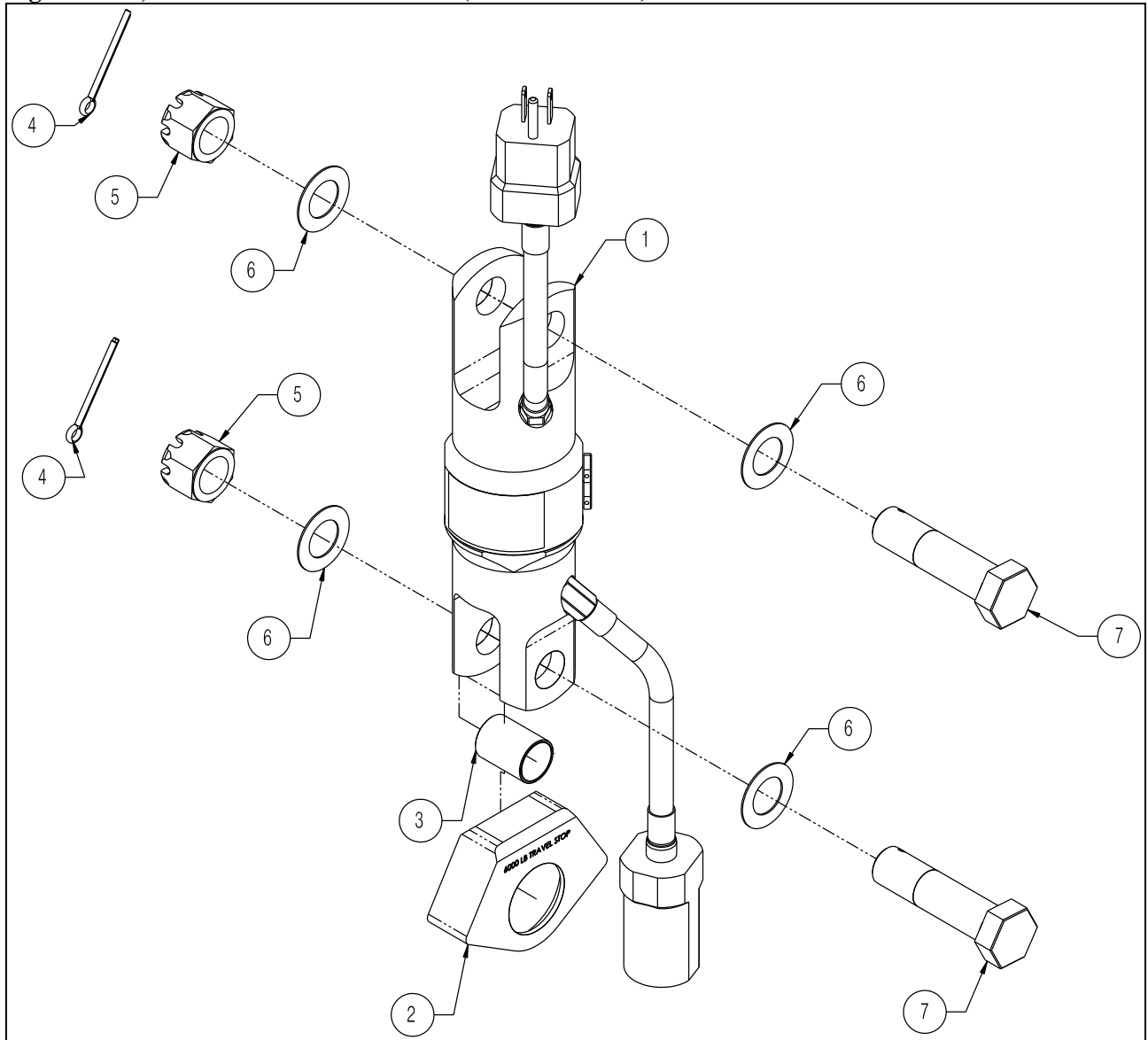
2-Channel Electric Swivel Exploded View

Figure 3-1 3,000 lb Electric Swivel Parts (200-372-00)



