

This service bulletin for ASCO 920 Remote Control Switches explains how to replace the main contacts, operator coil, control contacts, and how to add auxiliary contacts. It covers both green nameplate design and black & silver nameplate design. Read all instructions before you begin the work.

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Tools Needed

- 1/8" hex key (Allen) wrench
- 9/64" hex key (Allen) wrench
- 3/8" nut driver
- #25 Torx^R driver (magnetized)
- torque wrench (0 to 30 in-lb minimum)
- electrical tape
- wood pencil
- multimeter (or continuity tester)
- needlenose and regular pliers

Parts replacement is easier when the switch is removed from its installation.

DANGER

ELECTROCUTION HAZARD

To prevent the possibility of fatal electrical shocks and burns, disconnect all power sources to the switch before working on it.

Switch Removal

1. Open the circuit breaker feeding the switch poles. Use a voltmeter to make sure there is no voltage on the extended bus plates.
2. Label the three control wires L, O, C (left side of switch) and disconnect them. Tape the loose ends.
3. Remove the nuts from the extended bus plates and remove the switch to a work bench.
4. Remove the cover from the switch by removing two screws counterclockwise (arrows in Figure 1).

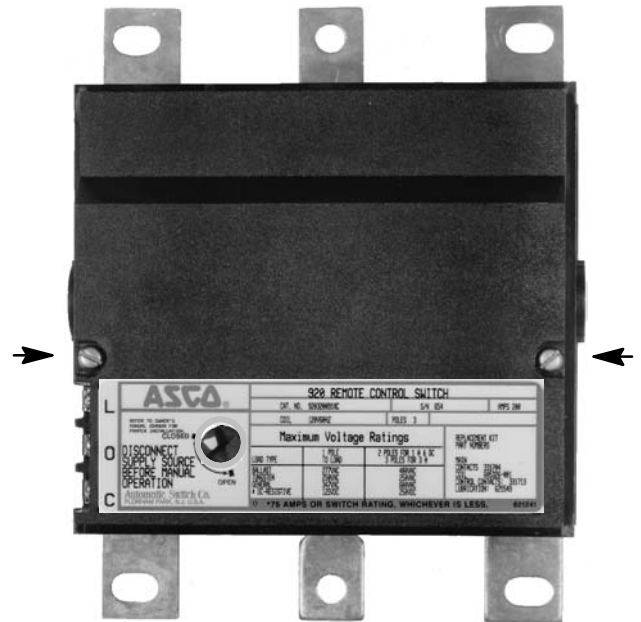


Figure 1. Two cover screws.

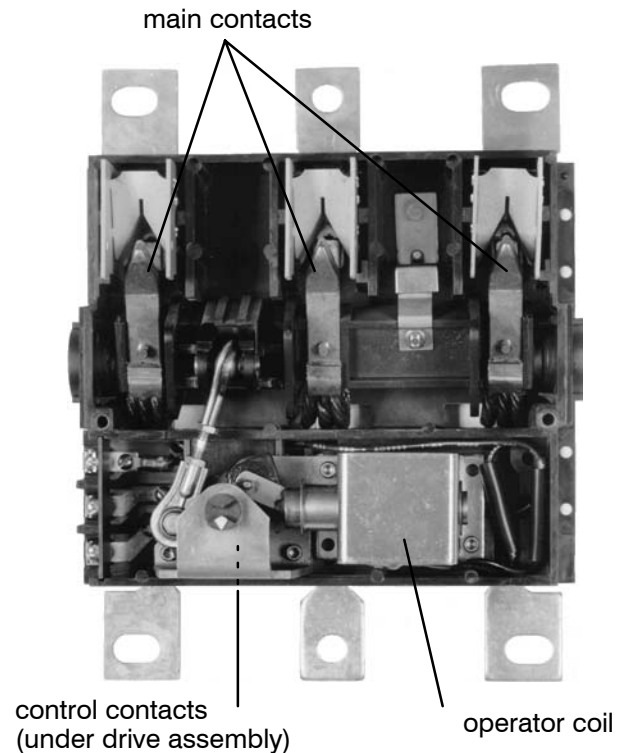


Figure 2. Cover removed.

Manual Operator

After all power is OFF the switch contacts can be opened and closed by turning the manual operator with a medium blade screwdriver. The slotted socket directly connects to the solenoid operator mechanism. Turn the socket 1/4 turn clockwise to close the contacts or counterclockwise to open them. See Figure 3.

