



DESCRIPTION • OPERATION • MAINTENANCE INSTRUCTIONS

MECHANICAL RELIEF DEVICE

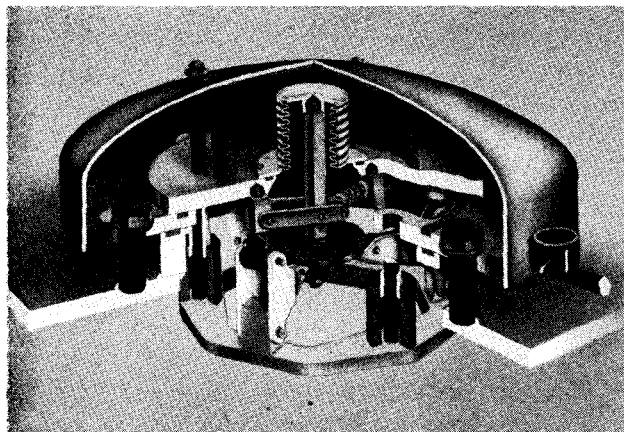


FIG. 1. Cutaway View of Device.

THE MECHANICAL RELIEF DEVICE, mounted on the transformer cover, is designed to relieve any dangerous pressures which may build up within the transformer tank. When a predetermined pressure is exceeded, a tripping mechanism unlocks the relief cover, allowing it to rise and vent the tank.

It is always possible, although fortunately very unusual, that some fault under the oil level may result in a primary explosion. While the wave-front of pressure created in this way is not as steep as that of a secondary explosion of hydrogen or acetylene and air above the oil, nor the results as violent, the abnormal pressure following an arc is often great enough to rupture the tank if no effective relief device is provided.

DESCRIPTION

The construction of the Mechanical Relief Device is shown in Figs. 1, 2, 3, and 4. Its operating parts consists of a tripping bellows, trigger, toggle mechanism, latch plate, latches attached to a pressure ring, and relief cover. All parts are constructed of corrosion-resistant material and the device is gasketed to make it gas tight. A generous weatherproof hood is provided, not only to protect the cork neoprene gaskets from exposure, but also

to prevent the entrance of water after operation of the device.

All parts are sturdily constructed to allow the device to operate any number of times without damage to any part except the gasket between the relief cover and the flange. If this gasket is blown out during an operation, a new one must be inserted. Gaskets shown in Figure 3 are cork neoprene and are for use with oil; for Askarel, these gaskets are replaced with cork.

The rollers on the latches, as well as the flange surfaces and latch plate with which they come in contact, are hardened.

OPERATION

The mechanism in the latched or sealed position is shown in Fig. 3, while Fig. 4 shows its maximum venting position. The trigger spring is set at the factory so that tripping will occur at a pressure of ten pounds per square inch. This adjustment should not be changed in the field.

Under normal transformer operation through cycles of changing pressure (or vacuum), there are no moving parts in the relief device, and there is no flexing of the bellows until the pressure against the bellows builds up to the required tripping

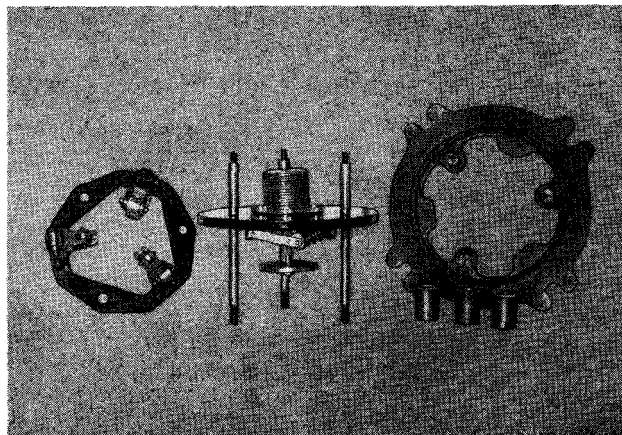


FIG. 2. Components of the Relief Device.

MECHANICAL RELIEF DEVICE

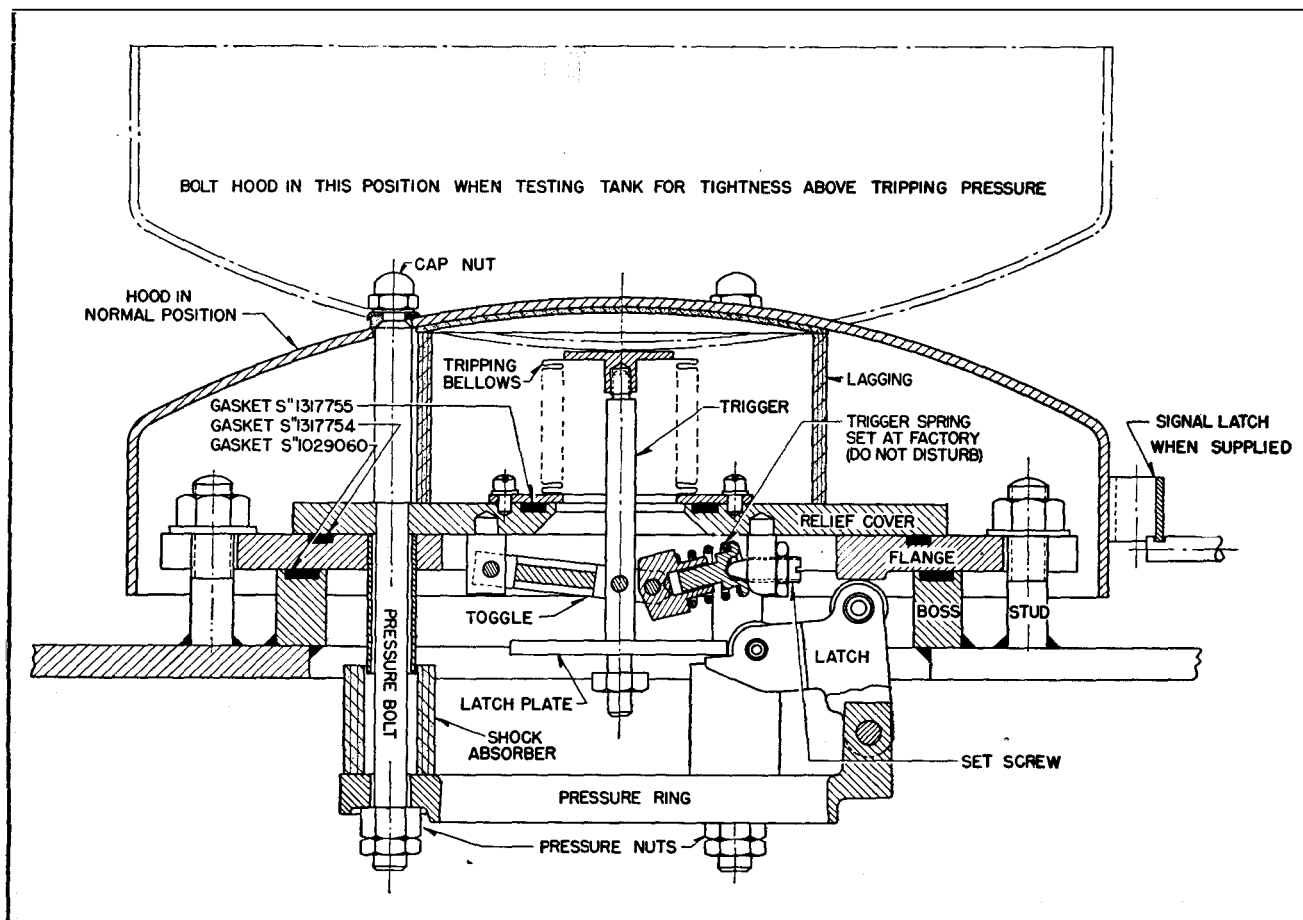


FIG. 3. The Relief Device in Latched or Sealed Position.

pressure. The trigger spring is overcome and the top of the bellows moves upward pulling the trigger with it. As the toggle moves through the zero point, the operation is accelerated by the trigger spring which is under compression and these combined forces cause the trigger to strike the latch plate and carry it free of the roller latches. These latches then roll inward allowing the relief cover to be moved upward by the pressure of the gases, thus venting the transformer. The operation of the mechanism is clearly illustrated in Figs. 3 and 4.

The bellows travel is limited by a shock-absorbing gasket in the top of the hood and the pressure ring comes up against the shock absorbers, protecting the mechanism from any damage. See Fig. 4.

After an operation, the device settles back into place with the relief cover against the flange. It is then necessary to reset the device. Proceed as follows:

1. Remove the three cap nuts and washers on top of the hood.

2. Remove the hood and lagging.

3. Reset the toggle mechanism by compressing the bellows with the palm of the hand. It will click back into position.

4. Remove the four nuts and washers holding the flange to the transformer boss.

5. Lift the device off the transformer and turn upside down, allowing it to rest on the cap nut end of the pressure bolts.

6. Loosen the three pressure nuts, backing them off until they are near the ends of the pressure bolts.

7. Inspect the gasket S#1317754 on the flange that bears against the relief cover. If this gasket needs replacement, put in a new gasket, cementing it on all sides. To replace this gasket, remove pressure nuts from pressure bolts and lift flange from relief cover, replace gasket in flange and reassemble. The relief cover gasket S#1029060 may also need to be replaced.

8. Lift up on the pressure ring, allowing the latches to drop back into place, making sure that

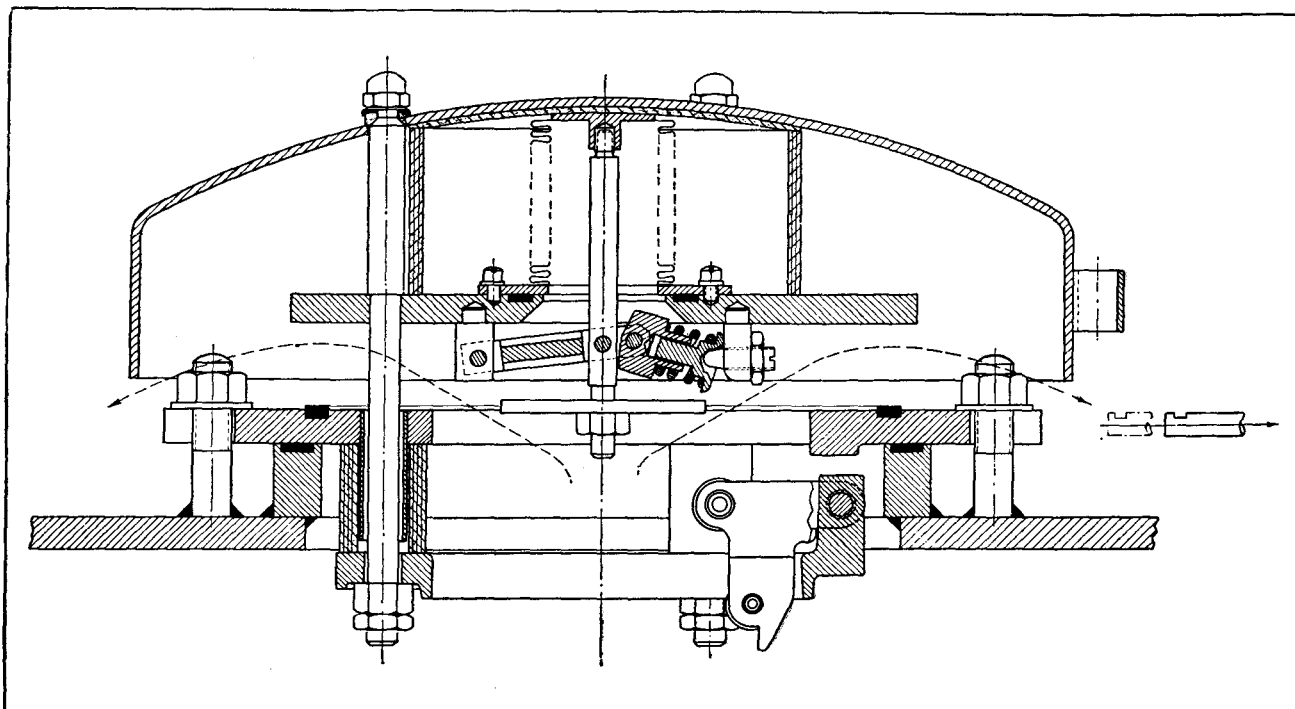


FIG. 4. The Relief Device at Moment after Tripping.

they set properly against the flange and latch plate.

9. Tighten the three pressure nuts on the pressure bolts evenly until the gasket between the flange and relief cover is compressed to prevent leakage.

10. Bolt the device back on the transformer.

11. Replace the lagging, hood, cap nut gasket and cap nuts. The device is now ready for operation.

MAINTENANCE

The only maintenance necessary is resetting after each operation. If the gasket between the transformer boss and flange has to be replaced, coat it on both sides and edges with red gasket

cement #7386 and let dry for 15 minutes. Apply a second coat and assemble, wiping excess cement off the edges of the gasket. The same procedure applies to the gasket between the flange and the relief cover.

Important: Before testing the transformer tank for leaks with pressures greater than 8 pounds, reverse the hood and bolt it in place as shown in Fig. 3.

Keep spare gaskets and cement on hand. A limited supply is furnished with the transformers. Do not keep gaskets in stock for more than two years. For additional parts, order from the nearest Westinghouse Sales Office, giving the serial and stock order number of the complete transformer as stamped on the nameplate.

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SHARON PLANT • TRANSFORMER DIVISION • SHARON, PA.

