

## SERVICE AND REPAIR PARTS

NEMA SIZE 0, NORMALLY OPEN, P/N 59301, 59302, 59303 SERIES  
 NEMA SIZE 1, NORMALLY OPEN, P/N 59311, 59312, 59313 SERIES  
 NEMA SIZE 2, NORMALLY OPEN, P/N 59321, 59322, 59323 SERIES

### INSTALLATION AND ADJUSTMENT

Mount the contactor vertically on a rigid support. Refer to Figure 1 for proper clearances above the top of the contactor (A), and in front of the arc shield (B) for arcing clearance and arc shield removal. Check that the contactor operating coil (25) is the correct voltage. With all power removed, remove the arc shield(s) and operate the contactor by hand. The contact tips (20 & 33) should meet SQUARELY. If they do not, align them by the procedure described below. Replace the arc shield(s.) **CAUTION: DO NOT OPERATE THE CONTACTOR UNDER LOAD UNLESS THE ARC SHIELD IS SEATED FULLY IN POSITION.**

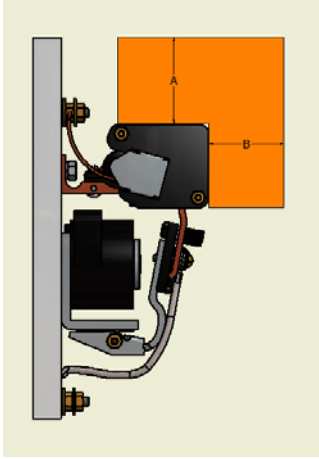
### CONTACTOR TIP ADJUSTMENT

1. With all power removed, remove the arc shield (5) and set it aside.
2. Check that the square projection on the lower end of the movable contact finger (33) is seated in the recess in the fingerboard (30).
3. Make sure the stationary contact tip (20) is tightly bolted against the stationary contact support (19) (Fig. 2)
4. Check that the contact tip surfaces are aligned both vertically and horizontally (Fig. 2.)
5. Replace the arc shield (5) back to the fully downward position.

### CONTACT TIP REPLACEMENT

The contact tips should be replaced when the contacts are worn down to dimension shown in Figure 2.

1. With all power removed, remove the arc shield (5).
2. Remove the movable contact finger (33) by removing the SEMS screw (35) and brass washer (8.) To remove the spring (32), push toward the contact, twist and release.
3. Remove the stationary contact tip (20) by removing the stainless steel screw (10) and lock washer (9) located on the stationary contact support (19).
4. Install the new stationary contact tip (20) using new hardware provided.
5. Install new movable contact finger (33) over the spring hook on the fingerboard (30.) Replace spring (32) by pushing down and releasing so that the internal spring loop engages the fingerboard hook.
6. Replace the shunt (34) using the brass flat washer (8) and sems screw (35). On size 2 contactors the arc horn (47) is held under the shunt by the sems screw (35).
7. Check that the contacts (19 and 33) tips meet squarely. Reinstall arc chute (5) and pivot into position.



**ELECTRICAL CLEARANCES**

Note: Shaded area for arcing clearances to ground, un-insulated enclosure or other control devices.

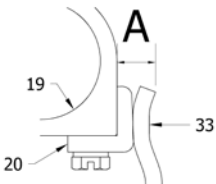
**NEMA SIZES**

DIM.	SIZE		
	0	1	2
A	2.5	3.5"	3.5"
B	.75	.75"	.85"

Fig. 1

**WARNING: ALL METAL PARTS OF THE CONTACTOR MAY BE AT LINE VOLTAGE. ALL POWER MUST BE DISCONNECTED FROM THE CONTACTOR BEFORE PERFORMING ANY ADJUSTMENT, MAINTENANCE OR TROUBLE-SHOOTING PROCEDURES.**

**CAUTION: FAILURE TO CONNECT THE OPERATING COIL TO THE PROPER VOLTAGE MAY RESULT IN IMPROPER CONTACTOR OPERATION OR DAMAGE TO THE COIL.**

Fig. 2	CONTACTOR SIZE		A	
			MATED DIMENSION	
 <p><b>SIZE 0, 1, 2 N.O.</b></p>			NEW	REPLACE
	0	N.O.	3/8"	7/32"
	1	N.O.	3/8"	7/32"
2	N.O.	13/32"	1/4"	

## AUXILIARY ELECTRICAL CONTACTS

With all power sources removed, check that auxiliary contact (37) has the proper follow-up. With new auxiliary contacts, the correct operating height is as shown in Figure 3 when the armature (31) is FULLY CLOSED.

The auxiliary electrical contacts (37) should be replaced when inspection of the contacts shows that they are burned or badly pitted. It is necessary that the entire auxiliary block be replaced as a unit.

