

September 30, 2003

GE CANADA

Engineering Services
107 Park St. N,
Peterborough, Ontario K9J 7B5

Attn: Mr. Andre Levesque

**Re: COAST GUARD CCGS GRIFFON
Breaker Overhaul/Retrofit - 2003**

Dear Sir:

We are happy to inform you that we have completed the overhaul/retrofit, inspection and testing of:

Six (6) FB – 20 DC Low Voltage Power Circuit Breakers

Please find attached our findings and recommendations based on our visual inspection, test results and observations.

We would like to take this opportunity to thank you for your interest in our services and hope you found our work to be satisfactory. If you have any questions or concerns regarding this report or any other matter, please do not hesitate to contact us at 905-633-7780.

Thank you for your continued assistance.

Respectfully Yours,

A handwritten signature in cursive script, appearing to read "Francis Bagol".

Francis Bagol C.E.T.

I. Circuit Breakers Overhauled/Retrofitted

Type ITE – FB – 20 DC circuit breakers rated 1000VDC, 2000 Amp frame, fixed mounted, 2 poles with nominal interrupting capacity of 50,000A. Total of six breakers with the following features:

- A. Electrical close, 115 VAC
- B. Electrical trip and manual emergency trip.

II. Retrofit Tasks Performed

The existing over-current protection devices were removed and replaced with new **Westrip 2000 DC** solid-state programmer that is designed to work with current shunts. The programmer comes with 'Long Time', 'Short Time' and 'Instantaneous' as standard trip functions. Loss of Voltage trip function is defeated at the factory on these relays. Trip indicators, trip indicator reset switch, power indicator light, amp tap switch and pick-up lights are all standard features of the unit. The normally closed contacts of the relays are wired in series with the magnetic holding coil circuit. In the event the relay detected a fault in the system, the contact opens removing power to the holding coil and thereby trip the breaker. Please refer to Propulsion Control System elementary diagram drawing number Z – 12.

New mounting brackets were made to accommodate the relays in front of the breakers. Cables for shunt connections are provided and will be wired to the shunts when the breakers are installed in their original cell locations.

III. Overhaul Tasks Performed

The following is a summary of work performed on the breakers:

1. Dismantled all arc chutes, cleaned all the vanes and housing from debris, burnt marks and dirt.
2. Primary bus holders were cleaned and painted with insulating varnish.
3. Painted all breaker steel frames and nameplate covers.
4. Main contacts and primary bus bars were silver-plated. Bars that were badly marked were removed, machined and re-silver plated to ensure a flat connection to the main bus bars.
5. Cracked insulations on the magnets outside the arc chutes (five (5) in total) were replaced.
6. All terminal blocks at the back with broken insulating stubs (plastic between the individual terminals) have been replaced. Total of 9 blocks, 8 – 8 poles and 1 – 4 poles.
7. All movable linkages were lubricated and grease applied where needed.
8. Main contacts, magnet assemblies and associated parts were dismantled and cleaned thoroughly.
9. All hardware was checked, loose ones were tightened and torque applied on others where required.
10. All missing GMP wiring terminal covers were added.
11. All pins holding the arc chute mounting bolts were replaced with new pins.
12. On breaker Serial # 20 – 305, the left-hand switch operator broke which prevented the breaker to close. This was repaired and is now operating properly. One normally open contact was found defective on the middle switch assembly and an entirely new switch was installed.

13. Windings on the variable resistor connected in series with the starting motor (7.1 ohms) were damaged. The area was by-passed and one end of the resistor equivalent to 7.1 ohms was utilized. On the manual trip button, the existing normally closed contact was found defective and wires were re-connected to the available contact located below.

IV. Inspection and Testing Operation Performed.

To have access to moving parts underneath the breaker, all arc chutes, main movable and stationary contacts were individually removed, cleaned and thoroughly inspected for signs of physical damage, wear and tear and over-all condition of the various parts. After the cleaning process, a pre-inspection was conducted to make sure that all moving parts were properly greased, lubricated and free of dust and debris. The second stage was the re-assembly of the stationary and moving contacts including the switch operators to a point where the breaker can be manually closed slowly. Contact pressure and contact wipe were properly observed and settings were left as per original. Final inspection was carried out after a number of electrical closing and tripping operations of the breaker to make sure all mechanical moving parts operated smoothly. Mounting bolts and screws were installed tightly and correctly. Wires were tucked-in properly away from the moving parts.

Electrical function testing of the breakers incorporating the new **Westrip 2000** programmable relay was done as per revised Elementary Diagram Propulsion Control System, CCGS GRIFFON. A full bridge rectifier rated 120V, at 35 Amps was used.

Sequence of operations is as follows:

1. Wires for 120VAC control were connected at terminals 10, 11 and 34 to the AC side of the rectifier assembly. The DC negative (-) was connected to terminal 36 and the DC positive (+) was at terminals 12 and 35.
2. With 120 VAC control voltage available, the circuit breaker may be closed by the local push button.
3. With local 'close' push button switch maintained in the closed position, the pick-up coil (54X) is actuated, and closes its contacts in the motor circuit. The motor closes the circuit breaker.
4. The magnetic coil (MC) pick-up during the closing operation and contact A2/002 closes, energizing the anti-pump relay coil (54Y). The coil then seals-in, defeating the pick-up circuit, and allowing contacts 54X/1 and 54X/3 to open the motor circuit. This prevents re-closing of the circuit breaker when contact switch is maintained. Remote closing was also tried by applying 120VDC on terminal 15.
5. Upon closing, the main contact armature is held closed by this magnet.
6. When the local trip push button is activated, the holding magnet coil is de-energized and releases the armature, allowing the mechanism to open the circuit breaker. The same condition is true when the Westrip N/C contact opens on fault condition. Remote tripping was also tried by applying 120VDC on terminal 14. Contact B1/0 is closed when the circuit breaker is in closed position. Trip coil TC pick-up and trip circuit breaker at the same time open switch B1/0, cutting power to trip coil TC.
7. **Westrip 2000** programmable relays were tested using Westinghouse Multi-Amp Unit Model SR-5-48, SR-51-4. The DC voltage output from the shunt is 50 mv/unit was simulated from this variable test unit.

