

System		Normal	Secondary	Direct
Primary Flight Computers (PFC)	Three Primary Flight Computers use control wheel and pedal inputs from the pilot to electronically command the primary flight control surfaces	All 3 PFC work in parallel	All 3 PFC work in parallel, but use simplified calculations	PFC no longer used. Pilot inputs are sent directly to flight controls through 4 ACE
	when		IRU fail, AHRU fail, flap/slat data loss	all 3 PFC fail or PFC data loss or manually selected
	EICAS		[] FLIGHT CONTROL MODE	[] PRI FLIGHT COMPUTERS
Autopilot (A/P)	The Left, Right and Center A/P are always engaged simultaneously	available		

Pitch		Normal	Secondary	Direct
Pitch Control	Control column forces increase with control displacement and with airspeed (see further Elevator Feel)	Pitch maneuver command	Elevator deflection command	
Pitch Compensation	Automatic compensation for pitch response to thrust changes, flap/gear configuration changes, turns up to 30° bank and turbulence	available		
Pitch Trim	System operation on ground	On ground, moves stabilizer directly. In flight, changes trim reference speed PFC → moves elevator → moves stabilizer to streamline elevator	On ground and in flight, the stabilizer is positioned directly	
	Alternate Pitch Trim	Alternate pitch trim commands from dual pitch trim switches have priority over primary pitch trim commands.		
	Trim switches	Primary and alternate trim switches work in all modes. All switches are inhibited when the A/P is engaged.		

Flight Envelope Protection	Overspeed and stall protection in manual (and automatic) flight	available		
Elevator Feel	Control column forces increase with increasing airspeed and with larger column displacement	Continuous variation with airspeed	Based on flaps position (flaps UP = higher forces)	
Spoilers	Automatic Speedbrakes : - rejected takeoff above 85 kts - both reversers are used on landing - (armed) main gear trucks untilt and - both thrust levers not in T/O range	available		
Autodrag	Deflecting ailerons upwards and raising two most outboard spoilers when above glideslope/path and flaps 25 or 30 and thrust in idle	available (in manual and automatic approach)		
Gust Suppression	Symmetric deflection of flaperons and elevators to alleviate gust acceleration	available with A/P in level flight (ALT HOLD, VNAV)		
Tail Strike Protection	Active on takeoff and landing, including autoland. No pilot feedback.	available		

Roll		Normal	Secondary	Direct
Roll Control	Control wheel forces increase with control displacement. Forces do not change with airspeed	Roll maneuver command	Flaperons are not used to control roll	
Flight Envelope Protection	Bank angle protection in manual (and automatic) flight	available		

Yaw		Normal	Secondary	Direct
Yaw Control	Pedal forces increase with pedal displacement. Forces do not change with airspeed.	Sideslip maneuver command		Rudder deflection command
Yaw Damper	Turn coordination and Dutch roll damping	available		Yaw Damping is degraded
Rudder Ratio	Rudder ratio changer reduces sideslip when airspeed increases	available		Based on flaps position (flaps UP = rudder response is less)
Rudder Trim	Manual inputs automatically zeroed during takeoff passing through 30 knots and upon landing. Manual inputs inhibited during LAND3.	Automatic trim (asymmetry compensation)		
		Manual trim		
Asymmetry Compensation	On ground, maintain zero yaw during crosswind / gustwind takeoff or asymmetric reverse thrust landing. Rudder pedals do not move	available		No asymmetry protection, except for Wheel to Rudder Cross-Tie (reduces maximum sideslip and vertical fin loads)
	In flight for any asymmetry condition. Rudder pedals move for awareness.			
	On ground above 60 knots, maintain almost zero yaw in case of engine failure on takeoff. Rudder pedals move .	In combination with Thrust Asymmetry Protection (TAP) which reduces thrust on the operating engine during takeoff		No asymmetry protection and no engine TAP

Self-Test		
After Landing checks	When flaps and speedbrakes retracted and groundspeed is below 30 knots	Self-test 90 seconds
	When hydraulic systems are depressurized	Self-test 70 seconds

	Non-Normals	Normal	Secondary	Direct
Uncommanded Stabilizer motion	The channel causing stabilizer motion is automatically shutdown and EICAS [] STABILIZER L2 or R2 is shown, or [] STABILIZER (with memory items) is shown in case motion continues after shutdown (message inhibited with both switches cutout) or when both channels shutdown (e.g. DUAL ENG FAIL)	Stabilizer does no longer move. Pitch trim remains available through elevators (Trim Reference Speed logic)	No Pitch Trim	
	L2 / R2 - Switch Cutout			
	Control Column Cutout (moving the control column opposite of the trim direction)	This function is only available in Primary and Secondary mode. If active for more than 20 seconds, the flight control system reverts to Direct Mode.		
Loss of hydraulic power		Use control wheel to electrically control two spoiler pairs Use primary or alternate trim switches to actuate stabilizer		
Loss of all control signaling		Use control wheel to electrically control one spoiler pair Use alternate trim switches to actuate stabilizer		

Flaps		Primary	Secondary	Alternate
Flaps	Extension / Retraction	LE / TE devices controlled together by Center hydraulic system	LE / TE devices controlled separately either from hydraulic or electrical system	LE and TE move electrically LE / TE extend simultaneously but LE retract after TE flaps
	Pilot Control	Flap Lever		Alternate Switch
	Max Selection	20-25-30	limited 20	limited 20
	Indication	single vertical bar (until 10" after UP)	expanded mode two filled bars	expanded mode index marks 5 - 20
	System Inhibit	Inhibited above 260 knots or above 20,000 feet		
Asymmetry Protection	Automatic shutdown for skew or asymmetric deployment	available		
Uncommanded Motion	TE or LE slats/flaps move away from, or move opposite or continue to move beyond selected position	Automatic transfer to Secondary Mode	Shutdown if uncommanded or slow motion continues after transfer	Direct Mode not to be used as per NNC procedure (no protection)
Flaps or Slat Disagree	Flaps do not move or move too slow (less 50% of normal rate) after commanded input			
Load Relief	Protects the TE flaps from excessive loads (limited to Flaps 5)	LOAD RELIEF when TE flaps in 15 - 30		
	LE slats protection	LE slats load relief not required	LE slats retract to midrange when above 225 knots	LE slats load relief not required
Slat Autogap	Extends LE slats to full extend when LE slats are in mid position, airspeed below 225 knots and high AOA	available	Slat Pregap moves LE to full when flaps not UP below 225 knots	not available LE slats stay in midrange
Cruise Flaps	Varies wing camber by symmetrically moving flaps, ailerons, flaperons and spoilers in cruise → reduce drag	available above 25,000 feet 0.54 - 0.87 Mach		