# Repair Instructions
# RS 200 & 201 Series

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Chapter

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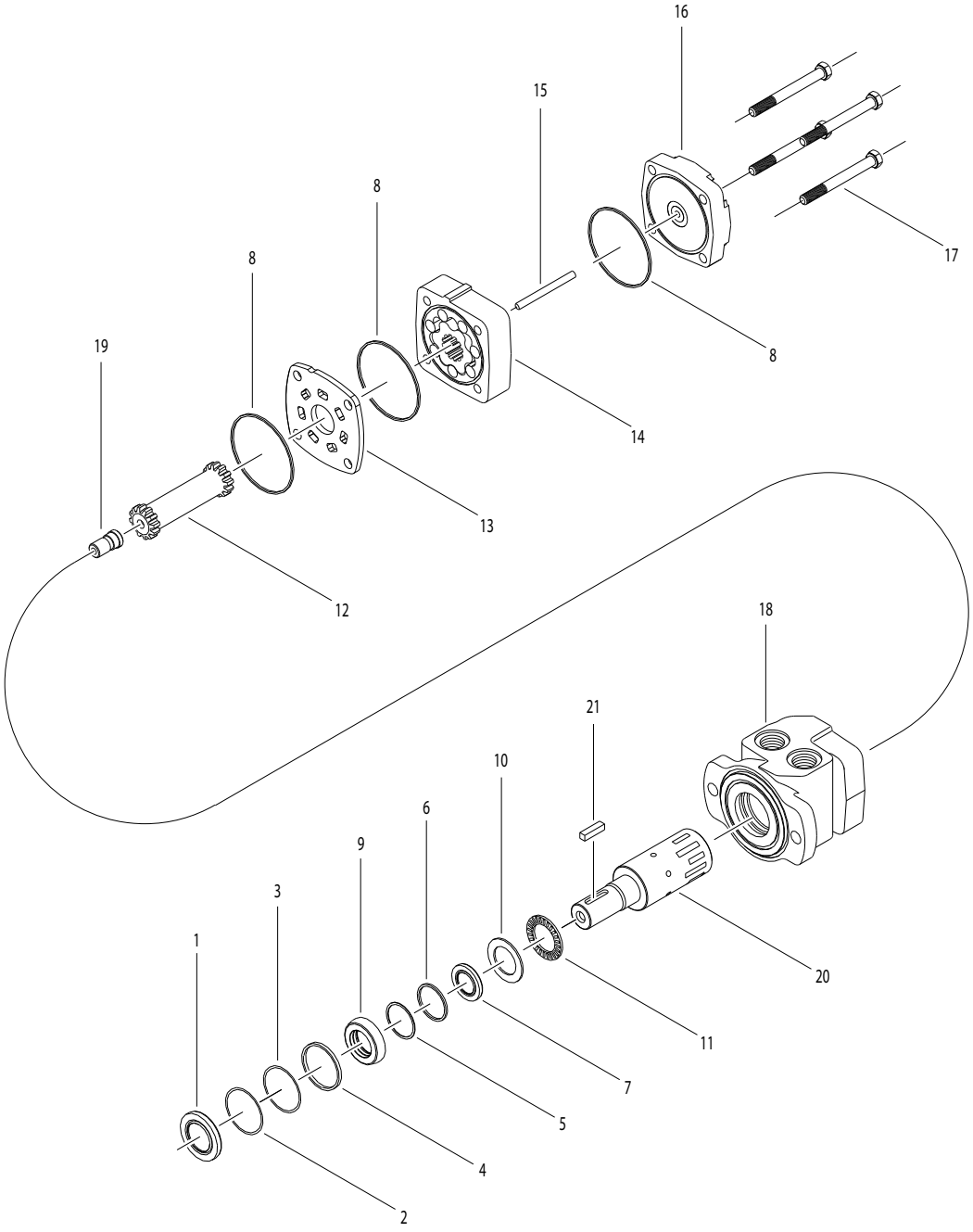
# RS 200 & 201 Series Diagram

