

simpson-lawrence

# horizon

400 WINDLASS

operation & maintenance instructions

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- |                              |                           |
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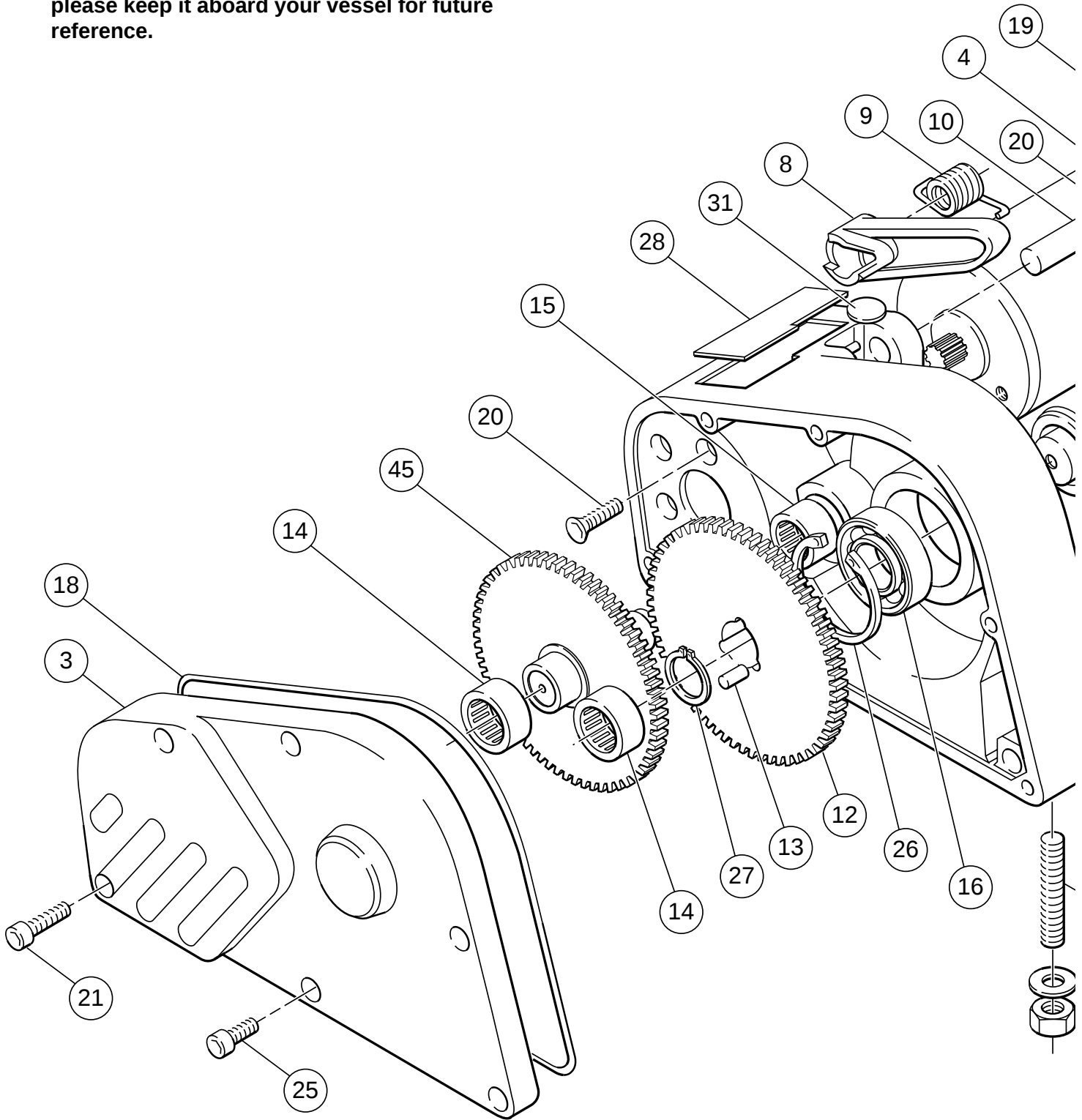
**This Manual forms part of the Product and MUST BE RETAINED along with, OR incorporated into, the Owner's Manual for the vessel to which the Windlass is fitted.**



