SAFETY ORDER

HYDRAULIC ELEVATORS – GRIFFIN CONTROLLERS

No: SO-ED 2013-01

Date of Issue: April 26, 2013

This safety order is issued pursuant to section 31 of the Safety Standards Act. A person affected by this safety order may appeal this order in writing to the Safety Standards Appeal Board within 30 days. The appeal process is set out on the Safety Standards Appeal Board's website at http://www.housing.gov.bc.ca/ssab/.

Failure to comply with a safety order is an offence under section 72 of the Safety Standards Act.

Part 1: Details of Regulated Work or Regulated Product

This safety order is issued to all Licensed Elevator Contractors and Building Owners/Property Managers and applies to all Hydraulic Elevators with Griffin Controllers.

A serious incident occurred on July 9, 2012 where an elevator helper had his right hand crushed when a hydraulic elevator that he was working on unexpectedly descended all the way to the buffer. He was in the pit area to remove the fastenings for the in car hand rails while the elevator mechanic was inching the elevator down by using the top of car inspection station. The top of car inspection station was in the inspection mode but the elevator unexpectedly moved at full speed in the down direction.

This Safety Order is effective immediately.

Part 2: Requirement(s) of this safety order

All Licensed Elevating Devices Contractors and Building Owners/Property Managers are jointly responsible for the requirements of this Safety Order.

1. At the next mandatory maintenance visit or in any event no later than 30 days of the Safety Order, signage must be posted on the elevator car top stating “Warning: This unit may enter high speed when inching down on inspection within bottom zone”. Follow company safe work procedures.
2. All Hydraulic Elevators with Griffin Controllers must be altered and tested to ensure safe operation by April 26, 2015. Please refer to the attached Vertech letter dated March 13, 2013 by Michael Chadney, P.Eng. and wiring schematics for guidance.
3. A Minor Alteration Technical Submission must be filed with the BCSA with the applicable fee at the end of the month the alteration was completed in.
4. Upon completion of the alteration, wiring diagrams onsite must be updated to reflect the change and a sign on the controller must be posted stating “This controller has been modified as per SO-ED 2013-01. The sign must be posted in the vicinity of the original Griffin Controller Data Tag.

505 SIXTH STREET, SUITE 200, NEW WESTMINSTER, BRITISH COLUMBIA, CANADA V3L 0E1
Toll Free: 1-866-566-7233 Fax: 778-396-2064 Web Site: www.safetyauthority.ca E-mail: info@safetyauthority.ca

FRM-1128-05 (2011-10-18)

5. By April 26, 2015, all Licensed Elevating Devices Contractors that maintain elevators with the type of equipment referred to in Part 1 of this safety order must notify the BCSA when the alterations are completed by submitting the electronic form (http://safetyauthority.ca/form/hydraulic-elevators-griffin-controller-submission-form) ensuring the following information is provided:
    a. Licensed Elevating Devices Contractor Name
    b. Licensed Elevating Devices Contractor Address
    c. Licensed Elevating Devices Contractor contact person and contact information
    d. Notification spreadsheet confirming that all Hydraulic Elevators with Griffin Controllers in their portfolio have been altered and tested as per the requirements of this Safety Order. The notification spreadsheet must include, in respect of each unit altered and tested by the Licensed Elevating Devices Contractor:
        i. BCSA Unit number
        ii. Building name
        iii. Building address
        iv. Date work was performed
        v. Reason if work not performed.

6. After April 26, 2015 any BCSA licensed elevating device contractor that identifies equipment referred to in Part 1 of this Safety Order that does not comply with this Safety Order must immediately remove the equipment from service and notify the BCSA in writing.

Part 3: Details of Issue (if applicable)

This safety order is being issued to the following:

- Building Owners, Property Managers and BCSA licensed Elevating Devices Contractors

In the event a property manager does not confirm responsibility for compliance with this Safety Order, the BCSA will enforce this Safety Order against the buildings' owner as is indicated on the Land Title or Assessment rolls.

Part 4: Details of Ordering Safety Manager or Safety Officer – Please read following page

I certify that I am authorized to issue this safety order in accordance with section 15 (d) of the Safety Standards Act or that I have been delegated this power under section 15 (g) of the Safety Standards Act.

Name of Safety Manager
Provincial Safety Manager – Elevating Devices

Date: April 26, 2013

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SAFETY ORDER

Safety Standards Act:

Safety Orders

31 (1) To prevent, avoid or reduce risk of personal injury or damage to property, a provincial safety manager may, in writing, issue a safety order.

(2) A safety order may be issued to any person in relation to any of the following:

(a) regulated work or regulated products generally;

(b) a specific class of regulated product or regulated work;

(c) a specific regulated product or regulated work.

