

Types 4H and V4H, single-phase reclosers; Types 6H and V6H,
three-phase reclosers installation of KA705H4-1 and KA705H4-3
plunger and plunger stop kit

This document is applicable to product serial numbers beginning with the characters CP57. See page 2 for additional product serial numbers.



Powering Business Worldwide

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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.

G122.3

Product information

Introduction

Service Information MN280015EN provides installation instructions for KA705H4-1 and KA705H4-3 plunger and plunger stop kit for Eaton's Cooper Power™ series Types 4H and V4H single-phase reclosers and Types 6H and V6H three-phase reclosers.

IMPORTANT

For Types 6H and V6H three-phase reclosers, change out the plunger and plunger stop on all three phases even if the problem exists only on one or two phases.

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 nor to 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 plunger and plunger stop kit is inspected at the factory and is in good condition 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 kit is to be stored for any length of time prior to installation, provide a clean, dry storage area.

ANSI standards

Eaton's 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

Earlier Types 4H and 6H reclosers may have experienced an operational problem with the contacts sticking in the open position although the recloser has not locked out. To correct this, the design of the plunger and plunger stop was modified for all reclosers starting with the serial numbers specified.

Kit parts are provided for major components (refer to Table 1 and 2), as well as wear items such as gaskets and retaining rings. Disassembly of the recloser is required for installation of the parts in this kit.

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

- *Service Information S280-10-3 Types 4H (below Serial No. 69275) and V4H Maintenance Instructions (below Serial No. 7542)*
- *Service Information S280-10-9 Types 4H (Serial No. 69276 and above) and V4H Maintenance Instructions (Serial No. 7543 and above)*
- *Service Information S280-10-5 Types 6H and V6H Maintenance Instructions*

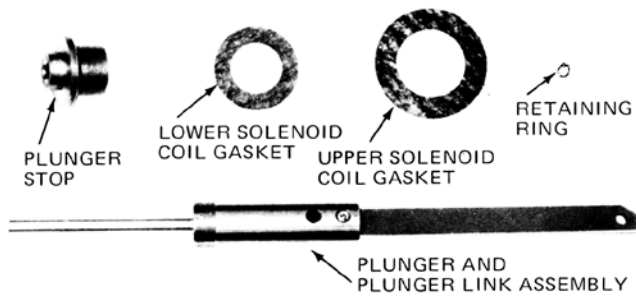


Figure 1. Components of KA705H4-1 Kit.

Table 1. Kit Parts for KA705H4-1

Description	Part No..	Quantity
Plunger Stop	4H00236001	1
Retaining Ring	KA20130008	1
Upper Coil Gasket	KA20900055	1
Lower Coil Gasket	KA20900060	1
Plunger Assembly	4HA0705901	1

Kit KA705H4-1 is applicable to the following reclosers:

- Type 4H: below Serial No. 62966
- Type V4H: below Serial No. 4491
- Type 6H: below Serial No. 11752 *
- Type V6H: below Serial No. 871 *

* Three kits are required for three-phase reclosers.

Table 2. Kit Parts for KA705H4-3

Description	Part No..	Quantity
Retaining Ring	KA20130008	1
Upper Coil Gasket	KA20900055	1
Lower Coil Gasket	KA20900060	1
Plunger Assembly	4HA0705903	1

Kit KA705H4-3 is applicable to the following reclosers:

- Type 4H: above Serial No. 62967
- Type V4H: above Serial No. 4492
- Type 6H: above Serial No. 11084 *
- Type V6H: above Serial No. 872 *

* Three kits are required for three-phase reclosers.

Kit 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

Disassembly

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.

- For Types 4H (below Serial No. 69275) and V4H (below Serial No. 7542) reclosers refer to *Service Information S280-10-3 Maintenance Instructions*.
- For Types 4H (above Serial No. 69276) and V4H (above Serial No. 7543) reclosers refer to *Service Information S280-10-9 Maintenance Instructions*.
- For Types 6H and V6H reclosers refer to *Service Information S280-10-5 Maintenance Instructions*.

IMPORTANT

For Types 6H and V6H three-phase reclosers, change out the plunger and plunger stop on all three phases even if the problem exists only on one or two phases.

⚠ 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

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.

⚠ CAUTION

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

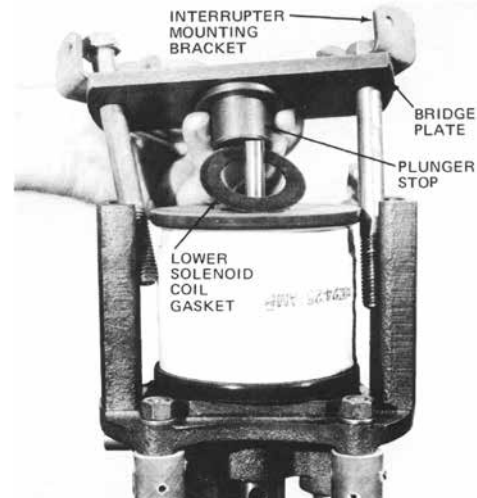


Figure 2. Removal of interrupter mounting brackets, bridge plate, plunger stop, and lower solenoid coil gasket.

