



TYPE KE AND KI ADJUSTABLE RELAYS

DESCRIPTION

Type KE relays are voltage sensitive adjustable relays.

Type KI relays are current sensitive adjustable relays.

These relays are available with one or two contact blocks. Each contact block may contain: One normally open circuit (1 NO), one normally closed circuit (1 NC), or one normally open and one normally closed circuit (1 NO & 1 NC).

RELAY ADJUSTMENT RANGES†

RELAY	PICK-UP ADJUSTMENT RANGE	DROP-OUT ADJUSTMENT RANGE
KE	20-134% of Rated Coil Volts*	4-70% of Rated Coil Volts
KI	20-134% of Rated Coil Amps*	4-70% of Rated Coil Amps

† Pick-up and drop-out adjustments are not independent of each other.

* Ratings above 100% are intermittent duty.

INSTALLATION AND ADJUSTMENT

Mount the relay vertically on a rigid support. Allowances for arcing clearance are not required.

With the relay power off, operate the relay by hand. It should operate freely. If it does not, check for binding in the armature knife edge and where the spring rod passes through the magnet frame. Check that all electrical connections are tight. Adjustments are not required since all KE and KI relays are normally factory adjusted to the specified pickup and/or dropout settings. If it should be necessary to change these settings, the following procedures should be used:

- I) Dropout adjustment
The relay dropout may be changed by adjusting the tension of the operating spring with adjusting knob (13) located on top of the relay. Increasing the spring tension increases the dropout value.
- II) Pickup adjustment
The relay pickup may be adjusted by changing the armature air gap. Adjusting knob #18 should be adjusted. Increasing the air gap increases the pickup value.
- III) Differential adjustment
Adjustment of the pickup to dropout differential is accomplished by using both of the above adjustment procedures. The dropout should be adjusted first and then the pickup.

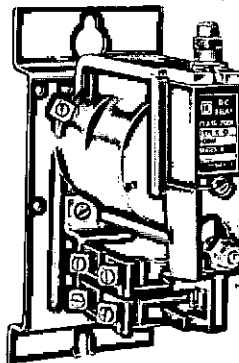
Although the KE and KI relays allow a large degree of adjustment, there may be situations where adjustment of the pickup and/or dropout characteristics is beyond the capabilities of the given relay. In these cases it may be necessary to change either the operating spring, core cap, operating coil, or any combination of these to get the desired operating characteristics.

NOTE: Make sure the jam nuts (12) are retightened after any adjustment is made to the relay.

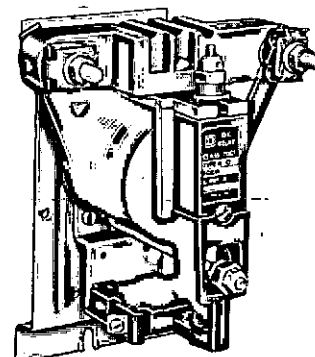
TROUBLESHOOTING

PROBLEM: Relay does not close when energized.

SOLUTION: Check the voltage or current at the operating coil terminals. An absence of voltage or current in-



Type KE0-22



Type KIO-01 with strap wound coil

dicates a fault elsewhere in the circuitry. If the coil voltage or current is normal, disconnect the coil leads and check the coil for continuity. See Coil Data Table. An open or shorted coil must be replaced.

REPAIR AND MAINTENANCE

The relay contacts consist of a copper body with a silver facing. Contacts must be replaced when the silver has worn off. Note: Do not clean the silver facing as the oxides of silver are conductive and discoloration is normal.

To replace contacts, proceed as follows using a screwdriver:

1. Loosen the two mounting bracket screws and remove the assembled mounting bracket (20).
2. Turn bracket over and remove two screws (21).
3. Remove contact block and replace with a new block.
4. Mount new contact block on mounting bracket (20). Orient the open side of the contact so it faces down.
5. Replace assembled mounting bracket on relay base. Fasten with the two captive screws.

Caution: Contact blocks should face open side down.

COIL REPLACEMENT

To replace the operating coil, proceed as follows:

1. Remove the coil leads. Grasp the operating arm (16) and also the adjustment knob (13) on top of the relay.
2. Pull down on the operator arm and lift the adjustment knob. (If this is not possible, see 2A.) Pull the entire assembly forward and it will snap free from the main part of the relay.
- 2A. When a strong operating spring (red) is used, it may not be possible to lift the adjustment knob (13). In this case, the adjustment must be changed. Back off or remove the lock nut (12). Mark the front of adjustment knob (13). Loosen adjustment knob and count the number of turns. Proceed as in 2 above.

