Sectionalizers

Type GN3 (Form 1) Maintenance Instructions

Supersedes 284-20SB-1

NOTICE

These instructions cover the maintenance procedures for Type GN3 (Form 1) three-phase, hydraulically controlled sectionalizer below serial no. 4100.

For Type GN3 (Form 2) sectionalizers (serial no. 4100 and above), see S270-10-7.

CAUTION

Do not energize this equipment out of oil.

CONTENTS

DESCRIPTION 1
GENERAL MAINTENANCE INFORMATION 2
PERIODIC FIELD INSPECTION AND MAINTENANCE 2
SHOP MAINTENANCE 3
Hydraulic Mechanism—Coils Rated 140 Amps and Lower 3
Hydraulic Mechanism—Coils Rated 160, 185, and 200 Amps 4
Contact Structure 6
Head Mechanism 8
Bushings 12
Head Casting and Associated Parts 13
ADJUSTMENTS 15
Contact Structure 15
Head Mechanism 16

DESCRIPTION

A Type GN3 sectionalizer is a three-phase oil switch that senses operation of a backup protective device and locks open during an interval when the backup device is open. The sectionalizer merely counts operations of the backup device and opens after the pre-set number of operations has occurred. Because the sectionalizer does not interrupt fault currents, it has no time-current characteristics and can be applied with any three-phase tripping and lockout backup device whose reclosing interval does not exceed ten seconds.

Each of the three counting mechanisms of the GN3 consists of a series coil, plunger, check valve, and trip piston. Each time fault current passes through a coil, the plunger is pulled down against spring pressure. When the backup device opens, the spring-loaded plunger returns to its normal position and, in so doing, pumps a measured quantity of oil under the trip piston. After the pre-set number of operations (one, two, or three) the trip piston advances enough to actuate the sectionalizer's trip mechanism.

Circuit opening is provided in each phase by double break contacts driven by a single opening spring. These contacts can be opened manually so the sectionalizer can also be used as a load-break device. Load currents up to 220 percent of the coil rating can be interrupted. See Figure 1 for additional description of features.

McGRAW-EDISON COMPANY
Power Systems Division
Canonsburg, Pennsylvania 15317

January 1976

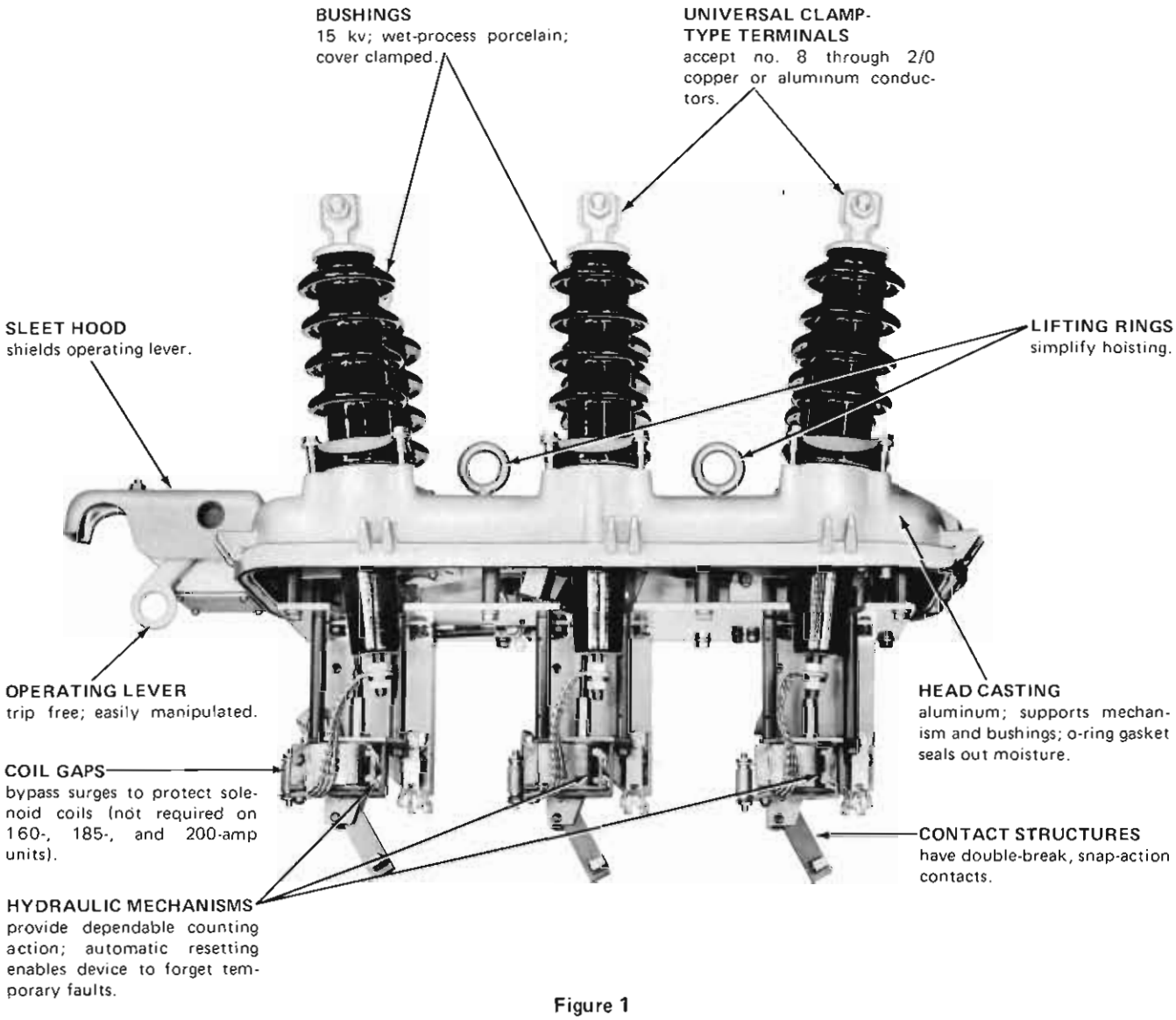


Figure 1
View of untanked GN3 sectionalizer.

GENERAL MAINTENANCE INFORMATION

GN3 sectionalizers do not interrupt fault currents, so contacts should experience little wear, and oil should deteriorate slowly. Thus, maintenance should be directed merely toward keeping the device's insulation level at a reasonable level. Usually this will be accomplished if the oil dielectric strength is at least 22 kv as measured across a standard 0.1-inch gap.

Oil deterioration generally is caused by accumulation of moisture condensed from air. Breathing, caused by changes in temperature, is responsible for introduction of new air. In humid locations having wide variations in temperature, breathing may be an important factor. Because climatic conditions vary widely, experience will provide the best guide in deciding when maintenance should be performed. Units should be inspected after the first year of operation. Periodic evaluation of solid insulation by use of an insulation tester will be useful in establishing maintenance intervals.

PERIODIC FIELD INSPECTION AND MAINTENANCE

Each periodic inspection and maintenance should include at least the following steps:

1. Bypass, trip, and de-energize the sectionalizer. Remove from pole.
2. Inspect external components. Look for paint scratches, cracked bushings, bullet holes, or other mechanical damage.
3. Untank mechanism. Remove tank clamps and lift mechanism out of oil. Check to see the o-ring head gasket is in good condition.
4. Test oil. Dielectric strength should be at least 22 kv as measured across a standard 0.1-inch gap. Oil that is contaminated with sludge, or tests below this value, should be discarded. Replace with new, dry transformer oil or oil that has been restored to like-new condition.

5. Examine hydraulic mechanism. This device should need no attention, but if it has been damaged, or if the coil is to be changed to another size, observe procedure outlined on pages 3 through 6.
6. Check moving and stationary contacts. If badly eroded, replace as shown on page 7.
7. Operate the control lever manually and observe if all components operate properly.
8. Wipe any carbon traces from insulating stringers, contact structure, hydraulic mechanism, and tank. Flush with clean, dry transformer oil.
9. Test electrical resistance of insulating stringers by use of an insulation tester.
10. Before retanking, invert the sectionalizer and introduce oil into the three hydraulic mechanisms with an ordinary squirt can. Then quickly place mechanism in tank far enough to cover the hydraulic mechanism with oil. Move trip pistons, identified in Figure 2, up and down several times to eject any entrapped air. Complete retanking operation.
11. Test operation. Momentarily connect a six-volt storage battery across sectionalizer terminals. Repeat this procedure at about one-second intervals and note if the sectionalizer locks open after the correct number of operations has occurred. If the unit does not lock out properly, wait three minutes and repeat test. Air in the hydraulic system can cause incorrect operation.

    If the unit still fails to operate properly, disassemble hydraulic mechanism as described on page 4. Check carefully for sludge accumulation, dirt, or scratches on any of the parts. Wash hydraulic parts in a clean degreasing fluid and carefully reassemble. Cleanliness is important! Repeat test.

SHOP MAINTENANCE

Observe the following procedure if components must be removed for any reason. Best results will be obtained if work is done in the order described.

HYDRAULIC MECHANISM–COILS RATED 140 AMPS AND LOWER

1. Grasp insulating stringers, Figure 2, with pliers. Be sure to use heavy cardboard between pliers and stringer to avoid damage to the stringer. Then loosen and remove both cap screws and lockwashers. Disconnect both coil terminals. One of these is visible in Figure 2, and the other is located between coil and contact box.

CAUTION

Support frame, solenoid plunger, and cylinder assembly are sold only in matched sets. Replace all three parts if any one is to be replaced. DO NOT INTERCHANGE HYDRAULIC MECHANISM PARTS BETWEEN PHASES.

Use new solenoid gaskets furnished with new coils.

Before replacing hydraulic mechanism, wash parts in a mineral spirit or degreasing fluid bath to remove any oxidized oil film that may be present. Pay particular attention to the trip piston and cylinder.

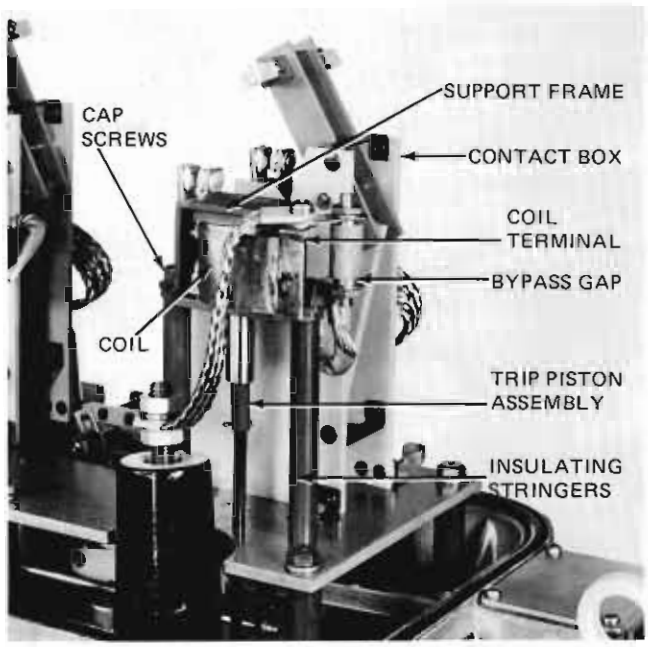


Figure 2
View of hydraulic mechanism prior to disassembly.

2. Lift off support frame and coil as shown in Figure 3. Remove the spring and plunger from inside the coil.
3. Lift the trip piston assembly out of the head mechanism.
4. To remove insulating stringers from the support plate, loosen and remove locknut on the threaded stud of the insulating stringer. Turn stringers counterclockwise to remove.
5. If further maintenance is to be performed, do not reassemble hydraulic mechanism. When reassembly is to be performed, simply reverse the foregoing procedure.

