

ASCO® G962 and G7ATB Transfer Switches

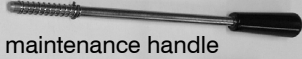

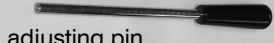

1000, 1200, 1600, and 2000 ampere sizes

**AUTOMATIC
TRANSFER SWITCHES**
962 & 7000 Series
Service Bulletin

This service bulletin explains how to replace the arcing and main contacts and the solenoid assembly in 1000, 1200, 1600, and 2000 ampere ASCO G962 and G7ATB Transfer Switches (lower assembly).

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Special Tools Needed

contact adjustment handle kit 607990	main contact shim gauge 601082-004
 maintenance handle	
 adjusting pin	
 adjusting hub	

Other Tools Needed

- small & large blade screwdrivers
- 3/8" ratchet drive, 6" & 12" extensions
- 3/8" and 1/2" sockets
- 5/16", 1/2" open-end / box wrenches
- torque wrench (0 to 50 in-lb minimum)
- 5/32" hex key (Allen) wrench
- ohmmeter (or continuity tester)
- needlenose & regular pliers
- *Loctite 222* thread locker

Maintenance Handle

A detachable manual operator handle is provided on the frame of the Transfer Switch for maintenance purposes only. After the Transfer Switch is isolated and pulled-out (drawn-out and totally deenergized) this handle can be used to change the position of the contacts and operator mechanism. The windows in the left side of the Transfer Switch frame indicate which contacts are open and closed.

1. Bypass, isolate, and pull out the transfer switch.

Follow the procedure explained in *Section 3* of the *Operator's Manual*. Verify that no electrical power is present at the pulled-out transfer switch. Fig. 1.

2. Install the hub and maintenance handle.

Locate and remove the maintenance handle and hub stored on the lower part of the Transfer Switch frame. Then install the hub onto the center operator shaft and insert the handle into the hole in the side of the hub.

3. Use the maintenance handle (if necessary).

To manually operate the deenergized Transfer Switch to the opposite position, grasp the handle firmly and turn either clockwise or counter-clockwise; remove handle and hub. See Figure 2.

DANGER

To prevent the possibility of fatal electrical shocks and burns, bypass, isolate, and pull out the transfer switch before working on it. Refer to *Section 3* of the *Operator's Manual*.

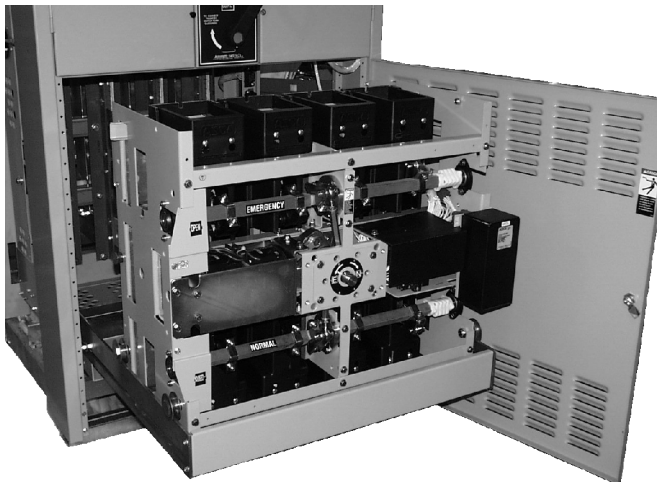


Figure 1. Isolated and pulled-out Transfer Switch.

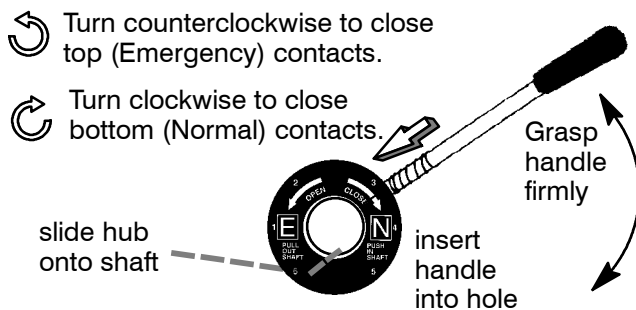


Figure 2. Maintenance handle on operator shaft.

Main and Arcing Contact Replacement

Main Contact Inspection and Replacement

⚠ DANGER

To prevent the possibility of fatal electrical shocks and burns, bypass, isolate, and pull out the transfer switch before working on it. Refer to Section 3 of the Operator Manual. See Figure 1.

The movable contact assemblies (two for each pole) are located above and below the operator mechanism.

- 1. Bypass, isolate, and pull out the transfer switch.**
Follow procedure explained in Section 3 of Operator's Manual. Verify that no electrical power is present at pulled-out transfer switch. Figure 1.
- 2. Use the maintenance handle** (if necessary).
Open the contacts that will be replaced (if not already open) by using the detachable maintenance handle. See Figure 2.
- 3. Remove the interphase barriers** (one per pole).
Use a blade screwdriver to loosen (ccw) two round-head screws holding each barrier to the arc chutes. Slide barrier away from operator mechanism until the keyholes in barrier clear the two round-head screws, then remove it. See Figure 3

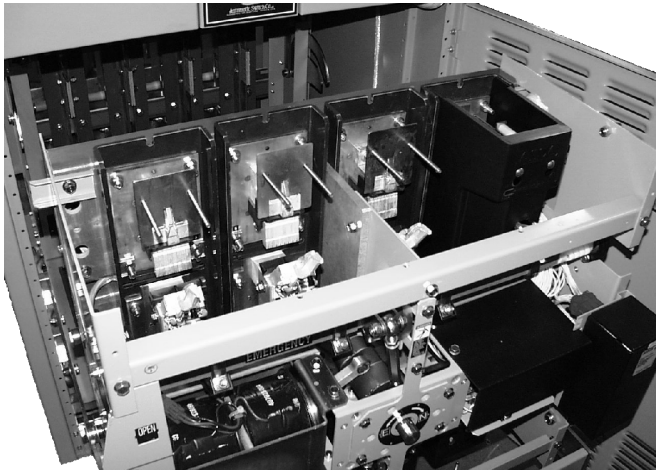


Figure 4. Arc chutes removed.