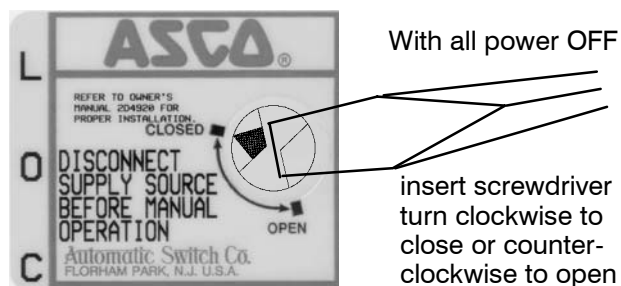
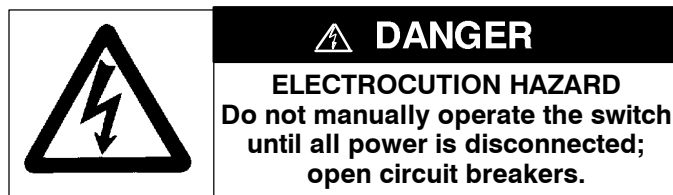


Figure 3. Manual operator (all power must be OFF).

Operator Coil Replacement

The solenoid operator coil is held in a frame and secured by the core tube. The coil assembly is mounted in the base with two screws. See Figure 4.

1. On the coil assembly, slide back the sleeving onto the switch wires (not onto the coil leads) to expose the in-line knife lugs. Disconnect the coil leads from these wires by bending the knife lugs 90 degrees and then unhooking them. See Figure 5.
2. Remove the coil assembly from the base by removing two screws. Use a 9/64, allen wrench counterclockwise. This assembly is under spring pressure to the right. Leave the core hooked onto the rotating weight. Take the coil assembly to a work bench for disassembly. See Figure 5.
3. Pull the core spring out of the core tube. Use a screwdriver to pry off the retaining ring that secures the core tube assembly in the frame. Then push the core tube assembly out the other end of the frame. See Figure 5.
4. Remove the coil and clamping washer from the frame. See Figure 5. *(continued on page 3)*

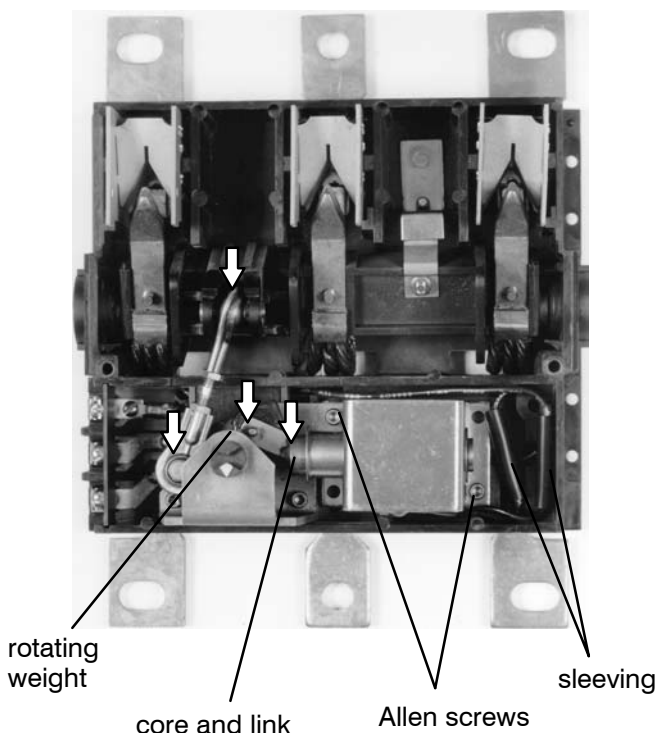


Figure 4. Coil assembly mounting and lubrication points (white arrows).

Lubrication Kit 625549

Under normal service, relubrication is not needed. However, when parts replacement or repair requires removal of lubrication, factory lubrication should be duplicated. Do not use oil. Only use ASCO Lubrication Kit 625549. Lubrication points are: core and link, inside the core tube, operator spring, rotating weight pin, and drive arm pivot joints. If the operator coil is replaced, lubricate the new spring and inside of the new core tube. See the white arrows in Figure 4.

⚠ CAUTION

MALFUNCTION HAZARD.
To prevent switch malfunction,
use lubrication kit 625549 as described.
Do not use oil or any other type of lubricant.

Operator Coil Replacement (continued)

