DESCRIPTION • MAINTENANCE • ADJUSTMENT

INSTRUCTIONS

TYPE NF — A-C CONTACTORS

2 or 3 Pole **SIZES 6-7-8** **Rear Connected**

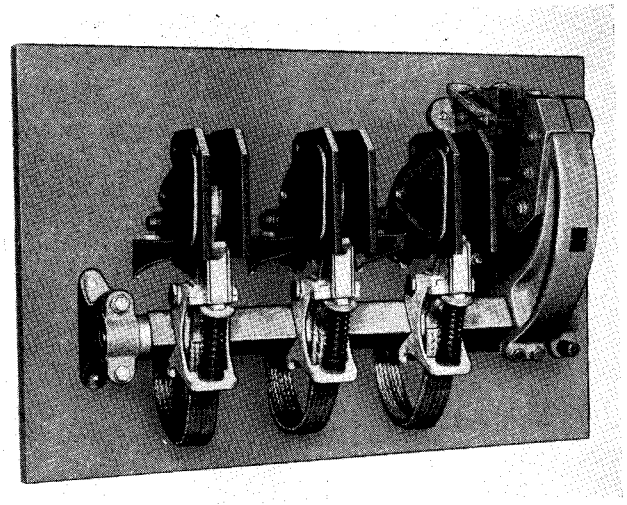

FIG. 1. Type NF-630 Contactor

TYPE NF SIZES 6, 7, or 8 CONTACTORS are a-c magnetic contactors designed for general purpose applications.

These contactors are insulated for 600 volts maximum. The a-c operating coils are designed for continuous duty and will operate the contactors at 85% to 110% of the rated voltage.

DESCRIPTION

The type NF contactors have a horizontal pole arrangement operated by a clapper type magnet. The contactor is available with either two or three poles and with or without magnetic blowout and arc boxes. All units are designed for mounting on an insulating panel up to two inches thick.

Magnet Frame. The magnet frame is made from high grade castings. The mating surfaces of magnet and armature are ground for a smooth, close fitting joint. All parts subject to corrosion except for working surfaces are protected by suitable treatment.

Arc Shield. The arc shield is molded from a very durable heat resisting compound and is securely fastened to the iron pole pieces of the blowout coil. The arc shield is hinged so that it may be easily raised by hand to make inspection and renewal of the contacts.

Contacts. The contacts are made from hard drawn copper strap of sufficient cross section to insure long contact life. They are designed to open with a rolling action so that the arcing occurs mostly at the extreme tip of the contact, and does not affect the current carrying surfaces. The contactor has been designed so that a slight wiping action is given to the contacts on opening and closing. This action insures a clean, low resistance contact area. A steel compression spring gives positive and sufficient contact pressure up to the maximum life of the contact and produces a quick opening of the contacts.

Shunts. The current carrying shunt is made from a flexible braided copper cable which gives complete freedom to the moving armature, and has ample capacity to withstand the maximum current for which the contactor is rated.

Table No. 1
RATINGS

	SIZE 6 NF620—2 POLES NF630—3 POLES		SIZE 7 NF720—2 POLES NF730—3 POLES		SIZE 8 NF820—2 POLES NF830—3 POLES	
	Open	Enclosed	Open	Enclosed	Open	Enclosed
Voltage, Maximum	600	600	600	600	600	600
8-Hour Rating, Amperes	600	540	900	810	1,350	1,215
1-Hour Rating, Amperes	800	720	1,200	1,080	1,800	1,620
Maximum Interrupting Amperes	10,000	10,000	10,000	10,000	13,500	13,500