Replacement Arc Chutes

1000–1200 A Arc Chute 601242	1600–2000 A Arc Chute 603735

- 5. Pin the weight to prevent mechanism from moving.**
Fully insert the adjusting pin (see page 1) through the frame and into the weight. Only one of the holes lines up with the hole in the weight. If you are replacing the upper contacts, use the hole labeled 2; if you are replacing the lower contacts, use the hole labeled 6. See Figure 5.

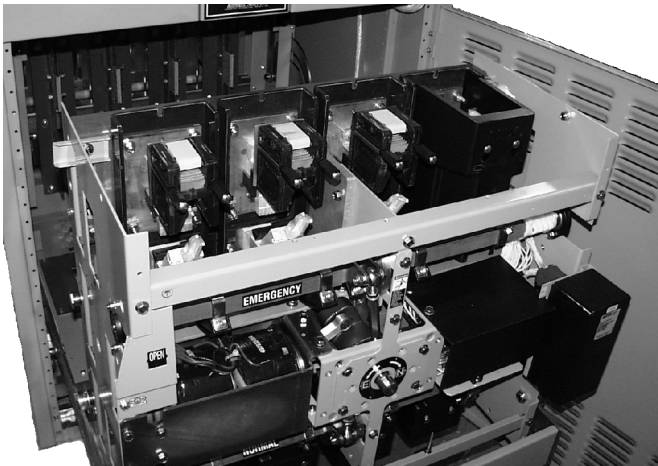


Figure 3. Interphase barriers removed.

- 4. Carefully remove the arc chutes.**
Use a 5/8" nutdriver to remove (ccw) two long insulator nuts. Then carefully pull the arc chute outward (off the long threaded rods). Place the arc chutes in a safe place to prevent breakage. See Figure 4.

⚠ CAUTION

The arc chutes are fragile. To prevent breakage, avoid jarring them and do not use any tool to pry them loose. If they become cracked, replace them.

⚠ WARNING

To prevent the possibility of personal injury, be sure to pin the weight to the weight frame so that the mechanism cannot move while replacing the contact assemblies.

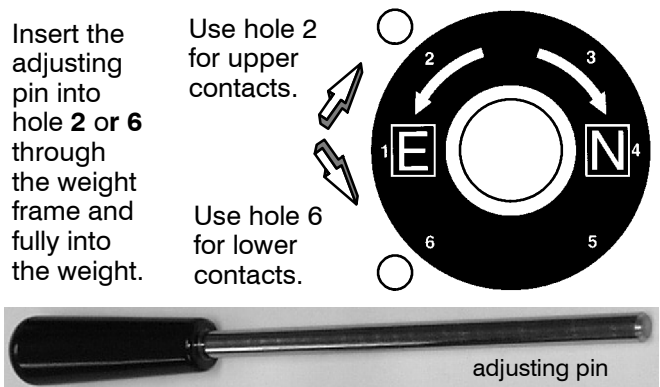


Figure 5. Pin the weight to the frame.

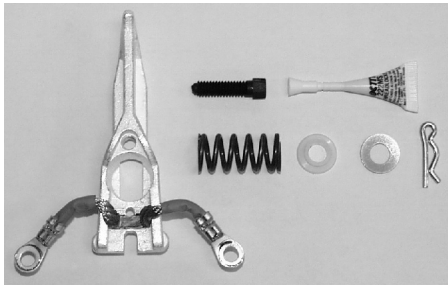
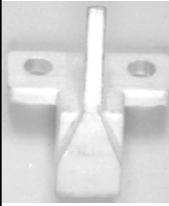
Main and Arcing Contact Replacement

Contact Inspection

The main contacts are protected by arcing contacts. The arcing contacts make first and break last to avoid arcing at the main contacts. Contact adjustments should be checked annually (see page 6). Contacts should be replaced when contact material becomes severely worn. Discoloration is normal. Do not file contacts because it wastes material. Instead use light emery paper to clean up the contact surfaces. If main contacts require replacement, follow procedure for *Main and Arcing Contact Assembly Replacement*. If only arcing contacts require replacement, follow the procedure for *Arcing Contact Replacement*.

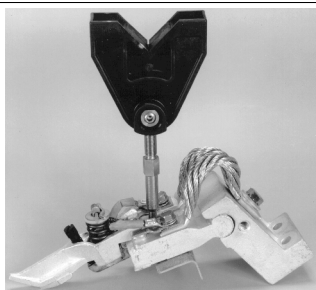
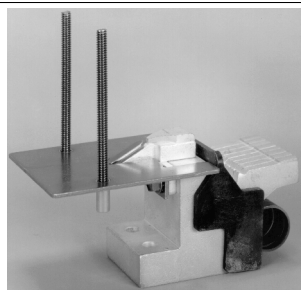
Arcing Contacts only include just the arcing contacts that *make* first and *break* last during load transfer.

