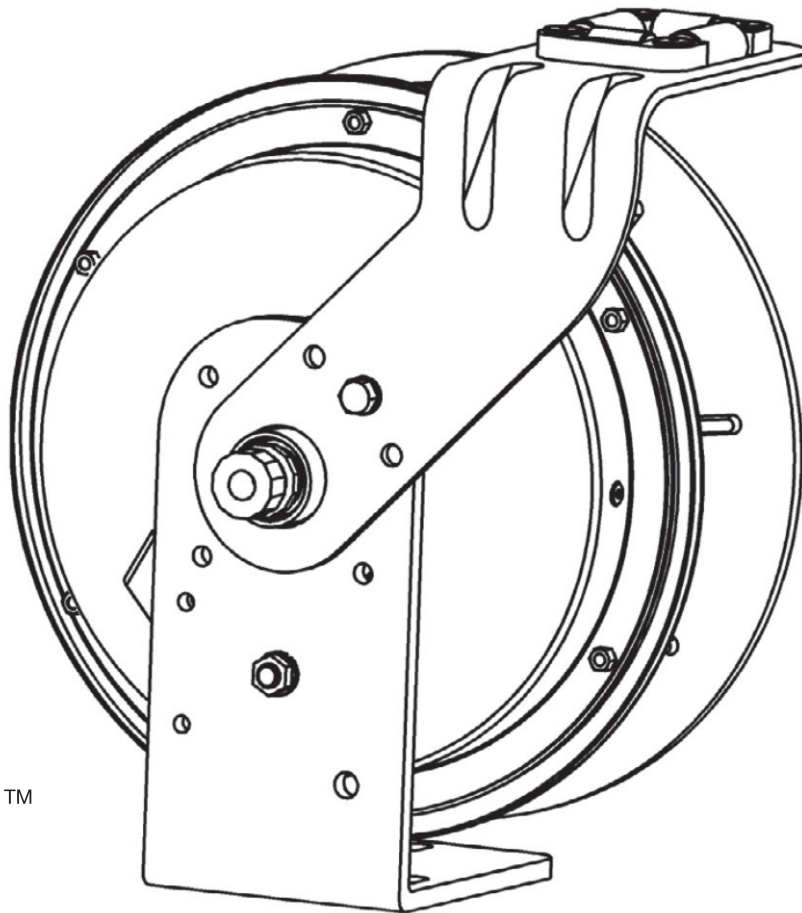




RTB Series Cord Reel Manual

Includes all models beginning in KH's ORB, ORA, and RTB Heavy Duty Retractable Power Cord Reel Series.



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KH Industries - Terms and Conditions of Sale

1. TERMS AND CONDITIONS OF CONTRACT.

Except where otherwise provided in a written agreement duly executed by an authorized signatory of K & H Industries, Inc. ("KH"), all goods and services supplied by KH pursuant to the Confirmation of Order overleaf and these terms and conditions (the "Goods") are provided subject to the details set out in the said Confirmation of Order and to the terms and conditions set forth herein. KH's ACCEPTANCE OF AN ORDER IS EXPRESSLY CONDITIONED UPON BUYER'S ASSENT TO THESE TERMS AND CONDITIONS, AND BUYER'S ACCEPTANCE OF GOODS HEREUNDER SHALL BE DEEMED AN ACCEPTANCE OF THESE TERMS AND CONDITIONS. KH specifically rejects any terms and conditions in Buyer's order or in any other document from Buyer that in any way conflict with, reduce or affect these terms and conditions.

2. PRICES. Unless otherwise agreed in writing, all prices are quoted F.O.B. at KH's premises in Hamburg, New York, USA. All price quotes by KH will remain valid for thirty (30) days. Thereafter, prices are subject to change without notice to Buyer. Typographic, clerical and manifest errors in any offer are subject to correction by KH at any time. The minimum billing per order is \$100 plus freight charges, orders that do not meet this minimum will be subject to a \$25 service charge.

3. PAYMENT TERMS. Payment for all Goods shall be made in U.S. funds and prior to shipment (either by cash, banker's draft, cashier's check, check drawn on good funds, telegraphic transfer or approved credit card) or, at the sole discretion of KH, C.O.D., unless Buyer has applied for and been granted a line of credit by KH, in which case purchases can be made up to approved credit limits with payment therefore due net 30 days. Late payments shall be charged interest at the rate of 1.5% per month. KH is entitled hereunder to delay shipment until payment monies have cleared (e.g. check has become final; credit card charge has been authorized). Credit terms are subject to change or withdrawal at any time at KH's sole discretion, regardless of prior credit arrangements. KH reserves the right to require current financial information from any buyer with an open account as a condition of the continued extension of credit. Buyer shall promptly reimburse KH in respect of KH's costs, including reasonable attorneys' fees, incurred in the collection of any monies owed to KH by Buyer. For orders invoiced or shipped outside the United States, KH will require a confirmed, irrevocable letter of credit, payable at sight in United States funds, advised and payable on an acceptable US bank. Buyer shall be solely responsible for procuring any and all necessary export, import and/or other permits. Buyer's order shall constitute a representation that Buyer is solvent, and KH is relying upon such representation. If KH at any time reasonably believes that the Buyer is insolvent or that the Buyer's credit is impaired, Buyer shall be in material breach thereof and hereof and KH may, without liability to Buyer, withhold performance hereunder, change the payment terms and/or repossess Goods delivered.

4. ADDITIONAL COSTS & TAXES. All prices and quotations are exclusive of sales, use, excise, duty, VAT and all similar taxes and levies. All such charges shall be for the account of Buyer and, if not included in an original invoice, may be invoiced or added to Buyer's credit card payment, if any, by KH at a later date.

5. CHANGES; CANCELLATION OF ORDER. If Buyer cancels or changes the order, or any part thereof, for any reason, Buyer agrees to pay cancellation charges for all costs incurred by KH due to such cancellation, including without limitation, costs incurred by KH in the design, development or manufacture of special, custom-made or custom-designed Goods, or Goods altered at the request of Buyer [plus related profit, as reasonably determined by KH.] The costs shall include commitments made by KH to third parties for labor or materials for use in completing such order. KH's determination of cancellation charges shall be final and conclusive.

6. SHIPPING. Title in Goods and risk of loss or damage thereto shall pass to Buyer upon delivery thereof by KH to the carrier at FOB point. Goods shall be shipped in accordance with the information set out in the Confirmation of Order overleaf. Unless instructed otherwise by Buyer, KH may ship by any reasonable manner and routing. All shipping costs shall be for the account of Buyer. All shipments shall be insured for their full replacement value and all such insurance shall be for the account of Buyer. All orders are subject to KH's current shipping and handling charges. KH shall not be liable or otherwise responsible for defaults or delays in delivery by carrier. Shipping dates set out on the Confirmation of Order are approximations only, subject to, inter alia, factory schedules and inventory. If any shipment of Goods is delayed due to any act or omission of Buyer, KH may charge Buyer reasonable storage fees in relation thereto, including without limitation, storage costs, insurance costs and cost of money. Unless otherwise agreed by KH in writing, KH, in its sole discretion, may make partial shipments of any order, for which pro rata payments shall be due and payable as indicated on the invoice issued pursuant thereto. KH reserves the right not to ship to Buyer if Buyer's account is overdue.

7. ACCEPTANCE OF GOODS. Buyer acknowledges that it has a duty to inspect Goods immediately upon receipt. Goods will be deemed accepted by Buyer unless notice of lawful rejection has been delivered in writing to KH within ten (10) business days after receipt thereof. Any notice of shortage must be delivered in writing to KH within three (3)

business days after receipt thereof by Buyer. Any notice of damage to Goods must be delivered in writing to KH and the relevant carrier within three (3) business days after receipt thereof by Buyer.