1. With all power "OFF", loosen terminal screws and remove terminal leads. NOTE POSITION OF LEADS so they can be replaced properly.
2. Remove fingerboard (30) by removing screws and washers (12, 13.)
3. Remove Contact Assembly by removing slotted screws (40).
4. Install NEW contact assembly (37) as shown in the exploded view.
5. Replace fingerboard (30) and hardware (12, 13.)
6. Manually operate the contactor and check the moving contacts for proper follow-up in Fig. 3.
7. Replace terminal leads.

## COIL REPLACEMENT

1. With all power removed, disconnect the coil leads.
2. Remove the armature hinge pin (31) by removing the nut (44) and lockwasher (43).
3. Remove the armature assembly (31) with the contact finger board assembly.
4. Remove the screw (29) on the front of the magnet core and remove non-magnetic spacer (28), core cap (27) and coil (25).
5. Install the new coil (25) using the core cap (27), non-magnetic spacer (28) and tighten the screw (29.) Note that the steel core cap (27), which is thicker than the non-magnetic phosphor bronze spacer (28), must be installed against the coil. (See Exploded View).
6. Replace the armature (31) and armature hinge pin (42). Install the lockwasher (43) and hex nut (44). Check that armature hinge pin is fully seated and the hardware is tight.
7. Check that the armature pivots freely and the contacts align.
8. Reconnect the coil leads.

## SHUNT REPLACEMENT

The shunt (34) should be replaced when the flexible braided wires are broken or burned or if the wires are

loose in the terminal connectors on either end of the shunt:

1. With all power removed, disconnect the bottom end of the shunt (34) by removing the hex nut (4), washer (3) and shunt (34.)
2. Disconnect the top end of the shunt by removing the sems screw (35), lock washer (8) and the shunt (34.)
3. Install the new shunt. Connect the top end of the shunt by replacing the shunt (34), screw (12) and washer (8.)
4. Connect the bottom end of the shunt by replacing the shunt, washer (4), and hex nut (3.)

**CAUTION: SHUNT MUST BE DIRECTLY AGAINST MOVABLE CONTACT (33) AT THE TOP END AND DIRECTLY AGAINST THE WIRE TERMINAL STUD (2) AT THE BOTTOM.**

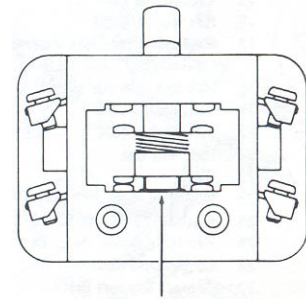


Fig. 3

## PROPER OPERATED HEIGHT

The snap ring on plunger is even with bottom edge of cover opening.