Replacement Arcing Contacts (a 3 pole switch requires 6 of each)

Movable Arcing Contact with adjustment screw, contact spring, spring retainer, washer, spring pin (thread locker <i>Loctite 222</i> required)	Stationary Arcing Contact
	
609897	291321

Main and Arcing Contact Assemblies include entire movable or stationary contact structure including contacts, springs, shunts, conductive lubricant, and hardware.

Main & Arcing Contact Assemblies (a 3 pole switch requires 6 of each)

Movable Main and Arcing Contact Assembly (<i>Loctite 222</i> required)	Stationary Main and Arcing Contact Assembly
	
609907-002	493668-002

Arcing Contact Replacement

1. Remove the movable arcing contact.

Use needlenose pliers and a screwdriver to remove the spring pin from the spring stud. Then remove the flat washer, spring guide, and contact spring. Next use a 3/8" socket wrench to remove (ccw) two Sems screws from the pigtails attached to the main movable contact. Now remove arcing contact retainer and the movable arcing contact.

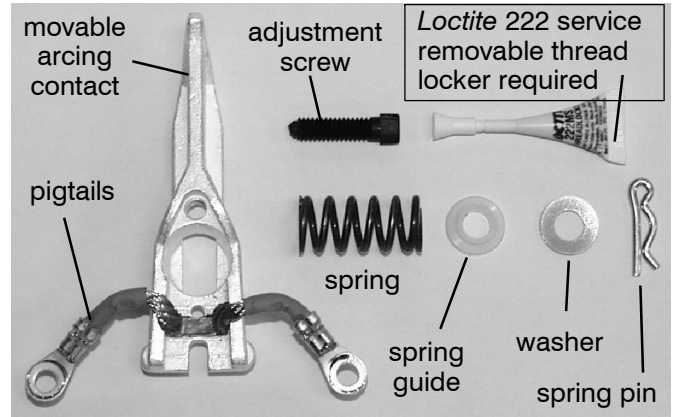


Figure 6. Movable arcing contact and hardware.

2. Remove the stationary arcing contact.

Use a 3/8" socket wrench to remove (ccw) two Sems screws holding the arcing contact (and arc chute support plate) to the main contact pivot block. Then remove the stationary arcing contact.

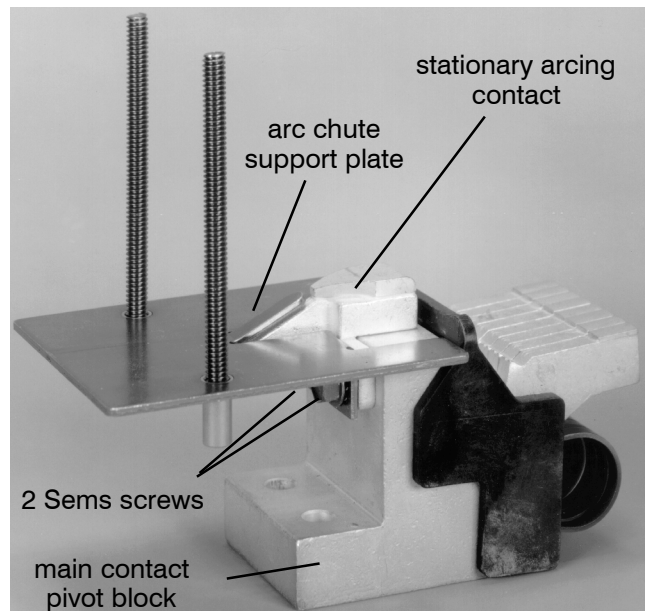


Figure 7. Stationary arcing contact.

3. Install new stationary arcing contact.

Install a new stationary arcing contact and the arc chute support plate onto the main contact pivot block. Use a 3/8" socket wrench (cw) to secure it with two Sems screws. Tighten both screws to 66 in-lbs (5.5 ft-lbs) torque. See Figure 7.

Main and Arcing Contact Replacement

4. Install new movable arcing contact.

Put two drops of *Loctite 222* (service removable threadlocker) to the lead threads of the adjustment screw. Then install the adjustment screw through the new movable arcing contact until it protrudes 1/8". Now install the movable arcing contact onto the movable main contact so that the spring stud goes through the arcing contact and its pivot points fit into the two depressions (in main contact). Finally, install the arcing contact spring, spring guide, flat washer, and spring pin. See Figure 6.

5. Reconnect the pigtails and shunts to the contact.

Place the arcing contact retainer over the movable arcing contact and between the shunts and pigtails. Install two Sems screws through the arcing pigtail lugs, arcing contact retainer, and main contact shunt lugs into the main movable contact. Use a 3/8" socket wrench to tighten the two screws (cw) to 66 in-lbs (5.5 ft.-lbs) torque.

6. Adjust arcing contacts.

After all arcing contacts (both stationary and movable) have been installed, contact adjustment is required. Refer to page 6.

⚠ CAUTION

To prevent contact damage perform contact adjustment as specified on page 6.

Main and Arcing Contact Assembly Replacement

1. Remove the contact supports from both sides.

Use a 1/2" box or open-end wrench to remove (ccw) four Sems screws (left & right, upper & lower). Then remove the two contact supports that run vertically between the Normal and Emergency movable contact assemblies (two for each pole). A 3 pole switch has 6 contact supports. See Figure 8.