Authorization from KH must be received by Buyer in writing prior to the return of any Goods by Buyer hereunder, and Buyer shall be solely responsible for adequate packing and pre-payment of freight with respect thereto. For the avoidance of doubt, KH shall not be obligated to accept any unauthorized return of Goods, any Goods inadequately packed or Goods for which freight has not been fully pre-paid by Buyer.

8. RETURNED GOODS. KH may, at its sole option, agree to accept unused and merchantable Goods from Buyer, subject always to a restocking charge of 20%. Buyer agrees that it shall not return any Goods prior to receiving written authorization from KH so to do. Any and all returned Goods shall be shipped freight pre-paid and risk of damage or loss shall remain vested in Buyer until the relevant Goods are received, inspected and accepted by KH. For the avoidance of doubt, KH is not obligated to accept any returned Goods pursuant to this paragraph. Custom manufactured Goods are non-cancelable/non-returnable.

9. RE-CONDITION & REPAIR. Before shipping any Goods to KH for repair, Buyer shall contact KH for Return Merchandise Authorization (RMA) and shipping instructions. With respect to any repairs by KH, Buyer shall be solely responsible for payment of freight charges, replacement parts, and labor costs at KH's then current prices. Any repairs to any of the Goods performed by Buyer or by third parties [pre-approved by KH] shall be carried out in strict accordance with the applicable repair manual(s), if any, published by KH from time to time.

10. LIMITED WARRANTY; EXCLUSION OF OTHER WARRANTIES; LIMITATION OF REMEDIES; INDEMNITY.

KH warrants the Goods to be free from defects of materials or workmanship, under normal and proper use and service, for a warranty period of one (1) year from the date of shipment (as such date is shown in KH's records)(the "Warranty Period"). If any of the Goods proves to be defective in any material respect within the Warranty Period, such defective Good(s) shall be promptly returned to KH, F.O.B. KH's factory, shipping charges prepaid, by the Buyer, and if the same is determined by KH to be defective in any material respect and covered by the terms of the warranty provisions set forth in this Section 10, it will be replaced or repaired, at the exclusive election of KH, free of charge. If Buyer believes any of the Goods are defective in any material respect during the Warranty Period, Buyer shall immediately cease using such Good(s) and notify KH in writing of such non-conformity or defect, specifying in reasonable detail the nature thereof.

Notwithstanding the foregoing, KH is not responsible for, and shall have no obligation to replace or repair any Goods which: (i) have been used, operated and/or installed other than in strict accordance with KH's written instructions and/or policies, if any; (ii) have been installed, operated or used in an improper, abnormal or inappropriate manner, as reasonably determined by KH; (iii) have been damaged due to the negligence of another party; (iv) have been damaged due to an accident, natural disaster, extreme weather, or other act of God; (v) have been serviced, repaired or altered by anyone other than KH or a third party approved by KH to service or repair the defective or damaged Goods, and provided further, that all such service, repair and alterations by approved third parties must be completed in accordance with the applicable repair manual(s) for the defected or damaged Good, if any; or (vi) have been used in a manner or for a purpose for which the Goods were not designed.

No warranty is made with respect to any defects in the Goods due to plans or instructions supplied to KH by or for Buyer. THE LIMITED WARRANTY SET FORTH IN THIS SECTION 10 IS MADE AND ACCEPTED BY BUYER IN LIEU OF ALL OTHER WARRANTIES WITH RESPECT TO THE GOODS, WHETHER EXPRESS OR IMPLIED, MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE. THE LIMITED WARRANTY SET FORTH IN THIS SECTION 10 IS BUYER'S SOLE AND EXCLUSIVE REMEDY FOR ANY DEFECTS OR DAMAGE TO THE GOODS, AND ALL OTHER REMEDIES ARE EXPRESSLY DISCLAIMED.

TO THE MAXIMUM EXTENT PERMITTED BY LAW, KH IS NOT RESPONSIBLE FOR DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY OR CONDITION OF THE GOODS, OR UNDER ANY OTHER LEGAL THEORY, INCLUDING BUT NOT LIMITED TO LOSS OF USE; LOSS OF REVENUE; LOSS OF ACTUAL OR ANTICIPATED PROFITS (INCLUDING LOSS OF PROFITS ON CONTRACTS); LOSS OF THE USE OF MONEY; LOSS OF ANTICIPATED SAVINGS; LOSS OF BUSINESS; LOSS OF OPPORTUNITY; LOSS OF GOODWILL; OR LOSS OF REPUTATION.

Buyer acknowledges that the Goods may be used in inherently dangerous activities and, accordingly, expressly bears the risk of injury damages and other harm to Buyer, and its employees, contractors, representatives, and other third parties arising out of use of the Goods in such inherently dangerous activity(ies). Buyer agrees to indemnify and hold KH harmless from and against any claims, awards, damages or other costs incurred by KH, including reasonable attorneys' fees incurred by KH in connection with same, arising out of the use of any Good(s) in inherently dangerous activities.

While KH uses reasonable endeavors to ensure the accuracy and quality of its publications, sales literature and other printed materials,

from time to time errors might occur in that regard. KH therefore does not guarantee the accuracy or completeness of any publication or other informational materials.

11. INTELLECTUAL PROPERTY. The purchase by Buyer of any Goods hereunder does not grant to, convey or confer upon Buyer or Buyer's customers, or upon anyone claiming under Buyer, a license or any other legal interest, express or implied, under any patent right, trademark, copyright or other intellectual property right, whether registered or not and whether pending or not, in any jurisdiction, of KH covering or relating to any of the Goods or any combination or process in which any of the Goods might be or are used.

Buyer understands and agrees that KH does not warrant that the Goods are free of claims of patent, trademark, trade secret or copyright infringement by a third party. KH hereby disclaims any such warranties or indemnification for such infringement(s) or intellectual property rights. Any rights not expressly granted herein are reserved by KH.

12. FORCE MAJEURE. KH shall not be liable for any failure to perform under the Confirmation of Order or these terms and conditions if it is unable to obtain parts or supplies at reasonable prices or through usual and regular sources on a timely basis, or due to any interruption of transportation, government regulation, labor disputes, strikes, riots, war, civil commotion, fire, flood, accident, storm, or act of God, or other cause beyond KH's reasonable control that renders it impractical for KH to perform.

13. ARBITRATION. Buyer agrees that the laws of the State of New York, without regard to principles of conflict of laws, shall govern the agreement between KH and Buyer with respect to all sales of Goods, and any dispute of any sort that may arise in connection with these terms and conditions and the sale of Goods to Buyer by KH (a "Dispute"). All Disputes shall be submitted to final and binding arbitration, the proceedings of which shall be located in Buffalo, New York, and conducted in accordance with the Commercial Arbitration Rules of the American Arbitration Association (the "Rules") by one arbitrator appointed in accordance with the Rules. Notwithstanding the foregoing, Buyer acknowledges that KH may, in its sole discretion, elect to commence an action in a court of competent jurisdiction located in Buffalo, New York (without resorting to commencing arbitration proceedings as specified above) to enforce Buyer's failure to timely pay any and all amounts due to KH for the purchase of Goods (a "Financial Default"). In connection with the foregoing, in the event KH elects to commence an action against Buyer in connection with a Financial Default, Buyer specifically acknowledges and irrevocably consents to the jurisdiction of a court of competent jurisdiction located in Buffalo, New York, waives objection to the laying of venue of any such action or other legal proceeding in Buffalo, New York, waives personal service of process in such action, and consents to the making of service of process in each such action by registered mail, directed by KH to the last known address of Buyer showing in the records for KH, service to be deemed complete five (5) days after the mailing thereof.

