§ 27.687 Spring devices.
(a) Each control system spring device whose failure could cause flutter or other unsafe characteristics must be reliable.
(b) Compliance with paragraph (a) of this section must be shown by tests simulating service conditions.

§ 27.691 Autorotation control mechanism.
Each main rotor blade pitch control mechanism must allow rapid entry into autorotation after power failure.

§ 27.695 Power boost and power-operated control system.
(a) If a power boost or power-operated control system is used, an alternate system must be immediately available that allows continued safe flight and landing in the event of—
(1) Any single failure in the power portion of the system; or
(2) The failure of all engines.
(b) Each alternate system may be a duplicate power portion or a manually operated mechanical system. The power portion includes the power source (such as hydraulic pumps), and such items as valves, lines, and actuators.
(c) The failure of mechanical parts (such as piston rods and links), and the jamming of power cylinders, must be considered unless they are extremely improbable.

LANDING GEAR
§ 27.723 Shock absorption tests.
The landing inertia load factor and the reserve energy absorption capacity of the landing gear must be substantiated by the tests prescribed in §§27.725 and 27.727, respectively. These tests must be conducted on the complete rotorcraft or on units consisting of wheel, tire, and shock absorber in their proper relation.

§ 27.725 Limit drop test.
The limit drop test must be conducted as follows:
(a) The drop height must be—
(1) 13 inches from the lowest point of the landing gear to the ground; or
(2) Any lesser height, not less than eight inches, resulting in a drop contact velocity equal to the greatest probable sinking speed likely to occur at ground contact in normal power-off landings.
§ 27.729 Reserve energy absorption drop test.

The reserve energy absorption drop test must be conducted as follows:

(a) The drop height must be 1.5 times that specified in §27.725(a).

(b) Rotor lift, where considered in a manner similar to that prescribed in §27.725(b), may not exceed 1.5 times the lift allowed under that paragraph.

(c) The landing gear must withstand this test without collapsing. Collapse of the landing gear occurs when a member of the nose, tail, or main gear will not support the rotorcraft in the proper attitude or allows the rotorcraft structure, other than the landing gear and external accessories, to impact the landing surface.

§ 27.729 Retracting mechanism.

For rotorcraft with retractable landing gear, the following apply:

(a) Loads. The landing gear, retracting mechanism, wheel-well doors, and supporting structure must be designed for—

(1) The loads occurring in any maneuvering condition with the gear retracted;

(2) The combined friction, inertia, and air loads occurring during retraction and extension at any airspeed up to the design maximum landing gear operating speed; and

(3) The flight loads, including those in yawed flight, occurring with the gear extended at any airspeed up to the design maximum landing gear extended speed.

(b) Landing gear lock. A positive means must be provided to keep the gear extended.

(c) Emergency operation. When other than manual power is used to operate the gear, emergency means must be provided for extending the gear in the event of—

(1) Any reasonably probable failure in the normal retraction system; or

(2) The failure of any single source of hydraulic, electric, or equivalent energy.

(d) Operation tests. The proper functioning of the retracting mechanism must be shown by operation tests.