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. Drain all oil from head assembly.

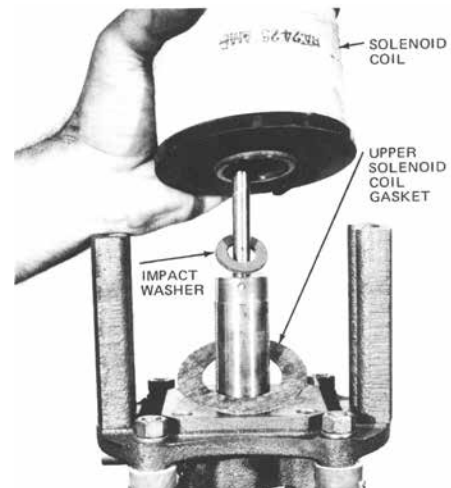


Figure 3. Removal of solenoid coil, impact washer, and upper solenoid coil gasket.

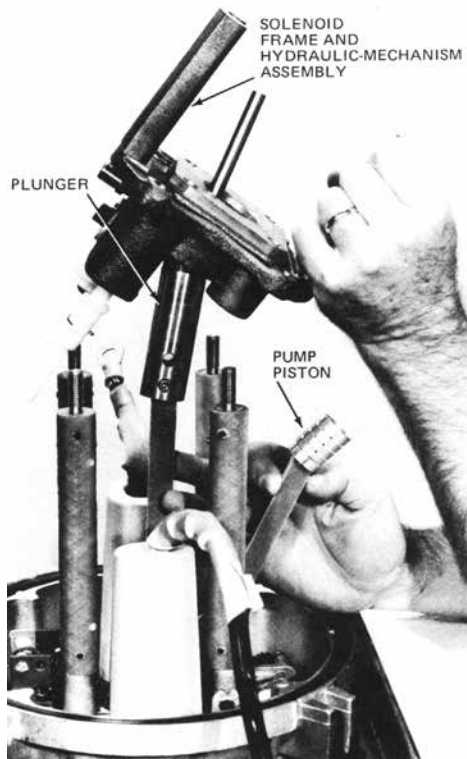


Figure 4. Removal of solenoid frame and hydraulic mechanism assembly.

5. Securely mount the mechanism upside down in a repair station.
6. Lock in the recloser by closing the yellow operating handle.
7. Disconnect the long bushing lead from one side of the interrupter assembly and the coil and coil gap leads from the other.
8. Remove the interrupter assembly by removing the four round-head screws that secure the assembly to the U-shaped mounting brackets (Figure 2).
9. Mark the position of the bridge plate and solenoid frame with a marker or scribe.

Note: The position of the bridge plate and the solenoid frame must be marked to ensure that the bridge plate is reinstalled in its original position for proper recloser operation.

10. Remove the two long hex-head bolts holding the bridge plate to the solenoid frame and remove the interrupter mounting brackets, bridge plate, and plunger stop (Figure 2).

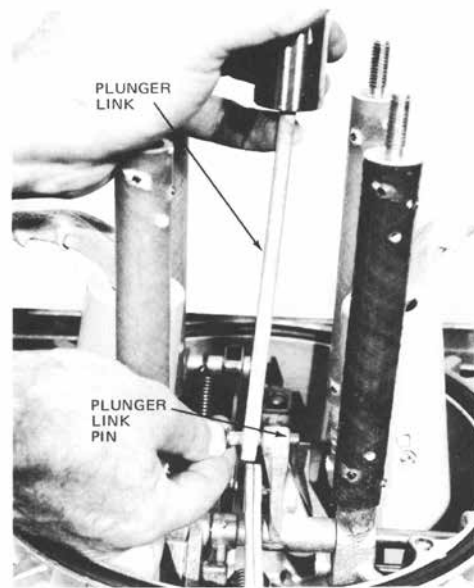


Figure 5. Removal of plunger link pin and plunger link.

11. Remove and discard the lower solenoid coil gasket.

Note: The upper and lower solenoid coil gaskets must be replaced whenever the solenoid coil is removed and reinstalled.

12. Disconnect the upper coil lead from the bushing and the coil gap leads.
13. Remove the solenoid coil and impact washer.
14. Remove and discard the upper solenoid gasket.
15. Trip open the recloser mechanism. While securely holding the yellow operating handle in the closed position, manually trip the lockout latch and then slowly release the operating handle.
16. Remove the four hex nuts and lockwashers that attach the solenoid frame to the support stringers and remove the assembly.

CAUTION

Equipment damage. Raise the solenoid assembly slowly to withdraw the plunger and pump piston assembly from their cylinders. Be careful to keep them from falling and being damaged. If either the solenoid assembly, plunger, or pump piston are nicked or damaged, the recloser can misoperate or fail to operate.

