Freight Elevator Doors Since 1905

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THE PEELLE COMPANY
34 CENTRAL AVENUE
HAUPPAUGE, NEW YORK
USA 11788-4734
1-800-645-1056
1-631-231-6000
FAX: 1-631-231-6059
E-Mail: sales@peelledoor.com

THE PEELLE COMPANY LTD.
195 SANDALWOOD PKWY. W.,
BRAMPTON, ONTARIO
CANADA L7A 1J6
1-800-787-5020
1-905-846-4545
FAX: 1-905-846-2161
E-Mail: exportsales@peelledoor.com

CONTROL SYSTEM & INTERFACE MANUALS
(Relay Logic)

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FREIGHT ELEVATOR DOOR SEQUENCE OF OPERATIONS MANUAL FOR RELAY LOGIC CONTROLLER SERIES 2741 (274100 TO 274159)

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1 GENERAL DESCRIPTION OF POWER DOORS. Peelle Power Doors are operated by two Peelle power door operators, one on each side of each hoistway-landing door. A power door operator consists of a motor driving a traction sheave through a single step, spiral gear reduction. Power door operation is recommended for doors larger than 2400mm wide by 2400mm high/ 8 feet wide by 8 feet high.

Note: Where the term Gate or Car Gate is used, it is inclusive of Car Doors. Where the term Door is used, it means Hoistway Landing Door.

The Peelle drive system for freight elevator power doors maintains full control of the doors and gates through their complete cycle of operation.

The system includes, besides the door and gate panels, power operators, coupled to a door controller, which are initiated by door operating pushbuttons in the car stations (and sometimes at the landing stations) and/or by signal from the elevator controller.

Door/gate travel is regulated by an individual limit switch assembly. Motor speed is controlled to ensure full travel without slamming. The equipment permits immediate manual operation in the event of power failure.

Each car gate operates in conjunction with an associated hoistway-landing door. Power operated doors and gates are programmed to open automatically as the elevator arrives at a floor and to close by continuous-pressure pushbutton operation. Door and gate will reopen automatically if not closed to full limit switch operation.

The equipment is designed for three phase A.C. power supplies of 50/60 Hz. frequency.

1.1 POWER DOORS/GATES-COMPONENT ASSEMBLIES

1. Hoistway Landing Doors and Car Gate(s).
2. Power Door Operator – two for each door.
3. Power Gate Operator – one for each car gate.
4. Geared Limit Switch Assembly – one for each door and one for each car gate.
5. Interlock (Door Locking Device) – one for each hoistway landing door (includes Door Closed Contact DC and Door Locking Contact DI plus Motor and Control Zone Switches Z).
6. Gate Contact –one for each car gate.
7. Controller –one controller for each line of doors, except one controller can serve two lines of doors if rear line doors are staggered from the front line doors. (See Staggered Openings Section 3.1.8) and Car Gate Motor Section 2.1.3). A Front Line (Line A) of doors includes all the hoistway doors providing entrance to the front end of the elevator and a Rear Line (Line C) includes all the hoistway doors providing entrance to the rear end of the elevator car.
8. Pushbutton Station – one station for each car gate when car operation is from inside only, and another station at the landing for each door if elevator is fully automatic. Note: Pushbutton Stations are usually elevator company supplied.
9. Retiring Cam-usually one for each line of doors to operate interlocks (a retiring cam unlocks doors, activates Door Locking Contact DI and Zone Contacts Z).
10. Door Unlocking Devices - Unlocking devices are used for emergency access to the hoistway and may be required at every landing. Where access switches (by Elevator installer) have not been provided, unlocking devices may be used to access the pit and/or the car top for inspection, maintenance and repair when provided at the lowest landing and the upper landing.
11. Reopening Device-usually one for each line of doors often mounted on the car gate.

1.2 COMPONENT ASSEMBLIES DESCRIPTIONS

1. *Hoistway Landing Doors and Car Gate(s).* The Power operated hoistway landing doors and car gate(s) are similar to manually operated doors/gates; with door rails and fastenings and installed in the same manner onto door frames. *The hoistway landing doors*, (vertically sliding biparting or two-section slideup) are suspended by roller chains from two power door operators mounted one on each door rail just above the head of the frame. The *slideup car gate* is counterbalanced by a guided counterweight. The gate counterweight travels in a track mounted on the outside of the car enclosure. A power gate operator with a double chain drive provides the opening and closing effort for the car gate. Each car gate is usually equipped with an infrared Sensor Beam reopening device. Interruption of the beam during gate close travel will cause the gate to return to full open position. Under several conditions where the Sensor Beam is rendered inactive (see section 3.1.4), car gate close travel will be at slow speed only.
2. *Power Door Operators and Power Gate Operator.* The power operator assemblies consist of two-speed, torque motors that drive the sheaves by means of pinion gears. On the door operator (60 Hertz power), one motor winding has a synchronous speed of 900 RPM and the other 450 RPM. On the gate operator, one motor winding has a synchronous speed of 900 RPM and the other 300 RPM. The high speed is for the main travel. The slow speed serves as a dynamic slowdown when in the slow speed zone to ensure full panel travel without slamming.
3. *Geared Limit Switch.* The geared limit switches control the travel length of the high speed zone and the start and middle of the slow speed zone. The end of the slow speed zone cutoff, is determined by either a geared limit switch, or a final limit timer. Geared limit cam settings are "locked" in step with the panel travel roller chains and sprockets. The arrangements of control circuits in the controller, and the setting of the limit switches, will start the door and / or gate, either to open or close, at the high speed power, will switch to slow speed power to dampen the inertia by initiating a dynamic braking effort and slow the door or gate down.
4. *Interlock and Gate Contact.* The interlock [hoistway door locking device], one located at each opening, is a combination assembly serving as a mechanical door lock, an electric interlock, and a zone selector. The lower portion of the door

interlock has a contact DC operated by action of the door panel. The upper portion has a contact DI and a series of zone contacts Z operated by action of a retiring cam mounted on the car. The gate contact GC on the car gate rail is operated by action of the car gate counterweight. Elevator operation is prevented unless the car gate contact GC, door contacts DC, and the retiring cam operated DI contacts, are all closed.

5. *Controller.* The door controller is usually located in the elevator machine room and can be mounted on the wall or set on a floor supported frame. The door controller contains the power contactors and logic functions to direct the door operation in accordance with the requirements. Sometimes the logic functions are included in the elevator controller. The power circuit for all controller types is based on 208/220/240 Volt A.C., three phase, 50/60 Hertz power. Other three phase AC voltages, must have transformers to provide the basic power. Transformers are available from Peelle as optional equipment. The **controller has**, besides the terminal blocks and fuses, the **following relays**:
   a. O & C – Open and Close Main Direction Relays, Mechanically interlocked.
   b. OA, OB, & OC – Auxiliary Open Direction Control Relays.
   c. CA – Auxiliary Close Direction Control Relay.
   d. DH & DL, GH & GL – Door & Gate High and Slow Speed Power Relays, with High & Slow Speeds Mechanically Interlocked.
   e. DS & GS – Door & Gate Speed Control Relays.
   f. CR – Reopening Control Relay.
   g. RC – Retiring Cam Power Relay.
   h. TP & TPR – Time Protection Relay & Time Protection Reset Switch.
   i. OT & CT – Direction Time Protection Relays.
   j. ACT & AOT (where used) – Time Limit Relays.
   k. GHA (where used) – Gate Staging Relay.
   l. OF (where used) – Gate Final Open Limit Relay.
   m. GCT – Gate Motor Cutoff Relay.
   n. AC – Open Pushbutton Relay.
   o. TRSF-Control Transformer.
   p. Reopening Device Relay Group:
      (1) GR & GRA – Reopening Device Relay and Reopening Device Auxiliary Relay.
      (2) TO- Reopening Device Override Time Relay.
      (3) TOA – Gate Slow Speed Setup Time Relay.
      (4) SP – Gate Slow Speed Override Time Relay.
      (5) SU – Low Volt Power Fail Relay. Note: See Section 3.1.4.1. for optional addition of contact-type gate reversing edge in addition to the Sensor Beam.
   q. SGA – Gate Selector Relay, used with Staggered Opening.
   r. Firefighters Service Relay Group:
      (1) FS: Phase I Relay
      (2) FSA: Auxiliary Phase I Relay
      (3) ES: Phase II Relay
      (4) ESA (where used):: Phase II Auxiliary Relay
      (5) RO: Momentary Open Disabling Relay
      (6) LU: Reversal To Close Lockup Relay
      (7) HO: Phase II Hold Open Relay
      (8) ESO (where used): Phase II Off Relay
      (9) ZL: (where used) Phase I Relay.
   s. Automatic Time Closing Relay Group Optional:
      (1) TG: Automatic Time Closing Time Allowance Relay
      (2) TAC: Warning Timer and Close Initiation Relay
      (3) GA: Bell Operation and Hold Relay
      (4) GB: Call Override Lockout Relay
6. *Pushbutton Station.* Door operation requires momentary action door-operating pushbuttons using momentary-pressure for the open direction and continuous-pressure for close direction.
7. *Retiring Cam.* The retiring cam (motor driven) is lifted (retired) by a torque motor that is capable of being stalled during elevator travel. Lifting and gravity dropping of the retiring cam operates the interlocks. At least one retiring cam is usually furnished for each line of doors and is mounted on the elevator car. A second retiring cam is supplied if side opposite locks are furnished.
8. *Reopening Device.* The reopening device detects an obstruction to the normal closing of the car gate and causes the car gate and associated hoistway landing door, if closing to reopen. There are two reopening device types: a) non-contact (infrared beam) (see section 3.1.4) and b) contact (reversing-edge).

2. BASIC POWER AND CONTROL OPERATIONS

(Refer to Job Schematic)

2.1 POWER CIRCUIT

2.1.1 GENERAL

The power circuit for controllers is based on 208/220/240 VAC, 3 phase, 50/60 Hertz power. Any other voltages, frequencies or direct current must have transformers or conversion equipment to provide basic power. Transformers for 50/60 Hertz power are available from Peelle as optional equipment, while special instruction will be required for any other conversion systems. Hoistway door operators are shipped in right and left hand pairs. Their high and slow speed motor windings are directionally phased at the factory. The entire line of door operator motors and the gate operator motor can be phased for open or close direction at the controller. Note: when an individual motor is replaced or relocated, it must be phase checked at the motor for proper direction rotation. The retiring cam motor must be phased to provide rotation for proper lift rod direction.

2.1.2 RETIRING CAM MOTOR

If all hoistway landing doors and the car gate are closed, and proper initiation energizes the RC relay making up the RC contacts, the retiring cam motor will operate. When this motor operates, the retiring cam retires (lifts), allowing the locking arm to extend, locking the door, opening all Z contacts, and closing the door interlock contact DI. If there are two lines of doors, a retiring cam may also be furnished for the additional rear Line C. When so furnished, it is connected in parallel with the retiring cam motor of the front Line A, and operates at the same time. Occasionally, especially for wide doors, there are two retiring cams per line of doors and they are also connected in parallel.

2.1.3 CAR GATE MOTOR

1. If contacts O and G*H* "make up", the car gate motor will operate at *high* speed in the open direction. If contacts C and G*H* "make up", the car gate motor will operate at *high* speed in the close direction.
2. If contacts O and G*L* "make up", the car gate motor will operate at *slow* speed in the open direction. If contacts C and G*L* "make up", the car gate motor will operate at *slow* speed in the close direction.
3. A rear line (Line C) of doors is considered "staggered" when no rear landing elevation is within 300mm / 12 in. above or below the elevation of a front landing. If there is a "staggered" rear line of doors, a single line controller is used to operate all the doors/gates including the rear line gate by the use of a SGA gate selector relay. With normally closed SGA contacts remaining "made up" as shown on the controller schematic diagram, the front line gate motor will operate under the same conditions as 1. and 2. above. With normally open SGA contacts "made up" (when SGA relay is energized), the rear line gate motor will operate under the same conditions as 1. and 2. above.

2.1.4 DOOR MOTORS

Zone control by landing:

1. If the elevator car is within 300mm / 12 in. above or below the floor and the door zone switch has been operated by the retiring cam, closing all Z contacts at that door, then:
2. If contacts O and D*H* "make up", the hoistway landing door motors will operate at *high* speed in the open direction. If contacts C and *DH* "make up", the hoistway door landing motors will operate at *high* speed in the close direction.
3. If contacts O and D*L* "make up", the hoistway landing door motors will operate at *slow* speed in the open direction. If contacts C and D*L* "make up", the hoistway landing door motors will operate at *slow* speed in the close direction.

2.1.5 POWER OPERATION OF DOORS AND GATES

The arrangement of the control circuits below and the setting of the Limit Switches are to provide initial power to the high-speed motors. This will start the door and/or gate, either opening or closing at high speed power, and then at the final travel position will apply the slow speed power to dampen the inertia and slow the door or gate down. Refer to installation Manual 203 covering the setting of Door and Gate Limit Switches.

2.2 CONTROL CIRCUIT

2.2.1 GENERAL

Standard Door Operation is based on using pushbuttons and applying momentary-pressure for the open direction and continuous-pressure for the closed direction.

A control transformer is provided with each controller and provides 120 VAC (approx.) single phase power for the control circuit, and is tapped to provide a 24 VAC (approx.) circuit for the reopening device (Sensor Beam and/or contact-type reversing edge).

Relays O and C are main Direction Relays, O for open direction and C for close direction. These relays are mechanically and electrically interlocked so both cannot "make up" at the same time. These relays set up the direction of the door and gate motors at the start of an operation, and remain energized until the final door and gate travel. Relays OA,OB,OC, and CA serve as auxiliary relays to operate in parallel with the O relay and the C relay respectively to provide additional contacts for the opening and the closing directions, and to provide time stages for functions in proper sequence.

High speed power relays, DH for the door and GH for the gate, become energized sequentially when either O or C relays become energized to power the high speed winding of door and gate motors. They remain energized until the door is approximately 200mm / 8 in. from the end of its travel and the car gate is 300mm / 12 in. from the end of its travel, when the door and the gate slow speed limits are actuated. They in turn actuate the relays DS and GS which de-energize the high speed power relays, energize the slow speed power relays, and prevent the high speed and the slow speed windings from being energized at the same time.

When the slow speed power relays DL for the door and GL for the gate, are energized, the slow speed windings allow the motors to dynamically check the speed of the door and gate to prevent slamming at the end of travel when DOFL or GOFL open final limits (or AOT open final limit timer where used) and ACT close final limit timer are actuated and relays O or C and DL and GL become de-energized.

