

PART 4

Tests

SECTION 66 - SCOPE

This part of the New Zealand Power Lift Rules sets out the tests for passenger, goods and service lifts. It includes requirements for tests where required by Parts 1, 2 and 3 to which it is complementary.

SECTION 67 - FIRST INSPECTION TESTING OF SAFETY GEAR

67.1 Application

After final installation, each safety gear shall pass the tests set out in this Section.

67.2 General Test Conditions

67.2.1 Test Load. For the testing of safety gear on lift cars, the lift car shall be loaded with 100 percent of rated load, the load being centred on each quarter of the platform symmetrically about the centrelines of the platform.

For the testing of safety gear on counterweights, there shall be no load in the lift car.

67.2.2 Governor Tripping Speed. Prior to testing safety gear, the governor tripping speed shall be measured by a tachometer and, if necessary, adjusted to comply with the requirements of Rules 30.2, 30.3, and 30.4.

67.2.3 Lift Car Safety Gear Switches. The operation of lift car safety gear switches shall be checked and shall comply with Clause 29.7.

67.2.4 Governor Rope Tension. The force necessary to pull the governor rope through the governor jaws shall be demonstrated by suitable means. The force shall be not less than twice that required to bring the safety gear into contact with the guide rails (see Rule 29.14).

67.2.5 Levelness of Car Platform. After each test and before the safety gear is released, the levelness of the car platform shall be checked for compliance with Rule 29.9.2.

67.3 Speed Test at Normal Speed

67.3.1 Applicability. This test applies to the following lifts:

- (a) Lifts equipped with a direct current lift motor and having a rated speed of less than 0.5 m/s.
- (b) Lifts equipped with an alternating current lift motor and for which the tests covered by Rule 67.4 are impracticable.

67.3.2 Test Procedure. The following procedure shall apply:

- (a) Render the safety gear switches ineffective for the duration of the test.
- (b) Run the car or counterweight, as applicable, at its normal speed in the down direction and trip the governor jaws by hand.
- (c) After the safety gear has stopped the lift, maintain power to the lift motor for sufficient time to demonstrate that the safety gear is effectively engaged.

67.3.3 Test Requirements. The safety gear shall operate and comply with the relevant requirements of Rule 67.5.

67.4 Speed Tests at Governor Tripping Speed

67.4.1 Applicability. Lifts not covered by Rule 67.3.1 shall pass either the drive-in test as specified by Rules 67.4.2 and 67.4.4 or the runaway test as specified by Rules 67.4.3 and 67.4.4. The company or organisation carrying out the test shall have the option of deciding which method will be used.

67.4.2 Drive-in Test Procedure. The drive-in test procedure shall be as follows:

- (a) During the test, render the overspeed switch and any overspeed regulating switch on the governor and the safety gear switches on the lift car ineffective.
- (b) Gradually increase the lift motor speed under power until the governor causes the safety gear to operate.
- (c) After the safety gear has stopped the lift, maintain power to the lift motor for sufficient time to demonstrate that the safety gear is effectively engaged.

67.4.3 Runaway Test Procedure. The runaway test procedure shall include the following consecutive tests:

- (a) Brake Tests. Demonstrate the effectiveness of the lift machine brake with rated load in the lift car and without regenerative braking using the following consecutive procedures:
 - (i) With the lift travelling at approximately 10 percent of rated speed.
 - (ii) With the lift travelling at approximately 50 percent of rated speed.
 - (iii) At a speed at which the governor overspeed switch operates.
- (b) Runaway Test. After passing the above brake tests, pass the following runaway tests:
 - (i) Allow the car with rated load or the counterweight to run away by holding the brake lifted until the safety gear has stopped the lift. Power may be applied to accelerate the lift to rated speed.
 - (ii) After the safety gear has stopped the lift, apply power to the lift motor for sufficient time to demonstrate that the safety gear is effectively engaged.

67.4.4 Test Requirements. The safety gear shall operate and comply with the relevant requirements of Rule 67.5.

67.5 Speed Test Requirements

67.5.1 Type A Safety Gear. Type A safety gear shall stop the car or counterweight and the stopping distance shall be a very short distance without significant slide.

67.5.2 Type B Safety Gear. Type B safety gear shall stop the car or counterweight and the stopping distance shall comply with the relevant requirements of Rule 29.4. The stopping distance shall be based on the actual speed at which the safety gear operated and shall be determined by one of the following measurements:

- (a) The actual distance traversed by the lift between the position at which the safety gear first engages with the guide rail and the position at which the lift car stops.

Such distance may be determined from the average of the overall length of the marks on each side of each guide rail made by the safety gear jaws, minus the length of the safety gear jaws or wedges used, plus the energising dimension.

The energising dimension is the vertical movement within the safety gear of the safety gear jaw or wedge between the first position of firm contact with the guide rail and the fully actuated position.

Where marking is indefinite, an average of several readings shall be accepted. Any marking medium used to clarify the position of jaw engagement and the length of jaw slide shall not affect the performance of the safety gear.