Other than a Financial Default (in which case KH may, in its discretion, elect to commence a lawsuit against Buyer in a court of competent jurisdiction located in Buffalo, New York), all Disputes shall be resolved exclusively by arbitration. Any award made by the arbitrator shall be final, binding and conclusive on the parties for all purposes. Any fees or charges of the arbitration and any cost of arbitration, including the cost of personal attorneys of each participant, shall be the sole responsibility of each party to the arbitration; provided, however, in the event of a Financial Default, KH may recover all costs and expenses incurred by it (including its attorney fees) in seeking payment or enforcement of these Terms and Conditions as a result of the Financial Default, including whether KH commences an action or initiates arbitration proceedings.

14. GENERAL. This agreement will be governed by and construed in accordance with the laws of the State of New York. The application of the United Nations Convention for the International Sale of Goods, if it would otherwise apply, is hereby expressly excluded. These terms and conditions and the Confirmation of Order overleaf set out the entire agreement between KH and Buyer relating to the Goods and supersede any prior agreement, arrangement, purchase order, correspondence, communication, advertising or representation concerning the Goods. This agreement may not be modified or amended except by a written instrument duly executed by authorized signatories of the parties. If any provision of this agreement is held to be invalid or unenforceable, that provision is to be given effect to the maximum extent permissible and the remaining provisions of this agreement will remain in full force and effect. Notices hereunder shall be delivered in writing by registered mail to the addresses of the parties overleaf, or as notified to the other party from time to time. If any term, provision, or covenant of these terms and conditions is held to be invalid, void, or unenforceable, the remainder of these terms and conditions shall remain in full force and effect and shall in no way be affected, impaired or invalidated. Each shipment of Goods shall be considered a separate transaction between Buyer and KH. In the event of any default by Buyer, KH may decline to make further shipments. If KH elects to continue to make shipments of Goods subsequently ordered by Buyer after a default, such subsequent shipments shall not constitute a waiver of default by KH or in any way affect its legal remedies for any such default.

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SECTION 1 - SAFETY

Safety Information Responsibility

All owner, operator, and maintenance personnel must read and understand all manuals associated with this product before installation, operation, or maintenance.

The manual provides information on the recommended installation, operation, and maintenance of this product. Failure to read and follow the information provided could cause harm to yourself or others and/or cause product damage. No one should install, operate, or attempt maintenance of this product prior to familiarizing themselves with the information in this manual.

Safety Messages

The following safety messages are used in this manual to alert you to specific and important safety related information.

CAUTION

- CAUTION indicates unsafe actions or situations that have the potential to cause injury, and/or minor equipment or property damage.

DANGER

- DANGER indicates hazards that have the potential to cause severe personal injury or death.

WARNING

- WARNING indicates unsafe actions or situations that have the potential to cause severe injury, death, and/or major equipment or property damage.

NOTE

- NOTE is used to alert you to installation, operation, programming, or maintenance information that is important, but not hazard related.

Electrical Warnings

Properly ground this equipment before use in accordance with both the National Electric Code and local electrical codes and ordinances.

Disconnect the electrical power from the cord reel before any service functions are performed.

Do not use this cord reel for loads greater than the current rating listed on the label and voltage greater than 300V with SJOW-A cable OR 600V with SOW-A cable. The ampacity (current) rating of the cable must be in accordance with the National Electric Code.

Electrical wiring on the reel must be done by a qualified electrician.

Operational Warnings

Exercise care when handling the cord reel during normal operation. This cord reel has a rotating spool powered by springs under tension.

Do not allow cable to retract without restraining the retraction speed.

Do not disassemble the spring motor for any reason. Serious personal injury could result. This cord reel is equipped with springs under tension. Contact the factory for assistance:

Call: 1-716-312-0088

Maintenance Warnings

Do not use cable different from that for which the reel is intended. Changes in diameter, weight per foot, length of cable or flexibility will affect the operation of the reel.

Mounting hardware and fasteners should be installed to maintain tightness under vibration and checked periodically to assure tightness.

Overhead installation mountings should be such that the reel is not suspended by bolts in tension. A safety chain or cable is strongly recommended to minimize damage and/or possible injury in the event of mounting failure.

WARNING: Modification of this equipment may cause excessive wear and will void the warranty. Contact the manufacturer regarding changes or modifications of equipment which could affect reliability or safety.

SECTION 2 - SAFETY

Electrical Rating

Reels equipped with or without cable.

Cord reels equipped with cable are rated and should not be used at voltages and/or amperes above the rating on the reel. Please consult factory prior to making any changes in volts and amps of cable, as a change could affect reliability or safety.

Color Code Chart		
Location of Ring	No. of Conductor	Base Color
top	Ground	Green
2nd from top	2	Black
3rd from top	3	White
bottom	4	Red

Cable AWG / # of Cond.	Ampacity
16/3	10
16/4	8
14/3	15
14/4	12
12/3	20
12/4	16

Labels & Marking

Every cord reel is marked with a label which includes the KH Industries name and logo, the product catalog number, the individual product serial number, NEMA rating, Amps, Volts, Watts and Cable Footage.

The UL / CSA Listing mark is applied to reels that comply with the applicable requirements and identified with the authorized mark.

The maximum cable footage, amperage and voltage rating for every cable reel supplied without cable is marked on the KH Industries Identification Label. The actual cable installed should not differ from what is indicated on the KH Industries label. If the cable must be different please consult the factory prior to installing the cable to ensure the change will not affect the reliability of the reel or the safety of the people working with the cord reel.