**Topics:**

# RS 200 & 201 Series Exploded View

### Exploded View Diagram




### Component List

| Description | Item Number |
|---|---|
| Dust seal | 1 |
| Split wire ring | 2 |
| Metal backup shim | 3 |

| **Description** | **Item Number** |
|---|---|
| High pressure sea; | 4 |
| Metal backup shim | 5 |
| Backup seal | 6 |
| Shaft seal | 7 |
| Body seal | 8 |
| Seal carrier | 9 |
| Thrust washer | 10 |
| Thrust bearing | 11 |
| Drive link | 12 |
| Wear plate | 13 |
| Rotor assembly | 14 |
| Drive link pin | 15 |
| Endcover | 16 |
| Assembly bolt | 17 |
| Housing | 18 |
| Cooling plug | 19 |
| Shaft | 20 |
| Shaft key | 21 |

# Chapter 2

# RS 200 & 201 Series Service Instructions

**Topics:**

## RS 200 & 201 Series Seal Kit Installation

**Caution:** The RS 200 and 201 series motors depend on the correct orientation of parts as well as correct internal timing for proper motor operation. Before disassembling the motor, it is highly recommended that paint or a marker be used to make a "V" shaped set of lines from the endcover to the housing. This will aid in reassembling the motor components properly. It is also important that the steps involving internal parts timing be followed carefully to insure proper motor operation.

1. Remove all shaft related components from shaft (20) (i.e. keys, wire rings, nuts). To aid in reassembly of the motor, make a "V" shaped set of lines from the endcover (16) to the housing using either paint or a marker. With shaft facing down, secure motor in vise by clamping on to housing (18).
2. Loosen and remove four bolts (17) holding motor assembly together. Remove endcover (16). Remove body seal (8) and discard seal. Remove rotor assembly (14) and wear plate (13). Remove body seals (8) from rotor assembly (14) and housing (18) and discard seals. Remove drive link pin (15) and drive link (12) from motor and lay aside.
3. Gently tap shaft (20) upward through housing (18) and remove through rear of housing. Turn shaft over and remove cooling plug (19). Remove housing (18) from vise and turn over. Pry dust seal (1) from housing. Push the seal carrier (9), thrust washer (10) and thrust bearing (11) down and remove through rear of housing. If a new seal carrier and thrust washer is included in kit, old items may be discarded. If not, carefully pry shaft seal (7), Teflon backup seal (6) and metal backup shim (5) from seal carrier (9) and discard items 5-7. Lay seal carrier (9) aside. Remove wire ring (2), metal backup shim (3) and high pressure seal (4) from inner bore groove of housing with a small screwdriver and discard items.

   **Note:** When removing items 9-11, care should be taken so that housing bore is not scratched or nicked.

   **Note:** At this point, all parts should be cleaned in an oil-based solvent and dried using compressed air (For safety, observe all OSHA safety guidelines). All new seals should be lightly coated in clean oil prior to installation.
4. Place shaft (20) on a clean flat surface with output end facing up. Place thrust bearing (11) then thrust washer (10) on shaft. Install shaft seal (7) down onto shaft (21) making sure that lip on seal faces down. See below for correct seal orientation. Install the Teflon backup seal (6) onto the shaft (20) with the flat side up and the seal lip facing the shaft seal (7). Place the metal backup shim (5) onto the shaft and against the Teflon backup seal (6). Place the seal carrier (9) onto the shaft (large end down) and carefully press the seal carrier (9) down onto the seal assembly using an arbor press and sleeve to compress the seals into the carrier.