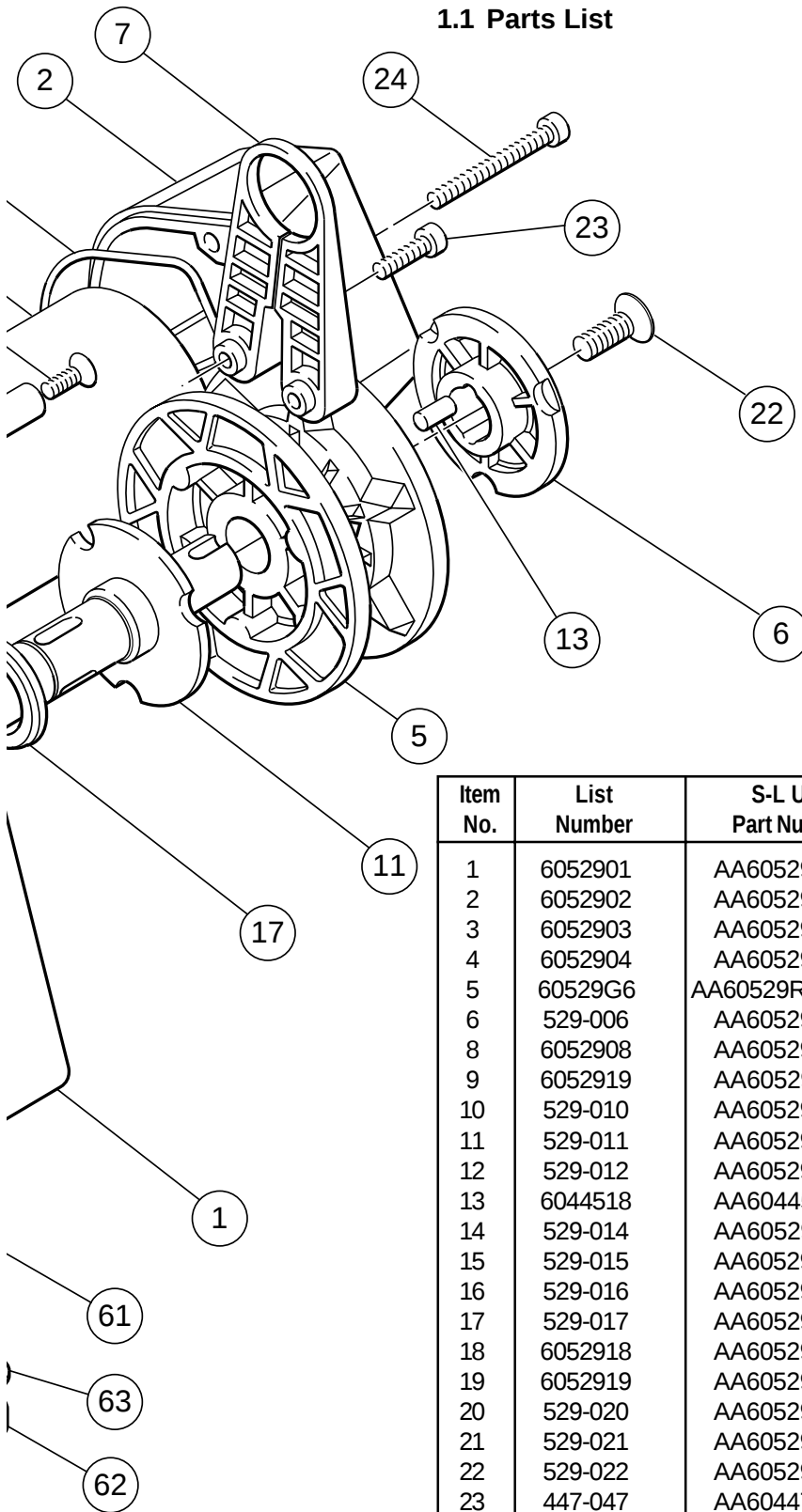
400

## 1. Exploded Diagram Model #0052800

After you have read this instruction booklet,  
please keep it aboard your vessel for future  
reference.



## 1.1 Parts List



| Item No. | List Number | S-L USA Part Number | Description                       | Qty. |
|----------|-------------|---------------------|-----------------------------------|------|
| 1        | 6052901     | AA6052901E          | Main Case                         | 1    |
| 2        | 6052902     | AA6052902E          | Motor Cover                       | 1    |
| 3        | 6052903     | AA6052903E          | Geartrain Cover                   | 1    |
| 4        | 6052904     | AA6052904E          | Electric Motor                    | 1    |
| 5        | 60529G6     | AA60529RC061E       | Rope/Chain Gypsy ( <b>RC061</b> ) | 1    |
| 6        | 529-006     | AA6052906E          | Gypsy Drive Cap                   | 1    |
| 8        | 6052908     | AA6052908E          | Control Arm                       | 1    |
| 9        | 6052919     | AA6052909E          | Torsion Spring                    | 1    |
| 10       | 529-010     | AA6052910E          | Pivot Point                       | 1    |
| 11       | 529-011     | AA6052911E          | Mainshaft                         | 1    |
| 12       | 529-012     | AA6052912E          | Mainshaft Gear                    | 1    |
| 13       | 6044518     | AA6044518E          | Drive Roller                      | Set  |
| 14       | 529-014     | AA6052914E          | Needle Roller Bearing             | 2    |
| 15       | 529-015     | AA6052915E          | Needle Roller Clutch              | 1    |
| 16       | 529-016     | AA6052916E          | Ball Bearing                      | 1    |
| 17       | 529-017     | AA6052917E          | Seal                              | 1    |
| 18       | 6052918     | AA6052918E          | External Circlip                  | 1    |
| 19       | 6052919     | AA6052919E          | Motor Seal                        | 1    |
| 20       | 529-020     | AA6052920E          | Socket Screw                      | 4    |
| 21       | 529-021     | AA6052921E          | Socket Screw                      | 2    |
| 22       | 529-022     | AA6052922E          | Socket Screw                      | 1    |
| 23       | 447-047     | AA6044747E          | Socket Screw                      | 2    |
| 24       | 529-024     | AA6052924E          | Socket Screw                      | 3    |
| 25       | 529-025     | AA6052925E          | Socket Screw                      | 4    |
| 26       | 529-026     | AA6052926E          | Internal Circlip                  | 1    |
| 27       | 529-027     | AA6052927E          | External Circlip                  | 1    |
| 28       | 528-028     | AA6052828E          | Nameplate                         | 1    |
| 45       | 6052945     | AA6052945E          | Compound Gear Assembly            | 1    |
| 61       | 445-023     | AA6044523E          | Mounting Studs                    | 3    |
| 62       | 445-026     | AA6044526E          | Nut                               | 3    |
| 63       | 445-030     | AA6044530E          | Washer                            | 3    |
| 72       | 6052907     | AA6052907E          | Rope/Chain Fleming                | 1    |
| 73       | 6052907C    |                     | Chain Only Fleming                | 1    |
| 74       | 6052990     |                     | Set of Seals                      | Set  |
| 75       | 529-075     | AA6052975E          | Locking Disc                      | 1    |

## WELCOME

Congratulations on becoming a proud owner of a **Simpson-Lawrence** Windlass. You can take confidence in being among men and women who have depended on our products for over 90 years. **Simpson-Lawrence** is known throughout the World as *Manufacturers of Quality Marine Equipment*. Our factory manufactured anchoring components, anchor rode, bow rollers and anchors, are specifically engineered to compliment one another. To ensure that we serve you in the best manner possible, we offer a complete range of anchoring systems to meet all of your needs.