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MECHANICAL RELIEF DEVICE

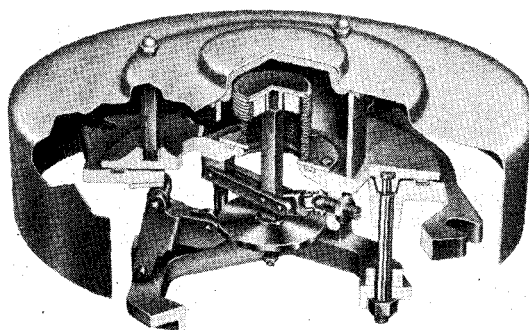


FIG. 1. Cutaway View of Device.

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It is always possible, although fortunately very unusual, that some fault under the oil level may result in a primary explosion. While the wave-front of pressure created in this way is not as steep as that of a secondary explosion of hydrogen or acetylene and air above the oil, nor the results as violent, the abnormal pressure following an arc is often great enough to rupture the tank if no effective relief device is provided.

DESCRIPTION

The construction of the Mechanical Relief Device is shown in Figs. 1, 2, 3, and 4. Its operating parts consist of a tripping bellows, trigger, toggle mechanism, latch plate, latches attached to a pressure ring, and relief cover. All parts are constructed of corrosion-resistant material and the device is gasketed to make it gas tight. A generous weatherproof hood is provided, not only to protect the cork neoprene gaskets from exposure, but also

to prevent the entrance of water after operation of the device.

All parts are sturdily constructed to allow the device to operate any number of times without damage to any part except the gasket between the relief cover and the flange. If this gasket is blown out during an operation, a new one must be inserted. Gaskets shown in Figure 3 are cork neoprene and are for use with oil; for Askarel, these gaskets are replaced with cork.

The rollers on the latches, as well as the flange surfaces and latch plate with which they come in contact, are hardened.

OPERATION

The mechanism in the latched or sealed position is shown in Fig. 3, while Fig. 4 shows its maximum venting position. The trigger spring is set at the factory so that tripping will occur at a pressure of ten pounds per square inch. This adjustment should not be changed in the field.

Under normal transformer operation through cycles of changing pressure (or vacuum), there are no parts moving in the relief device, and there is no flexing of the bellows until the pressure against the bellows builds up to the required tripping

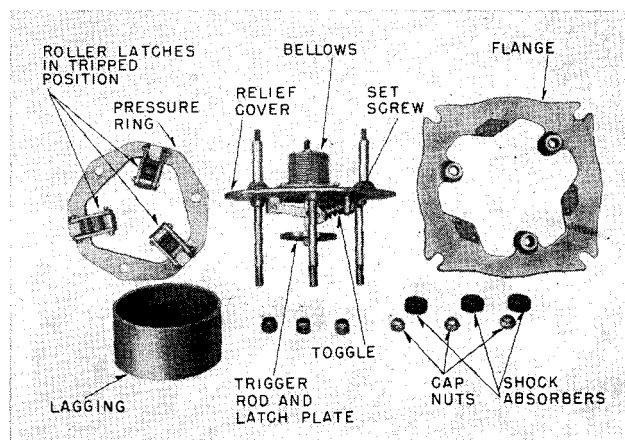


FIG. 2. Components of the Relief Device.

MECHANICAL RELIEF DEVICE

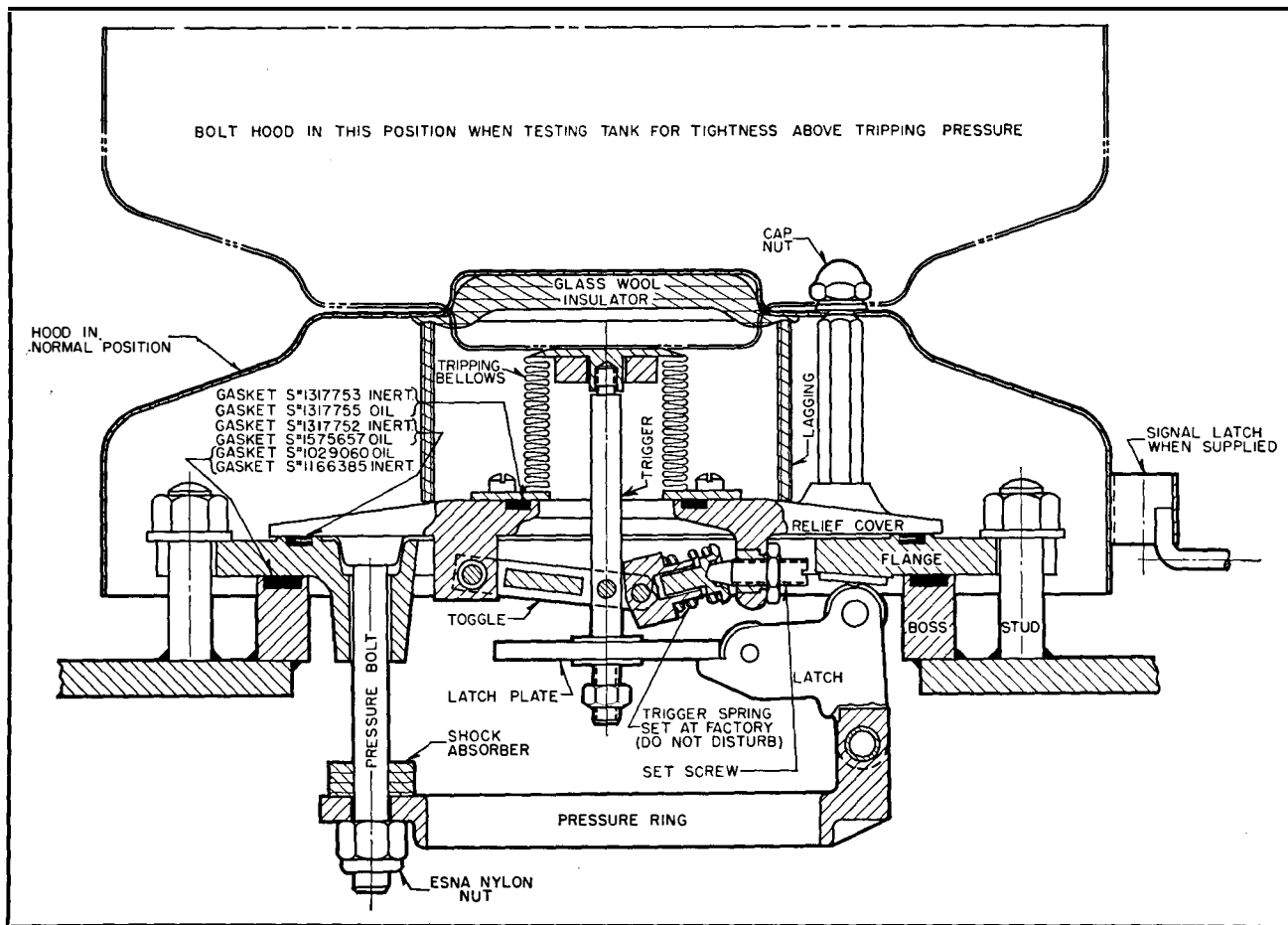


FIG. 3. The Relief Device in Latched or Sealed Position.

pressure. The trigger spring is overcome and the top of the bellows moves upward pulling the trigger with it. As the toggle moves through the zero point, the operation is accelerated by the trigger spring which is under compression and these combined forces cause the trigger to strike the latch plate and carry it free of the roller latches. These latches then roll inward allowing the relief cover to be moved upward by the pressure of the gases, thus venting the transformer. The operation of the mechanism is clearly illustrated in Figs. 3 and 4.

The bellows travel is limited by a shock-absorbing gasket in the top of the hood and the pressure ring comes up against the shock absorbers, protecting the mechanism from any damage. See Fig. 4.

After an operation, the device settles back into place with the relief cover against the flange. It is then necessary to reset the device. Proceed as follows:

1. Remove the three cap nuts and washers on top of the hood.

2. Remove the hood and lagging.

3. Reset the toggle mechanism by compressing the bellows with the palm of the hand. It will click back into position.

4. Remove the four nuts and washers holding the flange to the transformer boss.

5. Lift the device off the transformer and turn upside down, allowing it to rest on the cap nut end of the pressure bolts.

6. Loosen the three pressure nuts, backing them off until they are near the ends of the pressure bolts.

7. Inspect the gasket (S#1575 657 for oil, S#1317 752 for Askarel) on the flange that bears against the relief cover. If this gasket needs replacement, put in a new gasket, cementing it on top and bottom. To replace this gasket, remove pressure nuts from pressure bolts and lift flange from relief cover, replace gasket in flange and re-assemble.

8. Lift up on the pressure ring, allowing the latches to drop back into place, making sure that

MECHANICAL RELIEF DEVICE

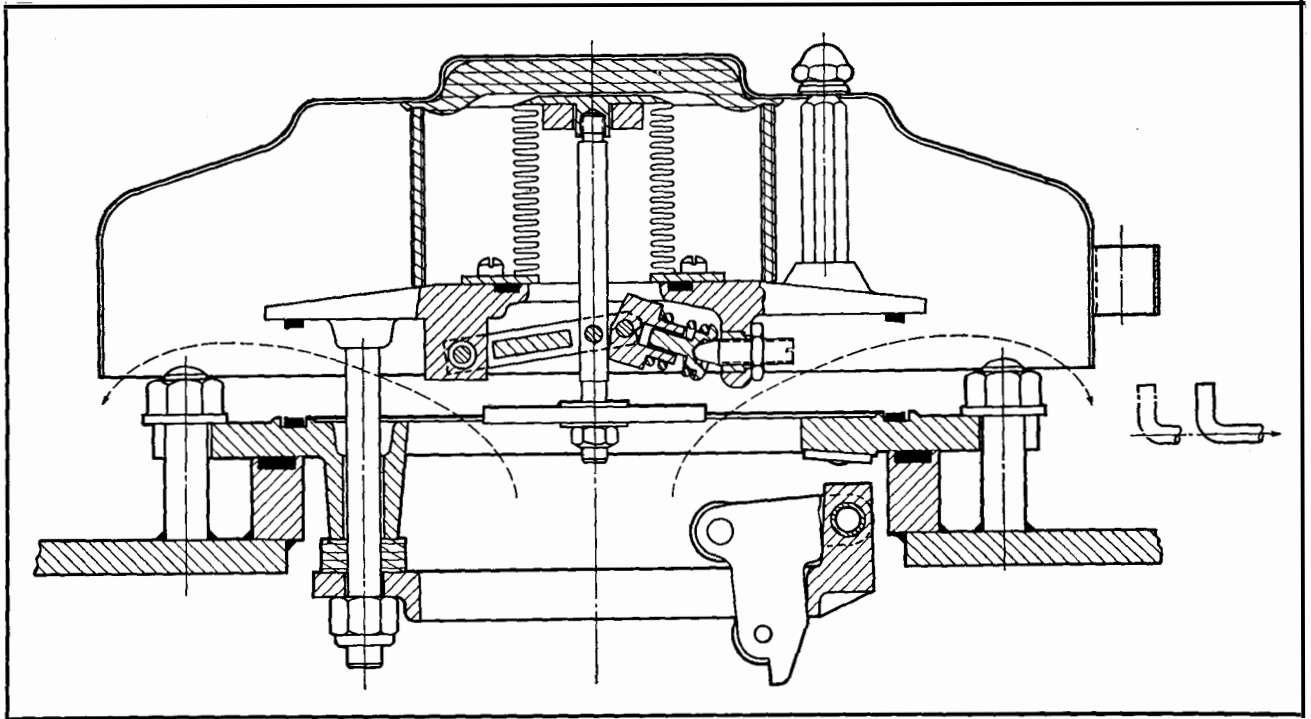


FIG. 4. The Relief Device at Moment after Tripping.

they set properly against the flange and latch plate.

9. Tighten the three pressure nuts on the pressure bolts evenly but not more than 150 inch lb. torque.

10. Bolt the device back on the transformer. Boss gasket (S#1029 060 for oil, S#1166 385 for Askarel) may need replacing.

11. Replace the lagging, hood, cap nut gasket and cap nuts. The device is now ready for operation.

MAINTENANCE

The only maintenance necessary is resetting after each operation. If the gasket between the transformer boss and flange has to be replaced, coat it on both sides and edges with red gasket cement #7386 and let dry for 15 minutes. Apply

a light second coat and assemble, wiping excess cement off the edges of the gasket. The same procedure applies to the gasket between the flange and the relief cover, except omit cement on edges and exercise care not to get cement in the slit.

Important: Before testing the transformer tank for leaks with pressures greater than 8 pounds, reverse the hood and bolt it in place as shown in Fig. 3.

Keep spare gaskets and cement on hand. A limited supply is furnished with the transformers. Do not keep gaskets in stock for more than two years. For additional parts, order from the nearest Westinghouse Sales Office, giving the serial and stock order number of the complete transformer as stamped on the nameplate.

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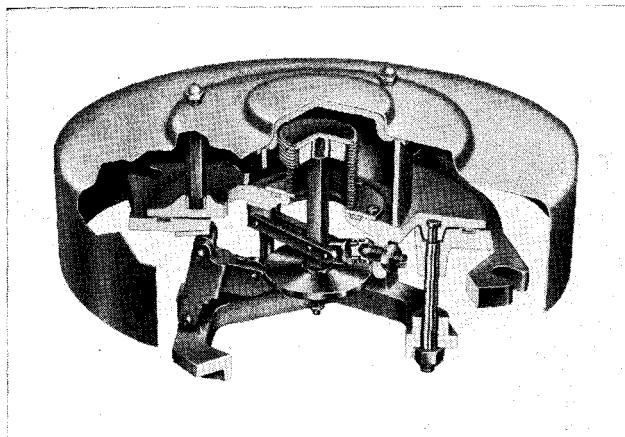


FIG. 1. Cutaway View of Device.

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It is always possible, although fortunately very unusual, that some fault under the oil level may result in a primary explosion. While the wave-front of pressure created in this way is not as steep as that of a secondary explosion of hydrogen or acetylene and air above the oil, nor the results as violent, the abnormal pressure following an arc is often great enough to rupture the tank if no effective relief device is provided.