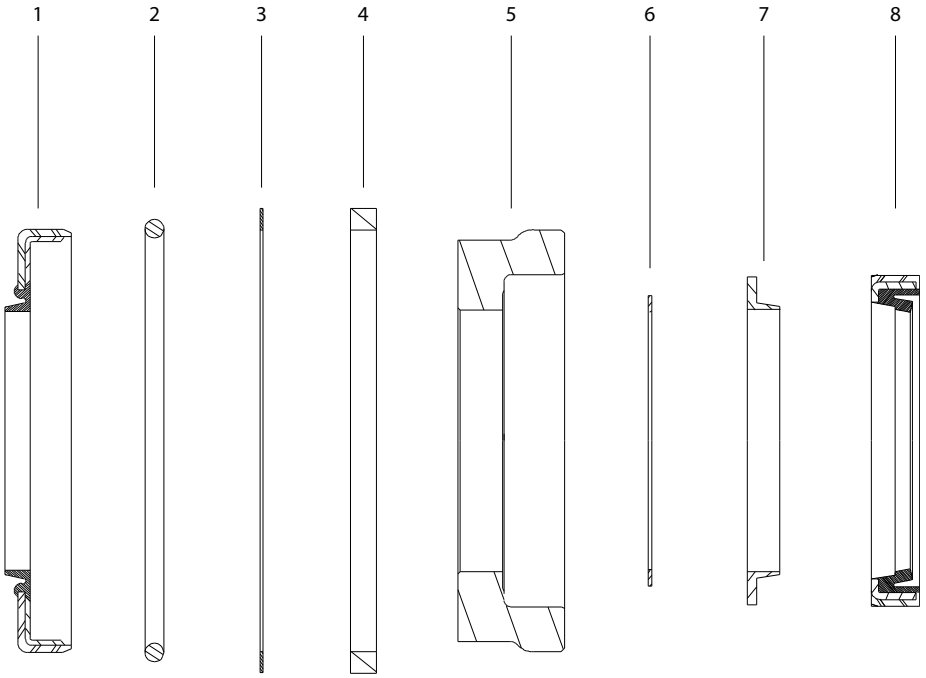



**Figure 1: RS Shaft Stackup**

**a.** Dust seal
**b.** Split wire ring
**c.** Metal backup shim
**d.** High pressure seal
**e.** Seal carrier
**f.** Metal backup shim
**g.** Backup seal
**h.** Shaft seal

**5.** Install high pressure seal (4) into groove in housing. Install metal backup shim (3) against high pressure seal (4) in groove in housing bore by squeezing the shim (3) between thumb and forefinger to bow shim (bow in the shim should be in the shape of a hill and not a valley for easier installation). While maintaining bow in shim, start the shim into the groove and use a small screwdriver to push the shim into groove. Install wire ring (2) into the groove making sure that the ends are butted.

**Note:** To return the RS Series Motors to proper operation, the rotation code of the motor must be known. The rotation code of the motor is 200 (standard) 201 (reverse timed)- the first 3 digits of the model code. If the rotational code is not known, motors that are to have the shafts turning clockwise (as viewed from the shaft end) should be timed using the "200" series and motors that are to have the shafts turning counterclockwise (as viewed from shaft end) should be timed using the "201" series.

**6.** Turn shaft (20) over so that output end of shaft faces down. Install cooling plug (19) down into shaft (20) making sure large O.D. end of cooling plug (17) faces up. Lower drive link (12) into shaft making sure that timing mark end of drive link faces up and that the timing mark on the end of the drive link (12) is aligned with one of the through holes in the shaft (20). When splines contact each other, slowly rotate drive link (12) counterclockwise for a "200" series, or clockwise for a "201" series motor until drive link splines engage with those on shaft (20).

**7.** Turn housing (18) over so that pilot of housing faces down and secure housing (18) in vise. Without disturbing seal carrier assembly (9) or drive link (12), carefully lower shaft assembly into housing. To seat seal carrier (9) against wire ring (2), gently tap drive link (12) down until end of shaft (20) is nearly flush with rear surface of housing.