### ***For Your Safety*** **Read Before Installing and Operating Your Windlass**

Classification Societies and Simpson-Lawrence require that a vessel at anchor must have its rode held by a chain stopper or equivalent strong point at all times!

At all times it is the responsibility of the boat user to ensure that the anchor and rode are properly stowed for the prevailing sea conditions. This is particularly important with high-speed powerboats, because an anchor accidentally falling in the water while under way can cause considerable damage. An anchor windlass is mounted in the most exposed position on a vessel and is thus subject to severe atmospheric attack resulting in a possibility of corrosion in excess of that experienced with most other items of deck equipment. As the windlass may only be used infrequently, the risk of corrosion is further increased. It is essential that the windlass is regularly examined, operated and given any necessary maintenance.

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## **2. PLANNING the INSTALLATION**

### **2.1 Gipsy Suitability**

The RC061 rope/chain gipsy is ideally suited to our factory made anchor rode, which consist of rope spliced to a chain tail. Rope used with this rope/chain gipsy must be windlass grade, ½" (12-14mm) medium lay three strand nylon. Ropes from different manufacturers have wide variations in stretch and consistency in diameter. Therefore, rope and chain from other manufacturers may require some experimentation to determine the optimum size. On **NO** account should multiplait ropes be used!

¼" American ACCO BBB or ¼" American G-4 ISO (7mm) calibrated chain should be chosen to suit your gipsy. Should you have difficulty in matching a gipsy to your chain please consult your local agent or our international network of Simpson-Lawrence distributors worldwide.

### **2.2 Package Contents**

Windlass  
Mounting Studs, Nuts, Washers and Clamping  
Safety Instructions  
Mounting Template  
Instruction Booklet  
Breaker/Isolator  
Control Switch

### **2.3 Additional Requirements**

Each windlass installation requires:

#### **WINDLASS INSTALLATION**

- a. An appropriate marine sealant
- b. The following tools:
  - 3/8" (10mm) Diameter Drill
  - 2" (50mm) Diameter Hole Saw
  - ½" (13mm) Wrench
  - File
  - Jig Saw or Trepanning Tool

## WIRING INSTALLATION

Flat Bladed Screwdriver  
Crimping Pliers/Wire Stripper  
Suitable electrical cable and crimp terminals.

### 2.4 Electric Cable Selection

To achieve the best performance and safeguard your electrical system it is essential that any electrical windlass be fitted with sufficiently large diameter cable to cope with the current draw imposed upon it and to keep the voltage drop within acceptable limits. In any circumstance voltage drop due entirely to cable resistance should not exceed 10% for a 12V installation.

The following table gives recommended cable sizes. The recommendations are based on total length of cable required, from the battery, following the route of the cables.

***Total length of cable run is from the battery to the windlass, and from the windlass back to the battery.***

***DO NOT confuse cable Length with the length of the vessel!***

#### METRIC or STARTER CABLE

| Cable Length<br>ft.            m | Size<br>(mm <sup>2</sup> ) |
|----------------------------------|----------------------------|
| 0-51      0-15.5                 | 6                          |
| 51-58    15.5-17.7               | 7                          |
| 58-72    17.7-21.6               | 8.5                        |

#### AMERICAN CABLE

| Cable Length<br>(ft.) | Size<br>(AWG) |
|-----------------------|---------------|
| 0-44                  | 10            |
| 44-73                 | 8             |

*In Multi Station installations 14 AWG wire (1.5mm<sup>2</sup> cross sectional area, 21/0.30 PVC covered) is used to connect the switches to the reversing control box.*

## 3. ACCESSORIES

Use only genuine Simpson-Lawrence parts and accessories to ensure top performance and eliminate the risk of voiding your warranty. For additional accessories and replacement parts, please see your dealer or call Simpson-Lawrence.

25 Amp Breaker                      HM25BKR(0050713)

#### Single Station

Reversing Control Switch                      0052519

or

#### Multi Station Operation

Dual Direction Solenoid                      0052531

*With any of the following or the Switchgear marketed by Simpson-Lawrence UK and its International distributors throughout the world can also be used.*

|                           |                      |
|---------------------------|----------------------|
| Hand Held Remote Switch   | QU1002               |
| Black Covered Foot Switch | QU900/D              |
| Black Covered Foot Switch | QU900/U              |
| White Covered Foot Switch | QU900/D              |
| White Covered Foot Switch | QU900/U              |
| Remote Console Switch     | HMCONSW<br>(0052518) |

## 4. SPECIFICATION

#### Performance

##### Maximum Load

|                |                   |
|----------------|-------------------|
| Chain in Gipsy | 440 lbs. (200 kg) |
| Rope in Gipsy  | 480 lbs. (225 kg) |

## Typical Working Figures

| LOAD<br>lbs./kg | SPEED<br>ft./min m/min |      | AMPS |
|-----------------|------------------------|------|------|
| 55/25           | 71                     | 21.8 | 20   |
| 110/50          | 57                     | 17.5 | 35   |
| 220/100         | 50                     | 15.3 | 52   |
| 330/150         | 25                     | 7.7  | 61   |

|           |    |      |   |
|-----------|----|------|---|
| Power Out | 90 | 27.6 | 5 |
|-----------|----|------|---|

When all the holes have been made, remove the template.

