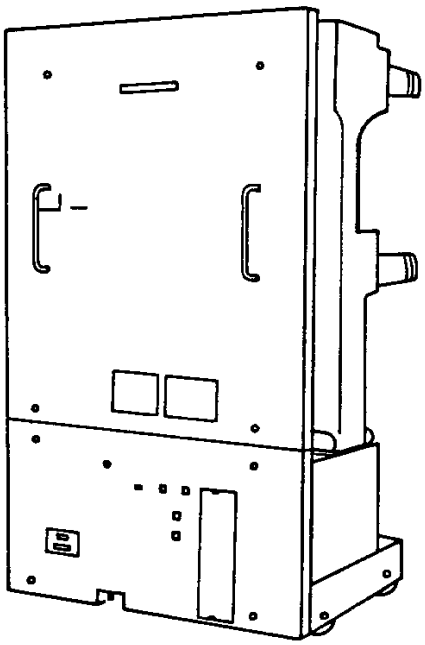
TOSHIBA

6F9A2110

TOSHIBA VACUUM CIRCUIT BREAKER

VY-30M/P25



TOSHIBA CORPORATION

FCF500001A

CODE V.C.B

C O N T E N T S

1. PREFACE

This instruction manual is good for operating and maintenance manual of VY type VACUUM CIRCUIT BREAKER.

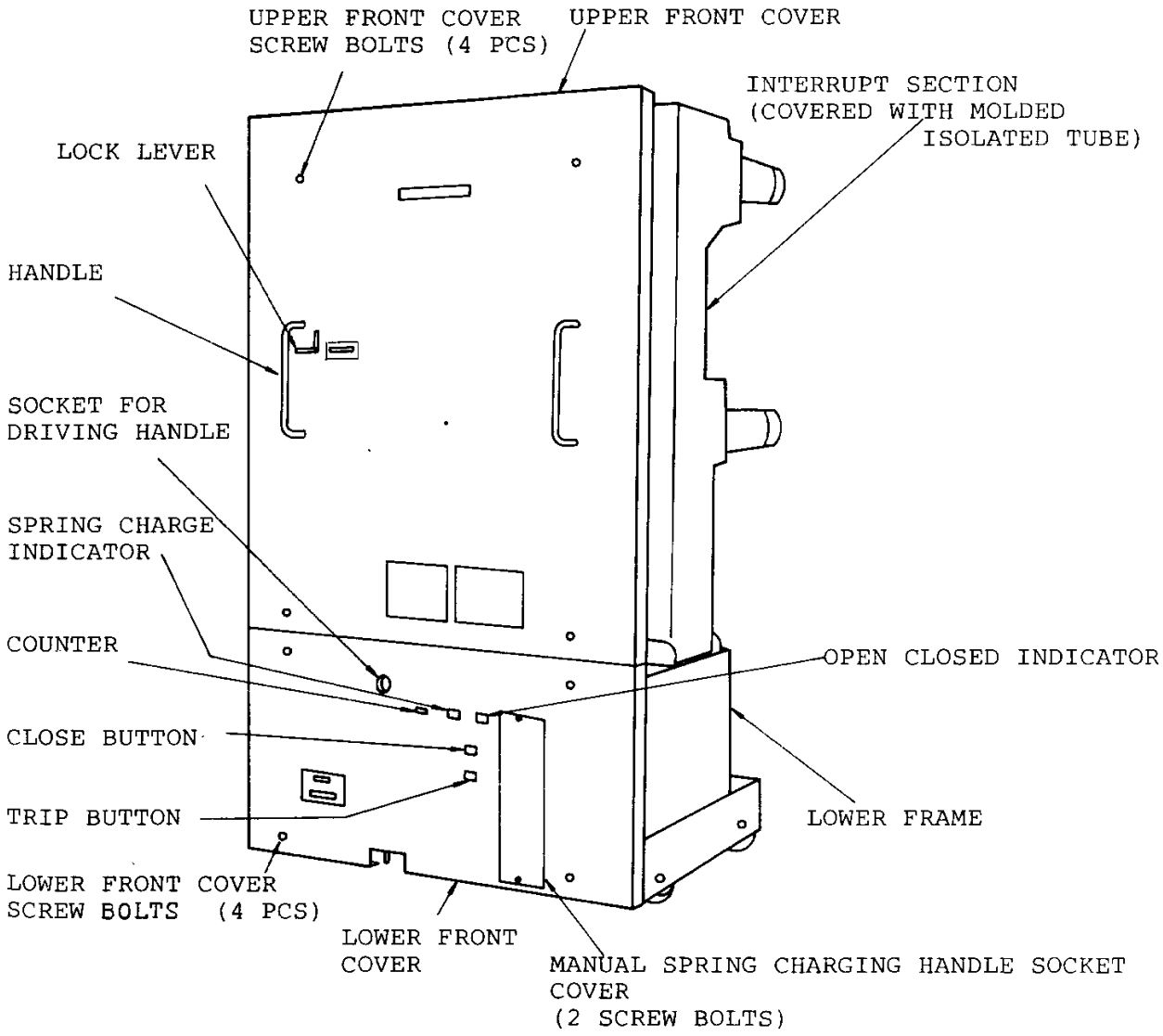


FIG. 1 THE VACUUM CIRCUIT BREAKER EXTERIOR VIEW.

2. UNPACKING AND TRANSPORTATION

2.1 UNPACKING

They are never available ways to set this VACUUM CIRCUIT BREAKER un-predetermined position, such as upside down, inside out, and sidelong down, for no damage. And following factors must be considered during unpacking this VACUUM CIRCUIT BREAKER:

1) Nails, wooden broken pieces and the other packing materials must be handled carefully to avoid getting into this VACUUM CIRCUIT BREAKER during unpacking.
2) Careful unpacking must be done to avoid impact force to this VACUUM CIRCUIT BREAKER.
3) Please make sure that no damages, no distortions and no fissures are on the FRONT COVER and isolated part.
4) Please make sure that the number of accessories and spare parts are correct.

2.2 TRANSPORTATION

It must be hung up with hanger-hooked wire which hook on the HANGING-HOLES (4 pcs), where located on the UPPER FRAME, such as Fig. 2, during hanging up the VACUUM CIRCUIT BREAKER by crane or the like. And on the floor, the VACUUM CIRCUIT BREAKER must be carried with pushing the HANDLE on the FRONT COVER.

NOTE; ° Supporting sticks must be set between wire rope and molded pents to avoid damage for molded isolated tube during hanging up.
° Hanging down must be done slowly and carefully on the planed place.

