

SHUNT TRIP DEVICE FOR K-LINE<sup>®</sup> CIRCUIT BREAKERS<sup>™</sup>

## INTRODUCTION

The shunt trip device, as used on the K-line circuit breakers, is used to trip the circuit breaker electrically by means of an electrical contact from a remote control station. This tripping contact may be in a form of a simple pushbutton switch contact or it may be a contact in an elaborate relay scheme.

Tripping energy for the shunt trip is usually in the form of a storage battery, control power transformer, or a d-c generator source.

The K-Line shunt trip as shown in Fig. 1 is a compact and simple unit which operates directly upon the mechanism latch. This insures dependable, trouble-free tripping of the circuit breaker contacts. Ready attachment of the shunt trip device provides convenient addition or replacement. One design of shunt trip is used on the entire line, which simplifies the stocking of replacement units.

## DESCRIPTION AND OPERATION

Principle component parts of the K-Line shunt trip are:

- (a) Magnet structure including plunger
- (b) Operating coil
- (c) Tripping linkages
- (d) Tripping adjusting rod

The magnet structure is essentially a solenoid type design and is constructed of a cylindrical plunger operating in a U-shaped magnet frame. Energizing the coil (9) Fig. 2 causes the plunger (8) to move upward. This motion is transferred by linkage (7) to the trip rod (5) which serves to rotate the mechanism latch (3) in a tripping direction. The operating coil (9) is bobbin-wound, and covered with a thermo-setting glass tape. This provides a sturdy compact moisture-excluding construction. Type "T" lead wires are furnished.

The tripping adjustment is made from above by means of a screw driver. A nylon lock-nut (6) is used to maintain this adjustment. The surface area on the bottom of the trip rod (5) is extra large to insure positive engagement with the mechanism latch trip extension (4). The extension spring (2) is used to return the plunger (8) to its normal de-energized position.

The shunt trip device is always located on the lefthand side of the circuit breaker mechanism. The device is readily and securely attached to the side plate (1) by a key extension and one fastening screw.

\*Includes K-DONE<sup>®</sup> and KSP<sup>™</sup>

## CURRENT REQUIREMENTS

The current requirements of the shunt trip at various nominal voltages and the corresponding voltage range through which they must operate are:

Nominal Control Voltages	Nominal Current		Operating Range
	K-225 to K-2000	K-3000 & K-4000	
48 Volt dc	3.14	5.0	28-50
125 Volt dc	1.3	2.0	70-140
250 Volt dc	.65	1.0	140-280
115 Volt ac	6.5	10.0	50-125
230 Volt ac	1.15	1.84	150-250

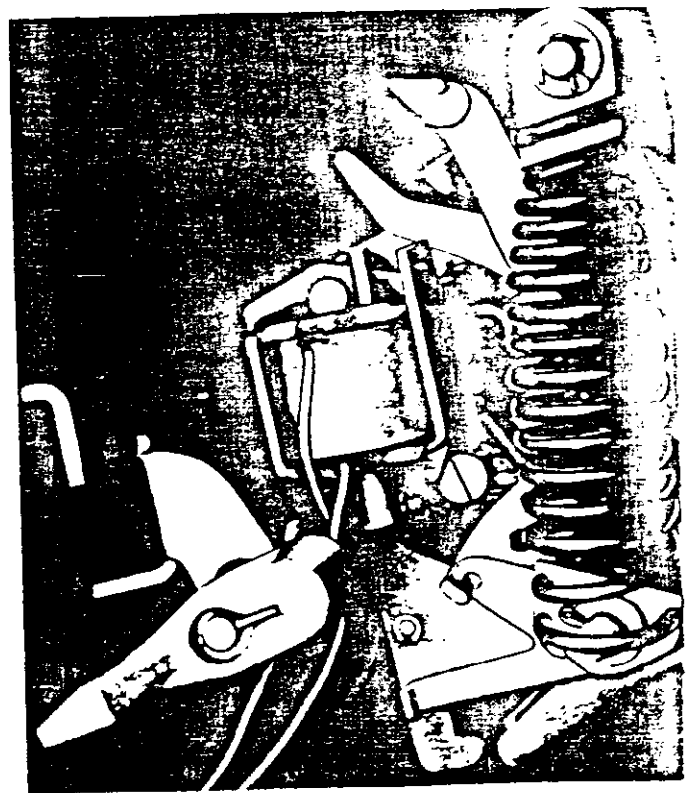


Fig. 1-Shunt trip device for K-Line Circuit Breakers.

It should be observed, that the operating coil is designed for intermittent duty, and that the operating current is interrupted by a normally open contact on the auxiliary switch of the circuit breaker. Starting from zero, the time to trip open the circuit breaker contacts by the shunt trip device is approximately



## SHUNT TRIP DEVICE (Cont.)

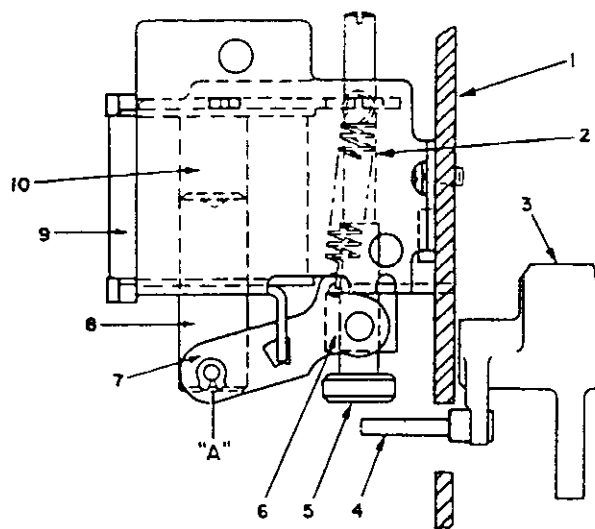
0.0167 seconds. The total time of current flow in the operating coil is approximately 0.022 seconds.

## FACTORY TESTS

Each shunt trip device is factory tested for proper operation over the required voltage range, and for proper insulation by means of dielectric tests.

## REPLACEMENT PARTS

The shunt trip device for K-Line circuit breaker is an integral designed unit. If for any reason, part of the unit must be changed, then it is recommended that a complete new trip unit be installed. We recommend this policy, because of the "staked" construction used in the assembly of the unit.



## LEGEND

- |                               |                   |
|-------------------------------|-------------------|
| 1. L. H. mechanism side plate | 6. Lock-nut       |
| 2. Spring (trip link)         | 7. Trip link      |
| 3. Latch bar (mech.)          | 8. Plunger        |
| 4. Trip extension (latch bar) | 9. Operating coil |
| 5. Trip adjusting rod         | 10. Magnet frame  |

Fig. 2 - Shunt trip device for K-Line Circuit Breakers.