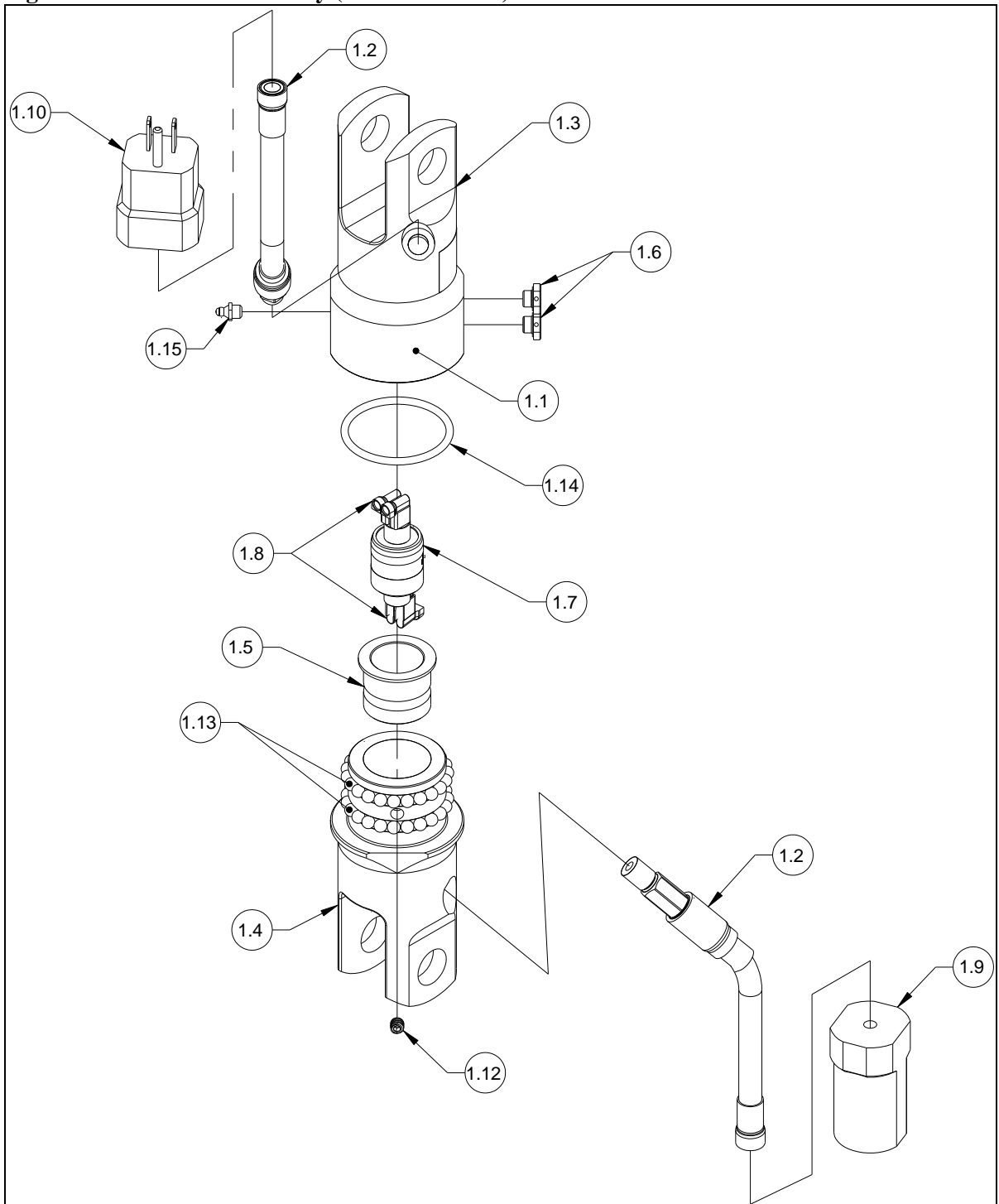
2-Channel Electric Swivel Exploded View, continued

Figure 3-2 6,000 lb Electric Swivel Parts (P/N 200-373-00)



2-Channel Electric Swivel Exploded View, continued

Figure 3-3 Swivel Subassembly (P/N 232-457-00)



2-Channel Electric Swivel Parts

This section describes and lists the assemblies and detail parts of the Electric Swivel kits.