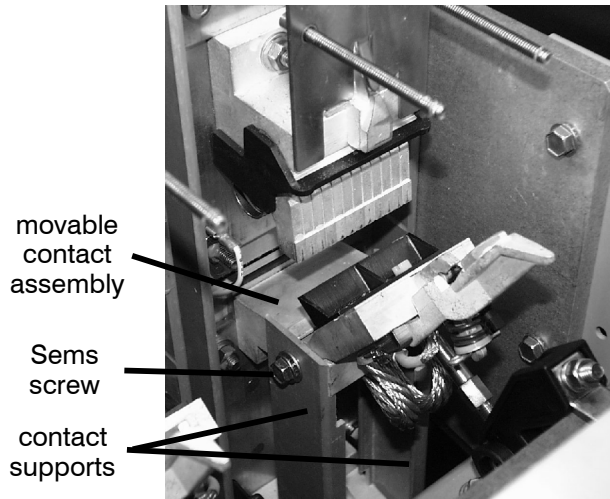


Figure 8. Contact supports (both sides).

2. Disconnect the crank arm from the shaft.

Use a 1/2" socket wrench to remove (ccw) two nuts with lock washers from each shaft clamp. Then remove the loose clamp from the shaft. Save all hardware. See Figure 9.

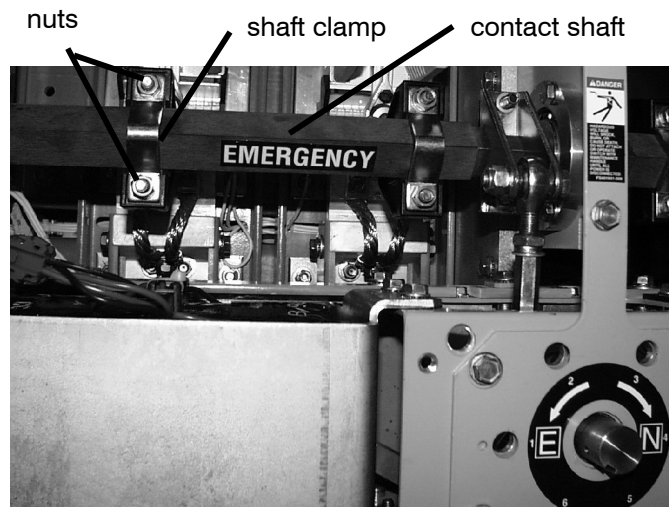


Figure 9. Movable contact shaft clamps.

Main and Arcing Contact Replacement

3. Remove the movable contact assembly.

Use a 1/2" socket wrench with 12" extension to remove (ccw) two nuts with lock washers from base of each movable contact assembly. See Figure 10.

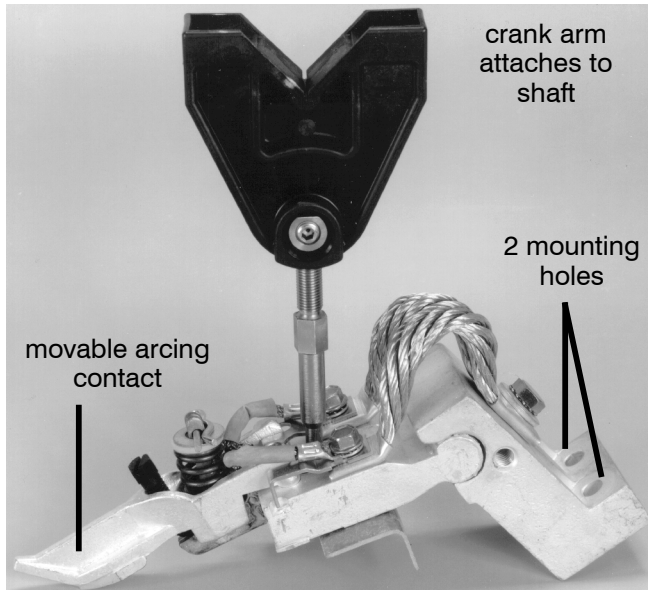


Figure 10. Movable contact assembly.

4. Remove the stationary contact assembly.

Use a 3/8" socket wrench to remove (ccw) two Sems screws from the top (or bottom) of each stationary contact assembly. Then use a 1/2" socket wrench with 12" extension to remove (ccw) two nuts with lock washers from the base of each main stationary contact assembly. See Figure 11.

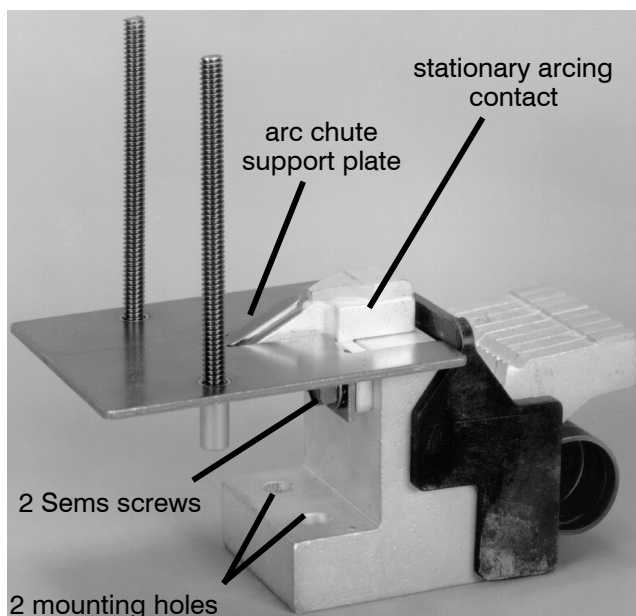


Figure 11. Stationary contact assembly.

