Boston Gear®
ORC-S Series Trig-O-Matic Overload Release Clutches

Installation & Operation Instructions

P-3003-BG

ORC-S Series

Boston Gear®
Altra Industrial Motion

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Overload Release Clutches – Standard Model S

Installation and Maintenance Instructions

I. Introduction

A. Operating Principle

The ORC Series, Model S Overload Release Clutch consists of two basic components: the rotor and the housing assembly. The clutch rotor is keyed and secured to a shaft with a setscrew.

The housing assembly includes a drive pawl and a reset pawl which are pivoted within the clutch housing. The drive pawl is held engaged in the rotor notch by the combined compression of the drive and reset springs as shown in Figure 1. The combined compression of these two springs determines the maximum torque which will be transmitted without overload. With the clutch in the engaged position shown in Figure 1, the rotor and the housing are held together and the entire unit rotates with the drive shaft at the same speed.

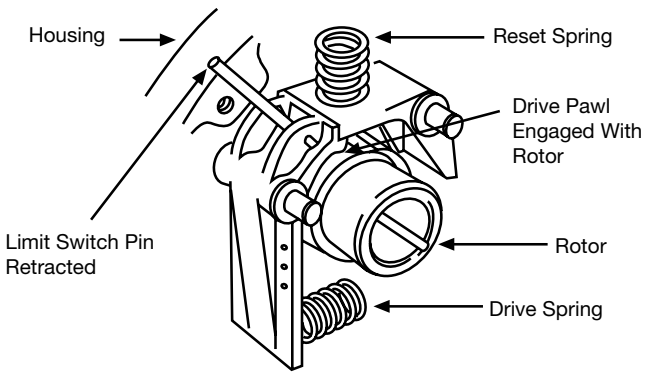


Figure 1

When an overload occurs, the rotor rotates from its normal position within the housing. At this instant, the combined compression of the drive and reset springs is overcome. For a manual reset clutch, the drive pawl is forced out of its engaged position from the rotor and as it pivots up, the reset pawl lifts and locks the drive pawl out of contact with the rotor as shown in Figure 2. The clutch is then free to rotate until it is reset. For a clutch with the automatic reset feature, the reset pawl applies pressure to the top of the drive pawl, holding it in contact with the rotor as shown in Figure 3.

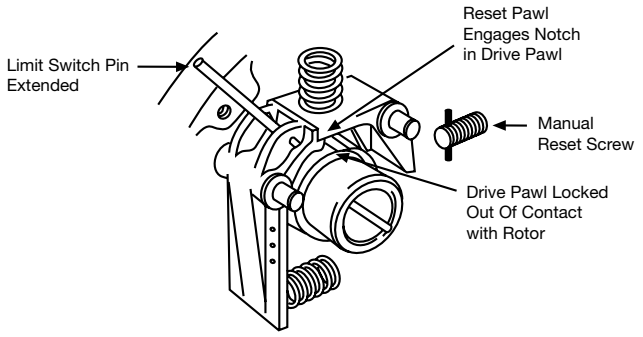


Figure 2 - Manual Disengaged

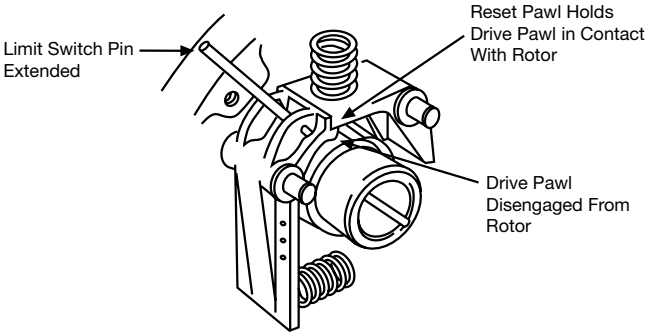


Figure 3 - Automatic

B. Instructions

1. Manual Reset

Note: Be sure not to use a powered wrench as it may cause damage to the reset pawl and/or reset spring!

a. After the overload condition has been corrected, rotate the drive until the rotor keyway is in alignment with the hole stamped 22 located on the outside diameter of the housing. (See Figure 4)

b. Reset the clutch by inserting a hex wrench into the reset screw (Stamped 20) shown in Figure 4, and turn the screw clockwise until the reset pawl releases the drive pawl. Refer to Table 5 for the proper wrench size.

c. After the drive pawl enters the rotor notch, turn the wrench counterclockwise until the reset screw has stopped at its original position, which is approximately flush with the O.D. of the clutch housing. **This is essential to restore the torque to its original setting**.

d. Reducing the clutch torque setting may make the reset procedure easier if the clutch is near the maximum torque.

2. Automatic Reset

After one complete revolution the drive pawl will automatically return to its original engaged position. After the overload condition has been corrected, "jog" the drive until the drive pawl engages with the rotor.

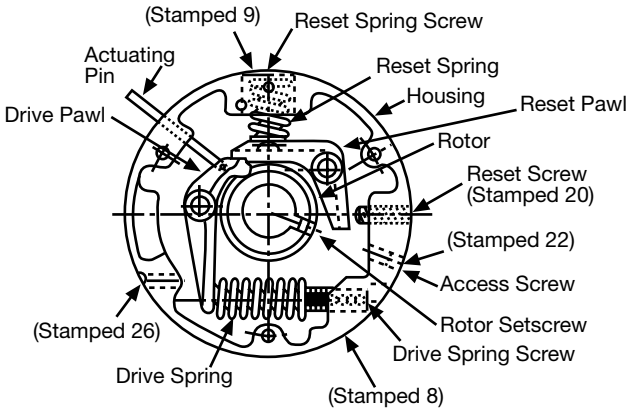


Figure 4 - Clutch Internal Components

C. Torque Adjustment

The clutch is supplied with a torque selector dial. This dial makes torque adjustments on the clutch possible. There are mill marks on the housing near the hole stamped 9 on the outside diameter of the housing. The mill marks have stamped values indicating a set, or minimum and maximum torque. (See Figure 5) If a drastic change in torque is desired, it may be necessary to change springs. See Section VI for spring replacement.

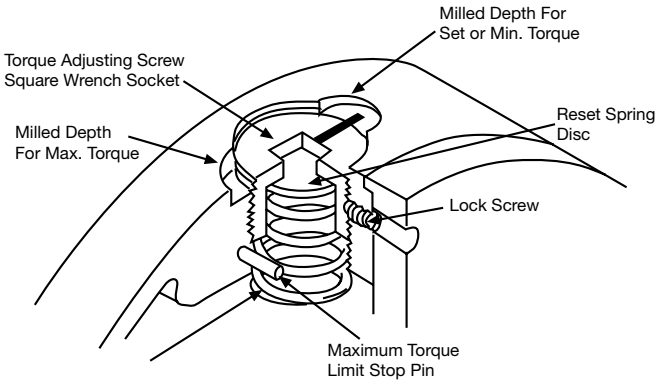


Figure 5

1. Increasing the Torque.
   a. Make sure the clutch is engaged.
   b. Turn the torque adjustment screw clockwise until it is flush with the milled depth of the desired torque setting or until nuisance trips are eliminated.
   c. Check its operation.
2. Decreasing the Torque.
   a. Make sure that the clutch is engaged.
   b. Turn the torque adjustment screw counterclockwise until it is flush with the milled depth of the desired torque setting.
   c. Check its operation.
3. See Figure 6 for Limit Switch Actuating Mechanism adjustment.

Limit Switch Actuating Mechanism (LSAM)

In some cases, it may be necessary to adjust the actuating mechanism. This is accomplished by first setting the clutch at the minimum torque settings, and second disengaging the clutch. Remove access plug #5 (stamped #26) and insert an allen wrench into the actuating adjusting screw #29. (Refer to Table 5 for wrench sizes) Rotate adjusting screw #29 clockwise until the spring pressure applied by the actuating spring #28 against the actuating stud nut #39 is just sufficient to release the actuating plate #31. The adjustment should then be tested by resetting the clutch and then disengaging it. If the adjustment is correct, the actuating plate will release at the exact time of clutch disengagement. Replace plug #5. If the trip plate does not release, repeat the entire proess.