The CR Reopening Control Relay energizes after the close direction (or the open direction) is established and remains energized until the last slow down limit action of the door or gate occurs.

Until de-energizing, a closed NO contact on the CR relay will initiate the open direction if close direction is interrupted (by the release of the door close pushbutton or operation of the gate Sensor Beam reopening device).

Interruption of the Sensor Beam reopening device (or pressure on the contact-type reversing edge) will interrupt the closing direction and the closed NO contact on the CR relay will instantly initiate the open direction causing full open travel.

The Sensor Beam will be deactivated and gate/door speed will be restricted to slow speed (low KE) under the following conditions:

(a) fire service recall (Phase I),
(b) power loss to the Sensor Beam,
(c) 20 seconds of continuous beam interruption (smoke, dust, buildup, beam loss)

The OT and CT Direction Time Protection Relays (Timers) are on-delay, automatic reset, timers. These timers provide 30 seconds for normal door and gate open/close functions. Normally these functions complete within this time allowance and the relay resets prior to operation.

Mis-operation of limits or pushbuttons, that sends a continuous direction signal beyond the normal time span will force operation of the respective protection timer, opening its contact which de-energizes the associated power and control relays. The protection timer contact will remain open as long as the protection timer coil is energized. The timer will recycle and close its contact when de-energized through door operating pushbutton initiation (door button of opposite direction), opening the zone contacts, clearing the fault, or removal of power.

If open close power to motors does not turn off within two seconds of the end of the door and gate movement, but continues on until OT or CT timer times out, adjustment or circuit correction is required.

The TP time protection relay (3 minute timer) is an electronic, on-delay timer. This TP timer commences timing when either the O series, C series, or RC relays are energized closing either O-5NO, C-5NO, or RC-4NO contact. Under normal operation those contacts reopen prior to the timer contact operation. This allows the timer to reset to full time allowance without operating the time protection. If those contacts remain closed for 3 minutes, the TP timer will open contact TP-1NC which de-energizes the control circuit. When the TP-1NC contact operates, TP becomes self-holding through contact TP-1NO until its coil circuit is interrupted either by opening the TPR reset switch contact or removing power from the control portion of the controller. The TPR switch is a push. type reset switch with a momentary action, normally closed contact. When the TPR contact switch is opened, or control power is removed, the TP timer is de-energized and recycles to a full time allowance and re-closes contact TP-1NC allowing the control circuit to re-energize. For Peelle #2741 series controllers manufactured 2000 and after, holding door-open-button in the car will open the doors and will override door close input to the controller from the door-close-button either in the car or at the landing.

2.2.2 RETIRING CAM OPERATION

The RC relay controls the operation of the retiring cam. When elevator operation is initiated, a contact on the elevator controller is made, causing the RC relay to energize, operating the cam motor, which moves (lifts) the cam into a retired position. When the car levels to a floor or is standing at the floor, the contact on the elevator controller opens, de-energizing the RC relay. This permits the cam to extend by gravity, engaging the interlock/zone switch roller. The cam remains extended until the door and gate are completely closed and the car is signaled to go to another landing.
The elevator control de-energizing of the RC relay should be set so that the RC relay is dropped out before the automatic opening is initiated! This will allow the zone switch to be made up completely before power is applied to the door motors. This sequence prevents power from being applied to the door motor before the door is completely unlocked. The doors are unlocked at the same time as the zone switch is made up. The elevator circuitry must also provide that initiation of the RC relay be subject to both the hoistway landing door (DC) and car gate (GC) contacts and not either contact individually. Further, if the cam retires (lifts), but the hoistway landing door interlock (DI) contact does not "make up", or the car does not run for some other reason, the initiation to the RC relay should be discontinued after a short time period, thereby preventing continuous power from being applied to the cam motor.

2.2.3 FIREFIGHTERS SERVICE

1. Firefighters service is included in the logic system of Peelle controller since the 1992 edition of the A17.1 Code.
2. Where Firefighters service is not required, Firefighters initiating interconnect terminals should be left unconnected.
3. A write up of Firefighters Service is provided in Section 3.4.

2.2.4 ELEVATOR-TO-DOOR INITIATIONS AND THEIR INTERPANEL CONNECTIONS

1. Each schematic diagram has a list of the elevator controller-to-door controller inter-panel connections necessary for operation of the logic system covered in the schematic. The terminal wiring number on the elevator controller is listed when there is a timely return of the Peelle drawing submission sheets.
2. A complete explanation of initiations and their inter-panel connections are covered in Peelle Manual #202.

3. SEQUENCE OF OPERATION - EXPLANATION

3.1 SEQUENCE OPERATION – Hoistway Door and Car Gate

Based on: Peelle Schematic #274106, single line or Line A of a double line. Peelle Schematic #274107, Line C of a double line of doors. Peelle Schematic #274108 , double line of doors at staggered levels. Sequence operation, standard since 1995, is a door and gate operating system where the hoistway landing door is at least 2/3 open prior to the opening of the adjacent car gate, and the car gate is at least 2/3 closed prior to the closing of the adjacent hoistway landing door. Sequence Operation meets the requirements of A17.1, Rule 112.6.

3.1.1. *OPENING* DIRECTION-SEQUENCE OPERATION;GEARED SLOWDOWN AND *GEARED* FINAL LIMITS.

1. All doors and car gates being closed, the elevator car leveling to or is at the landing, and with the retiring cam extended pushing the locking arm roller causing zone contacts Z to be closed:
2. Automatic opening is initiated when the car is leveling to a landing through a contact on the elevator controller closing the circuit from DO1 to DO2, which parallels the door open pushbutton circuit.
3. When contacts Z, C-4NC, OT-1NC are closed, the DOFL door open final limit switches are closed, the gate final limit contact OF-2NC is closed (GOFL limit switch is open), and the automatic opening initiating circuit is closed (or door open pushbutton is momentarily pressed and energizes relay AC through contact AC-1NO in parallel with D01-D02), the O open main direction relay, OA auxiliary relay end OT

time protection relay become energized, causing O and OA contacts to operate.

4. Contact O-5NO closes initiating TP time protection relay, contact OA-1NO closes, energizing the OB relay, contact OA-2NO closes, creating a holding circuit across the door open pushbutton, and contact OA-3NO closes energizing the DS relay.
5. Contacts OB-2NO and DS-1NO close energizing DH door high speed power relay, contact OB-1NO closes energizing the GS relay, contact OB-3NO closes energizing the OC relay, contact DS-2NC opens, DS-3NO (where used) closes, contact DH-3NO closes energizing CR relay and contact DH-4NC opens temporarily locking out GH gate high speed relay.
6. Contact OC-1NO closes setting up a subsequent operation of DL & GL, contacts OC-2NO and GS-1NO close setting up GH gate high speed power relay.
7. Contact CR-1NO closes and seals CR relay through closed contact DL-4NC or GL-4NC and GCT-2NC. CR relay and associated contacts perform no function in the open direction except under special arrangements not explained here.
8. The hoistway-landing door is now operating in the open direction powered by high-speed motor windings.
9. The hoistway landing door will continue in high speed until it reaches approximately 200mm / 8 in. of full opening, at which time the DOL-1 slow speed limit will open, de-energizing DS relay.
10. Contact DS-1NO opens, de-energizing DH high speed door opening relay; contact DS-2NC closes, energizing DL slow speed door power relay and contacts DS-3NO (when used) opens.
11. With DH de-energized, contact DH4NC closes energizing GH gate high-speed power relay and the gate starts to open and moves open at high speed.
12. The door speed is now being changed from high speed to slow speed and the gate is now operating at high speed.
13. The door continues at slow speed to full open position and opens DOFL door final limit switch. The door remains held at this full open position by stalled, slow speed power through open direction holding contact OF-2NC. When the gate reaches approximately 300mm / 12 in. from its full open position, the GOL gate low speed limit opens, de-energizing GS relay.
14. Contact GS-1NO opens, de-energizing GH high speed car gate power relay; and contact GS-2NC closes, energizing GL slow speed car gate power relay.
15. With DL and GL energized, contacts DL-4NC and GL-4NC are opened and CR relay is de-energized.
16. The gate speed is now being changed from high speed to slow speed and continues at slow speed until approximately 25mm / 1 in. before full open travel. At that position the GOFL gate open final limit closes and OF gate open final is energized.
17. Contact OF-2NC opens and with DOFL door open final limit switch open, open direction relays O, OA, OB, and OC de-energize and time relays OT and TP reset.
18. Contacts OA-3NC and OB1-NC close, and since DCL-1 and GCL-1 have previously closed due to the opening of the door and gate, relays DS and GS energize, operating their respective contacts. Fast acting contact GS-3NC opens, preventing any slower acting power relay contacts from introducing a pulse of closing power.
19. DOL-2 door Auto-Stay-Open (ASO) limit switch and GOL-2 car gate Auto-Stay-Open (ASO) limit switch close when door and car gate slow speed limit DOL-1 and GOL-1 open.
20. With Auto-Stay-Open (ASO) contacts DOL-2NO and GOL-2NO both closed, should door or gate rebound causing either DOFL final limit to close and/or GOFL gate final limit to open (causes the contact OF-2NC to close), this movement will change door/gate position from final position to slow speed position. Slow speed power is then applied to the door and gate motors until the final door and gate limits DOFL and GOFL operate. This should power the door and/or gate back to the full open position.
21. Should the open direction be energized for 30 seconds continuously, without completing an operation, which would allow the time protection relay OT to reset, OT times out opening contact OT-1NC that de-energizes all open direction relays. They remain open until; a) the fault is corrected, b) the door close push button is operated, or c) power is removed from the controller.

3.1.2 *CLOSING* DIRECTION-SEQUENCE OPERATION;GEARED SLOWDOWN AND *TIME* FINAL LIMITS

1. With the door and car gate in an open position, and with zone contacts Z, contacts HO-1NC, GR-1NC, AC-4NC, O-4NC, ACT-1NC, CT-1NC closed, then continuous-pressure of the car or landing door close pushbutton will energize CT direction time protection relay and CA auxiliary relay.
2. With DS and GS relays previously energized (see Opening Direction item 3.1.1.18), contact CA-1NO closes energizing GH gate high speed power relay through contact OC-2NC, SP-1NC and closed contact GS-1NO. Contact CA-2NO closes energizing C main direction relay. Contact CA-3NO closes setting up DH door high speed power relay and GCT gate motor cut off relay, both temporarily locked out through open contact GS-4NC while GL gate low speed power relay is temporarily locked out by open contact GS-2NC. Contact CA-4NO closes setting up slow speed operation to function when reopening device(s) are disabled.
3. With C main direction relay and GH gate high speed power relay energized, the gate moves in the close direction powered by the high

speed windings. Contact C-5NO closes initiating TP time protection relay. Contact GH-3NO closes energizing CR reopening relay and GH-4NC opens for preparation of ACT close final limit timer.

4. Contact CR-1NO closes and seals in CR relay through closed contacts DL-4NC and GL-4NC and GCT-2NC, and CR-2NO closes setting up the open direction for possible operation.
5. The car gate is now operating in the closed direction powered by high-speed motor windings.
6. The car gate will continue in high speed until approximately 300mm / 12 in. before full closed position, at which time slow speed gate limit GCL-1 will open, de-energizing GS relay.
7. Contact GS-1NO opens, de-energizing GH high speed gate power relay, contact GS2-NC closes energizing GL slow speed gate power relay. Contact GS-3NC closes setting up a close direction operation and contact GS-4NC closes energizing DH door high speed power relay and initiating GCT gate motor cut off timer.
8. With DH energized, the door operates in the closed direction powered by high-speed motor windings. Contact DH-3NO closes confirming the energization of CR and contact DH-4NC closes. With GL energized the gate speed is changed from high speed to slow speed.
9. The gate travels at slow speed to full closed position. The gate remains held at this full closed position until the GCT gate motor cutoff timer activates. Note: the GCT timer must be set with sufficient time to allow the gate to reach full close and stall under slow speed power before actuating. Contact GCT-1NC opens and de-energizes GL slow speed power relay.
10. Similarly, the door continues in high speed until it reaches 200mm / 8 in. (400mm / 16 in. opening space) less than full closing position at which time, slow speed door limit DCL-1 will open, de-energizing the DS relay.
11. Contact DS-1NO opens, de-energizing DH high speed door power relay, contact DS-2NC closes, energizing DL slow speed door power relay.
12. With DL energized, contact DL-3NO closes and initiates the ACT timer. Contacts DL-4NC opens locking out CR reversal relay. Contact DL-5NO closes to seal in the final close operation relays whether or not the close pushbutton is released.
13. The door speed is now being changed from high speed to slow speed. The door will travel at slow speed to full close position and remain held under stalled slow speed power until the ACT final close timer actuates. Note: the ACT timer must be set with sufficient time for the slow speed travel to complete plus a 1 to 2 second stall before actuating.
14. Upon completion of the time as set on the ACT timer (0.4. to 4 seconds), contact ACT-1NC opens and de-energizes main close relay C and auxiliary close relay CA.
15. When the C and CA close direction relays de-energize, TP and CT timers reset, DL relay de-energizes, and ACT and GCT timers recycle.
16. Should the door rebound or not close completely, pushing the door close pushbutton again will provide slow speed power on the door and gate for a new time allowance of ACT time (as set 0.4 to 4 seconds). Should the close pushbutton be operated continuously or should the ACT timer fail to de-energize after 30 seconds, the protection timer CT will trip and de-energize C and CA relays. CT relay will remain energized with contact CT-1NC held open, until a) cam retires and elevator moves, b) door open pushbutton is operated, c) ACT closed final limit timer is replaced or operation corrected, or d) power is removed from controller.
17. Contact O-6NC in the RC retiring cam power relay circuit prevents an attempt to power the retiring cam when a door open pushbutton is being held in as the door and gate are closing.

3.1.3 AUTOMATIC REOPENING

1. Reopening takes place anytime during high-speed gate travel, slow speed gate travel, and door high-speed travel, if the close pushbutton is released. CA auxiliary relay, and the CT close direction time protection relay and the main close direction relay C become de-energized; and
2. With CR reversal relay sealed in (See 3.1.2 Closing Direction, item 4.), contact CR-2NO is closed, and as soon as interlocking contact C-4NC "makes up", the open direction will initiate and continue as outlined beginning with item 3. of 3.1.1 Opening Direction.