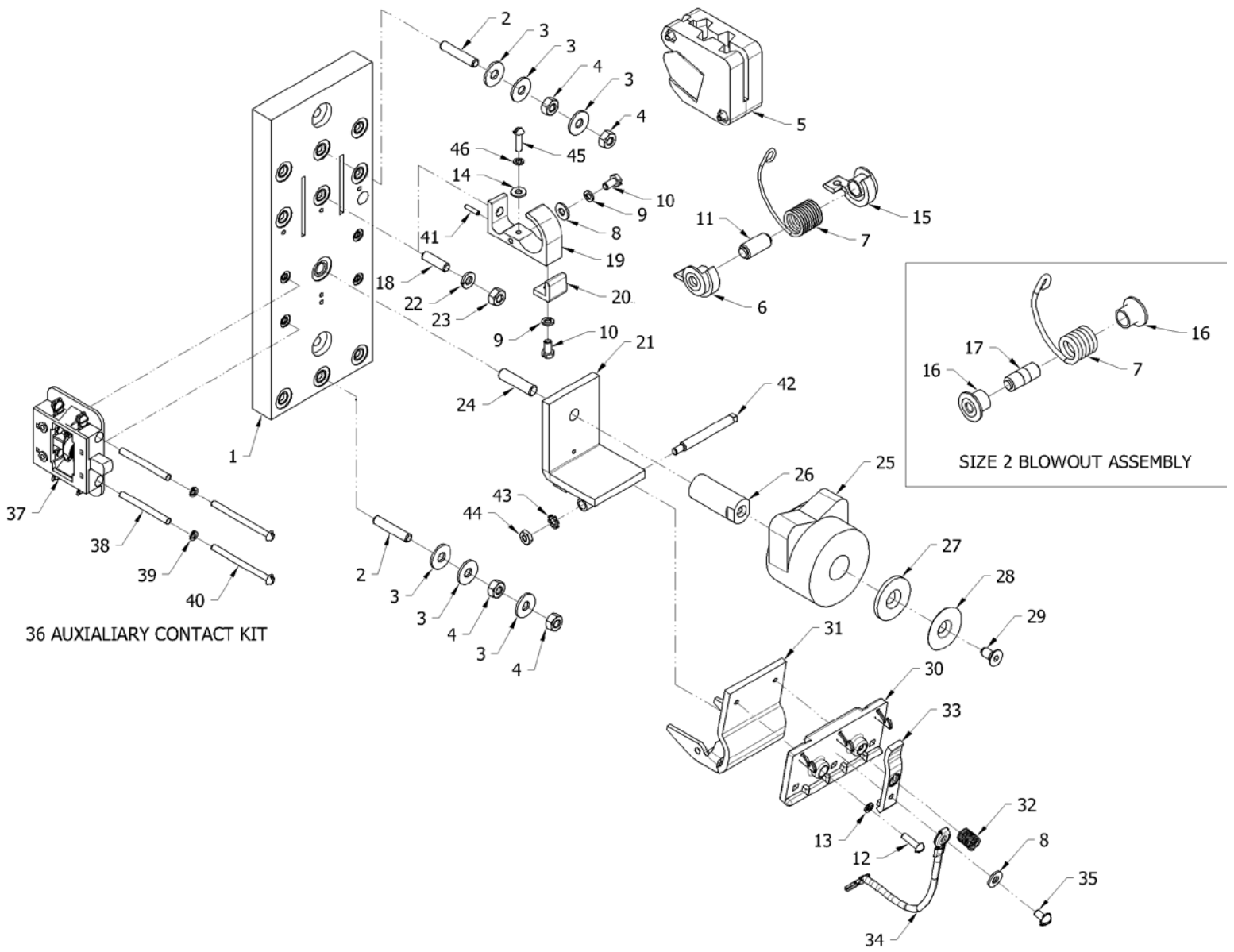
Item No.	Description	Part No.	Qty.			Item No.	Description	Part No.	Qty.		
			Size 0	Size 1	Size 2				Size 0	Size 1	Size 2
1	Molded Base	68013-003	1	1	1	32*+	Finger spring Size 1	04657-000	1	1	
2 +	Stud 1/4-20 x 1-5/16	66475-015	2	2	2		Finger spring Size 2	08838-000			1
3 +	Flat washer Brass 1/4	47251-041	6	6	6	33*+	Movable Finger Size 1 Std	05721-000	1	1	
4 +	Hex nut Brass 1/4-20	47254-011	4	4	4		Movable Finger Size 2 Std	05722-000			1
5 *+ #	Arc Shield Assembly (Size 1)	42855-001		1			Movable Finger Size 1 Silver	05721-001	1	1	
	Arc Shield Assembly (Size 2)	42856-001			1		Movable Finger Size 2 Silver	05722-001			1
6 +	Blowout coil support LH (Size 1 only)	42872-000		1		34*+	Finger Shunt Size 1	04870-001	1	1	
7 +	Blowout coil 5A size 1	58726-004		1			Finger Shunt Size 2	04873-000			1
	Blowout coil 10A size 1	58726-003		1		35+	SEMS Screw Brass 10-32 x 3/8	49138-083	1	1	1
	Blowout coil 15A size 1	58726-006		1		36*	Auxiliary Contact Kit (items 37-40)	68040-001	1	1	1
	Blowout coil 25A size 1 & 2	58726-002		1	1	37	Auxiliary contact block	67976-001	1	1	1
	Blowout coil 50A size 2	58726-001			1	38	Screw sheath	73108-000	2	2	2
	Blowout coil 38A size 2	58726-007			1	39	Lock washer No. 8	47252-006	2	2	2
8 +	Flat washer Brass No. 10	47251-008	2	2	2	40	Round head screw 8-32 x 2-1/4	47241-261	2	2	2
9 +	Lock washer No. 10	47252-065	2	2	2	41+	Groove pin 7/64 x 3/8	57404-001	1	1	1
10 +	Hex head screw SS 10-24 x 3/8	47779-042	2	2	2						
11 +	Blowout Coil Core Size 1	42023-000		1		42	Hinge pin	18581-000	1	1	1
12	Round head screw 8-32 x 5/8	47241-104	2	2	2	43	#10 ext lockwasher	47303-006	1	1	1
13	Lock washer No. 8	47252-064	2	2	2	44	#10 brass hex nut	47254-009	1	1	1
14 +	Flat Washer No. 8	47251-007		1		45+	Round head screw #8-32 x 5/8	47241-104		1	
15 +	Blowout Coil Support RH (Size 1)	42871-000		1		46+	Lockwasher #8	47252-064		1	
16 +	Blowout Coil Insulator (Size 2)	42014-000			2	47+	Size 2 arc horn (n/s)	49029-000			1
17 +	Blowout Coil Core Size 2	42024-000			1						
18 +	Stud 1/4-20 x 7/8	66457-016		1	1						
19 +	Stationary Contact Support Size 1	58661-001	1	1							
	Stationary Contact Support Size 2	58661-002			1						
20*+	Stationary contact tip Size 1 Std.	02315-000	1	1							
	Stationary contact tip Size 2 Std.	02317-000			1						
	Stationary contact tip Size 1 Silver	02315-001	1	1							
	Stationary contact tip Size 2 Silver	02317-001			1						
21	Stator	58663-000	1	1	1						
22+	Lock washer 1/4	47252-038	1	1	1						
23+	Hex Nut Steel 1/4-20	47253-021	1	1	1						
24	Stud 5/16-18 x 1-1/4	66475-017	1	1	1						
25*	Operating Coil 230/250V	68014-001			1						
	Operating Coil 115/125V	68014-002	1	1	1						
	Operating Coil 57.5V	68014-003	1	1	1						
	Operating Coil 24V	68014-004	1	1	1						
	Operating Coil 48V	68014-005		1	1						
	Operating Coil 36V	68014-006			1						
	Operating Coil 12V	68014-007		1	1						
	Operating Coil 230/250/275V	68014-008	1	1							
	Operating Coil 216V	68014-009		1	1						
	Operating Coil 108V	68014-010		1	1						
	Operating Coil 550V	68014-011		1	1						
	Operating Coil 460/500V	68014-012		1	1						
	Operating Coil 75V	68014-013			1						
26	Operating Coil Core	58660-001	1	1	1						
27	Core cap	18048-000	1	1	1						
28	Non-Magnetic spacer	19683-001	1	1	1						
29	Flat head screw 1/4-20 x 1/2 SS	49144-108	1	1	1						
30	Finger Board	42005-000	1	1	1						
31	Armature	18018-000	1	1	1						