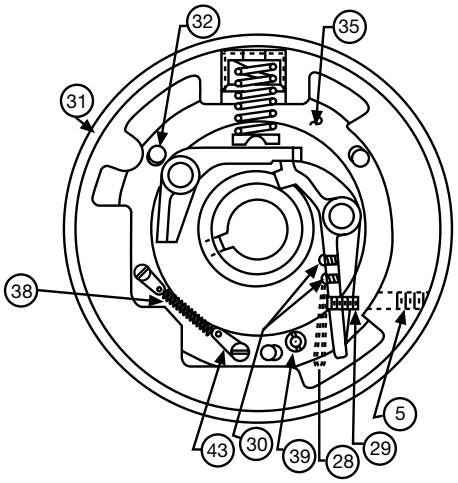


Figure 6

5	Adjustment Access Plug
28	Actuating Spring
29	Actuating Adjusting Screw
30	Spring Mounting Screw
31	Actuating Plate
32	Trip Pin
35	Release Ring
38	Return Spring
39	Actuating Stud Nut
43	Spring Terminal

Table 1
Sprocket Mounting Screw Seating Torques

Size	Screw Size	Qty	Dowel Size	Qty	Seating Torque	Ream Size
1	1/4-20	3	1/4	1	150 in.lb.	.2495
2	5/16-18	3	5/16	1	305 in.lb.	.3120
3	3/8-16	4	3/8	1	545 in.lb.	.3745
4	1/2-13	4	1/2	1	1,300 in.lb.	.4995
5	5/8-11	6	5/8	1	2,530 in.lb.	.6245
6	5/8-11	6	5/8	1	2,530 in.lb.	.6245

II. Mounting Sprockets or Sheaves to Clutch

A. Type "T" Housing (Refer to Figure 7)

1. Inspect mating pilots on clutch and sprocket or sheave for nicks or burrs and remove as required.
2. Position sprocket or sheave on housing and align dowel pin holes.
3. Attach sprocket or sheave to housing with mounting bolts and high collar lock washers. Refer to Table 1 for recommended seating torques.
4. Finish ream sprocket or sheave for dowel pin. Refer to Table 1 for dowel pin and recommended ream sizes.
5. Install dowel pins to a point where they bottom in housing.

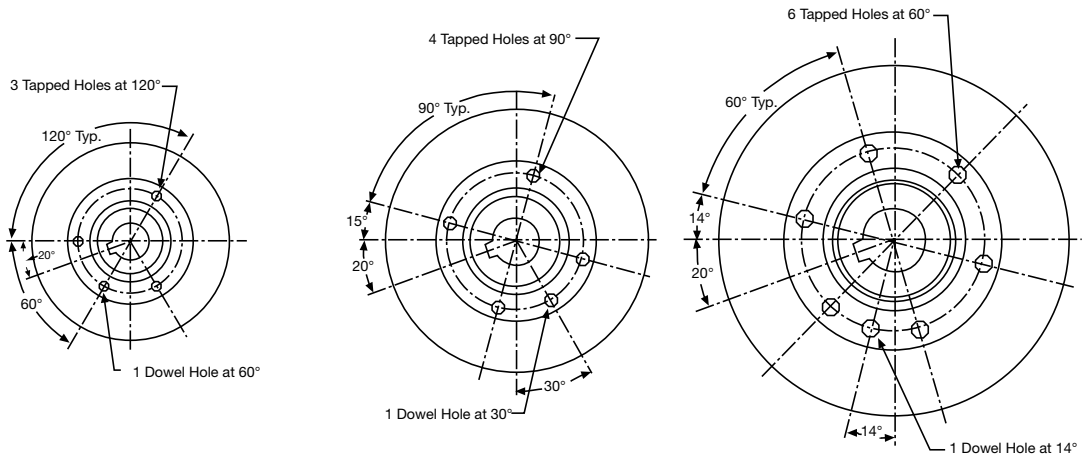
B. Type "B" Housing

A Type "B" is a basic unit and is sold without any mounting hole arrangement. It is modified by the customer for special applications. Refer to Figure 8.

Table 2
Minimum Number of Teeth of Standard Plate Sprockets Adaptable to Type "T" Clutch

Clutch Size	Chain Size and Pitch										
	#25 1/4 in. Pitch	#35 3/8 in. Pitch	#40 1/2 in. Pitch	#41 1/2 in. Pitch	#50 5/8 in. Pitch	#60 3/4 in. Pitch	#80 1 in. Pitch	#100 1-1/4 in. Pitch	#120 1-1/2 in. Pitch	#140 1-3/4 in. Pitch	#180 2 in. Pitch
1	40	28	22	22	18	—	—	—	—	—	—
2	54	36	28	28	22	19	—	—	—	—	—
3	X	45	34	36	28	25	19	—	—	—	—
4	X	X	42	45	36	30	23	19	—	—	—
5	X	X	X	X	42	36	30	22	19	17	—
6	—	—	X	X	X	48	36	30	24	21	19

Notes:
1. X - On Application Only.
2. For smaller sprockets consult factory. As in most cases, a design modification can be made.



Sizes 1 and 2 Mounting Hole Pattern | Sizes 3 and 4 Mounting Hole Pattern | Sizes 5 and 6 Mounting Hole Pattern

Figure 7 - Type "T" Standard Mounting Hole Patterns

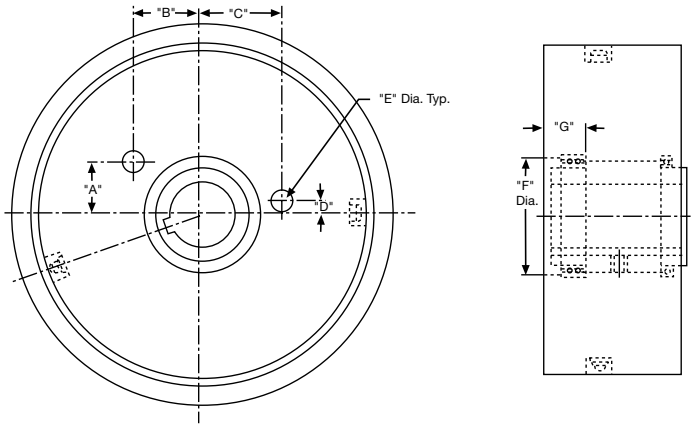


Figure 8 - Type "B" Housing Configuration

Table 3 - Type "T" Mounting Hole Patterns

Size	Thread	Depth	Bolt Circle	Pilot Dia. +.000 -.002
1	1/4-20	.50	2.375	1.875
2	5/16-18	.50	3.000	2.250
3	3/8-16	.62	4.125	3.250
4	1/2-13	.87	5.000	3.203
5	5/8-11	1.00	6.250	4.125
6	5/8-11	1.00	8.750	6.000

Notes:
1. Mounting bolts must be minimum 160,000 PSI tensile, Rc 36-43.
2. Dowel pins must be minimum 150,000 PSI shear, Rc 50-58 core hardness.

Table 4 - Type "B" Housing Dimensions

Size	A	B	C	D	E	F +.000 -.002	G
1	.81	.81	1.06	.11	.31	1.500	.69
2	.90	1.25	1.37	.18	.37	1.875	.81
3	1.25	1.62	1.94	.29	.50	2.750	.94
4	1.56	2.12	2.37	.43	.56	2.828	1.48
5	1.94	2.62	3.00	.58	.69	4.000	1.62
6	2.62	3.50	3.87	.90	.87	5.500	2.00

Notes:
1. The "E" Dimension on Table shows pawl trunnion holes. These holes are not through holes and they should be avoided when mounting a coupling, sprocket, etc. to the clutch.

III. Locating and Mounting Clutch and Couplings to Shaft

A. Location

The clutch should always be located as close as possible to the source of an overload condition. Figures 9 through 12 indicate both preferred and not preferred locations for mounting an ORC Series, Model S Overload Release Clutch.

