I.L. 15-825-5C
Filing No. 15-800

DESCRIPTION • INSTALLATION • MAINTENANCE

INSTRUCTIONS

Type GP—SIZE 5—A-C CONTACTORS

2-3-4-5 Pole **Front or Rear Connected**

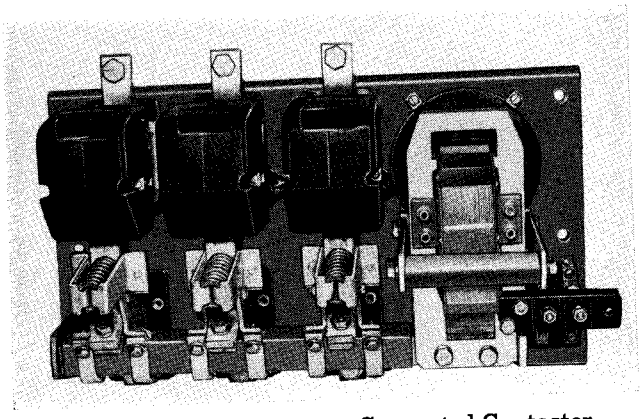

FIG. 1. Type GP-530 Front Connected Contactor

*THE TYPE GP SIZE 5 CONTACTORS are unit assembled A-C contactors having all parts mounted on a steel base. The unit is suitable for mounting on either steel or insulating panels. Contactors are available in 2, 3, 4 or 5 pole, front or rear connected assemblies, with or without arc quenchers. All parts are front removable.

Table 1. Ratings

CHARACTERISTICS	OPEN	ENCLOSED
Voltage	600	600
8-Hour Rating, Amperes	300	270
1-Hour Rating, Amperes	400	360

The type GP Size 5 Contactors are insulated for a maximum of 600 volts. The operating coils are designed for continuous duty and will operate the contactors at 85% to 110% of their rated voltage.

DESCRIPTION

The AC magnet is of a laminated "C" shape construction and mounted to the right of the contact arrangement. The moving armature engages the stationary magnet in a vertical plane parallel to the base plate and has a total travel from the opened to the sealed position of approximately 14 degrees.

*NOTE:—Formerly designated—Type NF.

The stationary magnet laminations are assembled into a precision die cast aluminum base. A permanent air gap is built into this structure to provide sufficient reluctance in the magnetic path to insure a positive drop out on de-energization. The air gap is so situated that the hammering resulting from operational impact will not decrease the amount of air gap. The operating coil surrounds the upper leg of the stationary magnet and is held in place by two bolts.

The moving armature is flexibly supported by a domed plate which makes it capable of self-alignment as it closes against the stationary magnet. An anti-bounce device straddling the armature and fastened to the stationary magnet absorbs the kinetic energy of the moving system on de-energization thereby minimizing armature bounce.

Needle bearing assemblies support the ends of the insulated shaft which mounts the moving armature and moving contact assembly. Stainless steel compression springs in the moving contact assembly supply final contact forces from 8½ to 10 lbs. with new contacts.

Each stationary contact assembly is mounted on an individual molded insulator. Conversion from front to rear connection or vice versa is easily accomplished by the addition or removal of a copper stud. The contacts, which are of copper, close with

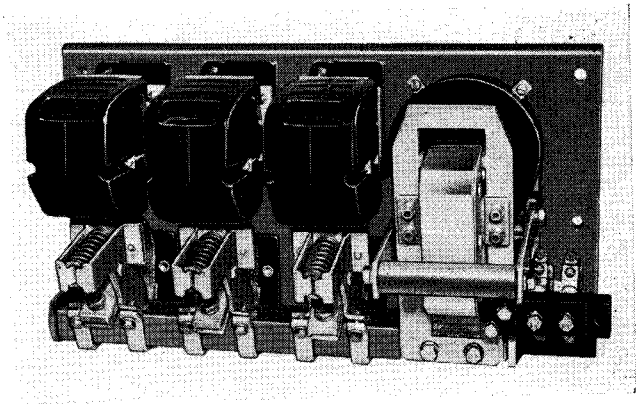

FIG. 2. Type GP-530 Rear Connected Contactor

SUPERSEDES I.L. 15-825-5B

AUGUST, 1959

a rolling and wiping action which serves to keep the contacting surfaces clean.