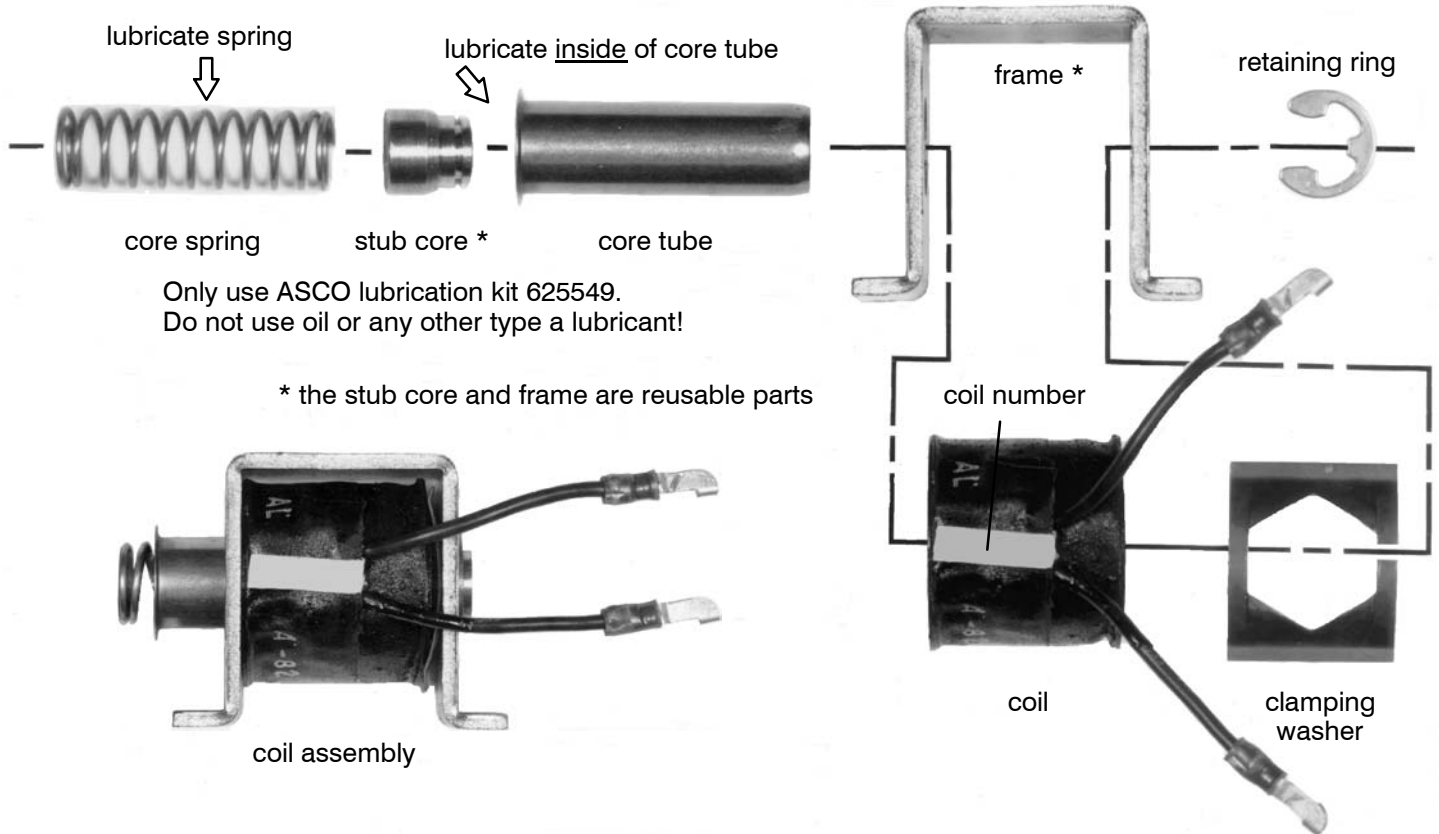


Figure 5. Breakdown of coil assembly.

5. Install the new coil and new clamping washer from the coil kit into the frame. Position the coil leads toward the smaller hole in the frame as shown. See Figure 5.
6. Insert the existing stub core into the new core tube from the coil kit. Slide the new core spring into the tube and push the core tube assembly through the frame. Use pliers to snap the new retaining ring into the core tube assembly groove. See Figures 4 and 5.
Note: Inspect and / or replace the control contacts now (see page 6, steps 3 through 7).
7. Remove the core spring and lubricate the inside of the new core tube and new spring with ASCO lubricant kit 625549. Then reinsert coil spring.
8. Reinstall the new coil assembly into the switch as follows: Insert the core into the spring and compress the spring into the coil assembly until it can be positioned over the two mounting holes. Use a 9/64, allen wrench clockwise to secure the coil assembly with two screws. Be sure the core's link remains hooked onto the pin on the rotating weight. Tighten the screws to 24–28 inch-pounds. See Figure 4.
Note: On green nameplate switches the coil frame slides under the drive unit frame.
9. Reconnect the coil leads to the switch wires and slide the sleeving over the in-line knife lugs. Push the wires inside the switch base.
10. Turn the manual operator in order to open and close the switch contacts several times. The action should be smooth and quick without mechanical binding. See Figure 3 on page 2.
11. After you replace an operator coil or the control contacts, check the control line circuit before re-connecting the switch. The control station must be a single pole double throw contact in each direction. Do not allow close and open signals to be applied to the switch at the same time; do not use overlapping contacts. Check the control voltage and the line run. Refer to Owner's Manual 381333-005.
Refer to Switch Installation on page 5.