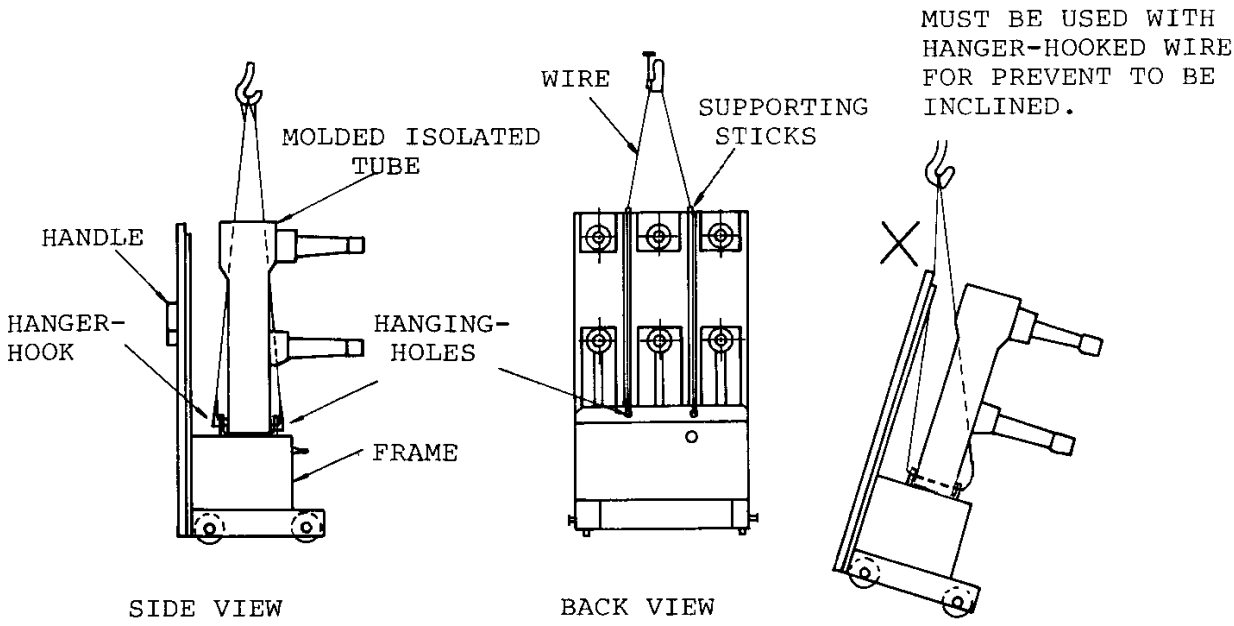


FIG. 2 VACUUM CIRCUIT BREAKER HANGING UP VIEW.

3. MANAGEMENT TILL SETTING

3.1 MATTERS TO BE ATTENDED TO MANAGEMENT

It must be stored in house, and must be considered following items.

1) TEMPERATURE; 0 ~ 40°C, MOISTURE; 45 ~ 75%
   NOTE: It must be kept off the place wherever they easily get quickly-change in temperature, for dewdrops on the system.
2) The methods, especially direct set application on the floor, is never done.
3) The methods, especially sideward set application, is never done.
4) It must be kept off the place wherever they get the vibration and impact force.
5) The VACUUM CIRCUIT BREAKER must be covered with plastic sheets for dust "ESCORT" the VACUUM CIRCUIT BREAKER. Moreover, it must be kept off dustry place.
6) The place, especially corrosive gas, such as SO_2, H_2S, NH_3, NOX, and salt, must be kept off.
7) The methods, especially getting direct sunbeam application, is never done.
8) It must be stored carefully without damages.

3.2 MAINTENANCE IN MANAGEMENT

The maintenance must be done with two factors, such as the VACUUM CIRCUIT BREAKER and room circumstance.

1) The room circumstance must be checked monthly for temperature, moisture, raindrops and the opening condition of windows and doors.
2) Emergency check must be done after earthquake, typhoon, heavy rain, and heavy snow.

3) The instruments, VACUUM CIRCUIT BREAKER, must be checked once a six months as following items.

① Isolated parts must be kept good conditions without damages such as bend, fissures and local disease such as colored.

② No spits are on the molded parts surface.

③ No stained parts are on the VACUUM CIRCUIT BREAKER by raindrops.

④ Tooling instruments and parts of the VACUUM CIRCUIT BREAKER must be set in correct place.

⑤ Plates such as name, model, and so on, must be placed in correct place.

⑥ Materials such as coating, gilding and painting, must be not take off from the VACUUM CIRCUIT BREAKER.

⑦ Cleaning the VACUUM CIRCUIT BREAKER can be done at need.

⑧ And, the manual operating of the VACUUM CIRCUIT BREAKER must be done with safe and correct.

4. CONSTRUCTION AND OPERATION

In this part, must be explained in the construction and operating principal of this VACUUM CIRCUIT BREAKER.

4.1 CONSTRUCTION

An exterior view of this VACUUM CIRCUIT BREAKER is shown on Fig. 1. This sytem; thus, lower frame part, molded isolated tube included the vacuum interrupter, and front cover including the integrated functions. The operating mechanism using the motor spring, and control circuit, are installed into lower frame part.

4.2 OPERATION

1) THE OPERATING MECHANISM BY THE MOTOR SPRING

The operating mechanism by the MOTOR SPRING in this VACUUM CIRCUIT BREAKER is shown as Fig. 3.

The closing spring gets the closing force power (or charge) by turning of the MOTOR, when the operating circuit connector was connected to the power supply. When charged up the closing spring, the limit switch opens, so that the MOTOR stops. The closing coil is magnetized by closing command signal, and then the closing catch is released, as a result, the closing cam starts to move by repulsion power of the closing spring, therefore, the MAIN SHAFT starts to move through LINK system.

The movement of the closing lever on the MAIN SHAFT, drives the moving rod of the VACUUM INTERRUPTER with isolated OPERATING ROD, through the WIPPING SPRING, and then, the VACUUM CIRCUIT BREAKER is completed to close.

As closing the breaker, LIMIT SWITCHES closed and the MOTOR starts to move and then, the closing spring gets the closing power force again (or RECHARGE) for next chance. (Fig. 3 is shown as "CLOSED AND CHARGED" position.)

The opening operation of the breaker system is done by trip command signal, and tripping coil is magnetized, as a result, setting the TRIP CATCH free, therefore, the vacuum circuits breaker is OPEN position by opening spring.

2) TRIP-FREE FUNCTION

In this system, VACUUM CIRCUIT BREAKER, the operating mechanism by the MOTOR SPRING is used the trip-free function. The trip-free function are shown on Fig. 4.

The normal open position of the operating mechanism is shown as Fig.4-(a). Fig. 4-(b) is shown as the closing position by closing command signal (just after closing and still the closing cam is rotating). And such as Fig. 4-(c), the trip command signal makes the circuit breaker into open position by force, even if, during the closing command signal on the way.