3.1.4 REOPENING DEVICE (PEELLE SENSOR BEAM)

1. The reopening device consists of a non-contact infrared beam, "Sensor Beam," across the full width of the gate. The beam leads the gate by approximately 125mm / 5 in. during the gate closing operation and retracts behind the gate vertical side members as the gate reaches full close position. NOTE: A contact-type reversing edge reopening device may be *optionally* included as a backup to the Sensor Beam. It is mounted directly on and across the full width of the gate leading edge. See item 8. below for electrical connection.
2. The reopening circuit consists of a fused low voltage 24VAC supply, tapped from the 120VAC control transformer, that powers the Sensor Beam source, Sensor Beam detector, and relays GR, GRA, and SU. Associated relays in the 120VAC control circuit are SP relay and timers TO and TOA.
3. When the gate is in any position except full closed, (gate closed final limit GCFL open), the reopening device is active. Beam interruption (or reversing edge physical contact) during close travel will cause GRA reopening device auxiliary relay to energize.
4. Contact GRA-1NO closes and energizes GR reopening device relay and contact GRA-2NO closes and initiates TO timer.

5. If the car gate is traveling in the open direction or is open, the operation of the GR relay has no effect. If the car gate is traveling in the close-direction, the opening of contact GR-1NC de-energizes CA auxiliary relay, CT direction time protection relay and the C main close direction relay. The actions of the Automatic Reopening circuit per item 3.1.3.2 above will occur.
6. With the gate returned to its full open position and the door full open (if the door was not full open it will also return to its full open position), the door and gate will respond normally to a new close initiation.
7. When a close initiation is made, contact CA-4NO closes. Under three conditions listed below the Sensor Beam circuitry will provide a slow speed low KE gate close operation. Each of these conditions will cause TOA timer, a very short term (±0.5 sec.) timer, to energize and when it times out, contact TOA-1NO closes and SP relay energizes and changes the gate power system from high speed to slow speed through contact SP-1NC opening and contact SP-2NO closing. Slow speed mode is sealed in until full close, by contact SP-3NO closing until SP relay is de-energized when the close operation completes.

7.1 Phase I Firefighters Service-When Phase I is initiated through an elevator control signal, contact FS-1NC opens, deactivating the Sensor Beam and contact FS-2NO closes energizing TOA timer.

7.2 Low voltage circuit failure-When low voltage power is disrupted but main control power keeps the door controller active, SU relay is de-energized and contact SU-1NC closes initiating TOA timer.

7.3 Beam interruption by beam source or detector failure, by smoke or other disturbance causes GRA relay to energize. Contact GRA-1NO closes and energizes GR relay and contact GR-1NC opens locking out close direction operation. Contact GRA-2NO closes and initiates TO timer which is preset for 20 seconds. If beam restoration is not made within this 20 second allowance, TO activates and contact TO-1NO closes and energizes TOA timer causing close direction speed change to slow speed (see 3.1.4.7) and contact TO-2NC opens de-energizing GR allowing close operation to proceed. Note: A detector failure has a remote possibility that slow speed will not be introduced.

8. Optional addition of a physical contact reversing edge type reopening device has been shown on the schematic diagram. Should a reversing edge be incorporated, it is to be connected at the gate electrical box in parallel with the Sensor Beam detector at wire points 32 and 19 on front Line A and at wire points 34 and 19 on rear Line C. Physical action on the reversing edge will cause the reopening circuit to function in the same manner as with the Sensor Beam activation. If the edge should short out, the action will be the same as a continuous beam interruption and if the edge will not electrically close (very rare) when physcially contacted but stays electrically open, a reversal will not take place.

3.1.5 STOPPING OF DOORS / GATES

1. A door stop pushbutton in the car station is standard, while non-inclusion is optional.
2. To stop the doors and gate *while closing*, release the door close pushbutton. This will brake the closing inertia and reopen the doors/gates.
3. After momentary pressure on the door stop button in the car station control will de-energize, thus removing power from the door and gate motors.
4. To stop the door and gate *while opening*, momentarily press the stop pushbutton in the car station to de-energize the control, thus removing power from the door and gate motors; some coasting will be experienced.
5. After a door stop pushbutton operation, if the door and gate are stopped and located in either the high speed zone (open or close) or the slow speed zone (close direction only), it will be necessary to reinitiate the desired operation (open or close). If the door and gate both coast into the (near full open position) slow speed zone and the door stop pushbutton is released, Automatic-Stay-Open will come into action and move the door and gate to their full open positions.
6. In the event de-energization of the control is desired, continuous pressure on the door stop pushbutton will de-energize all door-open and door-close control circuits.

3.1.6 CAR LEAVING LANDING

1. When a hoistway landing door is closed, the door contact DC actuated by the door panel is closed.
2. When gate is closed, the gate contact GC actuated by the cam on gate counterweight is closed.
3. With door contacts DC and gate contact (s) GC closed; when a floor selector button is pressed on the car-operating-panel, the contact [RC] on the elevator controller [not Peelle RC relay.] that initiates the retiring cam closes.
4. When contact [RC] on the elevator controller closes, the circuit between DO3 and DO4 closes, and, with contacts O-6NC and C-6NC being closed, Peelle RC retiring cam relay is energized on Peelle door controller.
5. Contact RC-4NO closes, energizing TP timer and starts the time cycle for retiring cam motor protection.
6. The retiring cam motor being energized, the cam is retired (lifted), disengaging the locking arm roller. The interlock locking arm is extended which mechanically locks the door, and causes the door interlock 'Door Locking' contact DI in the zone box to close.
7. Contacts GC (gate contact), DC (door contact) and DI (door interlock contact) being closed (***all must be closed***), the car moves from the landing with the cam retired.

8. The retiring cam remains retired until the car levels to, or stops at, the selected landing and the the elevator controller opens the circuit between DO3 and DO4.

3.1.7 LINE C OF A DOUBLE LINE OF DOORS

(Schematic #274107)

1. Where there are openings at the front and rear of the elevator and where at least one rear door is within the level of a front door landing zone, rear Line C schematic is used in combination with the front Line A schematic.
2. All the open and close power and control relays of Line A are duplicated in the Line C controller and thereby selective operation of front or rear doors is provided.
3. Isolated contact initiations from the elevator for rear Line C are required for automatic opening, landing located door pushbutton cutout, and inspection circuit; in addition to the front Line A contact initiations.
4. Line A to Line C controller inter-connections are required for power feed, retiring cam lockout, firefighters service and door open signal.
5. Line A and Line C retiring cams are driven by the ***same*** power relay RC on Line A controller, as both cams are to operate in unison.

3.1.8 DOUBLE LINE OF DOORS AT STAGGERED LEVELS

(Schematic #274108)

1. Where there are openings at the front and rear of the elevator but no rear door landing is within 300mm / 12 in. of the level of a front door landing, a single controller, using the staggered line schematic, operates both the front Line A and rear Line C doors and gates.
2. The logic system for staggered opening operation, is the same as the Line A diagram, but modified to operate the rear line gate when the elevator is within the landing zone of a rear line door by the addition of SGA relay on the controller and a control addition for the Sensor Beam on the rear gate.
3. One of the rear Line C door zone contacts energizes SGA relay which then transfers the power feeds from the Line A gate motor to the line C gate motor.
4. Since the front line gate and the rear line gate each have their own mechanical limits (GOL-A&C, GCL-A&C, GOFL-A&C, GCFL-A&C) connected in series or parallel to suit, proper operation of the gates can only be achieved if the ***gate opposite to the gate and door being operated is kept in the closed position.***
5. There is a front line retiring cam and a rear line retiring cam. They operate in unison similar to section 3.1.7. When the retiring cams are de-energized and the elevator is at a rear door level, the rear door retiring cam unlocks the rear door and closes the zone contacts. The front line cam extends but with no unlocking action or contact action.
6. Interconnections between the elevator controller and the door controller are the same as a single line, Line A controller.

3.2 *ALTERNATE*: MODIFIED LIMIT ARRANGEMENT

Based on: Schematic #274118 single line or Line A of a double line Schematic #274119 Line C of a double line of doors Schematic #274120 double line of doors staggered levels.

Time final door limits and cam operated door open and close slow speed limits are provided as a practical and economical alternative to geared individual door limits with a minimum reduction in performance where high cost equipment is required to meet environmental conditions.

3.2.1 Switches for the open/close door and gate slowdown limits DOL, DCL, GOL and GCL and gate final limits GOFL and GCFL are modified to suit the particular NEMA (IP) conditions. Door final limit DOFL is eliminated and its function handled by an AOT timer on the controller.

3.2.2 With AOT open final limit timer provided and DOFL eliminated, open direction operation proceeds as outlined in Opening Direction Sequence Operation section 3.1.1, paragraphs 3.1.1.1 through 3.1.1.12 and with the following paragraphs substituted for 3.1.1.13 through 3.1.1.20.

3.2.2.1 (modified from 3.1.1.13) The door continues at slow speed to full open position and remains at this full open position by stalled slow speed power. When the gate reaches approximately 300mm / 12 in. from its full open position, the GOL gate slow speed limit opens, de-energizing GS relay.

3.2.2.2 (repeats 3.1.1.14) Contact GS-1NO opens, de-energizing high speed GH high speed gate power relay and contact GS-2NC closes, energizing GL slow speed gate power relay.

3.2.2.3 (modified from 3.1.1.15) With DL and GL energized and contact DS-4NC being closed, contact GL-3NO closes initiation AOT open limit timer. Contacts DL-4NC and GL-4NC open de-energizing CR reopening relay.

3.2.2.4 (modified from 3.1.1.16) The gate speed is now being changed from high speed to slow speed and continues at slow speed to full open position.

3.2.2.5 Slow speed power remains applied to the door and gate motors until the AOT timer relay allowance completes and activates. AOT time is adjustable (0-4 seconds similar to ACT-see paragraph 3.1.2.13) and should be set long enough to allow full opening of the gate and a short motor stall time before activating and de-energizing the open direction series of relays.

3.2.3 Upon completion of the time as set on the AOT timer (0 to 4 seconds), contact AOT-1NC opens and de-energizes all open holding circuits and allows timers TP and OT to reset while AOT resets.

3.2.4 Pushing the door open pushbuttons will provide slow speed power on the door and gate motors for a new time allowance of AOT time. Should the door open pushbutton be operated continuously or should the AOT timer fail to operate, after 30 seconds the direction timer OT will operate and de-energize all open direction relays. OT relay will remain energized with contact OT-1NC held open until a) the fault is corrected, b) the door close

pushbutton is operated, c) power is removed from the controller

3.2.5 Close operation is the same as in the Close Direction Sequence Operation outlined in Section 3.1.2. Similar switches for DCL and GCL are supplied to suite the NEMA/IP condition.

3.2.6 Additionally, under explosion conditions NEMA 7 or 9, the GOFL and GCFL final limit switches are removed from the hazardous hoistway area and their functions handled in the controller by the AOT open final limit timer for the open direction and the GS speed control relay for the close direction. A modified schematic is issued for each particular job covering the job differentials. As this method does not measure the final open or close position of the gate, the Sensor Beam (and any parallel connected contact type reversing edge) is not operational after close gate travel is changed to slow speed. However, this portion of the travel is at *Low KE*.

3.3 ALTERNATE-SIMULTANEOUS OPERATION-(RARE)

Where the controller is arranged so that the hoistway landing door and the adjacent car gate operate at the same time, the operation is called "Simultaneous Operation." Simultaneous Operation is rarely used in present day operating systems.

3.3.1 Where Simultaneous Operation is specified, modified schematic diagrams are issued for the job. Simultaneous Operation logic systems are basically the same as Sequence Operation logic systems with the following modifications to the Sequence Operation controller.

3.3.1.1 Open Direction - A shunting jumper is placed around the temporary lock out contact DH-4NC to allow the gate to move open at the same time as the door.

3.3.2.1 Close Direction - An SOA auxiliary speed control relay is added with contacts to change the door speed from high speed to slow speed and function in the DH and DL relay circuits in the same way that SP speed control relay changes the gate speeds.

3.3.2.2 Temporary lock out contact GS-4NC is removed from the door close circuit to allow the door to move close at the same time as the gate.

3.4 FIREFIGHTERS SERVICE

3.4.1 GENERAL

Required on new Automatic Elevators and included in all logic systems and controllers covered in this manual.

Automatic freight elevators or Freight Elevators Permitted to Carry Passengers, require special provisions for Firefighters Service per ASME A17.1. The following are requirements for Peelle doors/ gates to meet the intent of Rules 211.3, 211.4 or 211.5. These requirements are for vertically sliding doors.

3.4.1.1 Elevators that are defined as "Automatic (non-attendant) Operation Elevators" require conformance to Rule 211.3. Power door controllers set up with Firefighters Service are provided with the logic necessary to alter standard operation of the doors and gate upon receipt of initiations from elevator-company-supplied isolated relay contact for Phase I – Designated /Alternate Landing, and Phase II-In Car Operation for On, Off and Hold. Manual doors, or continuous-pressure pushbutton power operated doors (for closing), require an audiovisual signal provided by elevator supplier/installer, to alert the attendant to close the doors (if open) and return the elevator to the designated level.

3.4.1.2 Elevators that are defined as "Attendant-Operated Elevators, with manually operated or power operated vertical slide doors and car gates, require an audiovisual signal provided by an elevator supplier/installer, to alert the attendant to close the doors (if open) and return the elevator to the designated level. See Rule 211.4. When the doors are power operated, a Phase II Operation may be desired or required by some jurisdictions. Advise Peelle Sales of such requirements prior to drawing approval.

3.4.1.3 Elevators defined as "Dual Operation Elevators" (attendant/non-attendant per Rule 211.5) when on non-attendant service shall conform to the requirements of Rule 211.3 (see paragraph 1 above). When on attendant service; a) with doors open at a landing, an audiovisual signal provided by the elevator supplier/installer shall alert the attendant to close the doors and alert the passengers that the car is returning nonstop to the designated landing and after 15 to 60 seconds the requirements of Rule 211.3 shall become effective and; b) if the elevator is in flight, shall conform immediately to the requirements of Rule 211.3.

3.4.2 PHASE I – AUTOMATIC OPERATION ELEVATORS

3.4.2.1 When a Phase I isolated initiation is received from the elevator controller as a result of the recall switch at the designated landing being turned to the ON position or due to smoke detector action:

3.4.2.1.1 With the car standing at a landing other than the designated level and with the doors open:

3.4.2.1.1.1 If equipped with Automatic Time Closing the door closing sequence (warning bell before door movement) will commence without delay.

3.4.2.1.1.2 If equipped with manually operated doors or power doors with Continuous-Pressure closing, the audiovisual signal installed by the elevator supplier/installer shall alert an attendant to manually or power operate the doors to a closed position.

3.4.2.1.2 With the elevator on Inspection Service at the time Phase I is initiated, the audiovisual signal shall alert the inspecting person to return the car to normal service.