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Main Contact Replacement

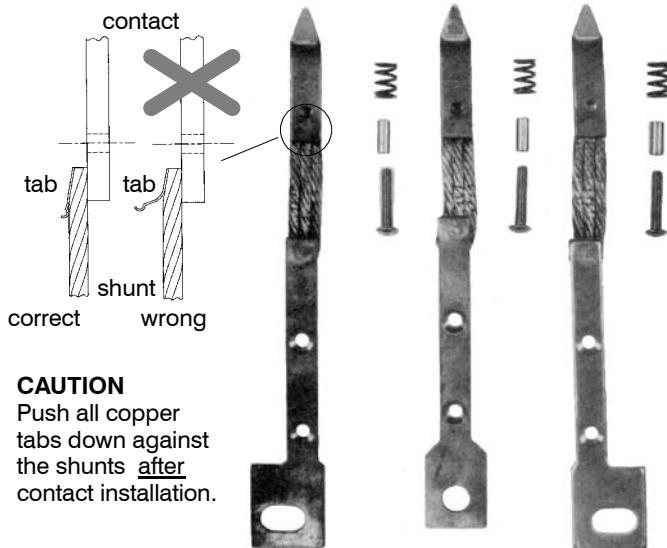


Figure 6. Movable contacts and hardware.
(150–225 amp shown)

Movable Contacts (Figure 6)

The movable contacts and lower bus plates are single units. The bus plates are mounted on the base and flexible shunts connect them to the movable contacts. These contacts are secured to the shaft by hardware accessible from the back through windows in the base.

1. Remove the arc chutes as follows: pull up, tip inward, and gently rock until free. See Figure 7.
2. Insert a pencil into the operator drive assembly from the left as follows: if the contacts are open, turn the manual operator clockwise to close the contacts. Insert a pencil behind the weight, and turn the manual operator fully counterclockwise until the pencil is pinched between the frame and the rotating weight. The pencil will hold the movable contacts in half-open position to make contact removal easier. See Figure 7.
3. Disconnect the movable contacts from the shaft by loosening the screws counterclockwise with a #25 Torx^R driver (or 1/8, allen wrench on older units). Remove the screws, bushings, and springs from the shaft. See Figures 6 and 8.
4. Remove the movable contact units by removing two flat-head Phillips head screws from back of base.

⚠ CAUTION

MALFUNCTION HAZARD. On black & silver nameplate switch do not remove shaft. On green nameplate switch shaft mounting bushings do not need to be removed; if they are removed replacements must be installed (included in the contact kit).

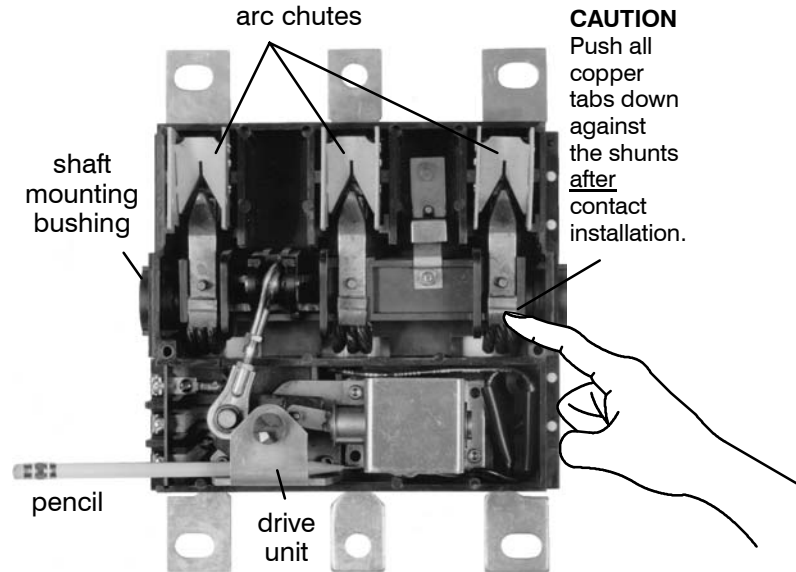


Figure 7. Pencil between weight and drive unit frame & shaft mounting bushings (green nameplate switch).

5. Install the new movable contact units from the kit. On 30–100 amp switches, the outside bus plates face inward; on 150–225 amp, they face outward. Be sure that the counter-sunk mounting holes face out. Follow this procedure for each contact: Insert the movable contact through the window in the back of the base, then fasten the bus plate to the base. Tighten the bus plate screws to 18–20 inch-pounds. See Figures 6 and 8.
6. Select appropriate contact springs as follows: use the clear color spring (6 turns) only for black and silver nameplate 30–100 amp switches. For all other switches use the green color contact spring (5 turns).
7. Secure the movable contacts to the contact shaft as follows: Put a new screw (from kit) with a new spring (read step 6) onto the magnetized #25 Torx driver. Insert the screw through the shaft from the back of the switch and hold it in place. Slip the bushing onto the screw from the front. Position the movable contact onto the shaft and tighten the screw clockwise to 30 inch-pounds. Lift the contact tip to check for spring pressure. Push the copper tabs down against the shunts. See Figures 6, 7, 8.