(Cont'd on page 4)

PARTS LIST FOR TYPE KE AND KI ADJUSTABLE RELAYS

Item No.	Part No.	Description	No. Required 1 or 2 Contact Blocks	Item No.	Part No.	Description	No. Required 1 or 2 Contact Blocks
1	A51152-024-50	Assembled Base	1	16	C51152-009-01	Operator Arm	1
2		5/16"-18x7/8" Steel Hex Cap Screw	1	17		#10-24x1-1/4" Oval Head Screw	1
3		5/16" Plain Lock Washer	1	18	A51152-029-01	Adjusting Knob	1
4	A51152-007-01	Magnet Frame	1	19	A51139-108-01	Nameplate	1
4A	A51152-007-02	Magnet Frame	1	20	A51152-014-50	Assembly Mounting Bracket	1
5	A51152-025-50	Assembled Coil Core (Long)	1	*21		#10-24x5/8" Pan Head Screw	
5A	A51152-075-50	Assembled Coil Core (Short)	1†		Class 9999	Assembly (2 Req'd.)	
5B	A51152-037-51	Assembled Coil Core (Long)	1	*22	Type KX-1 Kit	#10-24 Hex Nut (2 Req'd.)	
5C	A51152-037-50	Assembled Coil Core (Short)	1†	*23		Assem. Contact Block, 1 N.O. Contact	
6	A51017-041-01	Spring Washer	1	*21		#10-24x5/8" Pan Head Screw	
7	▲	Assembled Operating Coil	1		Class 9999	Assembly (2 Req'd.)	
* 7A	▲	Assembled Operating Coil (Strap Wound)	1	*22	Type KX-2 Kit	#10-24 Hex Nut (2 Req'd.)	
8	A51152-023-01	Core Cap (Steel)	1	*24		Assem. Contact Block, 1 N.C. Contact	1 or 2 As Required
8A	A51152-059-01	Core Cap (Aluminum)	1	*21		#10-24x5/8" Pan Head Screw	
8B	A51152-038-01	Core Cap (Aluminum)	1†		Class 9999	Assembly (2 Req'd.)	
9	A51152-022-01	Core Cap Spacer (Stainless Steel)	1	*22	Type KX-3 Kit	#10-24 Hex Nut (2 Req'd.)	
* 9A	A51152-153-01	Core Cap (Chrome Plated Steel)	1	*25		Assem. Contact Block, 1 N.O. and 1 N.C. Contact	
10		1/4"-20x3/4" Flat Head Brass Nylock Screw	1	26	C51152-032-50	Terminal Block (300A Max.)	2**
11	A51152-008-01	Armature	1	26A	C51152-032-51	Terminal Block (300A and up)	2**
12	23201-00210	1/4"-28 Jam Nut	2	*27		1/4"-20-3/4" Round Head Steel Screw	2**
13	A51152-030-50	Assembled Adjusting Knob	1			1/4" Plain Lock Washer	2**
14	B50502-601-40	Operating Spring (Red)	1	*28			
	B50502-601-41	Operating Spring (Yellow)	1	29	A51152-042-01	Insulator	1
	B50502-601-42	Operating Spring (Blue)	1	30	A51152-039-01	Insulator Tube	1
15	A51152-013-50	Assembled Spring Adjustment Rod	1	31	A51152-040-01	Coil Insulator	2

* Essential Parts For General Maintenance.

▲ See Coil Data For Selection.

■ Standard hardware. Listed without a Square D part number should be obtained from a local hardware supplier.

† Short Coil Core Used Only With Core Cap 8B.