Table 3-4 Electric Swivel Parts

<i>Item</i>	<i>Part No.</i>	<i>Description</i>	<i>Quantity per P/N 200-372-00³</i>	<i>Quantity per P/N 200-373-00</i>
1	232-457-00	Swivel Subassembly	1	1
1.1	215-245-00	Serial Number Decal	1	1
1.2	232-767-00 ⁴	Conduit Assembly	2	2
1.3	291-538-01	Swivel Top	1	1
1.4	291-539-01	Swivel Bottom	1	1
1.5	291-542-00	Contacto Adapter	1	1
1.6	291-544-00	Bolt	2	2
1.7	410-282-00	Swivel Contacto	1	1
1.8	410-283-00	Flag Connector	4	4
1.9	410-299-00	Electrical Connector	1	1
1.10	410-300-00	Electrical Plug	1	1
1.11	420-082-00 ¹	16" GA Wire, 30" Length	4	4
1.12	510-895-00	Set Screw	1	1
1.13	517-109-00	Ø .25" Bearing	46	46
1.14	556-071-00	O-Ring	1	1
1.15	518-004-00	Grease Fitting	1	1
2	291-541-00	3K Travel Stop	1	-
2	291-564-00 ²	6K Travel Stop	-	1
3	291-565-00 ²	Adapter Sleeve	-	1
4	510-605-00	Cotter Pin	2	2
5	510-729-00	Nut	2	2
6	510-897-00	Washer	4	4
7	510-899-00	Bolt	2	2

¹ Not shown.