3.4.2.1.3 With the door and gate closed, or if the Phase I initiation is received while the elevator is running with the door and gate closed, the elevator control directs the car to the Designated/Alternate landing.

3.4.2.2 An elevator control Phase I initiation received through interconnection at door controller terminals X10 and A11 energizes relays FS and FSA.

3.4.2.2.1 Contact FS-1NC, opens and de-activates the Sensor Beam reopening device, contact FS-3NO closes and provides an initiation to the FS relay on a rear Line C controller, contact FS-4NC opens and its function relates to Phase II, contact FS-2NO closes and sets up gate slow speed low KE travel

upon a close initiation, and in Automatic Time Closing systems (See Section 4.5) contact FSA-1NO closes to bypass the variable set time allowance for doors open time.

3.4.2.3 Upon arrival at Designated/Alternate landing, the elevator control will initiate normal automatic opening to the doors and for Automatic Time Closing door systems provides a Designated/Alternate landing initiation to deactivate the Automatic Closing feature. See Manual 202 (W20) for initiations.

3.4.2.4 *During Phase I operation, door open and close pushbuttons (in car and at landing) remain active.* When the retiring cam is activated (lifted), all door pushbuttons (open and close) are rendered inoperative through the door controller at the time the interlock contact DI closes and allows the car to run.

3.4.2.5 Firefighters Phase I Recall is completed when the elevator stops at the Designated/Alternate landing and the doors are opened. The door operating pushbuttons are active.

3.4.2.6 The Phase I recall initiation to the door controller, may be removed at any time during recall, at the completion of recall, or during Phase II, by moving the designated landing key switch from ON to BYPASS, or to BYPASS then OFF if Phase I was commenced through smoke detector action, or to OFF if Phase I was commenced by turning the switch to ON.

3.4.3 PHASE II – AUTOMATIC OPERATION ELEVATORS

3.4.3.1 When an isolated Phase II – ON initiation is received from the elevator controller as a result of the Emergency In-car Switch being placed in the ON position (and effective only with the Phase I Recall Switch also being in the ON position or when smoke detector has activated and the elevator is at the designated or alternate landing with the door open), Phase II operation is effective and the door controller provides:

1. When door is open: *Continuous*-pressure door close pushbutton operation is provided as *usual.* (this is standard freight door pushbutton operation). This provides automatic reversal to the fully open position should the door close pushbutton be released prior to the completion of the close operation.
2. The Sensor Beam reopening device is rendered inoperative throughout Phase II operation. Gate and Door speeds are the same as standard.
3. When the door and gate opening power operation is completed during Phase II, an isolated contact on the door controller closes to provide a door open signal to the elevator controller.
4. When door is closed: *Continuous* pressure door open pushbutton operation is provided (*this is opposite from standard freight door pushbutton operation*). This provides automatic reversal to the fully closed position should the door open pushbutton be released prior to the completion of the operation.

3.4.3.2 An elevator control Phase II initiation received through interconnection at door controller terminals X10 and X13 will energize ES relay.

1. Contact ES-1NC opens and keeps the Sensor Beam circuit deactivated, contact ES-3NO provides an initiation to ES relay on a rear Line C door controller, and contact ES-2NC opens to reset the gate travel speed from the Phase I slow speed only mode to standard high main and slow final travel speeds.

3.4.3.3 The elevator controller shall disable the hoistway landing door pushbutton circuit between terminals DO1 and D012 during Phase II *except when Phase II OFF is initiated.*

3.4.3.4 *For most local jurisdictions for Phase II operation, both* open and close pushbutton are now continuous-pressure operation.

1. The door open pushbutton operation energizes AC relay, contact AC-1NO closes and initiates the open direction relays, contact AC-2NO closes and energizes RO relay, contact AC-3 is not used here and contact AC-4NC opens and locks out close direction relays. .
2. Contact RO-1NC opens deactivating the open direction holding circuit, contact RO-2NC opens locking out the reversal-to-open contact CR-2NO, and contact RO-2NO closes energizing LU lockup relay.
3. Contact LU-1NO closes, setting up the close direction, contact LU-2NO closes which seals in RO relay and contact LU-3NO closes, sealing in LU relay.
4. In the event the open pushbutton is released during open travel, the AC relay de-energizes causing the open direction relays to de-energize and the close direction relays are energized and held in through closed contact LU-1NO until final close is complete.
5. When the close direction travel completes, ACT final close timer operates and de-energizes LU relay in addition to the close direction relays and subsequently RO relay is de-energized. A new open attempt is now available through the open pushbutton.
6. If pressure is maintained on the open pushbutton to final open travel, limit switch GOFL closes, which energizes OF relay and the open direction relays are de-energized. The close direction setup is cleared and the LU relay is de-energized and in turn the RO relay de-energizes. The control is available for a close initiation.

3.4.3.5 The initiation of Phase II ON from elevator controller is to remain effective until elevator car is at the designated landing with the doors open and emergency in-car switch is turned OFF.

3.4.3.6 When Emergency In-Car Switch is turned to HOLD and with doors-open-signal (terminals X15 – X16) to elevator controller effective, elevator controller shall provide an isolated Phase II HOLD initiation to the door controller. The door controller registers this signal at X10-X14 and disables power door closing.

1. The elevator controller HOLD initiation received from door controller (terminals X10 and X14) energizes HO relay.
2. Contact HO-1NC opens and locks out the close door direction relays, and contact HO-2NC performs the same function on a rear

Line C controller through direct interconnection.

3.4.3.7 When the Emergency In-Car Switch is turned to OFF and with the door-open-signal (terminals X15 – X16) to the elevator controller effective, the elevator controller shall provide an isolated Phase II OFF initiation to the door controller. The door controller registers this signal at terminals X10-X18 and,

3.4.3.7.1 If Phase I is ***in effect***, with relays FS and FSA energized (see 3.4.2.2), contact FS-4NC is open preventing energization of HO hold open relay. The elevator control shall also close the initiation at door control terminals DO-1and DO-12 (DO-10 and DO-22 on Line C) to the door operating buttons on the landing making the landing door buttons effective. Door power closing is enabled (see 3.4.2.1.1) and when the doors are closed, a Phase I recall to the designated/alternate landing should result.

3.4.3.7.2 If Phase I is ***not in effect***, contact FS-4NC is closed allowing HO hold relay to energize and contact HO-1NC and HO-2NC open to lock out Line A and Line C close operation.

3.4.3.8 When the door and gate are open, the door controller provides an open door isolated initiation to the elevator controller through door controller terminals X15 and X16.

3.4.3.9 This completes Firefighters Service Phase II. Normal operation can be restored with the elevator at the designated landing with the door open.

4. AUTOMATIC TIME CLOSING SYSTEM - OPTIONAL

4.1 CODE REQUIREMENTS:

Based on:

Schematic #274109, single line or Line A of a double line.

Schematic #274110, Line C of a double line.

Schematic #274111, double line of doors at staggered levels.

Controllers of the 2741 series with optional Automatic Time Closing have timers and relays that automatically close car gate (s) and associated door (s) after being open a pre-determined time. Controllers that have Automatic Time Closing usually have changes/additions required for Firefighters Service.

The purpose of Automatic Time Closing System is to keep all doors closed making elevator available for a call from a remote floor.

Peelle control arrangement complies with Automatic Time Closing System requirements of Elevator Code ASME A17.1 paragraph 112.3d for power doors on automatic elevators or continuous-pressure operation elevators. **Peelle equipment for Automatic Time Closing System includes:**

4.1.1 A **warning bell** mounted on the car which sounds 5 seconds before the door or gate starts to automatically close and continues to sound until door reaches slow speed (hoistway door substantially closed). An optional amber flashing light visual signal, to simultaneously operate with the warning bell, is available from Peelle.

4.1.2 **Sequence Operation** of hoistway landing door and adjacent car gate is required (refer to Sequence Operation Section).

4.1.3 A car gate **reopening device** (Sensor Beam) and associated relays are furnished.

4.1.4 **Momentary-pressure** stop and reopen is provided through operation of a (landing or car mounted) door-open pushbutton when the door and gate are in Automatic Time Closing operation.

4.1.5 **Average closing hoistway door panel and gate panel speeds for ATC (Automatic Time Closing) are the same as non-ATC speeds, with the high speed travel of the hoistway door panels and car gate panel at the nominal panel speed of 0.3m/s(1ft/sec) and 0.6m/s (2ft/sec) or less, respectively. The average closing speeds depend upon the length of the slow speed final travel.**

4.2 OTHER FEATURES:

4.2.1 The Automatic Time Closing System initiation is self-contained within the Peelle controller and optional elevator control initiation is needed only for Override or Hold-Open (See Section 4.3).

4.2.2 Continuous-pressure activation of the door close pushbutton in the car or at the landing is always available without time delay for the Automatic Time Closing System.

4.2.3 During or prior to Automatic Time Closing, the time delay may be reset to full allowance of open-door-time by use of the door-open pushbutton in the car or at the landing.

4.2.4 An adjustable time relay TG is provided with a 0 to 5 min. range. The timer is set to a customer/user's desired time for load and unload condition. (Note, this timer should not be set to less than 30 sec.) Changes in this timer setting to suit modified loading conditions should be made by an authorized person familiar with control apparatus.

4.2.5 During Automatic Time Closing, if reopening device senses an obstruction causing a reversal (reopen) during an Automatic Time Closing, a full time delay will occur prior to allowance of a new automatic time closing or remote automatic time closing.

4.3 IN ADDITION TO CODE REQUIREMENTS: OVERIDING THE TIME DELAY. THERE IS A PROVISION MADE IN THE DOOR CONTROLLER:

4.3.1 An initiation from the elevator controller allows an Override to the Automatic Time Closing time delay period. When this initiation is received, the warning bell will ring for the required 5 seconds, and then the car gate and door will close sequentially without waiting for the full, predetermined time (up to 5 seconds). See Peelle Manual 202 for initiation requirements.

4.3.2 To receive a Hold-Open initiation from the elevator controller that will make the Automatic Time Closing operation inoperative, when desired. See Peelle Manual 202. The purpose of this feature is to *permit* an *extended period* of *loading* or *unloading* when desired. See also Other features sections 4.2.3 and 4.2.4 relative to extending open door time.

4.4 AUTOMATIC TIME CLOSING – DETAILED EXPLANATION

4.4.1 After an open initiation of the door and gate, through automatic-opening upon elevator arrival or by door pushbutton, and when the gate has moved sufficiently to allow gate slow speed close limit GCL-1to close,TG timer is energized through normally closed contacts CR-3,TAC-2, ZL-1, ESA-2, AC-3, and GA-1

1. After the preset time (0 to 5 minutes), TG timer operates and contact TG-1NO closes energizing GA relay and TAC timer which commences timing.
2. Contact GA-1NC opens de-energizing TG timer, allowing it to recycle. Normally open contacts GA-1 and GA-2 close, activating a holding circuit from feeder wire number 4 through normally closed contacts OA-2, DL-6, GR-2, ZL-1, ESA-2 and AC-3, (contacts ZL-1 and ESA-2 only function during Firefighters Service-see 4.5.1.5 & 4.5.2). Contact GA-3NO closes, energizing B warning bell/buzzer through previously closed contact DS-3NO.
3. After 5 seconds (minimum preset time), TAC timer operates and contact TAC-1NO closes, initiating close direction operation (See Sequence Operation 3.1.2 Closing Direction) and opening contact TAC-2NC, which isolates the GS relay from the timing circuit.
4. When the close operation proceeds to the point of door slow speed, contact DL-6NC opens, interrupting the timing holding circuit, de-energizing GA relay and allowing TAC timer to recycle. Completion of the close direction from slow speed to full closed position is the same as the Sequence Operation arrangement without Automatic Time Closing. (See Sequence Operation 3.1.2. Closing Direction).

4.4.2. If an obstruction in the path of a car gate is registered by the Sensor Beam during the Sequence Operation close operation, GRA relay is energized closing contact GRA-1NO which energizes GR Reopening Relay. Close operation is changed to open operation causing door and gate to reopen, setting up a new time cycle for Automatic Time Closing.

1. Contact GR-1NC opens, which de-energizes the close direction relays, contact GR-2NC opens, dropping out the timing holding circuit, contact GR-2NO closes, which energizes GB relay.
2. With the close direction de-energized, re-opening initiation through closed contact CR-2NO takes place immediately.
3. Contact GB-1NO closes to self-hold GB relay through timer contact TG-2NC, and contact GB-2NC opens to lockout an override attempt until a full completion time of TG timer.
4. The only close operation available until the full TG time expires is by continuous-pressure close pushbutton.

4.4.3 During the Automatic Time Closing timing by the TG timer from the first energization of TG timer until closing travel motion begins, momentary pressure on the door open pushbutton will energize AC open control relay, causing contact AC-2NC to open, which activates a reset of the timing to full time.

4.4.4 During the Automatic Time Closing operation: from the beginning of closing travel motion to the beginning of hoistway landing door slow speed, momentary pressure on the AC open control relay, causes contact AC-3NC to open, which interrupts the timing holding circuit de-energizing relays TAC and GA. This causes de-energization of the close direction relays and automatic reopening is initiated. (See Sequence Operation 3.1.3. Automatic Reopening).

4.4.5 If the door and car gate are closed by operating the door close pushbutton (on the elevator car, or at the associated landing) before the warning bell rings, Sequence Operation, continuous-pressure, close operation is attained. (Note: See Sequence Operation 3.1.2. Closing Direction).

4.4.6 If the door close pushbutton is operated with continuous-pressure after the warning bell sounds but before commencement of the close on automatic (closing of contact TAC-1NO), normal closing operation will occur but the warning bell will continue to ring. To provide proper close operation contact CR-3NC opens and isolates GS relay from the timing circuit, allowing a normal GS function. The timing circuit remains operative in this situation and the Automatic Time Closing will be effective after TAC-1NO closes. Should the door close pushbutton be released prior to establishment of the automatic time closing, automatic reopening (See Sequence Operation 3.1.3. Automatic Reopening) is immediately initiated and the subsequent opening of contact OA-2NC will interrupt the time holding circuit.

4.4.7 Remote initiation of the warning bell, followed 5 seconds later by a closing operation, takes place when the elevator controller provides an Automatic Time Closing override initiation, closing the timing circuits between contact terminals DO-6 and DO-7 for the front Line A and DO-60 and DO-70 for rear Line C, except after a reopening device activation (See 4.4.2.3 and 4.4.2.4 above).