Fully screw the three mounting studs into the base of the windlass. This can be done, quite simply, by screwing two nuts onto the opposite end. Put them close enough to one another to use the inner one as a lock nut. Use the outer nut to screw the nut into the case with the aid of the spanner or wrench. Do this to each of the nuts in turn and remove the nuts for later use.

Apply a suitable sealant (DO NOT use a permanent adhesive/sealant, e.g., 5200) to the base of the windlass, any mounting pad and around the studs. **DO NOT get CAULK or SEALANT under the GEARTRAIN COVER (3).** Secure the windlass firmly to the deck from below, using the nuts and washers supplied.

**Note:** If using silicone or other rubbery type sealant, it is advisable to allow curing of the sealant before final tightening of the mounting nuts.

## 5. INSTALLATION

### 5.1 Fitting the Windlass to the Deck

If the deck is not flat, a suitable mounting pad may be required to take up camber or sheer. Decks that are thin, or of foam or balsa laminate construction, will require reinforcement in order to spread the loads that will be applied to the deck while the windlass is in use. It is recommended to use a backing plate (Part No. **GM500** US only).

Place the windlass on the deck and decide upon a position for it with reference to the vessel's stemhead roller and the chain locker below. Rode lead from the roller should ideally be fed horizontally back to the top of the gipsy and along its centerline. There must be sufficient vertical fall for the chain or rope, even with a full locker, to draw the rode from the gipsy when hauling in.

The standard M8 threaded mounting studs supplied suit deck and packing thickness of up to 3 1/8" (80mm). These are adequate for most installations. Place the mounting template on the deck or mounting pad in the desired position for the windlass and hold it in place using adhesive tape. Using a 3/8" (10mm) diameter drill, make the three holes for the mounting studs. With a 2" (50mm) diameter hole saw, make the hole for the rode to pass through. It is advisable to cut these holes by alternating between them, because if one hole is made straight through the deck, the center of the second one will be removed. Using a file or a jig saw, remove the unwanted material from the sides of the resulting hole and smooth any rough edges away. To help avoid water absorption by the deck, apply an appropriate marine sealant to the freshly cut hole edges.

### 5.2 Wiring

The wiring system should be of the two cable fully insulated return type, which avoids possible electrolytic corrosion problems. We recommend the use of type III stranded, tinned copper wire with copper crimp terminals. Most modern installations are negative return (negative ground) but polarity should be checked.

In a Multi Station installation, the reversing control box must be sited in a dry location. **DO NOT install the control box in the anchor locker.** If a control box is installed in an anchor locker it is exposed to harsh conditions it is not designed to withstand. Furthermore this type of installation will void your warranty.

Overload protection must be built into the windlass wiring circuit. This protects the wiring and prevents undue damage to the windlass motor, in the event of its being stalled by an excessive load in service.

It is advisable to site the circuit breaker in a dry, readily accessible place. Our recommended Breaker/Isolator must be manually reset should an overload occur that causes it to trip to the **off** position.

**Note:** Crimp terminals should be used on all

wire ends wherever possible for good electrical contacts.

### 5.3 Control Switch Installation

Follow the mounting instructions supplied with the switch. Remember, in a Multi Station installation all switches must be wired in a parallel circuit.

### 5.4 Electromagnetic Compatability

It is essential that this product does not cause any electromagnetic disturbance to any other electrical or electronic equipment installed in the vessel. This will be achieved if the windlass is connected to the same battery as the vessel's starter motor and not to the service battery to which other equipment is connected. In addition, the run of the wiring, from the battery to the windlass, should be kept as far apart from the other wiring on the vessel as possible. For instance, if the main wiring loom is to starboard, fit the windlass wiring to port. It should be noted that there is no evidence to indicate that windlass installations do cause magnetic interference but the installer is advised to carry out checks when the installation is complete.

## 6. OPERATING INSTRUCTIONS

As a prudent act of seamanship, anchor recovery operations require the undivided attention of skipper and crew to prevent personal injury or damage to the vessel.

In a typical anchor recovery situation, the windlass will pass through a number of operational phases.

### 6.1 Safety First

To avoid personal injuries ensure that limbs, fingers and clothing are kept clear of the anchor rode and windlass during operation. Always ensure that there are no swimmers or divers nearby when dropping your anchor.

### 6.2 Letting Go

Release any independent anchor locks.

If it is safe to do so, let go under power by operating a **down** control.

### 6.3 Lying to Anchor Safely

Vessels at anchor will snub on the rode and this can cause slippage or apply excessive loads to the windlass.

**For maximum safety and to prevent damage, the windlass must not be left to take the entire force from the anchor rode while at anchor.** The rode should be made fast directly to a bollard, sampson post or cleat.

### 6.4 Hauling In

Untie the bridle or replace the rode in the gipsy.

If it is safe to do so, operate an 'Up' control.

Having retrieved the anchor, ensure it is independently secured to prevent its accidental release.