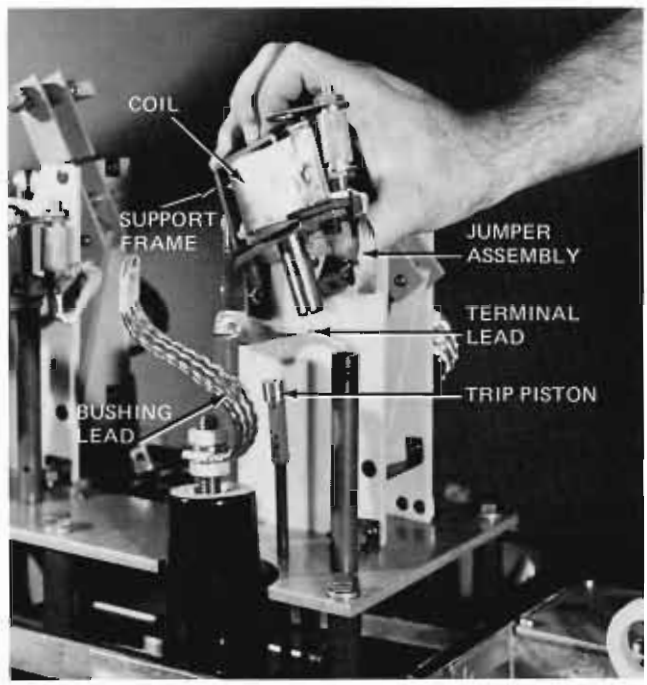


Figure 3
Removal of series coil.

SHOP MAINTENANCE—CONT'D.

HYDRAULIC MECHANISM—COILS RATED 160, 185, AND 200 AMPS

Sectionalizers having these ratings employ hydraulic mechanisms that differ somewhat from those used in lower-rated units. The 160-, 185-, and 200-amp ratings are achieved by positioning of the series coil with respect to the plunger in each mechanism. Figures 4, 5, and 6 show how this positioning is obtained by use of a short and a long spacer. To obtain the 165-amp rating, Figure 4, both spacers are installed above the coil when the sectionalizer is inverted. The long spacer is installed below the coil and the short spacer above the coil, Figure 5, to achieve the 185-amp rating. Both spacers are placed below the coil, Figure 6, to obtain the 200-amp rating.

Disassembly procedure for these mechanisms is similar to that for lower-rated units. Note, however, that the coil support kit, Figure 8, includes several matched parts, all of which are designated Item 1. These parts cannot be furnished singly.

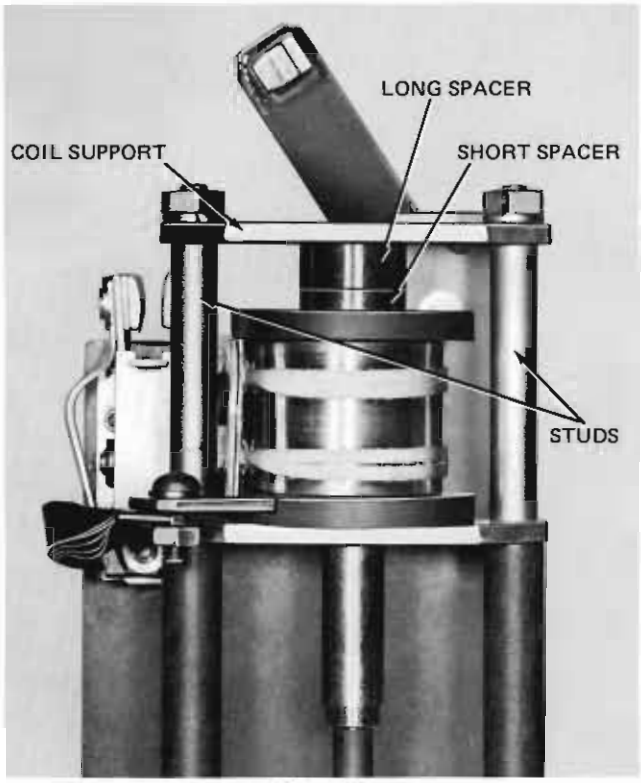


Figure 4
Hydraulic mechanism for 160-amp sectionalizer.

UPRATING UNITS RATED 140 AMPS AND LOWER TO 160, 185, TO 200 AMPS

To uprate units rated 140 amps and below to any one of the three highest ratings, Items 11 through 24 in Figure 7 must be replaced by a KA711GN3 replacement coil kit. This kit includes all the items shown in Figure 8. Note that the bypass gap is not required for the larger coils.

In addition, the KP257NR lead assembly, Item 21 in Figure 14 and Item 18 in Figure 7, must be replaced by two KP156GN3 leads. Observe procedures outlined on pages 3 and 4 to dismantle and reassembly hydraulic mechanisms.

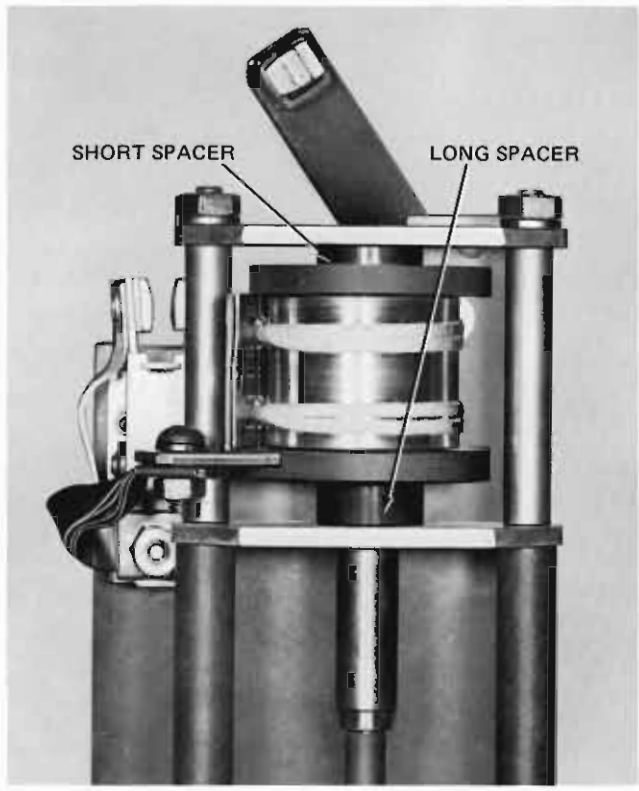


Figure 5
Hydraulic mechanism for 185-amp sectionalizer.

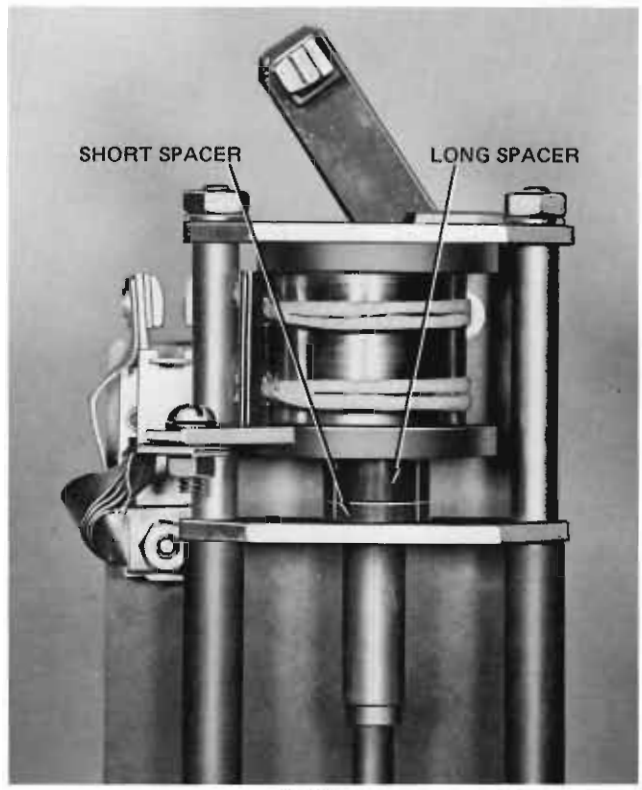


Figure 6
Hydraulic mechanism for 200-amp sectionalizer.

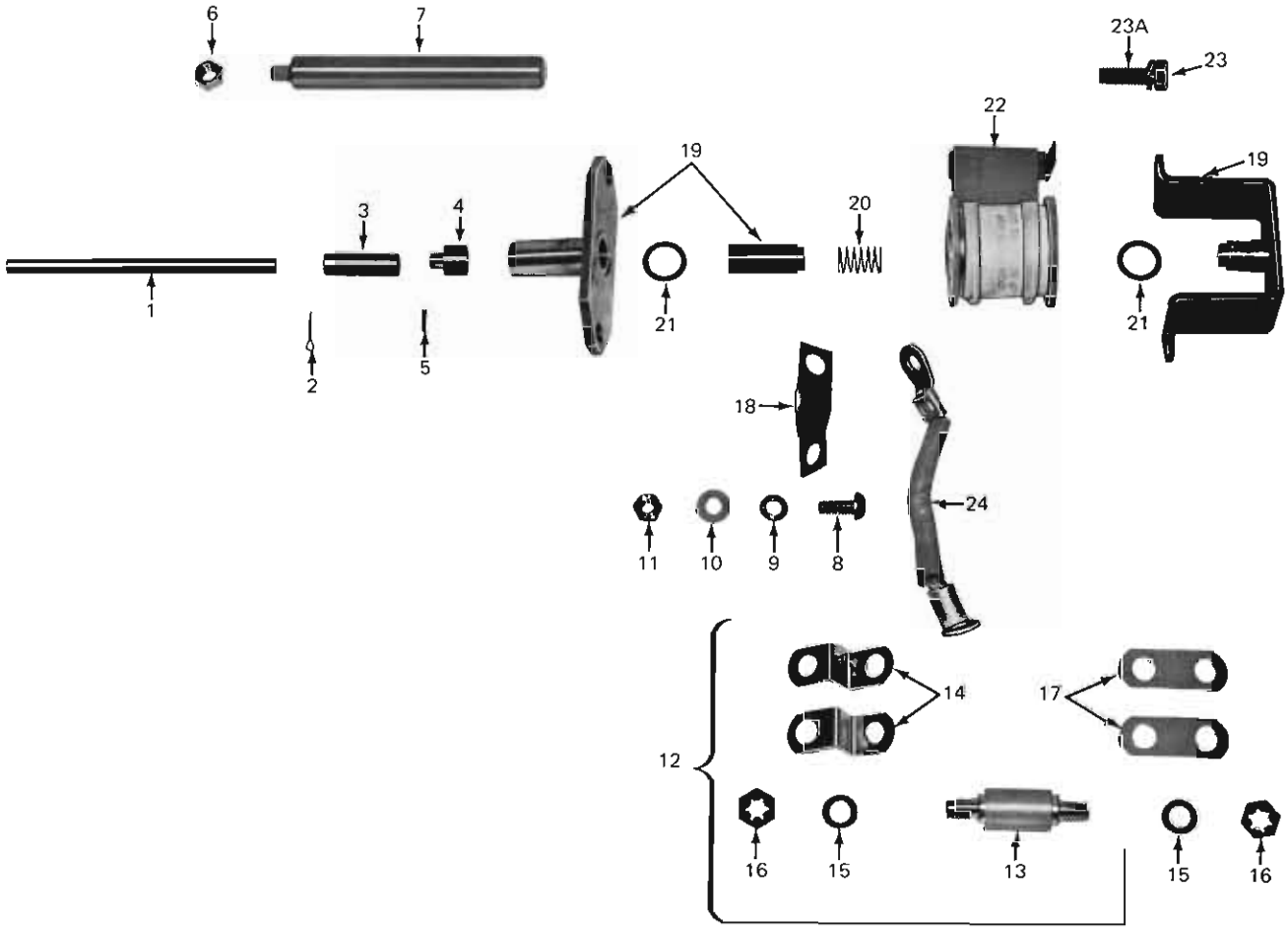


Figure 7
Hydraulic mechanism parts layout for sectionalizers rated 140 amps and lower.