Note: Clutch mounted sprockets, etc. and couplings should be positioned as close to a supporting bearing as possible to minimize overhung loads. A minimum shaft engagement of 1-1/2 times the shaft diameter is recommended for clutch and coupling flange installation.

1. Direct Drives

   a. Figure 9 shows the preferred location for mounting in a direct drive application. The clutch is mounted on the low speed side of the reducer, and transmits power from its housing, through its rotor to the driven shaft.

   b. Locating the clutch as shown in Figure 10 is not preferred. Here the clutch is mounted on the high-speed side of the reducer. Generally, mounting in this manner requires the clutch to be hypersensitive to perform satisfactorily.

2. Indirect Drives

   a. Either location of the clutch shown in Figure 11 is preferred in indirect drive applications.

   b. The mounting location in Figure 12 is not preferred for the same reasons as those for Figure 10. Always consult the factory when a mounting of this type is necessary.

B. Mounting Basic Clutch

1. Inspect shaft and key for any nicks or burrs and remove any that may be present.

2. Remove the access screw from the hole stamped 22 outside of the clutch housing. Make sure that the clutch is engaged where the rotor keyway is in line with the hole stamped 22.

3. Position shaft key and slide clutch onto shaft.

4. Align sprocket or sheave mounted to clutch with mating sprocket or sheave in drive train. Refer to installation and alignment instructions furnished with sprocket or sheave.

5. Select the correct hex wrench from Table 5 and insert it through the hole stamped 22 in the housing. Tighten the rotor setscrew securing the clutch to the shaft.

Note: Turn wrench clockwise only! Do not remove setscrew from rotor!

Refer to Table 6 for recommended setscrew seating torques.

6. Remove the hex wrench and replace access screw in the housing.

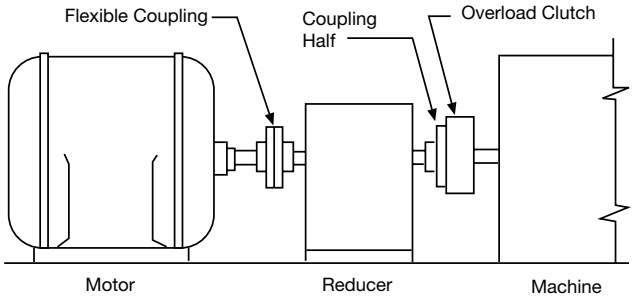


Figure 9

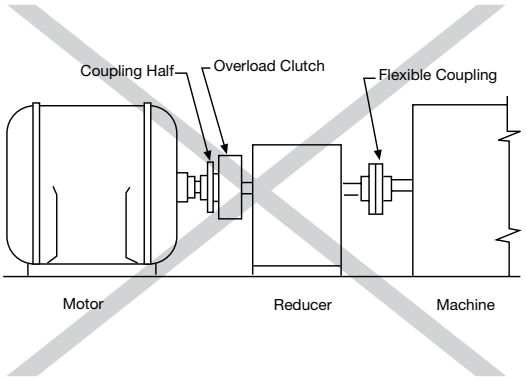


Figure 10

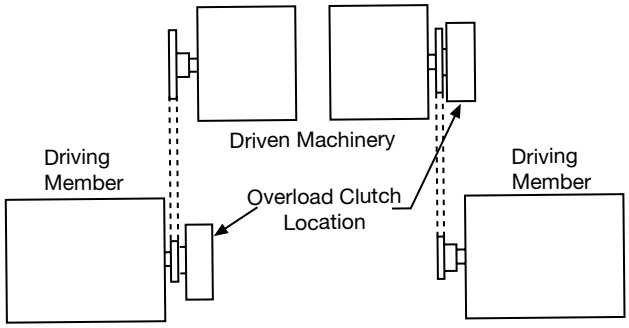


Figure 11

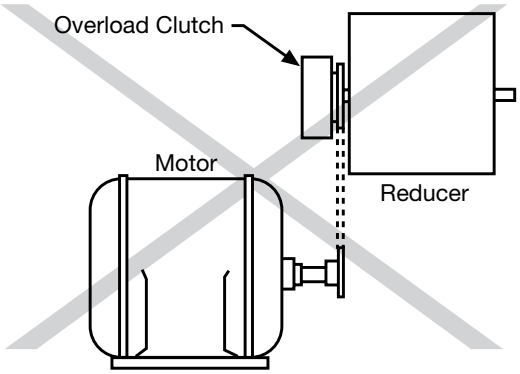


Figure 12

Table 5 - Wrench Size Chart

Clutch Size	Drive Spring Screw Hex Wrench	Reset Spring Screw Square Wrench	Manual Reset Screw Hex Wrench	Rotor Setscrew Hex Wrench	Access Screws Hex Wrench	Locking Screw Hex Wrench	Adjustment Screw Hex Wrench
1	3/16	3/8	3/16	3/32	1/8	3/32	1/16
2	1/4	3/8	1/4	1/8	5/32	3/32	5/64
3	5/16	1/2	5/16	3/16	3/16	1/8	1/8
4	5/16	1/2	3/8	1/4	5/16	1/8	1/8
5	3/8	1/2	1/2	5/16	5/16	1/8	1/8
6	3/4	3/4	1/2	5/16	5/16	1/8	1/8

Table 6 - Rotor Setscrew Seating Torques

Size	Screw Size	Seating Torque
1	10-32	36 in. lb.
2	1/4-28	87 in. lb.
3	3/8-24	290 in. lb.
4	1/2-20	620 in. lb.
5	5/8-18	1,325 in.lb.
6	5/8-18	1,325 in.lb.

Table 7 - Coupling Setscrew Seating Torques

Size	Screw Size	Seating Torque
1	5/16-18	165 in. lb.
2	3/8-16	290 in. lb.
3	3/8-16	290 in. lb.
4	1/2-13	620 in. lb.
5	1/2-13	620 in.lb.
6	1/2-13	620 in.lb.

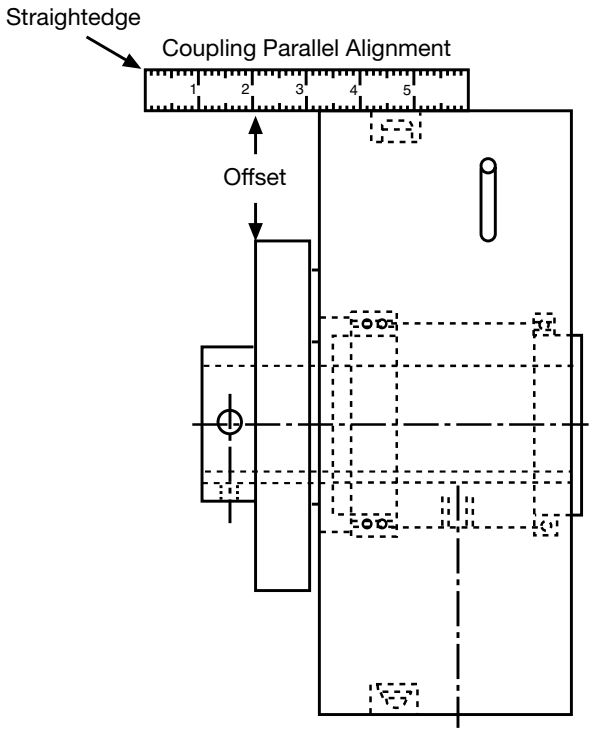


Figure 13

C. Mounting Type "C" Flexible Coupling

1. After the clutch has been mounted on its shaft as explained in Section lll, inspect the coupling shaft and key for any nicks or burrs and remove any that are present.

2. Make sure that the coupling shaft keyway is in alignment with the clutch shaft keyway. Position shaft key and slide coupling onto the appropriate shaft.

3. Slide the coupling flange onto the coupling studs. The coupling flange and adapter should be separated by a gap of 1/8".

4. Secure the coupling to drive shaft by tightening the two setscrews located in the hub of the flange. Refer to Table 7 for recommended coupling setscrew seating torques.