⚠ CAUTION

MALFUNCTION HAZARD. To prevent switch malfunction, do not loosen or change the length of the drive linkage. Be sure to push down the copper tabs against the shunts after contact installation.

8. Remove the pencil from the operator drive assembly and turn the manual operator counterclockwise so the contacts are completely open.

Main Contact Replacement

Torx or Allen-head screws

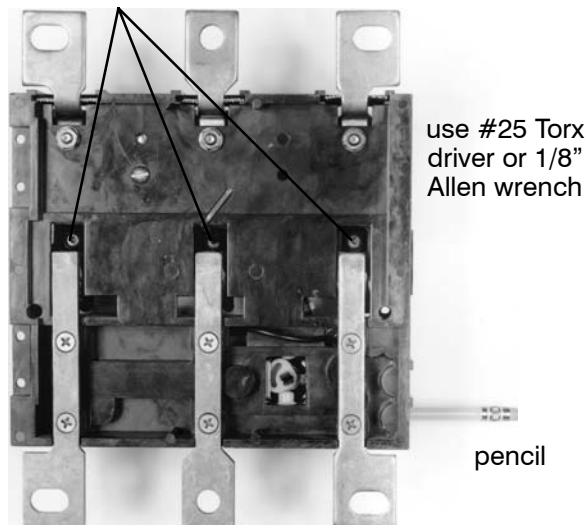


Figure 8. Movable contact screws.
(access through back of base)

Stationary Contacts (Figure 9)

The stationary contacts and upper bus plates are single units mounted in the base. Each contact plate is secured by a single arc runner stud and nut, accessible from the back of the switch.

1. Remove the stationary contact plates by removing the nuts on the back of the base. Use a 3/8" nut-driver counterclockwise. See Figure 10.
2. Install new stationary contact units and secure them with new arc runner studs from the kit, (30–100 ampere outer plates face each other; 150–225 ampere outer plates face away from each other.) Be sure that the tips of the arc runners drop into the holes in the contact plates. Then tighten the nuts clockwise to 30–32 inch pounds. See Figures 9 and 10.

3. Insert the arc chutes into the base with the *TOP* markings up. Make sure that the chutes are properly seated by manually operating the switch and observing movable contact clearance to the chute. See Figure 7.

Refer to Switch Installation below.

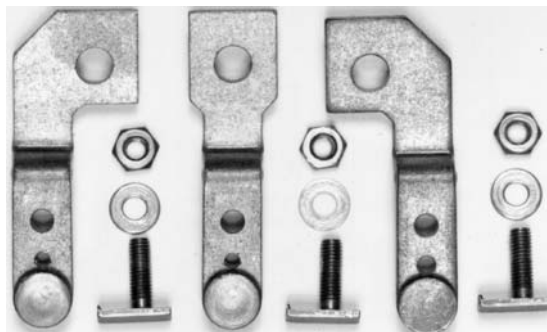


Figure 9. Stationary contacts and hardware.

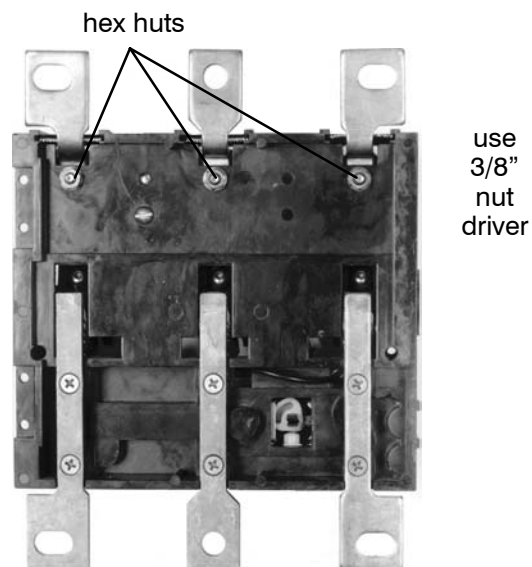


Figure 10. Stationary contact nuts.

Switch Installation

⚠ CAUTION

MALFUNCTION HAZARD. With all power OFF, turn the manual operator to open and close the switch several times. The action should be smooth and quick without mechanical binding.

