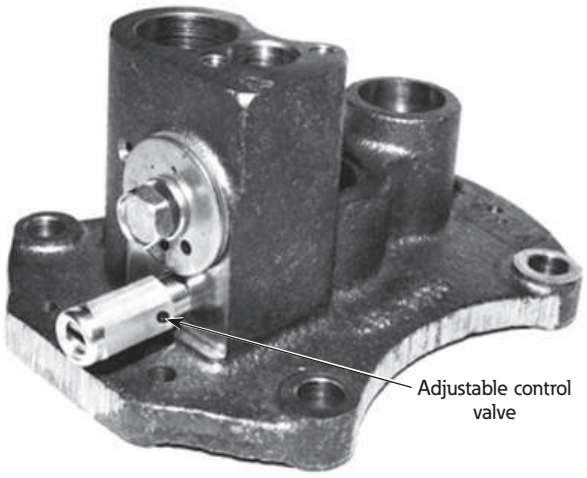
Types H, 3H, 4H, V4H, 6H, and V6H Reclosers Adjustable Control Valve Kits KA722H4-1, -2, and -3 Installation and Adjustment Instructions



Powering Business Worldwide

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Contents

Safety for life

Eaton meets or exceeds all applicable industry standards relating to product safety in its Cooper Power™ series products. We actively promote safe practices in the use and maintenance of our products through our service literature, instructional training programs, and the continuous efforts of all Eaton employees involved in product design, manufacture, marketing, and service.

We strongly urge that you always follow all locally-approved safety procedures and safety instructions when working around high-voltage lines and equipment, and support our "Safety For Life" mission.

Safety information

The instructions in this manual are not intended as a substitute for proper training or adequate experience in the safe operation of the equipment described. Only competent technicians who are familiar with this equipment should install, operate, and service it.

A competent technician has these qualifications:

- Is thoroughly familiar with these instructions.
- Is trained in industry-accepted high- and low-voltage safe operating practices and procedures.
- Is trained and authorized to energize, de-energize, clear, and ground power distribution equipment.
- Is trained in the care and use of protective equipment such as arc flash clothing, safety glasses, face shield, hard hat, rubber gloves, clampstick, hotstick, etc.

Following is important safety information. For safe installation and operation of this equipment, be sure to read and understand all cautions and warnings.

Hazard Statement Definitions

This manual may contain four types of hazard statements:

DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in equipment damage only.

Safety instructions

Following are general caution and warning statements that apply to this equipment. Additional statements, related to specific tasks and procedures, are located throughout the manual.

DANGER

Hazardous voltage. Contact with hazardous voltage will cause death or severe personal injury. Follow all locally-approved safety procedures when working around high- and low-voltage lines and equipment. G103.3

WARNING

Before installing, operating, maintaining, or testing this equipment, carefully read and understand the contents of this manual. Improper operation, handling, or maintenance can result in death, severe personal injury, and equipment damage. G101.0

WARNING

This equipment is not intended to protect human life. Follow all locally-approved procedures and safety practices when installing or operating this equipment. Failure to comply can result in death, severe personal injury, and equipment damage. G102.1

WARNING

Power distribution and transmission equipment must be properly selected for the intended application. It must be installed and serviced by competent personnel who have been trained and understand proper safety procedures. These instructions are written for such personnel and are not a substitute for adequate training and experience in safety procedures. Failure to properly select, install, or maintain power distribution and transmission equipment can result in death, severe personal injury, and equipment damage. G122.2

Product information

Introduction

Service Information MN280017EN provides installation and adjustment instructions for adjustable control valves for the B, C, and D time-current curves. Carefully read and understand the contents of this manual.

The information contained in this manual is organized into the following major categories: *Safety Information, Product Information, Installation, Adjustments, and Testing.*

Read this manual first

Read and understand the contents of this manual and follow all locally approved procedures and safety practices before installing or operating this equipment.

Additional information

These instructions cannot cover all details or variations in the equipment, procedures, or process described, or provide directions for meeting every possible contingency during installation, operation, or maintenance. For additional information, please contact your Eaton representative.

Acceptance and initial inspection

Each adjustable control valve kit is in good condition at the factory and when accepted by the carrier for shipment.

Upon receipt, inspect the carton for signs of damage. Unpack the kit(s) and inspect it thoroughly for damage incurred during shipment. If damage is discovered, file a claim with the carrier immediately.

Handling and storage

Be careful during handling and storage of the kit to minimize the possibility of damage. If the valve is to be stored for any length of time prior to installation, provide a clean, dry storage area.