Y	AUXILIARY RELAY COIL
Yb	AUXILIARY RELAY CONTACT
X	CONTROL RELAY COIL
Xa, Xb	CONTROL RELAY CONTACT
a1	AUXILIARY SWITCH A TYPE CONTACT
b1	AUXILIARY SWITCH B TYPE CONTACT
LS	LIMIT SWITCH
IS	INTERLOCK SWITCH
D1 ~ D5	DIODES
R1 ~ R4	RESISTORS

Broken line shows supply circuit

(or CONTROL SWITCH BOARD)

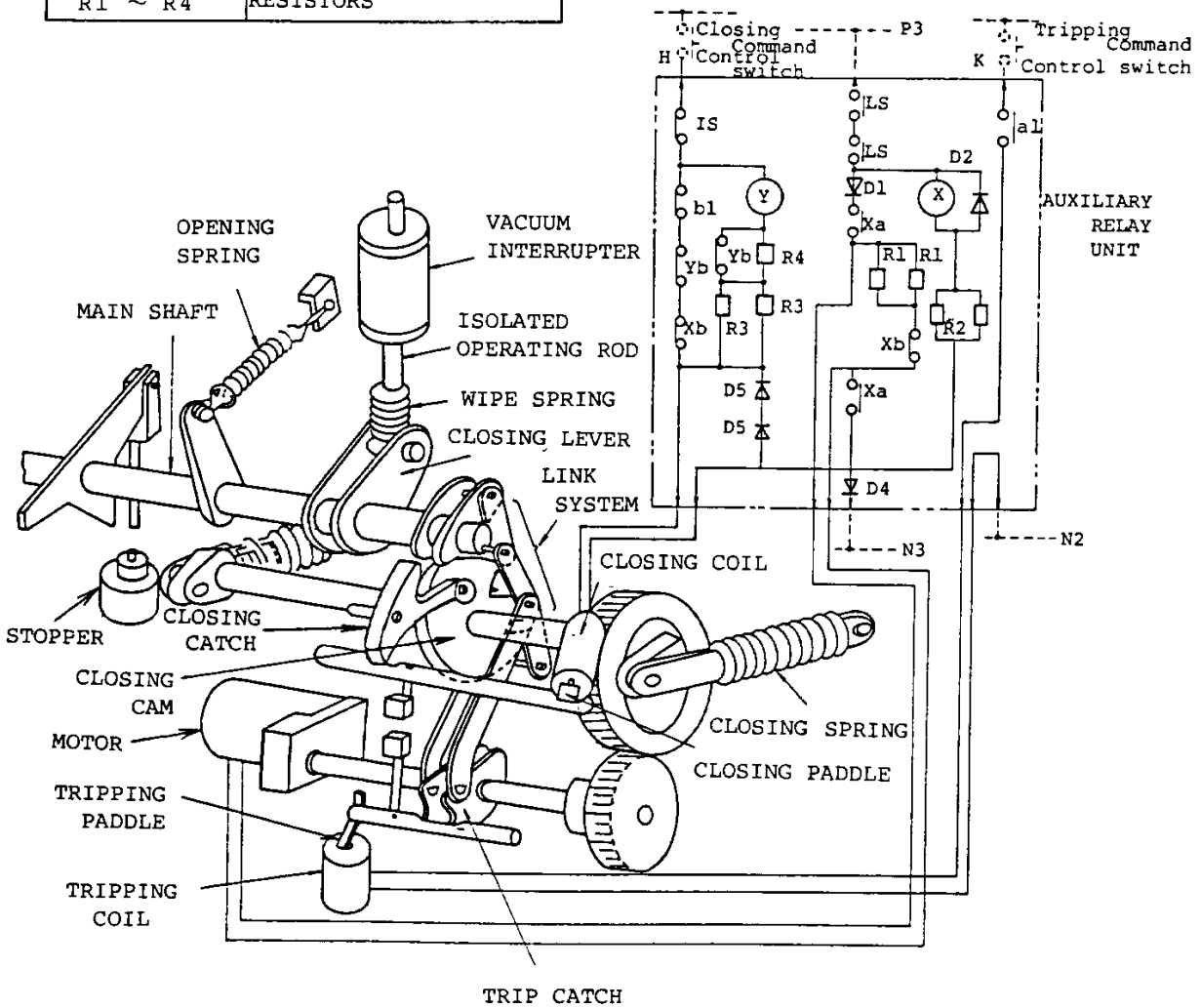


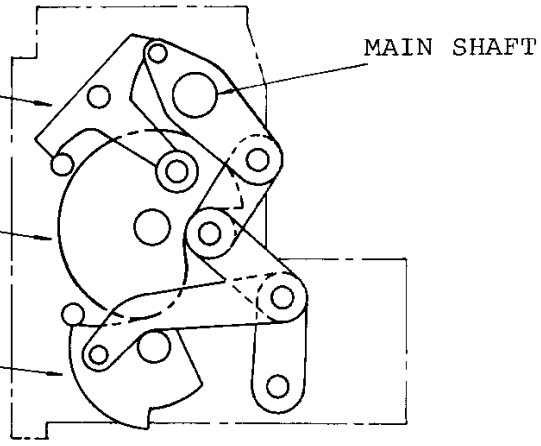
FIG. 3 OPERATING PRINCIPAL

NOTE:

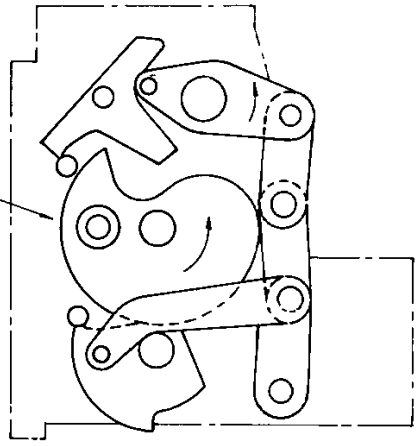
A TYPE CONTACT; NORMALLY OPEN CONTACT.

B TYPE CONTACT; NORMALLY CLOSED CONTACT.

a) NORMAL OPEN STATE



b) JUST AFTER CLOSING POSITION BY CLOSING COMMAND SIGNAL



c) FORCED TRIPPING POSITION BY TRIPPING COMMAND SIGNAL DURING THE CLOSING COMMAND SIGNAL ON.

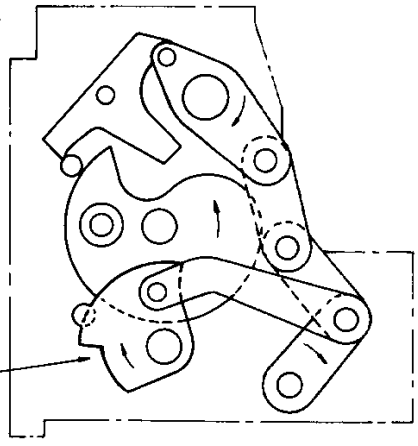


FIG. 4 TRIP-FREE FUNCTION OPERATING PRINCIPAL.

4.3 INTERLOCK MECHANISM (FOR WITHDRAWABLE TYPE)

Given below is a description on interlocks intended to restrict withdrawing or inserting of the circuit breaker in order to operate it safety.

1) The VACUUM CIRCUIT BREAKER can be withdrawn or inserted only under opened state.
2) The VACUUM CIRCUIT BREAKER can't be closed either electrically or mechanically during withdrawing or inserting.