The shunts are made from flexible braided copper cable. A projecting lip on the moving end lines up the shunt with the lower end of the moving contact. The fixed end of the shunt is secured to a molded insulator. Here, again conversion from front to rear connection or vice versa is accomplished readily by the addition or removal of a copper connecting stud.

Electrical Interlocks. The Type GP Size 5 Contactor will accommodate a total of three type L-60 electrical interlocks. Two such interlocks are shown mounted on the contactor pictured in Figure 1. The interlocks may be converted from normally-closed to normally-open circuit action or vice versa without adding parts. Instruction Leaflet I.L.-15829.

Mechanical Interlocks. The Type M-40 mechanical interlock is used when a pair of contactors must be mechanically protected against closing of one when the other is closed. Mechanical interlocking is possible on all pole arrangements and only when one contactor is mounted below another.

The mechanical interlock consists of a bearing bracket, operating arms and lever. An adjustment screw and locknut is provided at each end of the lever. The following procedure should be followed when adjustments are made. With the upper contactor in the fully closed position, and the lower adjusting screw resting on the lower contactor operating arm, adjust the upper adjusting screw until there is 1/64 inch clearance between it and the upper operating arm. Next, tighten the locknut. Check adjustment by opening the upper contactor and fully closing the lower contactor. The clearance specified above should prevail. Lock the adjusting screw in position by tightening locknut.

INSTALLATION AND MAINTENANCE

Arc Quenchers. The arc quenchers and their hanger plates should be in place at all times that the contactor is required to interrupt a circuit.

The arc quencher is held in place by two fillister head machine screws and special washers located in recesses on each side of the arc quencher. To avoid mis-alignment stresses, the back side of the arc quencher must seat intimately against the face of the arc quencher hanger plate, before and after being fastened in place. Mis-alignment stresses could result in the fracture of the arc quencher due to the vibration encountered during contactor operation.

When replacing an arc quencher care must be taken to be sure that the special washers are placed correctly in the grooves in order to utilize the maximum groove bearing surface.

Armature Assembly. A periodic check of the armature assembly must be made to assure that the armature has the desired degree of freedom. It is essential that the two leaf springs are always in place between the bottom front of the bearing plate and the inside leg of the armature.

The socket head screws fastening the armature bearing plate to the armature support must be tightened at all times. The insulating plates and sleeves which are a part of this assembly must always be in place.

Operating Coil. Check the identification label when installing a new operating coil so that the voltage rating, frequency and coil style numbers are correct for the application.

Coils for Types GP-520 and GP-530 have been designed to operate within the temperature limits specified for NEMA Class A insulation.

Coils for the Types GP-540 and GP-550 contactors have been designed to operate at higher temperatures and are insulated to meet such service. The operator should not be alarmed to find the coils hot to the touch.

Table 2 gives a listing of the more commonly used coils.

Table 2. Operating Coils

COIL VOLTS	FREQ. CYCLES	GP-520 (2 Pole) GP-530 (3 Pole) Style Number	GP-540 (4 Pole) GP-550 (5 Pole) Style Number
220	60	1617 648	1625 681
440	60	1617 649	1625 682
550	60	1617 650	1625 683
600	60	1617 651	1625 684
220	50	1617 652	1625 685
380	50	1617 653	1625 686
440	50	1617 654	1625 687
550	50	1617 655	1625 688
220	25	1617 654	1625 687
440	25	1617 656	1625 689
550	25	1617 657	1625 690

The following procedure should be used in removing and replacing the operating coil:

1. Remove all arc quenchers.

2. Remove armature stop bracket by removing the bolts securing the assembly to each side of the stationary magnet base. This will permit the armature and moving contact assemblies to be rotated out of the way to facilitate coil removal.

3. Drop the coil leads and slide the coil forward until it is free of the stationary magnet.

To mount the new coil reverse the procedure.

CONTACTS

Contact Forces. Contact forces with new contacts should be as follows:

Initial Force—4.5 to 6.5 lbs.

Final Force—8.5 to 10.5 lbs.

Measure the contact force from a line 15/16 inch below the moving contact tip and in a line perpendicular to the center of the stationary contact face.

Initial contact force is measured with the contacts in the open position. The force reading should be taken at the instant contact overtravel begins, that is when the contact leaves the contact stop.

Contact replacement is necessary when the overtravel has been reduced to 5/32 inch. This is represented by a gap of 1/16 inch measured at point "X", Figure 3.

