

DCA24FA017

OPERATIONAL FACTORS/HUMAN PERFORMANCE

Attachment 13

Hawker Elevator Control Guidance

January 24, 2025

ELEVATOR CONTROL

Refer to Fig. 5

The elevator control surfaces are hinged from the rear of the horizontal stabiliser and each is fitted with a mass balance weight to prevent flutter and a horn balance to reduce the aerodynamic loads felt by the pilot.

A spring and a g-weight are connected to the left control circuit to provide acceptable stick force characteristics.

A stick shaker motor is attached to each control column and is operated by the stall warning system. A stick pusher unit is connected to the elevator cable system to provide a positive push forward (pitch down) at the onset of stall identification... see later paragraphs.

The cable circuit also provides an input for the autopilot servo unit.

Primary stops controlling the range of elevator movement are located on the middle hinge of each control surface. Secondary stops are located at the pulley drums under the flight compartment floor.

Elevator trim control system

Refer to Fig. 6

A trim tab is fitted to each elevator and is manually controlled from an elevator trim handwheel on the central control pedestal. Operation of the elevator moves the trim tab to give servo action.

The autopilot servo motor is used to provide: pitch trim, Mach trim and electric trim functions. The pitch trim and electric trim functions are described more fully in topic 4-3-30 Automatic Flight Control System.

If necessary these functions can be overridden by arresting the movement of the elevator trim handwheel, which turns as the automatic system applies trim via the servo.

Elevator out-of-trim warning

A warning of the elevator being out of trim for take-off is given by the ELEV/AIL TRIM annunciator being lit (on the main MWS panel) if the following conditions apply:

- Aircraft weight is on wheels.
- Both engine thrust levers are advanced to more than 40 to 60% N_1 power.

Mach Trim

The Mach trim system uses a Mach trim computer and the same pitch trim servomotor as the manual electric trim and the auto electric trim systems. The Mach trim computer accepts Mach number data from the air data computers and computes trim tab deflection to increase longitudinal stability at Mach numbers above 0.75 Mach when the autopilot is not engaged.

The Mach trim computer is mounted underneath the First Officer's seat.

There are no power switches for the system. On power-up of the aircraft busbars, the Mach Trim system performs a self-test routine and providing the following conditions are met, the system engages. The requisite conditions are

- Indicated Mach Number is less than 0.75 M.
- The autopilot is not engaged.

**ELEV/AIL
TRIM**