\* Recommended Parts for Maintenance

+Part quantity equal to the number of poles

# Arc Chute for Size 0 is only used on a three pole device and only on the center pole.

N/S Not Shown



### TROUBLE SHOOTING

TROUBLE	POSSIBLE CAUSE	SOLUTION
Contacts will not operate or operation is sluggish.	<ol style="list-style-type: none"> <li>1. Improper or defective operating coil.</li> <li>2. Low control circuit voltage.</li> <li>3. Loose connection in control circuit.</li> <li>4. Mechanical interference or binding.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check coil part number resistance to determine if coil is defective.</li> <li>2. Check that control circuit voltage is a minimum of 80% of rated coil voltage. If it is, the problem is elsewhere in the circuit.</li> <li>3. Check connections and tighten if loose.</li> <li>4. Check for mechanical interference or bindings:               <ol style="list-style-type: none"> <li>a. Check mechanical interlock interference.</li> <li>b. Manually close the contact arm; check that the armature hinge pins are not binding.</li> <li>c. Manually close the contactor; check that the armature bearings are not binding.</li> </ol> </li> </ol>
Contacts will not open.	<ol style="list-style-type: none"> <li>1. Core cap spacer damaged or missing.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inspect core cap spacer.</li> </ol>
Contact tips overheating, short contact tip life.	<ol style="list-style-type: none"> <li>1. Loose connections.</li> <li>2. Movable or stationary contact tip not properly aligned</li> <li>3. Foreign matter on contact surfaces.</li> <li>4. Contact tips worn beyond recommended limits.</li> <li>5. Contact surfaces severely scored or burned</li> <li>6. Arc shield not properly installed</li> <li>7. Normal load currents below 5% of rated current of contactor.</li> <li>8. Excessive current.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check contact tips and shunt connections and tighten if loose.</li> <li>2. Align contact tips by the procedure listed in the ADJUSTMENT-Contact Tip Alignment instructions in this Service Bulletin. Check for positive contact pressure from spring (32).</li> <li>3. Remove foreign matter.</li> <li>4. Check for contact wear by the procedure listing in the MAINTENANCE-Contact Tip Replacement instructions in this Service Bulletin.</li> <li>5. Inspect contact surfaces and dress with a file as required.</li> <li>6. Check that arc shield is pivoted to the fully down position.</li> <li>7. Use a smaller size contactor to improve blowout action.</li> <li>8. Check that load currents are within contactor rating.</li> </ol>
Operating Coil Overheats.	<ol style="list-style-type: none"> <li>1. Improper or defective</li> <li>2. High voltage condition on coil.</li> <li>3. Loose connection at coil terminals.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check coil part number and resistance to determine if coil is defective.</li> <li>2. Check that control circuit voltage does not exceed 110% of rated coil voltage for extended periods.</li> <li>3. Check connection and tighten if loose.</li> </ol>



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