This Regulation is the airworthiness standard for multi-engine Part 23 airplanes, i.e. for designing and certifying, not for their operational use. The Vmc definition should therefore not be used unchanged in flight manuals and pilot course books.

Two cases:
1. Maintain, i.e. recover control after a sudden failure to straight flight;
2. Maintain straight flight while an engine is inoperative, while banking the bank angle that the tail design engineeer used to size the vertical tail (for adequately counteracting the adversive yaw, and zero sideslip for maximum climb performance).

Highest CAS for cases1 & 2 = V_{MCA}. V_{MCA} is not for turning!

In comment text boxes, V_{MCA} (A for Airborne) is used rather than V_{MC}. These comments were added by a Test Pilot School graduate of AvioConsult(.com).

Case 1. Case 2.

The smaller the tail, the higher the airspeed required for maintaining directional control (V_{MCA}). This V_{MCA} limitation prevents the tail from being designed too small (cheaper, less heavy).

CS 23.149 Minimum control speed

(a) V_{MC} is the calibrated airspeed at which, when the critical engine is suddenly made inoperative, it is possible to maintain control of the aeroplane, with that engine still inoperative, and thereafter maintain straight flight at the same speed with an angle of bank not more than 5°. The method used to simulate critical engine failure must represent the most critical mode of powerplant failure with respect to controllability expected in service.

(b) V_{MC} for take-off must not exceed 1·2 V_{S1}, (where V_{S1} is determined at the maximum take-off weight) and must be determined with the most unfavourable weight and centre of gravity position and with the aeroplane airborne and the ground effect negligible, for the take-off configuration(s) with –

(1) Maximum available take-off power initially on each engine;

(2) The aeroplane trimmed for take-off;

(3) Flaps in the take-off position(s);

(4) Landing gear retracted; and

(5) All propeller controls in the recommended take-off position throughout.

(c) For all aeroplanes except reciprocating engine-powered aeroplanes of 2 722 kg (6 000 lb) or less maximum weight, the requirements of sub-paragraph (a) must also be met for the landing configuration with –

(1) Maximum available take-off power initially on each engine;

(2) The aeroplane trimmed for and approach with all engines operating at V_{REF} at an approach gradient equal to the steepest used in the landing distance demonstration of CS 23.75;

(3) Flaps in the landing position;

(4) Landing gear extended; and

(5) All propeller controls throughout in the position recommended for approach with all engines operating.

(d) A minimum speed to intentionally render the critical engine inoperative must be established and designated as the safe, intentional, one-engine-inoperative speed, V_{SSE}.

(e) At VMC, the rudder pedal force required to maintain control must not exceed 667 N (150 lbf) and it must not be necessary to reduce power of the operative engine . During the manoeuvre the aeroplane must not assume any dangerous attitude and it must be possible to prevent a heading change of more than 20°.

(f) V_{MCG}, the minimum control speed on the ground, is the calibrated airspeed during the take-off run, at which, when the critical engine is suddenly made inoperative and with its propeller, if applicable, in the position it automatically achieves, it is possible to maintain control of the aeroplane with the use of the primary aerodynamic controls alone (without the use of nose-wheel steering) to enable the take-off to be safely continued using normal piloting skill. The rudder control force may not exceed 667 N (150 lbf) and, [illegible] airborne, the lateral [illegible] to the extent of keeping [illegible] determination of V_{MCG}, [illegible] of the aeroplane [illegible] operating is along the centreline of the runway, its path from the point at which the critical engine is made inoperative to the point at which recovery to a direction parallel to the centreline is completed, may not deviate more than 9·1m (30ft) laterally from the centreline at any point. V_{MCG} must be established, with:-

Refer to the Flight Test Guides:
For V_{MCA}:
- the most unfavorable weight is low weight.
- the most unfavorable center of gravity position is aft.

Refer to Flight Test Guide:
Autofeather if installed, otherwise windmilling.

(1) The aeroplane in each take-off configuration at the option of the applicant, in the most critical take-off configuration;

(2) Maximum available take-off power or thrust on the operating engines;