Now, the function, using DRAW-OUT UNIT application, is explained roughly, and shown as Fig. 5 for the structure principal.

The LOCK LEVER, located at the left HANDLE on the FRONT COVER, won't be pushed up when the breaker is closed state, because the stopper on the MAIN SHAFT is set to JOINED LINK.

As the result, the VACUUM CIRCUIT BREAKER can't be pulled out by INTERLOCK PIN that was fallen into the INTERLOCK PIN SOCKET on the DRAW-OUT UNIT. When the VACUUM CIRCUIT BREAKER is set to open state position, the LOCK LEVER on the FRONT COVER can be pushed up, as the STOPPER on the MAIN SHAFT move to SET-OFF position. The CLOSE BUTTON must be locked in mechanical method, when this LOCK LEVER was pushed up.

3) CLOSING method, using electrical or manual application, can't done, when the INTERLOCK PIN doesn't fallen into the PIN SOCKET throughly.

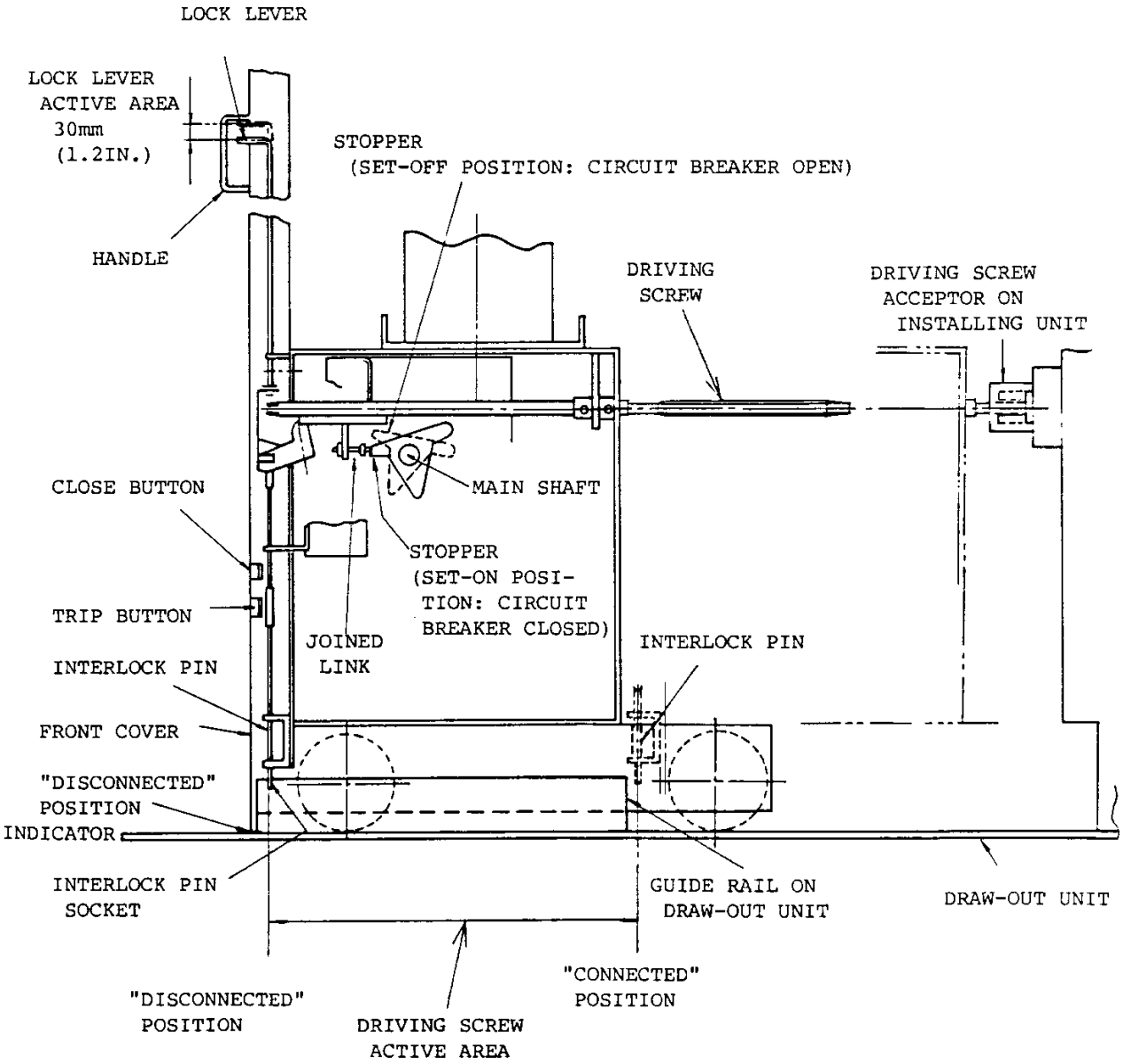


FIG. 5 INTERLOCK MECHANISM (ROUGH SIDE VIEW)

4-4 INTERLOCK OF CONTROL CIRCUIT

When using a plug with interlock, follow the procedure shown below.

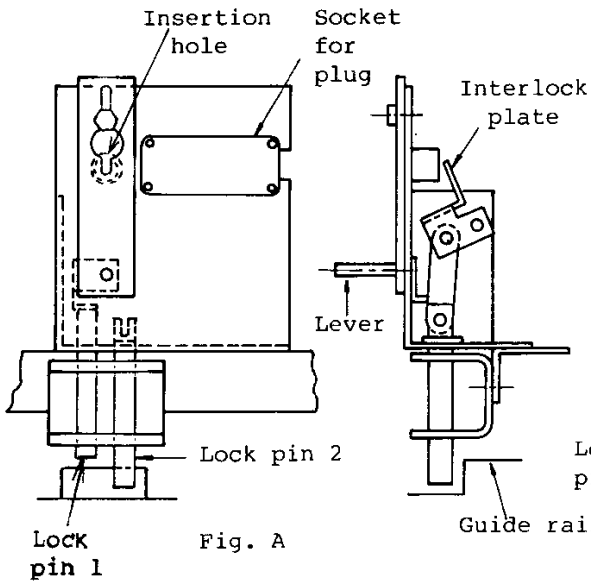


Fig. A

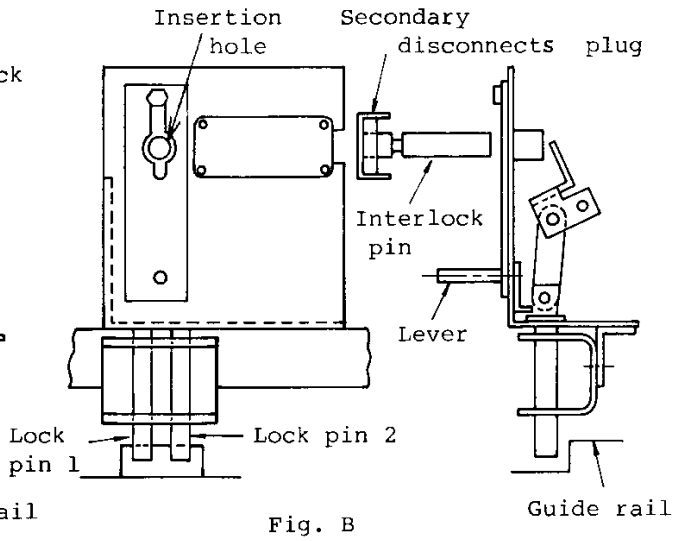


Fig. B

1) Disconnected position of DRAW-OUT UNIT.

   a) VACUUM CIRCUIT BREAKER can not be movable to connected position because the lock pin 2 is in lower position when the plug is not inserted.

   b) The plug can not be inserted because the insertion hole is closed by the lock pin 1.