## 6.5 Operating Tips

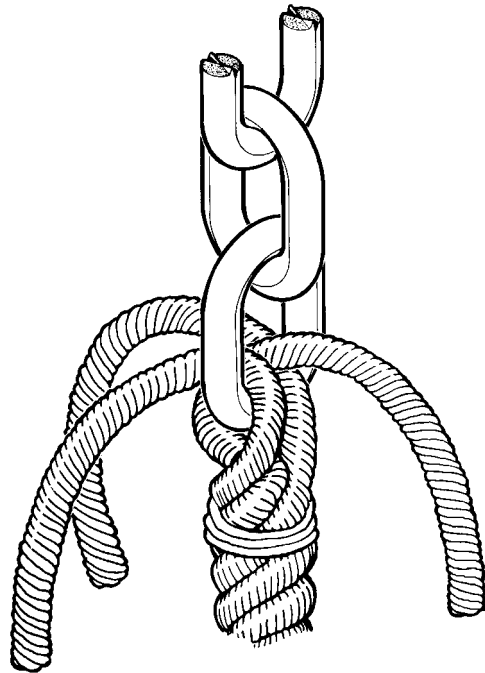
When anchoring, it is best to power the rode out, allowing the vessel to take up stern way before full scope is let out. This helps prevent the rode from becoming tangled on top of your anchor on the seabed.

To aid anchor recovery, we recommend that the vessel's engine be used to assist by moving the vessel towards the anchor. We do not recommend that the vessel be motored over and beyond the anchor, as this can cause the rode to damage your topsides.

As the anchor approaches the stemhead, the last few feet of rode should be inched in by judicious use of controls to avoid damage to the vessel.

Having retrieved the anchor, ensure it is independently secured to prevent accidental release. It is strongly advised to use an anchor safety strap (Part No. **HMSTRAP**), or chain stopper.

When mooring stern to, at a suitable distance from the jetty, deploy the anchor to prevent the bow from swinging. Gently pay out the rode under the influence of the stern way of the vessel as it approaches the jetty. Make fast your vessel with warps from the stern.



## 7. Joining Rope to Chain

When splicing rope to chain, select a length of chain that will avoid having the splice positioned in the gipsy when the anchor comes over the stemhead. Furthermore, ensure that the splice is no tighter than the rope. A hard splice is not desired.

With whipping twine or similar, seize your rope 8" from the rope's end and unlay the strands.

Pass one strand through the chain link from one side and the other two strands from the opposite side.

Remove seizing and complete a back splice in the normal manner for four full tucks.

With a hot knife pare down the three strands by one half of their diameter and continue with two further tucks.

With a hot knife, carefully melt the ends back into the line. Because of wide variations in rope type and construction some experimentation may be required.

Whip the line with permanent whipping at the beginning of the taper.

The above method of joining is designed to minimise chafe between the rope and chain but as a matter of prudent seamanship the splice should be checked regularly and remade if there is any evidence of wear.

## 8. MAINTENANCE

### General Recommendations

Isolate the windlass electrically, before carrying out any maintenance work.

After the first two or three anchor recoveries, check the mounting nuts to ensure that the windlass is still fastened tightly to your deck, as it should now be **bedded-in**.

Regularly wash down the exterior of your windlass with fresh water.

Examine all electrical connections for possible corrosion, clean and lightly grease as necessary.

Anchor rode splice should be checked regularly and remade if there is any evidence of wear.

The Gipsy (**RC061**) should be examined on a regular basis, because it is a high wear item. This Gipsy is designed for short scopes of chain and will last longer if properly used.

## 9. DISMANTLING PROCEDURES

### 9.1 Gipsy Replacement

Remove the Socket Screw (**22**), using a 5mm Allen Wrench. Withdraw the Gipsy Drive Cap (**6**) and carefully set aside the two Stainless Steel Rollers (**13**). Pull the Control Arm (**8**) upward until it clicks into the upright position. Remove the Screws (**23**) that retain the Fleming (**72**) using a 4mm Allen Wrench. Remove the Gipsy Assembly. Spread the Fleming and remove it from the Gipsy. To replace the Gipsy, reverse the above procedure but apply a drop of **Loctite™** to retain the Socket Screw (**22**) in the Mainshaft (**11**).

### 9.2 Control Arm Replacement

To remove the Control Arm (**8**) withdraw the Motor Cover (**2**) by removing the three Screws (**24**). Then remove the Socket Screw (**20**) and Pivot Point (**10**), taking care to retain the Locking Disc (**75**) as the Control Arm is withdrawn. Reverse this procedure to replace the Control Arm.

## 9.3 Mainshaft Replacement & Lubrication Service

**Note:** Lubrication and internal parts will not fall out when the windlass is disassembled. The geartrain and its bearings have been lubricated for you with **SFG 100** grease and should require no regular attention. PFG is a white synthetic grease containing PTFE. Use grease of a similar specification throughout. It is recommended that the above deck components be stripped, cleaned and re-greased at least annually. To do this, the gipsy with its Fleming should be removed as detailed above. Inspect the Mainshaft Seal (**17**) for signs of wear. If the seal is found to be unserviceable, the Mainshaft will have to be withdrawn and seal replaced. This entails removing the Geartrain Cover (**3**) using a 4mm Allen Wrench. **Do not use a screwdriver or sharp edged tool to pry the Geartrain Cover open. If there is sealant present, use a razor blade to cut through it.** Withdraw the Compound Gear (**45**). Remove the Circlip (**27**) and withdraw the Mainshaft Gear (**12**). Take care to retain the three Drive Rollers (**13**). The Mainshaft can now be withdrawn with or without the Gipsy Assembly attached, provided the Fleming is no longer attached to the Case. Remove the Seal and replace it with a new one. Clean the stripped down components in kerosene, dry them and inspect them for wear. Rebuild the windlass applying generous amounts of grease. To reassemble, reverse the above procedure.