Standards

Eaton reclosers are designed and tested in accordance with ANSI® standards C37.60 and C37.85 and ANSI® guideline C37.61.

Quality standards

ISO 9001 Certified Quality Management System

Description

This kit includes instructions for adjustable control valves for the B, C, and D time-current curves. The adjustable control valve can be used to replace the high pressure control valve in Eaton's Cooper Power™ series Types H, 3H, 4H, V4H, 6H, and V6H reclosers.

The control valve adjusts the timing curves at the point where the valve opens (hydraulic pressure), as well as at the standard orifice.

For additional information on disassembly, reassembly, and testing procedures, refer to the appropriate instruction manual:

- *Service Information MN280050EN Types 6H and V6H Maintenance Instructions*
- *Service Information MN280052EN Types H, 4H and V4H Maintenance Instructions*

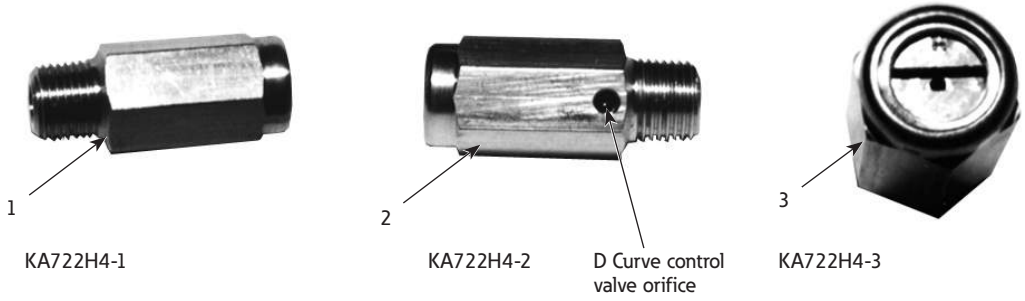

Figure 1. Adjustable control valve kits KA722H4-1, KA722H4-2, and KA722H4-3

Table 1. Adjustable Control Valve Kits KA722H4-1, KA722H4-2, and KA722H4-3

Item	Part Number	Description	KA722H4-1	KA722H4-2	KA722H4-3
1	KA96H4-1	B and C Time-Current Curve Valve (for Type 4H, V4H, 6H, and V6H)	1	–	–
2	KA97H4-1	D Time-Current Curve Valve (for Types 4H, V4H, 6H, and V6H)	–	1	–
3	KA250H1	B and C Time-Current Curve Valve (for Types H and 3H)	–	–	1
4	KA2048-425	Kit Instructions MN280017EN	1	1	1

Installation

⚠ CAUTION

Equipment damage. Keep work areas clean to prevent debris from accumulating on or in the hydraulic mechanism during disassembly and reassembly procedures. Failure to comply can result in hydraulic failure and recloser misoperation. T254.0

Refer to the appropriate maintenance manual for the step-by-step procedures to remove the recloser from service and for specific disassembly and reassembly procedures.

IMPORTANT

When installing this kit, use a clean, lint-free cloth to prevent contamination of the hydraulic mechanism during valve replacement.

For Types H, 4H and V4H reclosers, refer to *Service Information MN280052EN: Types H, 4H and V4H Maintenance Instructions*.

For Types 6H and V6H reclosers, refer to *Service Information MN280050EN: Types 6H and V6H Maintenance Instructions*.

⚠ WARNING

Hazardous voltage. De-energize the switchgear before installing this kit. Follow all locally approved safety practices and procedures when working around high voltage lines and equipment. Failure to comply can result in contact with high voltage, which will cause death or severe personal injury. T232.3

CAUTION

Follow all locally approved safety practices when lifting and mounting the equipment. Use the tapped lifting provisions provided. Lift the load smoothly and do not allow the load to shift. Improper lifting can result in equipment damage. G126.0

CAUTION

Equipment damage. Recloser must be open (yellow operating handle, under sleet hood, down) before untanking. Tripping the mechanism out of oil will cause excessive mechanical shock to the operating mechanism, which will cause accelerated wear and/ordamage to the mechanism. T202.0

⚠ CAUTION

Equipment damage. Refer to the specific switchgear unit maintenance manual for tanking/untanking procedures and related instructions. Failure to follow these instructions could result in equipment damage or personal injury. T238.0

The entire installation process should be conducted in a clean environment, such as a repair shop.