8. The output leads were connected to terminals 1 & 2 of the relay. Power to the relay was taken from the rectifier assembly connected to terminals 7 & 8. Long Time, Short Time and Instantaneous trip functions were simulated at a preset pick-up setting. Test results and breaker trip relay indications were observed and recorded. Please refer to LV CIRCUIT BREAKER (DC) test results.
9. Contact resistance readings for the 2 poles were taken and recorded.
10. Megger tested all breakers: phase to ground, phase to phase when circuit breaker is closed and line to load when breaker is open at 500V for 1 minute.
11. All the tests for first five (5) breakers were conducted in the presence of Mr. Ralph Wilhelm, Mr. Don Thompson and Mr. Peter Cooney.
All the tests for the sixth (last) breaker were conducted in the presence of Mr. Peter Cooney – Technical Director Engineering Services General Electric

Please note that the revised '**Elementary Diagram – Propulsion System CCGS Griffon**' was based on the original by Techsol Inc. drawn for General Electric and submitted to Pelikan Inc. from General Electric.

All test instruments used in the testing process were calibrated to the latest standards by Duncan Instruments Inc.

TEST RESULTS

FB – 20 CIRCUIT BREAKER SERIAL # 20 – 302

FB – 20 CIRCUIT BREAKER SERIAL # 20 – 303

FB – 20 CIRCUIT BREAKER SERIAL # 20 – 304

FB – 20 CIRCUIT BREAKER SERIAL # 20 – 305

FB – 20 CIRCUIT BREAKER SERIAL # 20 – 306

FB – 20 CIRCUIT BREAKER SERIAL # 20 – 307

LOW VOLTAGE CIRCUIT BREAKER (DC)

| | |
|--------------------------------|--------------------------|
| CUSTOMER: GE CANADA | JOB NO : J03 - 674 |
| SITE: Coast Guard CCGS Griffon | DATE: September 16, 2003 |
| EQUIP. DESIGNATION: | TECHNICIAN: F.B. |

NAMEPLATE DATA

| | | |
|--|---------------------|----------------------------------|
| MANUFACTURER: ITE | TYPE: FB - 20 | FRAME SIZE: RMV - 1000VDC, 2000A |
| INTERRUPTING RATING: Unlimited for rate of rise bet/ 1.7 to 15 A per microsecond | SERIAL NO: 20 - 302 | SENSORS: DC Shunt |

MECHANICAL AND ELECTRICAL INSPECTION

| DESCRIPTION | STATUS | NOTES | DESCRIPTION | STATUS | NOTES |
|---------------------|--------|-------|-----------------------------|--------|-------|
| EXT/INT CONDITION | √ | | ARC CHUTES | √ | |
| DRAWOUT MECHANISM | N/A | | MAIN CONTACTS | √ | |
| PRIMARY CONNECTION | √ | | ARCING CONTACTS | √ | |
| SECONDARY CONTACTS | √ | | AUX. CONTACTS (N.O. & N.C.) | N/A | |
| GROUND CONNECTION | √ | | MANUAL CLOSING/OPENING | N/A | |
| INTERLOCK | N/A | | ELECTRICAL CLOSING/OPENING | √ | |
| LUBRICATION | √ | | KEY INTERLOCK | N/A | |
| INSULATING BARRIERS | √ | | | | |

RELAY TESTS AND SETTINGS

| | |
|--|-------------------------------|
| RELAY TYPE: Westrip 2000 DC (Marine) | RELAY SERIAL NO: 22018 |
| TEST EQUIPMENT : Multi-Amp | TYPE OF INJECTION : Secondary |

| TYPE OF PROTECTION | SETTING | SPECIFICATION ± 10% | TRIPPING RESULT | | | | TRIP INDIC |
|-------------------------|---------|------------------------|---------------------|----------------|----------------|----------------|---------------|
| | | | From Shunt (m v) | Min. (Sec.) | Int. (Sec.) | Max. (Sec.) | |
| LONG TIME | 1x | | 50 | N/A | N/A | N/A | N/A |
| LONG TIME DELAY at 6xlc | | | 307 | 1.88 | 6.59 | 21.80 | √ |
| SHORT TIME | 10X | | 509 | N/A | N/A | N/A | N/A |
| SHORT TIME DELAY | | | 509 | 0.35 | 0.435 | 0.75 | √ |
| INSTANTANEOUS @ 10 x lc | 3X | | 509 | .073 | .073 | .073 | √ |

CONTACT RESISTANCE (MICROHMS)

| | | |
|-------|-------|-------|
| PHASE | A: 48 | B: 39 |
|-------|-------|-------|

INSULATION RESISTANCE (MEGOHMS) (500 volts dc) for 1 min

| | | |
|-----------------|---------------------------|---------------------|
| PHASE TO PHASE | A - B : >51,000 | |
| PHASE TO GROUND | A - GROUND: >51,000 | B - GROUND: >51,000 |
| BREAKER OPEN | (A) LINE: - LOAD: >51,000 | (B) LOAD: >51,000 |

Note:

Instantaneous have no time setting.

Weather: Sunny

Counter Reading: 04947

Witness Test by: Mr. Peter Cooney

STATUS: (C) Correct (N/C) Non Conform (N/A) Non Applicable (N/V) Non Verified (✓) Satisfactory

LOW VOLTAGE CIRCUIT BREAKER (DC)

CUSTOMER: GE CANADA

JOB NO : J03 - 674

SITE: Coast Guard CCGS Griffon

DATE: September 16, 2003

EQUIP. DESIGNATION:

TECHNICIAN: F.B.