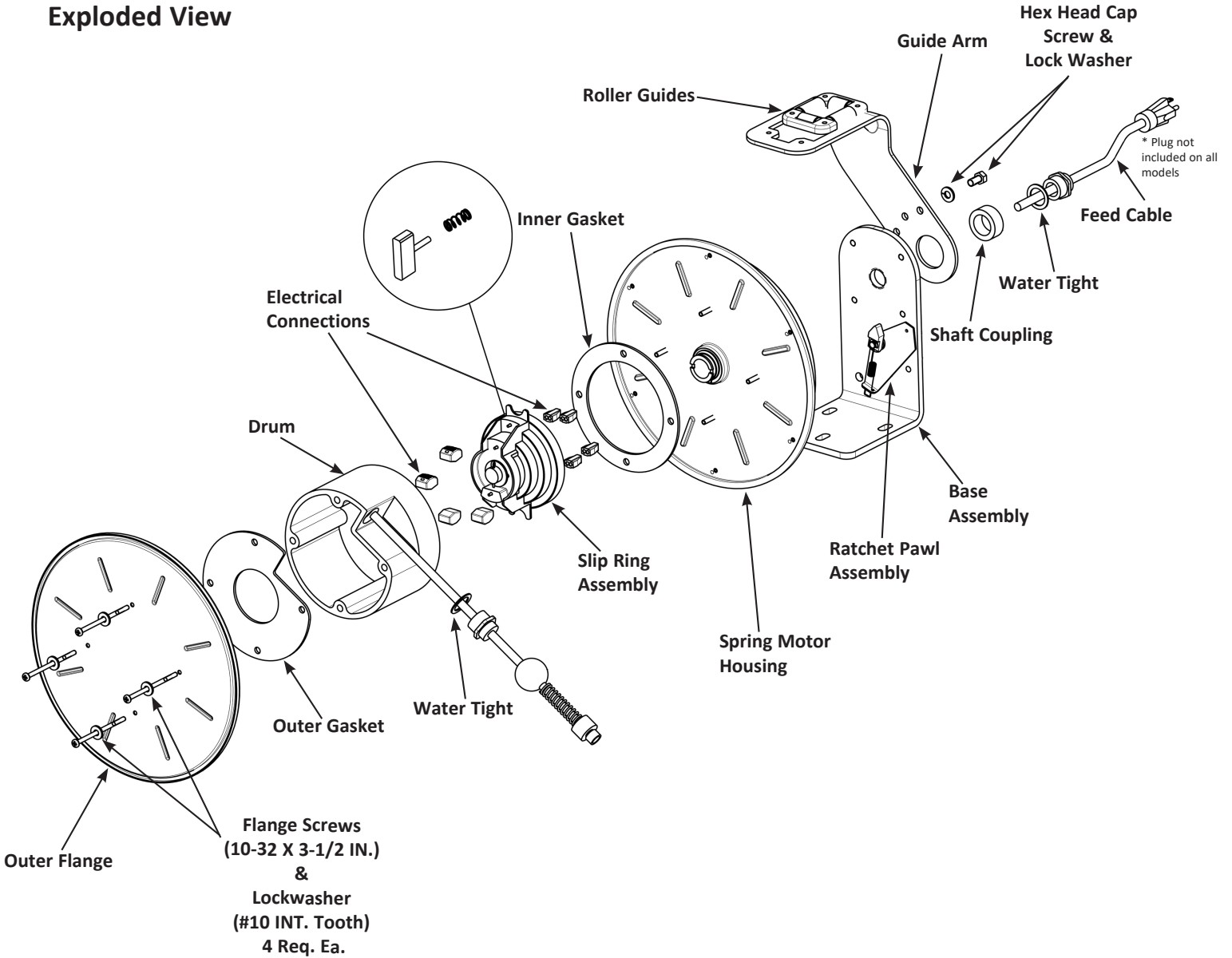



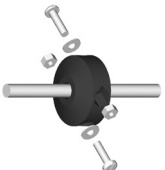
LISTED
REEL
6 7 N 6



SECTION 2 - OVERVIEW

Exploded View



RTB Series Ball Stops		
Type A	Part No.	Description
	KH200-00287	For cable O.D. ranges 0.188" to .438"
Type B	Part No.	Description
	KH200-00269	For cable O.D. ranges 0.438" to .624"
	KH200-00007	For cable O.D. ranges 0.625" to .749"
	KH200-00322	For cable O.D. ranges 0.750" to 1.05"

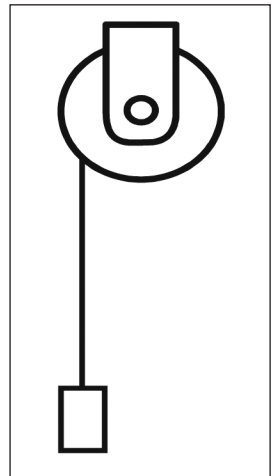
SECTION 3 - INSTALLATION

Application Types

Lift Applications

The cable is lifted vertically in lift applications. The reel is normally designed to handle only the total weight of the cable. Some lift applications may require a ball stop and ratchet to control the length of cable to be retracted. See **Figure 8-1**.

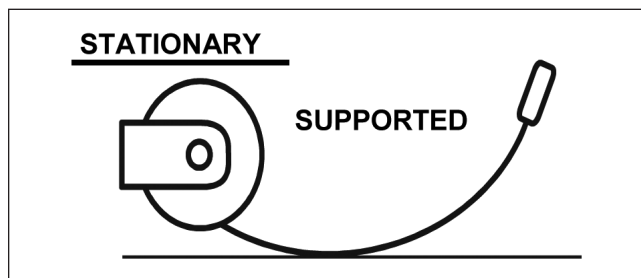
Figure 8-1



Drag Applications

The reel is mounted on a stationary object and is required to drag the cable over the surface to the reel. The cable is supported by the ground or some type of cable tray. A ball stop may be required. All RTB Series reels sold with cable have a ball stop installed on the reel. See **Figure 8-2**.

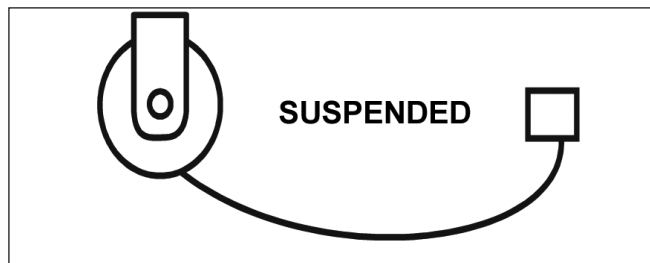
Figure 8-2



Stretch Applications

The cable is suspended without any intermediate support. Stretch reels generally require a line pull equal to two times the weight of the cable, which allows approximately 10% sag at full extension. On long applications where sag cannot be tolerated, it is sometimes desirable to put supports at intervals of 5 to 10 feet. See **Figure 8-3**.

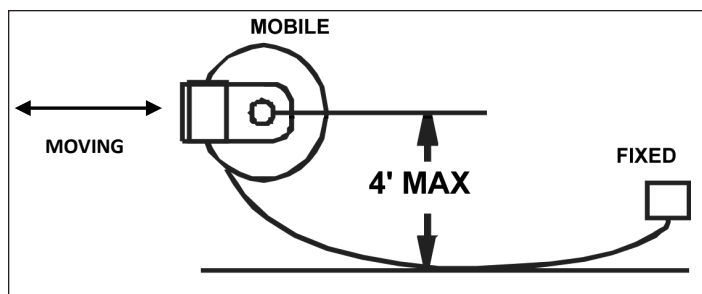
Figure 8-3



Retrieve Applications

The reel is mounted on the moving object and winds up or pays out the cable as the machine approaches or moves away from the fixed end. See **Figure 8-4**.

Figure 8-4



SECTION 3 - INSTALLATION

Mounting

Standard Mounting

The reel may be mounted by bolting the base to any flat surface which is structurally sound enough to support it and the forces of winding and unwinding the cable.

The spool drum must rotate on a horizontal axis.

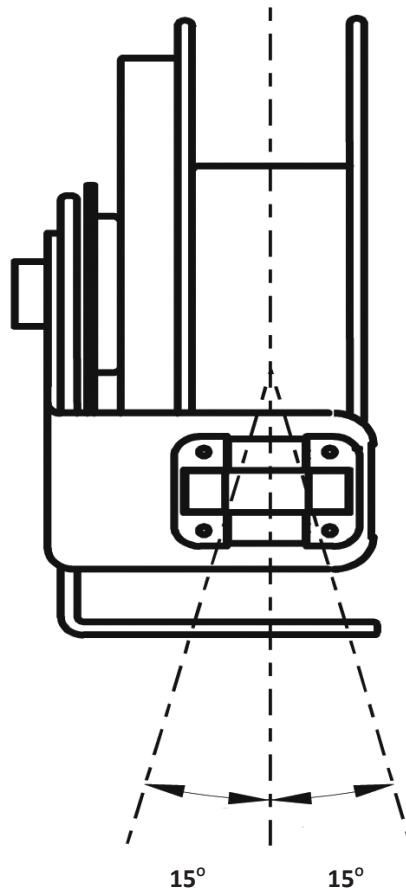
The reel should be oriented so that the cable extends perpendicular to the rotation of the spool. The cable deflection should not exceed 15° to either side of center. See **Figure 9-5**.

If deflection is constant to either side of the reel and operation is impaired, re-mount the reel. See **Figure 9-5**. If the total angle of deflection exceeds 30° a Pivot Base should be used, otherwise excessive cable wear and unreliable operation will result.

We recommend a safety chain for all overhead installations. Attach the safety chain using the 0.39 hole provided in the base.

Cable Deflection with Roller Guide

Figure 9-5



SECTION 3 - INSTALLATION

Pivot Base Mounting (Optional Accessory)

All RTB Series Cord Reels can be furnished with a pivot base to allow the reel to rotate and keep the extended cable perpendicular to the application. See **Figure 10-1**.

The PVB Pivot Base will rotate up to 345°. Travel can be limited to 90°, 180°, or 270° by installing an additional roll pin in the appropriate available hole.