** Used Only When Strap Wound Series Coil Is Used.

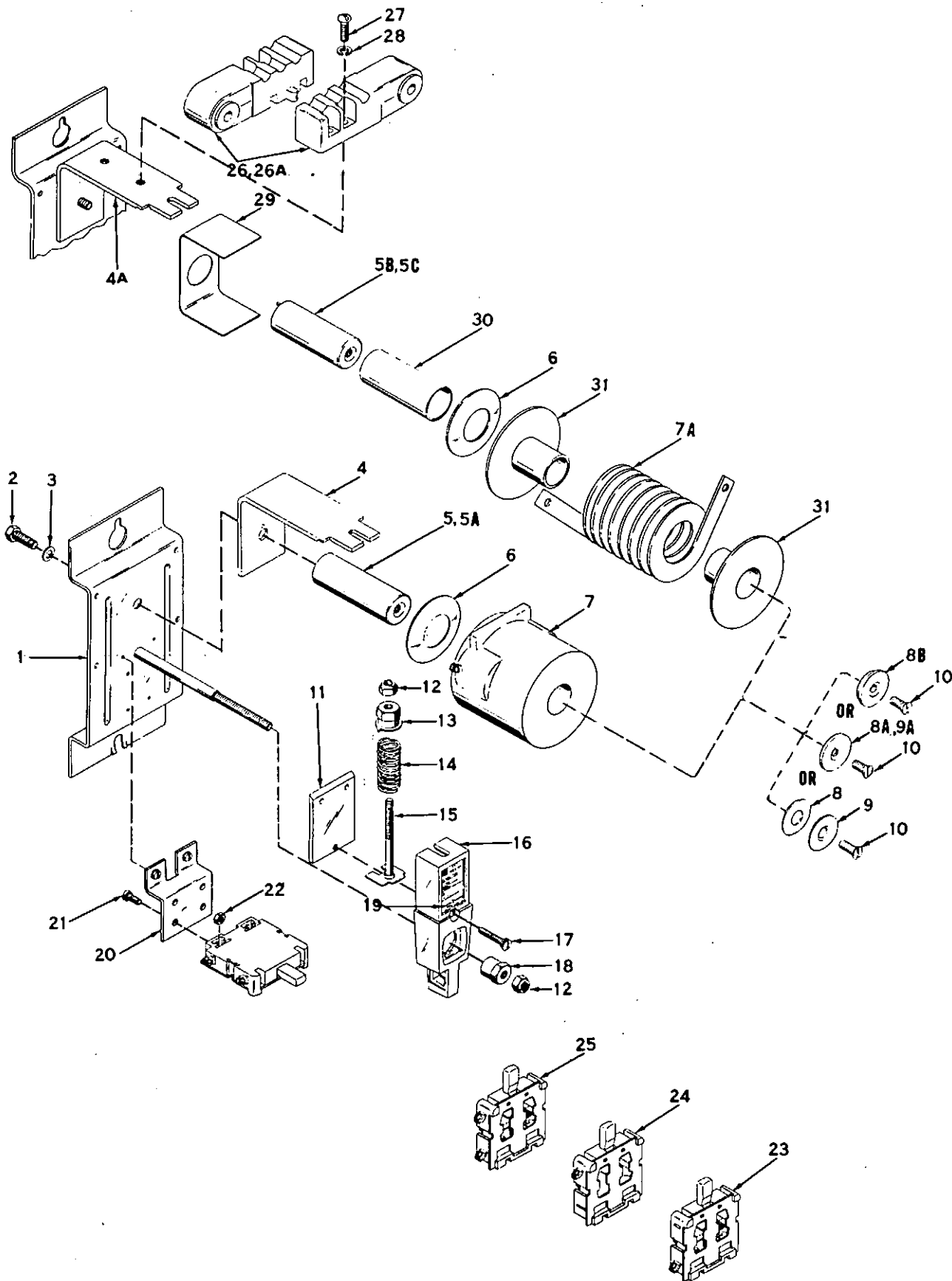
• Minor Revision Since Previous Issue.

COIL DATA

COIL PART NO.	COIL RATING (CONTIN.)	COIL RES. (COLD)
A51017-067-50	300 V	2050 Ohm
A51017-056-50	240 V	1619
A51017-067-52	190 V	863
A51017-067-53	150 V	547
A51017-056-51	120 V	437
A51017-067-55	100 V	226
A51017-067-56	75 V	140
A51017-067-57	60 V	90
A51017-067-58	45 V	57
A51017-067-59	36 V	36
A51017-067-60	24 V	13
A51017-067-61	12 V	3.5
A51017-067-62	6 V	0.88

COIL PART NO.	COIL RATING (CONTIN.)	COIL RES. (COLD)
A51152-077-50	0.39A	177
A51152-077-51	0.49A	110
A51152-077-52	0.62A	71
A51152-077-53	0.77A	46
A51152-077-54	0.97A	29
A51152-077-55	1.2 A	17
A51152-077-56	1.6 A	10
A51152-077-57	2.0 A	6.7
A51152-077-58	2.4 A	4.5
A51152-077-59	3.1 A	2.8
A51152-077-60	3.8 A	1.8
A51152-077-61	4.9 A	1.1
A51152-077-62	6.1 A	0.69
A51152-077-63	7.8 A	0.44
A51152-077-64	9.9 A	0.27

COIL PART NO.	COIL RATING (CONTIN.)	NO. OF TURNS
A51152-078-50	12.5A	200
A51152-078-51	16.0A	156
A51152-078-52	20.8A	120
A51152-078-53	26.8A	93
A51152-078-54	35.2A	71
A51152-078-55	45.3A	55
A51152-078-56	58.0A	43
A51152-078-57	75.6A	33
A51152-079-01	114A	25.5
A51152-079-02	172A	16.5
■ A51152-079-04	200A	13.5
A51152-079-03	258A	10.5



REPAIR AND MAINTENANCE (cont'd.)

3. Remove screw (10), holding the core cap (8) and core cap spacer (9). Observe the number and order of core caps and core cap spacers.
4. Remove the core cap and core cap spacer. Note: Some relays use only a single core cap (8A, 8B) and no core cap spacer.
5. Remove the operating coil (7, 7A) and replace it with a new coil.
6. Replace the core cap (8) and core cap spacer (9). Fasten with screw (10). Connect coil leads.
7. To reassemble relay, grasp operating arm and lift the adjustment knob. Replace assembly on relay.

8. No adjustments are necessary since the adjustments were not disturbed during the coil change.

8A. If adjustment was changed per 2A, return adjustment to original setting by tightening adjustment knob same number of turns as loosened in 2A. Lock adjustment knob (13) with lock nut (12).

Caution: The two projecting points on the bottom of the adjusting knob (13) must be properly seated in the two slots on top of magnet frame (4).

LUBRICATION

The Type KE and Type KI relays require no lubrication.