Contact removal is achieved by the following procedure:

1. Remove arc quenchers.

2. Remove shunt bolt from moving contact.

3. Remove armature stop bracket.

4. Remove the knife edge bearing by taking out the two bolts securing it.

5. Remove moving contact.

6. Remove stationary contact.

To install new contacts, reverse the procedure outlined above.

Contact Adjustment. Make sure that the contacts touch simultaneously. Sufficient adjustment can generally be obtained by a selective tightening of the two bolts securing the shaft clamp to the moving contact bracket (Fig. 3), tightening one more than the other to produce a slight rotation of the assembly on shaft.

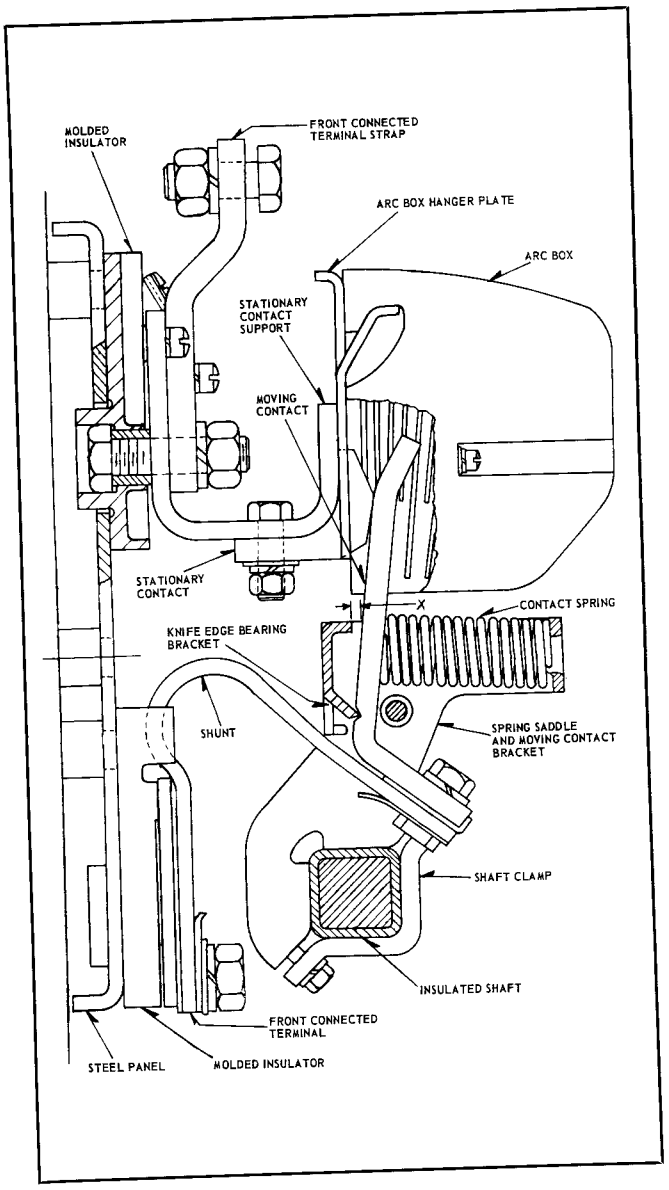

FIG. 3. Overtravel Measurement

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I.L. 15-825-5D
Filing No. 15-800

DESCRIPTION • INSTALLATION • MAINTENANCE

INSTRUCTIONS

Types "GP" and "GPD"—SIZE 5—A-C CONTACTOR

2-3-4-5 Pole **Front or Rear Connected**

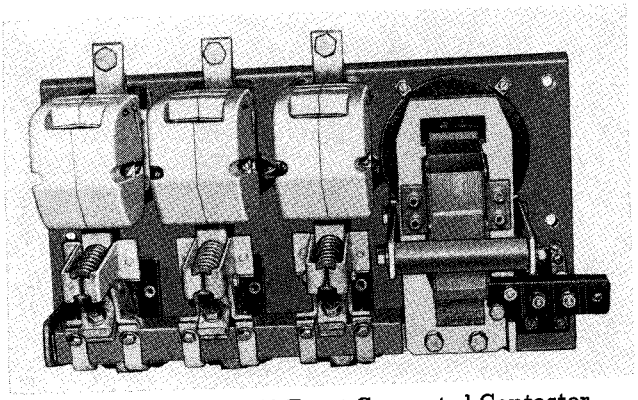

FIG. 1. Type GP-530 Front Connected Contactor, A-C Magnet

***THE TYPE GP AND GPD SIZE 5 CONTACTORS** are unit assembled A-C contactors having all parts mounted on a steel base. The unit is suitable for mounting on either steel or insulating panels. Contactors are available in 2, 3, 4 or 5 pole, front or rear connected assemblies, with or without arc quenchers. All parts are front removable.