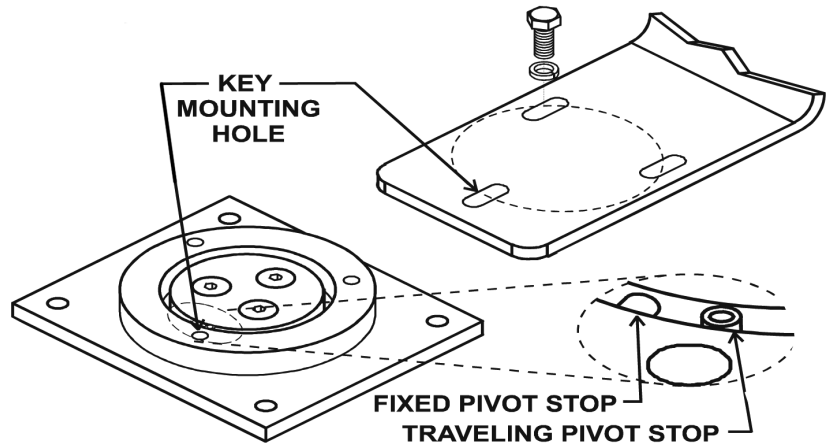
A pivot base is required for carousel or loop track applications.

When a pivot base is used the reel must be mounted horizontally (“ceiling” or “floor” mounted).

The roller guide should be mounted to require the cable to travel perpendicular to the axis of rotation. This will guard against cable twisting and ensure effective swivel action from the pivot base.

Swing mount and swivel base available, consult factory.

Figure 10-1



Roller Guides

All RTB Series units are equipped with a roller guide. The guide’s function is to center the cable on the spool and to help the reel wrap cable more evenly. See **Figure 10-2**.

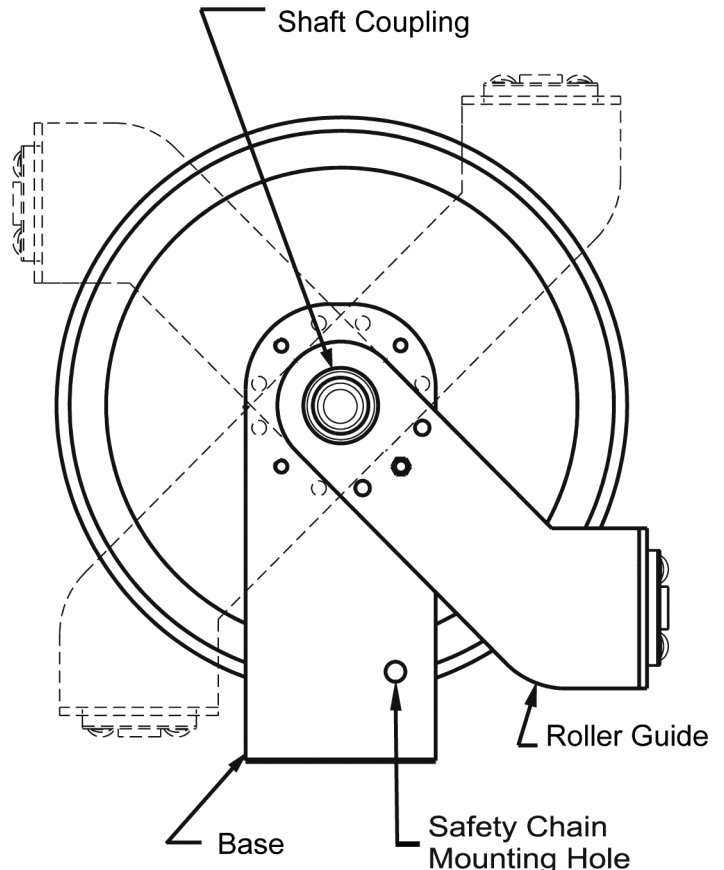
The cable should not bear against either end of the spool during winding as this will tend to inhibit level winding of the cable.

The guide should be secured at the best of twelve possible positions so that a minimum change of direction occurs at the guide; otherwise, cable life will be reduced.

A max 15° angle from guide arm center to cable pay out from reel is suggested.

The guide arm is shipped attached to the reel. The guide must be located and secured in the most appropriate position with the 5/16-18 x 5/8” hex head screw and lock washer provided, prior to making any electrical connections.

Figure 10-2



Ratchet

Ratchet Lock

The ratchet lock can be engaged or disengaged, depending upon the application. Reels are sent from factory with ratchet lock engaged. See **Figure 11-1**.

Operation with Ratchet

The ratchet pawl is spring loaded. It is designed to function in all acceptable mounting configurations. See **Figure 11-1**.

A slight pull on cable will disengage the ratchet. See **Figure 11-1**.

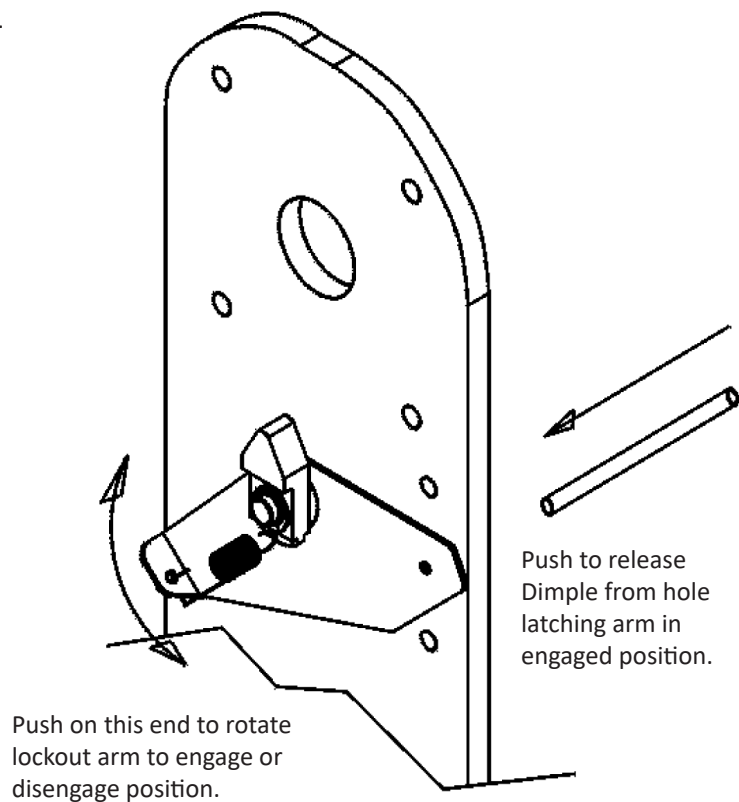
Operation without Ratchet

Disengage the ratchet by pivoting the lock-out bar to the lower position. This will remove the ratchet pawl from the path of the ratchet plate. Locate the dimple on the lock-out bar in the hole provided. See **Figure 11-1**.

WARNING

- Do not engage the ratchet abruptly. Sudden engagement may cause excessive shock loads to the ratchet pawl.

Figure 11-1



Cable Installation

Either of two methods for installing cable on the reel may be used. The **first method** is to simply lay the cable out straight along the path of travel and wrap onto the reel. The **second method** requires using a support for the cable being wrapped (see **Figure 13-1**, next page). In either method, it is important that the cable not twist or loop.

1. Remove the 4 screws securing the outer flange. Remove outer flange, gasket and drum from the remaining assembly.
2. Strip back approximately 6" of cable jacket.
3. Feed cable through the watertight and the drum, so that 1" of the jacket is through the watertight. Secure a cable-tie 1/4" from the end of the jacket and tighten watertight. Replace inner flange gasket if damaged (see **Figure 13-3**, next page).
4. Cut the individual wires such that the white and green wires extend 3" beyond the cable jacket and the red and black wire extend 6" beyond the cable jacket. Strip approximately 1/2" of insulation. Insert each cable wire and it's corresponding slip ring brush wire into the toggle lock wire connector. See **Figure 12-1**.
5. Perform a continuity check to verify circuits.
6. Attach outer flange gasket and outer flange to drum (replace outer flange gasket if damaged). Attach with 10-32 x 3-1/2" screws. Longer screws will damage the reel.
7. Wrap new cable on drum spool.
8. Adjust spring tension by following spring tension adjustment procedure (page 14).