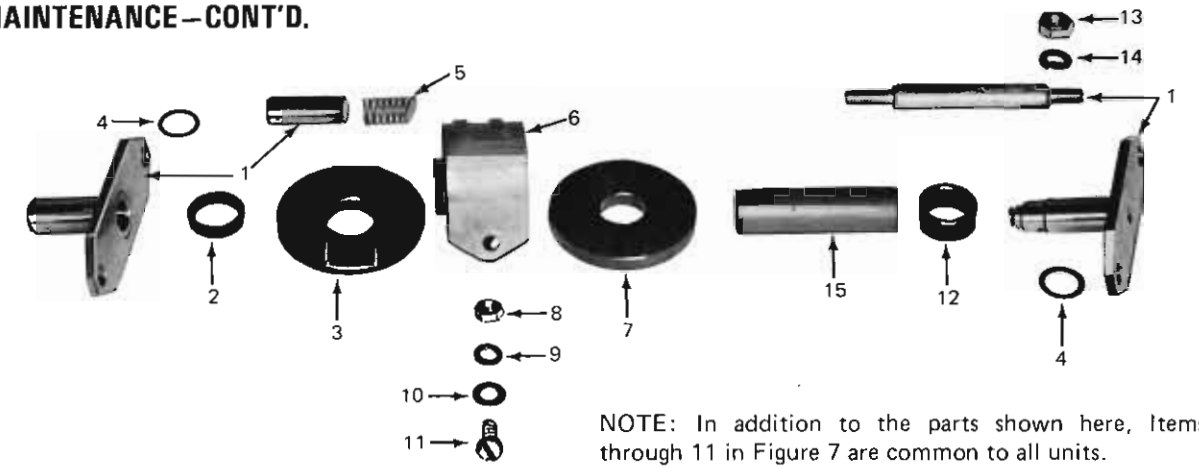
PARTS LIST
HYDRAULIC MECHANISM
UNITS RATED 140 AMPS AND LOWER

Item No.	Description	Catalog Number	No. Per Sectionalizer
1	Trip piston rod	KP115GN3	3
2	Cotter pin, 1/16" x 1/2", stl	KP301	3
3	Trip adjuster	KP135GN3	3
4	Trip piston	KP114GN3	3
5	Roll pin, 1/16" x 3/8"	KP509	3
6	Jam nut, 5/16"–18UNC2A, hex stl	KP289	6
7	Spacer and stud assembly	KA24GN3	6
8	Machine screw, 1/4"–20UNC2A x 5/8", rd hd, brass	KP647	6
9	Lockwasher, 1/4", med, bronze	KP347	12
10	Washer, flat	KP339	6
11	Nut, machine screw, 1/4" 20UNC2B, hex, brass	KP274	12
12	Coil gap assembly (includes Items 13 and 14 and one each of Items 15 and 16)	KA30GN3	3

Item No.	Description	Catalog Number	No. Per Sectionalizer
13	Coil gap	KA116GH	3
14	Lead	KP222GH	6
15	Washer, 5/16" AN, med, stl	KP1114	6
16	Palnut, std	KP2064A3	6
17	Lead	KP3251A1	6
18	Terminal lead	KP257NR	3
19	Coil support assembly (3 pieces)	KA44GH	3
20	Solenoid spring	KP84GH	3
21	Solenoid gasket (included with Item 22)	KP2090A51	6
22	*Coil assembly replacement kit	KA717GN3	3
23	Machine screw and lockwasher–5/16"–18UNC2A x 1", hex hd	KP112	6
24	Jumper assembly	KA115GH	3

*Add coil load rating in amperes as suffix. (5, 10, 15, 25, 35, 50, 70, 100 or 140)

SHOP MAINTENANCE—CONT'D.



NOTE: In addition to the parts shown here, Items 1 through 11 in Figure 7 are common to all units.

Figure 8
Hydraulic mechanism parts layout for sectionalizers rated 160, 185, or 200 amps.

PARTS LIST
HYDRAULIC MECHANISM
UNITS RATED 160, 185, AND 200 AMPS

Item No.	Description	Catalog Number	No. Per Section-alizer
1	Coil support sub-assem kit (6 pieces)(includes Item 5)	KA715GN3	3
2	Short fiber spacer	KP2090A4	3
3	Upper coil flange	KP143GN3	3
4	Solenoid gasket	KP2090A51	6
5	Solenoid plunger return spring	KP84GH	6
6	Coil assembly replacement kit	KA710GN3	3
7	Lower coil flange	KP2090A5	3
8	Brass hex nut—1/4"—20UNC2B	KP274	6
9	Stl lock washer—1/4"	KP337	6
10	Brass flat washer	KP555	6

Item No.	Description	Catalog Number	No. Per Section-alizer
11	Machine screw—1/4"—20UNC2A x 5/8", brass, rd hd	KP647	6
12	Long fiber spacer	KP2090A3	3
13	Stl lock washer—5/16" (included in Item 1)	KP356	6
14	Brass hex nut—5/16"—18UNC2 (included in Item 1)	KP283	6
15	Spool tube	KP142GN3	3
	Replacement solenoid kit for uprating units rated 140 amps and lower, includes all items shown in Figure 8.	KA711GN3	

CONTACT STRUCTURE

Figure 9 illustrates appearance of the contact structure of one phase after the hydraulic mechanism has been removed.

1. Remove hex nut and lock washer from stationary contact assembly. Lift off terminal lead and pull contact leaves off the stud as demonstrated in Figure 10.
2. Remove contact retainer and stationary contact assembly.
3. Remove two self-tapping screws that secure the moving contact bar to the backing strip.
4. Slide off insulating spacer, Figure 11, and backing strip. Then pull out moving contact bar. Two additional spacers will be released.
5. Remove C ring and withdraw pin that connects the insulated link and moving contact arm as illustrated in Figure 12. Contact torsion spring and two spacers will also be released.
6. Remove C ring and flat washer from one end of pivot pin and withdraw pin as shown in Figure 13. A spacer on either side of the contact art will also be released. Lift out contact arm.

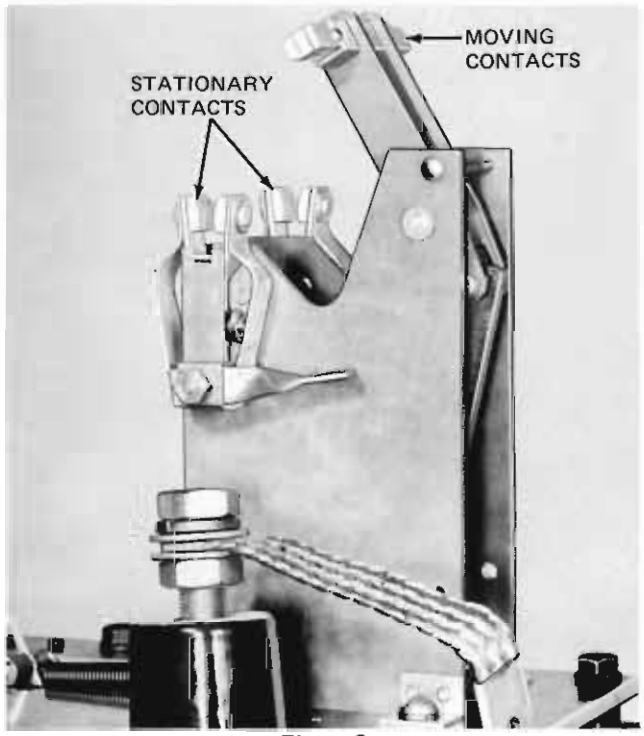


Figure 9
Contact structure prior to disassembly.

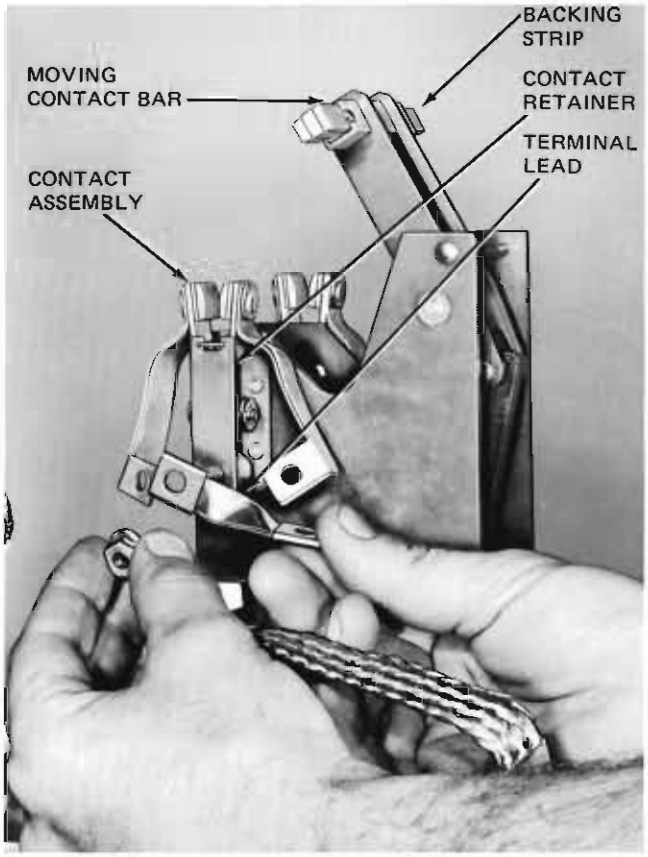


Figure 10
Stationary contact disassembly.

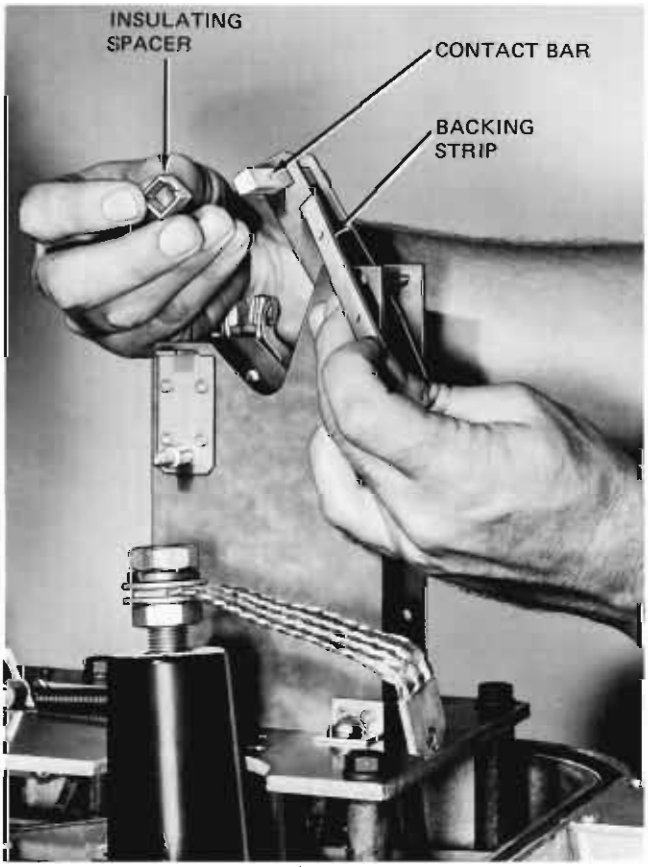


Figure 11
Removing moving contact.

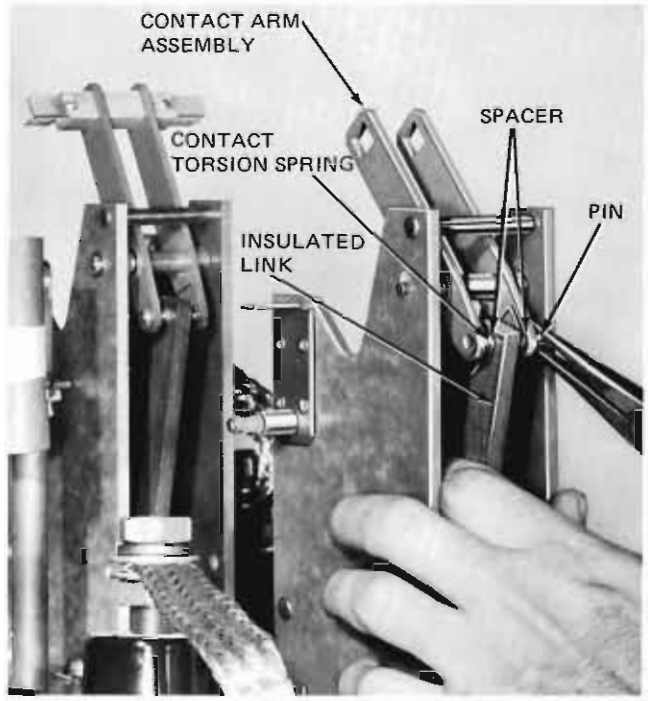


Figure 12
Disconnecting insulated link from contact arm assembly.