4.4.8 With the door and gate open, opening the circuit between DO-6 and DO-8 (DO-60 and DO-80 for the rear line), by operation of an elevator controller Hold-Open initiation, disconnects the timing circuit and allows the door and gate to remain open for an indefinite period, although closing is possible by door close pushbutton activation.

4.4.9 One warning bell is provided for either Single Line, or Double Line operation. For Single Line, the warning bell is energized when contact GA-3NO closes. For Double Line, the warning bell is energized by: a) the front Line A controller (contact GA-3NO) when Line A alone, or front Line A and rear Line C together, energizes a warning ring (rear Line C initiation is locked out by contact GA-3NC); and b) rear Line C controller when Line C only is energizing a warning ring.

4.5 FIREFIGHTERS SERVICE WITH AUTOMATIC TIME CLOSING

When Firefighters service is initiated through elevator controller to door controller interconnects, the action is the same as covered under Section 3.4 Firefighters Service with the modifications below.

4.5.1 On receipt of a Phase I initiation, when the relays FS and FSA are energized, contact FSA-1NO

closes to bypass the TG timer and immediately energizes the TAC warning timer and GA relay.

1. Contact GA-1NC opens to lock out TG timer, contact GA-2NO closes to seal in GA relay and contact GA-3NO closes to ring the B warning bell.
2. After the TAC timer activates (5 seconds minimum), contact TAC-1NO closes to energize the close direction relays to full close travel.
3. With the doors closed, the elevator returns to the designated/alternate landing, and upon reaching that landing, an initiation to the door controller terminals X10 and X12 is required from the elevator controller during the period the elevator is at this location.
4. Receipt of this initiation energizes ZL relay, and the initiation is only to be present while the elevator is at the designated/alternate landing.
5. Contacts ZL-1NC and ZL-2NC are opened and act together to de-energize the Automatic Time Closing and warning bell circuitry. Contact ZL-3NC is a transfer contact to a rear Line C controller (if included) and closes to perform a similar function for Line C.
6. This completes the Phase I recall with the elevator at the designated/alternate landing. The doors are open but are available for a continuous-pressure pushbutton close.

4.5.2 On receipt of a Phase II initiation, normally closed contact ESA-2 opens deactivating the TG timer and the TAC timer. The circuitry continues in a de-energized state and continuous-pressure close pushbutton operation is available.

4.5.2.1 Phase II door functions as outlined in Section 3.4 Firefighters Service are in effect.

4.5.2.2 When the Phase II key is turned to OFF at a floor away from the designated/alternate landing and;

1. If Phase I is *ON*, ESO relay is energized and the doors will automatically close after TAC time warning bell sounds, and Phase I recall will take place.
2. If Phase I is *OFF*, HO relay is energized and the close direction relays are locked out. The doors will stay open or will open with continuous-pressure open pushbutton operation and then will stay open.

4.5.2.3 Phase II shall remain effective until the elevator is returned to the designated/alternate landing where normal door operation can be restored.

5.1

POWER OPERATED FREIGHT ELEVATOR DOOR AND GATE CONTROLLER SERIES 2741

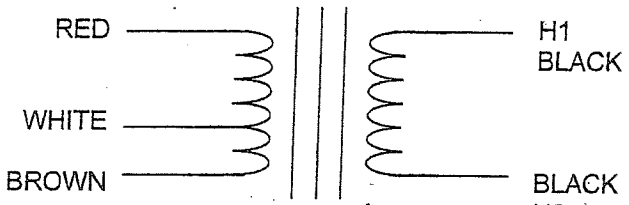
FEATURES			CONTROLLER NUMBERS		
OPEN FINAL LIMIT	FIREFIGHTERS' SERVICE	AUTOMATIC TIME CLOSING	SINGLE, OR FRONT LINE "A" OF DOUBLE LINE	REAR LINE "C" OF DOUBLE LINE	DOUBLE LINE STAGGERED OPENING
GEARED SWITCH	WITHOUT	WITHOUT	274100	274101	274102
		WITH	274103	274104	274105
	WITH	WITHOUT	274106	274107	274108
		WITH	274109	274110	274111
TIMED OUT	WITHOUT	WITHOUT	274112	274113	274114
		WITH	274115	274116	274117
	WITH	WITHOUT	274118	274119	274120
		WITH	274121	274122	274123

POWER OPERATED FREIGHT ELEVATOR DOOR AND GATE CONTROLLER SERIES 2741 (STANDARD SLAVE TYPE)

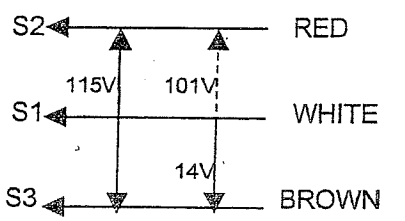
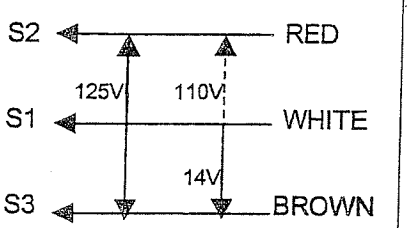
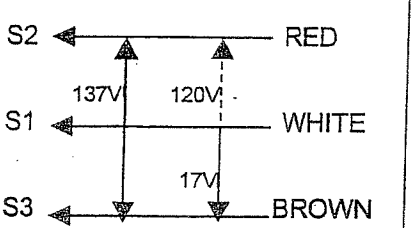
FEATURES	CONTROLLER NUMBERS		
OPEN FINAL LIMIT	SINGLE, OR FRONT LINE "A" OF DOUBLE LINE	REAR LINE "C" OF DOUBLE LINE	DOUBLE LINE STAGGERED OPENING
GEARED SWITCH	274124	274125	274126
TIMED OUT	274127	274128	274129

5.2 CONTROL TRANSFORMER – CONNECTIONS (1969-1994)

THE CONTROL TRANSFORMER 'TRSF' IS FACTORY CONNECTED TO SUIT THE CONTROLLER NAMEPLATE VOLTAGE. CONNECTION IS THE SAME WHEN APPLIED VOLTAGE IS 220/240 VOLT. IF APPLIED VOLTAGE IS 208 AND NAMEPLATE SHOWS 220 OR 240 VOLT, FIELD EXCHANGE THE WHITE AND BROWN TRANSFORMER LEADS AT CONNECTION POINT S1 AND S3 (SEE CHART BELOW). CONTROL VOLTAGE SHOULD BE BETWEEN 110V AND 125V – NO LOAD.



TRSF LEAD COLORS

CONNECT CONTROL TRANSFORMER SECONDARY AS SHOWN		
WHEN H1 – H2 IS 208 V	**WHEN H1 – H2 IS 220 V**	**WHEN H1 – H2 IS 240 V**
		

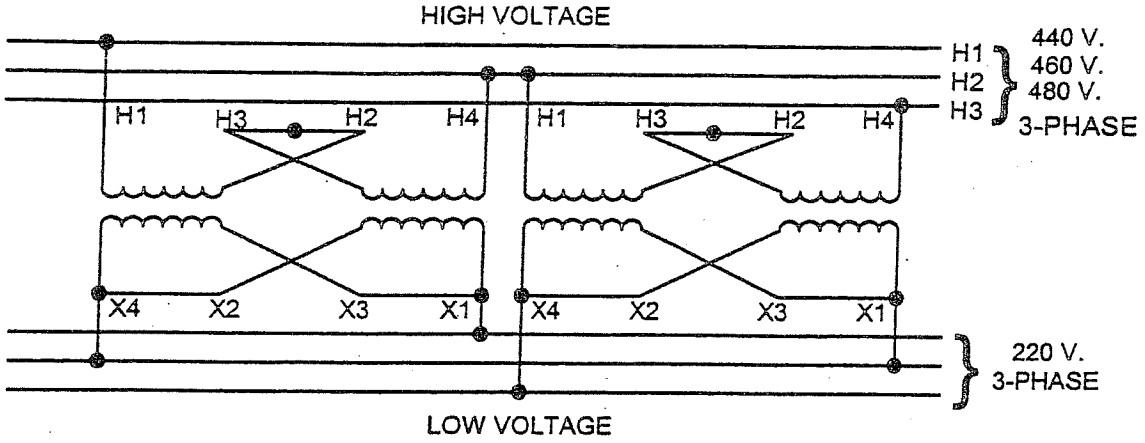
5.3 POWER TRANSFORMER – CONNECTIONS (1969-1988)

THE POWER TRANSFORMER 'TRSF' IS FACTORY WIRED TO SUIT THE SPECIFIED JOB VOLTAGE. IF ACTUAL JOB VOLTAGE VARIES FROM FACTORY WIRED VOLTAGE, CHANGE CONNECTIONS AS SHOWN IN CHART BELOW.

		CONNECT HIGH VOLTAGE LINES TO H1, H2 & H3		
	VOLTAGE	**WIRE CONNECTIONS**		
LINE	480	H1 TO H6	H2 TO H4	H3 TO H5
	460	H1 TO H9	H2 TO H7	H3 TO H8
	440	H1 TO H12	H2 TO H10	H3 TO H11
SECONDARY	220	CONNECT LOAD LINES TO X1, X2 & X3		

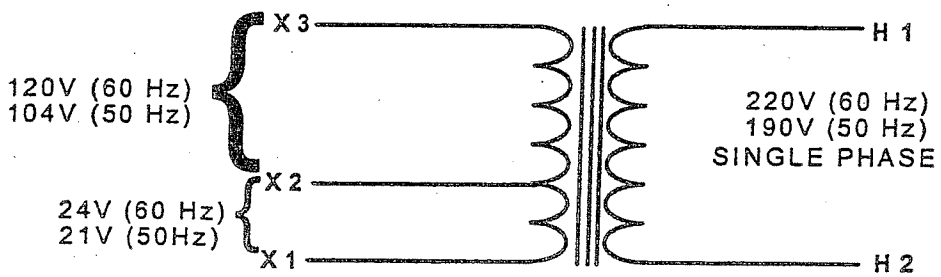
5.4 POWER TRANSFORMER – CONNECTIONS (1988-1994)

THE POWER TRANSFORMER 'TRSF2' IS FACTORY WIRED FOR JOB VOLTAGES RANGING FROM 440V. TO 480V. THEY ARE TWO SINGLE-PHASE TRANSFORMERS CONNECTED IN OPEN DELTA TO A THREE-PHASE CIRCUIT.



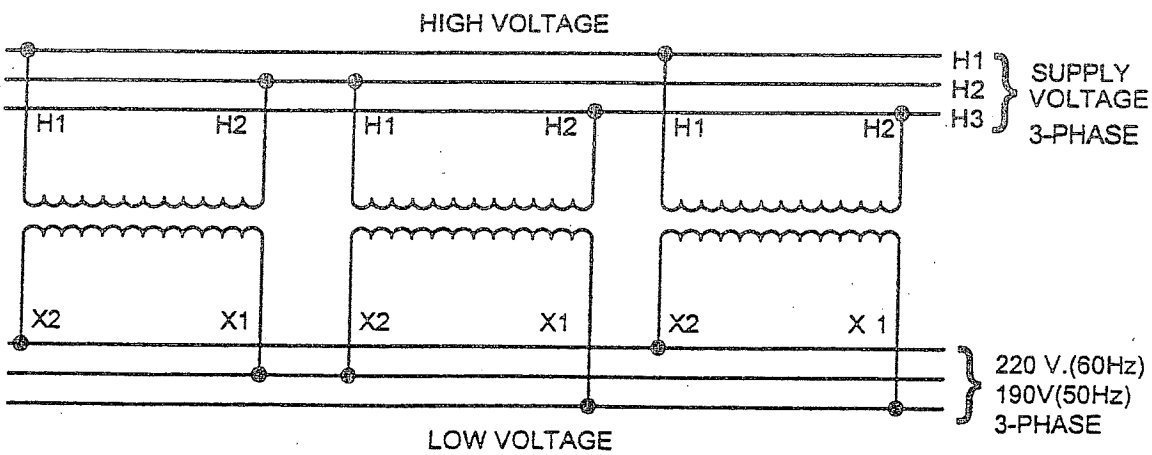
5.5 CONTROL TRANSFORMER – CONNECTIONS (1995-PRESENT)

THE CONTROL TRANSFORMER 'TRSF' IS FACTORY WIRED 220V/120V-24V (60HZ). IF APPLIED VOLTAGE IS 208V THE CONTROL VOLTAGE WILL BE 114 VOLTS. NO WIRING CHANGES ARE REQUIRED.



5.6 POWER TRANSFORMER – CONNECTIONS (1995-PRESENT)

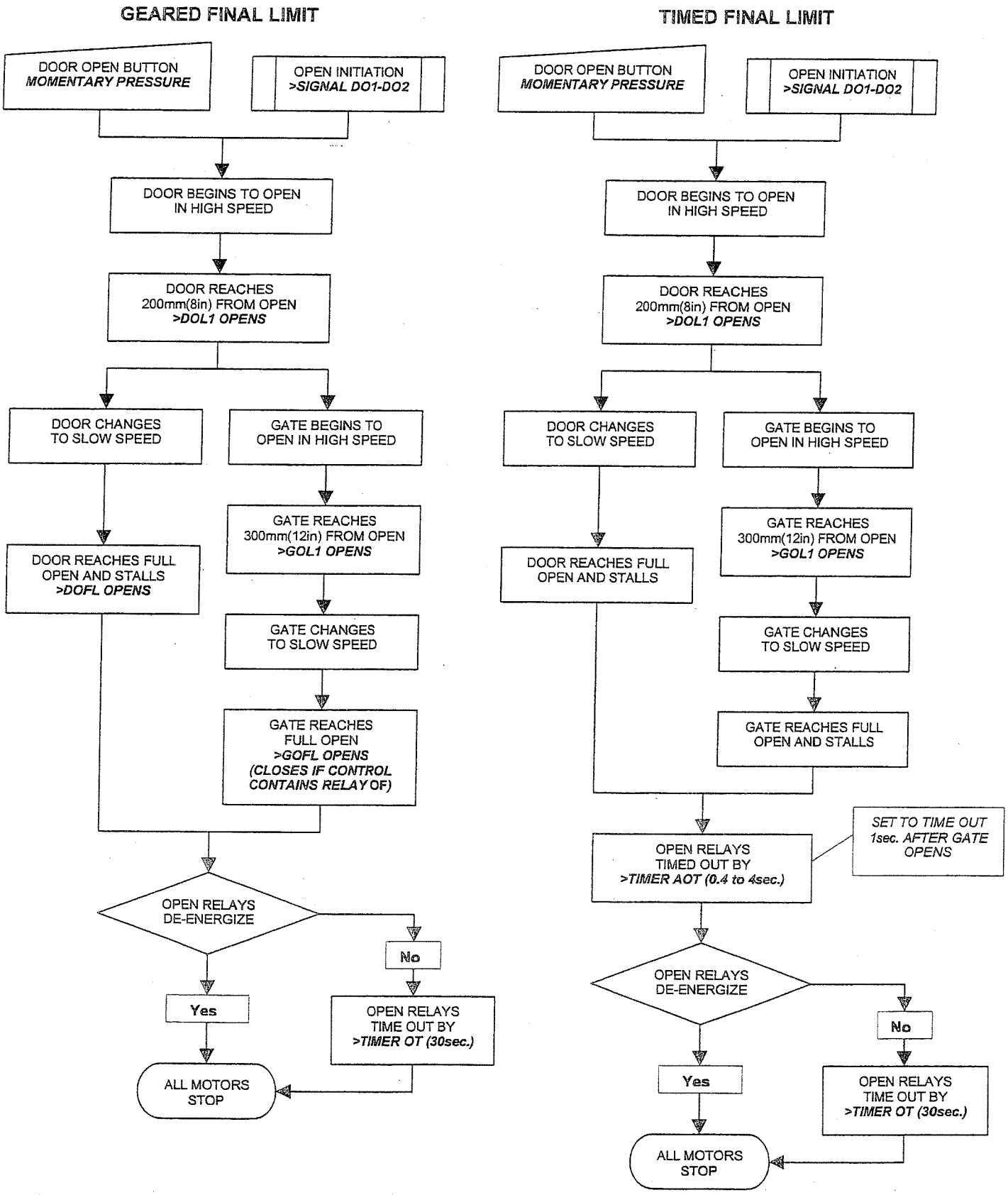
THE POWER TRANSFORMER 'TRSF2' IS FACTORY WIRED FOR JOB VOLTAGES RANGING FROM 380V. TO 600V. FOR 50 Hz OR 60 Hz DEPENDING ON LOCATION. THERE ARE THREE SINGLE-PHASE TRANSFORMERS CONNECTED IN CLOSE DELTA TO A THREE PHASE CIRCUIT.