Figure 12-1

- | | |
|-------------------|-----------|
| 1. Plastic Washer | 5. Ring 2 |
| 2. Bearing | 6. Ring 3 |
| 3. Cotter Pin | 7. Ring 4 |
| 4. Ground Ring | |

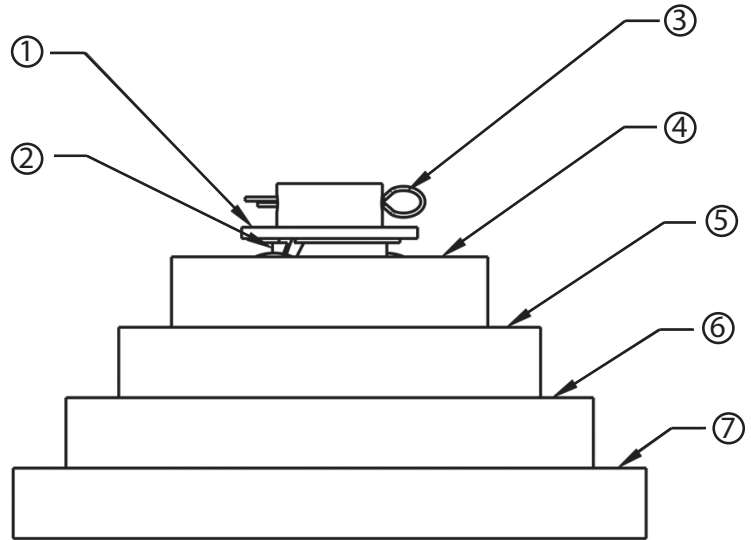


Figure12-2

Location of Ring	No. of Conductor	Base Color
top	Ground	Green
2nd from top	2	Black
3rd from top	3	White
bottom	4	Red

SECTION 3 - CABLE INSTALLATION DRAWINGS

Figure 13-1

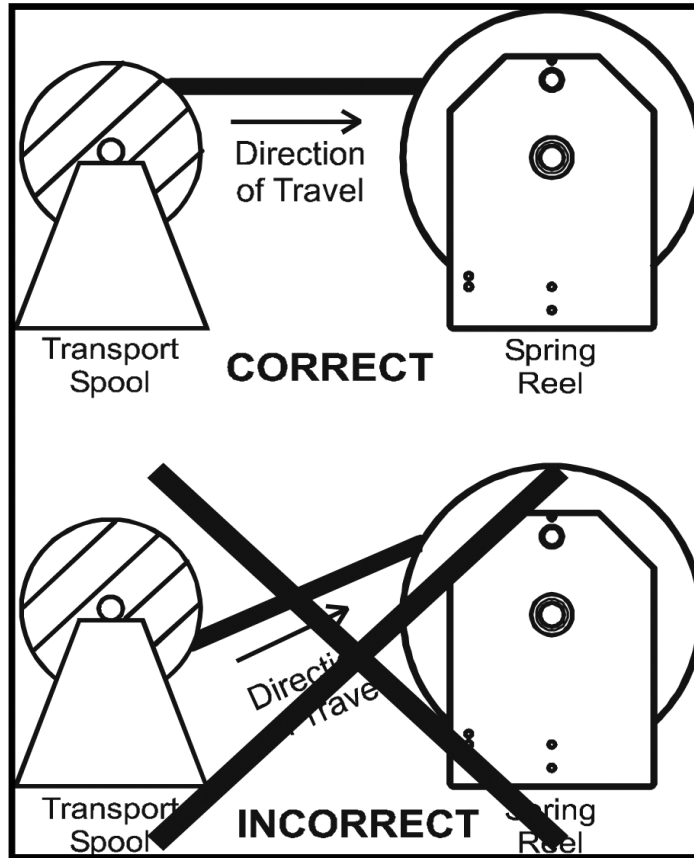
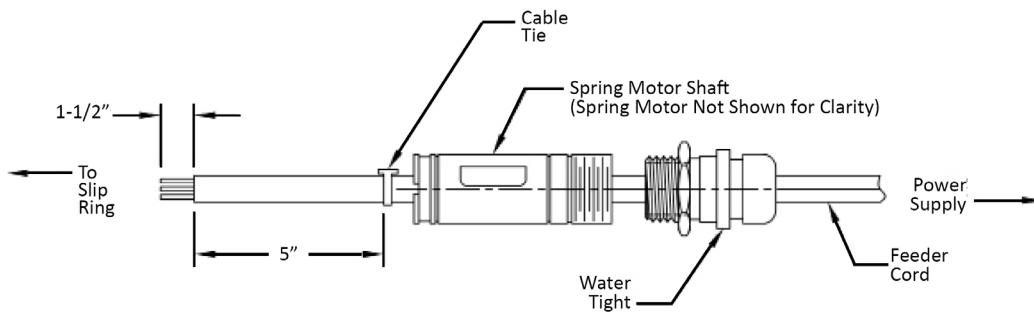


Figure 13-2

Power Connection

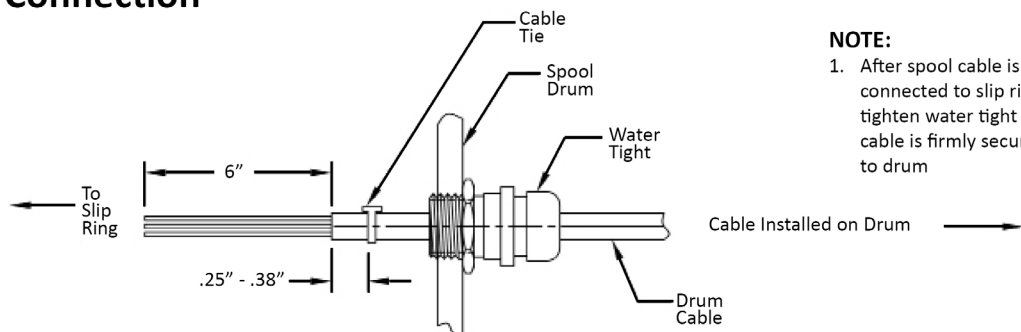


NOTE:

1. After installing cable tie slide cable back into shaft so cable tie goes in contact with water tight
2. Tighten water tight so cable is firmly secured to reel

Figure 13-3

Spool Drum Connection



NOTE:

1. After spool cable is connected to slip ring tighten water tight so cable is firmly secured to drum

Feed Cord Connection

Power supply should have overcurrent protection to prevent overheating of the reel and cable.

Follow procedure in **Section 5 - Maintenance** if feed cord is not installed on reel.

1. Connect feed cord to power supply, per NEC and local codes.

Spring Tension Adjustment

To assure that the cable will retract properly and operate under the correct tension, the reel should be tested.

1. Install cable on drum but do not connect the free end of cable. Securely mount reel before testing.
2. Pull the cable out approximately 20 - 30 feet and allow it to rewind. This procedure should be repeated 5 to 10 times in order to set the spring.
3. Walk the cable back to the reel during the spring tension adjusting process.

⚠ WARNING

- Do not allow cable to retract without restraining the retraction speed. Always maintain two full cable wraps on drum at maximum cable extension, size cable accordingly.

4. With all the cable wound on the reel, grasp the end of the cable and rotate the drum and cable together in a clockwise direction in order to pre-tension the spring. Generally, one full turn is adequate for most applications. Use no more than two full turns for pre-tension. See **Figure 14-1**.
5. Feed the end of the cable through the cable guide and pull the cable out the required length.