5. Parallel Alignment

    a. Place a straightedge across the clutch housing and coupling flange as shown in Figure 13.

    b. Measure the offset around the periphery of these two components without rotating the shafts.

    c. If the difference in offset from any two points 180 degrees apart exceeds the maximum value shown in Table 8, the shafts must be realigned.

Table 8 - Type "C" Misalignment

Size	Maximum Allowable Misalignment	
	Parallel	Angular
1	.012"	.074"
2	.015"	.091"
3	.016"	.102"
4	.027"	.159"
5	.031"	.183"
6	.045"	.231"

6. Angular Alignment

    a. Measure the gap around the periphery between the coupling flange and the clutch housing without rotating the shafts. (See Figure 14).

    b. If the difference between any two points 180 degrees apart exceeds the maximum angular misalignment shown in Table 8, the shafts must be realigned.

    c. If a correction is required to satisfy angular alignment requirements, then recheck the parallel alignment.

D. Mounting the "N" Index Coupling and Type "R" Rigid Coupling

1. After the clutch has been mounted on its shaft as explained in Section lll, inspect mating pilots of clutch and coupling for any nicks or burrs and remove any that are present.

2. Inspect coupling shaft and key for any nicks or burrs and remove any that are present.

3. In the case of a Type "R" make sure that the coupling shaft keyway is in alignment with the clutch shaft keyway. Position the shaft key and slide the coupling flange onto the shaft.

4. Slide the coupling onto the clutch housing making sure that the coupling pilot fits into the housing pilot and that the mounting holes are aligned. In the case of a Type "N" index coupling, make sure that the desired mounting slots are aligned with the clutch housing mounting holes.

5. Secure the coupling to the drive shaft by tightening the two setscrews located in the hub of the flange. Refer to Table 7 for recommended setscrew seating torques.

6. Parallel Alignment

    a. Place a straightedge across the clutch housing and coupling flange as shown in Figure 13.

    b. Measure the offset around the periphery of these two components without rotating the shafts.

    c. The shafts must be aligned until no offset exists or is equal at all points around the periphery.

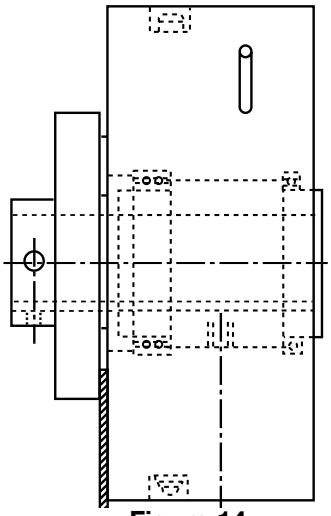


Figure 14

7. Angular Alignment

   a. Measure the gap around the periphery between the coupling flange and clutch housing without rotating the shafts. (See Figure 14)

   b. The shafts must be aligned until no gap exists or is equal at all points around the periphery.

   c. If a correction is required to satisfy angular alignment requirements, then recheck the parallel alignment.

Note: The Type "N" and "R" coupling connection is rigid and does not allow for forgiveness of parallel or angular misalignment. To eliminate unnecessary bearing loads, both shafts must be in near perfect alignment.

Table 9 - Coupling Mounting Bolt Seating Torques

Size	Bolt Size	Seating Torque
1	5/16-18	160 in.lb.
2	3/8-16	280 in.lb.
3	1/2-13	700 in.lb.
4	5/8-11	1,200 in.lb.
5	5/8-11	1,200 in.lb.
6	5/8-11	1,200 in.lb.

8. Loosen the coupling setscrews and attach coupling to clutch with hex head bolts and flat washers. Refer to Table 9 for recommended bolt seating torques. Secure coupling to drive shaft by tightening the setscrews to the recommended seating torques in Table 7.

IV. Limit Switches

The ORC Series, Model S Overload Release Clutch is available with two types of limit switch actuators, a limit switch pin (LSAP) and a limit switch actuating mechanism (LSAM).

A. Limit Switch Pin

A Limit Switch Pin is furnished as a standard item to activate a limit switch that triggers the electrical controls. The Limit Switch Pin protrudes radially from the clutch housing and its travel is controlled by the drive pawl motion upon disengagement. The Limit Switch Pin can be used if the housing continues to rotate when an overload occurs and the rotor stops, i.e, the housing is the driver and the rotor is the driven. Housing RPM has to be considered to determine the time for the Limit Switch Pin to revolve around before contacting the limit switch, see Figure 15, for Limit Switch Pin Travel.

The standard Limit Switch Pin extension is 1 inch from the outside diameter of the clutch housing. It can also be made flush with the surface of the housing in an engaged position.

B. Limit Switch Actuating Mechanism

A Limit Switch Actuating Mechanism provides instant operation of a limit switch to immediately shut down the drive or actuate an alarm should an overload occur.

The mechanism is entirely contained in the clutch cover and is actuated by the motion of the drive pawl. When an overload occurs, the drive pawl motion releases the actuating plate and it trips a limit switch. The total travel of the plate is 5/16 of an inch. (See Figure 15)

The actuating plate must be reset by manually pushing it back into position. The clutch must be engaged when resetting the plate or the plate will not reset when the clutch is disengaged.

Limit Switch Pin Travel	
Size	**Travel**
1	.13 “
2	.13”
3	.13”
4	.13”
5	.13”
6	.25”

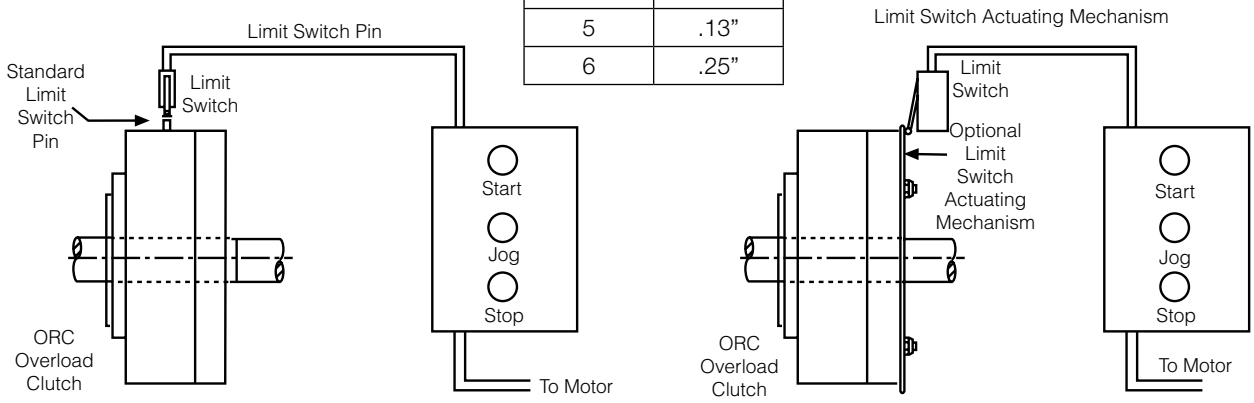


Figure 15 - Limit Switch Layout

A limit switch should be able to operate within the plate travel of 5/16 of an inch. The switch should be wired in parallel with a jog circuit so that the drive can then be indexed to the start/run circuit.

V. General Maintenance

A. Lubrication

The Overload Release Clutch is prelubricated at the factory and is also equipped with a grease pack fitting. For optimum performance and wear resistance it is suggested that the clutch be lubricated with a Bentone type, NLGI grade 0 grease. The lubrication schedule should be in accordance with good operating practices for the equipment on which the clutch is mounted. The clutch is also supplied with a grease relief fitting. When there is enough grease in the clutch any excess grease will be extruded through the relief fitting.

B. Annual Inspection

The Overload Release Clutch is constructed of heavy duty materials. Under reasonably clean conditions the unit will operate with a minimum of maintenance. A scheduled annual inspection of bearings, pawls, rotor, springs, tripping mechanism, and other internal components is suggested. However, the actual frequency should be in accordance with good operating practices for the equipment on which the clutch is installed.