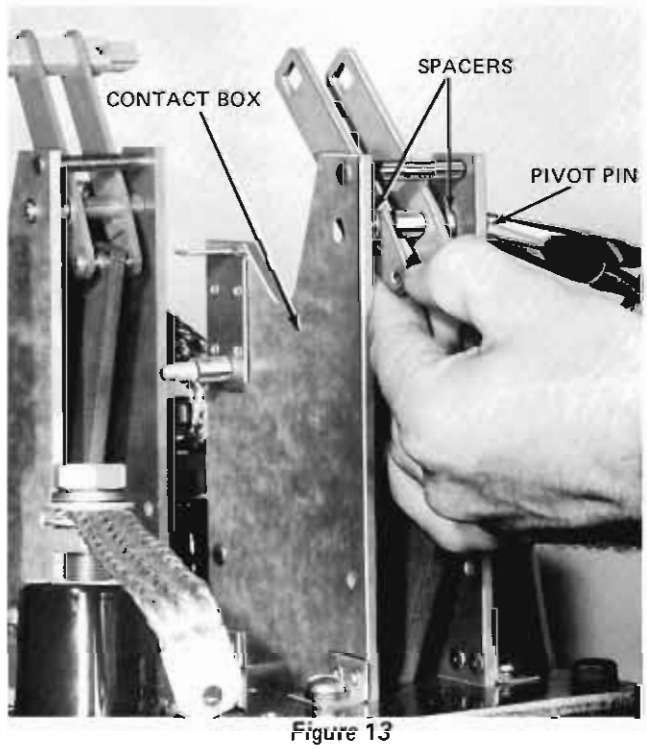


Figure 13
Pulling pivot pin from moving contact arm.

7. Remove four round-head machine screws and lock washers to release contact box assembly.

   NOTE: The two screws nearest the sleet hood are slightly longer than the others and are used to secure the flat trip lever spring. To remove these screws, first remove hex nuts on the opposite side of the head mechanism support plate. See Figure 19, page 9.

   Instructions for removing the insulating link are given on page 9.

SHOP MAINTENANCE—CONT'D.

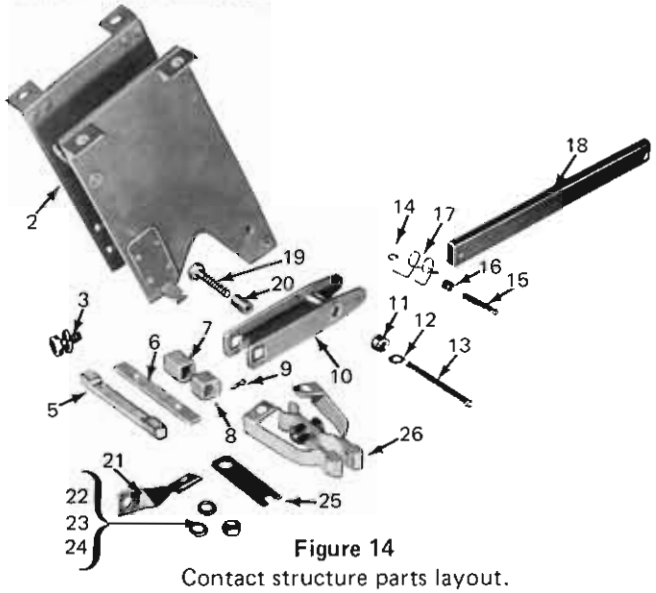


Figure 14
Contact structure parts layout.

PARTS LIST
CONTACT STRUCTURE

Item No.	Description	Catalog Number	No. Per Section-alizer
1	Side plate assembly (includes parts numbered 2 through 18)	KA8GN3	3
2	Side plates – order only as part of Item 1 (KA8GN3)	–	
3	Machine screw and lock washer, 5/16"–18UNC2A x 1/2", lg, hex hd	KP114	10
	Machine screw and lock washer, 5/16"–18UNC2A x 1", lg, hex hd (used in two holes closest to sleet hood)	KP115	2
4	Toggle assembly–(includes parts numbered 5 through 18)	KP9GN3	3
5	Moving contact bar	KA78NR	3
6	Copper backing strip for moving contact	KP165NR	3
7	Center spacer for moving contact assembly	KP161NR	3
8	Outer spacer for moving contact assembly	KP160NR	6
9	Self-tapping screw, #6-32 x 3/8", lg, Type F	KP24	6
10	Contact arm assembly	KA118NR	3
11	Spacer	KP3008A2	6
12	Washer, 7/16" x 0.200" x 0.036", brass	KP335	6
13	Pin (connects toggle to box)	KP3123A11	3
14	Retaining ring, WA510, Type C	KP72	12
15	Pin (connects Item 10 and 18)	KP3123A7	3
16	Spacer	KP3005A1	6
17	Toggle torsion spring	KP92NR	3
18	Insulated operating link	KP116GN3	3
19	Capscrew, 1/4"–20UNC2A x 1-1/4", hex hd, brass	KP757	6
20	Contact roller	KP256NR	6
21	Terminal lead–units rated 140 amps and lower	KP257NR	3
	Terminal lead–units rated 160 amps and higher	KP156GN3	6
22	Flat washer, #14S, plain, brass	KP339	6
23	Lockwasher, 1/4", med	KP337	6
24	Machine screw nut, 1/4"–20UNC2B, hex, brass	KP274	6
25	Contact retainer	KP214NR	6
26	Contact assembly	KA159NR	6

HEAD MECHANISM

This mechanism should require no maintenance. If disassembly is necessary, observe steps outlined below. Illustrations in this section show the contact structures and hydraulic mechanisms removed from the head mechanism. The head mechanism can, however, be disassembled or adjusted without removing these components.

1. Remove sleet hood box cover plate. Then remove C ring, Figure 15, and pull pin.
2. Remove eight hex cap screws and lock washers that secure the head mechanism support plate to the head casting. Lift out the head mechanism.
3. Disconnect insulating links that operate moving contacts. Head mechanism at this point is shown in Figures 16 and 17.
4. Remove two round-head screws to release one trip shaft bracket. Lift out trip shaft as shown in Figure 18. Drive out short roll pin in end of trip bar to release trip shaft bracket. Note that a brass washer is present on either side of the bracket.
5. Remove C rings pointed out in Figure 19, pull pin "A," and remove toggle assembly.
6. Unhook opening spring, Figure 19, remove C ring, pull pin "B," and remove operating bar. Remove trip-lever spring if this has not been done previously.

   NOTE: Trip-lever spring is secured by a flat bar held under two hex nuts. These nuts, and consequently the flat bar, must be removed to enable release of one contact box. These parts are shown here to illustrate positioning only.
7. Remove retaining rings on all three pins designated "C," pull pins, and lift out associated operating cranks.

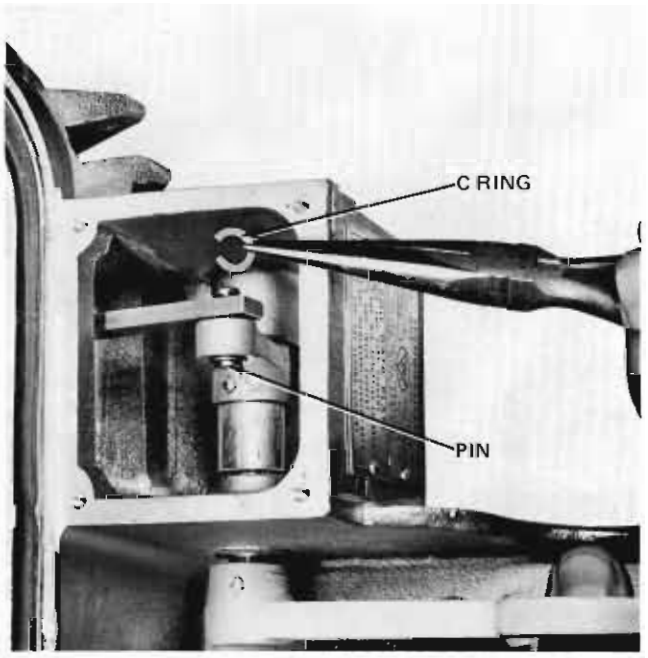


Figure 15
Disconnecting manual operating lever.

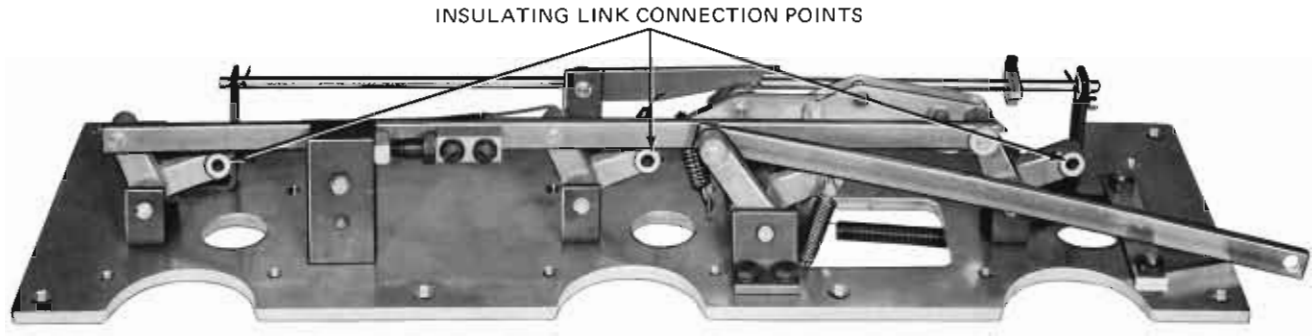


Figure 16
Head mechanism prior to disassembly.

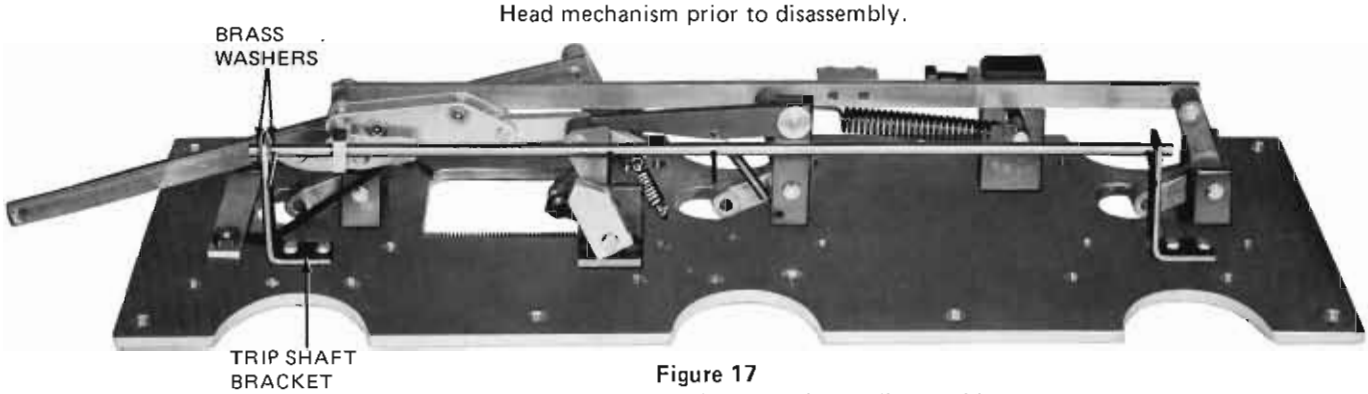


Figure 17
Trip shaft side of head mechanism prior to disassembly.