DESCRIPTION

The construction of the Mechanical Relief Device is shown in Figs. 1, 2, 3, and 4. Its operating parts consist of a tripping bellows, trigger, toggle mechanism, latch plate, latches attached to a pressure ring, and relief cover. All parts are constructed of corrosion-resistant material and the device is gasketed to make it gas tight. A generous weatherproof hood is provided, not only to protect the cork-neoprene gaskets from exposure, but also

to prevent the entrance of water after operation of the device.

All parts are sturdily constructed to allow the device to operate any number of times without damage to any part except the gasket between the relief cover and the flange. If this gasket is blown out during an operation, a new one must be inserted. Gaskets shown in Fig. 3 are cork-neoprene for use with oil; for Askarel, these gaskets are replaced with cork.

The rollers on the hatches, as well as the flange surfaces and latch plate with which they come in contact, are hardened.

Signals: The mechanical relief device may be supplied with semaphore, alarm contacts, or both, as a means of indicating that the unit has operated.

The semaphore is locked by the cover as shown in Fig. 3 before operation. When the cover rises during operation the rod of the semaphore slips off the signal latch and is retracted by a spring, Fig. 5. This retracting action uncovers the semaphore or indicator to show that the mechanical relief device has been tripped.

The alarm type indicator, Fig. 4, incorporates a double throw microswitch which is depressed to close a normally open circuit for the untripped

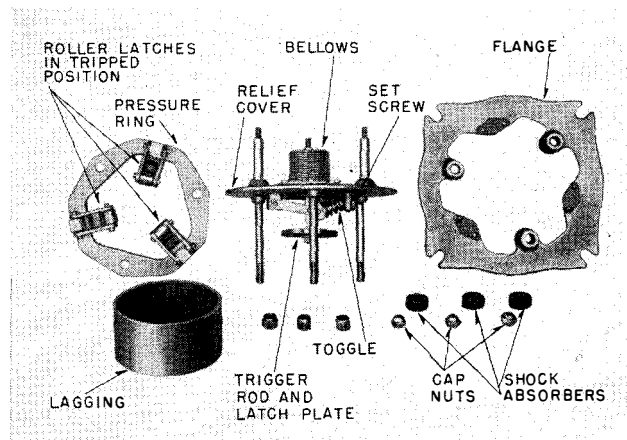


FIG. 2. Components of the Relief Device.

MECHANICAL RELIEF DEVICE

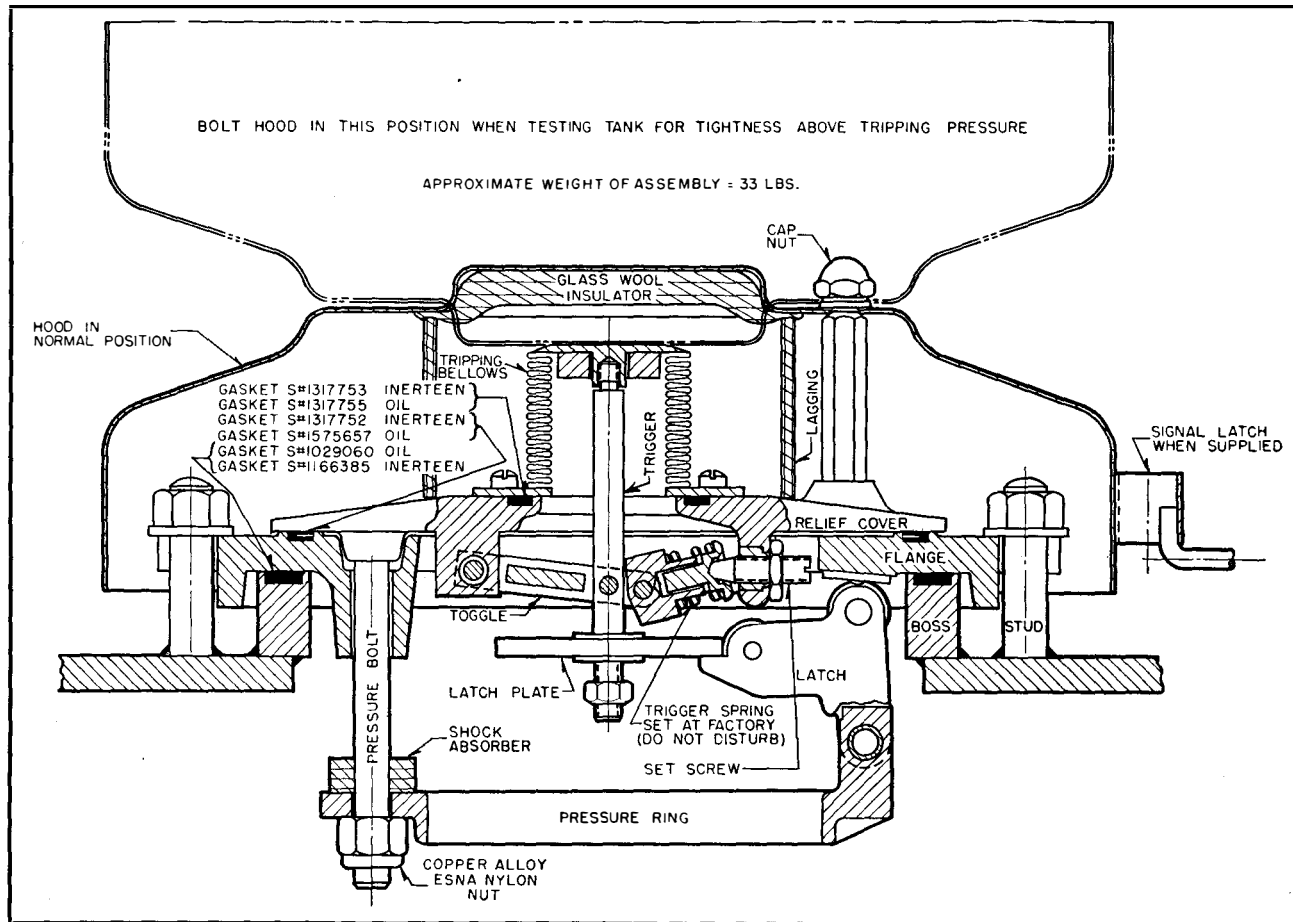


FIG. 3. The Relief Device in Latched or Sealed Position.

position of the relief device, Fig. 4. When the relief device trips, a pressure plug drops out of position and the microswitch changes to a normally closed circuit. Closing this circuit actuates the alarm.

OPERATION

The mechanism in the latched or sealed position is shown in Fig. 3, while Fig. 5 shows its maximum venting position. The trigger spring is set at the factory so that tripping will occur at a pressure of ten pounds per square inch. This adjustment should not be changed in the field.

Under normal transformer operation through cycles of changing pressure (or vacuum), there are no parts moving in the relief device, and there is no flexing of the bellows until the pressure against the bellows builds up to the required tripping pressure. The trigger spring is overcome and the top of the bellows moves upward pulling the trigger with it. As the toggle moves through the zero point, the operation is accelerated by the trigger spring which is under compression and these

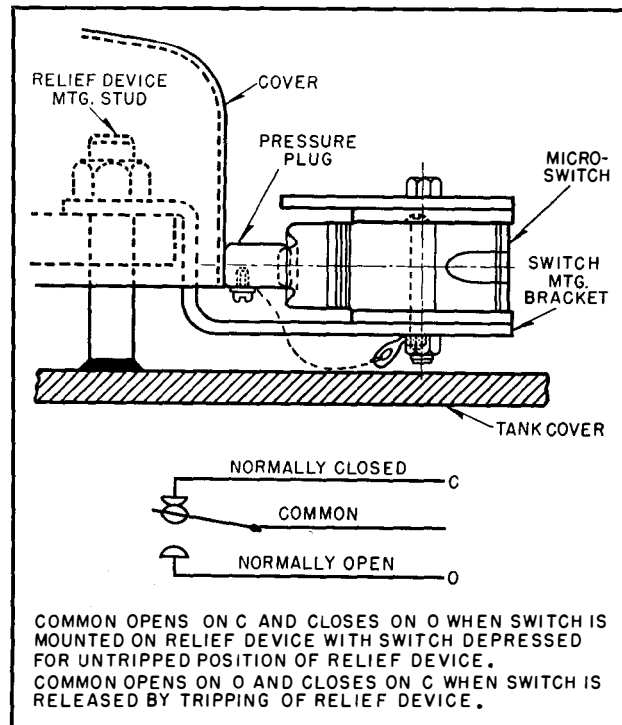


FIG. 4. Alarm Contact in Cocked Position.

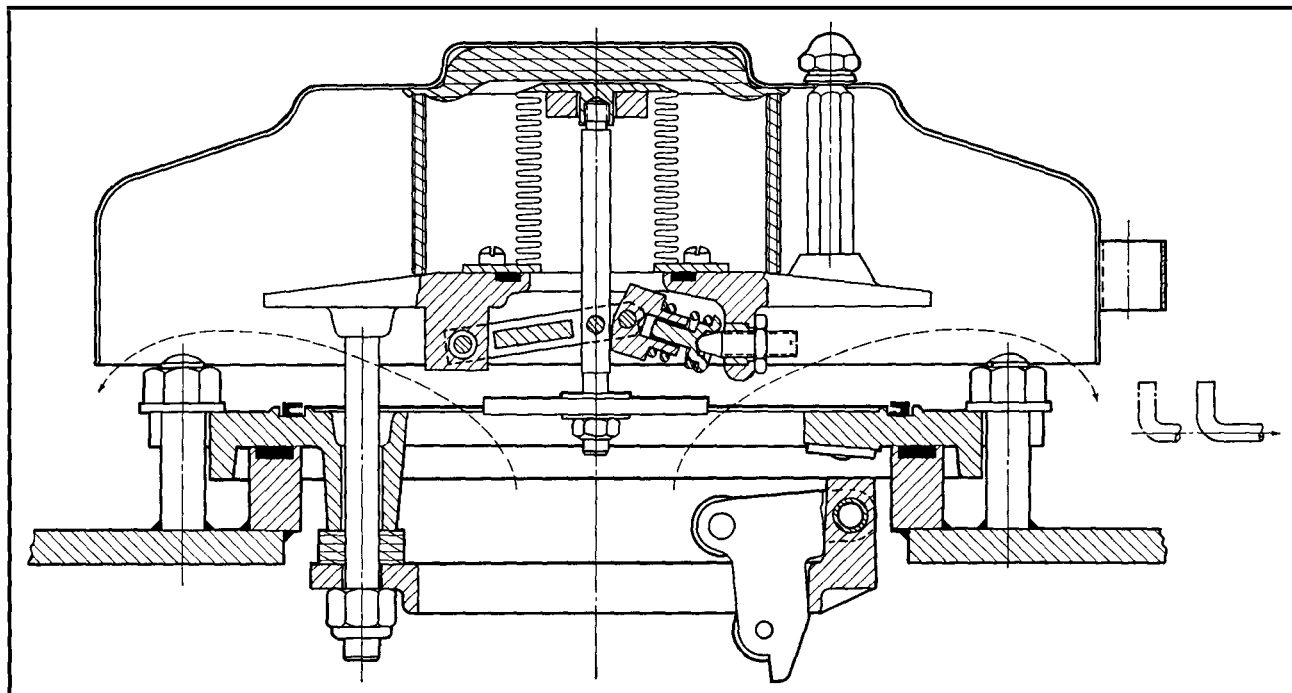


FIG. 5. The Relief Device at Moment after Tripping.

combined forces cause the trigger to strike the latch plate and carry it free of the roller latches. These latches then roll inward allowing the relief cover to be moved upward by the pressure of the gases, thus venting the transformer. The operation of the mechanism is clearly illustrated in Figs. 3 and 5.

The bellows travel is limited by a shock-absorbing gasket in the top of the hood and the pressure ring comes up against the shock absorbers, protecting the mechanism from any damage. See Fig. 5.

Travel of the hood upward serves to trip the alarm device if one is attached.

After an operation, the device settles back into place with the relief cover against the flange. It is then necessary to reset the device. Proceed as follows:

1. Remove the three cap nuts and washers on top of the hood.
2. Remove the hood and lagging.
3. Reset the toggle mechanism by compressing the bellows with the palm of the hand. It will click back into position.
4. Remove the four nuts and washers holding the flange to the transformer boss.
5. Lift the device off the transformer and turn upside down, allowing it to rest on the cap nut end of the pressure bolts.
6. Loosen the three pressure nuts, backing them off until they are near the ends of the pressure bolts.

7. Inspect the gasket (S#1575 657 for oil, S#1317 752 for Inerteen or Askarel) on the flange that bears against the relief cover. If this gasket needs replacement put in a new gasket; (A) for oil—cement it on the bottom only, and coat the top with petrolatum; (B) for Inerteen or Askarel—cement it all over. To replace this gasket, remove pressure nuts from pressure bolts and lift flange from relief cover, replace gasket in flange and reassemble. Refer figure 3—only gasket S#1575 657 is slotted, gasket S#1317 752 is solid.

8. Lift up on the pressure ring, allowing the latches to drop back into place, making sure that they set properly against the flange and latch plate.

9. Tighten the three pressure nuts on the pressure bolts evenly but not more than 150 inch lb. torque.

10. Bolt the device back on the transformer. Boss gasket (S#1029 060 for oil, S#1166 385 for Askarel) may need replacing.

11. Replace the lagging, hood, cap nut gasket and cap nuts. The device is now ready for operation.

12. If a signal device is provided with the mechanical relief device it is cocked at the time the hood is replaced. The semaphore is cocked by hooking the semaphore rod into the signal latch on the hood. Fig. 3 shows the cocked position. The microswitch alarm is cocked by replacing the switch and its mounting on one of the four relief

MECHANICAL RELIEF DEVICE

device mounting studs, and inserting the pressure plug between the hood and the pressure button of the microswitch. Fig. 4 shows the cocked position.