1. Install the switch cover with the contacts open. Press the cover squarely in place, making sure it is fully seated. Then insert two screws and tighten clockwise until the heads of the screws touch the cover. Do not overtighten the screws.
2. Mount the switch and securely tighten the nuts onto the extended bus plates. If an ASCO subpanel is used tighten the nuts to 64–66 inch-pounds.
3. Reconnect the labeled control wires to terminals L, O, C. Close circuit breaker feeding switch poles. Check electrical operation of the switch. Refer to wiring diagram in Owner's Manual 381333–005.

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Control Contact Replacement

The coil clearing control contacts are housed in the base under the operator drive assembly. They are actuated by a cam.

1. If main contacts are closed, turn the manual operator counterclockwise to open the main contacts.
2. Remove the coil assembly with the core and link. (Follow steps 1-2 on page 2, but also unhook the core and link from the weight.)
3. Detach the operator drive assembly from the base by unscrewing three allen-head screws (two screws on black and silver nameplate switches). Use a 9/64, allen wrench counterclockwise. See Figure 11.
4. Swing the assembly up and away from the base to expose the control contacts. See Figure 12.
5. Disconnect the coil lead from the stationary control contact. Remove the screws and replace the movable and stationary control contacts. Reconnect the coil lead, then tighten screws. See Figures 12 and 13.
6. Reattach the operator drive assembly so that the cam is between the control contacts. A window is provided in the back of the switch for inspection. Tighten the screws to 24–28 inch-pounds. See Figures 10 and 11.
7. Reinstall the coil assembly with link and core connected to the weight pin. (Follow steps 8-11 on page 3.)

Refer to Switch Installation on page 5.

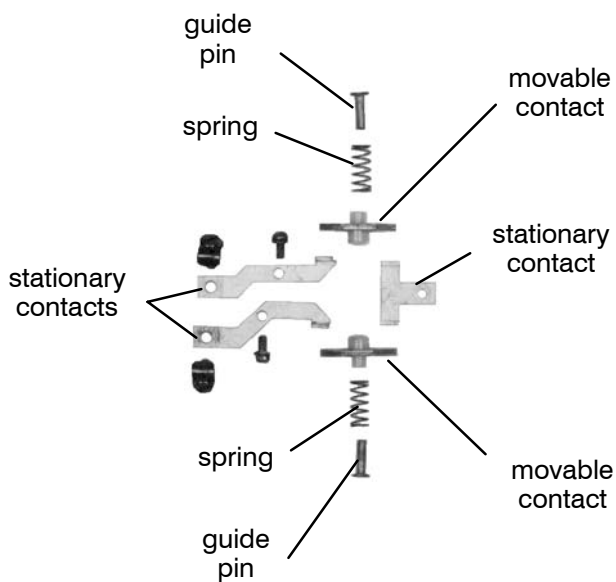


Figure 13. Control contacts and hardware.

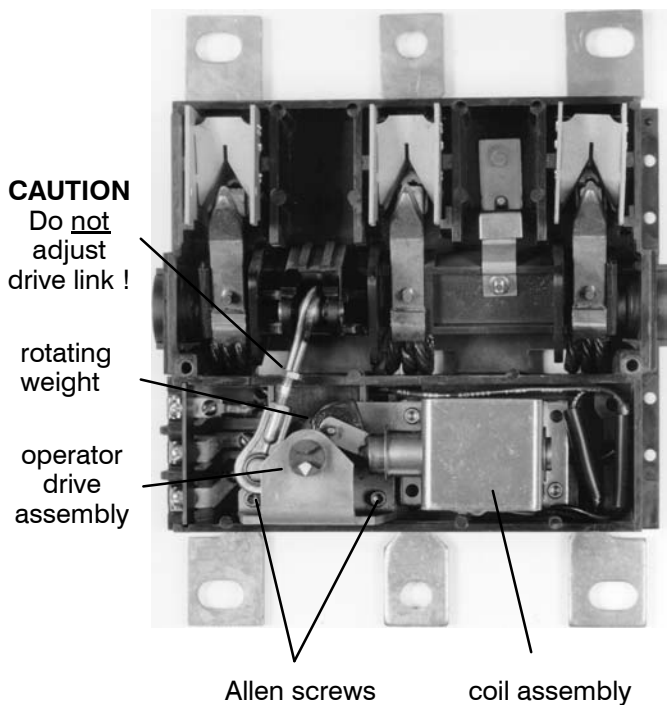


Figure 11. Operator drive assembly.