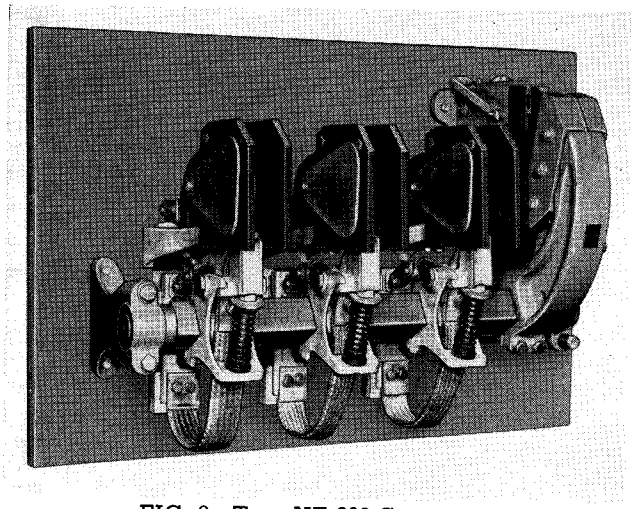

FIG. 2. Type NF-830 Contactor

MAINTENANCE

Cleaning. The contactor should never be cleaned with an oily rag or waste. A film of oil will collect dirt particles, which will decrease the creepage and may cause an arc between adjacent parts.

Bearings. The bearings of the armature shaft require no lubrication. Oil quickly collects dust which will, unless the parts are frequently cleaned, make the contactor sluggish in opening, thus causing the arc to hang on longer.

Arc Shields. The arc shields should always be down so that the arc is broken within the field of the blowout coil, otherwise the interruption will not be satisfactory. The shield should always be renewed before the molded material is burned away sufficiently to expose the steel pole pieces.

Operating Coil. The operating coil may be removed by taking off the two bearings which allows the armature to be lowered, and then disconnecting the terminal leads and removing the screws which hold it in place.

Magnet Gap. The magnet gap on these contactors should be approximately 3 7/16 inches, when the magnet is in the full open position, measured between the top edge of the magnet and the top edge of the armature. A greater gap may prevent the magnet from picking up on the minimum voltage for which the operating coil has been designed. The gap is adjusted by means of shims, S# 1599867, on the armature bracket tail piece.

Magnet Noise. Humming on an a-c contactor may develop. Should it become excessive, check to see if any of the following conditions exist:

1. The pole faces of the magnet may be corroded, which will not permit the magnet to seat properly.

2. The armature lever may be distorted through rough handling, which will not allow the armature to find a square seat. Check this by placing a sheet of paper between the two pole faces and close the magnet electrically, leaving an impression at the high points. Full contact is not actually necessary, but it should be over a large portion of the face.

3. The voltage may be below the minimum rating of the operating coil.

4. The shading coil on the magnet may be broken.

5. The spring pressure may be too high.

Failure to Close. A magnet may fail to close for any of the following reasons:

1. The lead wire to the operating coil may be disconnected.

2. The operating coil may be open circuited.

3. There may be mechanical friction.

4. The voltage may be below 85% of the rated voltage.

Failure to Open. Failure may be caused by mechanical interference or friction. The contacts may be welded together, or residual magnetism may be holding the magnet due to low spring pressure or insufficient air gap. The air gap measured on the inclined pole face should be between .046 and .086 of an inch.

Contacts and Spring Force. Use no oil or other lubricant on the copper contacts. The contacts normally wear to give the best contact surfaces without any attention. The roughened appearance of the contacts is no indication that good contact is not being obtained. Low spring force should be guarded against to avoid excessive heating of the contacts. Excessive heating increases the resistance, which may cause arcing and welding of the contacts.

To measure the spring force, when contacts are new, place a thin piece of paper between the contacts and close the contactor. Then measure the pounds pull necessary to separate the contacts by means of a hook spring balance attached to the moving contact at a point 1½ inches from the end of the moving contact as shown in Figs. 3 and 4. Read the pounds pull required at the instant the paper can be moved. The proper spring force for each size contactor is given below.

ADJUSTMENT—SIZES 6 and 7

The contact overtravel should be adjusted whenever new contacts are installed as well as part of

the usual periodic maintenance procedure. The overtravel is measured as indicated in Fig. 3. Before adjusting, the magnet gap should be checked as outlined above.

a. To adjust, close the contactor, then loosen the locknut on the eccentric pin on any pole and rotate the pin until the overtravel is $^{13}/_{32}$ of an inch.

b. With the operating coil de-energized, mechanically close the contactor until the contacts on the adjusted pole just touch.

c. Adjust the eccentric pins on the other poles until these contacts also just touch.

d. The final position of the eccentric should be such that the moving contact extends into the arc box as far as possible.