5. Install the new stationary contact assembly.

Position the new main stationary contact assembly onto the two 5/16" studs. Use a 1/2" socket wrench with 12" extension to install (cw) two nuts with lock washers to secure the assembly. Tighten to 132 in-lbs. (11 ft.-lbs) torque.

6. Install arc chute support plate & arcing contact.

Use a 3/8" socket wrench to install (cw) two Sems screws through the new arc chute plate and new stationary arcing contact to the top (or bottom) of each new stationary contact assembly. Tighten to 66 in-lbs (5.5 ft.-lbs) torque.

7. Install the new movable contact assembly.

Position the new movable contact assembly onto the two 5/16" studs. Use a 1/2" socket wrench with 12" extension to install (cw) two nuts with lock washers to secure the assembly. Tighten to 132 in-lbs. (11 ft.-lbs) torque.

8. Connect new movable contact assembly to shaft.

Position the new movable contact assembly (black drive arm) under the shaft. Then position the metal half clamp over the front and install two bolts (from opposite side). Use a 1/2" wrench to install (cw) two nuts with lock washers to secure each clamp. Tighten the clamp nuts to 132 in-lbs (11 ft.-lbs) torque.

9. Adjust the arcing and main contacts.

After all movable and stationary contact assemblies have been installed, contact adjustment is required. Proceed to to page 6.

CAUTION

To prevent contact damage perform contact adjustment as specified on page 6.

Main and Arcing Contact Adjustment

DANGER

To prevent the possibility of fatal electrical shocks and burns, bypass, isolate, and pull out the transfer switch before working on it. Refer to Section 3 of the Operator's Manual. See Figure 1.

Check contact adjustment once a year. After contacts are replaced contact adjustment is required before the Transfer Switch can be reenergized. Adjustment includes: A – Stationary Arcing Contact Alignment and B – Arcing Contact Lead Adjustment.

1. Bypass, isolate, and pull out the transfer switch.

Follow procedure explained in Section 3 of Operator's Manual. Verify that no electrical power is present at the pulled-out transfer switch. See Figure 1 on page 1.

2. Use the maintenance handle (if necessary).

Open the contacts that will be adjusted (if not already open) by using the detachable maintenance handle. See Figure 2 on page 1.

3. Remove the barriers.

Use a blade screwdriver to loosen only (ccw) two round-head screws holding each barrier to the arc chutes. Slide barrier away from operator mechanism until the keyholes in barrier clear the two round-head screws, then remove it. See Figure 3 on page 2

4. Carefully remove the arc chutes.

Use a 5/8" nutdriver to remove (ccw) two long insulator nuts. Then carefully pull the arc chute outward (off the long threaded rods). Place the arc chutes in a safe place to prevent breakage. See Figure 4 on page 2.

A – Stationary Arcing Contact Alignment

A maximum horizontal offset of 0.090" is allowed between the movable and stationary arcing contacts. See Figure 12. If adjustment is needed follow these steps:

1. Loosen screws & move stationary arcing contact.

Use a 3/8" socket wrench to loosen (ccw) the two Sems screws, then move the stationary contact left or right to approximately center it under the movable arcing contact.

2. Retighten the stationary arcing contact screws.

Use the maintenance handle to open and close the contacts to recheck contact alignment. Use a 3/8" socket wrench to retighten (cw) the two nuts to 66 in-lbs (5.5 ft-lbs) torque.

CAUTION

To prevent arc chute breakage, be sure that the stationary arcing contact alignment is set correctly.

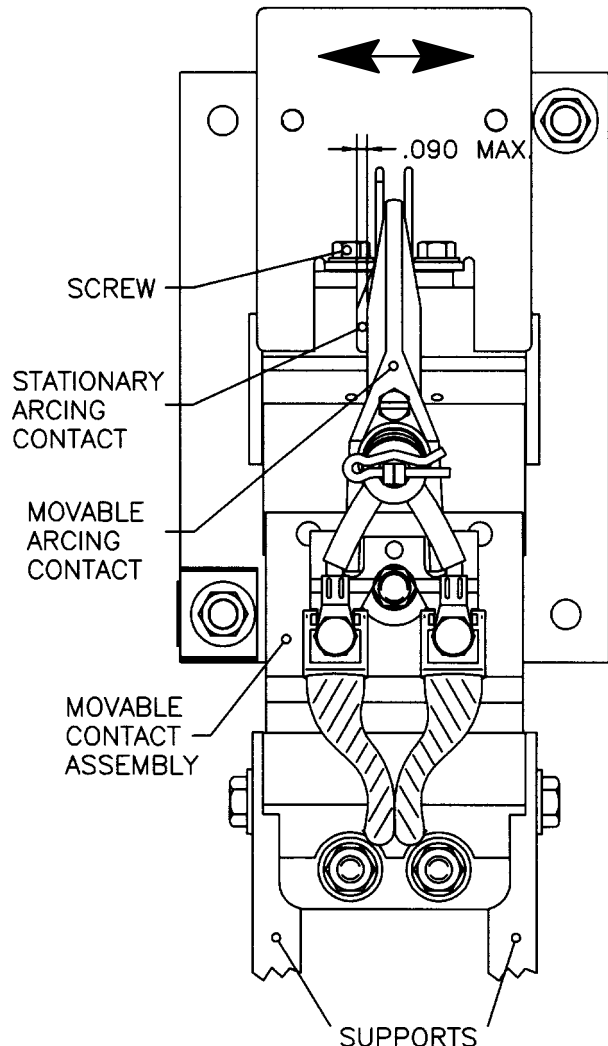


Figure 12. Stationary arcing contact alignment.