### 9.4 Electric Motor Replacement

#### Isolate the windlass electrically!

Disconnect the Motor Cables from the vessel's wiring loom. Remove the Motor Cover (**2**) using a 4mm Allen Wrench as detailed above. Remove the Geartrain Cover (**3**) using a 4mm Allen Wrench. Withdraw the Compound Gear (**45**) from its bearing in the Main Case (**1**) to allow access to the three motor mounting Screws (**20**). Using a 3mm Allen wrench, remove the Screws. Withdraw the motor from the Main Case. Note that silicone is used to seal the hole in the case where the motor wires pass through. Be careful not to strip the insulation from the Motor Wires when pulling them through the Main Case. Replace the Motor by reversing the above procedure, using fresh silicone to seal the wire hole in the case.

Use **Loctite™** on the Motor Screws.

## 9.5 'O' Ring Seals

When replacing 'O' Ring Seals (**18** and **19**) apply a few small spots of **Loctite™ 406** to keep them in place on the covers until they are clamped against the Main Case, being careful not to use too much glue.

## 10. TROUBLESHOOTING

### 10.1 Anchor rode pays out independently while Windlass is not in use.

The Compound Gear Assembly (**45**) is locked. To remedy this, first remove the Socket Screws (**21** x 2 and **25** x 4) and Geartrain Cover (**3**). Withdraw the Compound Gear Assembly by slowly rotating the gear whilst gently pulling it out. (See **fig. 1**). When the flat spot on the thrust washer is aligned with the Mainshaft Gear (**12**), the Compound Gear Assembly will slide out. Now secure the larger gear of the Compound Gear Assembly in a vice, taking care not to damage the teeth. Next, using a pair of channel lock pliers, slightly rotate the smaller gear of the assembly to free it. (See **fig. 2**). To reassemble, reverse the above procedure. This problem is a result of not securing the anchor rode or of non-judicious control upon anchor recovery into the bow.

### 10.2 Electrical Troubleshooting

As with most electrical marine equipment the majority of problems that arise are electrical in

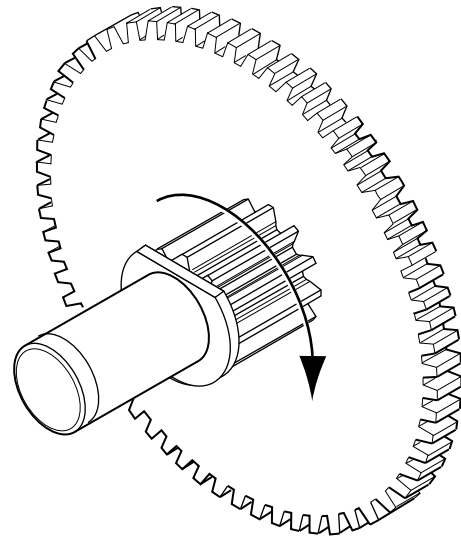


fig. 2

nature. Therefore it is essential that the proper voltage be maintained. The proper voltage on a 12 volt system is 13.5 volts. (Constant low voltage will destroy the motor). Ensure that electrical cable size is large enough to handle the current draw imposed upon it and to keep the voltage drop within acceptable limits. In any circumstance voltage drop due entirely to cable resistance should not exceed 10% for 12 volt installation.

Follow the charts to troubleshoot the problem.

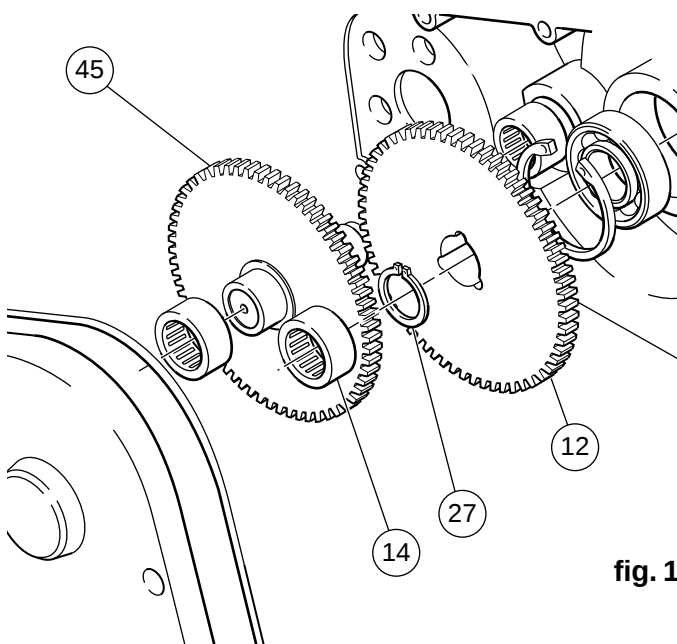


fig. 1

## Failure to Operate

### Troubleshooting Chart: H500 Reversing Control Switch (#0052519)

|                                                                                                                                                                                                                       |                                                                                                                                                                            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Is there voltage at the input terminal (positive) to the control switch?</p> <p><b>Yes ↓      No ⇒</b></p>                                                                                                         | <p>If no voltage is present the battery isolation switch is <b>off</b>, the breaker is tripped or a fuse has blown. The battery may also have be dead or disconnected.</p> |
| <p>Check voltage at the output terminals of the control switch with the switch on forward then reverse.</p> <p>Is there voltage at either output terminal for forward then reverse?</p> <p><b>Yes ↓      No ⇒</b></p> | <p>Control switch is defective.</p>                                                                                                                                        |
| <p>Replace the motor.</p>                                                                                                                                                                                             |                                                                                                                                                                            |