13. The device is now ready for operation.

MAINTENANCE

The only maintenance necessary is resetting after each operation. If the gasket between the transformer boss and flange has to be replaced: (A) for oil—coat it on both edges and bottom with cement # 7386, and on top with petrolatum; (B) for Inerteen or Askarel—coat it all over with cement # 7386. After applying first coat of cement let dry

for 15 minutes, apply a light second coat of cement to the same surfaces, wiping excess cement off the edges of the gasket.

Important: Before testing the transformer tank for leaks with pressures greater than 8 pounds, reverse the hood and bolt it in place as shown in Fig. 3.

Keep spare gaskets and cement on hand. A limited supply is furnished with the transformers. Do not keep gaskets in stock for more than two years. For additional parts, order from the nearest Westinghouse Office, giving the serial and stock order number of the complete transformer as stamped on the nameplate.



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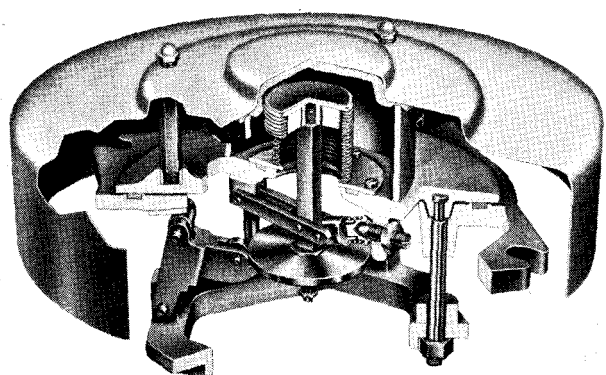


FIG. 1. Cutaway View of Device.

THE MECHANICAL RELIEF DEVICE, mounted on the transformer cover, is designed to relieve any dangerous pressures which may build up within the transformer tank. When a predetermined pressure is exceeded, a tripping mechanism unlocks the relief cover, allowing it to break the sealing gasket and vent the tank.

It is always possible, although fortunately very unusual, that some fault under the oil level may result in a primary explosion. While the wavefront of pressure created in this way is not as steep as that of a secondary explosion of hydrogen or acetylene and air above the oil, nor the results as violent, the abnormal pressure following an arc is often great enough to rupture the tank if no effective relief device is provided.

DESCRIPTION

The construction of the Mechanical Relief Device is shown in Figs. 1, 2, 3, and 4. Its operating parts consist of a tripping bellows, trigger, toggle mechanism, latch plate, latches attached to a pressure ring, and relief cover. All parts are constructed of corrosion-resistant material and the device is gasketed to make it gas tight. A generous weatherproof hood is provided, not only to protect the Cortite* gaskets from exposure, but also to prevent the entrance of water after operation of the device.

All parts are sturdily constructed to allow the device to operate any number of times without damage to any part except the gasket between the relief cover and the flange. If this gasket is blown out during an operation, a new one must be inserted. The gasket shown in Fig. 3 is Cortite and may be used with oil or Askarel (Inerteen®).

The rollers on the latches, as well as the flange surfaces and latch plate with which they come in contact, are hardened.

Signals. The mechanical relief device may be supplied with semaphore, alarm contacts, or both, as a means of indicating that the unit has operated.

The semaphore is locked by the cover as shown in Fig. 3 before operation. When the cover rises during operation the rod of the semaphore slips off the signal latch and is retracted by a spring, (Fig. 5). This retracting action uncovers the semaphore or indicator to show that the mechanical relief device has been tripped.

The alarm type indicator, Fig. 4, incorporates a double throw microswitch which is depressed to close a normally open circuit for the untripped position of the relief device, Fig. 4. When the relief device trips, a pressure plug drops out of position and the microswitch changes to a normally closed circuit. Closing this circuit actuates the

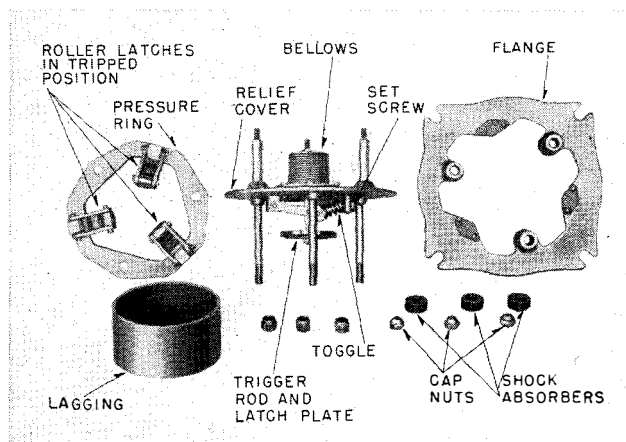


FIG. 2. Components of the Relief Device.

MECHANICAL RELIEF DEVICE

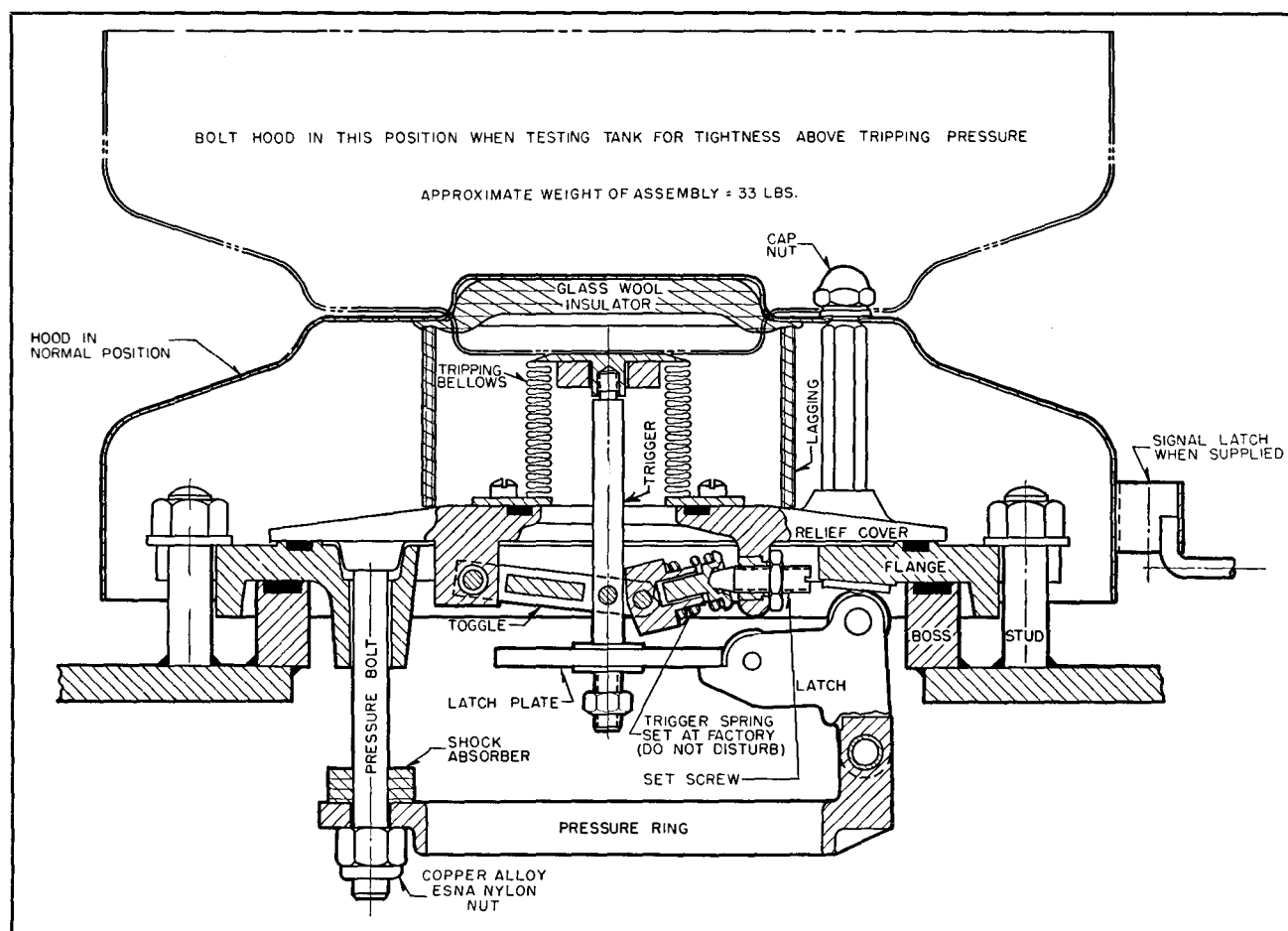


FIG. 3. The Relief Device in Latched or Sealed Position.

alarm. The microswitch rating appears in Table No. 1.

OPERATION

The mechanism in the latched or sealed position is shown in Fig. 3, while Fig. 5 shows its maximum venting position. The trigger spring is set at the factory so that tripping will occur at a pressure of ten to twelve pounds per square inch.

After the mechanism trips, the gasket (S# 1646548) is subjected to the pressure of the gas space, and will fracture to relieve the transformer tank in the range of ten to twelve pounds per square inch, depending on the rate of pressure rise.

Under normal transformer operation through cycles of changing pressure (or vacuum), there are no parts moving in the relief device, and there is no flexing of the bellows until the pressure against the bellows builds up to the required tripping pressure. The trigger spring is overcome and the top of the bellows moves upward pulling the trigger with it. As the toggle moves through the zero point, the operation is accelerated by the trigger spring which is under compression and these

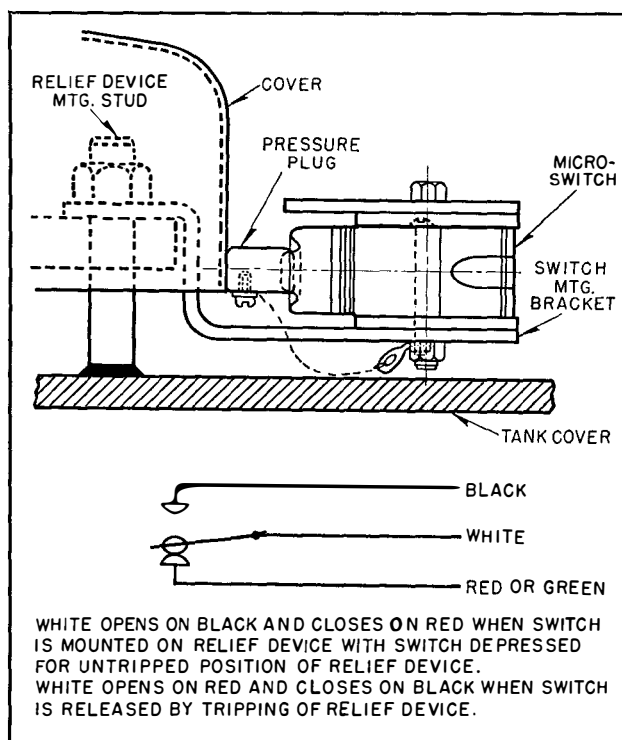


FIG. 4. Alarm Contact in Cocked Position.

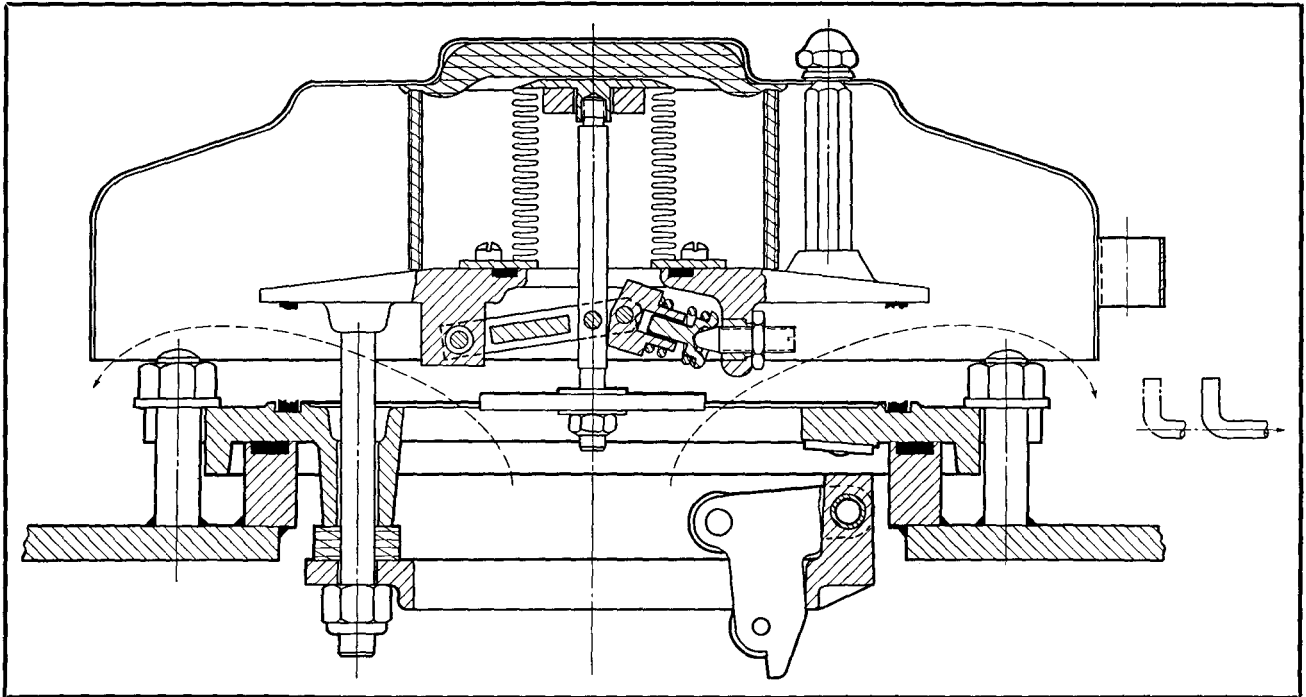


FIG. 5. The Relief Device at Moment after Tripping.

combined forces cause the trigger to strike the latch plate and carry it free of the roller latches. These latches then roll inward, allowing the relief cover to be moved upward by the pressure of the gases and to break the sealing gasket, thus venting the transformer. The operation of the mechanism is clearly illustrated in Figs. 3 and 5.