(3) For certainty, a safety order issued under this section may apply to

(a) regulated work that meets the requirements under this Act,

(b) regulated work that previously met the requirements under this Act or a former Act but does not meet the current requirements under this Act,

(c) regulated products that meet the requirements under this Act, or

(d) regulated products that previously met the requirements under this Act or a former Act but do not meet the current requirements under this Act, including a regulated product that bears a certification mark.

(4) A safety order may specify any requirement that is intended to prevent, avoid or reduce the risk of personal injury or damage to property and may include any of the following orders:

(a) that an existing regulated work or regulated product must be made safe in compliance with the safety order;

(b) that a regulated product must be

(i) disconnected from a power source,

(ii) uninstalled, or

(iii) modified before continued use;

(c) that a regulated product must be operated, installed, manufactured or disposed of only as specified or that a regulated product must not be moved;

(d) that current or future regulated work or a regulated product must conform to the terms or conditions of the order;

(e) that a person take or refrain from taking any action that a safety manager considers necessary to prevent, avoid or reduce a risk of personal injury to persons or damage to property;

(f) that the manufacturer make reasonable efforts to recall the regulated product.

(5) The provincial safety manager must give written notice of the safety order to the following persons:

(a) the manufacturer of the regulated product;

(b) an owner of the regulated product if the identity of the owner is known to the provincial safety manager;

(c) the person in charge of the regulated work.

(6) The notice must state the reasons for the decision and that the person has the right to appeal the decision to the appeal board.

(7) Despite section 54, a safety order may not be stayed during an appeal.

References:

Safety Standards Act

For more information on the British Columbia Safety Authority, please visit our website at:
www.safetyauthority.ca

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V E R T E C H

March 13, 2013

BC Safety Authority
505 6th Street,
New Westminster, BC V3L 0E1
Canada

Attn: Janice Lee, P. Eng.

Subject: Griffin Controller Down Speed Issue and Resolution

Background:

As described in the Safety Order from the BC Safety Authority, it has been discovered that it is possible for hydraulic elevators equipped with a Griffin relay logic controller to lower in the down direction at high speed while on top of car inspection in lower floor zone.

An incident occurred on July 9, 2012 where an elevator technician helper had his right hand crushed when the hydraulic elevator unexpectedly descended all the way to the buffer. He was in the pit area to remove the fastening for the in car hand rails while the elevator mechanic was inching the elevator down by using the top of car inspection station. The top of car inspection station was on inspection mode but the elevator unexpectedly moved at full speed in the down direction.

The purpose of this memo is to explain is simplified terms the operation of the Grffin Controller, a description of the problem with the operating circuit that can cause this issue and a description of the solution that was agreed to with the Griffin Controller sub-committee in British Columbia in February of 2013.

Basic Operation of the Elevator:

The Griffin Controller is a relay logic controller. The design of this controller allows the operation of the elevator at "High Speed" while on top of car inspection operation. This is permitted by the Safety Code, but this is not universal on hydraulic elevator controls.

The following is a simplified description of the operation of the elevator, in particular when it enters the lower floor zone. Whether on AUTOMATIC or INSPECTION operation, the control of the down speed is the same.

When operating normally, the elevator will travel at full speed with the DOWN FAST and DOWN SLOW solenoids picked. Once the elevator passes into the bottom door zone, a physical switch labelled "1Z" is closed. (Note this switch is set to close a predetermined distance from the floor depending on the speed of the elevator).

Closing the "1Z" switch engages the "1Z" relay coil. Activating the "1Z" relay coil in turn engages the "SDL" (slow down relay) coil. The "SDL" relay then engages the "SP2" relay. When the "SP2" relay is

engaged, the normally closed contacts of this (SDL) relay opens and removes power from the DOWN FAST solenoid.

It appears that the combination of timing between the engagement of 1Z – SDL – SP2 relays and the time required to physically engage and release the valve solenoids, there is an opportunity for the DOWN FAST solenoid to remain ON while in the final slow down zone. This situation has been tested and documented on several different hydraulic elevators equipped with the Griffin Relay Logic Controller.

The power to the terminal supply power to both the down FAST and down SLOW solenoids can remain high, a closer examination of the operation circuit will show how this is possible. The issue with the relay race and operating the elevator at High Speed in the lower zone is always active and possible with the current controller design.

Proposed Solution

A design change has been made and tested to ensure safe operation of the elevator in the lower floor zone, and will work without compromising the operation or safety of the original elevator design.

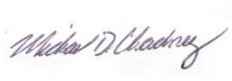
In order to resolve the issue of the "relay race" and the possibility of power going to the down FAST relay before SDL contacts can open and remove power to the solenoid, an auxiliary relay "1ZX" is installed to engage when the "1Z" switch is closed. Engagement of the "1ZX" relay will then engage the "1Z" relay which will continue the normal operation of the elevator. The significant change is that the normally closed contacts of the "1ZX" relay are installed in series with the "SP2" relay contacts and thus remove power from the DOWN FAST solenoid, in ADVANCE of SP2 and SDL relays engaging.