8. Place a body seal (8) in the groove in the rear surface of the housing (18). Using alignment marks as a guide, place wear plate (13) on housing making sure that notch in wear plate (13) is aligned with port side of housing (18).
9. Place a body seal (8) in the groove in the face of the rotor assembly (14). Lower rotor (14) onto drive link (12) making sure that timing mark on drive link is aligned with a peak on the rotor (14) (see below)

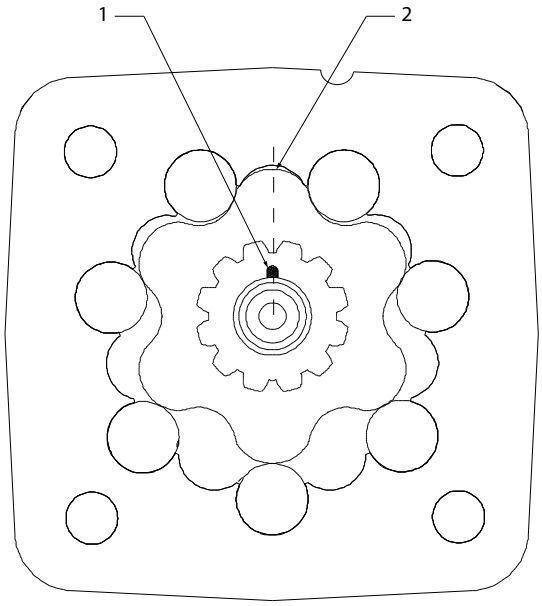



**Figure 2: RS drive link/rotor timing**

**a.** Timing mark on drive link
**b.** A peak on the rotor

10. Once splines are engaged, rotate rotor (14) so that notch on rotor is aligned with notch on wear plate (13) and ports on housing (18). Insert drive link pin (15) into end of drive link (12) making sure that concave end faces up.
11. Place remaining body seal (8) in groove in endcover (16). Using alignment marks as a guide, place endcover (16) onto motor making sure that end of drive link pin (15) is in hole in center of endcover. Insert four assembly bolts (17) into bolt holes and pre-torque to 13.6 Nm [10 ft. lb.]. Using a crisscross pattern, torque bolts to 67.8 Nm [50 ft. lb.].
12. Remove motor from vise and place on work surface with shaft (20) facing up. Making sure that lip on dust seal (1) faces up, place dust seal (1) over shaft (20). Using a sleeve and hammer, carefully drive dust seal (1) into place.

# Chapter 3

# RS 200 & 201 Series Parts Listing

**Topics:**

# RS 200 & 201 Series Replacement Kits

## Available Parts Kits

**Note:** Referto the *RS 200 & 201 Exploded View* for item numbers.

### Table 1: Seal Kit(s)

| Description | Exploded View Item Number | Qty. In Kit | Order Number |
|---|---|---|---|
| Dust seal | 1 | 1 | 200222002 (Includes item numbers 1-8) |
| Split wire ring | 2 | 1 | |
| Metal backup shim | 3 | 1 | 200222002B (Items 1-8 w/Buna shaft seal) |
| High pressure seal | 4 | 1 | |
| Metal backup shim | 5 | 1 | 200222001 (includes items 1-10) |
| Backup seal | 6 | 1 | |
| Shaft seal | 7 | 1 | 200222001B (items 1-10 w/Buna shaft seal) |
| Body seal | 8 | 3 | |
| Seal carrier | 9 | 1 | |
| Thrust washer | 10 | 1 | |

### Table 2: Miscellaneous Kit(s)

| Description | Exploded View Item Number | Qty. In Kit | Order Number |
|---|---|---|---|
| Thrust bearing | 11 | 1 | 200018011 |
| Cooling plug | 19 | 1 | 200018999 |
| Wear plate | 13 | 1 | 200012000 |
| Mid-mount wear plate | Not shown | 1 | 200012001 |
| Endcover | 16 | 1 | 200016003 |
| 1000 psi relief valve | Not shown | 1 | 500018228 |
| 2000 psi relief valve | Not shown | 1 | 500018231 |
| ¾-28 slotted nut | Not shown | 1 | 200229300 |
| ¾-28 lock nut | Not shown | 1 | 200018077 |
| Manifold seal | Not shown | 1 | 200018022 |