- (b) Where there is a definite relationship between the stopping distance of the car or counterweight and the stopping distance of the governor rope, that stopping distance determined by an effective system using governor rope markings.

67.5.3 Type C Safety Gear. Type C safety gear shall stop the car or counterweight and the stopping distance shall comply with the relevant requirements of Rule 29.4. The stopping distance shall be based on the actual speed at which the safety gear operated and shall be the average of the overall length of the marks made by the safety gear jaws, on each side of each guide rail, minus the length of the safety gear jaws used.

Where marking is indefinite, an average of several readings shall be accepted.

The governor rope pull-out shall comply with Rule 29.11.

67.5.4 Type D Safety Gear. Type D safety gear shall comply with the following:

- (a) Stopping Distance. The safety gear shall stop the car or counterweight. The stopping distance shall be equal to the stroke of the buffer located between the lower member of the car frame and the auxiliary safety plank and shall comply with the requirements of Rule 29.8.2.

When the safety gear stops the car, the levelness of the auxiliary safety plank shall comply with Rule 29.8.2(f).

- (b) Buffer Compression Switch and Oil Level Device. The buffer compression switch and oil level device shall be tested for compliance with Rule 29.8.2(g) and (h).

67.6 Inertia Application Test for Type A Safety Gear

Type A safety gear operated by a governor or inertia rope shall be subjected to the following inertia application test, to demonstrate compliance with the inertia actuation requirements of Rule 29.8.1:

- (a) Test Procedure.
 - (1) The person demonstrating the effectiveness of the safety gear shall determine the mass of the test weight to be added to the governor rope or inertia rope.
 - (ii) The test weight to be added to the governor rope or inertia rope shall be that necessary to reproduce inertia operation of the safety gear equal to 0.9 g.
 - (iii) The test weight shall be attached to the return run of the governor rope or inertia rope.
 - (iv) The lift car shall be stationary during testing.
 - (v) The test weight shall be released.
- (b) Test Requirement. The test weight shall move the safety gear parts into contact with the rails.

67.7 Broken Suspension Rope Test for Type A Safety Gear

Type A safety gear without governors, operated only as a result of the breaking or slackening of a suspension rope, shall first be tested with the car stationary, by obtaining the necessary slack rope to cause the safety gear to engage.

The safety gear shall then be engaged at rated speed by independent means and shall cause the lift to stop.

SECTION 68 - FIRST INSPECTION TESTING OF OIL BUFFERS**68.1 Application**

After final installation, each oil buffer shall pass the tests set out in this Section.

68.2 Oil Level Test

The oil level shall be within the maximum and minimum allowable limits (see Rule 10.5.7).

68.3 Plunger Return Tests

Buffers shall pass the following plunger return tests:

- (a) The buffer shall be correctly filled with oil.
- (b) The plunger shall be fully compressed and when released shall return to the fully extended position within 90 s.
- (c) For spring return type buffers, a weight of 9 kg shall be placed on the plunger and the plunger shall be depressed 50 mm and then released. When released, the plunger with the weight resting on it shall return to the fully extended position within 30 s.

68.4 Load and Speed Tests

Buffers shall pass the following load and speed tests:

(a) Test Procedure

- (i) Prior to the test, the use of the correct buffer shall be confirmed by ensuring that the buffer nameplate information (see Rule 10.5.1) satisfies the requirements of Rule 10.5.
- (ii) The normal terminal limit switches shall be made temporarily ineffective.
- (iii) The final terminal limit switches may remain operative, but if used shall be temporarily relocated so as to open just before the buffer fully compresses.
- (iv) For car buffers, run the car with rated load onto the buffer.

For counterweight buffers, run the counterweight with no load in the lift car onto the buffer.

The speed at which buffer engagement occurs shall be -

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A. where buffers operate at normal stroke, the rated speed; or

B. where buffers operate at reduced stroke, the reduced striking speed as specified in Rule 10.5.2(b).

(b) Test Requirement. The measured buffer stroke shall comply with Rule 10.5.2.

SECTION 69 - FIRST INSPECTION TESTING OF ELECTROHYDRAULIC EQUIPMENT

Equipment subject to hydraulic pressure on the cylinder side of the check valve and down stop valve shall pass the following test:

- ~~(a) The test shall be made in the presence of an Engineer Surveyor.~~
 - (b) The test shall be made after erection but before being put into service.
 - (c) The equipment shall be subjected to a test pressure not less than the greater of -
 - (i) 2 times the working pressure required to raise the rated load at rated speed; and
 - (ii) 1.6 times the pressure at which the relief valve is set to by-pass.
- The test pressure shall hold for not less than 30 min without failure of any part or external leakage, except for slight leakages at glands.
- (d) Where such leakage appears excessive, a further test shall be carried out by placing the fully loaded lift car at the top landing. While the oil is cool enough to prevent oil volume changes due to temperature effects, the downward car movement during a 4-hour test period shall be not more than 13 mm.
 - (e) Flow restriction valve test in accordance with the requirements of Rule 36.5.