The contacts should be replaced when the overtravel is reduced to $^{3}/_{32}$ of an inch.

The contact spring force on these contactors should be between 55 and 61 pounds when measured at the point indicated in Fig. 3.

ADJUSTMENT—SIZE 8

The Size 8 contactor differs from Sizes 6 and 7 in that there are two contacts per pole—an arcing

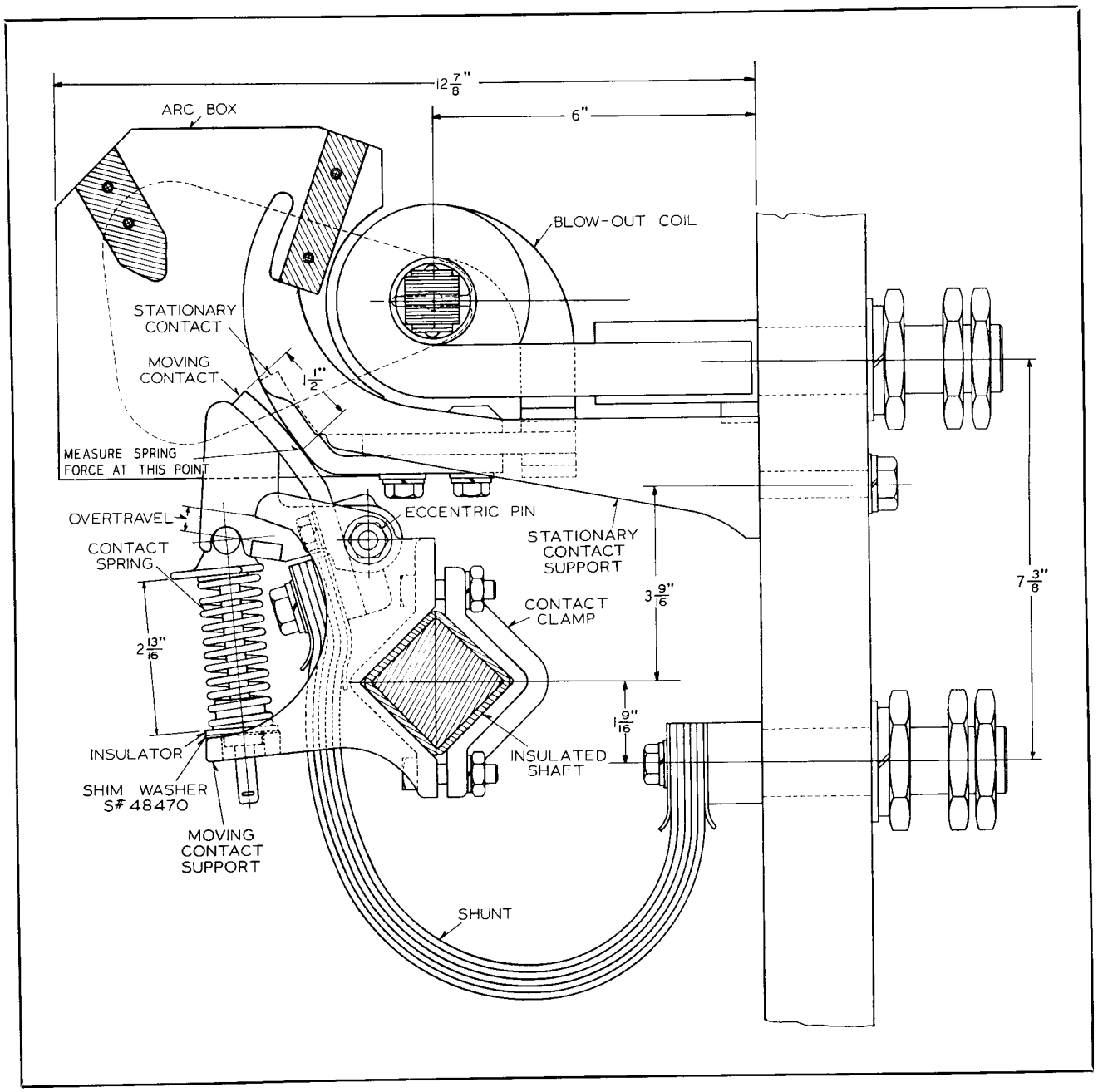

FIG. 3. Overtravel Adjustment on Sizes 6 and 7


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contact and a current-carrying contact. The current-carrying contacts have pure silver faces for low contact resistance.

To adjust these contacts proceed as follows on each pole:

a. Adjust the magnet gap as outlined above.

b. With main contact spring in place and magnet sealed, back off adjusting screw to provide at least 1/16 of an inch clearance between head of adjusting screw and contact clamp (See Fig. 4). Then determine number of shim washers S# 1603428 required under the main contact spring to give the 1 19/32 inches dimension for the spring length as shown in Fig. 4.

c. With contacts open, remove main contact spring by backing off adjusting screw. Install number of shim washers determined in Step (b).

d. Reinstall main contact spring.

e. With magnet sealed, set adjusting screw to provide the 1/16 ± .010 inch gap between adjusting screw head and contact clamp as shown in Fig. 4.

f. With the operating magnet gap set to 1.275 inches measured between the top edges of the magnet and armature, adjust the eccentric pins until the arcing contacts touch. The preferred adjustment is such that the moving contact extends into the arc box as far as possible.

g. Tighten locknut. Main contact gap should be a minimum of .115 of an inch when the arcing contacts just touch.

