

## SECTION B — PERFORMING OPERATIONS; TRANSPORTING

### B64 AIRCRAFT; AVIATION; COSMONAUTICS

#### B64C AEROPLANES; HELICOPTERS (air-cushion vehicles B60V)

#### Note(s)

As far as possible, classification is made according to constructional features; classification according to particular kinds of aircraft is normally regarded as being of secondary importance, except in cases where this is considered to be the characteristic feature.

#### Subclass index

##### STRUCTURES, FAIRINGS

Features common to different elements.....	1/00
Fuselages; wings; stabilising surfaces.....	1/00, 3/00, 5/00
Other structural elements.....	7/00

##### PROPELLERS, FLIGHT CONTROL

Propellers.....	11/00
Adjustable control surfaces or members; control systems.....	9/00, 13/00
Control by jet reaction.....	15/00
Stabilisation and controls not otherwise provided for.....	17/00, 19/00

##### MODIFYING LIFT BY ACTION ON AIR-FLOW.....13/00, 21/00, 23/00

##### ALIGHTING GEAR.....25/00

##### AIRCRAFT KINDS AND THEIR COMPONENTS NOT OTHERWISE PROVIDED FOR

Supersonic.....	30/00
Seaplanes.....	35/00
Aircraft intended to be sustained without power plant; powered hand-glider-type aircraft; microlight aircraft.....	31/00
Convertible aircraft.....	37/00
Vertical-take-off or landing aircraft.....	29/00
Rotorcraft; ornithopters.....	27/00, 33/00
Others.....	39/00

#### Aircraft structures or fairings

##### **1/00 Fuselages; Constructional features common to fuselages, wings, stabilising surfaces, or the like**

(aerodynamical features common to fuselages, wings, stabilising surfaces, or the like B64C 23/00; flight-deck installations B64D)

- 1/06 • Frames; Stringers; Longerons
- 1/08 • • Geodetic or other open-frame structures
- 1/10 • • Bulkheads
- 1/12 • • Construction or attachment of skin panels
- 1/14 • Windows; Doors; Hatch covers or access panels; Surrounding frame structures; Canopies; Windscreens (fairings movable in conjunction with undercarriage elements B64C 25/16; bomb doors B64D 1/06)
- 1/16 • specially adapted for mounting power plant
- 1/18 • Floors
- 1/20 • • specially adapted for freight
- 1/22 • Other structures integral with fuselages to facilitate loading
- 1/24 • Steps mounted on, and retractable within, fuselages (readily removable B64D 9/00)
- 1/26 • Attaching the wing or tail units or stabilising surfaces

- 1/28 • Parts of fuselage relatively movable to improve pilots view
- 1/30 • Parts of fuselage relatively movable to reduce overall dimensions of aircraft
- 1/32 • Severable or jettisonable parts of fuselage facilitating emergency escape (ejector seats B64D 25/10)
- 1/34 • comprising inflatable structural components (connection of valves to inflatable elastic bodies B60C 29/00)
- 1/36 • adapted to receive aerials or radomes (aerials or radomes per se H01Q)
- 1/38 • Constructions adapted to reduce effects of aerodynamic or other external heating
- 1/40 • Sound or heat insulation
- 3/00 Wings** (stabilising surfaces B64C 5/00; ornithopter wings B64C 33/02)
  - 3/10 • Shape of wings
  - 3/14 • • Aerofoil profile
  - 3/16 • • Frontal aspect
  - 3/18 • Spars; Ribs; Stringers (attaching wing unit to fuselage B64C 1/26)
  - 3/20 • Integral or sandwich constructions (layered products or sandwich constructions in general B32B)

