

(2) For the caution range, a yellow arc extending from the red line specified in paragraph (b)(1) of this section to the upper limit of the green arc specified in paragraph (b)(3) of this section.

(3) For the normal operating range, a green arc with the lower limit at  $V_{SI}$  with maximum weight and with landing gear and wing flaps retracted, and the upper limit at the maximum structural cruising speed  $V_{NO}$  established under § 23.1505(b).

(4) For the flap operating range, a white arc with the lower limit at  $V_{SO}$  at the maximum weight, and the upper limit at the flaps-extended speed  $V_{FE}$  established under § 23.1511.

(5) For reciprocating multiengine-powered airplanes of 6,000 pounds or less maximum weight, for the speed at which compliance has been shown with § 23.69(b) relating to rate of climb at maximum weight and at sea level, a blue radial line.

(6) For reciprocating multiengine-powered airplanes of 6,000 pounds or less maximum weight, for the maximum value of minimum control speed,  $V_{MC}$ , (one-engine-inoperative) determined under § 23.149(b), a red radial line.

(c) If  $V_{NE}$  or  $V_{NO}$  vary with altitude, there must be means to indicate to the pilot the appropriate limitations throughout the operating altitude range.

(d) Paragraphs (b)(1) through (b)(3) and paragraph (c) of this section do not apply to aircraft for which a maximum operating speed  $V_{MO}/M_{MO}$  is established under § 23.1505(c). For those aircraft there must either be a maximum allowable airspeed indication showing the variation of  $V_{MO}/M_{MO}$  with altitude or compressibility limitations (as appropriate), or a radial red line marking for  $V_{MO}/M_{MO}$  must be made at lowest value of  $V_{MO}/M_{MO}$  established for any altitude up to the maximum operating altitude for the airplane.

[Doc. No. 4080, 29 FR 17955, Dec. 18, 1964, as amended by Amdt. 23-3, 30 FR 14240, Nov. 13, 1965; Amdt. 23-7, 34 FR 13097, Aug. 13, 1969; Amdt. 23-23, 43 FR 50593, Oct. 30, 1978; Amdt. 23-50, 61 FR 5193, Feb. 9, 1996]

#### § 23.1547 Magnetic direction indicator.

(a) A placard meeting the requirements of this section must be installed on or near the magnetic direction indicator.

(b) The placard must show the calibration of the instrument in level flight with the engines operating.

(c) The placard must state whether the calibration was made with radio receivers on or off.

(d) Each calibration reading must be in terms of magnetic headings in not more than 30 degree increments.

(e) If a magnetic nonstabilized direction indicator can have a deviation of more than 10 degrees caused by the operation of electrical equipment, the placard must state which electrical loads, or combination of loads, would cause a deviation of more than 10 degrees when turned on.

[Doc. No. 4080, 29 FR 17955, Dec. 18, 1964; 30 FR 258, Jan. 9, 1965, as amended by Amdt. 23-20, 42 FR 36969, July 18, 1977]

#### § 23.1549 Powerplant and auxiliary power unit instruments.

For each required powerplant and auxiliary power unit instrument, as appropriate to the type of instruments—

(a) Each maximum and, if applicable, minimum safe operating limit must be marked with a red radial or a red line;

(b) Each normal operating range must be marked with a green arc or green line, not extending beyond the maximum and minimum safe limits;

(c) Each takeoff and precautionary range must be marked with a yellow arc or a yellow line; and

(d) Each engine, auxiliary power unit, or propeller range that is restricted because of excessive vibration stresses must be marked with red arcs or red lines.

[Amdt. 23-12, 41 FR 55466, Dec. 20, 1976, as amended by Amdt. 23-28, 47 FR 13315, Mar. 29, 1982; Amdt. 23-45, 58 FR 42166, Aug. 6, 1993]

#### § 23.1551 Oil quantity indicator.

Each oil quantity indicator must be marked in sufficient increments to indicate readily and accurately the quantity of oil.