NAMEPLATE DATA

MANUFACTURER: ITE

TYPE: FB - 20

FRAME SIZE: RMV - 1000VDC, 2000A

INTERRUPTING RATING: Unlimited for rate
of rise bet/ 1.7 to 15 A per microsecond

SERIAL NO: 20 - 303

SENSORS: DC Shunt

MECHANICAL AND ELECTRICAL INSPECTION

| DESCRIPTION | STATUS | NOTES | DESCRIPTION | STATUS | NOTES |
|---------------------|--------|-------|-----------------------------|--------|-------|
| EXT/INT CONDITION | √ | | ARC CHUTES | √ | |
| DRAWOUT MECHANISM | N/A | | MAIN CONTACTS | √ | |
| PRIMARY CONNECTION | √ | | ARCING CONTACTS | √ | |
| SECONDARY CONTACTS | √ | | AUX. CONTACTS (N.O. & N.C.) | N/A | |
| GROUND CONNECTION | √ | | MANUAL CLOSING/OPENING | N/A | |
| INTERLOCK | N/A | | ELECTRICAL CLOSING/OPENING | √ | |
| LUBRICATION | √ | | KEY INTERLOCK | N/A | |
| INSULATING BARRIERS | √ | | | | |

RELAY TESTS AND SETTINGS

RELAY TYPE: Westrip 2000 DC (Marine)

RELAY SERIAL NO: 22020

TEST EQUIPMENT : Multi-Amp

TYPE OF INJECTION : Secondary

| TYPE OF PROTECTION | SETTING | SPECIFICATION ± 10% | TRIPPING RESULT | | | | TRIP INDIC |
|-------------------------|---------|------------------------|---------------------|----------------|----------------|----------------|---------------|
| | | | From Shunt (m v) | Min. (Sec.) | Int. (Sec.) | Max. (Sec.) | |
| LONG TIME | 1x | | 50 | N/A | N/A | N/A | N/A |
| LONG TIME DELAY at 6xlc | | | 312 | 1.85 | 5.35 | 20.02 | √ |
| SHORT TIME | 10X | | 509 | N/A | N/A | N/A | N/A |
| SHORT TIME DELAY | | | 517 | 0.27 | 0.40 | 0.540 | √ |
| INSTANTANEOUS @ 10 x lc | 3X | | 517 | 0.10 | 0.10 | 0.10 | √ |

CONTACT RESISTANCE (MICROHMS)

PHASE

A: 38

B: 36

INSULATION RESISTANCE (MEGOHMS) (500 volts dc) for 1 min

PHASE TO PHASE

A - B : >51,000

PHASE TO GROUND

A - GROUND: >51,000

B - GROUND: >51,000

BREAKER OPEN

(A) LINE: - LOAD: >51,000

(B) LOAD: >51,000

Note:

Instantaneous have no time setting.

Weather: Sunny

Counter Reading: 04604

Witness Test by: Mr. Peter Cooney

STATUS: (C) Correct (N/C) Non Conform (N/A) Non Applicable (N/V) Non Verified (✓) Satisfactory

LOW VOLTAGE CIRCUIT BREAKER (DC)

CUSTOMER: GE CANADA

JOB NO : J03 - 674

SITE: Coast Guard CCGS Griffon

DATE: September 16, 2003

EQUIP. DESIGNATION:

TECHNICIAN: F.B.

NAMEPLATE DATA

MANUFACTURER: ITE

TYPE: FB - 20

FRAME SIZE: RMV -- 1000VDC, 2000A

INTERRUPTING RATING: Unlimited for rate
of rise bet/ 1.7 to 15 A per microsecond

SERIAL NO: 20 - 304

SENSORS: DC Shunt

MECHANICAL AND ELECTRICAL INSPECTION

| DESCRIPTION | STATUS | NOTES | DESCRIPTION | STATUS | NOTES |
|---------------------|--------|-------|-----------------------------|--------|-------|
| EXT/INT CONDITION | √ | | ARC CHUTES | √ | |
| DRAWOUT MECHANISM | N/A | | MAIN CONTACTS | √ | |
| PRIMARY CONNECTION | √ | | ARCING CONTACTS | √ | |
| SECONDARY CONTACTS | √ | | AUX. CONTACTS (N.O. & N.C.) | N/A | |
| GROUND CONNECTION | √ | | MANUAL CLOSING/OPENING | N/A | |
| INTERLOCK | N/A | | ELECTRICAL CLOSING/OPENING | √ | |
| LUBRICATION | √ | | KEY INTERLOCK | N/A | |
| INSULATING BARRIERS | √ | | | | |

RELAY TESTS AND SETTINGS

RELAY TYPE: Westrip 2000 DC (Marine)

RELAY SERIAL NO: 22017

TEST EQUIPMENT : Multi-Amp

TYPE OF INJECTION : Secondary

| TYPE OF PROTECTION | SETTING | SPECIFICATION ± 10% | TRIPPING RESULT | | | | TRIP INDIC |
|-------------------------|---------|------------------------|---------------------|----------------|----------------|----------------|---------------|
| | | | From Shunt (m v) | Min. (Sec.) | Int. (Sec.) | Max. (Sec.) | |
| LONG TIME | 1x | | 50 | N/A | N/A | N/A | N/A |
| LONG TIME DELAY at 6xlc | | | 308 | 2.76 | 5.49 | 21.1 | √ |
| SHORT TIME | 10X | | 509 | N/A | N/A | N/A | N/A |
| SHORT TIME DELAY | | | 509 | .38 | .39 | .55 | √ |
| INSTANTANEOUS @ 10 x lc | 3X | | 509 | .075 | .075 | .075 | √ |

CONTACT RESISTANCE (MICROHMS)

PHASE

A: 34

B: 37

INSULATION RESISTANCE (MEGOHMS) (500 volts dc) for 1 min

PHASE TO PHASE

A - B : >51,000

PHASE TO GROUND

A - GROUND: >51,000

B - GROUND: >51,000

BREAKER OPEN

(A) LINE: - LOAD: >51,000

(B) LOAD: >51,000

Note:

Instantaneous have no time setting.