1. Bypass, trip, and de-energize the recloser.
2. Carefully transport the unit to a suitable service facility.
3. With the recloser in the open position, untank the recloser by loosening the head bolts and washers on the head casting. Carefully lift the head assembly out of the tank using the lifting lug(s).
4. Remove the control valve from the mechanism per the appropriate instructions as listed above.
5. Install the new control valve per the appropriate instructions as listed above.

Adjustments

The maximum full turns of the adjustable spring retainer on the B, C, and D time-current curve valves are 3-1/2 - from all the way out to all the way in. See Figure 2. Use a screwdriver and the specified drill bit for each of the time-current curve adjustments.

Note: Types H and 3H control valves are stamped with an H on the end of the valve. See Item 3 in Figure 1.

Type H control valves are designed so that the control valve can only be adjusted for the B and C time-current curves.

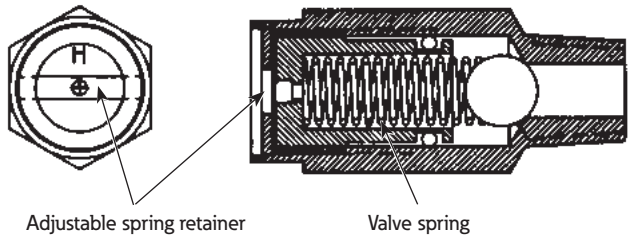

Figure 2. Adjustable control valve

"B" time-current curve adjustments (KA722H4-1 and -3)

1. Turn the adjustable spring retainer counterclockwise all the way out. See Figure 2.
2. Use a 0.067 inch drill bit (#51) and drill out the hole in the top of the valve.
3. It is very important that all metal drilling fragments be carefully removed from the control valve. Make certain fragments have not entered the orifices in the valve.
4. Turn the adjustable spring retainer clockwise 1-1/2 turns back in.
5. Screw the control valve into the mechanism.
6. Index the timing plate to the "B" Time-Current Curve.

"C" time-current curve adjustments (KA722H4-1 and -3)

1. Turn the adjustable spring retainer counterclockwise all the way out. See Figure 2.

Note: New control valve kits come with a 0.055 inch hole already drilled, so no drilling is necessary. Disregard steps 2 and 3 if the valve is already drilled.

2. Use a 0.055 inch drill bit (#54) and drill out the hole in the top of the valve.
3. It is very important that all metal drilling fragments be carefully removed from the control valve. Make certain fragments have not entered the orifices in the valve.
4. Turn the adjustable spring retainer clockwise 1-1/2 turns back in.
5. Screw the control valve into the mechanism.
6. Index the timing plate to the "C" Time-Current Curve.

"D" time-current curve adjustments (KA722H4-2)

There is a second orifice (hole) in the side of the D time-current curve valve that has been drilled to a 0.101 inch standard. See Item 2 in Figure 1.

1. Turn the adjustable spring retainer counterclockwise all the way out. See Figure 2.
2. Turn the adjustable spring retainer clockwise 1-1/2 turns back in.
3. Screw the control valve into the mechanism so that the orifice on the side of the valve is in either a horizontal or down position on the mechanism. See Figure 3.

Note: Do not set the orifice in a vertical (up) position on top of the valve.

4. Index the timing plate to the "B" Time-Current Curve.

IMPORTANT

To achieve the "D" Time-Current Curve, it is necessary to index the timing plate to the "B" Time-Current Curve.

5. If necessary, drill out the hole in the adjustable spring retainer at the top of the valve using a 0.055 inch drill bit (#54).

Note: If the timing is still too slow, increase the drill bit size until the proper timing has been achieved.

6. Carefully remove any metal fragments from the control valve.

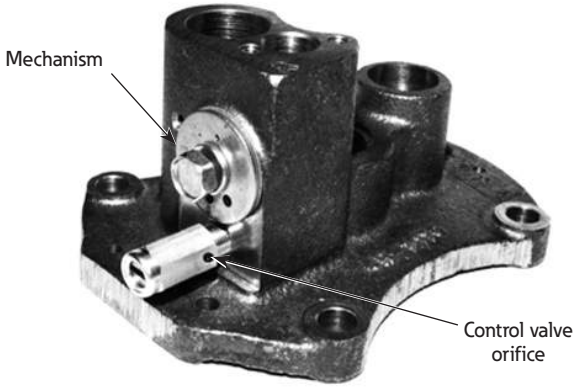

Figure 3. "D" Time-Current Curve orifice location

Testing

To test the recloser after the appropriate adjustable control valve kit has been installed, refer to the applicable instruction manual for further information:

- *Service Information MN280050EN: Types 6H and V6H Maintenance Instructions*
- *Service Information MN280052EN: Types 4, 4H and V4H Maintenance Instructions*

To verify "B" and "C" Time-Current Curves, refer to Reference Information R280-91-1 Types H (1Ø), 3H (3Ø) Time-Current Curves.