The bellows travel is limited by a shock-absorbing gasket in the top of the hood and the pressure ring comes up against the shock absorbers, which protect the mechanism from any damage. See Fig. 5.

Travel of the hood upward serves to trip the alarm device if one is attached.

After an operation, the device settles back into place with the relief cover against the flange. It is then necessary to reset the device. Proceed as follows:

1. Remove the three cap nuts and washers on top of the hood.
2. Remove the hood and lagging.
3. Reset the toggle mechanism by compressing the bellows with the palm of the hand. It will click back into position.
4. Remove the four nuts and washers holding the flange to the transformer boss.
5. Lift the device off the transformer and turn upside down, allowing it to rest on the cap nut end of the pressure bolts.

6. Loosen the three pressure nuts, backing them off until they are near the ends of the pressure bolts.

7. Inspect the gasket (S# 1646 548 for oil or Askarel) on the flange that bears against the relief cover. If this gasket needs replacement, remove pressure nuts from pressure bolts, lift flange, clean off all the old gasket and cement, and proceed as follows:

- (a) Paint bottom of gasket recess in flange with a light coat of cement #7386 and let dry;
- (b) Paint bottom of gasket with a light coat of cement and allow to become tacky;
- (c) Place gasket in gasket recess with tacky bottom down, and hold flat with relief cover until dry;
- (d) Paint top of gasket with light coat of cement, replace relief cover and reassemble. NOTICE: Do not paint edges of gasket, and do not use an excess of cement. Any extra cement will flow from gasket and recess to cement the flange and the relief cover together, thus requiring a pressure in excess of 10-12 psi to open the relief device.

8. Lift up on the pressure ring, allowing the latches to drop back into place, making sure that they set properly against the flange and latch plate. The latch plate should be centered between the latches.

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9. Tighten the three pressure nuts on the pressure bolts evenly but not more than 150 inch-lb. torque.

10. Bolt the device back on the transformer. Boss gasket (S#1029 060 for oil, S#1166 385 for Askarel) may need replacing.

11. Replace the lagging, hood, cap nut gasket and cap nuts. The device is now ready for operation.

12. If a signal device is provided with the mechanical relief device it is cocked at the time the hood is replaced. The semaphore is cocked by hooking the semaphore rod into the signal latch on the hood. Fig. 3 shows the cocked position. The microswitch alarm is cocked by replacing the switch and its mounting on one of the four relief device mounting studs, and inserting the pressure plug between the hood and the pressure button of the microswitch. Fig. 4 shows the cocked position.

13. The device is now ready for operation.

MAINTENANCE

The only maintenance necessary is resetting after each operation. If the gasket between the transformer boss and flange has to be replaced: (A) for oil—coat it on both edges and bottom with cement #7386, and on top with petrolatum; (B) for Inerteen or Askarel—coat it all over with cement #7386. After applying first coat of cement let dry for 15 minutes, apply a light second coat of cement to the same surfaces, wiping excess cement off the edges of the gasket.

Important: Before testing the transformer tank for leaks with pressures greater than 8 pounds, reverse the hood and bolt it in place as shown in Fig. 3.

Note: The mechanical relief device will withstand full vacuum, and need not be removed from the transformer tank during any vacuum treatment.

TABLE NO. I

VOLTAGE	NON-INDUCTIVE LOAD—AMPS.	INDUCTIVE LOAD AMPS. L/R = .026*
125 A-C	10	10
250 A-C	5	5
125 D-C	0.5	0.05
250 D-C	0.25	0.025

*Equal to or less than .026. If greater, refer to factory for adjusted rating.

Important: When checking circuits through this device, it is necessary to follow Table No. 1. This means that a low voltage bell ringer cannot be used unless switched through a high impedance relay. An indicating light type device is generally recognized as best for checking circuits through instruments containing microswitches of similar capacities.

Keep spare gaskets and cement on hand. A limited supply is furnished with the transformers. Do not keep gaskets in stock for more than two years. For additional parts, order from the nearest Westinghouse Office, giving the serial and stock order number of the complete transformer as stamped on the nameplate.



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SHARON PLANT • TRANSFORMER DIVISION • SHARON, PA.

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DESCRIPTION • OPERATION • MAINTENANCE INSTRUCTIONS

MECHANICAL RELIEF DEVICE

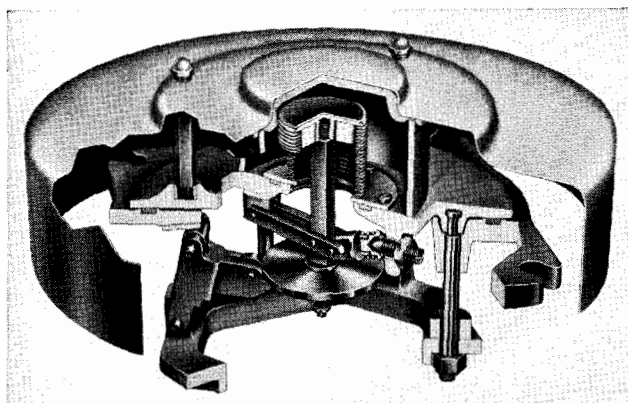


FIG. 1. Cutaway View of Device

THE MECHANICAL RELIEF DEVICE, mounted on the transformer cover, is designed to relieve any dangerous pressures which may build up within the transformer tank. When a predetermined pressure is exceeded, a tripping mechanism unlocks the relief cover, allowing it to break the gasket seal and vent the tank.

It is always possible, although fortunately very unusual, that some fault under the oil level may result in a primary explosion. While the wave-front of pressure created in this way is not as steep as that of a secondary explosion of hydrogen or acetylene and air above the oil, nor the results as violent, the abnormal pressure following an arc is often great enough to rupture the tank if no effective relief device is provided.

DESCRIPTION

The construction of the Mechanical Relief Device is shown in Figs. 1, 2, 3, and 4. Its operating parts consist of a tripping bellows, trigger, toggle mechanism, latch plate, latches attached to a pressure ring, and relief cover. All parts are constructed of corrosion-resistant material and the device is gasketed to make it gas tight. A generous weatherproof hood is provided, not only to protect the Cortite* gaskets from exposure, but also to prevent the entrance of water after operation of the device.

All parts are sturdily constructed to allow the device to operate any number of times without damage to any part. If the gasket between the relief cover and the flange is damaged for any reason, a new one must be inserted. The gasket shown in Fig. 3 is Cortite and may be used with oil or Askarel (Inerteen®).

The rollers on the latches, as well as the flange surfaces and latch plate with which they come in contact, are hardened.

Signals. The mechanical relief device may be supplied with semaphore, alarm contacts, or both, as a means of indicating that the unit has operated.

The semaphore is locked by the cover as shown in Fig. 3 before operation. When the cover rises during operation the rod of the semaphore slips off the signal latch and is retracted by a spring, (Fig. 5). This retracting action uncovers the semaphore or indicator to show that the mechanical relief device has been tripped.

The alarm type indicator, Fig. 4, incorporates a double throw microswitch which is depressed to close a normally open circuit for the untripped position of the relief device, Fig. 4. When the relief device trips, a pressure plug drops out of position and the microswitch changes to a normally closed circuit. Closing this circuit actuates the

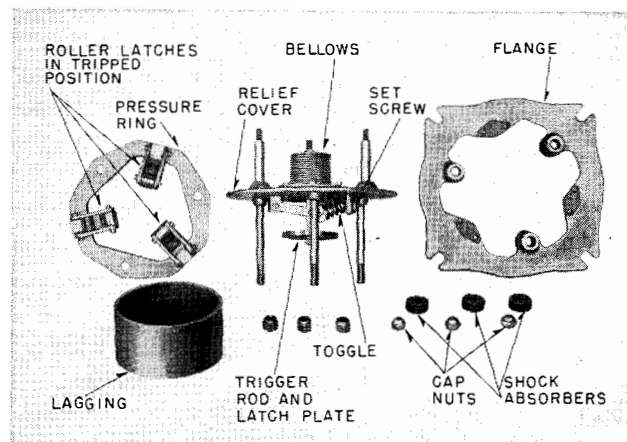


FIG. 2. Components of the Relief Device

MECHANICAL RELIEF DEVICE

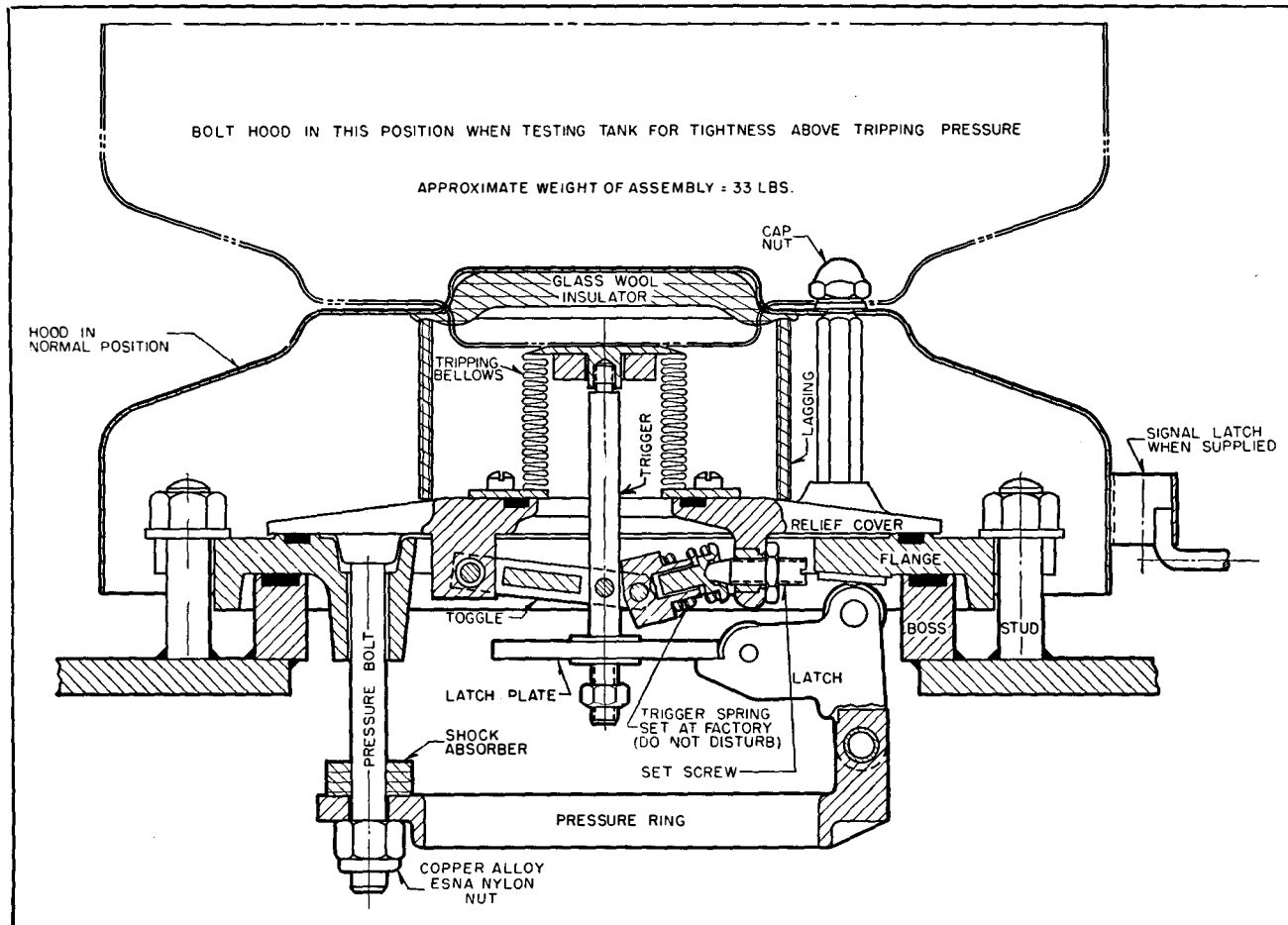


FIG. 3. The Relief Device in Latched or Sealed Position

alarm. The microswitch rating appears in Table No. 1.

OPERATION

The mechanism in the latched or sealed position is shown in Fig. 3, while Fig. 5 shows its maximum venting position. The trigger spring is set at the factory so that tripping will occur at a pressure of ten to twelve pounds per square inch.

After the mechanism trips, the gasket seal will be broken by the pressure of the gas space, and will relieve the transformer tank in the range of ten to twelve pounds per square inch, depending on the rate of pressure rise.