Weather: Sunny

Counter Reading: 00851

Witness Test by: Mr. Peter Cooney

STATUS: (C) Correct (N/C) Non Conform (N/A) Non Applicable (N/V) Non Verified (√) Satisfactory

LOW VOLTAGE CIRCUIT BREAKER (DC)

CUSTOMER: GE CANADA

JOB NO : J03 - 674

SITE: Coast Guard CCGS Griffon

DATE: September 26, 2003

EQUIP. DESIGNATION:

TECHNICIAN: F.B.

NAMEPLATE DATA

MANUFACTURER: ITE

TYPE: FB - 20

FRAME SIZE: RMV - 1000VDC, 2000A

INTERRUPTING RATING: Unlimited for rate
of rise bet/ 1.7 to 15 A per microsecond

SERIAL NO: 20 - 305

SENSORS: DC Shunt

MECHANICAL AND ELECTRICAL INSPECTION

| DESCRIPTION | STATUS | NOTES | DESCRIPTION | STATUS | NOTES |
|---------------------|--------|-------|-----------------------------|--------|-------|
| EXT/INT CONDITION | √ | | ARC CHUTES | √ | |
| DRAWOUT MECHANISM | N/A | | MAIN CONTACTS | √ | |
| PRIMARY CONNECTION | √ | | ARCING CONTACTS | √ | |
| SECONDARY CONTACTS | √ | | AUX. CONTACTS (N.O. & N.C.) | N/A | |
| GROUND CONNECTION | √ | | MANUAL CLOSING/OPENING | N/A | |
| INTERLOCK | N/A | | ELECTRICAL CLOSING/OPENING | √ | |
| LUBRICATION | √ | | KEY INTERLOCK | N/A | |
| INSULATING BARRIERS | √ | | | | |

RELAY TESTS AND SETTINGS

RELAY TYPE: Westrip 2000 DC (Marine)

RELAY SERIAL NO: 22016

TEST EQUIPMENT : Multi-Amp

TYPE OF INJECTION : Secondary

| TYPE OF PROTECTION | SETTING | SPECIFICATION ± 10% | TRIPPING RESULT | | | | TRIP INDIC |
|-------------------------|---------|------------------------|---------------------|----------------|----------------|----------------|---------------|
| | | | From Shunt (m v) | Min. (Sec.) | Int. (Sec.) | Max. (Sec.) | |
| LONG TIME | 1x | | 50 | N/A | N/A | N/A | N/A |
| LONG TIME DELAY at 6xlc | | | 312 | 1.69 | 5.15 | 20.50 | √ |
| SHORT TIME | 10X | | 517 | N/A | N/A | N/A | N/A |
| SHORT TIME DELAY | | | 517 | 0.28 | 0.40 | 0.56 | √ |
| INSTANTANEOUS @ 10 x lc | 3X | | 517 | 0.10 | 0.10 | 0.10 | √ |

CONTACT RESISTANCE (MICROHMS)

PHASE

A: 40

B: 35

INSULATION RESISTANCE (MEGOHMS) (500 volts dc) for 1 min

PHASE TO PHASE

A - B : >51,000

PHASE TO GROUND

A - GROUND: >51,000

B - GROUND: >51,000

BREAKER OPEN

(A) LINE: - LOAD: >51,000

(B) LOAD: >51,000

Note:

Instantaneous have no time setting.

Weather: Sunny

Counter Reading: 08985

Witness Test by: Mr. Peter Cooney

STATUS: (C) Correct (N/C) Non Conform (N/A) Non-Applicable (N/V) Non Verified (✓) Satisfactory

LOW VOLTAGE CIRCUIT BREAKER (DC)

CUSTOMER: GE CANADA

JOB NO : J03 - 674

SITE: Coast Guard CCGS Griffon

DATE: September 16, 2003

EQUIP. DESIGNATION:

TECHNICIAN: F.B.

NAMEPLATE DATA

MANUFACTURER: ITE

TYPE: FB - 20

FRAME SIZE: RMV - 1000VDC, 2000A

INTERRUPTING RATING: Unlimited for rate of rise bet/ 1.7 to 15 A per microsecond

SERIAL NO: 20 - 306

SENSORS: DC Shunt

MECHANICAL AND ELECTRICAL INSPECTION

| DESCRIPTION | STATUS | NOTES | DESCRIPTION | STATUS | NOTES |
|---------------------|--------|-------|-----------------------------|--------|-------|
| EXT/INT CONDITION | √ | | ARC CHUTES | √ | |
| DRAWOUT MECHANISM | N/A | | MAIN CONTACTS | √ | |
| PRIMARY CONNECTION | √ | | ARCING CONTACTS | √ | |
| SECONDARY CONTACTS | √ | | AUX. CONTACTS (N.O. & N.C.) | N/A | |
| GROUND CONNECTION | √ | | MANUAL CLOSING/OPENING | N/A | |
| INTERLOCK | N/A | | ELECTRICAL CLOSING/OPENING | √ | |
| LUBRICATION | √ | | KEY INTERLOCK | N/A | |
| INSULATING BARRIERS | √ | | | | |

RELAY TESTS AND SETTINGS

| RELAY TYPE: Westrip 2000 DC (Marine) | | RELAY SERIAL NO: 22015 | | | | | |
|--|---------|-------------------------------|---------------------|----------------|----------------|----------------|---------------|
| TEST EQUIPMENT : Multi-Amp | | TYPE OF INJECTION : Secondary | | | | | |
| TYPE OF PROTECTION | SETTING | SPECIFICATION ± 10% | TRIPPING RESULT | | | | TRIP INDIC |
| | | | From Shunt (m v) | Min. (Sec.) | Int. (Sec.) | Max. (Sec.) | |
| LONG TIME | 1x | | 50 | N/A | N/A | N/A | N/A |
| LONG TIME DELAY at 6xlc | | | 314 | 1.70 | 5.37 | 20.59 | √ |
| SHORT TIME | 10X | | 512 | N/A | N/A | N/A | N/A |
| SHORT TIME DELAY | | | 516 | 0.30 | 0.35 | 0.50 | √ |
| INSTANTANEOUS @ 10 x lc | 3X | | 514 | 0.085 | 0.085 | 0.085 | √ |