To verify the "D" Time-Current Curve, refer to Figure 4 below, or refer to Reference Information R280-91-2 Types 4H, V4H, PV4H, (1ø); 6H, V6H (3ø) Time-Current Curves.

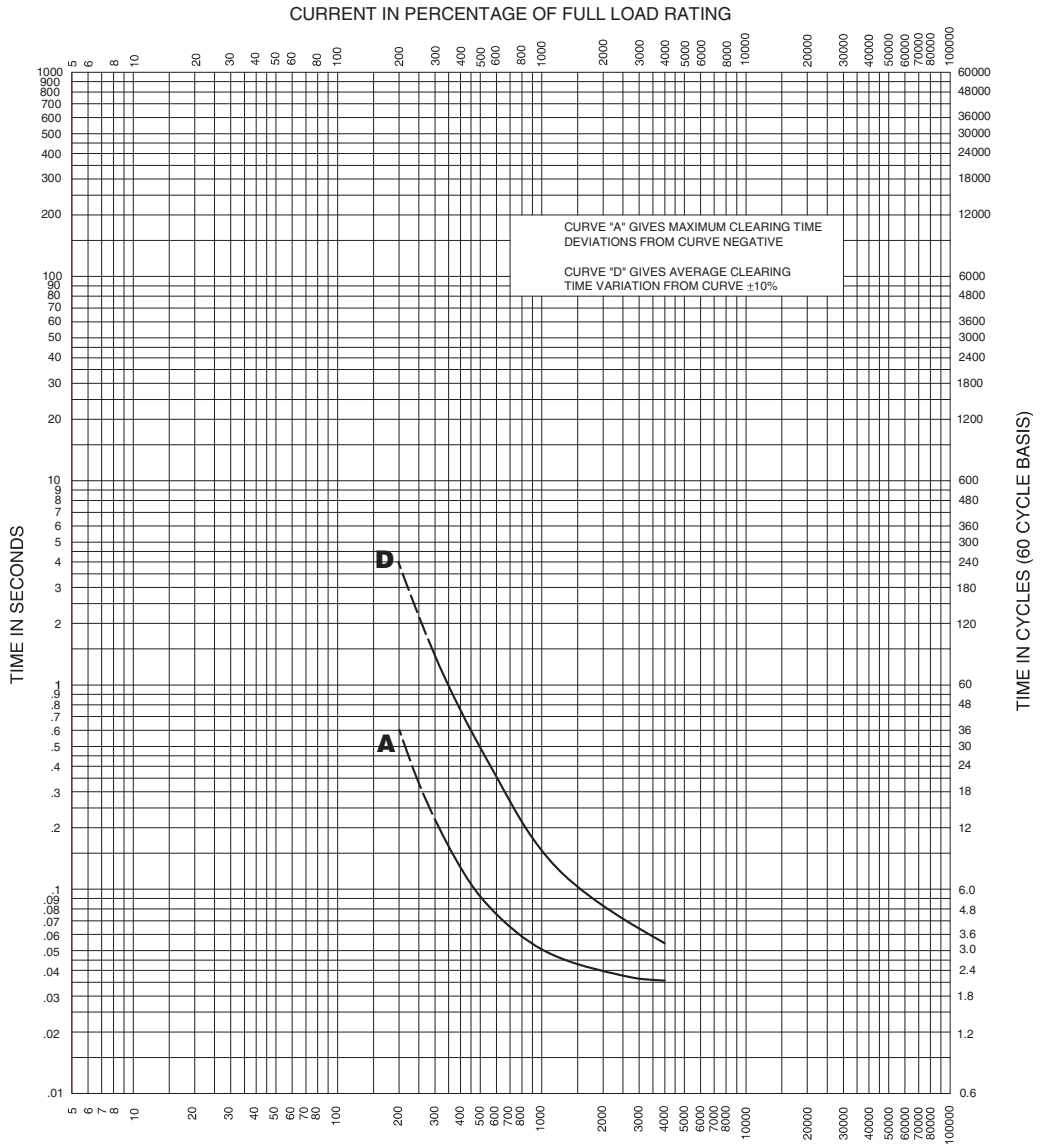

Figure 4. "D"TCC 466

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