- 3/22 • Geodetic or other open-frame structures
- 3/24 • Moulded or cast structures
- 3/26 • Construction, shape, or attachment of separate skins, e.g. panels
- 3/28 • Leading or trailing edges attached to primary structures, e.g. forming fixed slots
- 3/30 • comprising inflatable structural components (connection of valves to inflatable elastic bodies B60C 29/00)
- 3/32 • specially adapted for mounting power plant
- 3/34 • Integrally-constructed tanks, e.g. for fuel (other aircraft fuel tanks or fuel systems B64D)
- 3/36 • Structures adapted to reduce effects of aerodynamic or other external heating
- 3/38 • Adjustment of complete wings or parts thereof
- 3/40 • • Varying angle of sweep
- 3/42 • • Adjusting about chordwise axes
- 3/44 • • Varying camber
- 3/46 • • • by inflatable elements (connection of valves to inflatable elastic bodies B60C 29/00)
- 3/48 • • • by relatively-movable parts of wing structures
- 3/50 • • • by leading or trailing edge flaps (ailerons B64C 9/00)
- 3/52 • • Warping
- 3/54 • • Varying in area (flaps extendable to increase camber B64C 3/44)
- 3/56 • • Folding or collapsing to reduce overall dimensions of aircraft
- 3/58 • provided with fences or spoilers (adjustable for control purposes B64C 9/00)
- 5/00 Stabilising surfaces** (attaching stabilising surfaces to fuselage B64C 1/26)
  - 5/02 • Tailplanes (fins B64C 5/06)
  - 5/04 • Noseplanes
  - 5/06 • Fins (specially for wings B64C 5/08)
  - 5/08 • mounted on, or supported by, wings
  - 5/10 • adjustable
    - 5/12 • • for retraction against or within fuselage or nacelle
    - 5/14 • • Varying angle of sweep
    - 5/16 • • about spanwise axes
    - 5/18 • • in area
- 7/00 Structures or fairings not otherwise provided for**
  - 7/02 • Nacelles

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- 9/00 Adjustable control surfaces or members, e.g. rudders** (trimming stabilising surfaces B64C 5/10; systems for actuating flying-control surfaces B64C 13/00)
    - 9/02 • Mounting or supporting thereof
    - 9/04 • with compound dependent movements
    - 9/06 • with two or more independent movements
    - 9/08 • bodily displaceable (varying camber of wings B64C 3/44)
    - 9/10 • one surface adjusted by movement of another, e.g. servo tabs (B64C 9/04 takes precedence; adjusting surfaces of different type or function B64C 9/12)
    - 9/12 • surfaces of different type or function being simultaneously adjusted
    - 9/14 • forming slots (boundary-layer control B64C 21/00)
    - 9/16 • • at the rear of the wing
    - 9/18 • • • by single flaps
    - 9/20 • • • by multiple flaps
    - 9/22 • • at the front of the wing

- 9/24 • • • by single flap
- 9/26 • • • by multiple flaps
- 9/28 • • by flaps at both the front and rear of the wing operating in unison
- 9/30 • Balancing hinged surfaces, e.g. dynamically
- 9/32 • Air braking surfaces (braking by parachutes B64D 17/80)
- 9/34 • collapsing or retracting against or within other surfaces or other members
- 9/36 • • the members being fuselages or nacelles
- 9/38 • Jet flaps
- 11/00 Propellers, e.g. of ducted type; Features common to propellers and rotors for rotorcraft** (rotors specially adapted for rotorcraft B64C 27/32)
  - 11/02 • Hub construction
  - 11/04 • • Blade mountings
    - 11/06 • • • for variable-pitch blades
    - 11/08 • • • for non-adjustable blades
    - 11/10 • • • • rigid
    - 11/12 • • • • flexible
  - 11/14 • • Spinners
  - 11/16 • Blades
    - 11/18 • • Aerodynamic features
    - 11/20 • • Constructional features
      - 11/22 • • • Solid blades
      - 11/24 • • • Hollow blades
      - 11/26 • • • Fabricated blades
      - 11/28 • • • Collapsible or foldable blades
    - 11/30 • Blade pitch-changing mechanisms
      - 11/32 • • mechanical
        - 11/34 • • • automatic
        - 11/36 • • • non-automatic
      - 11/38 • • fluid, e.g. hydraulic
        - 11/40 • • • automatic
        - 11/42 • • • non-automatic
      - 11/44 • • electric
    - 11/46 • Arrangements of, or constructional features peculiar to, multiple propellers
      - 11/48 • • Units of two or more coaxial propellers
      - 11/50 • • Phase synchronisation between multiple propellers
- 13/00 Control systems or transmitting systems for actuating flying-control surfaces, lift-increasing flaps, air brakes, or spoilers**
  - 13/02 • Initiating means
  - 13/04 • • actuated personally
    - 13/06 • • • adjustable to suit individual persons
    - 13/08 • • • Trimming zero positions
    - 13/10 • • • comprising warning devices
    - 13/12 • • • Dual control apparatus
    - 13/14 • • • lockable (locking in position to suit individual persons B64C 13/06)
  - 13/16 • • actuated automatically, e.g. responsive to gust detectors
    - 13/18 • • • using automatic pilot (automatic pilots per se G05D 1/00)
    - 13/20 • • • using radiated signals
    - 13/22 • • • readily revertible to personal control
  - 13/24 • Transmitting means
    - 13/26 • • without power amplification or where power amplification is irrelevant
      - 13/28 • • • mechanical
        - 13/30 • • • • using cable, chain, or rod mechanisms
        - 13/32 • • • • using cam mechanisms