CONTACT RESISTANCE (MICROHMS)

| | | |
|-------|-------|-------|
| PHASE | A: 31 | B: 35 |
|-------|-------|-------|

INSULATION RESISTANCE (MEGOHMS) (500 volts dc) for 1 min

| | | |
|-----------------|---------------------------|---------------------|
| PHASE TO PHASE | A - B : >51,000 | |
| PHASE TO GROUND | A - GROUND: >51,000 | B - GROUND: >51,000 |
| BREAKER OPEN | (A) LINE: - LOAD: >51,000 | (B) LOAD: >51,000 |

Note:

Instantaneous have no time setting.

Weather: Sunny

Counter Reading: 07952

Witness Test by: Mr. Peter Cooney

STATUS: (C) Correct (N/C) Non Conform (N/A) Non Applicable (N/V) Non Verified (√) Satisfactory

LOW VOLTAGE CIRCUIT BREAKER (DC)

CUSTOMER: GE CANADA

JOB NO : J03 - 674

SITE: Coast Guard CCGS Griffon

DATE: September 16, 2003

EQUIP. DESIGNATION:

TECHNICIAN: F.B.

NAMEPLATE DATA

MANUFACTURER: ITE

TYPE: FB - 20

FRAME SIZE: RMV - 1000VDC, 2000A

INTERRUPTING RATING: Unlimited for rate of rise bet/ 1.7 to 15 A per microsecond

SERIAL NO: 20 - 307

SENSORS: DC Shunt

MECHANICAL AND ELECTRICAL INSPECTION

| DESCRIPTION | STATUS | NOTES | DESCRIPTION | STATUS | NOTES |
|---------------------|--------|-------|-----------------------------|--------|-------|
| EXT/INT CONDITION | √ | | ARC CHUTES | √ | |
| DRAWOUT MECHANISM | N/A | | MAIN CONTACTS | √ | |
| PRIMARY CONNECTION | √ | | ARCING CONTACTS | √ | |
| SECONDARY CONTACTS | √ | | AUX. CONTACTS (N.O. & N.C.) | N/A | |
| GROUND CONNECTION | √ | | MANUAL CLOSING/OPENING | N/A | |
| INTERLOCK | N/A | | ELECTRICAL CLOSING/OPENING | √ | |
| LUBRICATION | √ | | KEY INTERLOCK | N/A | |
| INSULATING BARRIERS | √ | | | | |

RELAY TESTS AND SETTINGS

RELAY TYPE: Westrip 2000 DC (Marine)

RELAY SERIAL NO: 22019

TEST EQUIPMENT : Multi-Amp

TYPE OF INJECTION : Secondary

| TYPE OF PROTECTION | SETTING | SPECIFICATION ± 10% | TRIPPING RESULT | | | | TRIP INDIC |
|-------------------------|---------|------------------------|---------------------|----------------|----------------|----------------|---------------|
| | | | From Shunt (m v) | Min. (Sec.) | Int. (Sec.) | Max. (Sec.) | |
| LONG TIME | 1x | | 50 | N/A | N/A | N/A | N/A |
| LONG TIME DELAY at 6xlc | | | 315 | 1.68 | 6.26 | 21.93 | √ |
| SHORT TIME | 10X | | 513 | N/A | N/A | N/A | N/A |
| SHORT TIME DELAY | | | 513 | 0.30 | 0.43 | 0.60 | √ |
| INSTANTANEOUS @ 10 x lc | 3X | | 513 | 0.10 | 0.10 | 0.10 | √ |

CONTACT RESISTANCE (MICROHMS)

PHASE

A: 37

B: 31

INSULATION RESISTANCE (MEGOHMS) (500 volts dc) for 1 min

PHASE TO PHASE

A - B : >51,000

PHASE TO GROUND

A - GROUND: >51,000

BREAKER OPEN

(A) LINE: - LOAD: >51,000

B - GROUND: >51,000

(B) LOAD: >51,000

Note:

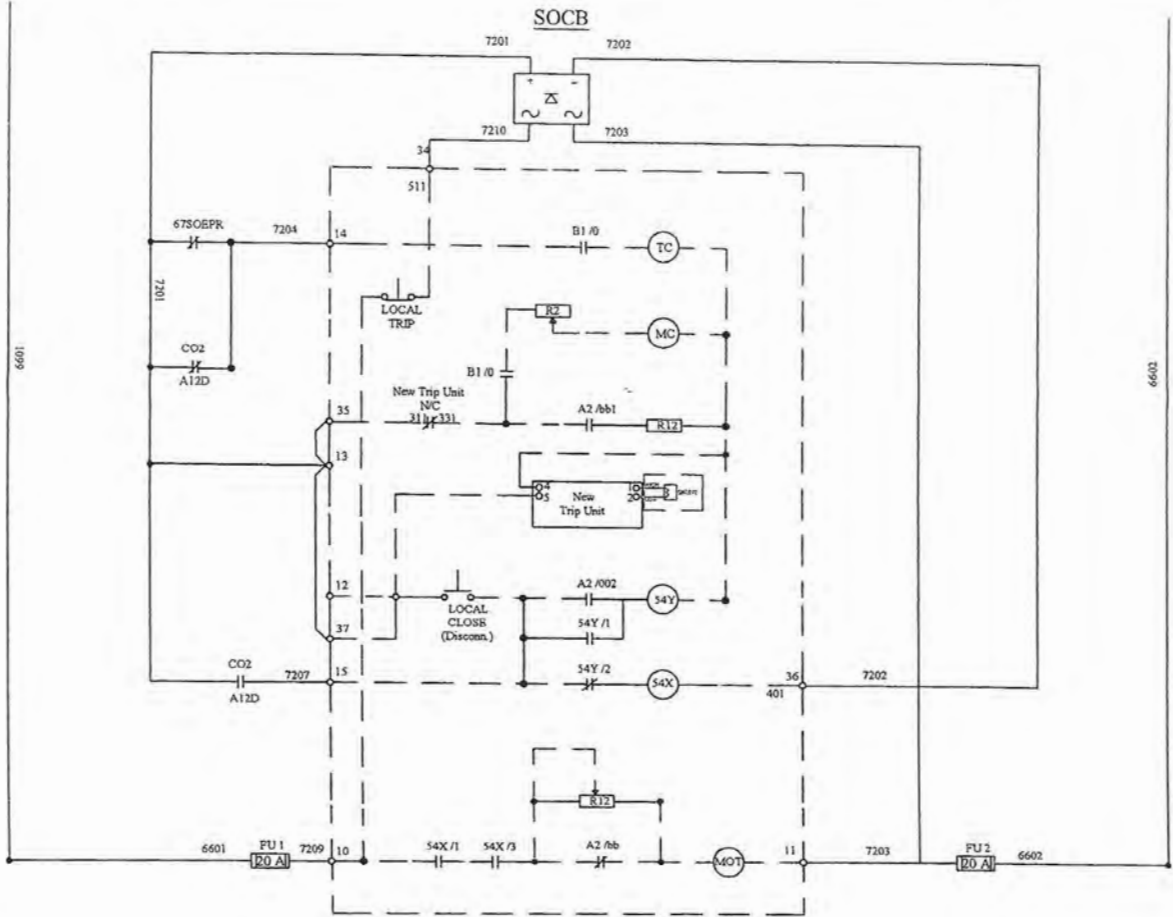
Instantaneous have no time setting.

Weather: Sunny

Counter Reading: 05676

Witness Test by: Mr. Peter Cooney

STATUS: (C) Correct (N/C) Non Conform (N/A) Non Applicable (N/V) Non Verified (√) Satisfactory



PELIKAN INC.
POWER ON ELECTRIC

4129 HARVESTER RD. UNIT L
BURLINGTON, ON. L7L5M3
tel: 905-633-7780

Project:

ELEMENTARY DIAGRAM

PROPULSION CONTROL SYSTEM, CCGS GRIFFON
STBD LOGIC OUTBD GENERATOR C. B. CONTROL

Drawn: Zoran Zlatanovski

DATE: Sept. 04, 2003

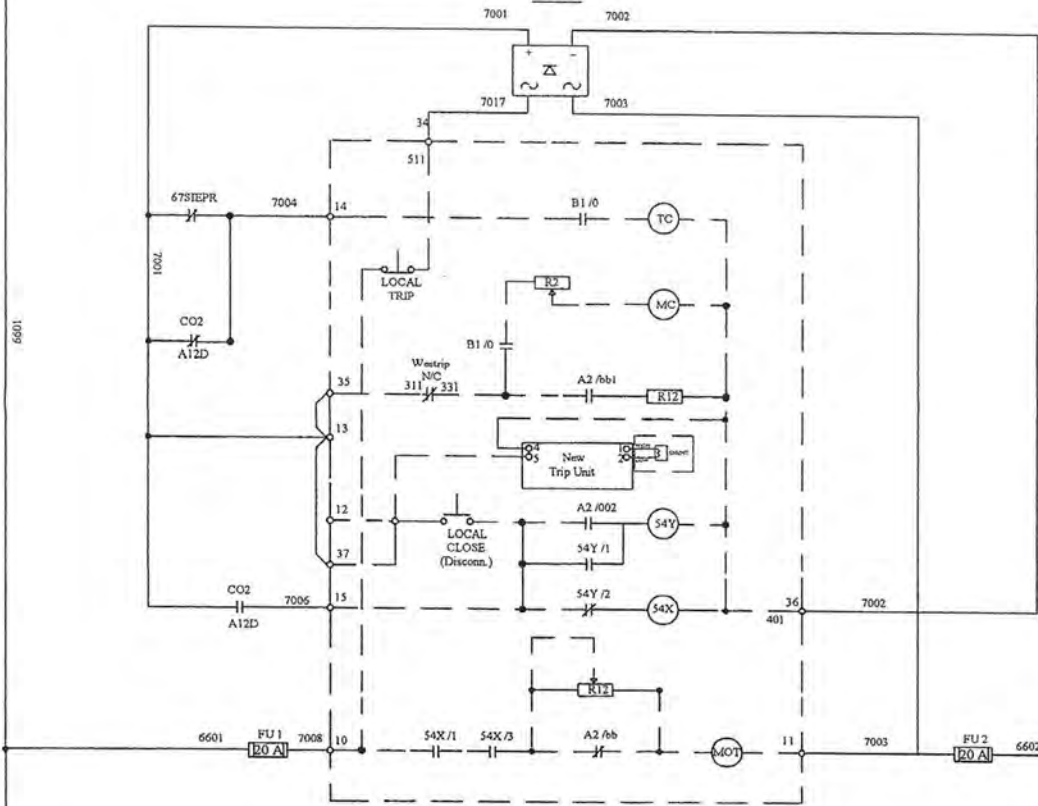
Job Number: 674

Checked:

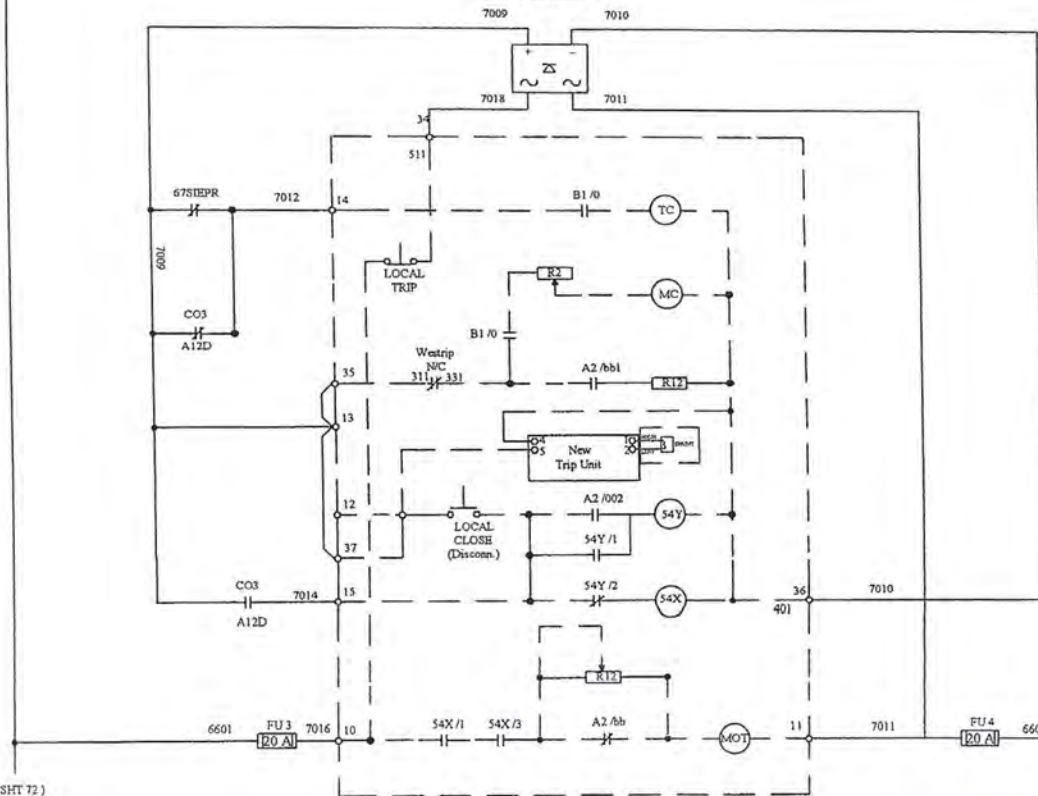
REV:

Drawing Number: 2 - 10

CICB



SICBX



(SHT 72)

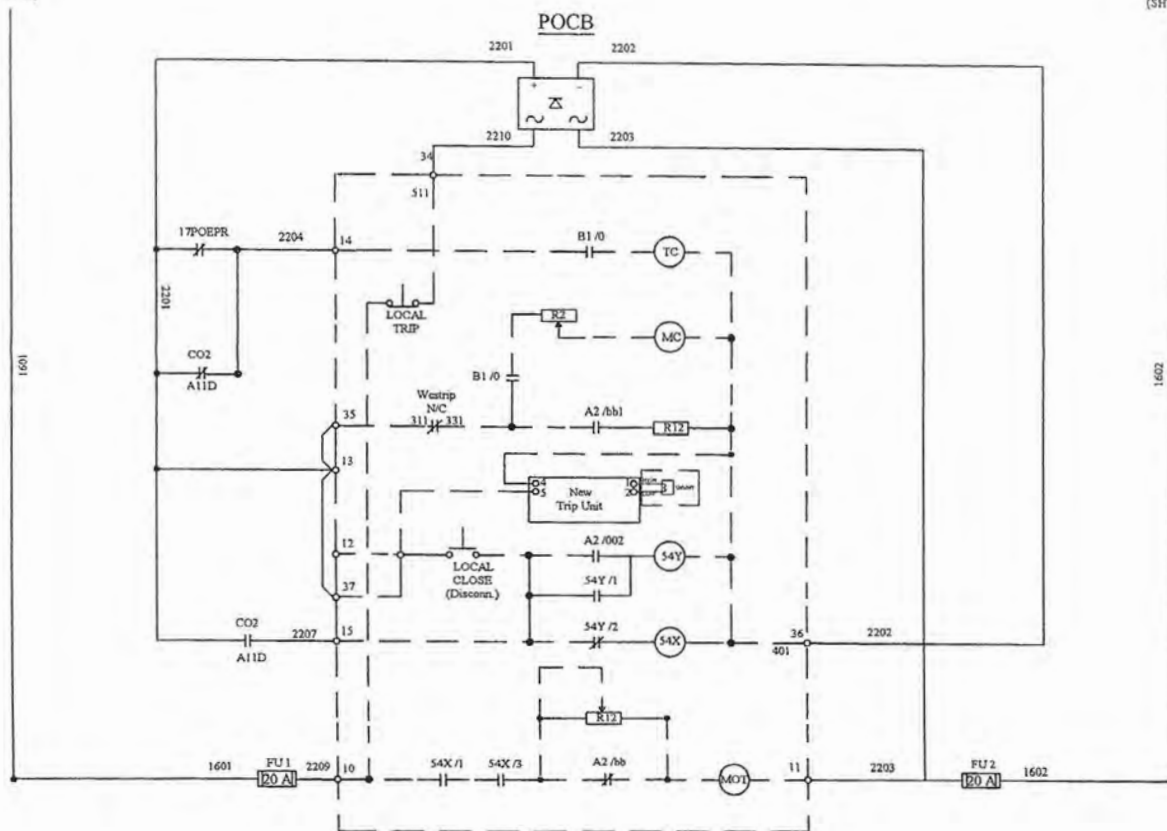
(SHT 72)