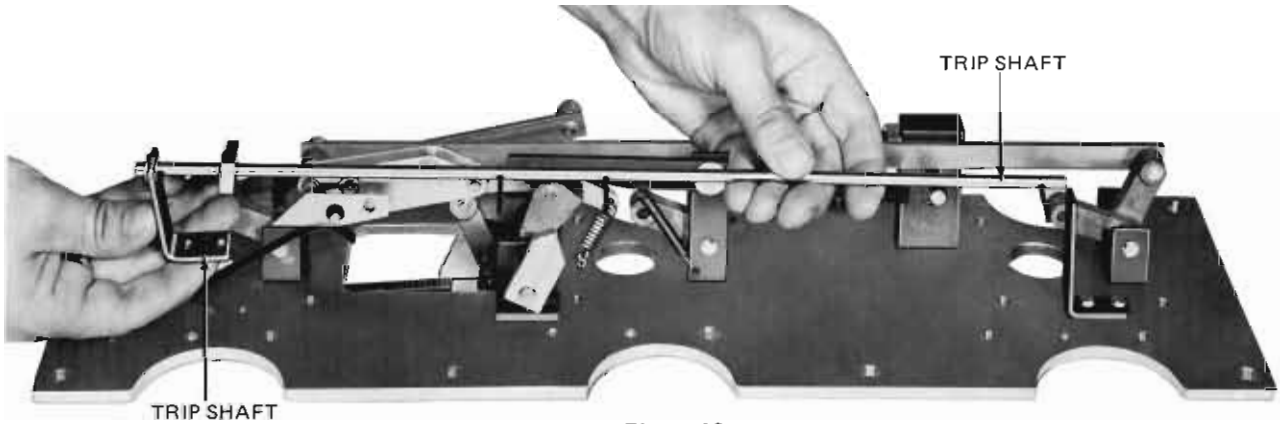


Figure 18
Trip shaft removal.

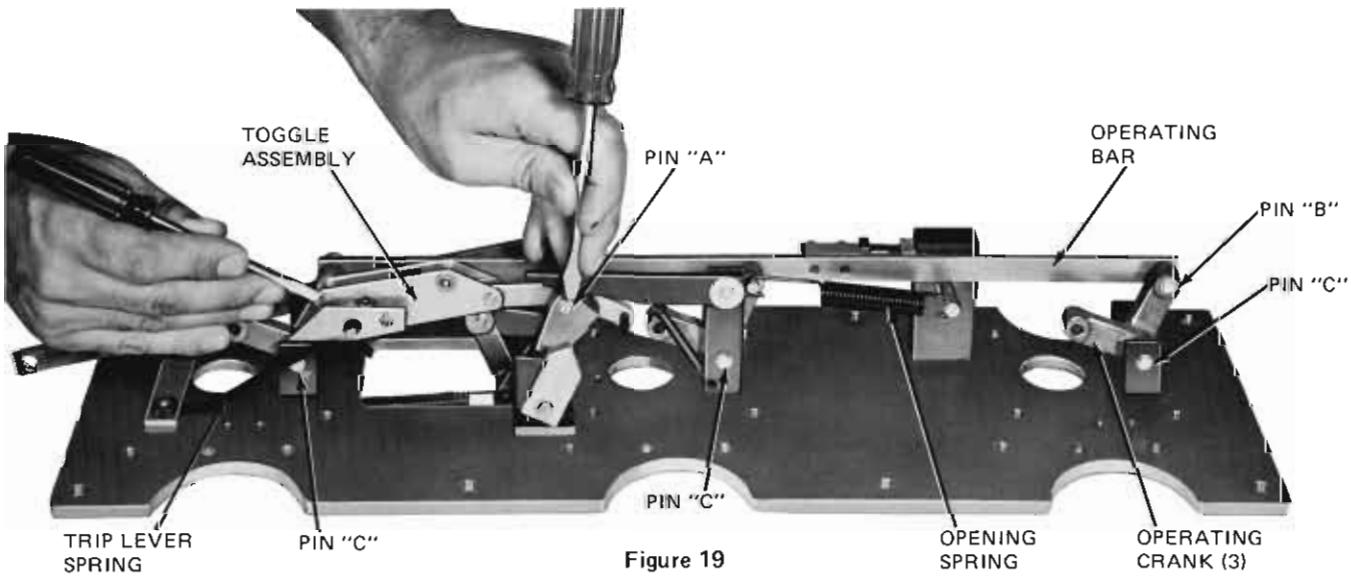


Figure 19
Toggle assembly and operating bar removal.

SHOP MAINTENANCE—CONT'D.

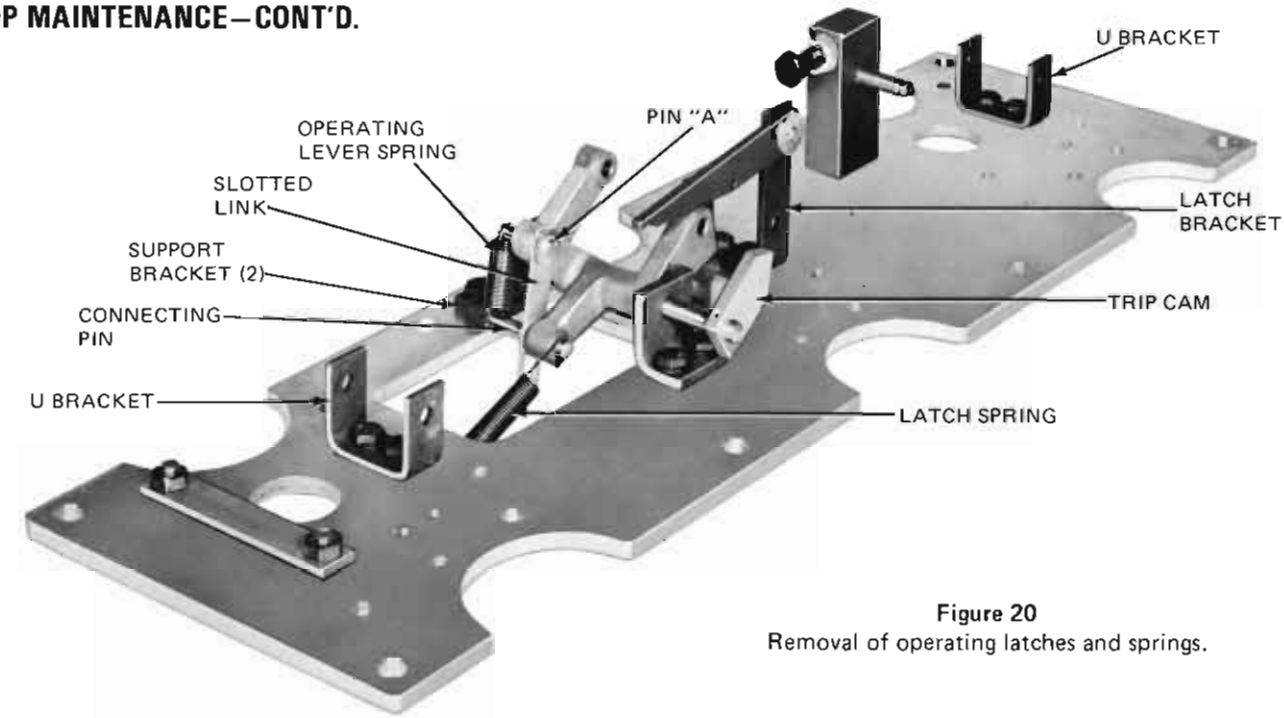


Figure 20
Removal of operating latches and springs.

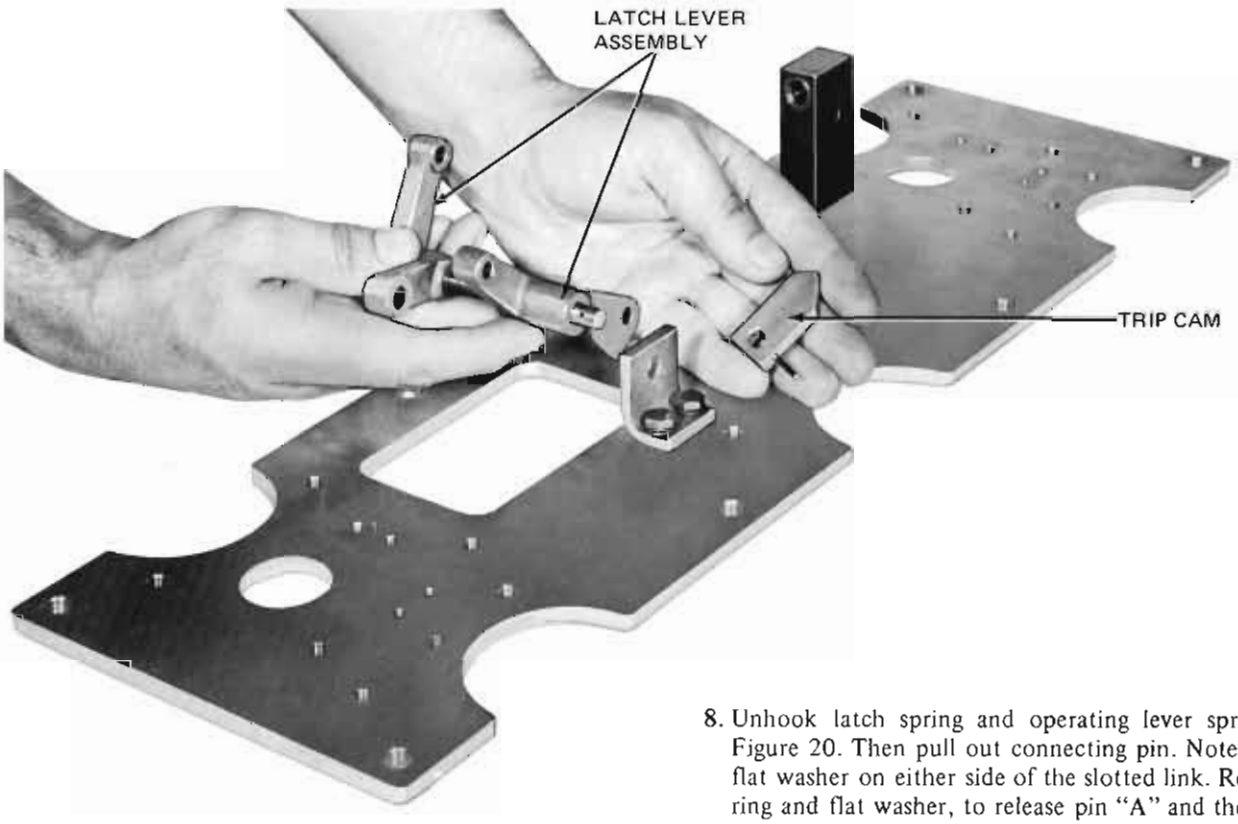


Figure 21
Final disassembly of head mechanism.

8. Unhook latch spring and operating lever spring. See Figure 20. Then pull out connecting pin. Note use of a flat washer on either side of the slotted link. Remove C ring and flat washer, to release pin "A" and the slotted link.
9. Remove both U brackets and the latch bracket.
10. Drive out roll pin in trip cam, Figure 20, enough to release shaft. Remove support bracket on opposite side. Then lift out latch lever assembly as shown in Figure 21.

Components can be further disassembled as illustrated in Figure 22. Reassemble by reversing the foregoing procedure. See page 15 for adjustment information.