Under normal transformer operation through cycles of changing pressure (or vacuum), there are no parts moving in the relief device, and there is no flexing of the bellows until the pressure against the bellows builds up to the required tripping pressure. The trigger spring is overcome and the top of the bellows moves upward pulling the trigger with it. As the toggle moves through the zero point, the operation is accelerated by the trigger spring which is under compression and these

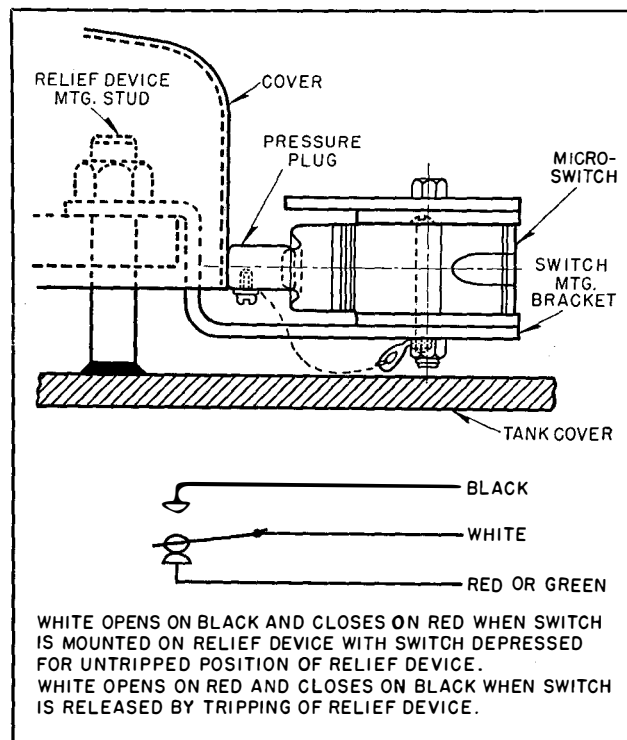


FIG. 4. Alarm Contact in Cocked Position

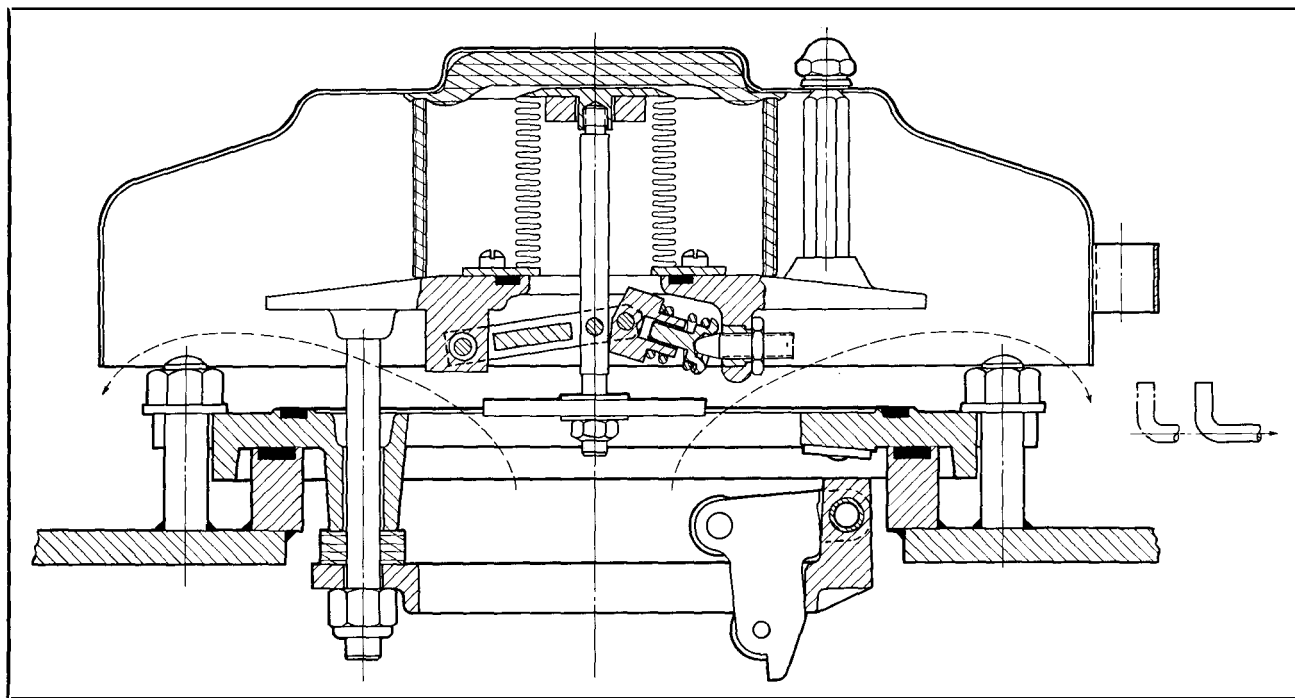


FIG. 5. The Relief Device at Moment after Tripping

combined forces cause the trigger to strike the latch plate and carry it free of the roller latches. These latches then roll inward, allowing the relief cover to be moved upward by the pressure of the gases and to break the gasket seal thus venting the transformer. The operation of the mechanism is clearly illustrated in Figs. 3 and 5.

The bellows travel is limited by a shock-absorbing gasket in the top of the hood and the pressure ring comes up against the shock absorbers, which protect the mechanism from any damage. See Fig. 5.

Travel of the hood upward serves to trip the alarm device if one is attached.

After an operation, the device settles back into place with the relief cover against the flange. It is then necessary to reset the device. Proceed as follows:

1. Remove the three cap nuts and washers on top of the hood.
2. Remove the hood and lagging.
3. Reset the toggle mechanism by compressing the bellows with the palm of the hand. It will click back into position.
4. Remove the four nuts and washers holding the flange to the transformer boss.
5. Lift the device off the transformer and turn upside down, allowing it to rest on the cap nut end of the pressure bolts.

6. Loosen the three pressure nuts, backing them off until they are near the ends of the pressure bolts.

7. Inspect the gasket seal and the gasket (S# 1646 548 for Oil or Askarel) to see if the sealing material has hardened and damaged the gasket. In most cases the sealing material will be still plastic and no action will be necessary. If however the gasket has been damaged and needs replacement, remove pressure nuts from pressure bolts, lift flange, clean off all the old gasket and sealing compound, and proceed as follows:

- (a) Paint bottom of gasket recess in flange with a light coat of plastic lead seal #8138-3.
- (b) Place gasket in gasket recess.
- (c) Paint top of gasket with a light coat of plastic lead seal, replace relief cover and reassemble.

NOTICE: Do not use an excess of sealing compound as any extra will flow from gasket and recess.

8. Lift up on the pressure ring, allowing the latches to drop back into place, making sure that they set properly against the flange and latch plate. The latch plate should be centered between the latches.

9. Tighten the three pressure nuts on the pressure bolts evenly but not more than 150 inch-lb. torque.

MECHANICAL RELIEF DEVICE

10. Bolt the device back on the transformer. Boss gasket (S# 1029 060 for oil, S# 1166 385 for Askarel) may need replacing.

11. Replace the lagging, hood, cap nut gasket and cap nuts. The device is now ready for operation.

12. If a signal device is provided with the mechanical relief device it is cocked at the time the hood is replaced. The semaphore is cocked by hooking the semaphore rod into the signal latch on the hood. Fig. 3 shows the cocked position. The microswitch alarm is cocked by replacing the switch and its mounting on one of the four relief device mounting studs, and inserting the pressure plug between the hood and the pressure button of the microswitch. Fig. 4 shows the cocked position.

13. The device is now ready for operation.

MAINTENANCE

The only maintenance necessary is resetting after each operation. If the gasket between the transformer boss and flange has to be replaced: (A) for oil—coat it on both edges and bottom with cement # 7386, and on top with petrolatum; (B) for Inerteen or Askarel—coat it all over with cement # 7386. After applying first coat of cement let dry for 15 minutes, apply a light second coat of cement to the same surfaces, wiping excess cement off the edges of the gasket.

Important: Before testing the transformer tank for leaks with pressures greater than 8 pounds, reverse the hood and bolt it in place as shown in Fig. 3.

Note: The mechanical relief device will withstand full vacuum, and need not be removed from the transformer tank during any vacuum treatment.

TABLE NO. 1

VOLTAGE	NON-INDUCTIVE LOAD—AMPS.	INDUCTIVE LOAD AMPS. L/R = .026*
125 A-C	10	10
250 A-C	5	5
125 D-C	0.5	0.05
250 D-C	0.25	0.025

*Equal to or less than .026. If greater, refer to factory for adjusted rating.

Important: When checking circuits through this device, it is necessary to follow Table No. 1. This means that a low voltage bell ringer cannot be used unless switched through a high impedance relay. An indicating light type device is generally recognized as best for checking circuits through instruments containing microswitches of similar capacities.

Keep spare gaskets and cement on hand. A limited supply is furnished with the transformers. Do not keep gaskets in stock for more than two years. For additional parts, order from the nearest Westinghouse Office, giving the serial and stock order number of the complete transformer as stamped on the nameplate.



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DESCRIPTION • OPERATION • MAINTENANCE INSTRUCTIONS

MECHANICAL RELIEF DEVICE

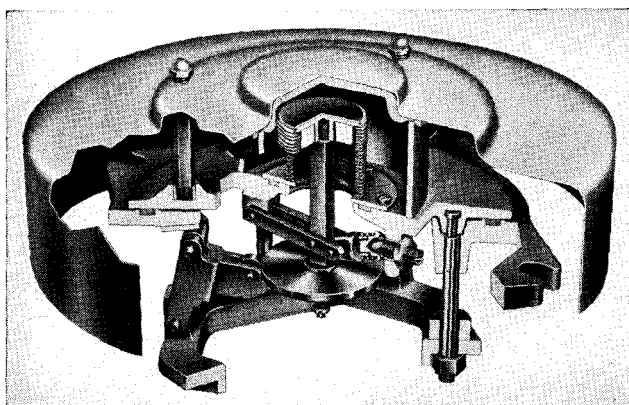


FIG. 1. Cutaway View of Device

THE MECHANICAL RELIEF DEVICE, mounted on the transformer cover, is designed to relieve any dangerous pressures which may build up within the transformer tank. When a predetermined pressure is exceeded, a tripping mechanism unlocks the relief cover, allowing it to break the gasket seal and vent the tank.

It is always possible, although fortunately very unusual, that some fault under the oil level may result in a primary explosion. While the wave-front of pressure created in this way is not as steep as that of a secondary explosion of hydrogen or acetylene and air above the oil, nor the results as violent, the abnormal pressure following an arc is often great enough to rupture the tank if no effective relief device is provided.

DESCRIPTION

The construction of the Mechanical Relief Device is shown in Figs. 1, 2, 3, and 4. Its operating parts consist of a tripping bellows, trigger, toggle mechanism, latch plate, latches attached to a pressure ring, and relief cover. All parts are constructed of corrosion-resistant material and the device is gasketed to make it gas tight. A generous weatherproof hood is provided, not only to protect the gaskets from exposure, but also to prevent the entrance of water after operation of the device.

All parts are sturdily constructed to allow the device to operate any number of times without damage to any part. If the gasket between the relief cover and the flange is damaged for any reason, a new one must be inserted. The gasket shown in Fig. 3 is a Buna-N compound and may be used with oil or Askarel (Inerteen®).

The rollers on the latches, as well as the flange surfaces and latch plate with which they come in contact, are hardened.

Signals. The mechanical relief device may be supplied with semaphore, alarm contacts, or both, as a means of indicating that the unit has operated.

The semaphore is locked by the cover as shown in Fig. 3 before operation. When the cover rises during operation the rod of the semaphore slips off the signal latch and is retracted by a spring, (Fig. 5). This retracting action uncovers the semaphore or indicator to show that the mechanical relief device has been tripped.

The alarm type indicator, Fig. 4, incorporates a double throw microswitch which is depressed to close a normally open circuit for the untripped position of the relief device, Fig. 4. When the relief device trips, a pressure plug drops out of position and the microswitch changes to a normally closed circuit. Closing this circuit actuates the