NOTE

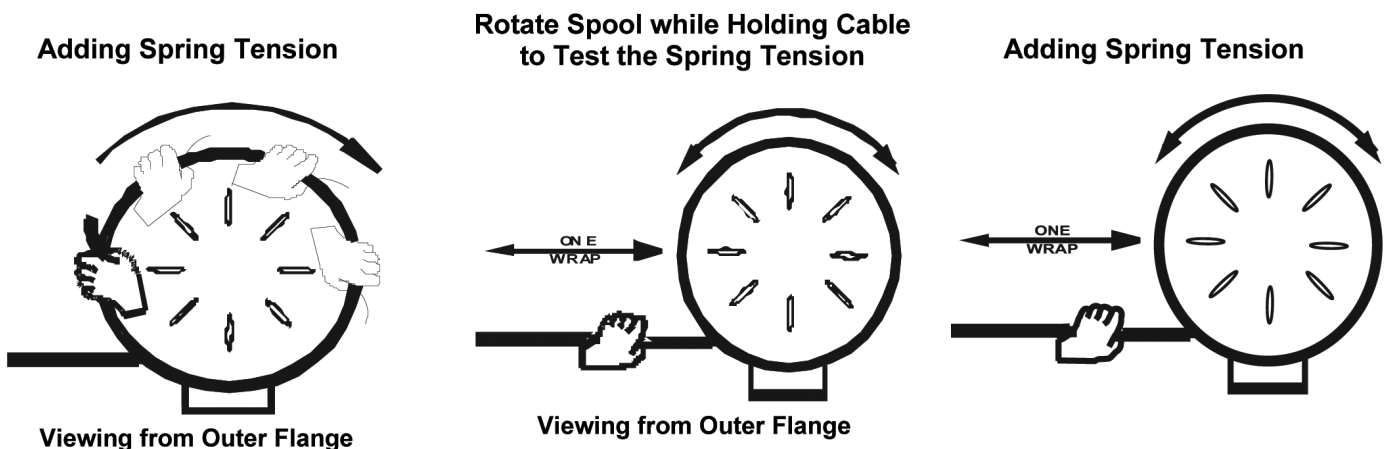
- The number of spool revolutions including the pre-tension turns should not exceed 26 full turns on models with model numbers beginning with RTBB or 30 turns on models with model numbers beginning with RTBA. Consult factory or your representative if number of spool turns are not within parameter.

6. Repeat steps if necessary to add or decrease tension. See **Figure 14-1**.

NOTE

- All reels with factory installed cable have one full pre-wrap on the reel, but has not had the spring tension adjustment process completed.

Figure 14-1



SECTION 4 - OPERATION

- Do not exceed the voltage or ampere rating of the reel. Overheating, fire, damage to equipment or personal injury could result.
- Do not allow cable to retract without restraining the retraction speed.
- Operate the reel within the cable size and length and spring tensioning limits for which it was intended.
- Two wraps of cable should remain on the reel at maximum extension to avoid excessive tension on the cable entrance watertight.
- The spring should not be wound to its last two turns at maximum payout to avoid over-stressing the spring, thus reducing its life or damaging the reel.
- Keep the reel and cable clean to avoid excessive wear and damage.
- Arrange for maintenance service if damage is found on the cable or reel.
- Cable should be fully retracted when not in service to maximize spring life.

BE SURE THE POWER IS OFF FOR ALL MAINTENANCE.

Lubrication

- All springs and bearings are lubricated for life at the factory. Additional lubrication should not be required.
- Do not apply any lubricants or solvent cleaning agents to slip ring, brush or insulator surfaces.

Inspections

- Periodically check the reel for any loose or missing fasteners. Tighten or replace as necessary.

NOTE

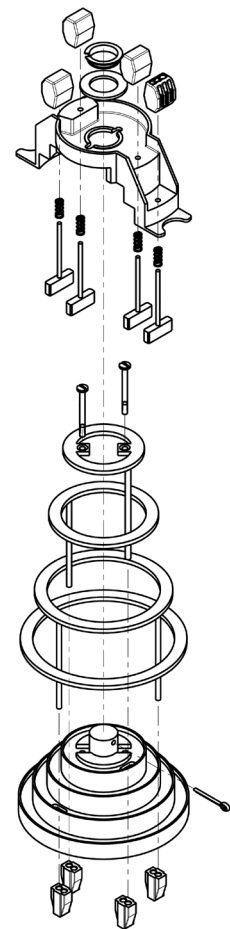
- Do not over tighten, this will cause fasteners to snap.
- The slip ring assembly should be checked periodically as follows:
 - » Clean to remove dust and dirt from the slip ring housing area and all slip ring assembly and brush surfaces.
 - » Inspect cable for damage or wear which would make it unsafe to use.

Slip Ring & Feed Cord Replacement

The slip ring assembly should be replaced, not rebuilt, if it becomes damaged.

1. Remove the 4 screws securing the outer flange. Remove outer flange and gasket from remaining assembly. Remove or unwrap the cable from the drum and lay it next to the reel. See **Figure 16-1**.
2. Disconnect the wires from the spool cable. Remove the drum (black plastic tube) from the reel and place next to the slip ring.
3. Loosen feed cord watertight located at the shaft end.
4. Remove the brush block from the slip ring by removing the cotter pin and washer at the top of the slip ring assembly. Remove the 2 screws securing the slip ring to the shaft. See **Figure 16-1**.
5. Remove the slip ring from the shaft while feeding in the feed cord through the shaft. Cut wires if they are butt spliced or disconnect connectors if locking wire connectors are used. Reinsert the washer and cotter pin after removal of the slip ring from the shaft to keep the assembly together.
6. Carefully and thoroughly clean the inside surfaces of both flanges and the drum. Inspect both gaskets for damage and replace as necessary.
Caution: Damaged gaskets may affect UL / CSA rating of reel.
7. Remove old feed cord and insert approximately 5" -10" of new feeder cord through the watertight and shaft. Secure cable-tie as shown in **Figure 13-2** (page 13).
8. Install inner gasket.
9. Connect the slip ring leads to the feed cord with the provided wire connectors and install the slip ring on the shaft. Ensure the wire connectors are outside the shaft and under the slip ring body before securing the slip ring to the shaft. Be careful not to over tighten or strip the Phillips head screws.
10. Install the 2 screws to secure the slip ring to the shaft.
11. For remaining assembly, follow Cable Installation and Spring Tension Adjustment in Section 3.

Figure 16-1



Cable Replacement

Replacement cable should be the same size and length as existing cable. Any variations to cable specifications should be pre-approved by the factory.

1. Disconnect all electrical service to the reel before replacing the cable as per Lock-Out/Tag-Out procedures outlined in OSHA section 1910.147.
2. Disconnect the terminated service end of the cable and allow the cable to retract onto spool. Make sure the end of the cable is through the roller guide. Ensure all spring tension has been relieved by manually rotating the spool counter clockwise as viewed from outer flange.
3. Remove the 4 screws securing the outer flange. Remove outer flange and gasket from remaining assembly. Remove or unwrap the cable from the drum and lay it next to the reel.
4. Disconnect the wires from the spool cable. Remove the drum (black plastic tube) from the reel and place next to the slip ring.
5. Loosen feed cord watertight located at the shaft end.
6. Remove the brush block from the slip ring by removing the cotter pin and washer at the top of the slip ring assembly. Remove the 2 screws securing the slip ring to the shaft (see exploded view).
7. Remove the slip ring from the shaft while feeding in the feed cord through the shaft. Cut wires if they are butt spliced or disconnect connectors if locking wire connectors are used. Reinsert the washer and cotter pin after removal of the slip ring from the shaft to keep the assembly together.
8. Remove cable.
9. Carefully and thoroughly clean the inside surfaces of both flanges and the drum. Inspect both gaskets for damage and replace as necessary.



CAUTION

- Damaged gaskets may affect UL / CSA rating of reel.

10. Install inner gasket.
11. For remaining assembly, follow Cable Installation and Spring Tension Adjustment in Section 3.

Spring Motor Replacement

CAUTION

- Do not open the spring motor or personal injury may result.