Upon further review of this solution, it was decided that the changes made to this part of the controllers should be made to ensure compliance with the most recent edition of the B44 Safety Code for Elevators. According to clause 2.26.9.3 of the B44-07 Safety Code, the failure of a single contact or relay shall not permit the elevator to travel at FULL SPEED, it was therefore decided to put an additional redundant contact in the circuit. Therefore, two (2) relays are added, "1ZXA" and "1ZXB" as shown on the attached schematic. This way, if either of the 1ZXA or 1ZXB relay coils fail, or if any of the contacts get stuck, the operation will remain safe.

Additional Notes

There are a number of varieties of Griffin Controllers, so the solution shown in the attached schematic is considered a "generic" solution and references to terminal blocks, relays or contacts may not match exactly to each job site. We do have a high level of confidence that all of the Griffin Controllers will use some close variation and the design concept. The final solution needs to include the elements included in this memo and in accordance with the sketch provided.

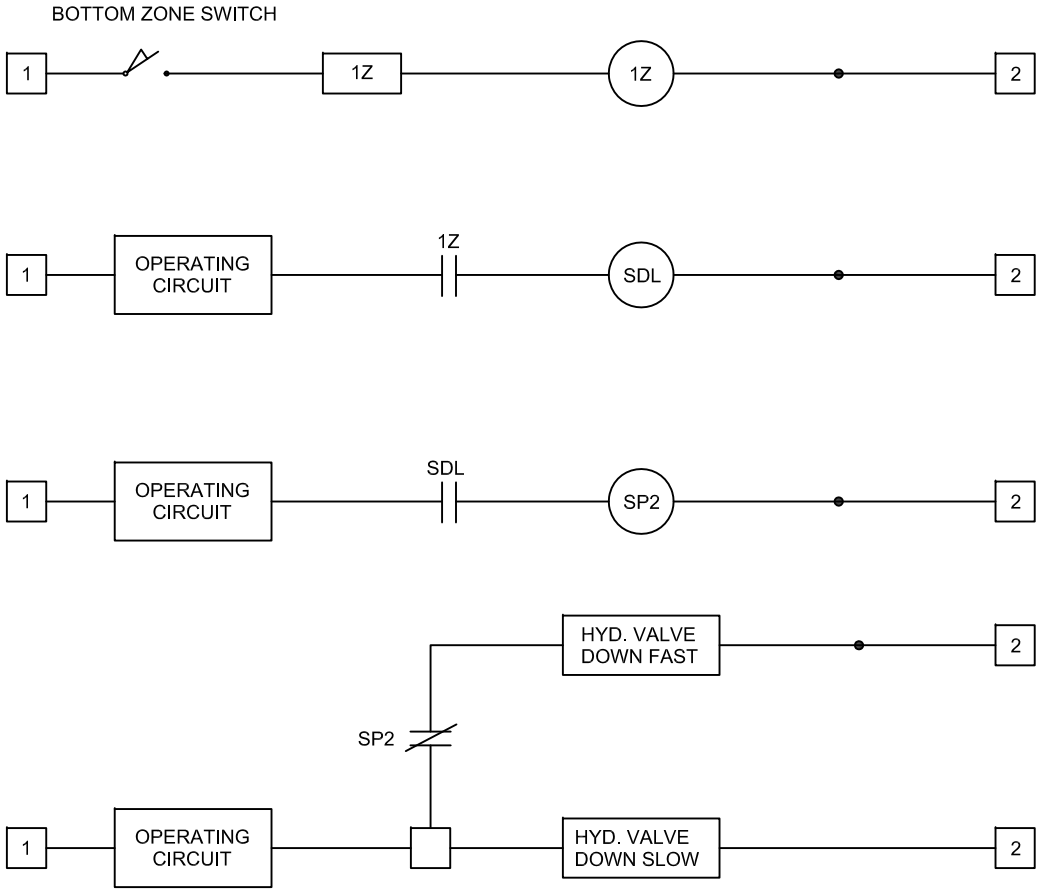
Sincerely,
VERTECH Elevator Services Inc.