The Type GP Contactor has an A-C operating magnet, and the Type GPD Contactor has a D-C operating magnet.

The Type GP and GPD Contactors are insulated for a maximum of 600 volts. The operating coils are designed for continuous duty. The A-C coils will operate the contactor at 85% to 110% of rated coil voltage. The D-C coils will operate the contactors at 80% to 110% of rated coil voltage.

Table 1. Ratings

CHARACTERISTICS	OPEN	ENCLOSED
Voltage	600	600
8-Hour Rating, Amperes	300	270
1-Hour Rating, Amperes	400	360

DESCRIPTION

The A-C magnet is of a laminated "C" shape construction and mounted to the right of the contact arrangement. The moving armature engages the stationary magnet in a vertical plane parallel to the base plate and has a total travel from the opened to the sealed position of approximately 14 degrees.

The stationary magnet laminations are assembled into a precision die cast aluminum base. A permanent air gap is built into this structure to provide sufficient reluctance in the magnetic path to insure a positive drop out on de-energization. The air gap is so situated that the hammering resulting from operational impact will not decrease the amount of air gap. The operating coil surrounds the upper leg of the stationary magnet and is held in place by two bolts.

The moving armature is flexibly supported by a domed plate which makes it capable of self-alignment as it closes against the stationary magnet. An anti-bounce device straddling the armature and fastened to the stationary magnet absorbs the kinetic energy of the moving system on de-energization thereby minimizing armature bounce.

The D-C magnet frame parts are made of high grade steel. A beryllium copper shim on the top pole face provides a permanent air gap to insure positive drop-out when the coil is de-energized.

Needle bearing assemblies support the ends of the insulated shaft which mounts the moving armature and moving contact assembly. Stainless steel compression springs in the moving contact assembly supply final contact forces from 8½ to 10½ lbs. with new contacts.

Each stationary contact assembly is mounted on an individual molded insulator. Conversion from

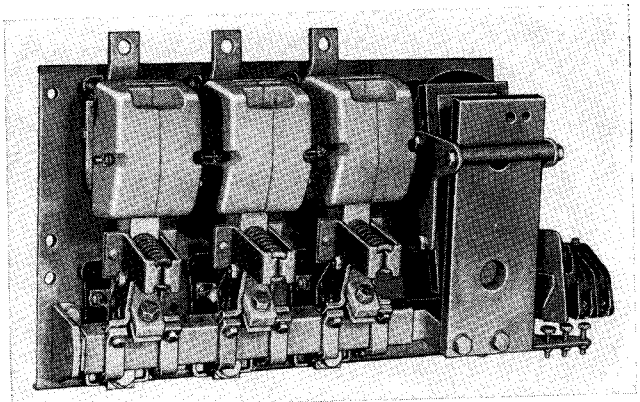

FIG. 2. Type GPD-530 Front Connected Contactor, D-C Magnet

*NOTE:—Formerly designated—Type NF.

front to rear connection or vice versa is easily accomplished by the addition or removal of a copper stud. The contacts, which are of copper, close with a rolling and wiping action which serves to keep the contacting surfaces clean.

The shunts are made from flexible braided copper cable. A projecting lip on the moving end lines up the shunt with the lower end of the moving contact. The fixed end of the shunt is secured to a molded insulator. Here, again conversion from front to rear connection or vice versa is accomplished readily by the addition or removal of a copper connecting stud.

Electrical Interlocks. The Type GP (A-C magnet) Size 5 Contactor will accommodate a total of three Type L-60 electrical interlocks. The interlocks may be converted from normally open to normally closed circuit action or vice versa without additional parts as illustrated in Instruction Leaflet I.L. 15-829-2.

The Type GPD (D-C magnet) Size 5 Contactor will accommodate a total of three Type L-63 electrical interlocks. The interlocks may be converted from normally open to normally closed circuit action or vice versa without additional parts as illustrated in Instruction Leaflet I.L. 15-829-4.