## Sluggish Operation

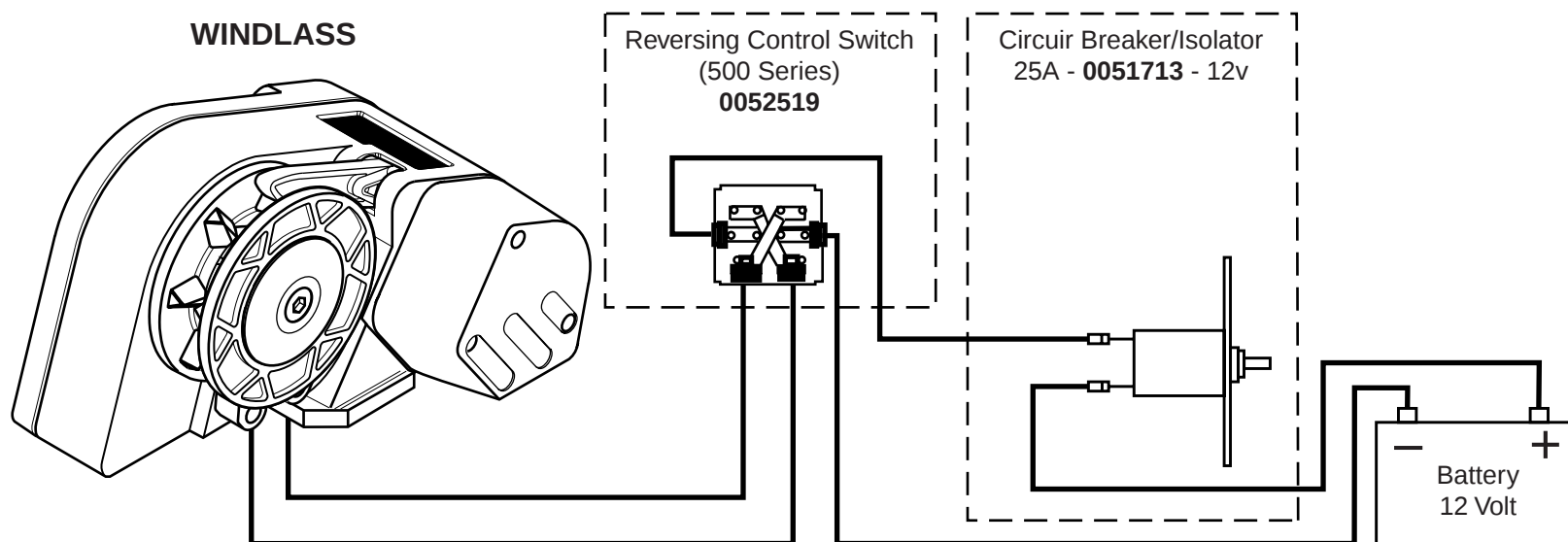
### Troubleshooting Chart

|                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Is the windlass overloaded?</p> <p><b>Yes ↓      No ⇒</b></p>                                                                                                                                                                                    | <p>Ease the load and ensure the battery is well charged.</p>                                                                                                                                                                                       |
| <p>Check the voltage across the motor leads with the windlass on. (Proper voltage is 13.5 volts. Constant low voltage will destroy the motor).</p> <p>Is the voltage low? (Below 11.0 volts on a 12 volt system).</p> <p><b>Yes ↓      No ⇒</b></p> | <p>There is a severe voltage drop in the circuit. Check for undersized cables, poor connections or corroded connections. Also check for resistance across the battery isolation switch or solenoid. (Feel them to see if they are heating up).</p> |
| <p>Is the voltage correct? (Above 11.0 volts and anchor is not fouled).</p> <p><b>Yes ⇒</b></p>                                                                                                                                                     | <p>The motor is defective. Replace the motor.</p>                                                                                                                                                                                                  |

### Troubleshooting Chart: Electric Windlass - Failure to Operate

|                                                                                                                                                            |                                                                                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| <p>Is there voltage at the input terminals to the solenoids and foot switches?</p> <p><b>Yes ↓      No ⇒</b></p>                                           | <p>Check the battery isolation switch, circuit breaker, helm console switch and any fuses.</p> |
| <p>Press the foot switch or operate the remote switch. Is there voltage at the positive switch terminal on the solenoid?</p> <p><b>Yes ↓      No ⇒</b></p> | <p>The foot switch or remote switch (or its wiring), is defective.</p>                         |
| <p>Keep the foot or remote switch activated. Is there voltage at the main output terminal on the solenoid?</p> <p><b>Yes ↓      No ⇒</b></p>               | <p>Check the solenoid coil ground circuit. If okay, replace the solenoid.</p>                  |
| <p>Check the voltage at the motor. If voltage is present, the motor is defective. If you have any questions call Simpson-Lawrence.</p>                     |                                                                                                |