2) Preparation for plug connection.

   a) Pushing down the lever, the insertion hole is in open and the plug can be inserted.

   b) In this condition, VACUUM CIRCUIT BREAKER can not be movable to the connected position because the lock pin 1 and 2 are in lower position.

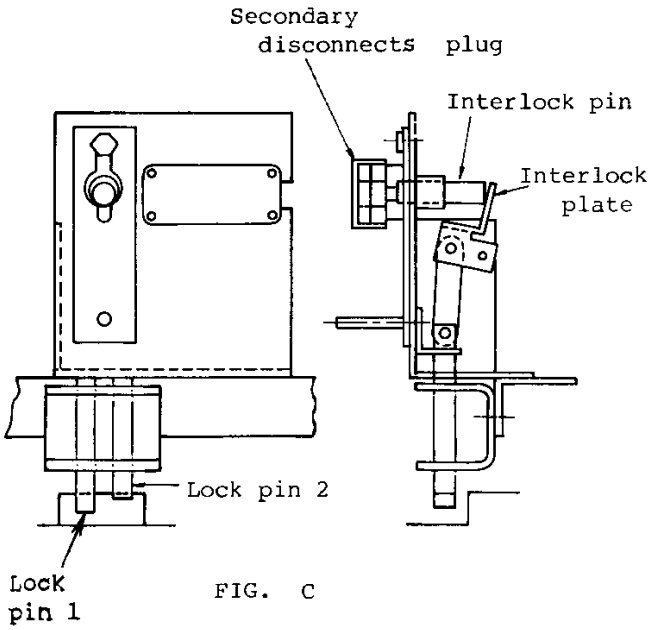


FIG. C

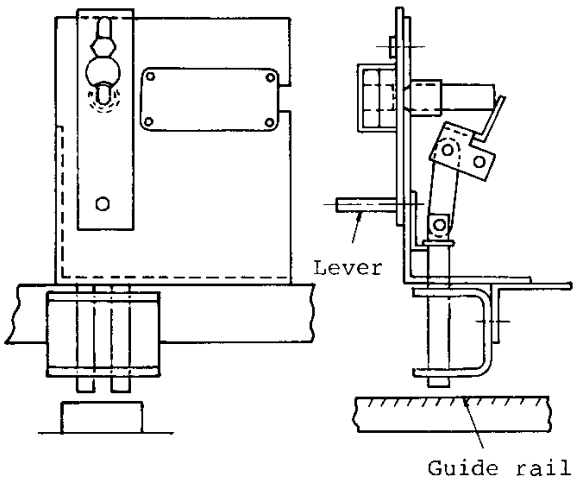


Fig. D

3) Uncomplete connection of the plug.

a) While inserting the plug, the interlock plate is pushed by the interlock pin and the lock pin 2 is raised.

b) VACUUM CIRCUIT BREAKER can not be movable to the connected position because the interlock plate is not raised by the interlock pin of the secondary disconnects plug.

c) Removing the plug from uncomplete connection, lock pin 1 and 2 return to the condition as shown in Fig. A.

4) Complete connection of the plug.

a) Connecting the plug completely as shown in Fig. D the lock pin 1 is raised and VACUUM CIRCUIT BREAKER can be movable to the connected position.

b) In the connected position, coupling of the interlock pin and the lock pin 1 prevents removing of the plug.

c) Lower the lever down when the attempt is made to remove the plug in the connected position, however, the plug is not removed because the lock pin 1 strikes against the Guide rail and can not be lowered.

5. PRETREATMENT AND OPERATING

5.1 PRECHECK

The VACUUM CIRCUIT BREAKER must be checked following ordered steps.

1) It must be cheked that no foreign materials is introduced into the system, and no touch either.
2) Also, please make sure that neither damages nor distortions are on the surface.
   Next, it must be done operating check by manual mode after visual check.
   The method, manual mode operating application, is shown on next item, so that it must be done after perusing.

5.2 OPERATING METHOD

Please refer to Fig. 1 for the parts name.

1) MANUAL MODE (MANUAL OPERATION)
   This mode, manual operation, must be done to check OPEN/CLOSE operating before control circuit on.
   So, please make sure that the VACUUM CIRCUIT BREAKER is set OPEN condition by the OPEN CLOSED INDICATOR "OPEN".

   ① CLOSING SPRING CLAMPING METHOD
   a) The manual spring charging HANDLE SOCKET COVER can be taken off by removing the two finger screws which are located at the cover on the right side of the lower FRONT COVER. (refer to Fig. 6).
   b) The manual spring charging HANDLE must be set for centering the shafts, and putting in gears accurately, with 4mm sliding to left side.

(After all, please make sure that the shafts and the gears are put into accurate position.)
(refer to Fig. 7)

c) The MANUAL SPRING CHARGING HANDLE must be moved up and down, and after six or seven times of above action, the SPRING-CHARGE INDICATOR will be turned to yellow from white, then, stop to wind up, as the closing force power of the CLOSING SPRING will be stored thoroughly.

d) After winding up of the CLOSING SPRING, the MANUAL SPRING CHARGING HANDLE must be removed from the SOCKET with 5mm sliding to right side.

e) Therefore, after all, it can be covered the MANUAL SPRING CHARGING HANDLE SOCKET with the cover.