Mechanical Interlocks. The Type M-40 mechanical interlock is used when a pair of GP contactors must be mechanically protected against closing of one when the other is closed. Mechanical interlocking is possible on all pole arrangements and only when one contactor is mounted below another.

The Type M-40 mechanical interlock consists of a bearing bracket, operating arms and lever. An adjustment screw and locknut is provided at each end of the lever. The following procedure should be followed when adjustments are made. With the upper contactor in the fully closed position, and the lower adjusting screw resting on the lower contactor operating arm, adjust the upper adjusting screw until there is 1/64 inch clearance between it and the upper operating arm. Next, tighten the locknut. Check adjustment by opening the upper contactor and fully closing the lower contactor. The clearance specified above should prevail. Lock the adjusting screw in position by tightening locknut.

The Type M-42 mechanical interlock is used when a pair of GPD contactors must be mechanically protected against closing of one when the other is closed. Mechanical interlocking is possible on all pole arrangements with contactors mounted one below another.

The Type M-42 mechanical interlock consists of an upper operating lever, a tie rod, a lower operating lever and an operating pin secured to the top of the armature of the lower contactor. With the upper contactor open and the lower contactor closed, adjust the tie rod so that the lower operating lever clears the operating pin by 1/16 inch. Tighten the tie rod lock nuts.

INSTALLATION AND MAINTENANCE

Arc Quenchers. The arc quenchers and their hanger plates should be in place at all times that the contactor is required to interrupt a circuit.

The arc quencher is held in place by two fillister head machine screws and special washers located in recesses on each side of the arc quencher. To avoid mis-alignment stresses, the back side of the arc quencher must seat intimately against the face of the arc quencher hanger plate, before and after being fastened in place. Mis-alignment stresses could result in the fracture of the arc quencher due to the vibration encountered during contactor operation.

When replacing an arc quencher care must be taken to be sure that the special washers are placed correctly in the grooves in order to utilize the maximum groove bearing surface.

Armature Assembly. A periodic check of the armature assembly must be made to assure that the armature has the desired degree of freedom. It is essential that the two leaf springs are always in place between the bottom front of the bearing plate and the inside leg of the armature.

The socket head screws fastening the armature bearing plate to the armature support must be tightened at all times. The insulating plates and sleeves which are a part of this assembly must always be in place.

A-C and D-C Operating Coils. Check the identification label when installing a new operating coil so that the voltage rating, frequency and coil style numbers are correct for the application.

Coils for Types GP-520 and GP-530 have been designed to operate within the temperature limits specified for NEMA Class A insulation.

Coils for the Types GP-540, GP-550 and GPD contactors have been designed to operate at higher temperatures and are insulated to meet such service. The operator should not be alarmed to find the coils hot to the touch.

Table 2 gives a listing of the more commonly used coils.

Table 2. Operating Coils

COIL VOLTS	FREQ. CYCLES	2, 3 POLE Style Number	4, 5 POLE Style Number
220	60	1617 648	1625 681
440	60	1617 649	1625 682
550	60	1617 650	1625 683
600	60	1617 651	1625 684
220	50	1617 652	1625 685
380	50	1617 653	1625 686
440	50	1617 654	1625 687
550	50	1617 655	1625 688
220	25	1617 654	1625 687
440	25	1617 656	1625 689
550	25	1617 657	1625 690
80	D-C	438C804G01	438C804G01
115	D-C	438C804G02	438C804G02
160	D-C	438C804G03	438C804G03
230	D-C	438C804G04	438C804G04
250	D-C	438C804G05	438C804G05
320	D-C	438C804G06	438C804G06
400	D-C	438C804G07	438C804G07

To remove and replace the A-C operating coil, proceed as follows:

1. Remove all arc quenchers.

2. Remove armature stop bracket by removing the bolts securing the assembly to each side of the stationary magnet base. This will permit the armature and moving contact assemblies to be rotated out of the way to facilitate coil removal.

3. Drop the coil leads and slide the coil forward until it is free of the stationary magnet.

To mount the new coil reverse the procedure.

To remove and replace the D-C operating coil, proceed as follows:

1. Remove coil leads.

2. Remove the top two 5/16 inch bolts that secure the armature stop brackets to the top magnet pole face and loosen the bottom two 5/16 inch bolts that secure the armature stop brackets to the bottom pole face.