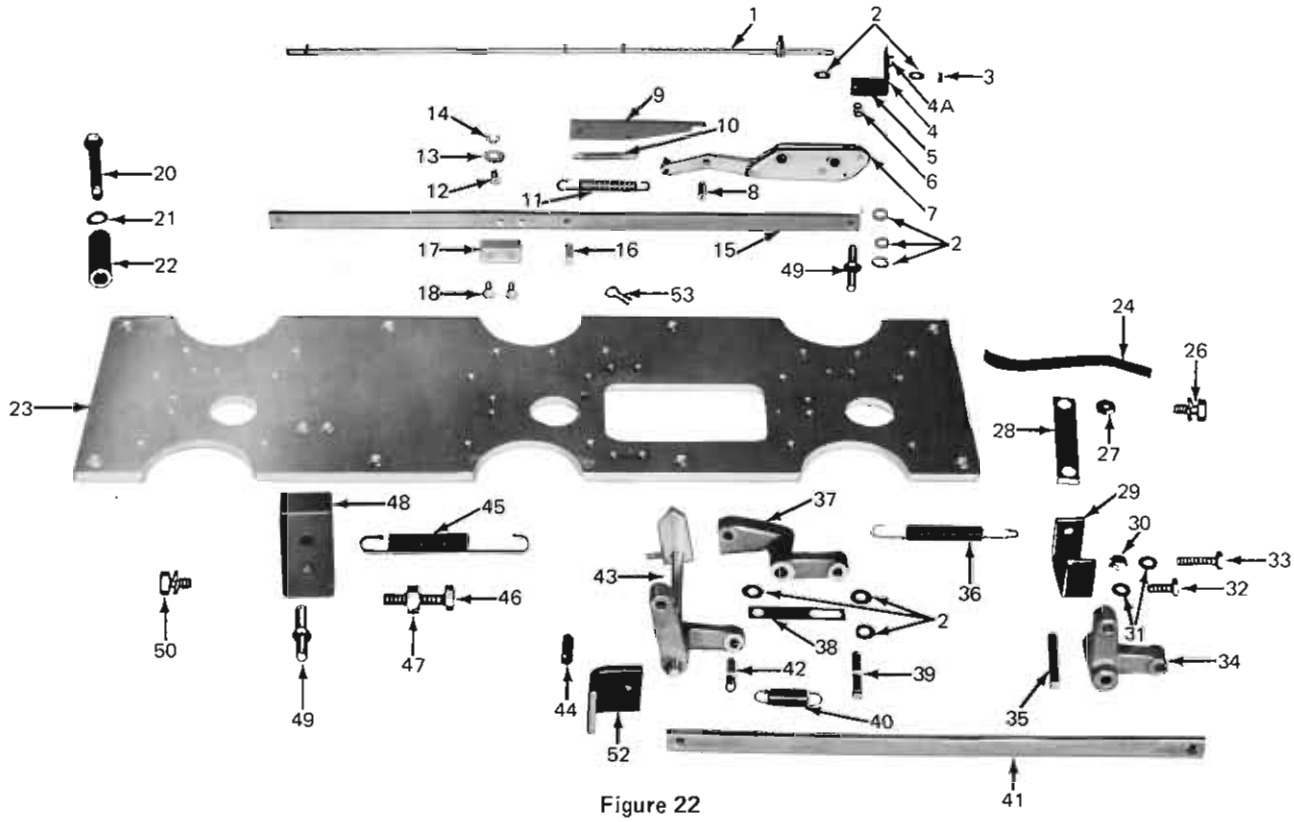


Figure 22
Head mechanism parts layout.

PARTS LIST
HEAD MECHANISM

Item No.	Description	Catalog Number	No. Per Section-alizer
1	Trip shaft assem	KA6GN3	1
2	Brass washer—No. 14S	KP339	10
3	Stl roll pin—3/32" x 5/8"	KP508	1
4	Trip shaft stop bracket assem	KA21GN3	1
4A	Roll pin—5/32" x 7/8"	KP507	2
4B	Trip shaft bracket (supports Item 1 on end opposite Item 4) not shown	KP107GN3	1
5	Stl lock washer—No. 10	KP825	4
6	Rd-hd stl mach scr—No. 10—24UNC2A x 7/16"	KP489	4
7	Toggle latch assem	KA3GN3	1
8	Pin	KP3124A14	5
9	Trip bar assem	KA22GN3-1	1
10	Spring, trip bar	KP553R	1
11	Toggle relatch spring	KP12GH	1
12	Trip latch pin	KP3124A15	5
13	Brass washer—No. 14S	KP339	1
14	Retaining ring, WA514	KP75	28
15	Contact connection link	KP112GN3	1
16	Spring anchor pin	KP129GN3	1
17	Stop block	KP120GN3	1
18	Stl rivet—3/16" x 1"	KP253	2
20	Stl hex cap scr—3/8"—16UNC2A x 3"	KP747	8
21	Med stl lock washer—3/8" x .141" x .094"	KP1108	8
22	Spacer	KP109GN3	8
23	Mech support plate	KP100GN3	1
24	Trip lever spring	KP122GN3	1
25	Stl lock washer—5/16" (with Item 26)		2
26	Machine screw and lockwasher—5/16"—18UNC2A x 1", lg, hex hd	KP115	2

Item No.	Description	Catalog Number	No. Per Section-alizer
27	Hex jam nuts—5/16"—18UNC2	KP1201	2
28	Plate (for clamping Item 24)	KP152GN3	1
29	Mech support bracket	KP101GN3	2
30	Hex nut, elastic stop—1/4"—20UNC2B	KP2020A3	1
31	Stl lock washer—1/4" x .109" x .062"	KP337	12
32	Stl hex cap scr—1/4"—20UNC2A x 5/8" black oxide	KP748	9
33	Stl hex car scr—1/4"—20UNC2A x 1" black oxide	KP749	1
34	Contact rod lever	KP103GN3	3
35	Pin, grooved	KP153GN3	3
36	Spring—long	KP98L	1
37	Latch lever	KP105GN3	1
38	Drive link	KP119GN3	1
39	Spring anchor pin	KP130GN3	1
40	Spring	KP12GH	1
41	Manual operating lever link	KP110GN3	1
42	Drive link pin	KP132GN3	1
43	Main shaft assem	KA5GN3	1
44	Pin	KP3124A14	1
45	Main closing spring	KP118GN3	1
46	Stl hex cap scr—3/8"—16UNC2A x 1-1/2"	KP750	1
47	Stl hex nut—3/8"—16UNC2B	KP594	1
48	Stop block and spring support	KP117GN3	1
49	Closing spring anchor pin	KP131GN3	1
50	Hex head P.A. mach scr and lock washer—5/16" x 1/2"	KP114	10
52	Latch mech bracket	KP106GN3	2
53	Brass cotter key—3/32" x 3/4"	KP304	1

SHOP MAINTENANCE—CONT'D.

BUSHINGS

If bushings have been damaged, complete assemblies can be installed or new porcelain only can be used. New gaskets should always be installed. Removal of the head mechanism is not required to change bushings.

1. Remove three hex cap screws that hold bushing clamps. Lift out entire assembly as demonstrated in Figure 23.
2. Twist aluminum clamping ring to remove it.

If a new bushing assembly is to be installed, position a new bushing gasket, and add the clamping ring. Then position the bushing. Add clamps and tighten bolts evenly.

If new porcelain only is to be used observe the following steps:

1. Remove, in order, from the lower end of bushing rod the hex nut, lock washer, flat washer, terminal lead, flat washer, and hex nut. See Figure 24.
2. Remove bushing terminal, and pull rod out the lower end of the porcelain.
3. Add new spacer washer between two C rings on the rod. Assemble parts in new porcelain by reversing this procedure. Use new terminal gasket.

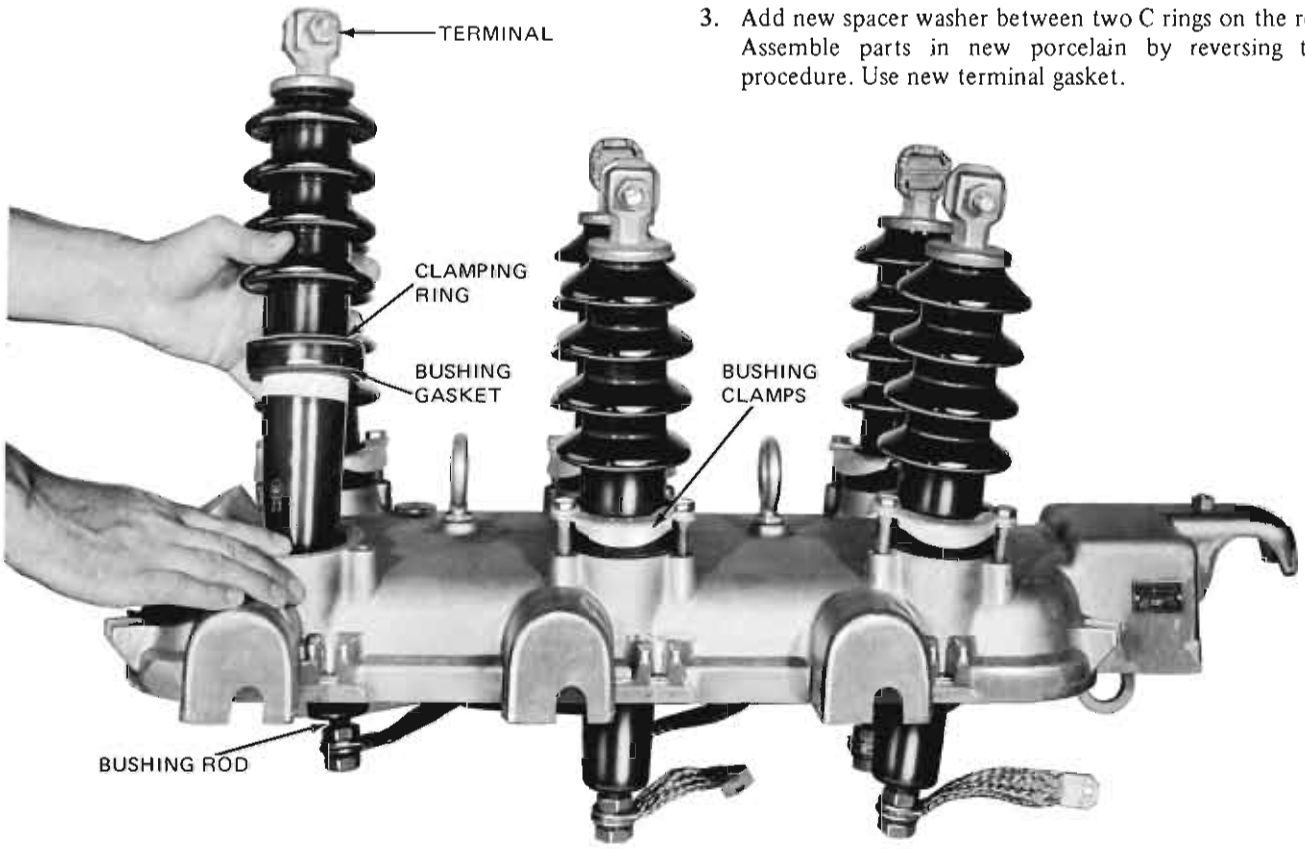


Figure 23
Taking out bushings.

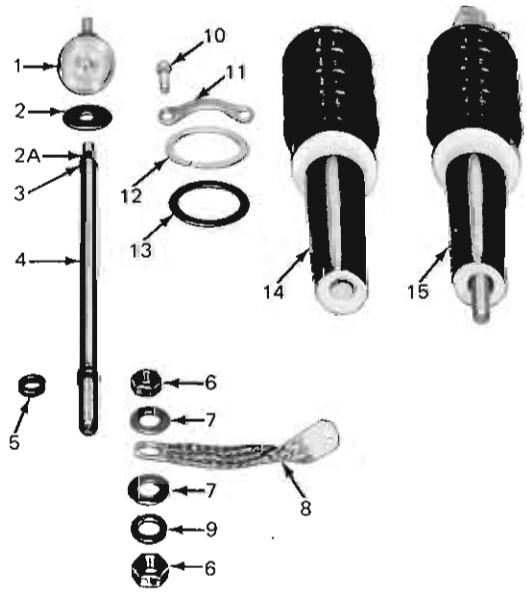


Figure 24
Bushing parts layout.

PARTS LIST – BUSHINGS

Item No.	Description	Catalog Number	No. Per Section-alizer
1	Bushing terminal	KA143L	6
2	Terminal gasket	KP2090A57	6
2A	Roll pin, 1/8 x 3/4, stl	KP502	6
3	Retaining ring, Type C, WA-522	KP933	18
4	Bushing rod	KP158GN3-1	6
5	Washer	KP2090A38	6
6	Jam nut, 1/2-13, brass	KP1202	12
7	Flat washer, 1/2", brass	KP560	12
8	Lead assembly	KP3251A42	*
9	Lockwasher, med, 1/2, bronze	KP542	6
10	Capscrew, 3/8-16 x 1-5/8, sst	KP414	18
11	Bushing clamp	KP41L	18
12	Clamping ring	KP121L	6
13	Bushing gasket	KP2090A29	6
14	Porcelain bushing	KP130VR	6
15	Bushing assy (includes Items 1, 2, 2A, 3, 4, 5 and 14)	KA160E4	6

*For 5—140-amp units, 12 are required; for 160—200-amp units, 18 are required.