VI. Repair Instructions

A. General Disassembly

1. All item numbers in parenthesis will refer to the key numbers shown in the clutch exploded view drawing and parts identification tables.
2. Place the clutch preferably in a three-jaw chuck with the actuating plate or cover facing up.
3. There are two locking screws (25) located on the face of the cover which lock down the reset spring screw (14) and the drive spring screw (21). Loosen these screws to relieve the pressure on the drive spring screw and reset spring screw.
4. Turn the reset spring screw (14) counterclockwise to relieve the compression on the reset spring (19).
5. Remove the sealing wax from the drive spring screw (21) and turn the screw counterclockwise to relieve the compression on the drive spring (18).
6. Remove the cover screws (27).
7. Pry off the cover (8). Use care not to break the inner pilot of the cover. (See Figure 16)
8. Remove the reset screw (14) and take out the reset spring (19), and the ball thrust (20) through the hole stamped 9.

9. Remove the reset pawl (11) by simply lifting out.

10. Remove the drive pawl (10) and the drive spring (18). This will require a little more effort because of the slight pressure on the drive spring.

11. Remove the housing (1) from the mounting surface and press out the rotor (12).

12. If clutch is manual reset, remove the reset screw (24) by turning clockwise into the housing.

13. Inspect hardened bushings (3) in housing (1) and cover (8) for excessive wear.

14. Replace any worn or broken parts.

B. Basic Unit Assembly

1. If clutch is manual reset, install the reset screw (24) from the inside of the housing turning counter-clockwise until the reset screw pin stops the screw from turning.

2. Press the long end of rotor (12) into housing bearing (2).

3. This step is for manual reset only. Go to next step for automatic reset. Install the drive pawl (10) into the appropriate hole in the housing (1), and the reset pawl (11) into its appropriate hole in the housing. Check the fit of the reset pawl into the notch of the drive pawl with the clutch disengaged. The reset pawl should fit approximately one-third of the way into the notch. Grinding the nose of the reset pawl may be necessary to obtain the proper fit. (See Figure 17)

4. Remove the drive pawl (10). The drive pawl and the drive spring (18) will have to be installed simultaneously. If a drastic change in torque is desired, use this step to change the drive spring. Place one end of the drive spring over the drive spring thrust washer (22). Insert the knob of the drive pawl into the other end of the drive spring. Insert the trunnion of the drive pawl into the hardened bushing in the housing, while the nose of the drive pawl fits into the notch of the rotor (12).

5. Coat the inside of the housing and all components with a quality all-purpose grease. A Bentone type, NLGI grade 0 grease or equivalent is recommended.

6. Insert the reset spring disc (15) inside the reset spring screw (14). Apply grease to the surface of the disc.

7. If a drastic change in torque is desired, use this step to change the reset spring. Place the reset spring (19) on the surface of the reset spring disc. Apply grease to the end of the ball thrust (20) and insert ball thrust into the reset spring.

8. Apply grease to the threads of the reset spring screw (14) and insert the assembly of the reset spring screw, reset spring disc (15), reset spring (19), and ball thrust (20) through the hole stamped 9 on the housing. Tighten the reset spring screw until it is flush with the surface of the housing. (See Figure 17)

9. Fill the entire housing cavity with grease to ensure a proper grease packing.

10. Press the cover on to the housing assembly. Make sure that the trunnion holes and the cover screw holes line up.

11. Install the cover screws and tighten to the recommended seating torques in Table 10.

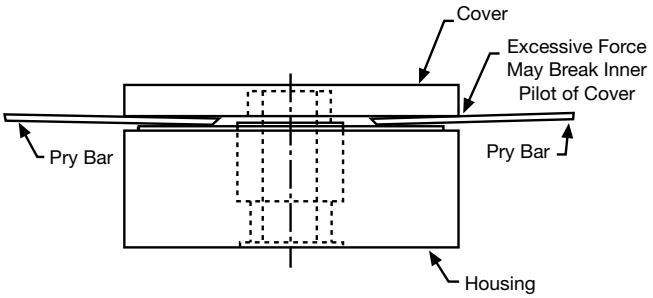


Figure 16

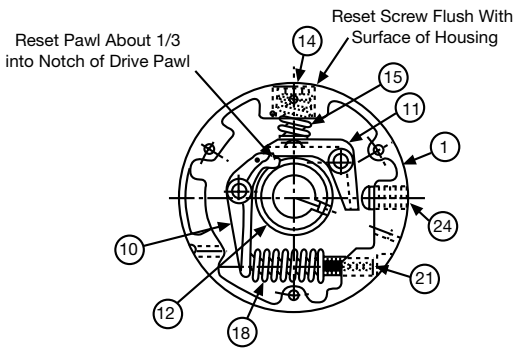


Figure 17

C. Torque Verification

1. Place the clutch in a chuck or vise with the cover facing upward.
2. Insert the appropriate size arbor and key into rotor. (See Figure 18)
3. Turn the drive spring screw (21) clockwise until it is flush with the surface of the housing.
4. The clutch is supplied with a torque selector dial. The torque selector dial is the mill marks located at the hole stamped 9 on the housing. If a drive spring (18), reset spring (19), and/or a reset spring screw (14) were replaced, chances are that the stamped torque values on the dial are no longer valid. It may be necessary to grind the old numbers off and to stamp new ones.
5. Tighten the reset spring screw (14) until it reaches the limit stop pin (4). This will be the maximum torque position. If the maximum torque is not desired, tighten the reset spring screw to one of the locations on the torque selector dial.
6. Disengage the clutch with a torque wrench. Fine tune the torque by turning the drive spring screw (21) until the desired release torque is obtained.
7. Refer to Section I, C for further details on torque adjustment.
8. Once the desired release torque is obtained, tighten the locking screws (25) located over the drive spring and reset spring screws to ensure that they will not move. The unit is now ready for installation. Refer to Section lll for installation of basic clutch.

Table 10 - Cover Screw Seating Torques

Clutch Size	Screw Size	Quantity	Seating Torque
1	1/4-20	3	100 in.lb.
2	5/16-18	3	200 in.lb.
3	3/8-16	3	350 in.lb.
4	1/2-13	4	850 in.lb.
5	5/8-11	4	1,700 in.lb.
6	5/8-11	4	1,700 in.lb.

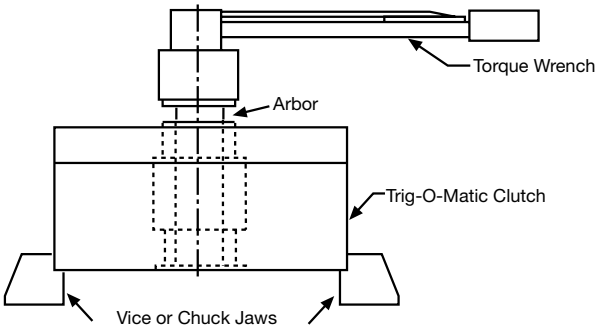


Figure 18

D. Limit Switch Actuating Mechanism (LSAM) Assembly

1. Apply a graphite lubricant to the release ring groove of the cover (8).
2. Insert the actuating stud (40) through the appropriate hole in the release ring (35). To identify this hole place the release ring in the groove of the cover. When the trip pin holes line up with the through holes of the cover, the actuating stud hole will line up with the counterbored hole in the groove of the cover.
3. Install the actuating stud nut (39) onto the actuating stud (40) and tighten.
4. Install a spring terminal (43) on each end of the return spring (38). Clutch sizes 5 & 6 require two return springs.
5. Insert a spring terminal screw (41) through the hole of the spring terminal (43), and place a spacer collar (36) on the end of the screw. Insert the end of the screw into the threaded hole of the release ring (35) and tighten. The end of the screw may protrude past the release ring. Grind the end of the screw flush with the surface of the release ring. Install second spring terminal screw on clutch sizes 5 & 6 as just described. Move to Step 13 for clutch sizes 5 & 6.
6. Press the trip pins (32) into the trip plate (31).
7. Install a bowed snap ring (34) into the groove of each trip pin located next to the trip plate.
8. Place the trip plate flat on a table with counterbored holes facing up. Insert the thrust springs (37) into the counterbores.