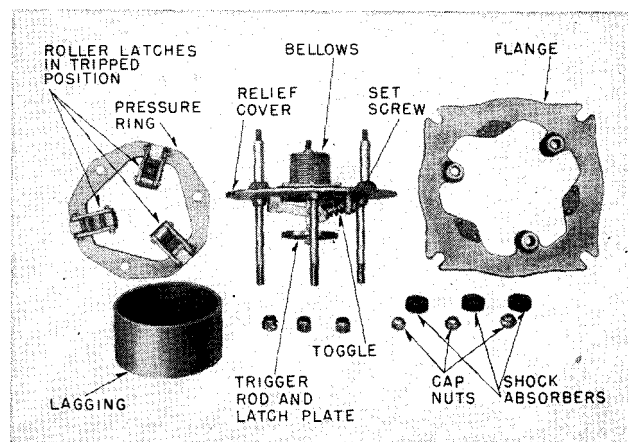


FIG. 2. Components of the Relief Device

MECHANICAL RELIEF DEVICE

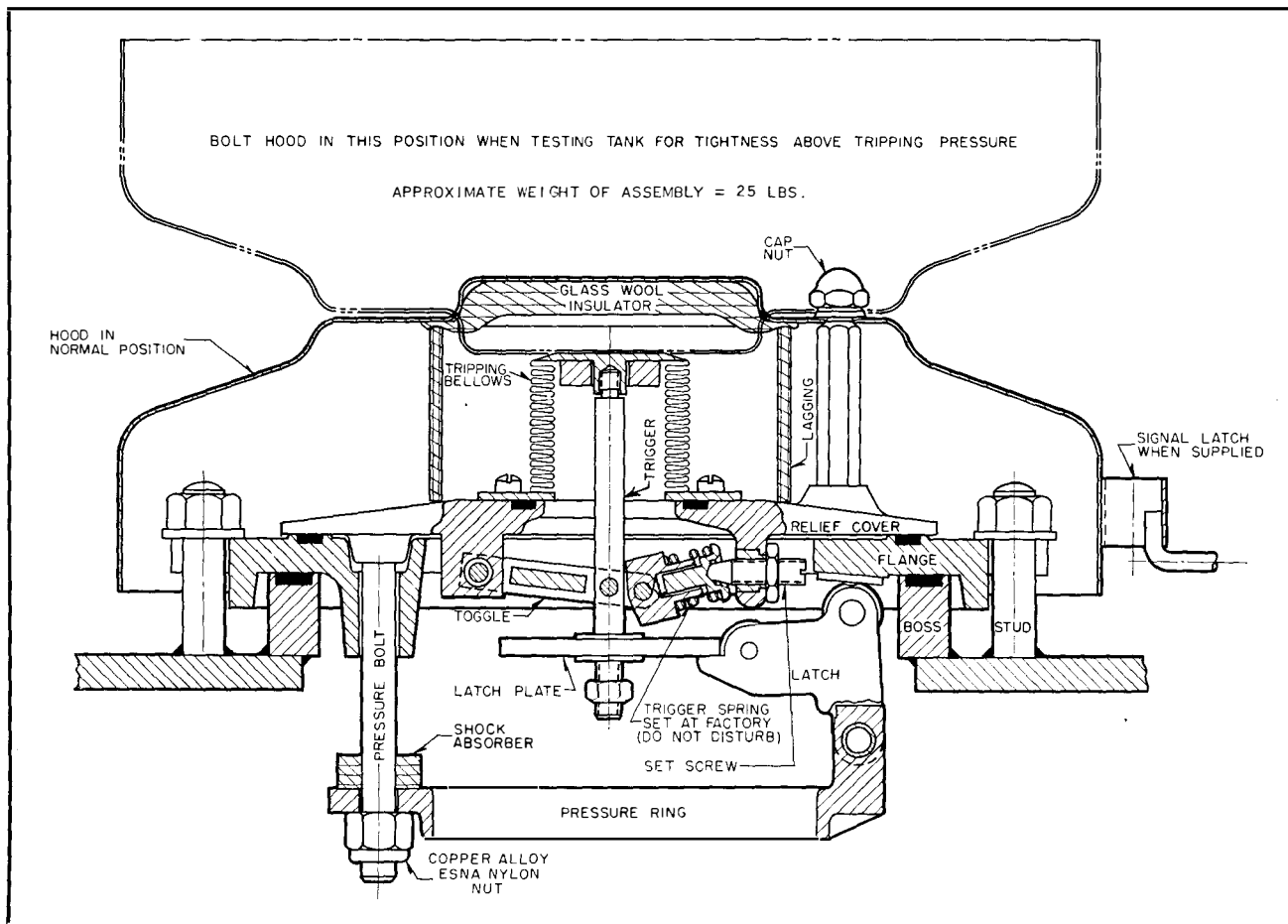


FIG. 3. The Relief Device in Latched or Sealed Position

alarm. The microswitch rating appears in Table No. 1.

OPERATION

The mechanism in the latched or sealed position is shown in Fig. 3, while Fig. 5 shows its maximum venting position. The trigger spring is set at the factory so that tripping will occur at a pressure of ten to twelve pounds per square inch.

After the mechanism trips, the gasket seal will be broken by the pressure of the gas space, and will relieve the transformer tank in the range of ten to twelve pounds per square inch, depending on the rate of pressure rise.

Under normal transformer operation through cycles of changing pressure (or vacuum), there are no parts moving in the relief device, and there is no flexing of the bellows until the pressure against the bellows builds up to the required tripping pressure. The trigger spring is overcome and the top of the bellows moves upward pulling the trigger with it. As the toggle moves through the zero point, the operation is accelerated by the trigger spring which is under compression and these

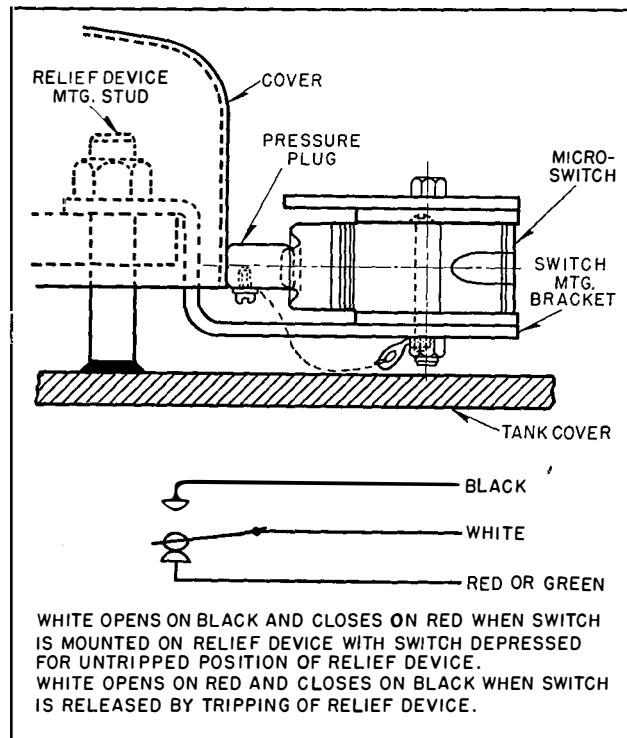


FIG. 4. Alarm Contact in Cocked Position

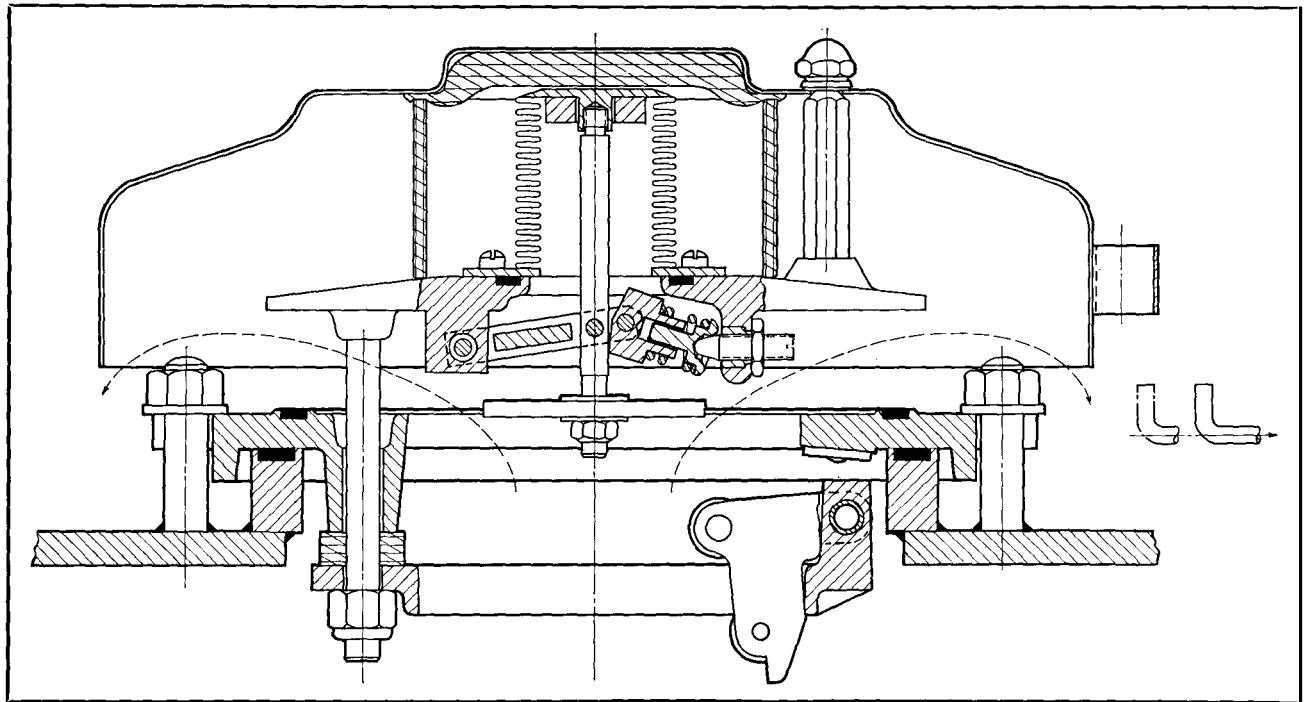


FIG. 5. The Relief Device at Moment after Tripping

combined forces cause the trigger to strike the latch plate and carry it free of the roller latches. These latches then roll inward, allowing the relief cover to be moved upward by the pressure of the gases and to break the gasket seal thus venting the transformer. The operation of the mechanism is clearly illustrated in Figs. 3 and 5.

The bellows travel is limited by a shock-absorbing gasket in the top of the hood and the pressure ring comes up against the shock absorbers, which protect the mechanism from any damage. See Fig. 5.

Travel of the hood upward serves to trip the alarm device if one is attached.

After an operation, the device settles back into place with the relief cover against the flange. It is then necessary to reset the device. Proceed as follows:

1. Remove the three cap nuts and washers on top of the hood.
2. Remove the hood and lagging.
3. Reset the toggle mechanism by compressing the bellows with the palm of the hand. It will click back into position.
4. Remove the four nuts and washers holding the flange to the transformer boss.

5. Lift the device off the transformer and turn upside down, allowing it to rest on the cap nut end of the pressure bolts.

6. Loosen the three pressure nuts, backing them off until they are near the ends of the pressure bolts.

7. Inspect the gasket (S#55-D-5555-P-1 for Oil or Askarel) to see if it has been damaged. In most cases no action will be necessary. If, however, the gasket has been damaged and needs replacement, remove pressure nuts from pressure bolts, lift flange, clean off the gasket surface carefully and proceed as follows:

(a) Apply a light coat of Silicone Lubricant #5861-4 to the bottom of the gasket recess in the flange.

(b) Place gasket in gasket recess.

(c) Apply a light coat of Lubricant to the top of the gasket, replace relief cover and reassemble.

NOTICE: Do not use cement or any material which may bond the relief cover to the flange or gasket.

8. Lift up on the pressure ring, allowing the latches to drop back into place, making sure that they set properly against the flange and latch plate. The latch plate should be centered between the latches.

9. Tighten the three pressure nuts on the pressure bolts evenly but not more than 125 inch-lb. torque.

MECHANICAL RELIEF DEVICE

10. Bolt the device back on the transformer. Boss gasket (S#1029 060 for oil, S#1166 385 for Askarel) may need replacing.

11. Replace the lagging, hood, cap nut gasket and cap nuts. The device is now ready for operation.

12. If a signal device is provided with the mechanical relief device it is cocked at the time the hood is replaced. The semaphore is cocked by hooking the semaphore rod into the signal latch on the hood. Fig. 3 shows the cocked position. The microswitch alarm is cocked by replacing the switch and its mounting on one of the four relief device mounting studs, and inserting the pressure plug between the hood and the pressure button of the microswitch. Fig. 4 shows the cocked position.

13. The device is now ready for operation.

MAINTENANCE

The only maintenance necessary is resetting after each operation. If the gasket between the transformer boss and flange has to be replaced: (A) for oil—coat it on both edges and bottom with cement #7386, and on top with petrolatum; (B) for Inerteen or Askarel—coat it all over with cement #7386. After applying first coat of cement let dry for 15 minutes, apply a light second coat of cement to the same surfaces, wiping excess cement off the edges of the gasket.

Important: Before testing the transformer tank for leaks with pressures greater than 8 pounds, reverse the hood and bolt it in place as shown in Fig. 3.

Note: The mechanical relief device will withstand full vacuum, and need not be removed from the transformer tank during any vacuum treatment.

TABLE NO. 1

VOLTAGE	NON-INDUCTIVE LOAD—AMPS.	INDUCTIVE LOAD AMPS. L/R = .026*
125 A-C	10	10
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125 D-C	0.5	0.05
250 D-C	0.25	0.025

*Equal to or less than .026. If greater, refer to factory for adjusted rating.

Important: When checking circuits through this device, it is necessary to follow Table No. 1. This means that a low voltage bell ringer cannot be used unless switched through a high impedance relay. An indicating light type device is generally recognized as best for checking circuits through instruments containing microswitches of similar capacities.

Keep spare gaskets and cement on hand. A limited supply is furnished with the transformers. For additional parts, order from the nearest Westinghouse Office, giving the serial and stock order number of the complete transformer as stamped on the nameplate.



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DESCRIPTION • OPERATION • MAINTENANCE INSTRUCTIONS

MECHANICAL RELIEF DEVICE

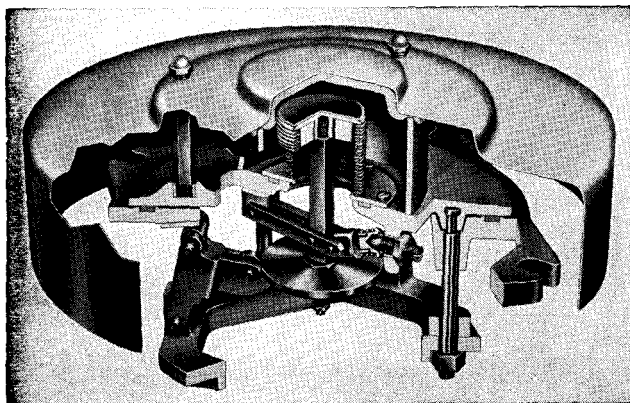


FIG. 1. Cutaway View of Device

THE MECHANICAL RELIEF DEVICE, mounted on the transformer cover, is designed to relieve any dangerous pressures which may build up within the transformer tank. When a predetermined pressure is exceeded, a tripping mechanism unlocks the relief cover, allowing it to break the gasket seal and vent the tank.

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DESCRIPTION

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All parts are sturdily constructed to allow the device to operate any number of times without damage to any part. If the gasket between the relief cover and the flange is damaged for any reason, a new one must be inserted. The gasket shown in Fig. 3 is a Buna-N compound and may be used with oil or Askarel (Inerteen®).

The rollers on the latches, as well as the flange surfaces and latch plate with which they come in contact, are hardened.

Signals. The mechanical relief device may be supplied with semaphore, alarm contacts, or both, as a means of indicating that the unit has operated.

The semaphore is locked by the cover as shown in Fig. 3 before operation. When the cover rises during operation the rod of the semaphore slips out of the signal latch and is retracted by a spring, (Fig. 5). This retracting action uncovers the semaphore or indicator to show that the mechanical relief device has been tripped.