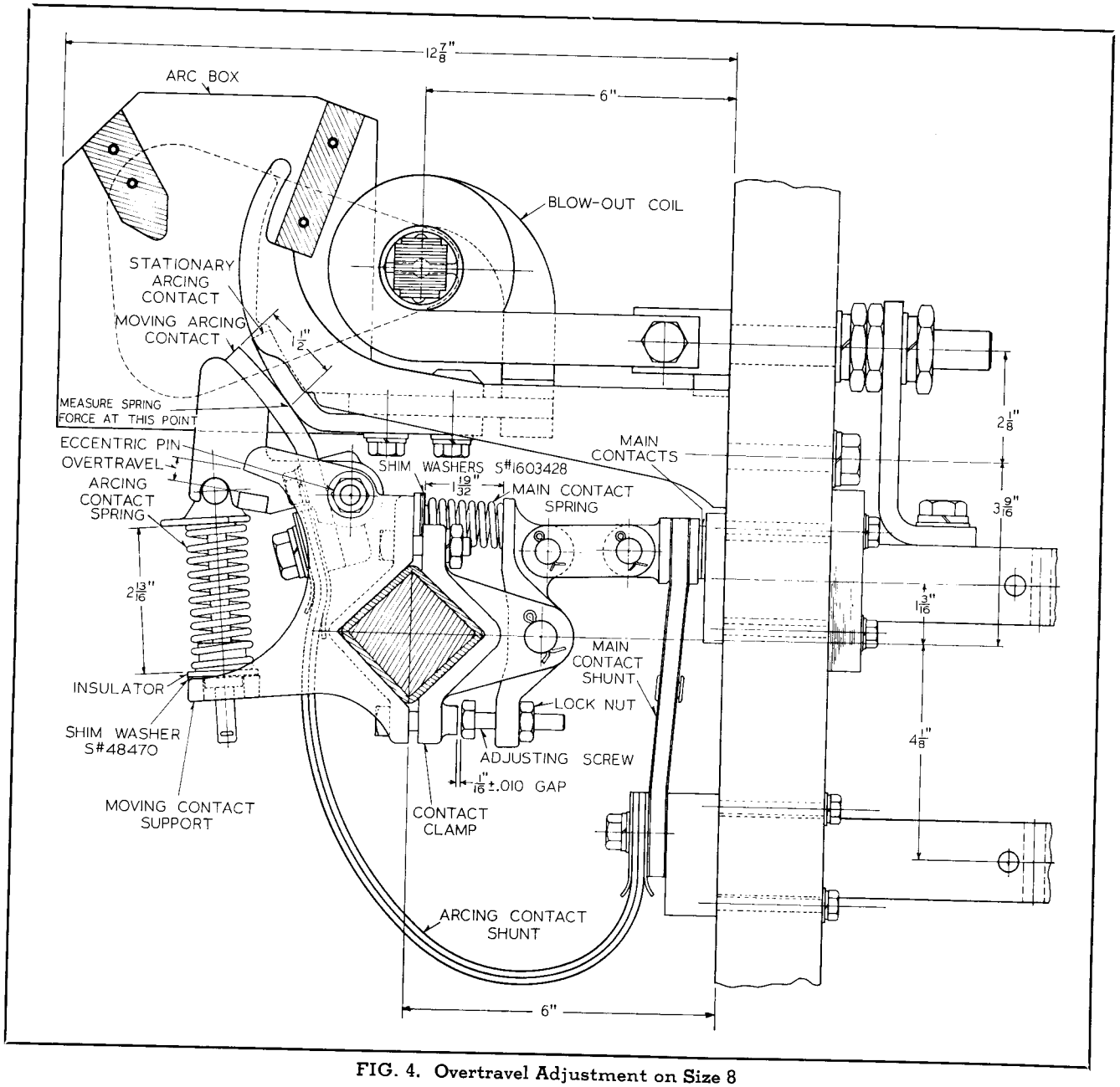

FIG. 4. Overtravel Adjustment on Size 8

h. With magnet sealed, adjust arcing contact spring to 2 13/16 inch dimension by changing shim washers S# 48470.

i. Armature should drop out freely from arcing contact touch point. Be sure there is no binding in linkage.

The arcing contacts should be replaced when the overtravel measured as shown in Fig. 4 is reduced to 3/32 of an inch. The current-carrying contacts should be replaced when the 1/16 ± .010 inch gap is reduced to .015 of an inch.

On Size 8 contactors, the arcing contact spring force should be between 30 and 35 pounds. On the main contact, it should be between 71 and 79 pounds.

ELECTRICAL INTERLOCKS

The three pole contactors will accommodate a total of 2 type L-61 electrical interlocks giving 4 separate circuits any of which may be normally open or normally closed. The two pole contactors will accommodate 1 type L-61 electrical interlock.

Installation. The interlocks are installed by mounting on the contactor panel between the poles of the contactor. The operating lever clamps on the contactor operating shaft. The interlock should be adjusted by loosening the locknut and adjusting the screw to give a maximum travel of 3/8 of an inch. Retighten the locknut. Be sure the interlock does not bottom when the contactor is closed.

Ordering Instructions. To order an interlock complete, order operating arm style number 1754174, plus one of the following interlock style numbers:

One normally open	S# 1486682
One normally closed	1486684
Two normally open	1490310
Two normally closed	1490312
One NO and One NC	1486686

MECHANICAL INTERLOCKS

A type M-16 mechanical interlock is available to insure against a pair of contactors being closed simultaneously. This interlock may be applied to any combination of NF sizes 6, 7 or 8 contactors and also NFD sizes 6, 7 or 8 contactors.

For interlocking any of the above contactors with an NF size 5, use type M-40 mechanical interlock.

Table No. 2

OPERATING COILS

RATING	STYLE NUMBER FOR TWO POLE CONTACTORS	STYLE NUMBER FOR THREE POLE CONTACTORS
110 V.—60 Cyc.	698112	421161
220 V —60 Cyc.	461728	418597
440 V.—60 Cyc.	286052	418598
550 V.—60 Cyc.	461800	461916
110 V.—25 Cyc.	.....	421162
220 V.—25 Cyc.	461729	402803
440 V.—25 Cyc.	462094	418599
550 V.—25 Cyc.	461731	418600

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