9. Place the cover (8) over the trip plate, lining up the counterbores in the cover with the springs.

10. Place the release ring (35) into the groove of the cover. Make sure that all of the holes line up properly.

11. Insert a spring terminal screw (41) through the hole of the other spring terminal (43) and place a spacer collar (36) on the end of the screw. Insert the end of the screw into the tapped hole of the cover and tighten.

12. Push down on the cover and release ring until the release ring engages into the grooves of the trip pins. Install two snap rings (33) into the grooves of each trip pin. Move to Step 22.

13. Place the release ring (35) into the groove of the cover. Make sure that all of the holes are properly aligned.

14. Insert the trip pins (32) through the matching holes in the release ring (35) and cover (8). Make sure that the tapped hole of the trip pin is inserted first.

15. Slide the release ring (35) counterclockwise so that the ring engages into the grooves of the trip pins.

16. Insert a spring terminal screw (41) through the other spring terminal (43) and place a spacer collar (36) on the end of the screw. Insert the screw into the tapped hole in the cover and tighten. Repeat this process for the other return spring .

17. Turn the cover over so that the release ring is facing down against the surface of the table.

18. Insert the thrust springs (37) into the counterbores of the cover.

19. Place the trip plate (31) over the cover making sure that the springs will sit in the counterbores of the trip plate and that all the holes properly line up.

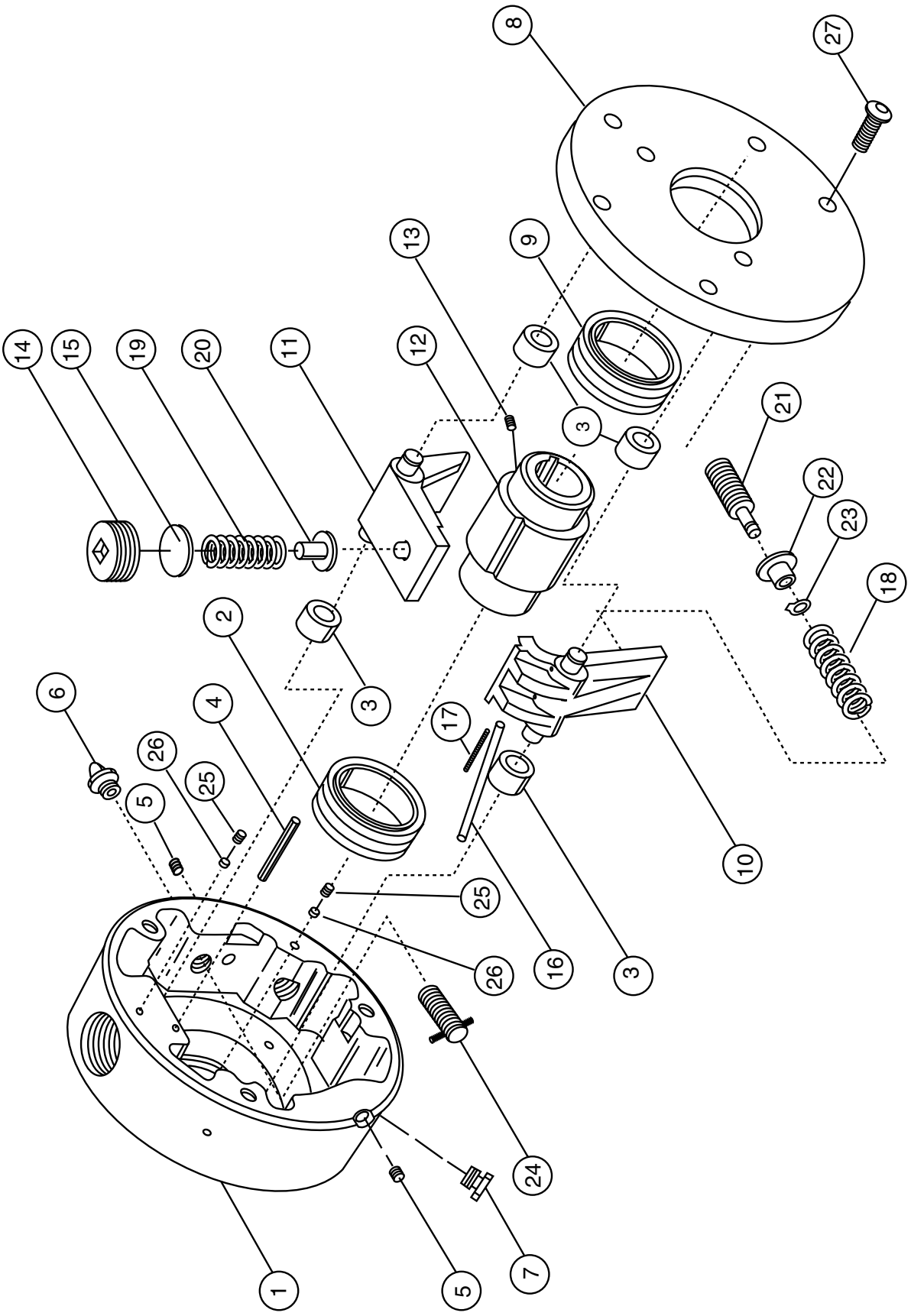
20. Press down on the trip plate (31) until it stops against the trip pins.

21. While pressing down on the trip plate (31) insert the plate mounting screws (42) into the tapped holes of the trip pins and tighten.

22. Press the cover assembly onto the housing assembly (1). Make sure that the trunnion holes and the mounting screw holes line up.