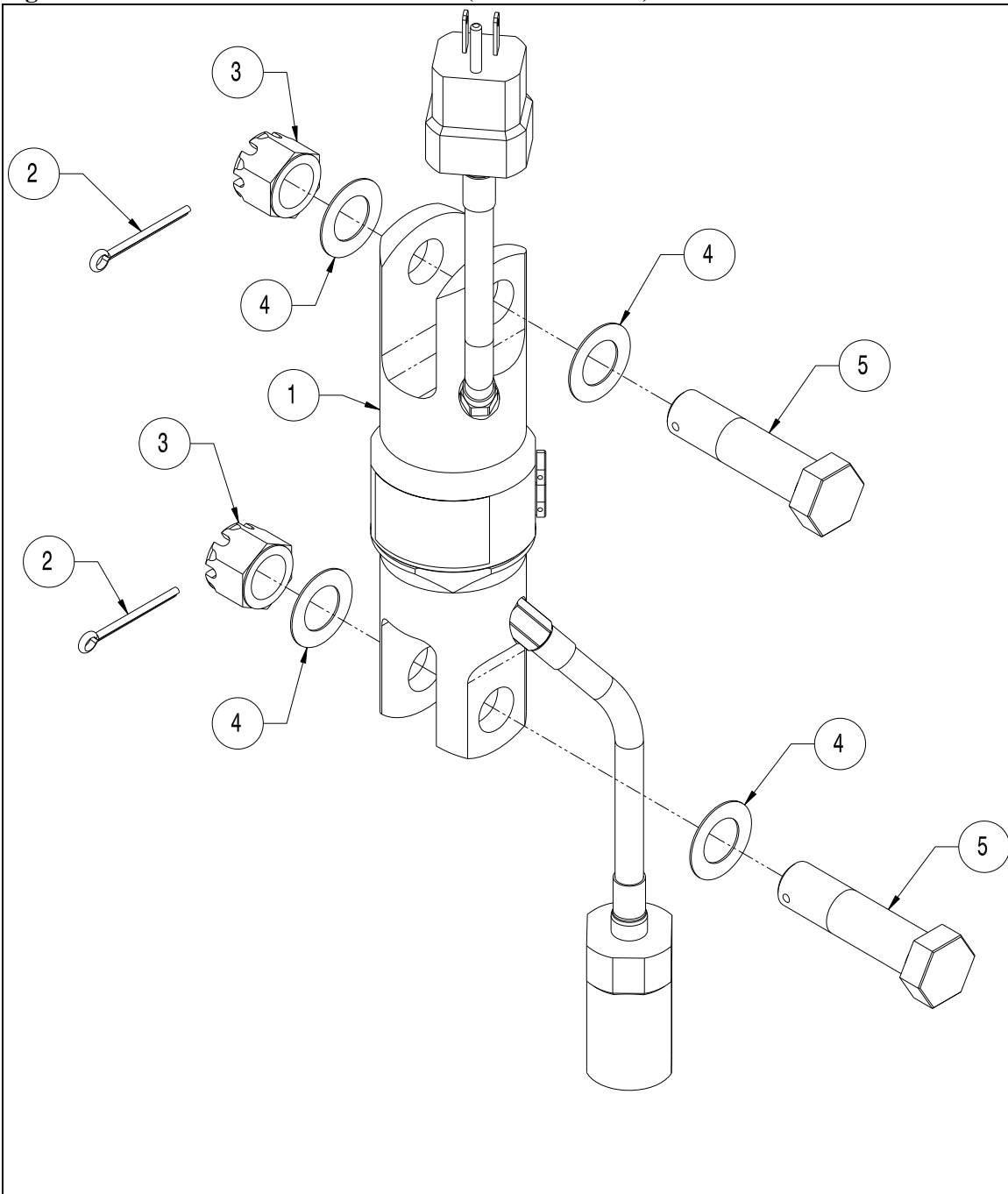
² Used on P/N 200-373-00 only.

³ Kit P/N 200-372-00 can be converted to Kit P/N 200-373-00 for use with a 6000 lb long line cargo hook (P/N 528-019 series of cargo hooks) by swapping out the Travel Stops and incorporating Sleeve P/N 291-565-00.

⁴ Supersedes 232-448-00.