This will allow the armature and moving contact assemblies to be rotated out of the way to facilitate coil removal.

3. Remove top pole face and beryllium copper shim by removing 5/16 inch bolt.

4. Remove coil from top core.

To mount the new coil reverse the procedure.

CONTACTS

Contact Forces. Contact forces with new contacts should be as follows:

Initial Force—4.5 to 6.5 lbs.

Final Force—8.5 to 10.5 lbs.

Measure the contact force from a line 15/16 inch below the moving contact tip and in a line perpendicular to the center of the stationary contact face.

Initial contact force is measured with the contacts in the open position. The force reading should be taken at the instant contact overtravel begins, that is when the contact leaves the contact stop.

Contact replacement is necessary when the overtravel has been reduced to 5/32 inch. This is represented by a gap of 1/16 inch measured at point "X", Figure 3.

Contact removal is achieved by the following procedure:

1. Remove arc quenchers.

2. Remove shunt bolt from moving contact.

3. Remove armature stop bracket.

4. Remove the knife edge bearing by taking out the two bolts securing it.

5. Remove moving contact.

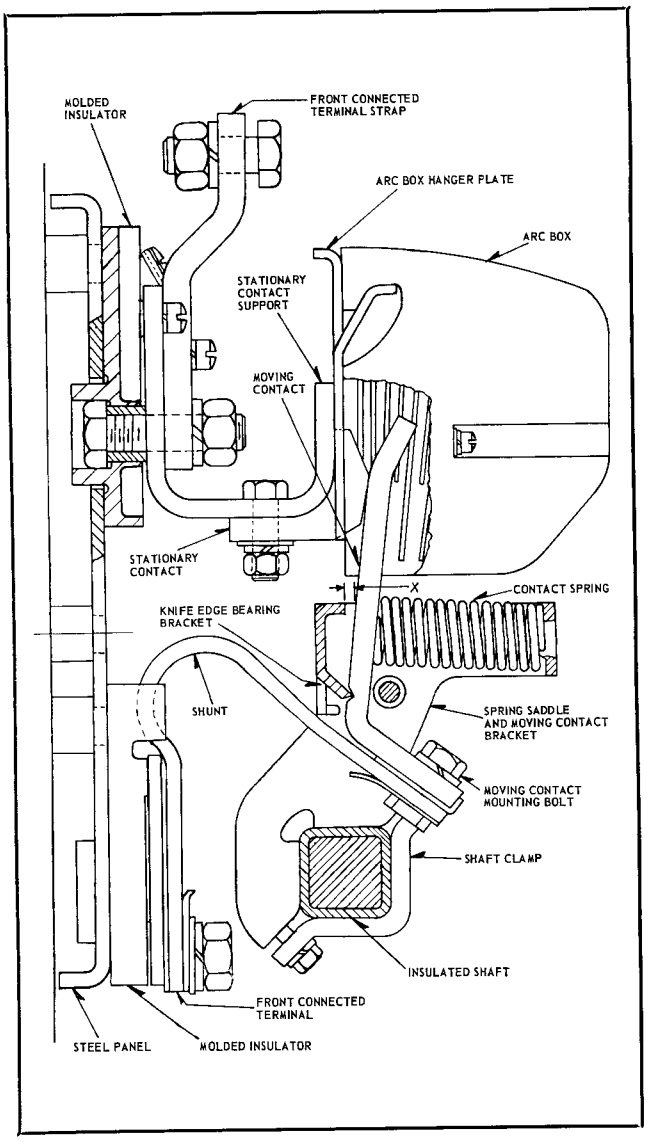

FIG. 3. Overtravel Measurement

6. Remove stationary contact.

To install new contacts, reverse the procedure outlined above.

Caution: Be sure shunt is held straight and true while tightening moving contact mounting bolt or lower terminal hardware to avoid twisting braided shunt and prevent binding between shunt clip and moving contact support. Moving contact should rotate about knife edge bearing freely with very low friction when shunt has been properly re-assembled.

Contact Adjustment. Make sure that the contacts touch simultaneously. Sufficient adjustment can generally be obtained by a selective tightening of the two bolts securing the shaft clamp to the moving contact bracket (Fig. 3), tightening one more than the other to produce a slight rotation of the assembly on shaft.

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