T243.1

17. Using a Waldes-Truac No. 02 pliers with a 90 degree tip or equivalent, remove the retaining ring from the plunger link pin which attaches the upper end of the plunger link to the operating mechanism.
18. Remove the plunger link pin and the plunger assembly (Figure 5).

Cleaning

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

CAUTION

Dielectric failure, equipment damage. Never use volatile solutions, detergents, or water-soluble cleaners when cleaning the interior of this equipment. These cleaners will contaminate the insulating oil, reducing its dielectric strength. Operation with contaminated insulating oil can result in internal flashovers that will cause equipment damage and possible personal injury.

T201.2

IMPORTANT

Use a clean, lint free cloth to prevent contamination of the hydraulic mechanism.

Clean all the locations in head casting and solenoid assembly where operating handle shaft, pump piston, plunger or bushings are installed. Make sure areas are clean of any dirt particles or shavings.



Figure 6. Check the plunger for binding.

Reassembly

1. Install the new plunger assembly with the beveled edge of the plunger link toward the pump piston link to allow clearance between the two links.

Fasten with the plunger link pin and secure the pin with a new retaining ring.
2. Attach the solenoid frame assembly to the support stringers with the four hex nuts and lockwashers.

Make sure both the plunger and the pump piston are inserted into their respective cylinders.
3. Lock-in the mechanism by closing the yellow operating handle.
4. Install a new coil gasket and reinstall the impact washer and the solenoid coil.
5. Install a new coil gasket and a new plunger stop and reinstall the bridge plate in its original position.
6. Reinstall the interrupter assembly mounting brackets and secure the brackets and bridge plate with the two long hex-head bolts. Tighten the bolts evenly.
7. Check the plunger for binding. Grasp the end of the plunger between the thumb and fingertips and move it up and down with a slight twisting wrist motion (Figure 6). The plunger should move freely without sticking.
 - A. If the plunger moves freely proceed to Step 8.
 - B. If the plunger is not moving freely, refer to the Service Information at the beginning of the Kit Installation section of this manual to replace the solenoid frame and the bridge plate assembly.
8. Loosen the two bolts slightly to allow the interrupter assembly mounting brackets to swivel and reinstall the interrupters assembly.

Tighten the four round-head screws first, then retighten the hex-head bolts evenly.
9. Reconnect the coil leads, the coil gap leads, and the bushing leads.

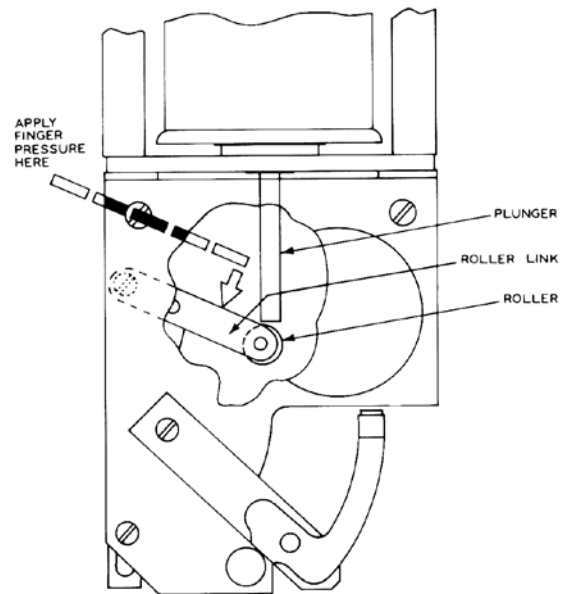


Figure 7. Final check of plunger operations.

10. After reassembly of the mechanism, turn the unit upright in the repair station for a final check of the plunger operations.
 - A. With the recloser still locked-in (yellow operating handle in the CLOSED position), insert two fingers into the back of the contact box assembly and push down on the roller link until the contacts open (Figure 7). The plunger will drop down to follow.
 - B. Release the roller link very slowly and check for plunger binding as it is being lifted by the roller link.
 - C. If contact hang-up or plunger binding is still detected, return the entire unit to the factory for a complete inspection.

Testing

After the plunger and plunger stop kit has been installed, the recloser must be tested to verify proper operation before re-tanking the mechanism and returning to service. For additional maintenance instructions refer to the **Disassembly** section at the beginning of **Kit Installation** section of this manual.

Safety requirements

To prevent accidental contact with high voltage parts, the recloser and high voltage transformer must be placed in a suitable test cage and all proper grounding procedures must be observed.

WARNING

Hazardous voltage. The switchgear (apparatus and control) and high-voltage transformer must be in a test cage or similar protective area to prevent accidental contact with high-voltage parts.

Solidly ground all equipment. Failure to comply can result in death, severe personal injury, and equipment damage.

T221.5

Refer to the recloser nameplate (located on the sleet hood) for the recloser serial number and product type and perform the following tests as instructed in the applicable recloser maintenance manual.

For additional information on low voltage AC testing of reclosers, refer to *Reference Data R280-90-2*.

1. Mechanical Operation Test.
2. High Potential Insulation Level Withstand Test.
3. Minimum-Trip Current Test.
4. Timing Characteristics Test.



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