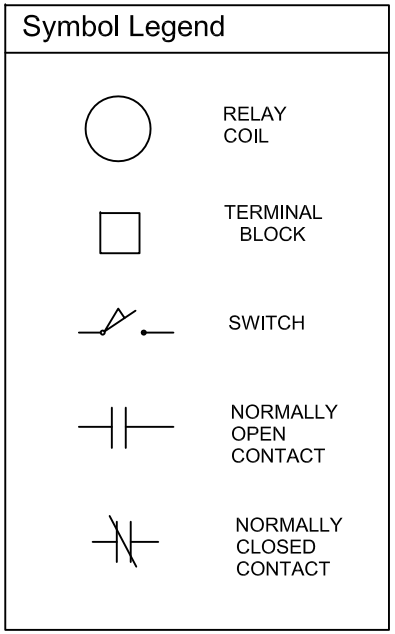


Michael D. Chadney, P.Eng.

Griffin Controller

Simplified Schematic of Existing Circuit

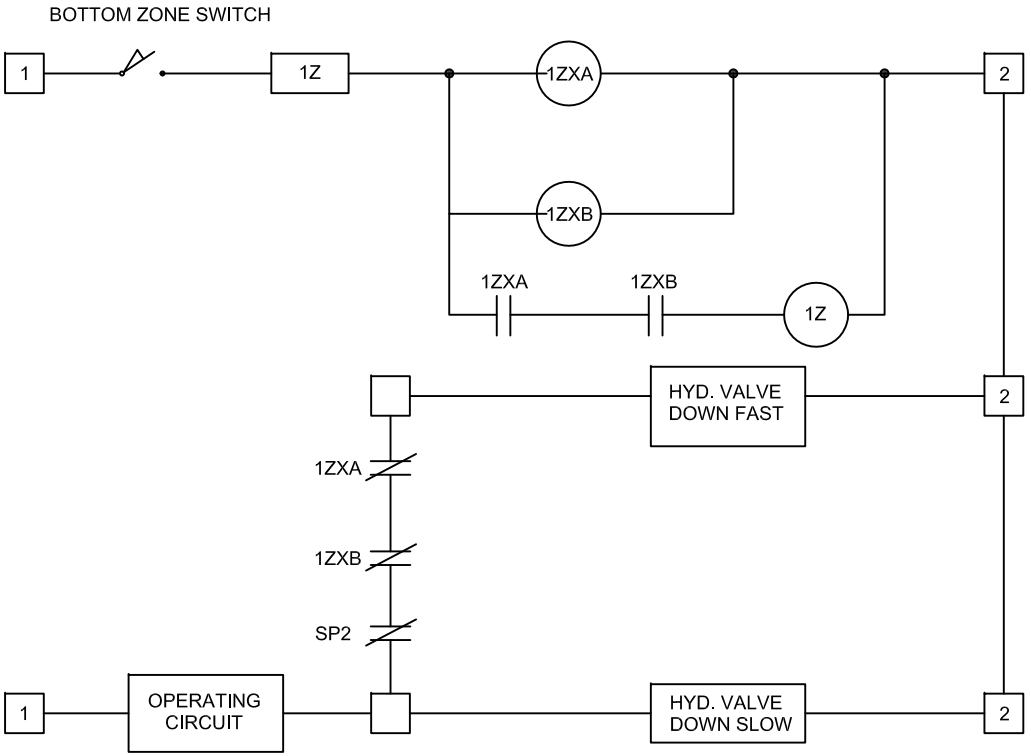


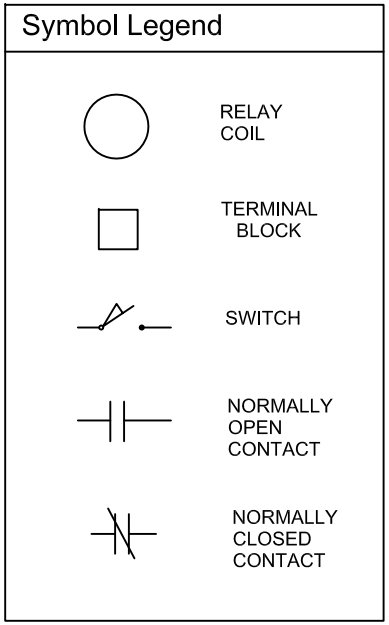


VERTECH ELEVATOR SERVICES INC VANCOUVER, BC	PROJECT: **GRIFFIN CONTROLLER**	Date	2013-04-19
		Scale	N.T.S.
DRAWING TITLE: SIMPLIFIED SCHEMATIC OF EXISTING CIRCUIT	DRAWING NUMBER: GC 001	Drawn	A.E.
		Checked	M.C.

Griffin Controller

Simplified Schematic of Revised Circuit





VERTECH ELEVATOR SERVICES INC	PROJECT: GRIFFIN CONTROLLER VANCOUVER, BC		Date 2013-04-19
			Scale N.T.S.
DRAWING TITLE: SIMPLIFIED SCHEMATIC OF REVISED CIRCUIT		DRAWING NUMBER: GC002	Drawn A.E. Checked M.C.