23. Install the cover screws (27) and tighten to the recommended seating torques shown in Table 10.

NOTES



ORC Series, Model S with Limit Switch Pin (LSAP) Types SA & SM

Part Identification - Model S with Limit Switch Pin (LSAP) Types SA & SM

Key No.	Name	Size 1 (Qty.)	Size 2 (Qty.)	Size 3 (Qty.)	Size 4 (Qty.)	Size 5 (Qty.)	Size 6 (Qty.)
*1	T Housing Ass'y., or	711257-XXX (1)	711148-XXX (1)	711180-XXX (1)	711223-XXX (1)	711238-XXX (1)	711266-XXX (1)
	B Housing Ass'y.,or	711258-XXX (1)	711149-XXX (1)	711181-XXX (1)	711224-XXX (1)	711239-XXX (1)	711267-XXX (1)
	C Housing Ass'y.,or	711259-XXX (1)	711150-XXX (1)	711182-XXX (1)	711225-XXX (1)	711240-XXX(1)	711268-XXX (1)
	N/R Housing Ass'y,	711260-XXX (1)	711151-XXX (1)	711183-XXX (1)	711226-XXX (1)	O/A	O/A
2	Housing Bearing	039273-041 (1)	039273-043 (1)	039273-044 (2)	039273-038 (1)	711900-006 (1)	711900-008 (1)
3	Hardened Bushing	—	730634-002 (2)	730634-003 (2)	730634-004 (2)	730634-005 (2)	—
4	Limit Stop Pin	730422-001 (1)	730422-001 (1)	730422-002 (1)	730422-002 (1)	730422-003 (1)	730422-003 (1)
5	Access Screws	040940-031 (2)	040940-042 (2)	074102-003 (2)	074102-078 (2)	074102-078 (2)	040940-078 (2)
6	Grease Fitting	034186-029 (1)	034186-029 (1)	034186-029 (1)	034186-029 (1)	034186-029 (1)	034186-029 (1)
7	Relief Fitting	034186-028 (1)	034186-028 (1)	034186-028 (1)	034186-028 (1)	034186-028 (1)	034186-028 (1)
8	Cover Ass'y	711261-001 (1)	711146-001 (1)	711185-001 (1)	711219-001 (1)	711242-001 (1)	711269-001 (1)
9	Cover Bearing	039273-040 (1)	039273-042 (1)	039273-045 (1)	039273-038 (1)	711900-005 (1)	711900-007 (1)
3	Hardened Bushing	—	730634-002 (2)	730634-003 (2)	730634-004 (2)	730634-005 (2)	—
10	Drive Pawl	730429-001 (1)	730430-001 (1)	730431-001 (1)	730432-001 (1)	730433-001 (1)	730434-001 (1)
*11	Reset Pawl	730367-XXX (1)	730368-XXX (1)	730369-XXX (1)	730370-XXX (1)	730371-XXX (1)	730372-XXX(1)
**12	Rotor Assembly	710354-001 (1)	710354-002 (1)	710354-003 (1)	710354-004 (1)	710354-005 (1)	710354-006 (1)
13	Rotor Setscrew	043243-012 (1)	043243-022 (1)	043243-041 (1)	** (1)	043243-058 (1)	043243-058 (1)
14	Reset Spring Screw	730382-001 (1)	730382-002 (1)	730382-003 (1)	730382-004 (1)	730382-005 (1)	730382-006 (1)
15	Reset Spring Disc	730383-001 (1)	730383-002 (1)	730383-003 (1)	730383-004 (1)	730383-005 (1)	730383-006 (1)
16	LSAP Assembly	710355-001 (1)	710355-002 (1)	710355-003 (1)	710355-004 (1)	710355-005 (1)	710355-006 (1)
17	Roll Pin	040942-044 (1)	040942-044 (1)	040942-045 (1)	040942-045 (1)	040942-046 (1)	040942-045 (1)
18	Drive Spring - Low Torque Range (L)	730385-001 (1)	730385-007 (1)	730385-014 (1)	730385-020 (1)	730385-026 (1)	730385-032 (1)
19	Reset Spring - Low Torque Range (L)	730385-005 (1)	730385-011 (1)	730385-018 (1)	730385-024 (1)	730385-030 (1)	730385-035 (1)
18	Drive Spring - Medium Torque Range (M)	730385-001 (1)	730385-007 (1)	730385-015 (1)	730385-020 (1)	730385-026 (1)	730385-032 (1)
19	Reset Spring - Medium Torque Range (M)	730385-006 (1)	730385-012 (1)	730385-019 (1)	730385-025 (1)	730385-031 (1)	730385-036 (1)
18	Drive Spring - High Torque Range (H)	730385-001 (1)	730385-009 (1)	730385-015 (1)	730385-021 (1)	730385-027 (1)	730385-033 (1)
19	Reset Spring - High Torque Range (H)	730385-006 (1)	730385-013 (1)	730385-019 (1)	730385-025 (1)	730385-031 (1)	730385-037 (1)
20	Ball Thrust	—	730386-001 (1)	730386-002 (1)	730386-003 (1)	730387-001 (2)	730387-002 (2)
21	Drive Spring Screw	730379-001 (1)	730379-002 (1)	730379-003 (1)	730379-003 (1)	730380-001 (1)	730381-001 (1)
22	Drive Spring Washer	730388-001 (1)	730388-002 (1)	730388-003 (1)	730388-003 (1)	730388-004 (1)	730388-005 (1)
23	Snap Ring	—	040682-029 (1)	040682-030 (1)	040682-030 (1)	040682-030 (1)	040682-031 (1)
24	Reset Screw Ass'y.	710356-001 (1)	710356-002 (1)	710356-003 (1)	710356-004 (1)	710356-005 (1)	710356-006 (1)
25	Locking Screw	074102-015 (2)	074102-015 (2)	074102-031 (2)	074102-031 (2)	074102-027 (2)	074102-027 (2)
26	Locking Insert	730389-001 (2)	730389-001 (2)	730389-002 (2)	730389-002 (2)	730389-003 (2)	730389-003 (2)
27	Cover Screw	041315-048 (3)	041315-062 (3)	041315-077 (3)	041315-106 (4)	041315-121 (4)	041315-021 (4)

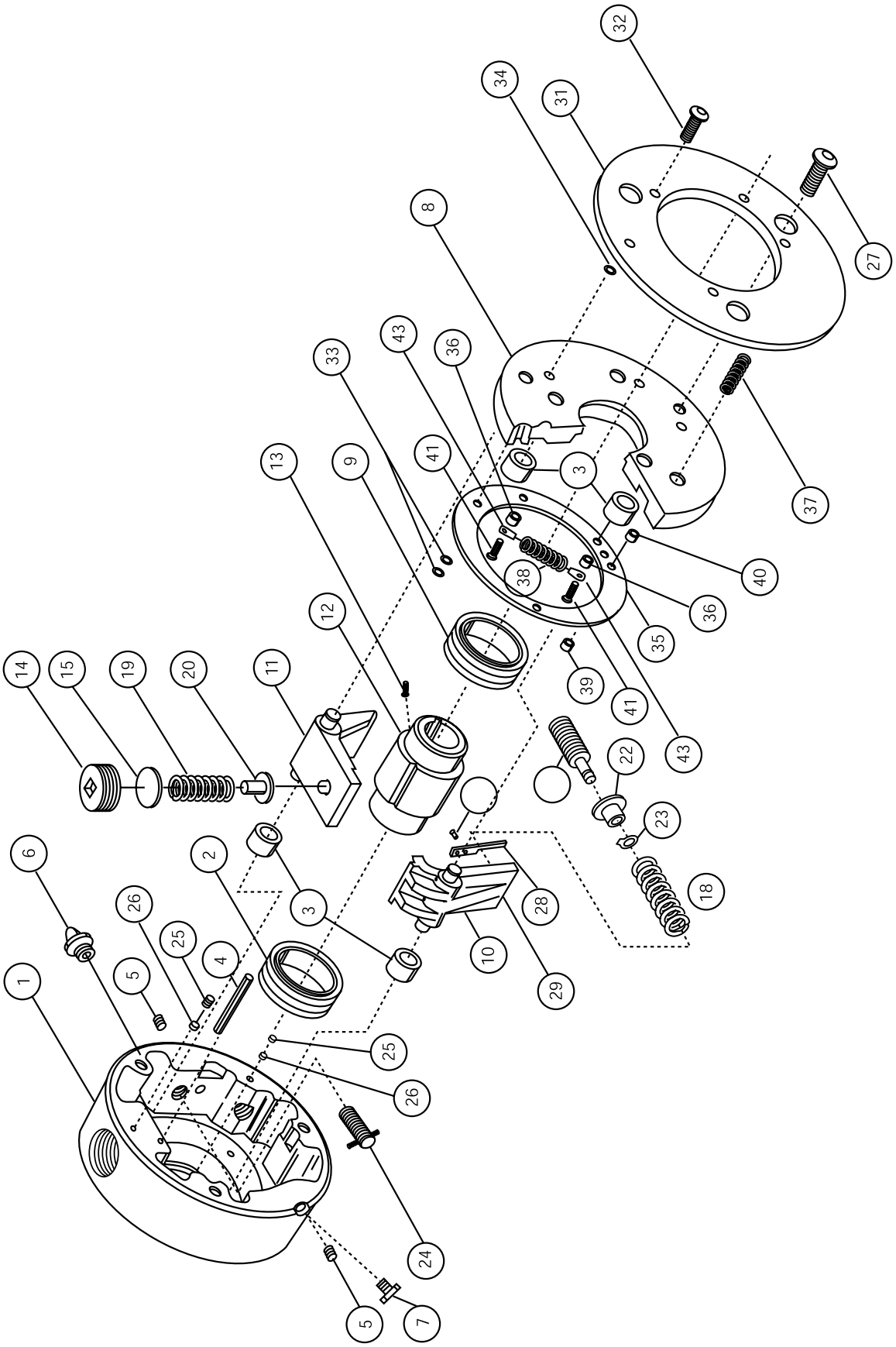
* Dash Numbers Are:	SA/SB/SC Automatic	SM/SP/SS Manual
T Housing Ass'y.	-001	-002
B Housing Ass'y.	-001	-002
C Housing Ass'y.	-001	-002
N/R Housing Ass'y.	-001	-002
Reset Pawl	-001	-003

**Dependent upon bore—consult the factory.

Note: Please include clutch catalog number when ordering any spare parts.