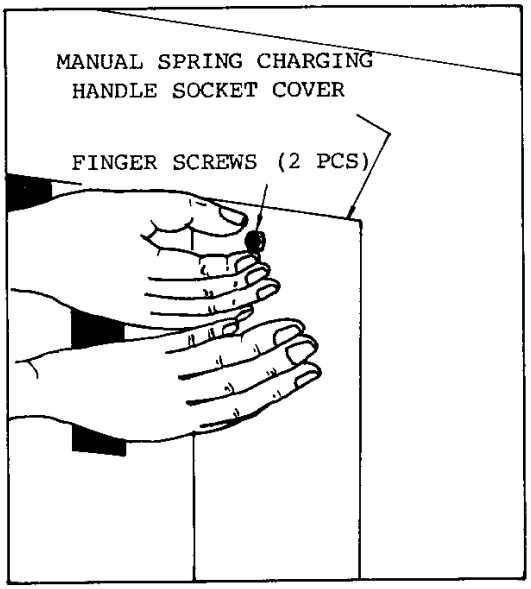


FIG. 6 COVER SETTING OF MANUAL SPRING CHARGING HANDLE SOCKET

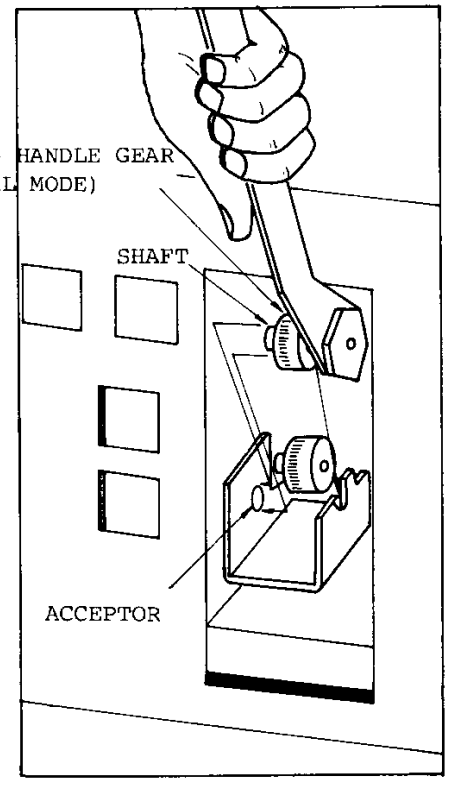


FIG. 7 MANUAL SPRING CHARGING HANDLE SETTING

② MANUAL CLOSING OPERATION

Push the CLOSE BUTTON on the FRONT COVER, and the OPEN CLOSED INDICATOR turns to "CLOSED" from "OPEN", and the SPRING CHARGE INDICATOR turns to "WHITE" from "YELLOW", then the VACUUM CIRCUIT BREAKER is set the "CLOSED" condition. It shouldn't be pushed the CLOSE BUTTON during "CLOSED" on OPEN CLOSED INDICATOR, because the pushing during "CLOSED" condition, such as free discharge of closing spring, makes troubles.

③ MANUAL OPENING OPERATION

Push the TRIP BUTTON on the lower FRONT COVER, and the OPEN CLOSE INDICATOR turns to "OPEN", then the VACUUM CIRCUIT BREAKER is set the "OPEN" condition.

2) AUTO MODE (ELECTRICAL OPERATION)

Please refer to Fig. 3, OPERATING PRINCIPAL.

① CLOSING SPRING CHARGING METHOD

The MOTOR turns on whenever the power switch is set on, after connecting the control power source of the VACUUM CIRCUIT BREAKER, in a while, the SPRING CHARGE INDICATOR will turn to "YELLOW" from "WHITE", and the MOTOR will be stopped, and finished.

② CLOSING OPERATION

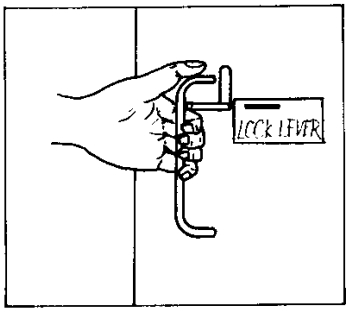
The CLOSING command signal from the CONTROL SWITCH BOARD, makes the CLOSING COIL magnetized, and the OPEN CLOSED INDICATOR turns to "CLOSED" from "OPEN", then the VACUUM CIRCUIT BREAKER is set "CLOSED" condition. And simultaneously, the MOTOR start to move for winding-up the CLOSING SPRING again.

③ OPENING OPERATION

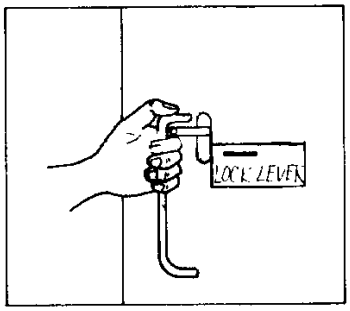
The TRIPPING command signal from the CONTROL SWITCH BOARD, makes the TRIP COIL magnetized, and the OPEN CLOSED INDICATOR turns to "OPEN" from "CLOSED" condition, then, the VACUUM CIRCUIT BREAKER is set "OPEN" condition.

5.3 INSTALLATION WITH DRAW-OUT UNIT (FOR WITHDRAWABLE TYPE)

In this section, the installation of the VACUUM CIRCUIT BREAKER to DRAW-OUT UNIT of switchgear cubicle, are explained. Fig. 8(a), (b) are shown as the LOCK LEVER handling.



(a)
LOCK LEVER normal position (The position, between the LOCK LEVER and the arrow sign, is agreed.)



(b)
LOCK LEVER up position (The LOCK LEVER is brought up.)

Fig. 8 LOCK LEVER HANDLING

1) SETTING THE VACUUM CIRCUIT BREAKER FROM OUTSIDE OF DRAW-OUT UNIT TO "DISCONNECTED" POSITION.

① Make sure that the OPEN CLOSED INDICATOR is "OPEN" condition and the SPRING-CHARGE INDICATOR is "WHITE" condition.

② It must be set the VACUUM CIRCUIT BREAKER with pushing the HANDLES into the DRAW-OUT UNIT to the position, where the FRONT COVER of the VACUUM CIRCUIT BREAKER agree to the "DISCONNECTED" indicator on the DRAW-OUT UNIT, while the LOCK LEVER is held the "BROUGHT UP" POSITION. And, the VACUUM CIRCUIT BREAKER can be fixed on the "DISCONNECTED" position, if the LOCK LEVER down to the "NORMAL" position, agreed the arrow sign. (refer to Fig. 8(a)).
And, if not, it must be slightly moved the VACUUM CIRCUIT BREAKER front and back, to set the LOCK LEVER down.

③ CONNECTION WITH CONTROL WIRE

The CONTROL WIRE must be connected with the VACUUM CIRCUIT BREAKER, after the VACUUM CIRCUIT BREAKER is fixed the "DISCONNECTED" position. And the CONTROL WIRE must be released from the VACUUM CIRCUIT BREAKER, for safety maintenance, which needs to be set the "DISCONNECTED" position for long hour maintenance.

④ CHECK THE OPEN/CLOSED OPERATION

After the CONTROL WIRE was connected, and the CONTROL CIRCUIT power was set on, it must be made sure that no trouble is brought out by electrical operations with those above items 5.2.2).

2) SETTING THE VACUUM CIRCUIT BREAKER FROM "DISCONNECTED" POSITION INTO "CONNECTED" POSITION.

Please refer to Fig. 5, INTERLOCK FUNCTION AND DRAW-OUT. In case of no trouble in electrical operation, those above items 5.3-1)-④, the VACUUM CIRCUIT BREAKER can be installed into "CONNECTED" position from "DISCONNECTED" position in order of following items.