HEAD CASTING AND ASSOCIATED PARTS

1. Drive out pin in operating lever as shown in Figure 25. Then drive out pin in crank lever as illustrated in Figure 26.
2. Slide operating lever off shaft. Remove plug in sleet hood and slide shaft out to release crank lever and spacer.
3. Head gasket, lifting lugs, nameplates, and adjustment screw can be removed if necessary.

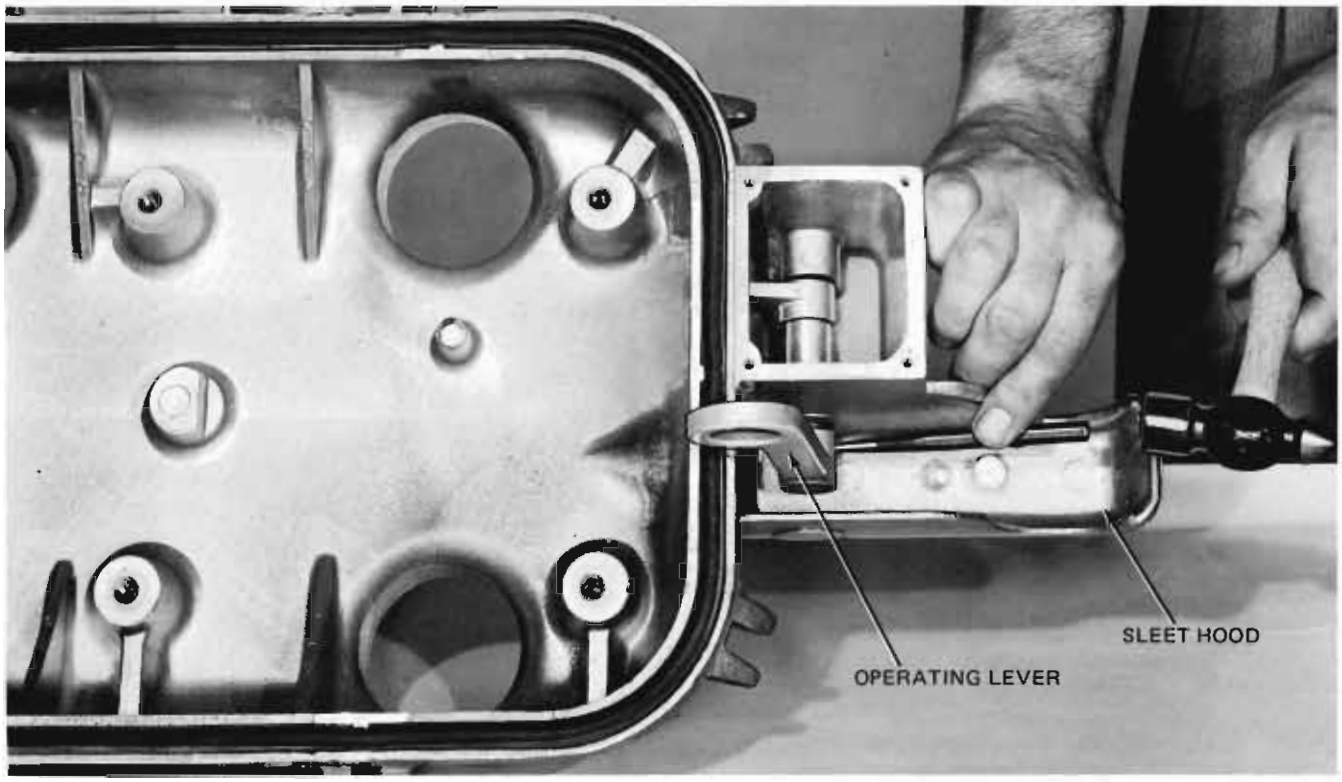


Figure 25
Operating lever removal.

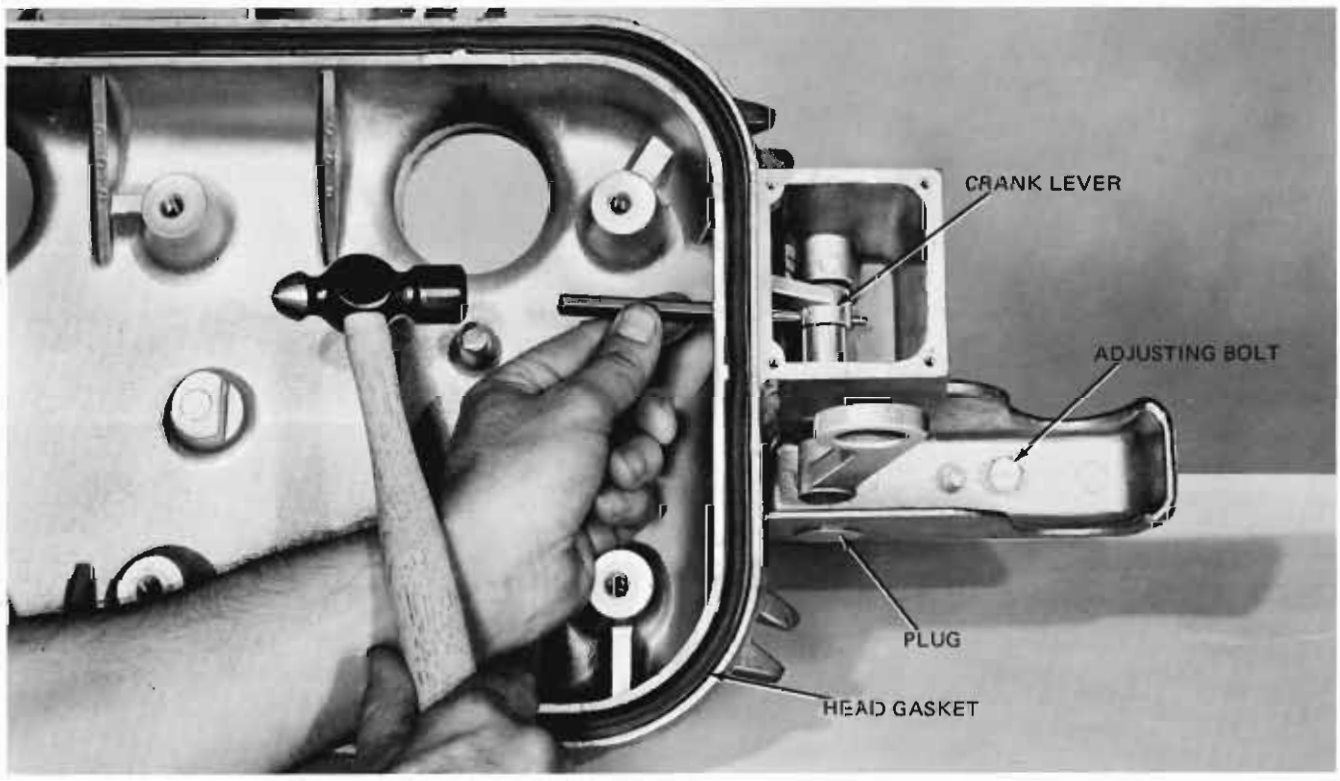


Figure 26
Driving out pin in crank lever.

SHOP MAINTENANCE—CONT'D.

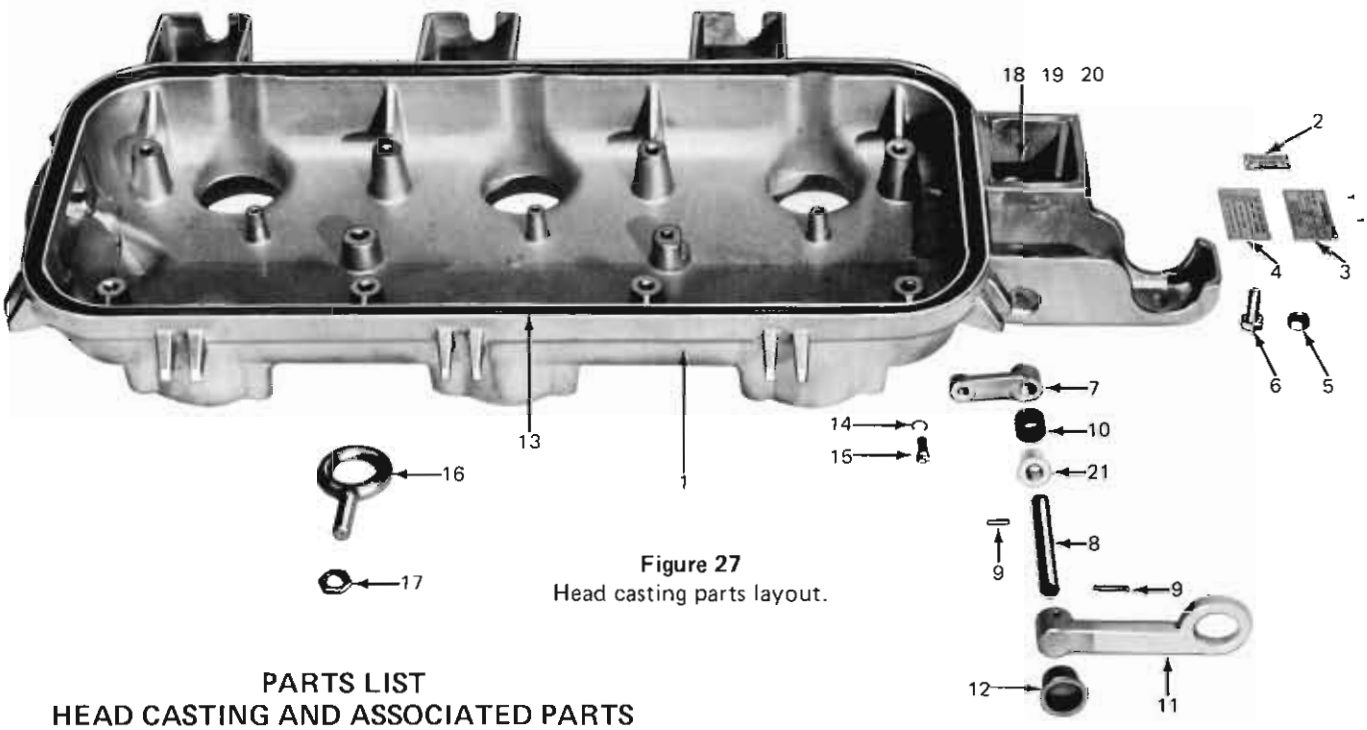


Figure 27
Head casting parts layout.

PARTS LIST
HEAD CASTING AND ASSOCIATED PARTS

Item No.	Description	Catalog Number	No. Per Section-alizer
1	Head casting (includes pressed-in handle shaft bushing)	KP136GN3	1
2	Operations-to-lockout data plate and two self-tapping scrs	KP207GH	1
3	Nameplate and two self-tapping screws	KP140GN3	1
4	Coil data plate and two self-tapping screws	KP138GN3	1
5	Hex nut, 3/8-16, stl	KP1215	1
6	Capscrew, 3/8-16 x 1", stl	KP1357	1
7	Crank lever	KP5H3	1
8	Shaft	KP139GN3	1
9	Roll pin—5/32" x 7/8", steel	KP507	2
10	Spacer	KP3182A2	1
11	Operating lever	KP6H3	1
12	Caplug	KP2073A15	1
13	O-ring head gasket	KP2103A6	1
14	Stl ret ring, WA516	KP76	4
15	Pin, groove	KP3125A10	1
16	Replaced by lifting lug kit	KA764H	2
17			
18	Sleet hood box cover plate (not shown)	KP31H3	1
19	Sleet hood box cover plate gasket (not shown)	KP32H3	1
20	Rd-hd mach screw No. 10—32 x 1/2" (not shown)	KP652	4
21	Bushing, operating shaft	KP3106A14	1

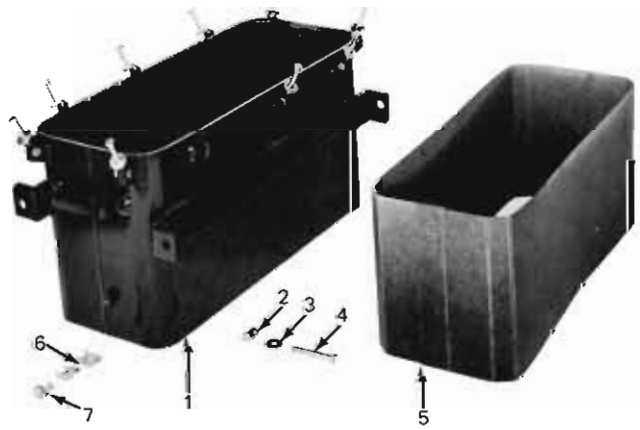


Figure 28
Tank assembly parts layout.