### Table 3: Rotorset, Drive link, Spacer and Bolt Kit(s)

| Exploded View Item Number | 14 | 14 | 12 | 15 | 17 |
|---|---|---|---|---|---|
| **Displacement** | **Standard Rotorset Kit** | **Freeturn Rotorset Kit** | **Drive Link Kit** | **Drive Link Pin Kit** | **Bolt Set Kit (4)** |
| 050 | 200037003 | 200037005 | 200014002 | 200224003 | 200225003 |
| 080 | 200047004 | 200047005 | 200014002 | 200224008 | 200225004 |

| **Exploded View Item Number** | **14** | **14** | **12** | **15** | **17** |
|---|---|---|---|---|---|
| **Displacement** | **Standard Rotorset Kit** | **Freeturn Rotorset Kit** | **Drive Link Kit** | **Drive Link Pin Kit** | **Bolt Set Kit (4)** |
| 090 | 200067010 | 200067012 | 200014001 | 200224005 | 200225004 |
| 100 | 200997001 | N/A | 200014001 | 200224008 | 200225010 |
| 110 | 200087003 | 200087004 | 200014001 | 200224006 | 200225005 |
| 125 | 200097003 | 200097004 | 200014001 | 200224008 | 200225010 |
| 160 | 200107003 | 200107010 | 200014003 | 200224010 | 200225010 |
| 200 | 200127009 | 200127011 | 200014003 | 200224012 | 200225012 |
| 250 | 200147005 | 200147006 | 200014003 | 200224014 | 200225014 |
| 300 | 200187009 | 200187011 | 200014003 | 200224018 | 200225018 |
| 400 | 200247009 | 200247011 | 200014003 | 200224024 | 200225024 |

**Table 4: Housing Kits (Exploded View Item Number 18)**

| **Housing Code** | **Order Number** | **Description** | **Order Number** |
|---|---|---|---|
| F30 | 200013401 | A62 | 200013606 |
| F31 | 200013301 | A63 | 200013605 |
| A10 | 200013201 | A19 | 200013105 |
| A11 | 200013101 | F39 | 200013304 |
| F37 | 200013501 | A68 | 200013607 |
| A17 | 200013700 | A67 | 200013703 |
| A12 | 200013601 | B18 | 200013612 |
| A13 | 200013600 | B10 | 200013203 |
| A70 | 200013204 | B11 | 200013106 |
| A71 | 200013108 | B70 | 200013205 |
| A78 | 200013610 | B71 | 200013109 |
| A18 | 200013604 | B78 | 200013611 |

**Note:** Because the housing and shaft are match ground to extremely tight tolerance, it is not recommended to replace individual housings or shafts. It is recommended that a housing/shaft kit be ordered. To order a housing/shaft kit please contact a Customer Service Representative

**Table 5: Shaft/Key Kit(s)**

| **Exploded View Item Number** | **20** | **21** |
|---|---|---|
| **Shaft Code** | **Shaft Kit Order Number** | **Key Kit Order Number** |
| 01 | 200011700 | N/A |
| 02 | 200011600 | N/A |
| 05 | 200011000 | N/A |
| 10 | 200011100 | 200229100 |

| Exploded View Item Number | 20 | 21 |
|---|---|---|
| **Shaft Code** | **Shaft Kit Order Number** | **Key Kit Order Number** |
| 12 | 200011101 | 200229101 |
| 13 | 200011103 | 200229102 |
| 15 | 200011106 | 200229100 |
| 16 | 200011107 | 200229101 |

**Note:** Shaft kits come with all related shaft components (shaft keys, shaft nuts, etc.).