- 13/34 • • • • using toothed gearing
- 13/36 • • • fluid
- 13/38 • • with power amplification
- 13/40 • • • using fluid pressure
- 13/42 • • • • having duplication or stand-by provisions
- 13/44 • • • • overriding of personal controls; with automatic return to inoperative position
- 13/46 • • • • with artificial feel
- 13/48 • • • • characterised by the fluid being gaseous
- 13/50 • • • using electrical energy

**15/00 Attitude, flight direction, or altitude control by jet reaction** (details of jet-engine plants, e.g. of nozzles or jet pipes, F02K) [3]

- 15/02 • the jets being propulsion jets
- 15/12 • • the power plant being tilttable
- 15/14 • the jets being other than main propulsion jets (jet flaps B64C 9/38)

**17/00 Aircraft stabilisation not otherwise provided for**

- 17/02 • by gravity or inertia-actuated apparatus
- 17/04 • • by pendular bodies
- 17/06 • • by gyroscopic apparatus (automatic-pilot control B64C 13/18)
- 17/08 • by ballast supply or discharge (for lighter-than-air aircraft B64B)
- 17/10 • Transferring fuel to adjust trim

**19/00 Aircraft control not otherwise provided for**

- 19/02 • Conjoint controls

**Influencing air-flow over aircraft surfaces, not otherwise provided for**

**21/00 Influencing air-flow over aircraft surfaces by affecting boundary-layer flow** (boundary-layer control in general F15D)

- 21/02 • by use of slot, ducts, porous areas, or the like
- 21/04 • • for blowing (B64C 21/08 takes precedence)
- 21/06 • • for sucking (B64C 21/08 takes precedence)
- 21/08 • • adjustable
- 21/10 • using other surface properties, e.g. roughness

**23/00 Influencing air-flow over aircraft surfaces, not otherwise provided for**

- 23/02 • by means of rotating members of cylindrical or similar form
- 23/04 • by generating shock waves
- 23/06 • by generating vortices
- 23/08 • using Magnus effect

**25/00 Alighting gear** (air-cushion alighting gear B60V 3/08)

- 25/02 • Undercarriages
- 25/04 • • Arrangement or disposition on aircraft
- 25/06 • • fixed
- 25/08 • • non-fixed, e.g. jettisonable
- 25/10 • • • retractable, foldable, or the like
- 25/12 • • • • sideways
- 25/14 • • • • fore-and-aft
- 25/16 • • • • Fairings movable in conjunction with undercarriage elements
- 25/18 • • • • Operating mechanisms
- 25/20 • • • • • mechanical

- 25/22 • • • • • fluid
- 25/24 • • • • • electric
- 25/26 • • • • • Control or locking systems therefor
- 25/28 • • • • • • with indicating or warning devices
- 25/30 • • • • • • emergency actuated
- 25/32 • characterised by elements which contact the ground or similar surface (arrestor hooks B64C 25/68)
- 25/34 • • wheeled type, e.g. multi-wheeled bogies
- 25/36 • • • Arrangements or adaptations of wheels, tyres, or axles in general (construction of wheels or axles B60B; construction of tyres in general B60C)
- 25/38 • • endless-track type
- 25/40 • • the elements being rotated before touch-down
- 25/42 • • Arrangement or adaptation of brakes (the ground braking force being regulated, at least in part, by a speed condition, e.g. acceleration or deceleration of the ground engaging alighting gear, B60T 8/32) [4]
- 25/44 • • • Actuating mechanisms
- 25/46 • • • • Brake regulators for preventing skidding or aircraft somersaulting
- 25/48 • • • • differentially operated for steering purposes
- 25/50 • • Steerable undercarriages; Shimmy-damping (steering devices applicable to land vehicles B62D)
- 25/52 • • Skis or runners
- 25/54 • • Floats
- 25/56 • • • inflatable (connection of valves to inflatable elastic bodies B60C 29/00)
- 25/58 • • Arrangements or adaptations of shock-absorbers or springs (shimmy-dampers B64C 25/50; vehicle suspension arrangements in general B60G; shock-absorbers per se F16F)
- 25/60 • • • Oleo legs
- 25/62 • • • Spring shock-absorbers; Springs
- 25/64 • • • • using rubber or like elements
- 25/66 • • Convertible alighting gear; Combinations of different kinds of ground or like engaging elements
- 25/68 • Arrestor hooks (arresting gear, e.g. on aircraft carriers, B64F)