**SECTION 70 - ROUTINE INSPECTION, ADJUSTMENT AND TESTING OF
SAFETY GEAR****70.1 Periodic Inspection and Tests**

70.1.1 Frequency. Governors and safety gear shall be inspected, adjusted, and tested in accordance with this Section at periods not more than three years.

70.1.2 Governors. Governors shall be cleaned down, lubricated, inspected, adjusted where necessary, and operated by hand to ensure that all parts operate freely and correctly and are without excessive wear. The mechanical tripping speed for the governor and the speed at which the governor overspeed switches operate shall be determined. This may be done by driving the governor by hand or by a motor-driven device with gradual acceleration to the required speed. Adjustments shall be made as required. Where adjustment involves the breaking of a seal, the seal shall be replaced.

70.1.3 Inspection and Adjustment of Safety Gear. The safety gear shall be cleaned down, lubricated, inspected, adjusted, and tested where necessary to ensure that it is in satisfactory working condition and that there is adequate clearance between each gripping member and its associated guide rail when the safety gear is in the unoperated condition.

70.1.4 Test for Type A Safety Gear. Type A safety gear shall be tested in accordance with Rule 67.3, except that the car shall be without load and shall descend at the slowest operating speed. The governor, where provided, shall be tripped by hand. The safety gear shall stop the car in a very short distance without significant slide.

70.1.5 Test for Types B, C, and D Safety Gear. Types B, C, and D safety gear shall be operated by tripping the governor by hand with the car unloaded and descending at the slowest operating speed. The safety gear shall stop the car promptly. The stopping distance is not required to comply with the minimum stopping distance nominated in Rule 29.4.

70.2 Tests Following Any Alteration Affecting Safety Gear

70.2.1 General. Where a lift is modified in such a way as will affect the performance of the safety gear, the governor and safety gear shall be tested and shall pass the relevant tests detailed in Rules 70.2.2 and 70.2.3. Such modifications include increase of rated load, alteration of car involving an increase in its dead weight, alteration or replacement of safety gear, and replacement of guide rails.

70.2.2 Governors. Governors, where provided, shall be cleaned down, inspected, adjusted, and tested in accordance with Rule 70.1.2.

70.2.3 Safety Gear.

70.2.3.1 Inspection and Adjustment. The safety gear shall be cleaned down, inspected, lubricated, and adjusted in accordance with Rule 70.1.3.

70.2.3.2 Tests. The safety gear shall be tested with rated load in the car in accordance with Section 67, except that stopping distances shall comply with standards or regulations applying when the lift was installed.

SECTION 71 - REQUIREMENTS FOR LIFTS ON ACCESS ROUTES FOR PEOPLE WITH DISABILITIES

71.1 Levelling

Under all conditions of loading the levelling accuracy of the lift car shall be ± 20 mm.

71.2 Lift car size

The minimum interior dimensions of the lift car shall be 1400 x 1400 mm.

71.3 Car and landing doors

Car and landing doors shall be power operated and fitted with passenger protective devices and delayed closing complying with Rule 23.6.1. The doors shall remain open for at least 5 seconds before they start to close.

Comment:

The time necessary for the doors to stay fully open to safeguard people with disabilities depends on a number of factors including:

- *notification method of lift arrival.*
- *distance from call button to the lift.*
- *number and configuration of lifts.*
- *type of passenger protective devices.*

Alternative solutions with different delay times may be acceptable, provided it can be demonstrated that people with disabilities have sufficient time to move into the lift car without being struck by the closing doors.

71.3.2 The doors shall provide a minimum opening width of 900 mm.

71.3.3 The doors shall be clearly colour contrasted with their surroundings.

71.4 Lift controls

71.4.1 All controls shall be located within a height of 900 mm and 1500 mm from the floor level. An acceptable layout for a control panel inside the lift car is shown in Figure 1.

71.4.2 Call and control buttons shall have:

- (a) A positive movement on actuation, and
- (b) A width or diameter of at least 20 mm.

71.4.3 Control buttons shall have raised or indented designations immediately to the left of the button. These designations shall be as shown on Figure 1 and shall be at least 15 mm high.

71.4.4 Call buttons shall have a tactile distinction from the wall or faceplate in which they are positioned.

71.5 Lift indicators

71.5.1 Each landing shall have:

- (a) A 'lift coming' or 'call accepted' indicator, and
- (b) Audible and visual signals notifying the arrival of the lift and it's direction of travel.

71.5.2 An acceptable audible signal is two gongs for downward travel and one gong for upward

travel. An acceptable visual signal is an illuminated arrow.

71.5.3 Inside the lift car a position indicator shall be fitted in a location easily read by passengers facing the main doorway.

71.5.4 Except where audible notification is given, raised, tactile numbers shall be provided on the leading edge of the landing doors to advise of floor level. These numbers shall be positioned between 900 mm and 1500 mm above floor level and be at least 20 mm high.

71.6 Handrails

71.6.1 Handrails shall be provided on all walls except those with doors. The handrails shall comply with D1/AS1, Paragraph 6.0.

Figure 1: Control panel for passenger carrying lifts
Paragraph 2.0 (Rule 71.4)