① Make sure that the OPEN CLOSED INDICATOR is set the "OPEN" condition

② Next, push the VACUUM CIRCUIT BREAKER to the end, while the LOCK LEVER near the left HANDLE on the COVER is held the "BROUGHT UP" position.

③ Then, please wind up the "DRIVING SCREW" in clockwise by inserting the "DRIVING HANDLE", belonged one, into the "DRIVING HANDLE SOCKET", during holding up the LOCK LEVER.

The "WIND UP" must be done till running idle, at the begining, lightly, and heavy, and finally, more heavier rotating. (approx, 80 rotating)

④ After wind up or after running idle, the "DRIVING HANDLE" can be removed off from the "DRIVING HANDLE SOCKET", and moreover, the "LOCK LEVER" must be made sure of downing to the "NORMAL" position,agreed the arrow sign.

3) DRAWING OUT THE VACUUM CIRCUIT BREAKER FROM "CONNECTED" POSITION TO "DISCONNECTED" POSITION.

The VACUUM CIRCUIT BREAKER can be draw-out from "CONNECTED" position to "DISCONNECTED" position in order of following items.

① Make sure that the OPEN CLOSED INDICATOR is set the "OPEN" condition.

② Next, bring up the LOCK LEVER near the left HANDLE on the FRONT COVER, and put the DRIVING HANDLE into the DRIVING HANDLE SOCKET.

③ Then, turn the DRIVING HANDLE in counterclockwise till running idle. In this time, the charge up currents such as, transformer exiting currents or cable charging currents, are cut off at primary disconnects.
Therefore, the cut-off-noise are brought up, however, those noises are not abnormal.
But, it needs a quickly motion in DRIVING HANDLE.

④ At the last, pull out the DRIVING HANDLE, then make sure that the LOCK LEVER is settled the "NORMAL" position, agreed the arrow sign.

4) DRIVING OUT THE VACUUM CIRCUIT BREAKER FROM "DISCONNECTED" POSITION TO OUTSIDE OF DRAW-OUT UNIT

① Make sure that the VACUUM CIRCUIT BREAKER is set the "DISCONNECTED" position, then disconnect the control wire.

② Make sure that the OPEN CLOSED INDICATOR is set the "OPEN" condition and the SPRING-CHARGING INDICATOR is set the "WHITE" condition.
When the SPRING-CHARGING INDICATOR indicates "YELLOW", push the CLOSE BUTTON then push the TRIP BUTTON.

③ Next bring up the LOCK LEVER, and pull out the VACUUM CIRCUIT BREAKER slowly with the HANDLE on the FRONT COVER, until the VACUUM CIRCUIT BREAKER is withdrawn from DRAW-OUT UNIT.

6. MAINTENANCE

6.1 PATROLLING CHECK

The patrolling check is done on patrolling the systems, with checking from outward, and testing the conditions during running.

And it must be cared about the dangerous zone, charge up section, at opening the switchgear panel or attacking the charge up section on the DRAW-OUT UNIT.

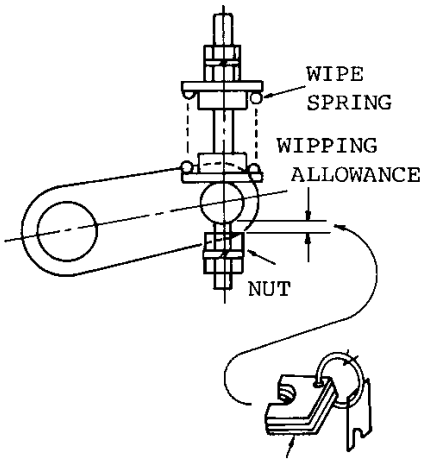
CHECK ITEMS	CHECK POINTS	CONDITION	GUIDE
OUT-LOOKING.	CHECKING THE DISPLAY OF THE INDICATORS AND THE COUNTER.	·THE DISPLAY HAS STOPPED ON THE WAY. ·NO-AGREEMENT BETWEEN COUNTER AND ACTUAL VALUE.	IT MUST BE TAKEN CORRECT MEASURES AFTER TROUBLE SHOOTING.
	CHECKING THE BAD SOUNDS AND SMELLS.	·SPARKING CORONA SOUND OR ABNORMAL SOUND. ·STRANGE SMELL	IT MUST BE TAKEN CORRECT MEASURE AFTER TROUBLE SHOOTING UNDER EMERGENCY POWER STOPPAGE.

6.2 PERIODICAL GENERAL INSPECTION

The VACUUM CIRCUIT BREAKER must be stopped to check in predetermined term. And, the term depends on the circumstance and frequency of operation.

CHECK ITEMS	CHECK POINTS	TERM.	COMMENTS
OPEN/CLOSED OPERATION.	·PERFORMANCE TEST IN OPEN CLOSED INDICATOR. ·PERFORMANCE TEST IN COUNTER. ·CHECK THE PRIMARY DISCONNECTING PLUG.	ONCE A YEAR.	IT MUST BE TESTED IN ONE YEAR BLANK OPERATING. (BY CONTROL SWITCH.)
OUT-LOOKING.	·CHECK THE INSTALLATION OF THE SPRINGS. ·CHECK THE DUST ON THE CONTACT PARTS. ·CHECK THE TIGHTENING OF CONNECTING PARTS. ·CLEANING THE ISOLATING MATERIALS AND FRAMES.	ONCE A THREE YEARS OR, ONCE A 5,000 TIMES	NEW BELONGED GREASE MUST BE PUT ON THINNED AND EQUALIZED, AFTER CLEANING THE DUST AND REMOVING THE OLD GREASE.

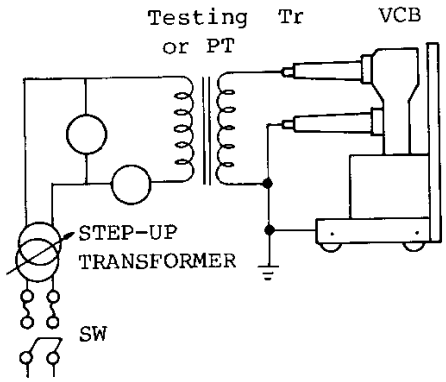
CHECK ITEMS	CHECK POINTS	TERM.	COMMENTS
OPERAT-ING MECHANISM AND CONTROL SECTION.	·CHECK THE TERMINALS ON THE JUNCTION LUG. ·CHECK THE BOLTS AND NUTS ON THE MACHINERY. ·CHECK THE PINS. ·CHECK THE OILING ON BEARINGS AND PINS.		REMOVE THE LOWER FRONT COVER SHOWN AS FIG. 1, AND CHECK. POUR A LITTLE MACHINE OIL INTO THE BEARINGS AND PINS.