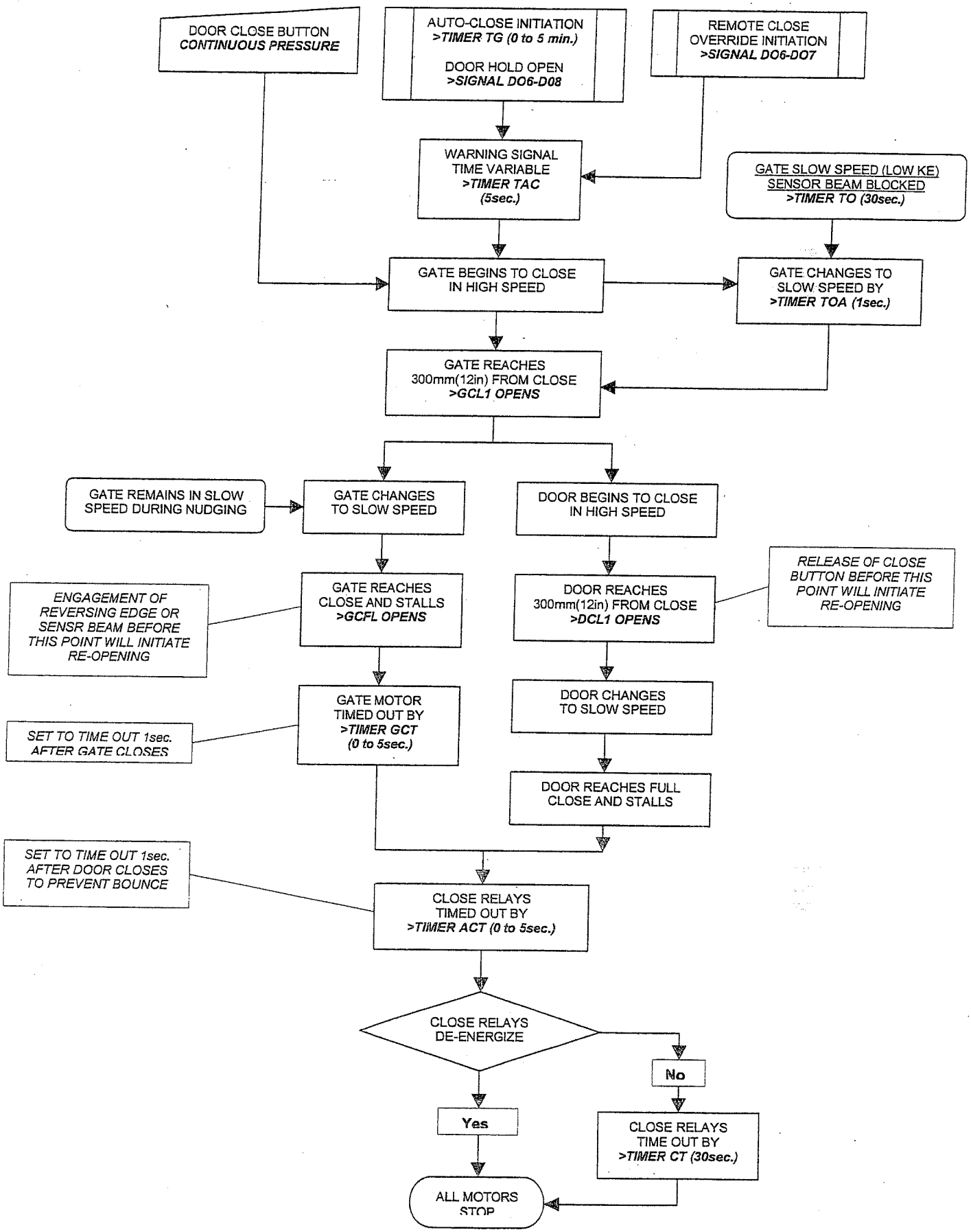
5.7 **PEELLE MOTOR DATA – FOR DOOR AND GATE AND REIRING CAM MOTORS**

MOTORS – 220 VAC, 3 PHASE, 60 Hz. TORQUE TYPE SQUIRREL CAGE INDUCTION HIGH SLIP					TORQUE MOTOR FULL LOAD VALUES (LOCKED ROTOR)					
TYPE	TORQUE	ENCLOSURE	ASSEMBLY OPERATOR PART NO.	MOTOR PART NO.	CURRENT AMPS HI	CURRENT AMPS LOW	NOMINAL TORQUE LBS. IN.	DUTY RATING MINUTES	MAXIMUM TIME ON %	PHASE RESIST-OHMS
HOISTWAY DOOR 900/450 SYN. RPM MOTOR	STANDARD TORQUE	TENV	0560	056921	1.5	0.8	15	5	16	105 – 250
		EXPLOSION RESISTANT	0594	059421	1.0	0.6				
		MOISTURE RESISTANT	0560M	056921M	1.0	0.6	15	4	14	
	HIGH TORQUE	TENV	0569	056910	2.0	1.0	20	5	16	70 – 150
		EXPLOSION RESISTANT	0595	059521	1.8	1.1				
		MOISTURE RESISTANT	0569M	056910M	1.8	1.1	20	4	14	
CAR GATE 900/300 SYN. RPM MOTOR NOTE: PRIOR TO 1994 SYN. RPM WAS 1200/300. LISTED UNITS ARE INTERCHANGEABLE REPLACEMENTS	STANDARD TORQUE	TENV	2518	25182	1.3	2.0	16	5	16	70 – 80
		EXPLOSION RESISTANT	2528	25282	0.7	2.2				
		MOISTURE RESISTANT	2548	25482	1.5	2.0				
	HIGH TORQUE	TENV	2517	25172	2.0	3.0	21	5	16	45 – 50
		EXPLOSION RESISTANT	2527	25272	0.8	2.8				
		MOISTURE RESISTANT	2547	25472	1.5	2.0				
RETIRING CAM 600 SYN. RPM MOTOR	STANDARD TORQUE	TENV	233020	033050	0.5		10	30	50	109
		EXPLOSION RESISTANT	23306	233048						
		MOISTURE RESISTANT	233065	233060						

6.1 PEELLE DOOR/GATE FLOWCHART (SEQUENCE OPERATION): *OPEN DIRECTION*



6.2 PEELLE DOOR/GATE FLOWCHART (SEQUENCE OPERATION): *CLOSE DIRECTION*



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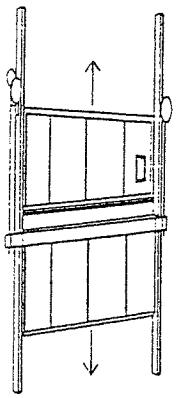
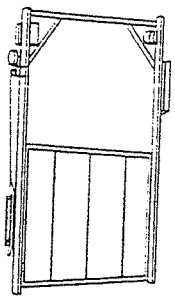


BIPARTING DOOR

THE PEELLE COMPANY
34 CENTRAL AVENUE
HAUPPAUGE, NEW YORK
USA 11788-4734
VOICE 1-800-645-1056, ext.26
VOICE 1-631-231-6000, ext.26
FAX 1-631-231-6059
E-Mail sales@peelledoor.com

THE PEELLE COMPANY, LTD.
195 SANDALWOOD PKWY. W.
BRAMPTON, ONTARIO
CANADA L4T 1G8
VOICE 1-800-787-5020
VOICE 1-905-846-4545
FAX 1-905-846-2161
E-Mail exportsales@peelledoor.com



CAR GATE

FREIGHT ELEVATOR POWER DOOR INITIATIING CONTACT REQUIREMENTS FOR CONTROLLER SERIES #2741

THIS MANUAL EXPLAINS INTERPANEL CONNECTIONS FOR POWER JOBS

SUBJECT: INITIATING CONTACT REQUIREMENTS FOR POWER-OPERATED FREIGHT ELEVATOR HOISTWAY LANDING DOORS AND CAR GATES. CONTROLLER SERIES #2741.

The initiating contact requirements for Peelle standard and optional door/gate operating systems are listed below. This manual is for Controller Series #2741. Optional circuits and their contacts are also listed. Circuits vary with contract requirements and some circuits may not be required. Check job and code specifications and select initiations required. Consult Peelle Engineering Department for special requirements not listed.

SECTION 1: CONTACTS TO BE FURNISHED BY THE ELEVATOR SUPPLIER FOR INITIATION OF HOISTWAY LANDING DOOR AND CAR GATE FUNCTIONS:

1.1 AUTO-OPENING CONTACT (DO1,DO2) (DO10,DO20)

This is an isolated normally-open, contact **on the elevator controller** that automatically initiates the door open circuits on the Peelle controller as the elevator car is stopping at the landing. The contact is to close as the elevator enters the landing zone, is to open after door open operation commences, and must not remake when the car starts away from the floor. A separate contact must be furnished for each line of doors except where there are staggered landings that allow a single Peelle controller to operate more than one line of doors.

Allowable automatic door opening arrangements are achieved by providing momentary impulse (30 milli-seconds minimum) contacts in parallel with the car-located door-open pushbutton (OC), with the provision that such circuits, if initiated from landing call buttons, are designed to be operative only within the landing zone of that floor.

1.2 DOOR-OPERATING PUSHBUTTON STATIONS

Standard initiations require that the elevator company supply a car operating station including door open, door close, and door stop pushbuttons and also supply landing stations at each landing with door open and door close pushbuttons. All pushbuttons are to be momentary-action type with one normally open contact, except stop pushbuttons which require one normally closed contact.

NOTE: See applicable Peelle controller schematic and hoistway shaft connection diagrams.

1.3 DUAL-OPERATION LANDING DOOR PUSHBUTTON "CUTOUT" CONTACT (DO1, DO12,) (DO12, DO22)

This is an isolated, normally closed, contact **on** attendant/non-attendant type **elevator controllers**, that *disables* for attendant use or *enables* for non-attendant-use all landing door pushbuttons. This separate "cutout" contact is required for each line of doors, except where staggered landings allow a single Peelle controller for more than one line of doors.

1.4 INSPECTION CIRCUIT CONTACT (DO3, DO5) (DO30, DO50) AND ACCESS SWITCH CONTACTS

This is an isolated, normally closed, contact **on the elevator controller** and access switch contacts (or contact incorporated in the inspection switch on top-of-car operating device) that deactivates the door and car gate portion of the Peelle control circuit. When the elevator controller is operated in inspection mode per ASME A17.1 Rule 210.1d or for "ACCESS" purposes per Rule 111.9d, the contact is to remain open to deactivate the door and car gate, and must remain closed for normal power operation of doors and car gate. Separate inspection circuit contacts are required for each line of doors, except where staggered landings allow a single Peelle controller for more than one line of doors.

Deactivation of the door and car gate circuit by this inspection circuit contact does not affect the energization of the retiring cam (see RETIRING CAM INITIATING CONTACT) nor the door contacts DC and car gate contacts GC in the interlock protection circuit.

1.5 RETIRING CAM INITIATING CONTACT (DO3, DO4)

This is an isolated, normally open, contact **on the elevator controller** that closes and initiates the retiring cam relay on the Peelle controller. The contact is to close after all doors/gates are completely closed, as indicated through the closing of the DC and GC contacts, and after a call to move the elevator car to another floor has been registered. The contact is to open when the car enters the landing zone, is to remain open while the car is at a landing, and is not to remake when the motor generator set is shut off. Only one retiring cam initiating contact is required per elevator car, regardless of the number of door lines.

1.6 AUTO CLOSE OVERRIDE CONTACT AND AUTO CLOSE HOLD-OPEN CONTACT

1.6.1 AUTO CLOSE OVERRIDE CONTACT (DO6,DO7) (DO60, DO70)

When the auto close feature is supplied as a portion of the Peelle controller and it is desired to close the open door and car gate from a remote landing *prior to* the automatic time closing.

To accomplish this purpose an isolated, normally open, contact must be provided **on the elevator controller** that will close when a remote floor call button is operated. This contact will provide an initiation to the Peelle controller to operate the five (5) second warning bell and then close the door and car gate at the landing where the elevator car is located. The operation of this initiation may be a momentary *impulse* (30 milli-second minimum) or a *maintained closure* until the elevator reaches the leveling zone of the called floor, at which point the contact must reopen.