PARTS LIST – TANK ASSEMBLY

Item No.	Description	Catalog Number	No. Per Section-alizer
1	Tank assem, does not include Items 2, 3 and 4	KA2GN3	1
2	Combination nut and pin	KP3061A3	10
3	Washer	KP2028A33	10
4	Capscrew, 3/8-16 x 3", stl	KP1356	10
5	Tank liner assem	KA27GN3	1
6	Grounding clamp	KP226H	1
7	Capscrew, 1/2"—13 x 1" stl	KA1282	1

ADJUSTMENTS

Adjustments described in this section may be required when a unit has been disassembled or when new parts are installed.

CONTACT STRUCTURE

1. Separation between stationary and moving contacts must be about two inches when in the open position. Adjust by means of the stop bolt shown in Figure 29. Tighten locknut when adjustment is completed. This adjustment can be made on an assembled but untanked sectionalizer.
2. Contacts must be fully engaged when in the closed position.
3. Move manual operating lever slowly from open to closed position. Latching should be felt 1/32 to 1/16 inch before the lever contacts the stop bolt in the sleet hood. If necessary, adjust the stop bolt to achieve this dimension. Tighten locknut.

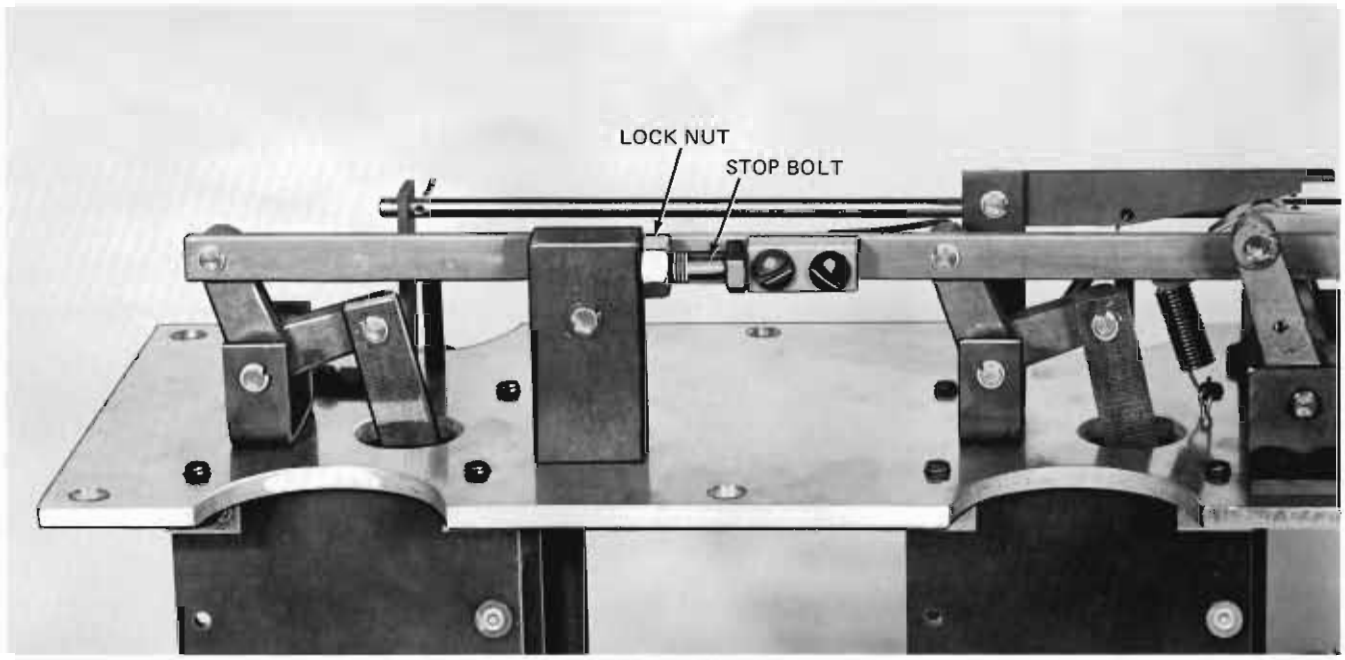


Figure 29
Contact stop adjustment.

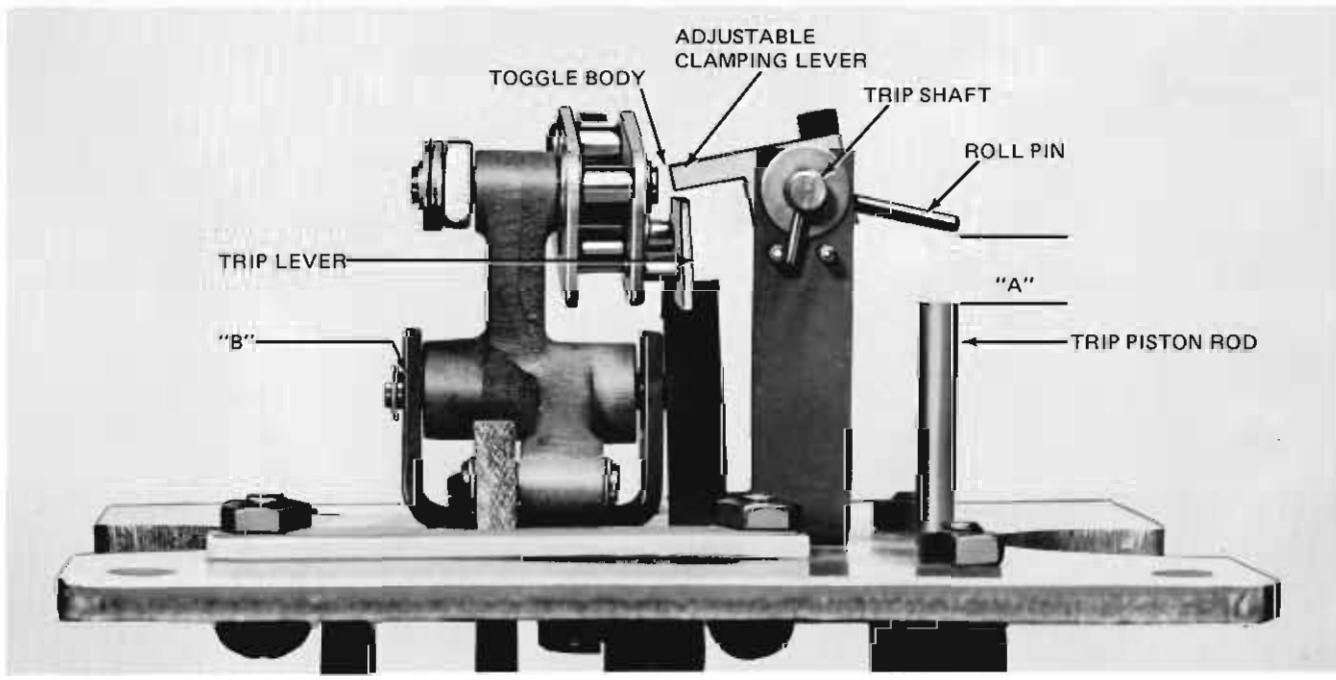


Figure 30
Normal spacing between trip rods and trip shaft roll pins.

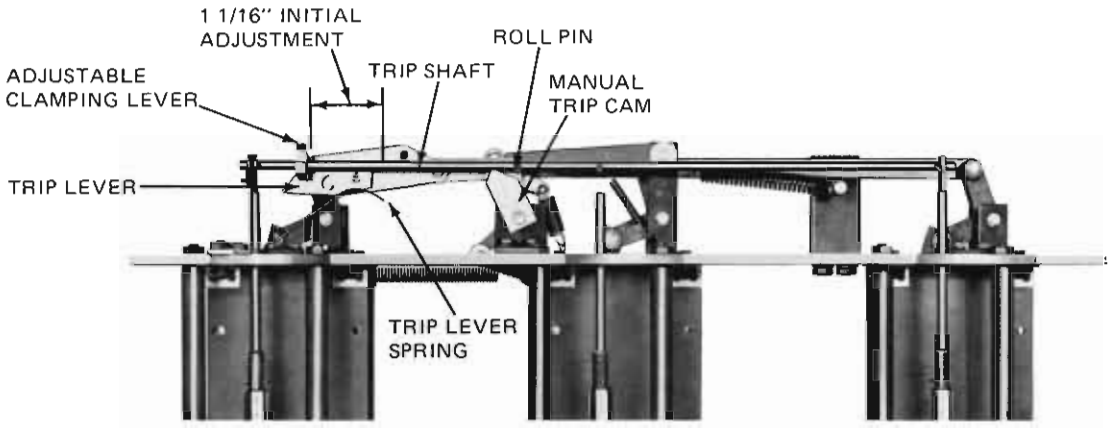


Figure 31
Adjustment of clamping lever, manual trip cam, and trip lever spring.

HEAD MECHANISM

Adjustment of the head mechanism can be performed on an assembled but untanked sectionalizer. Figures 30 and 31 show a sectionalizer with the head casting removed but this is for clarity only.

1. Check to see that the trip shaft, Figure 30, moves freely within its limited range. When all three trip pistons are fully settled, the trip piston rod ends should clear the roll pins in the trip shaft by the following amounts:

Clearance (Dimension "A", Figure 30)	Fault Current Pulses Before Lockout
1/32"	1
1/4"	2
15/32"	3

   If necessary, bend roll pins slightly to achieve the correct dimension.

2. Operate the sectionalizer manually and see that the manual trip cam rotates the trip shaft through its full range. Bend the associated roll pin to produce this result.

3. The adjustable clamping lever, Figure 31, should be adjusted initially as follows:

   A. Slide the adjustable clamping lever along the trip shaft until it is about 1-1/16 inch from the toggle latch pin when the sectionalizer is in the closed position.

   B. Push down on any of the four long roll pins in the trip shaft and rotate the adjustable clamping lever until it clears the trip lever by about 1/32 inch. Tighten the set screw. See Figure 30.

   Complete the adjustments described under paragraphs 4 and 5 which follow, and then perform electrical testing described in paragraph 6 to determine if further movement of the adjustable clamping lever is required.

4. Check to see that the toggle body clears the adjustable clamping lever by about 1/8 inch when the sectionalizer is being closed. If necessary, gain the required clearance by shifting one trip shaft bracket. Additional clearance can be gained by spacing the toggle body on its fastening shaft using washers provided.

5. See that the trip lever spring is free to move within its limited range. Position this spring so it contacts the trip lever about 3/16 inch from the toggle latch pin when the sectionalizer is closed. This dimension can be varied if necessary to obtain positive latch engagement when closing the sectionalizer. See Figure 31.

6. Test the sectionalizer electrically as follows:

   A. Prime the hydraulic mechanism as described in paragraph 10 on page 3.

   B. Test each phase by momentarily connecting a six-volt storage battery across bushing terminals. If the unit locks out after the correct number of current pulses, adjustments described previously are satisfactory. If it does not lock out correctly, some correction can be achieved by rotation of the adjustable clamping lever. Equalization between phases can be obtained by bending individual roll pins in the trip shaft.