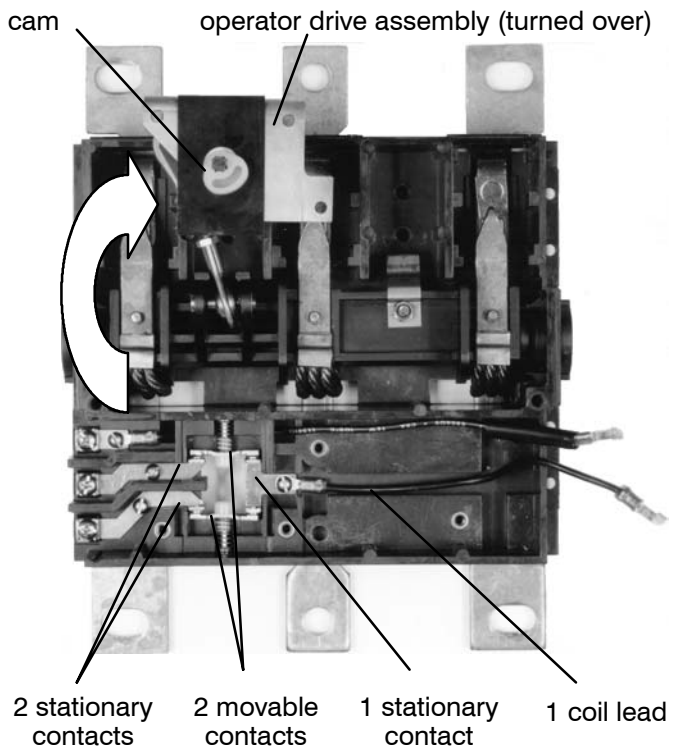


Figure 12. Control contact exposed.

Accessory 14A & B Auxiliary Contact Installation (green nameplate units only)

Kit 607039 includes parts to add Accessory 14A & B auxiliary contacts to a green nameplate ASCO 920.

Note: This accessory requires approximately 3" of clearance on the right side of the ASCO 920 switch. It also requires a standard 9/16" deep hole in the right end of the main contact shaft (use a pin or paper clip to check the depth).

1. Turn off all power to the switch (including control).
2. Make sure that the main contacts are open.
3. Locate the orientation mark on the cam in the kit. Align the cam with the mark on the top to the flat end of the main contact shaft. Be sure that the cam lobe faces the auxiliary contacts.
4. Put two drops of *Loctite 222* (from the kit) to the lead threads of the screw. Then insert the screw through the cam, and gently tighten into the contact shaft. Do not overtighten screw! Stop tightening as soon as the screw head feels secure in the cam.

⚠ CAUTION
MALFUNCTION HAZARD.
To prevent switch malfunction,
do not overtighten the cam screw.

5. Mount the auxiliary switch assembly to the switch base with the two screws (from the kit). The assembly fits under the cam.
6. Manually operate the switch (see page 2) to check operation of the auxiliary contacts. Then connect the wiring to unit. See Figure 17.

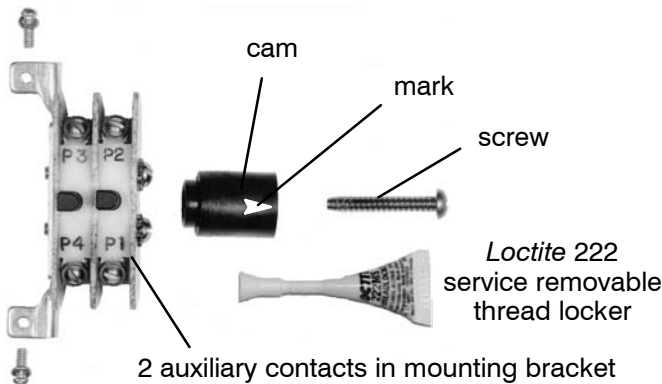


Figure 14. Accessory 14 Auxiliary Contact Kit. (for green nameplate units only).

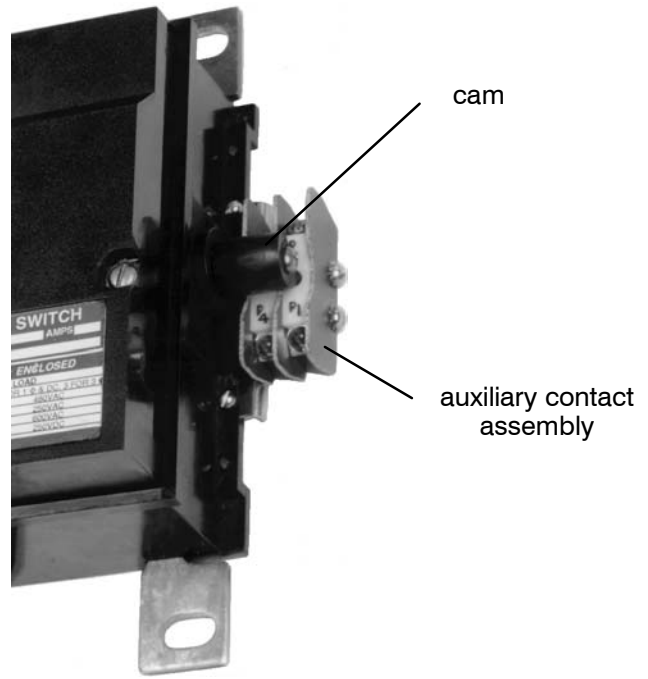


Figure 15. Auxiliary contacts installed on right side. (for green nameplate units only).