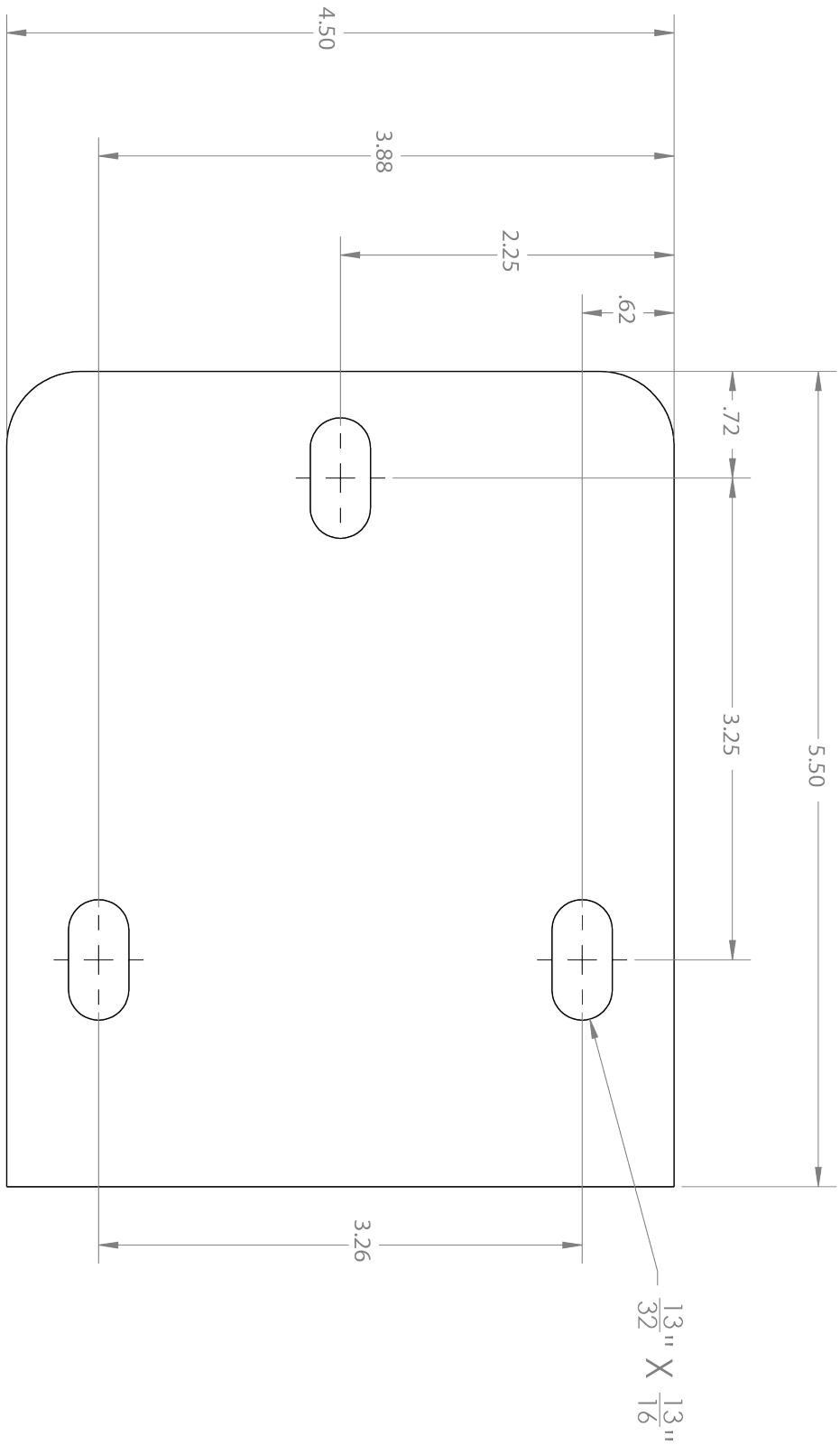
1. The spring replacement process is determined by the spring configuration and cannot be performed in the field. The entire spring motor assembly must be replaced as a unit. See Spring Motor Selection Chart (**Figure 19-1**) for proper spring motor selection.
2. Disconnect all electrical power to the reel before beginning any maintenance or service.
3. Remove the slip ring and feed cord from the reel by following the procedure in Slip Ring & Feed Cord Replacement section.
4. Remove the watertight and coupling from the shaft.
5. Remove the spring motor by unscrewing the shaft from the mounting base.
6. Re-assemble spring reel in reverse order with the new spring motor. Note the following:
 - A. Shaft must be fully seated on base before installing coupling and watertight.
 - B. Verify drum, slip ring, and ratchet teeth orientation as per **Figure 19-1**.
 - C. Adjust spring tension.

Figure 19-1

Spring Motor Selection Chart		
Cable Type	Cable Lengths That Use This Spring Motor	Spring Motor Part Number (Spring)
14/3 SJEOW-A	Up to 50'	RTPRT-SMG50
12/3 SJOW-A	Up to 50'	RTPRT-SMK50
14/4 SJEOW-A	Up to 50'	RTPRT-SMG50
12/4 SJOW-A	Up to 40'	RTPRT-SMK50
16/3 SOW-A	Up to 50'	RTPRT-SMG50
14/3 SOW-A	Up to 40'	RTPRT-SMK50
12/3 SOW-A	Up to 30'	RTPRT-SMK50
16/4 SOW-A	Up to 50'	RTPRT-SMK50
14/4 SOW-A	Up to 35'	RTPRT-SMK50
12/4 SOW-A	Up to 25'	RTPRT-SMK50

SECTION 6 - TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Reel will not retract cable but has some tension	1) Improper pretension	1) See tension adjustment section
	2) Incorrect reel for application (lift vs. stretch)	2) Quantify application vs. reel selection
	3) Improper cable or cable length installed	3) Install correct cable type and length
	4) Cable guide adjustment	4) Check guide alignment
Reel does not have spring tension	1) Broken spring. *Quantify application to prevent reoccurrence	1) Replace spring motor
Ratchet will not engage	1) Broken ratchet pawl spring 2) Lock-out option arm disengaged	1) Replace ratchet pawl spring 2) Engage lock-out arm
Ratchet will not disengage	1) Over-extension of reel	1) Manually rotate reel spool to disengage ratchet. Do not over-extend. (Guide adjustment may prevent lock-up when over-extended) 2) Adjust ball stop
Cable wraps improperly (uneven wrapping, wraps above or jumps flange)	1) Reel mounting not level 2) Cable retraction rate too high 3) Cable guide out of adjustment 4) Improper cable or cable length installed	1) Mount reel on level surface 2) Maintain steady retraction rate 3) Properly adjust cable guide 4) Install correct cable type and length
Cable twisting or knotting	1) Improperly installed cable	1) See cable installation section in IOM
	2) Cable rubbing on or bending around fixed object	2) Check roller guide for function and cable pay out path
	3) Excessive spring tension	3) Quantify application vs. reel selection Also check pretension
	4) Inadequate anchoring of cable	4) Adjust anchoring method (i.e. add strain relief)
Open or intermittent circuit	1) Inadequate connection	1) Check all termination points
	2) Loss of brush contact to slip ring	2) Check brush wear, spring tension and alignment
	3) Cable defective	3) Perform continuity check on cable termination points
Circuit trips and/or Pitted burned rings or brushes	1) Inadequate amp rating of reel selection	1) Quantify application requirements vs. reel & cable rating
Circuit arcing	1) Amp or voltage above rating of reel	1) Quantify application requirements vs. reel & cable rating
	2) Excessive carbon dust accumulation	2) Clean dust from inside slip ring
	3) Water or moisture in slip ring	3) Check gasket seal
	4) Loss of brush to ring contact	4) Replace brush spring



$\frac{13}{32}$ X $\frac{13}{16}$

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