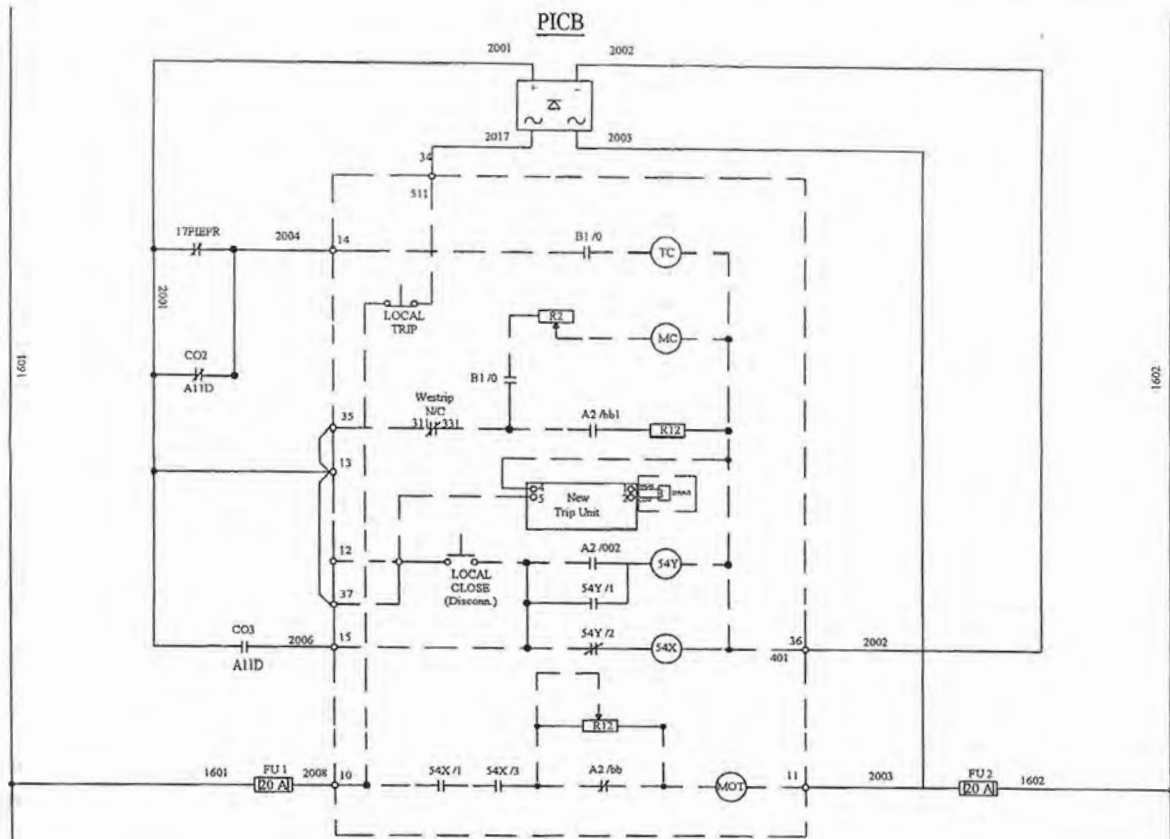
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tel: 905-633-7780

| | | |
|--|---------------------|------------------------|
| Project: ELEMENTARY DIAGRAM PROPULSION CONTROL SYSTEM, CCGS GRIFFON STBD LOGIC INBD GENERATOR C.B. CONTROL | | |
| Drawn: Zoran Zlatanowski | Date: Sept 04, 2003 | Job Number: 674 |
| Checked: | Rev: | Drawing Number: 2 - 11 |

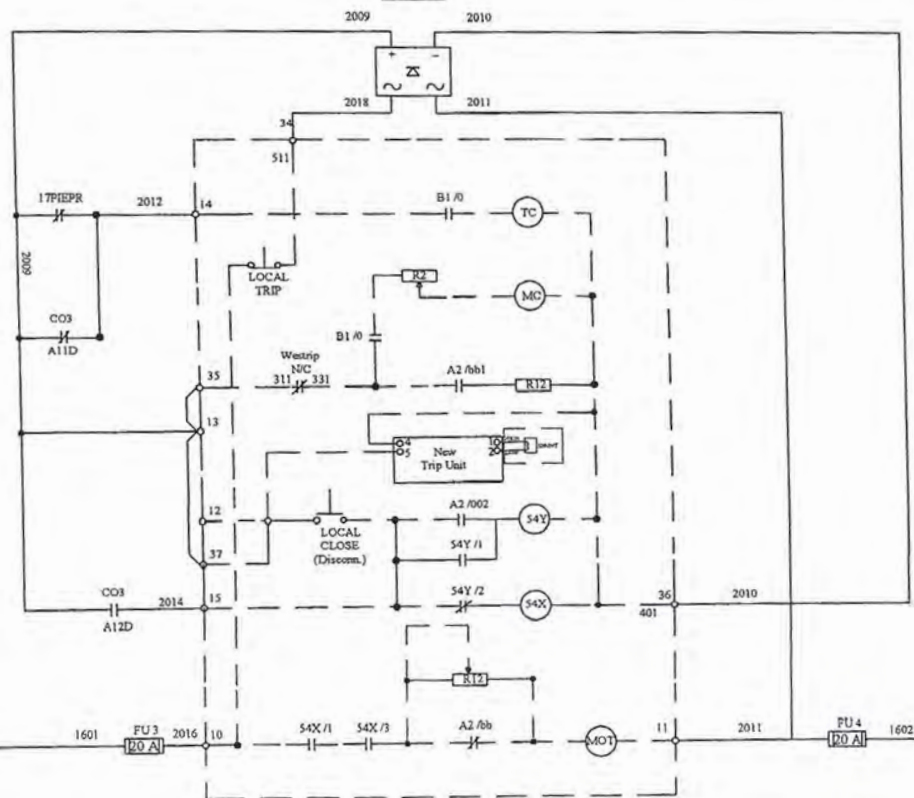
(SHT 20)





(SHT 22)

(SHT 22)

PICBX

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Tel: 905-633-7780

Project:

ELEMENTARY DIAGRAM

PROPULSION CONTROL SYSTEM, CCGS GRIFFON
PORT LOGIC INBD GENERATOR C.B. CONTROL

Drawn: Zoran Zlatanowski

DATE: Sept. 24, 2003

Job Number: 574

Checked:

REV:

Drawing Number: Z - 13

PICB