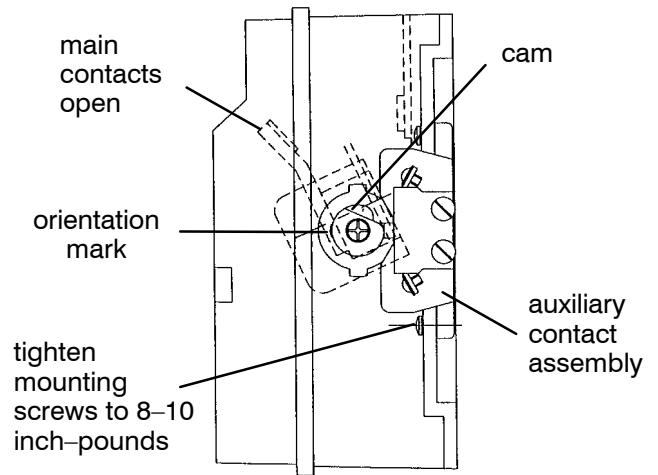


Figure 16. Side view of auxiliary contacts.

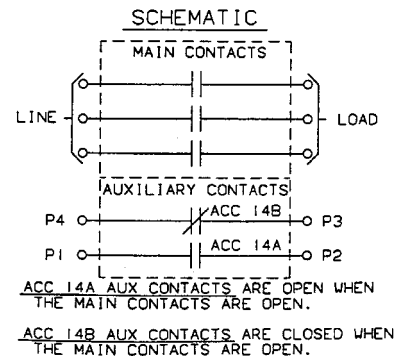


Figure 17. Wiring connections to auxiliary contacts.

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Replacement Parts Kits

For Black and Silver Nameplate ASCO 920s

ASCO 920 amp size	Main Contact Kits		Coil Kits (control voltage) includes coil part no. 118136-xxx			
	3 pole	2 pole	110-120 Vac	208-240 Vac	265-277 Vac	440-480 Vac
30, 60, 75,100	331703	331709	331700-1	331700-2	331700-3	331700-4
150, 200, 225	331704	331710	331700-5	331700-6	331700-7	331700-8

For Green Nameplate ASCO 920s

ASCO 920 amp size	Main Contact Kits		Coil Kits (control voltage) includes coil part no. 601071-xxx			
	3 pole	2 pole	110-120 Vac	208-240 Vac	265-277 Vac	440-480 Vac
30, 60, 75,100	331703	331709	605326-001	605326-008	605326-002	605326-003
150, 200, 225	331704	331710				

For both Black & Silver and Green Nameplate ASCO 920s

ASCO 920 amp size	Coil Control Contact Kit
all	331713

ASCO 920 amp size	Lubrication Kit
all	625549

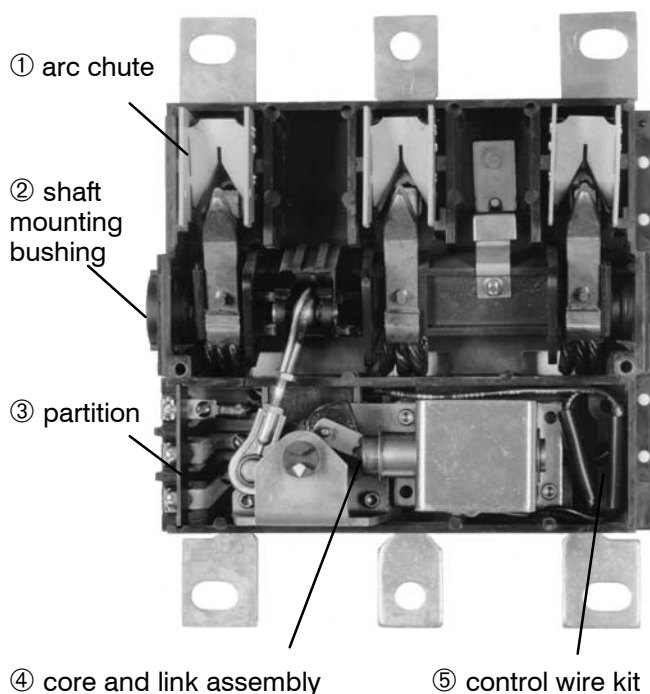


Figure 18. Other replacement parts.

Item Number	Part Description (see numbered items in Figure 18)	Quantity		Part Number
		2 Pole	3 Pole	
1	arc chute	2	3	323154
2	shaft mounting bushings (green nameplate ASCO 920s)	2	2	included in main contact kit
3	partition	1	1	323522
4	core and link assembly	1	1	315443
5	control wire kit	1	1	347806