The alarm type indicator, Fig. 4, incorporates a double throw microswitch which is depressed to close a normally open circuit for the untripped position of the relief device, Fig. 4. When the relief device trips, a pressure plug drops out of position and the microswitch changes to a normally closed circuit. Closing this circuit actuates the

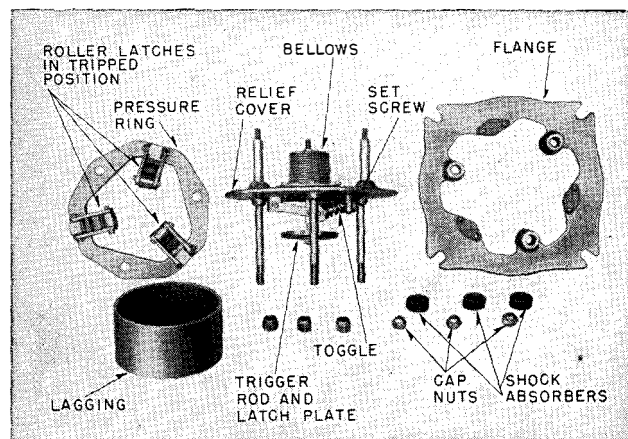


FIG. 2. Components of the Relief Device

MECHANICAL RELIEF DEVICE

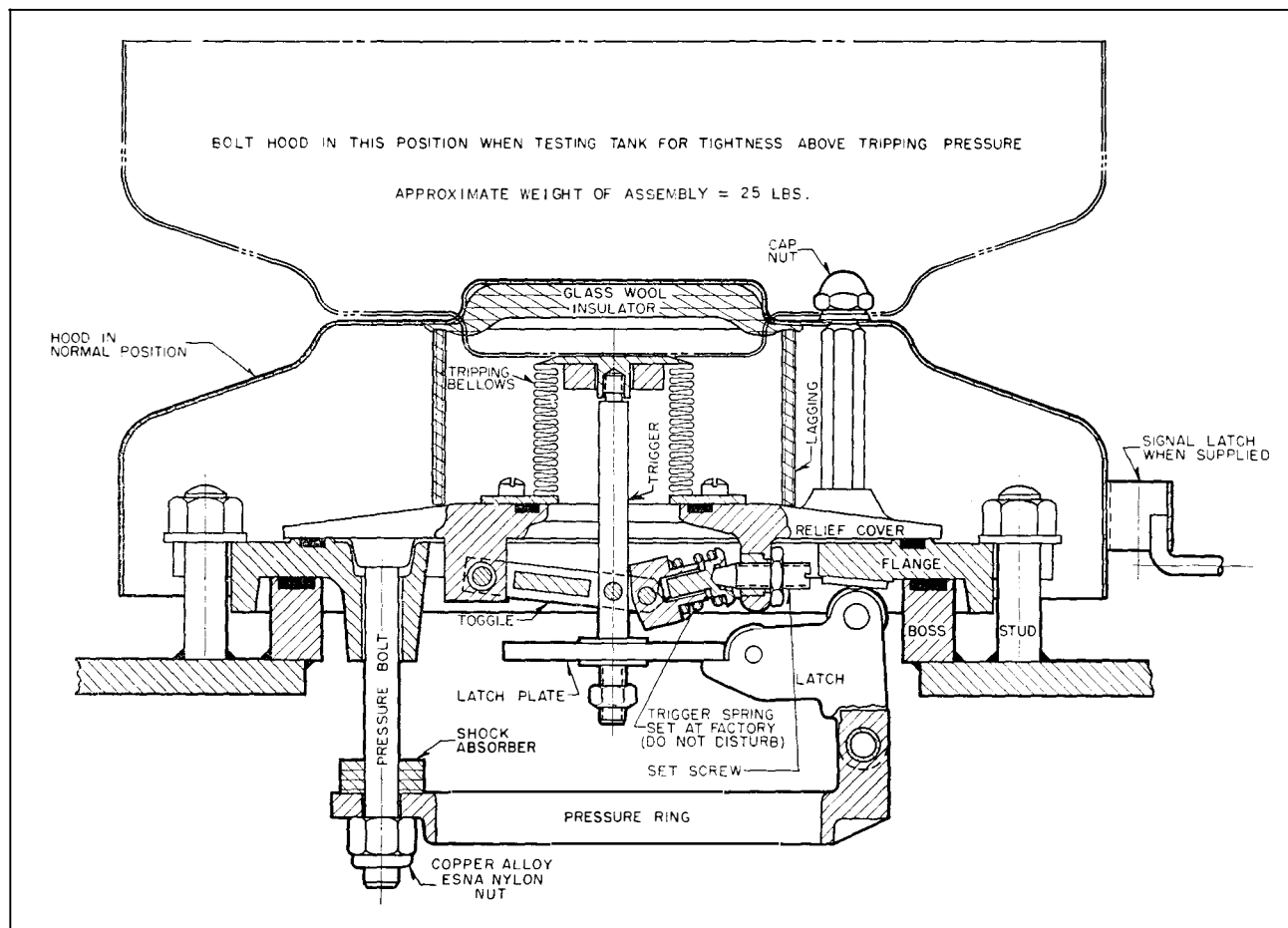


FIG. 3. The Relief Device in Latched or Sealed Position

alarm. The microswitch rating appears in Table No. 1.

OPERATION

The mechanism in the latched or sealed position is shown in Fig. 3, while Fig. 5 shows its maximum venting position. The trigger spring is set at the factory so that tripping will occur at a pressure of ten to twelve pounds per square inch.

After the mechanism trips, the gasket seal will be broken by the pressure in the gas space; this will relieve the transformer tank in the range of ten to twelve pounds per square inch, depending on the rate of pressure rise.

Under normal transformer operation through cycles of changing pressure (or vacuum), there are no parts moving in the relief device, and there is no flexing of the bellows until the pressure against the bellows builds up to the required tripping pressure. The trigger spring is overcome and the top of the bellows moves upward pulling the trigger with it. As the toggle moves through the zero

point, the operation is accelerated by the trigger spring which is under compression and these combined forces cause the trigger to strike the latch

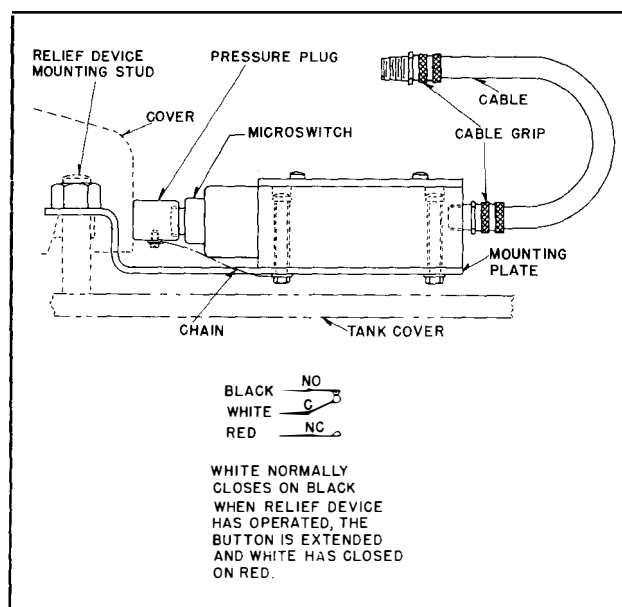


FIG. 4. Alarm Contact in Cocked Position

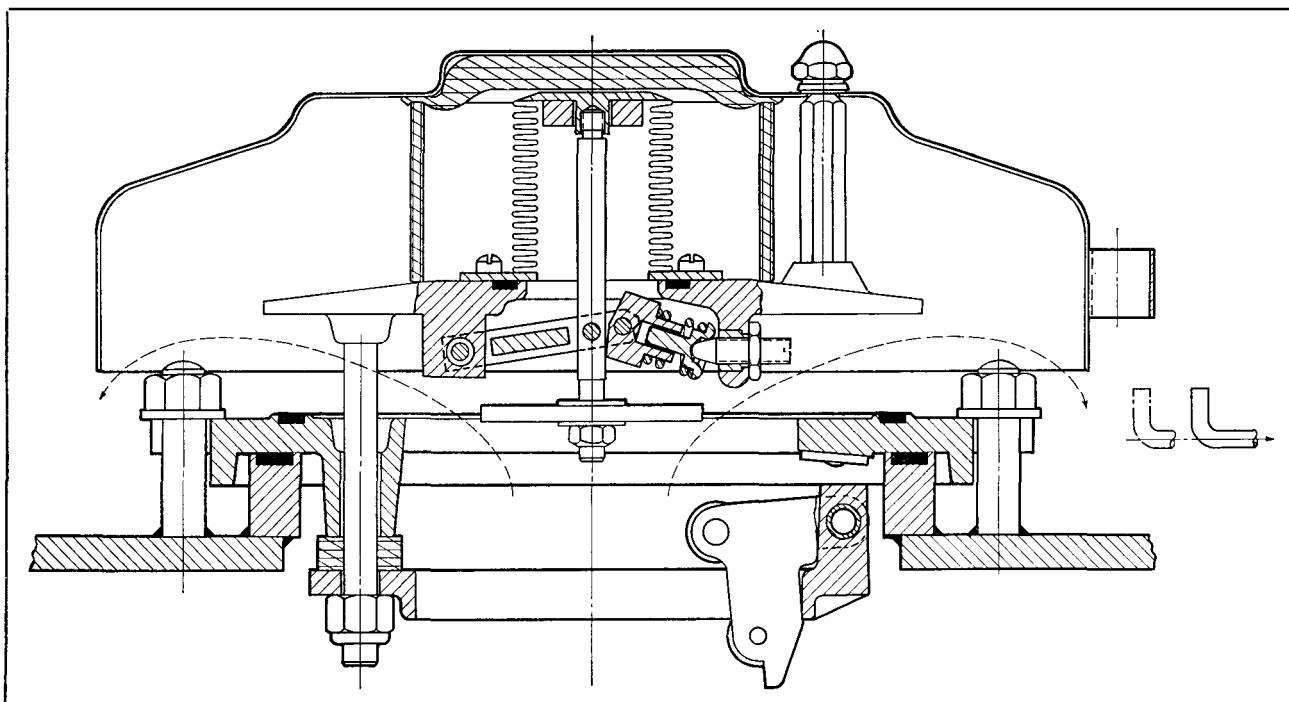


FIG. 5. The Relief Device at Moment after Tripping

plate and carry it free of the roller latches. These latches then roll inward, allowing the relief cover to be moved upward by the pressure of the gases and to break the gasket seal thus venting the transformer. The operation of the mechanism is clearly illustrated in Figs. 3 and 5.

The bellows travel is limited by a shock-absorbing gasket in the top of the hood and the pressure ring comes up against the shock absorbers, which protect the mechanism from any damage. See Fig. 5.

Travel of the hood upward serves to trip the alarm device if one is attached.

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2. Remove the hood and lagging.
3. Reset the toggle mechanism by compressing the bellows with the palm of the hand. It will click back into position.
4. Remove the four nuts and washers holding the flange to the transformer boss.

5. Lift the device off the transformer and turn upside down, allowing it to rest on the cap nut end of the pressure bolts.

6. Loosen the three pressure nuts, backing them off until they are near the ends of the pressure bolts.

7. Inspect the gasket (S#55-D-5555-P-1 for Oil or Askarel) to see if it has been damaged. In most cases no action will be necessary. If, however, the gasket has been damaged and needs replacement, remove pressure nuts from pressure bolts, lift flange, clean off the gasket surface carefully and proceed as follows:

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(b) Place gasket in gasket recess.

(c) Apply a light coat of Lubricant to the top of the gasket, replace relief cover and reassemble.

NOTICE: Do not use cement or any material which may bond the relief cover to the flange or gasket.

8. Lift up on the pressure ring, allowing the latches to drop back into place, making sure that they set properly against the flange and latch plate. The latch plate should be centered between the latches.

9. Tighten the three pressure nuts on the pressure bolts evenly but not more than 125 inch-lb. torque.

MECHANICAL RELIEF DEVICE

10. Bolt the device back on the transformer. Boss gasket (S#1029 060 for oil, S#1166 385 for Askarel) may need replacing.

11. Replace the lagging, hood, cap nut gasket and cap nuts. The device is now ready for operation.

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MAINTENANCE

The only maintenance necessary is resetting after each operation. If the gasket between the transformer boss and flange has to be replaced: (A) for oil—coat it on both edges and bottom with cement #7386, and on top with petrolatum; (B) for Inerteen or Askarel—coat it all over with cement #7386. After applying first coat of cement let dry for 15 minutes, apply a light second coat of cement to the same surfaces, wiping excess cement off the edges of the gasket.

Important: Before testing the transformer tank for leaks with pressures greater than 8 pounds, reverse the hood and bolt it in place as shown in Fig. 3.

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TABLE NO. 1

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125 A-C	10	10
250 A-C	5	5
125 D-C	0.5	0.05
250 D-C	0.25	0.025

* L/R equal or less than 0.026 where L = inductance in henrys and R = resistance in ohms.

Important: Relays, solenoids and motors are inductive loads. When an inductive circuit is opened, a voltage is induced in the circuit tending to maintain current flow. The resultant arcing causes severe contact duty and may result in failure of the contacts to interrupt current.

When checking circuits through this device, it is necessary to follow Table No. 1. This means that a low voltage bell ringer cannot be used unless switched through a high impedance relay. An indicating light type device is generally recognized as best for checking circuits through instruments containing microswitches of similar capacities.

Keep spare gaskets and cement on hand. A limited supply is furnished with the transformers. For additional parts, order from the nearest Westinghouse Office, giving the serial and stock order number of the complete transformer as stamped on the nameplate.



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