Now continue to the next page for Arcing Contact Lead Adjustment.

Main and Arcing Contact Replacement

⚠ DANGER

To prevent the possibility of fatal electrical shocks and burns, bypass, isolate, and pull out the transfer switch before working on it. Refer to Section 3 of the Operator's Manual. See Figure 1.

B – Arcing Contact Lead Adjustment

The arcing contacts must lead the main contacts on closing by 0.08 to 0.12". To set this contact gap (at the main contacts) use the adjusting hub, adjusting pin, and maintenance handle from the contact adjustment handle kit (see page 1). To check and/or change the adjustment follow these steps (see Figures 13–17):

1. Install the adjusting hub & maintenance handle.

Insert the maintenance handle completely into the hub (compress handle spring) and grasp it firmly. Use the maintenance handle to close the contacts that you are checking or adjusting (if they are not already closed). See Figure 1 on page 1.

2. For closed upper contacts, pin weight per Figure 15.

Turn the maintenance handle clockwise 30° until the **AM** hole is in the 9 o'clock position. Fully insert the adjusting pin into hole **AM** to lock the upper contact shaft in the *arc make* position. See Figure 14 (before) and Figure 15 (after).

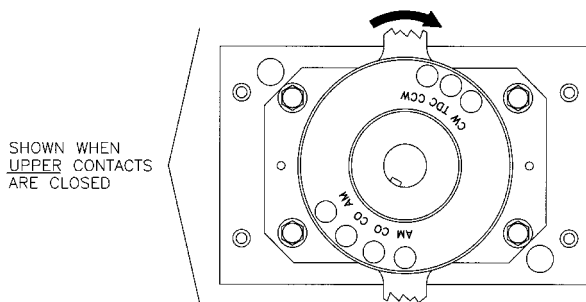


Figure 14. Pinning weight for upper contacts (before).

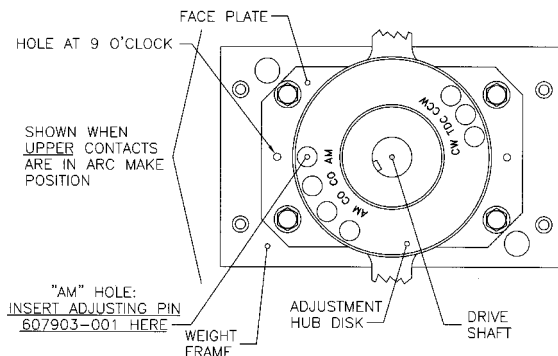


Figure 15. Pinned weight for upper contacts (after).

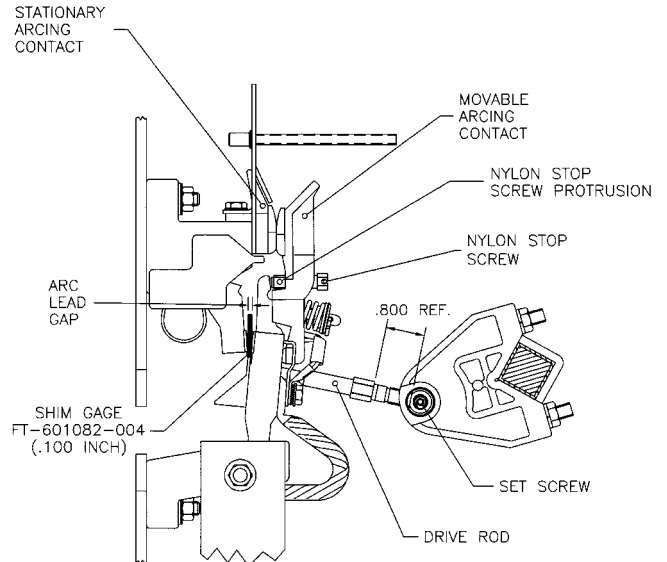


Figure 13. Arcing contact lead alignment.

⚠ WARNING

To prevent the possibility of personal injury, be sure to fully pin the weight to the weight frame so that the mechanism cannot move while you are adjusting the contacts.

3. For closed lower contacts, pin weight per Figure 17.

Turn the maintenance handle counterclockwise 30° until the **AM** hole is in the 9 o'clock position. Fully insert the adjusting pin into hole **AM** to lock the lower contact shaft in the *arc make* position. See Figure 16 (before) and Figure 17 (after).

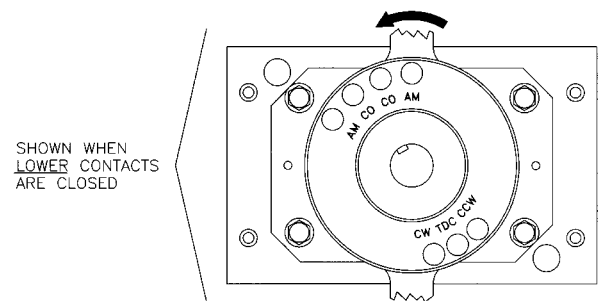


Figure 16. Pinning weight for lower contacts (before).