⚠CAUTION Rotating equipment is potentially dangerous and could cause injury or damage if not properly protected. Follow all applicable codes and regulations.

In accordance with our established policy to constantly improve our products, the specifications contained herein are subject to change without notice.



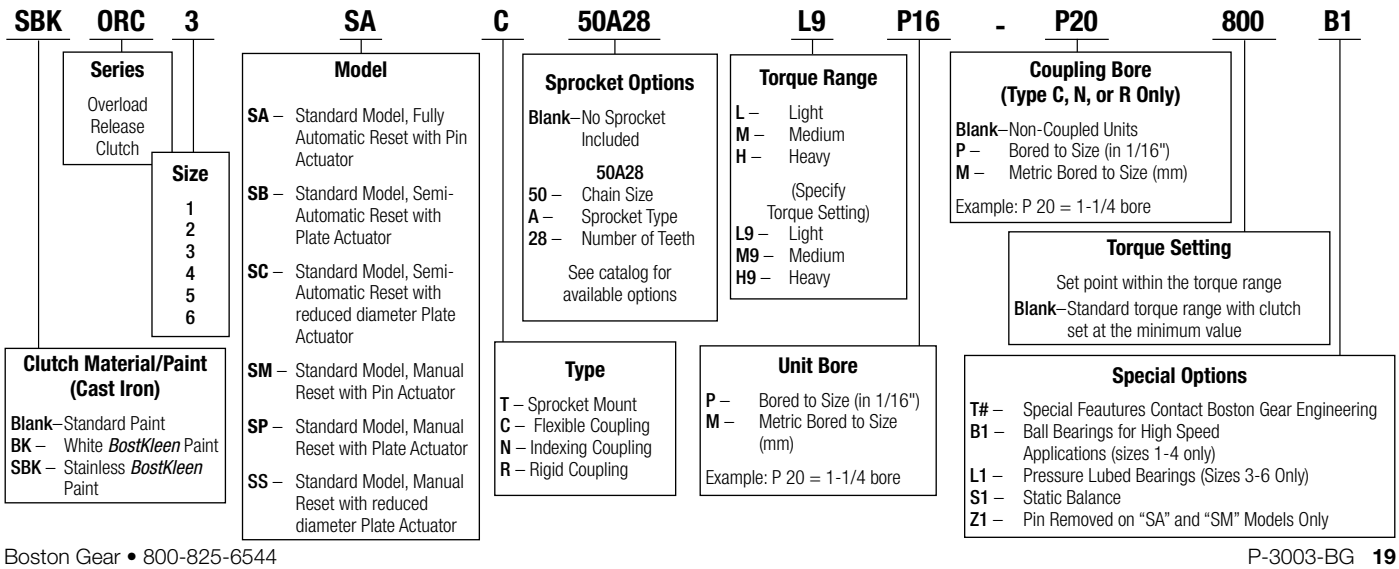
ORC Series, Model S with Limit Switch Actuation Mechanism (LSAM) Types SB, SC, SP & SS

Part Identification - Model S with Limit Switch Actuating Mechanism (LSAM)
Types SB, SC, SP & SS

Key No.	Name	Size 1 (Qty.)	Size 2 (Qty.)	Size 3 (Qty.)	Size 4 (Qty.)	Size 5 (Qty.)	Size 6 (Qty.)
8	Cover Ass'y. (LSAM)	711262-001 (1)	711187-001 (1)	711108-001 (1)	710766-001 (1)	711190-001 (1)	711270-001 (1)
9	Cover Bearing	039273-040 (1)	039273-042 (1)	039273-045 (1)	039273-038 (1)	711900-005 (1)	711900-007 (1)
3	Hardened Bushing	—	730634-002 (2)	730634-003 (2)	730634-004 (2)	730634-005 (2)	—
10	Drive Pawl (LSAM)	710290-001 (1)	710291-001 (1)	710292-001 (1)	710293-001 (1)	710294-001 (1)	710295-001 (1)
28	Actuating Spring	730414-001 (1)	730415-001 (1)	730416-001 (1)	730417-001 (1)	730418-001 (1)	730419-001 (1)
29	Adjustment Screw	018006-004 (1)	018006-017 (1)	018006-047 (1)	018006-047 (1)	018006-047 (1)	018006-047 (1)
30	Mount. Rivet/Screw	730420-001 (2)	730420-001 (2)	730420-002 (2)	730420-002 (2)	730420-002 (2)	074110-018 (2)
	Plate Ass'y (SB/SP),	710204-001 (1)	710205-001 (1)	710206-001 (1)	710207-001 (1)	—	—
	Plate Ass'y (SC/SS)	710204-002 (1)	710205-002 (1)	710206-002 (1)	710207-002 (1)	—	—
31	Plate (SB/SP), or	730397-001 (1)	730398-001 (1)	730399-001 (1)	730400-001 (1)	730401-001 (1)	730402-001 (1)
	Plate (SC/SS)	730397-002 (1)	730398-002 (1)	730399-002 (1)	730400-002 (1)	730401-002 (1)	730402-002 (1)
32	Trip Pin	730403-001 (3)	730404-001 (3)	730405-001 (3)	730406-001 (4)	730407-001 (4)	730408-001 (4)
33	Snap Ring	040682-035 (6)	040682-035 (6)	040682-036 (6)	040682-030 (8)	—	—
34	Bowed Snap Ring	040682-032 (3)	040682-032 (3)	040682-033 (3)	040682-034 (4)	—	—
35	Release Ring	730391-001 (1)	730392-001 (1)	730393-001 (1)	730394-001 (1)	730395-001 (1)	730396-001 (1)
36	Spacer Collar	730409-001 (2)	730409-002 (2)	730409-002 (2)	730409-002 (2)	730409-002 (4)	730409-002 (4)
37	Thrust Spring	730410-001 (3)	730410-002 (3)	730410-002 (3)	730410-002 (4)	730410-002 (4)	730410-003 (4)
38	Return Spring	730411-002 (1)	730411-001 (1)	730411-002 (1)	730411-001 (1)	730411-002 (2)	730411-001 (2)
39	Actuating Stud Nut	730412-001 (1)	730412-002 (1)	730412-003 (1)	730412-004 (1)	730412-004 (1)	730412-004 (1)
40	Actuating Stud	074111-126 (1)	074111-126 (1)	730413-001 (1)	730413-002 (1)	730413-002 (1)	730413-002 (1)
41	Terminal Screw	074110-003 (2)	074110-017 (2)	074110-017 (2)	074110-017 (2)	074110-017 (4)	074110-017 (4)
42	Plate Mount. Screw	—	—	—	—	730561-001 (4)	730561-002 (4)
43	Spring Terminal	730421-001 (2)	730421-002 (2)	730421-002 (2)	730421-002 (2)	730421-002 (4)	730421-002(4)
	C Coupling Ass'y.	710296-001 (1)	710297-001 (1)	710298-001 (1)	710299-001 (1)	O/A	O/A
	Coupling Bushing	730275-001 (3)	730275-002 (3)	730275-003 (4)	730275-004 (4)	—	—
	Setscrew	040940 041 (2)	040940-003 (2)	040940-003 (2)	040940-067 (2)	—	—
	Coupling Pin	730278-001 (3)	730278-002 (3)	730278-003 (4)	730278-004 (4)	—	—
	N/R Coupling Ass'y.	710301-001 (1)	710302-001 (1)	710303-001 (1)	710334-001 (1)	O/A	O/A
	Mounting Screw	074118-062 (3)	074118-077 (3)	074118-093 (4)	074118-110 (4)	—	—
	Flat Washer	074117-004 (3)	074117-006 (3)	074117-009 (4)	074117-013 (4)	—	—
	Setscrew	040940-041 (2)	040940-003 (2)	040940-003 (2)	040940-067 (2)	—	—

Note: Please include clutch catalog number when ordering any spare parts.

ORC Model S Series Part Numbering System



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