1) Separate override contacts are required for each line of doors, except where staggered landings allow a single Peelle controller for more than one line of doors. These separate override contacts should close in unison when any remote floor call button is operated.
2) In the *impulse* system, the initiation is canceled immediately, and should the elevator car proceed and stop at a floor other than the floor at which the original call was placed, a new initiation will be required.
3) In the *maintained closure* system, if the elevator car stops at an intervening floor and automatic opening takes place, the normal, automatic time closing time delay will be voided and the door and car gate will close after the warning bell rings for five (5) seconds.
4) If the car gate should sense or strike an obstruction during closing causing reopening device operation and a return to the open position, a full time delay will be experienced prior to automatic time closing. This delay can be bypassed by operating the close pushbutton on the car or the landing door close pushbutton at the elevator car position.

1.6.2 AUTO CLOSE HOLD-OPEN CONTACT (DO6, DO8) (DO60, D080)

When the auto close feature is supplied as a portion of the Peelle controller and it is desired to hold the door open and gate open for an extended period of time. Operation of the door open pushbutton will cause a) door reopen and full time reset if doors have started open and b) will provide a full time reset if the doors were full open. For this hold-open circuit an isolated, normally-closed, contact must be provided **on the elevator controller** or in the pushbutton station on the car, that will open and remain open as long as the circuit is to be voided. Separate hold-open contacts are required for each line of doors, except where staggered landings allow a single Peelle controller for more than one line of doors. Continuous pressure pushbutton door closing is still available, although with this hold-open feature automatic time closing is rendered inoperative.

1.7 FIRE SERVICE CONTACTS PER ASME A17.1 RULE 211.3

If Fire Service feature is supplied as a portion of the Peelle controller, initiations from the elevator controller must meet the following requirements for each elevator provided with Fire Service. Only one set of Fire Service Initiations is required for either single or double line applications, however, the Auto-Open circuit and Dual-Operation Landing Door Pushbutton "Cutout" circuit must be modified for Front Line A and also Rear Line C when supplied. See Fire Service Initiation Contact and Modification Listing illustrations later in this manual.

1.7.1 PHASE I - ELEVATOR RECALL

1) FIRE SERVICE (PHASE I) "ON" CONTACT (X10, X11)

This is an isolated, normally open, contact **on the elevator controller** that initiates Fire Service on the Peelle controller. The contact is to close when the Fire Service Phase I landing-located Key Switch at the designated landing (usually the main lobby) is turned to the "ON" position or when Phase I condition is initiated by a Smoke Detector. The contact is to open when the Fire Service Phase I condition is terminated.

This contact is for power operated doors closed by continuous-pressure pushbutton operation, automatic time closing or by momentary-pressure pushbutton operation.

Door operating pushbuttons (located in landing and in the car) are to remain effective. Auto-Open initiation shall be effective at the designated/alternate landing only.

For doors closed by *continuous-pressure* pushbutton operation, the audible and visual signal supplied by the elevator supplier/installer shall alert an attendant to perform the door close operation so the elevator can be recalled.

For door systems equipped with the automatic time closing feature or with momentary-pressure pushbutton closing, this recall initiation will cause the auto close sequence to commence when the elevator is at a remote floor with the doors open.

2) **DESIGNATED/ALTERNATE LANDING SIGNAL CONTACT (X10, X12).**
This is an isolated, normally open, contact **on the elevator controller** that is to close when Phase I and/or Phase II is in effect and while the elevator is within the landing zone of the designated or effective alternate landing. This contact is required only with automatic time closing or momentary-pressure close systems.

1.7.2. **PHASE II-EMERGENCY IN-CAR OPERATION**

1) **FIRE SERVICE (PHASE II) "ON" CONTACT (X10, X13)**
Emergency In-Car Operation *"ON"*.
This is an isolated, normally open, contact **on the elevator controller** that initiates emergency in-car operation on the Peelle controller. The contact is to close when the car-located Emergency Key Switch is effectively turned to the "ON" position and to remain closed as long as Phase II is in effect.

2) **FIRE SERVICE (PHASE II) "HOLD" CONTACT (X10, X14)**
Emergency In-Car Operation *"HOLD"*.
This is an isolated, normally open, contact **on the elevator controller** that closes only after the Emergency Key Switch is turned to "HOLD" and the doors have been opened.

3) **FIRE SERVICE (PHASE II) "OFF" CONTACT (X10, X18)**
Emergency In-Car Operation *"OFF"*.
This is an isolated, normally open, contact **on the elevator controller** that closes only after the Emergency Key switch is turned to "OFF" and the doors have opened.

1.8 ACCESS SWITCHES – (See ACCESS SWITCHES SECTION IN SECTION 2)
Access switches, when used, are provided by the elevator supplier. The effective action and initiation to the door controller is described in Section 2 along with the description of alternate, code allowed, unlocking devices.

SECTION 2: CONTACTS FURNISHED BY THE PEELLE CO.

2.1 FIRE SERVICE "DOOR OPEN" SIGNAL CONTACT (X15, X16)
This is an isolated, normally open, contact **on the Peelle controller** that closes when power door and car gate open operation is complete. This provides an initiation to the elevator controller for use with Fire Service Phase II. Each double line control panel is provided with this contact and the contacts are connected in parallel so that open doors on either the front or rear line will provide the open door signal to the elevator controller.

2.2 DOOR AND CAR GATE INTERLOCKING CIRCUITS CONTACTS (X1 to X9)

A. For "Door Closed" Contact DC and "Gate Closed" Contact GC.
It is required that all Door Closed Contacts DC and Gate Closed Contacts GC be connected in series and that the contacts be made when the doors and car gates are closed.

B. For "Door Locking" Contact DI.
It is required that all Door Locking Contacts DI be connected in series and that the contacts be made when the doors are locked.

When the elevator controller is given the signal that "all doors closed," the elevator controller may initiate retiring cam operation (see RETIRING CAM INITIATION CONTACT in Section 1.5). If all "door close" power operation is complete, initiation will cause the retiring cam face to retire (lift). When the interlock device is no longer depressed by pressure of the retiring cam face, hoistway landing door locking action takes place and the elevator controller is given a signal that the hoistway landing doors locking action is complete. The elevator controller shall not allow the elevator car to run unless all DC, GC and DI contacts are made.

2.3 DOOR UNLOCKING DEVICES SUPPLIED BY PEELLE
Biparting vertically sliding doors are unlocked when the elevator car is in a landing zone and they may be provided with unlocking devices per ASME A17.1 Rule 111.9d & e, (also see below for ACCESS SWITCHES if access switches are supplied). Unlocking devices are usually provided at the lowest landing and an upper landing and may be provided at every landing. Unlocking devices for power operated hoistway landing doors provided with landing-located door pushbuttons are equipped with a contact that zones out the door/gate power operation portion of the controller when the unlocking device is being used. For power doors, both power door operation and elevator operation are not available when the door unlocking device is in the unlocked position with the chain pulled.

2.4 ACCESS SWITCHES SUPPLIED BY ELEVATOR CONTRACTOR
Access switches, may be provided by the elevator supplier per ASME A17.1 Rule 111,9b & c. The Peelle controller is provided with terminals to allow access switch operation to bypass the lowest and/or upper floor hoistway landing door close contact DC, and to bypass car gate close contact GC. Access switch operation allows the elevator car to be operated with the respective hoistway landing door and car gate open. Access switch operation must also open the Inspection Circuit contact between DO3 & DO5 to prevent hoistway landing door and car gate being powered from landing or car stations; refer to section 1.4.

NOTE: With double line controls, access switch operation must provide an electrically separate means to open the inspection initiation between DO30 and DO50. (For bypass connections see X1, X2, X3, X3A--X3Y, X4 on Peelle Interconnection drawing sheet W-1).

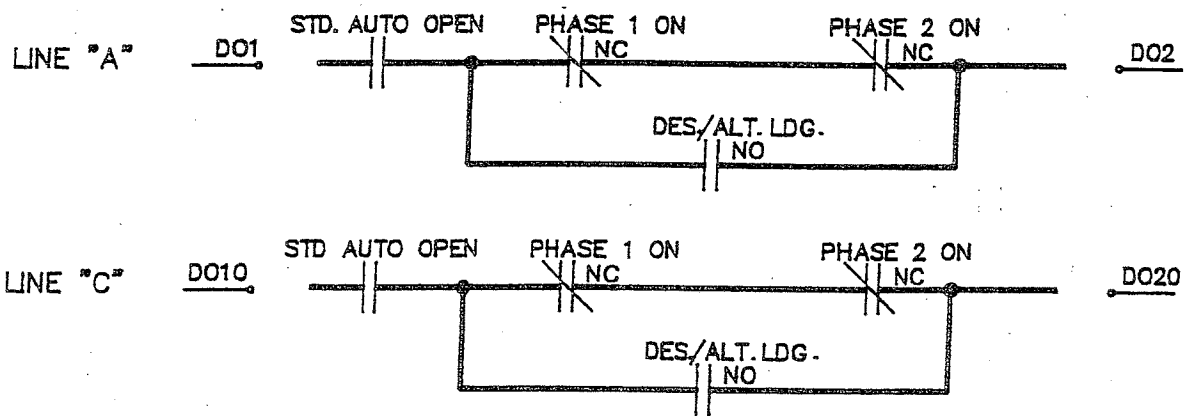
2.4 AUTOMATIC TIME CLOSING SYSTEM (AUTO CLOSE) (OPTIONAL)
No contact required for the auto close system; contact required for optional Override or Hold-Open, if provided, refer to section 1.6.

FIREFIGHTERS SERVICE INITIATION CONTACT AND MODIFICATION LISTING

1. ELEVATOR CONTROLLER INITIATIONS TO DOOR CONTROLLER

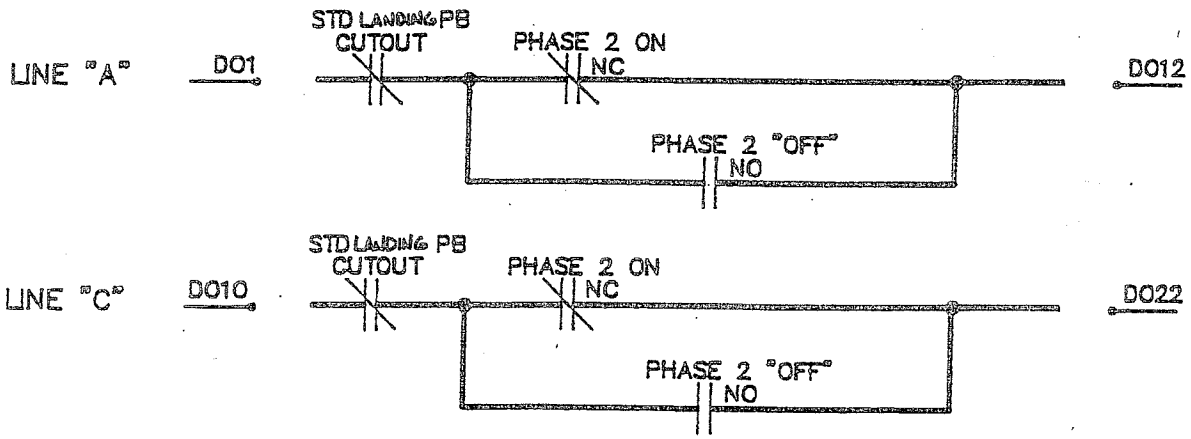
1.1 AUTO OPEN MODIFICATIONS FOR FIRE SERVICE.

PROVIDE ISOLATED CONTACTS TO DISABLE AUTO OPEN INITIATION WHEN EITHER PHASE 1 OR PHASE 2 CONDITION IS EFFECTIVE EXCEPT AT THE DESIGNATED/ALTERNATE LANDING.



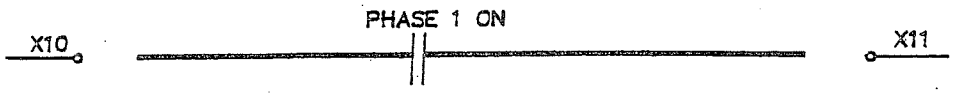
1.2 LANDING STATION LOCATED DOOR PUSHBUTTON DISABLING MODIFICATIONS FOR FIRE SERVICE.

PROVIDE ISOLATED CONTACTS TO DISABLE DOOR LANDING PUSHBUTTONS DURING PHASE 2 'ON' EXCEPT DURING PHASE 2 'OFF'.

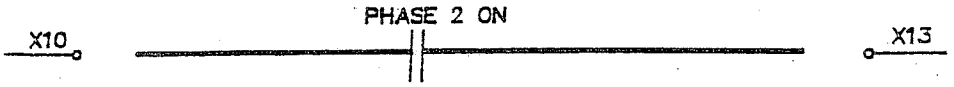


1.3 PHASE 1 AND PHASE 2 – NOTE: SEPARATE INITIATION OF LINE "C" IS NOT REQUIRED

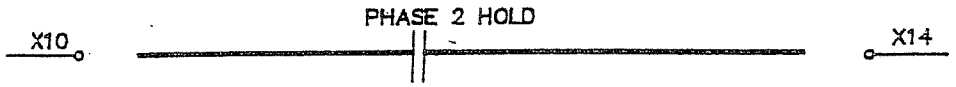
1.3.1. PHASE 1 INITIATION
PROVIDE AN ISOLATED CONTACT TO INITIATE PHASE 1 CONDITION. CONTACT TO CLOSE WHEN PHASE 1 SWITCH IS TURNED "ON" AND TO OPEN WHEN PHASE 1 SWITCH IS TURNED TO "BYPASS" THEN "OFF."



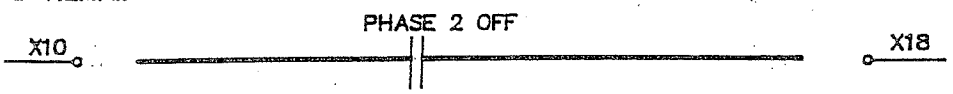
1.3.2. PHASE 2 INITIATION (CONTACT TO BE ON MODE RELAY)
PROVIDE ISOLATED CONTACT TO INITIATE PHASE 2 CONDITION. CONTACT IS TO CLOSE AND REMAIN CLOSED WHILE PHASE 2 IS EFFECTIVE.



1.3.3. PHASE 2 HOLD INITIATION (CONTACT TO BE ON MODE RELAY)
PROVIDE ISOLATED CONTACT TO INITIATE PHASE 2 HOLD. CONTACT IS TO CLOSE AND REMAIN CLOSED WHILE HOLD CONDITION IS EFFECTIVE.