## Single Station Power Reversing Wiring Diagram

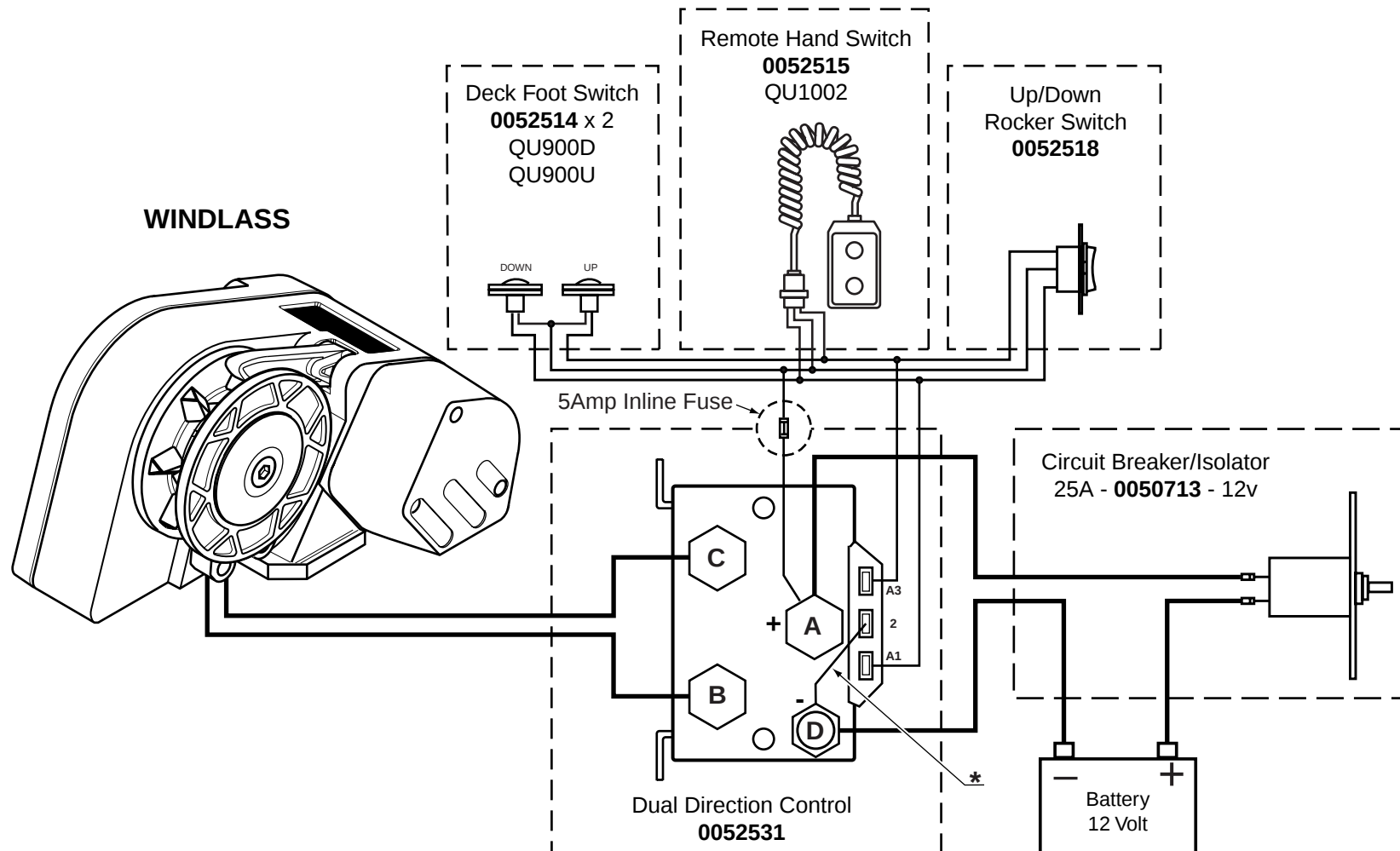


**NOTE:** All installations must be carried out in accordance with USCG, ABYC and NMMA requirements.  
If you have any questions regarding this installation, contact your nearest Simpson-Lawrence agent.

If the windlass operates in the wrong direction, change over the windlass cable connections at the reversing Control Switch.

**NOTE:** The above switch must **never** be used in conjunction with other switch gear.

## Multi Station Power Reversing Wiring Diagram



\*Dual Direction Control is supplied with jumper wire to connect the negative terminal **D** to terminal **2**.  
This provides a ground circuit for the Dual Direction Control relay.

## 11. WARRANTY STATEMENT

### **WARRANTY COVERAGE:**

Simpson-Lawrence, USA., warrants to the original purchaser, subject to the limitations and exclusions described below, that this product will be free from defects, in material and workmanship under normal use and service for a period of 1 year from the date of its original sale. Simpson-Lawrence will repair or replace any part, which proves to be defective in normal use during the period of the warranty.

### **WARRANTY CLAIMS PROCEDURES:**

If a defect is discovered during the applicable warranty period, the buyer must promptly notify Simpson-Lawrence of such, in writing, at the nearer address below, providing proof of purchase. For warranty service, the product must be returned to Simpson-Lawrence for examination. This examination will be performed at no charge to the buyer. The buyer is responsible for any labor costs associated with preparing the product or parts for shipping or transporting the products or parts to and from Simpson-Lawrence.

### **REMEDY:**

Simpson-Lawrence will repair any defect in material or workmanship or, at its option, correct such defect by replacing non-conforming goods or parts. Such repairs and/or new parts are warranted for the unexpired portion of the original warranty, or for 90 days, whichever is later. Warranty work (parts and/or labor) shall be at Simpson-Lawrence's expense; however, product preparation and shipping costs to and from Simpson-Lawrence shall be borne by the buyer. These remedies for breach of warranty.

### **LIMITATIONS AND EXCLUSIONS:**

- (1) This warranty applies only if the product is used under non-commercial, normal use in service, and shall not apply to (a) products subject to (i) conditions or usage that exceed the products performance specifications, (ii) incorrect maintenance, or (iii) use in applications for which they were not intended; (b) defects or damage caused by a force which exceed design specifications, including but not limited to, wear and tear, corrosion or ultraviolet degradation; and (c) defects or damages caused by unauthorized attachments, accessories or modifications.
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