CHECK ITEMS	CHECK POINTS	TERM.	COMMENTS
AUXILIARY SWITCHES.	CHECK THE CONTACT AND OPERATION OF THE AUXILIARY SWITCH. NOTE; JUDGEMENT. IT MUST BE REPLACED IN CASE OF BAD ACTION AND RUST CONTACT.	ONCE A THREE YEARS OR ONCE A 5,000 TIMES	
VACUUM INTER-RUPTER.	MEASURRING THE AMOUNT OF CONTACT WEAR. IT MUST BE MEASURED BY WIPE GAUGES FROM BACK SIDE OF THE VACUUM CIRCUIT BREAKER. AND, THE VACUUM CIRCUIT BREAKER SHOULD BE SET THE "CLOSED" CONDITION. NOTE; CONTACT ALLOWANCE 1mm  WIPE GAUGED (1mm/PIECE)		MEASURING THE CONTACT WEAR MEANS THE MEASURE-ING WIPPING ALLOWANCE, SUCH AS DRAWING.(LEFT). NORMALLY, NO WEAR, THE WIPPING ALLOWANCE ARE 3mm, HOWEVER, BELOW 1mm, THE VACUUM INTER-RUPTER SHOULD BE REPLACED.

<table>
<tr><th>CHECK ITEMS</th><th>CHECK POINTS</th><th>TERM.</th><th>COMMENTS</th></tr>
<tr><td>ISOLA-
TION
TEST.</td><td>IT MUST BE MEASURED THE ISO-LATION OF MAIN CIRCUIT AND CONTROL CIRCUIT.
<table><tr><th>TEST CIRCUIT</th><th>ISOLATION</th><th>TESTER (ISOLATION TESTER)</th></tr><tr><td>BETWEEN MAIN CIRCUIT AND THE EARTH</td><td>OVER THAN 500MΩ</td><td>1000V MEGOHM-TESTER</td></tr><tr><td>BETWEEN ALL CONTROL CIRCUIT AND THE EARTH</td><td>OVER THAN 2MΩ</td><td>500V MEGOHM-TESTER</td></tr></table></td><td>ONCE A THREE YEARS OR ONCE A 5,000 TIMES
ONCE A ONE OR TWO YEARS IN POOR PLACE</td><td>THE ISOLATION VALUE, ACTUAL RESISTANCE VALUE, CAN BE DEGRADED IN HIGH MOISTURE AND HEAVY DUST.
IN THOSE CASE, IT MUST BE RE-TESTED AFTER CLEANING.</td></tr>
<tr><td>OTHERS.</td><td>ITEMS TO BE CLASSIFIED TO PATROLLING CHECK.</td><td></td><td></td></tr>
</table>

6.3 PERIODICAL DETAIL INSPECTION

In this check, PERIODICAL DETAIL INSPECTION, it must be checked the predetermined system performance, while the VACUUM CIRCUIT BREAKER must be stopped.

CHECK ITEMS	CHECK POINT	TERM.	COMMENTS
VACUUM INTER-RUPTER.	WITHSTAND VOLTAGE TEST BETWEEN POLES (FOR CHECK OF VACUUM). *MEASURING METHOD. IT MUST BE TESTED WITH FORCING THE VOLTAGE BETWEEN TERMINALS OF THE VACUUM CIRCUIT BREAKER WHILE THE VACUUM CIRCUIT BREAKER IS SET "OPEN" CONDITION. A SAMPLE MEASURING CIRCUIT IS SHOWN AS BELOW.  *VOLTAGE FORCING METHOD IT MUST BE FORCED 70KV VOLTAGE FOR TEN SECOND, WHICH STEP-UP SPEED UP TO 70KV IS 5KV PER SECOND BY STEP-UP TRANSFORMER. *JUDGEMENT. ·THE FORCING VOLTAGE MUST BE STEPPED DOWN TO ZERO, WHEN THE CURRENT METER GOES HIGH AND LOW BY SPARKING DURING THE FORCING VOLTAGE STEPPING UP. AND, THEN, THE FORCING VOLTAGE WILL BE STEPPED UP AGAIN. AND, REPEAT A COUPLE TIME, FINALLY, THE FORCING VOLTAGE WILL BE GONE UP TO 70KV, IF IT WILL BE, THE VACUUM INTERRUPTER CAN BE CLASSIFIED IN GOOD. *GUIDE ·A BAD VACUUM INTERRUPTER SHOULD BE REPLACED BY NEW ONE.	ONCE A SIX YEARS.	MATTERS TO BE ATTENDED TO MEASURING. ·THE VACUUM CIRCUIT BREAKER SHOULD BE PARTED FROM ALL POWER SOURCE. ·THE FRAME GROUND SHOULD BE CONTACTED TO THE EARTH. ·IT MUST BE DONE CARE-FUL GOOD MANNER ABOUT DANGEROUS ZONE. AND, THE NO-USE METAL MATERIALS ARE NEVER PUT ON DANGEROUS ZONE, IMAGINE! 70KV HOW HIGH.

CHECK ITEMS	CHECK POINTS	TERM.	COMMENTS
OPEN/ CLOSE OPERA-TION.	IT MUST BE CHECK THE OPEN/CLOSE OPERATION BY MANUAL OPERATIONS.	ONCE A SIX YEARS.	TO BE TESTED AS 5.2.(1).
	MEASURING THE MINIMUM OPEN/ CLOSE OPERATION VOLTAGE. IT MUST BE MEASURED AND CHECKED THE MINIMUM OPEN/ CLOSE OPERATION VOLTAGE. *JUDGEMENT. THE OPEN/CLOSE SMOOTH OPERATION, THUS; THE MINIMUM OPENING VOLTAGE IS 75% OF RATED VALUE, AND THE MINIMUM CLOSING VOLTAGE IS 60% OF RATED VALUE; IN THOSE CONDITIONS, ARE JUDGED AS GOOD.		THE MINIMUM OPEN/CLOSE VOLTAGE ARE MEASURED BY ADJUSTING THE STEP-UP/ STEP-DOWN VARIABLE RESISTOR, THAT IS PUT IN OPENING OR CLOSING CONTROL CIRCUIT WITH DIRECT CURRENT METER. THE FORMULAR IS; MINIMUM VOLTAGE = MINIMUM ADJUSTED CURRENT X COIL RESISTANCE. NOTE; THE VALUE OF COIL RESISTANCE IS SHOWN ON A PERFORMANCE TEST REPORT.
OTHERS.	ITEMS TO BE CLASSIFIED TO PERIODICAL GENERAL INSPECTION.		

6.4 EMERGENCY CHECK

It can be checked the EMERGENCY CHECK in case of following.

CASES	CHECK ITEMS
INTERRUPT THE FOULT CURRENT.	·MEASURING THE CONTACT WEAR. ·WITHSTAND VOLTAGE TEST AT NEED
BROUGHT-OUT THE TROUBLE IN PATROLLING CHECK AND PERIODICAL INSPECTION.	IT MUST BE CHECKED AND MAINTENANCED IN TROUBLE PARTS.
OTHER; BROUGHT-OUT THE TROUBLE IN DAILY OPERATION.	