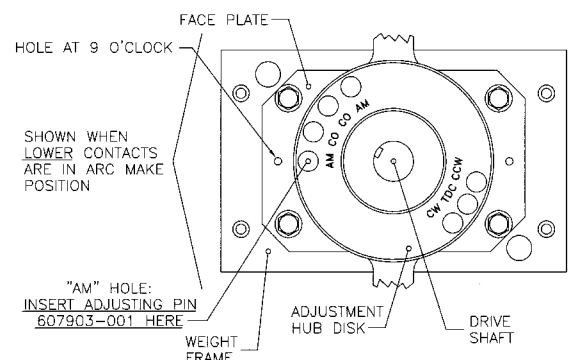


Figure 17. Pinned weight for lower contacts (after).

Main and Arcing Contact Adjustment

4. Measure and adjust movable arcing contact screws.

Check that all nylon adjustment screws protrude 1/8" through the far side of all movable arcing contacts. If adjustment is necessary use a blade screwdriver or 11/32" nutdriver to turn the adjustment screw. See Figure 13.

5. Check that main contacts are open approx. 1/8".

With the main contacts locked in the **AM** position (Figure 15 or Figure 17) verify that all main contacts are open approximately 1/8" on the shaft being adjusted. If any main contact is not open at least 1/8", use a 5/32" hex key (Allen) wrench to loosen (ccw) the set screw in the side of the crank arm. Then use a 7/16" open-end wrench to turn the movable contact drive rod counterclockwise until that main contact is 1/8" open. See Figure 13.

6. Insert main contact shim gauge & adjust drive rod.

With the main contacts locked in the **AM** position (Figure 15 or Figure 17) insert the shim gauge (see page 1) between the movable and stationary main contacts. The shim should fit finger tight (this shim gauge is the arcing contact lead dimension). To decrease the gap turn the drive rod clockwise; to increase the gap turn the drive rod counterclockwise. Recheck all gaps. See Figure 13.

7. Adjust movable arcing contact adjustment screws.

After all the main contacts on the shaft are set for the lead gap, adjust the arcing contacts. Turn each nylon adjustment screw until the arcing contacts just touch (no gap, no deflection). All arcing contacts on the same shaft should touch approximately at the same time. Recheck all gaps. Figure 13.

8. Carefully unpin the weight as follows:

After all contacts are checked and adjusted, insert the maintenance handle completely into the hub (compress handle spring), firmly grasp and hold the maintenance handle while you remove the adjusting pin. When the adjusting pin is pulled out, the weight releases suddenly and forcibly turns the handle to the closed contact position.

WARNING

To prevent the possibility of personal injury, fully insert maintenance handle into the hub and grasp and hold it firmly when you remove adjusting pin. Gently allow the contacts to close.

CAUTION

To prevent coil burnout in the solenoid assembly be sure to remove the adjusting pin so that the mechanism is free to operate again.

9. Manually operate switch and recheck adjustments.

Use maintenance handle (see Figure 1 on page 1) to manually operate the transfer switch several times. Then repeat steps 3 through 9. When you are finished with all contact adjustments, remove the hub and maintenance handle and store them on the lower frame in the place provided.

10. Carefully reinstall the arc chutes.

Carefully slide the arc chute (arc splitters toward the contacts and recess for nuts outward) between the two long threaded rods. Reinstall the two long insulator nuts (round shoulder in) and use a 5/8" nutdriver to GENTLY tighten (cw) until snug. Do not overtighten these nuts. See Figure 3 and Figure 4 on page 2.

CAUTION

To prevent arc chute breakage handle them gently. Do not clamp them too tightly (hand tighten the insulator nuts only).

11. Reinstall the barriers.

Install the barrier over the arc chute and slide it toward the operator mechanism until the two round-head screws align in the keyholes in the barrier. Then use a blade screwdriver to tighten (cw) the two round-head screws to secure the barrier to the arc chute insulator nuts. See Figure 3 on page 2

Solenoid Assembly Replacement

(solenoid assemblies listed below)

Solenoid Assemblies include entire solenoid with frame, coils, core tube, core spring, core and link.

Transfer Switch Service Voltage	Solenoid Assembly Number
190–208 V	493932–001
220–240 V	493932–002
380–415 V	493932–003
440–480 V	493932–004
550–600 V	493932–005

How to Replace the Solenoid Assembly

DANGER

To prevent the possibility of fatal electrical shocks and burns, bypass, isolate, and pull out the transfer switch before working on it. Refer to Section 3 of the Operator's Manual.

The solenoid assembly is located in the left front of the transfer switch. See Figure 18.

1. Bypass, isolate, and pull out the transfer switch.

Follow the procedure explained in Section 3 of the Operator's Manual. Verify that no electrical power is present at the removed transfer switch.

2. Manually operate switch to Emergency position.

After the transfer switch is pulled out completely, use the maintenance handle (Figure 1, page 1) to turn the weight (ccw) so that the core link is down, as shown in Figure 18 (Normal contacts are in the OPEN position). Refer to Section 2 of the Operator's Manual.

shaft indicator plate

mounting screw

coil harness plug

8 mounting bolts

Note: 2 longer bolts are used in the rear.