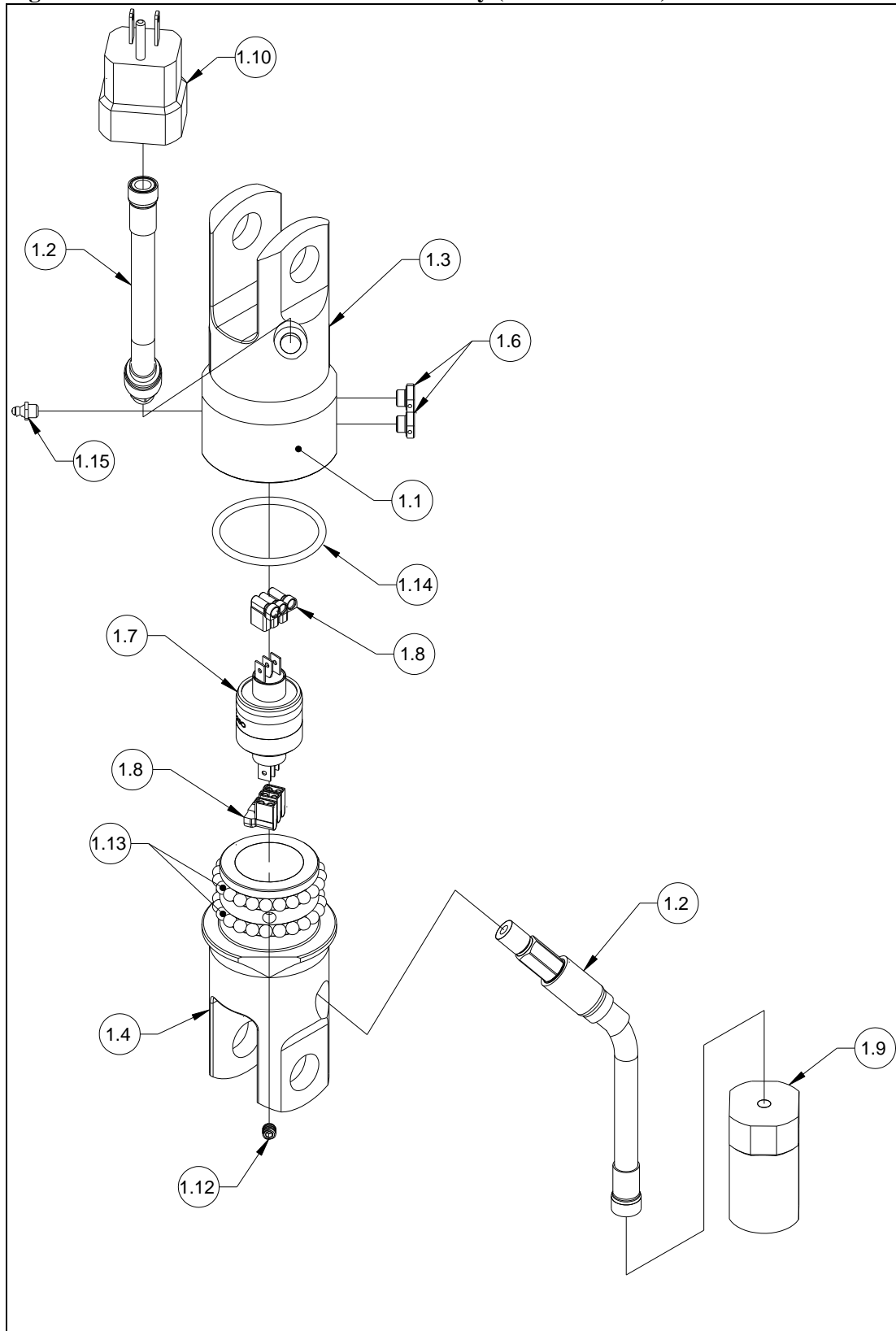
3-Channel Electric Swivel Exploded View

Figure 3-4 3-Channel Electric Swivel Kit (P/N 200-402-00)



3-Channel Electric Swivel Exploded View, continued

Figure 3-5 3-Channel Electric Swivel Assembly (P/N 232-457-30)



3-Channel Electric Swivel Parts

This section lists the assemblies and detail parts of the 3-Channel Electric Swivel.

Table 3-5 3-Channel Electric Swivel Parts

<i>Item</i>	<i>Part No.</i>	<i>Description</i>	<i>Quantity per P/N 200-402-00</i>
1	232-457-30	3-Channel Assembly	1
1.1	215-245-00	Serial Number Decal	1
1.2	232-767-00 ²	Conduit Assembly	2
1.3	291-538-01	Swivel Top	1
1.4	291-539-01	Swivel Bottom	1
1.5	--	<i>reserved</i>	--
1.6	291-544-00	Bolt	2
1.7	410-360-00	3-Channel Electric Swivel	1
1.8	410-283-00	Flag Connector	6
1.9	410-299-00	Electrical Connector	1
1.10	410-300-00	Electrical Plug	1
1.11	420-082-00 ¹	16 GA. Wire, 30" Length	6
1.12	510-895-00	Set Screw	1
1.13	517-109-00	.25" Ball Bearing	46
1.14	556-071-00	O-Ring	1
1.15	518-004-00	Grease Fitting	1
2	510-605-00	Cotter Pin	2
3	510-729-00	Nut	2
4	510-897-00	Washer	4
5	510-899-00	Bolt	2

¹ Not shown.

² Supersedes 232-448-00.

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:

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