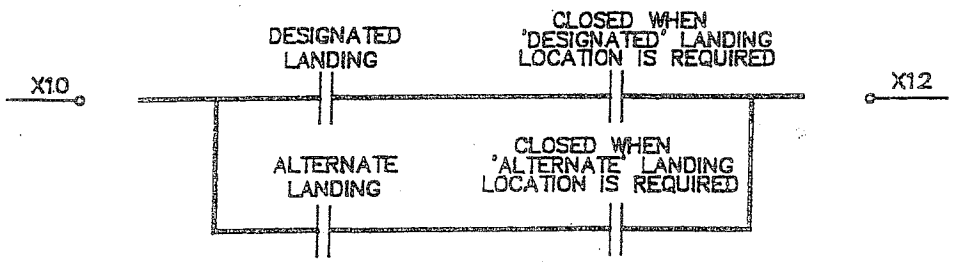


1.3.4. PHASE 2 OFF INITIATION (CONTACT TO BE ON MODE RELAY)
PROVIDE ISOLATED CONTACT TO INITIATE PHASE 2 OFF. CONTACT IS TO CLOSE AND REMAIN CLOSED WHILE OFF CONDITION IS EFFECTIVE.



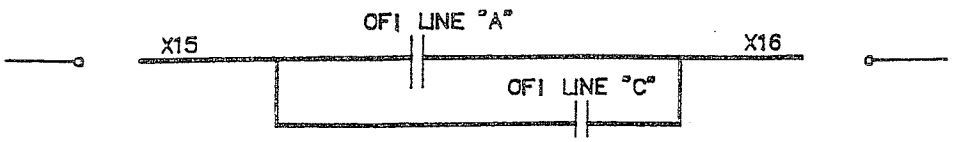
1.3.5. DESIGNATED/ALTERNATE LANDING INITIATION
NOTE: REQUIRED ONLY WITH MOMENTARY-PRESSURE OR AUTO CLOSE DOOR ARRANGEMENTS.

PROVIDE AN ISOLATED CONTACT TO SIGNAL ELEVATOR LOCATION IN THE LANDING ZONE OF THE DESIGNATED OR ALTERNATE LANDING.



2. DOOR INITIATIONS TO ELEVATOR CONTROLLER

2.1 DOOR OPEN SIGNAL For Fire Service.
PROVIDE ISOLATED CONTACTS TO INDICATE COMPLETION OF DOOR OPEN OPERATION ON EITHER FRONT LINE "A" OR REAR LINE "C".



SECTION 3: THE FOLLOWING INITIATING CONTACT REQUIREMENTS FOR POWER-OPERATED FREIGHT ELEVATOR LANDING DOORS AND CAR GATES ARE *SPECIFICALLY FOR PEELLE CONTROLLERS #274124 TO #274129.*

3.1 OPEN INITIATING CONTACT (DO1/DO2) (DO10/DO20), DOOR/GATE OPEN SIGNAL (X15/X16-X17) (X15R/X16R-X17R) & DOOR OPENING SIGNAL (X25/X26) (X25R/X26R)

DO1/DO2 and DO10/DO20 are isolated, normally open, contacts provided by the elevator control to initiate open. X15/X16 (X15R/X16R) is a normally open contact, X15/X17 (X15R/X17R) is a normally closed contact and X25/X26 (X25R/X26R) is an isolated, normally open, contact provided by the Peelle Control. To initiate open:

With the Retiring Cam fully extended, the car in the unlocking zone and opening desired, closing the open initiating circuit DO1/DO2 (DO10/DO20) will initiate and maintain open operation. X25/X26 (X25R/X26R) is a normally open contact which closes when the open initiation circuit is engaged and continues until the door and car door/gate achieve full open. When both hoistway door and car door/gate have achieved full open and activated the open final limits (both GOFL & DOFL) or by a predetermined time (timed final limits)(adjustable setting by AOT timer ideally at 1 full second after doors are open), X15/X16 (X15R/X16R) contact will close and X15/X17 (X15R/X17R) contact will open. DO1/DO2 (DO10/DO20) circuit is to then be opened, discontinuing open.

Continuous initiation of DO1/DO2 (DO10/DO20) until full open is required to maintain open operation. Should the open initiation circuit be dropped prior to activation of car door/gate low speed limit (GOL), power will be removed but the doors and gates will continue to coast open. Once hoistway door low speed and car door/gate low speed limits are activated (DOL, GOL), opening will continue automatically until full open is achieved.

OT is a time protection relay that times out and de-energizes all open direction relays. It's purpose is to prevent the motors from operating continuously for more than 30 sec. If OT times out before circuit X15/X16 (X15R/X16R) closes and X15/X17 (X15R/X17R) opens, DO1/DO2 (DO10/DO20) is to remain closed until: a) the fault that prevented the doors from fully opening is cleared, b) the door close push button is operated, or c) power is removed from the controller.

3.2 CLOSE INITIATING CONTACT (DO1/21) (DO10/21R), CAR GATE REVERSAL SIGNAL (X22/X23) (X22R/X23R) & DOOR CLOSING SIGNAL (X27/X28) (X27R/X28R)

DO1/21 and DO10/21R are isolated, normally open, contacts provided by the elevator control to initiate close. X22/X23 (X22R/X23R) and X27/X28 (X27R/X28R) are isolated, normally open, contacts provided by the Peelle Control. To initiate close:

With the Retiring Cam fully extended, the car in the unlocking zone and closing desired, closing the DO1/21 (DO10/21R) circuit will initiate and maintain close operation. X27/X28 (X27R/X28R) is a normally open contact which closes when the close initiation contact is engaged and continues until the door closes and holds closed for a predetermined time (adjustable setting by ACT timer ideally at 1 full second after doors are closed).

1. 1. Continuous initiation of DO1/21 (DO10/21R) is required to maintain close operation. Door close initiation is to remain closed until either: a) door closing signal X27/X28 (X27R/X28R) opens or b) both car gate close signal X3/X4 (X3/X8) and landing door close signal X1/X2 (X1/X7) close.
2. 2. If X22/X23 (X22R/X23R) closes, close initiation circuit DO1/21 (DO10/21R) is to be disabled. Open operation is to then be immediately initiated to re-open the door/gate by closing circuit (DO1/DO2, DO10/DO20) until X15/X16 (X15R/X16R) or X15/X17 (X15R/X17R) activates (see Open Initiation).
3. 3. During close operation release of the door close push button is to cause close initiation circuit DO1/21 (DO10/21R) to be disabled. Open operation is to then be immediately initiated to re-open the door/gate by closing circuit (DO1/DO2, DO10/DO20) until X15/X16 (X15R/X16R) or X15/X17 (X15R/X17R) activates (see Open Initiation). Note that in the very final stage of closing (less then 1ft/300mm) the Peelle control will lock in the door closing signal, initiation of DO1/DO2 (DO10/DO20) will not initiate re-opening until close cycle is fully complete and door closing signal X27/X28 (X27R/X28R) opens.

The purpose of locking in the closing signal is to:

(1) (1) Maintain door close operation during the final phase of closing from the point where slow speed operation of the hoistway door is initiated through 1 full second after the hoistway doors are fully closed (ACT times out). The purpose of ACT is to maintain power on the hoistway door after full close has been achieved to overcome any residual bounce and insure that the doors are fully closed.

(2) (2) Provide a definitive point in the closing operation where release of the door close button will not initiate automatic re-opening.

(3) (3) Provide slow speed power on the hoistway door and car door/gate for a new time allowance of the ACT time in response to a re-initiation of the door close push button. This is available in the event of a door rebound where additional power-on time is helpful.

CT is a time protection relay that times out and de-energizes the close direction relays. It's purpose is to prevent the motors from operating continuously for more than 30 sec. If a close signal is maintained continuously, CT will energize and remained energized until: a) the cam retires and the elevator moves, b) the fault creating the continuous close signal is cleared, c) the door open push button is operated, or d) power is removed from the controller.

3.3 INSPECTION CIRCUIT CONTACT (DO3/DO5) (DO30/DO50)

This is an isolated, normally closed, contact on the elevator controller (or incorporated in the inspection switch on top-of-car operating device) that opens and de-activates the door and gate portion of the Peelle control circuit when the elevator control is operated in inspection mode, per ASME A17.1, Rule 210.1d or for "Access" purposes, per rule 111.9d. The contact is to remain open to de-activate the door and gate, and must be closed for normal power operation of doors and gates. Separate inspection circuit contacts are required for each line of doors, except where staggered landings allow a single Peelle controller for more than one line of doors.

De-activation of the door and gate circuit by this inspection circuit contact does not affect the energization of the retiring cam (see Retiring Cam Initiating Contact) nor the door contacts DC and gate contacts GC in the interlock protection circuit.

3.4 RETIRING CAM INITIATING CONTACT (DO3/DO4)

This in an isolated, normally open, contact on the elevator control that closes and initiates the retiring cam. The contact is to close only after all doors/gates are completely closed, as indicated through the closing of the DC and GC contacts, and after a call to move the elevator car to another floor has been registered. The contact is to open when the car enters the unlocking zone, is to remain open while the car is standing at a landing, and is not to remake when the motor generator set is shut off. Only one retiring cam initiating contact is required per elevator car, regardless of the number of door lines.

Note: The Peelle protection system normally provides a three minute maximum continuous allowance for energization of the retiring cam relay. If operation under any circumstances ("Inspection", etc.) is liable to exceed three minutes, provision should be made in the elevator control system to provide "off" time after the three-minute allowance time.

3.5 AUTOMATIC TIME CLOSING ALARM BELL INITIATION (DO1/12)

Where automatic closing is provided, a warning bell mounted on the car is to sound 5 seconds prior to initiation of door close is to sound continuously while door close is commencing, DO1/DO21 (DO10/21R) is closed.

The minimum time allowance before closing is initiated should be 30 seconds. Freight type handling requires longer loading/unloading time then passenger elevators. Reduced automatic time closing allowance will result in excessive and unecessary cycling of the door operating system and premature wear.

When the alarm bell is provided by Peelle, the elevator control is to provide isolated normally open Alarm Bell initiation contacts D01/12 that when closed, will sound the bell.

3.6 FIRE SERVICE (PER ASME A17.1 RULE 211.3): CAR GATE SPEED OVERRIDE CONTACT (176/172) (176R/172R)

Car Gate Speed Override Contact 176/172 (176R/172R), (when required) are isolated, normally open, contacts provided by the elevator control to enable low speed mode car gate operation.

When Phase I condition is initiated:

1. 1. When door close is initiated DO1/21 (DO10/21R) during Phase I, circuit 176/172 (176R/172R) is to close and remain closed while DO1/21 (DO10/21R) is closed. This will cause timer TOA to energize and time out. TOA brings in relay SP which will cause the gate to run in low speed (low kinetic energy).
2. 2. Closure of X22/X23 (X22R/X23R) circuit is not to initiate re-opening.
3. 3. Door close is not to be disabled if Phase II Off condition is initiated.

When Phase II 'ON' condition is initiated:

1. 1. The circuit 176/172 (176R/172R) is to be held open allowing normal speed operation of the car gate.
2. 2. Closure of X22/X23 (X22R/X23R) circuit is not to initiate re-opening.
3. 3. Continuous-pressure door open push button operation with automatic reversal to the fully closed position should the door open push button be released prior to the completion of the open operation. Close operation is to continue until: a) door closing signal X27/X28 (X27R/X28R) opens or b) both car gate close signal X3/X4 (X3/X8) and landing door close signal X1/X2 (X1/X7) close.
4. 4. Continuous-pressure door close push button operation with automatic reversal to the fully open position should the door close push button be released prior to the completion of the close operation. Open operation is to continue until X15/X16 (X15R/X16R) contact closes and X15/X17 (X15R/X17R) contact opens.

When Phase II 'HOLD' condition is initiated and with the hoistway door and car door/gate open (circuit X15/X16 (X15R/X16R) closed and X15/X17 (X15R/X17R) opened), close door operation is to be disabled.

When Phase II "OFF' condition is initiated and with hoistway door and car door/gate open (circuit X17/X18 (X17R/X18R) closed) and Phase I condition off, close door operation is to be disabled.

3.7 DOOR OPEN AND DOOR CLOSE PUSH BUTTONS (X34-X39) (X34R-X39R)

Standard initiations require that the elevator company supply a car operating station including door open, door close, and door stop push buttons and also supply landing stations at each landing with door open and door close push buttons. All push buttons are to be momentary action with one normally open contact except stop push buttons which require one normally closed contact.

Located at each opening, is a combination assembly serving as a mechanical door lock, an electric interlock and a zone selector. Each door open and door close landing push-button is to be wired through the zone selector (Z contacts) located at it's landing. Each Z contact is an isolated normally open contact.

3.8 INTERLOCK CIRCUITS CONTACTS (X1-X9)

Approved interlocks are usually required when power operated vertically sliding elevator doors are installed. The Peelle supplied interlock arrangement requires that:

1. 1. All DC (hoistway door closed) and GC (car gate closed) contacts be connected in series and that the contacts be made when the doors and gates are closed.
2. 2. All DI (hoistway door locking) contacts be connected in series and that the contact be made when the doors are locked.

When the elevator controller is signaled "all doors closed", the elevator controller may initiate retiring cam operation (see Retiring Cam Initiation Contact). If all "door close" power operation is complete, initiation will cause the retiring cam face to retire (lift). When the interlock device is no longer depressed by pressure of the retiring cam face, hoistway door locking action takes place and the elevator controller is signaled that the hoistway doors locking action is complete. The elevator controller shall not allow the elevator car to run unless all DC (hoistway door closed) and GC (gate closed) and DI (hoistway door locking) contacts are made.

3.9 UNLOCKING DEVICES SUPPLIED BY PEELLE

Counterbalanced vertically sliding elevator doors are unlocked when the elevator car is in an unlocking zone and they may be provided with unlocking devices per ASME A17.1 Rule 111.9d & e, (also see Access Switches). Unlocking devices are usually provided at the bottom and an upper landing and may be provided at every landing. Unlocking devices for power operated hoistway doors provided with landing-located door open and door close door push buttons are equipped with a contact that zones out the door/gate power operation portion of the controller when the unlocking device is being used. In addition, elevator operation is not available when a door is unlocked or open.

3.10 ACCESS SWITCHES

Access switches may be provided by the elevator contractor per ASME A17.1 Rule 111.9b & c. The Peelle controller is provided with terminals to allow access switch operation to bypass the bottom and/or an upper floor (hoistway) door close contact DC and car gate close contact GC. Access switch operation allows the elevator car to be operated with the respective hoistway door and car gate open. Access switch operation must also open the inspection initiating contact between DO3 & DO5 to prevent hoistway door and car gate power operation from landing or car stations.

Note: With double line controls, access switch operation must provide an electrically separate means to open the inspection initiation between DO30 and DO50. (See X1, X2, X3, X3A — X3Y, X4 on Interconnection drawing for bypass connections)