mounting screw

shaft indicator plate

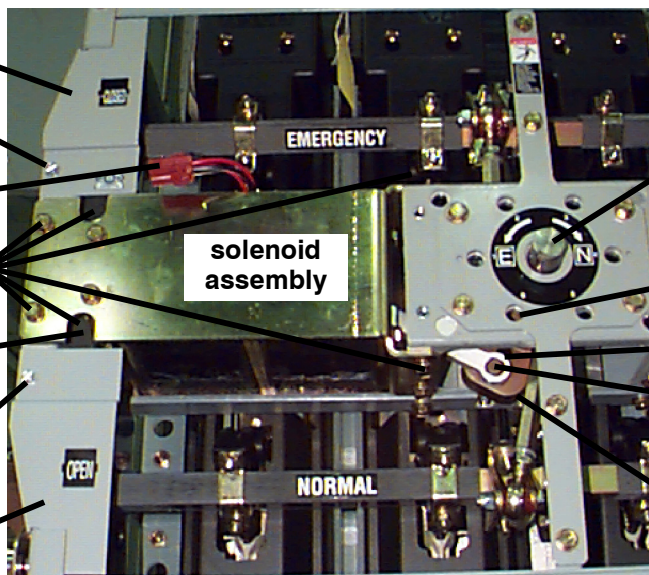


Figure 18. Location of the solenoid assembly and related parts in the drawn-out (removed) transfer switch.

3. Disconnect the solenoid assembly.

Squeeze the plug latches and separate the in-line wire harness plug to the coils to disconnect them.

4. Remove both shaft indicator plates (left side).

Use a 3/8" socket wrench to remove (ccw) two screws.

5. Pin the weight to prevent mechanism from moving.

Insert the adjusting pin (see page 1) through the weight frame and into the weight. Use the hole labeled 6 on the round label; it is the bottom left hole adjacent to the center operator shaft (in the 7 o'clock position). See Figure 19.

WARNING

To prevent the possibility of personal injury, be sure to pin the weight to the frame so that the mechanism cannot move while removing the solenoid assembly.

Insert the adjusting pin into hole 6 through the weight frame and fully into the weight.

Use hole 6.

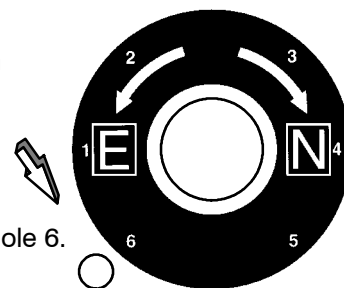


Figure 19. Pin the weight to the frame.

6. Remove the solenoid assembly.

First use a 1/2" socket wrench with 6" extension (min.) to remove (ccw) the two left rear hex-head bolts. Then use a 1/2" socket and/or open-end wrench to remove (ccw) the six other bolts (2 on the left, 4 on the right). Then carefully pull out the solenoid assembly (unhook the core link from the post on the weight) and swing out the left side first. It weighs about 35 lbs.

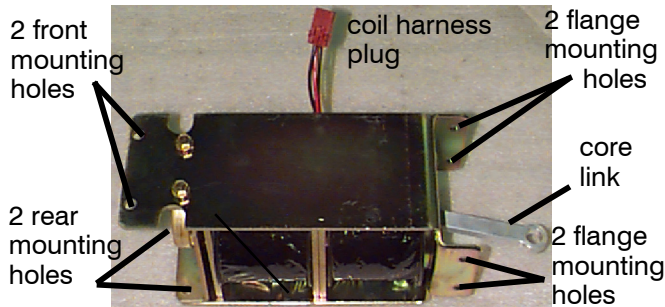


Figure 20. Solenoid assembly.

⚠ WARNING

The solenoid assembly weighs about 35 lbs.

7. Install the replacement solenoid assembly.

Position the solenoid assembly with the core link facing right and the coil wire harness plug on top. Install the new solenoid assembly (put in the right side first and hook the link onto the post on the weight). Use a 1/2" socket wrench with 6" extension (min.) to reinstall (cw) two longer screws in the left rear. Then use a 1/2" socket and/or open-end wrench to reinstall (cw) six hex-head bolts (4 on the right above and below the flanges, 2 on the far left side front). Tighten all eight bolts to 11 ft. lbs. torque.

8. Reinstall the two shaft indicator plates (on the left).
Use a 3/8" socket wrench to reinstall (cw) two screws.

9. Connect the new solenoid assembly.

The in-line wire harness plug and plug from the coils are keyed to go together only one way. Carefully connect the plugs and be sure that both latches *click*.

10. Unpin the weight to free the mechanism.

Insert the maintenance handle completely into the hub (compress handle spring), firmly grasp and hold the maintenance handle while you remove the adjusting pin from hole 6. When the adjusting pin is pulled out, the weight releases suddenly and forcibly turns the handle to the closed contact position.

⚠ WARNING

To prevent the possibility of personal injury, fully insert maintenance handle into the hub and grasp and hold it firmly when you remove adjusting pin. Gently allow the contacts to close.

⚠ CAUTION

To prevent coil burnout in the new solenoid assembly be sure to remove the adjusting pin so that the mechanism is free to operate again.

11. Manually operate the transfer switch.

Use maintenance handle (see Figure 1 on page 1) to operate the transfer switch several times. It should operate smoothly without any binding. If it does not, check to be sure that the solenoid is installed correctly. When you are finished with all contact adjustments, remove the hub and maintenance handle and store them on the lower frame in the place provided.

12. Check main contact adjustments.

Before returning the transfer switch to service the main contact adjustments must be checked. Refer to pages 6–8. When you are finished with all contact adjustments, remove the hub and maintenance handle and store them on the lower frame in the place provided.

⚠ CAUTION

To prevent possible damage to the transfer switch and interruption to the load, check main contact adjustments after replacing the solenoid assembly.

13. Return the transfer switch to service.

After you verify that the control and main contact adjustments are correct you can return the transfer switch to service. Follow the procedure explained in *Section 3* of the *Operator's Manual*.