**Aircraft kinds or components not otherwise provided for**

- 27/00 Rotorcraft; Rotors peculiar thereto** (alighting gear B64C 25/00)
- 27/02 • Gyroplanes
- 27/04 • Helicopters
- 27/06 • • with single rotor
- 27/08 • • with two or more rotors
- 27/10 • • • arranged coaxially
- 27/12 • • Rotor drives
- 27/14 • • • Direct drive between power plant and rotor hub
- 27/16 • • • Drive of rotors by means, e.g. propellers, mounted on rotor blades
- 27/18 • • • • the means being jet-reaction apparatus
- 27/20 • Rotorcraft characterised by having shrouded rotors, e.g. flying platforms
- 27/22 • Compound rotorcraft, i.e. aircraft using in flight the features of both aeroplane and rotorcraft
- 27/24 • • with rotor blades fixed in flight to act as lifting surfaces
- 27/26 • • characterised by provision of fixed wings

## B64C

- 27/28
  - with forward-propulsion propellers pivotable to act as lifting rotors
- 27/30
  - with provision for reducing drag of inoperative rotor
- 27/32
  - Rotors (features common to rotors and propellers B64C 11/00)
- 27/33
  - having flexing arms [3]
- 27/35
  - having elastomeric joints [3]
- 27/37
  - having articulated joints (B64C 27/33, B64C 27/35 take precedence) [3]
- 27/39
  - with individually articulated blades, i.e. with flapping or drag hinges [3]
- 27/41
  - with flapping hinge or universal joint, common to the blades [3]
- 27/43
  - see-saw type, i.e. two-bladed rotor [3]
- 27/45
  - with a feathering hinge only [3]
- 27/46
  - Blades
- 27/467
  - Aerodynamic features [6]
- 27/473
  - Constructional features [6]
- 27/48
  - Root attachment to rotor head
- 27/50
  - Blades foldable to facilitate stowage of aircraft
- 27/51
  - Damping of blade movements [3]
- 27/52
  - Tilting of rotor bodily relative to fuselage (of see-saw type construction B64C 27/43)
- 27/54
  - Mechanisms for controlling blade adjustment or movement relative to rotor head, e.g. lag-lead movement
- 27/56
  - characterised by the control initiating means, e.g. manually actuated (B64C 27/58 takes precedence)
- 27/57
  - automatic or condition responsive, e.g. responsive to rotor speed, torque or thrust [3]
- 27/58
  - Transmitting means, e.g. interrelated with initiating means or means acting on blades (initiating means B64C 27/56; means acting on blades B64C 27/72)
- 27/59
  - mechanical [3]
- 27/605
  - including swash plate, spider or cam mechanisms [3]
- 27/615
  - including flaps mounted on blades [3]
- 27/625
  - including rotating masses or servo rotors [3]
- 27/635
  - specially for controlling lag-lead movements of blades [3]
- 27/64
  - using fluid pressure, e.g. having fluid power amplification [3]
- 27/68
  - using electrical energy, e.g. having electrical power amplification [3]
- 27/72
  - Means acting on blades
- 27/78
  - in association with pitch adjustment of blades of anti-torque rotor

- 27/80
  - for differential adjustment of blade pitch between two or more lifting rotors
- 27/82
  - characterised by the provision of an auxiliary rotor or fluid-jet device for counter-balancing lifting-rotor torque or changing direction of rotorcraft
- 29/00
  - **Aircraft capable of landing or taking-off vertically** (attitude, flight direction, or altitude control by jet reaction B64C 15/00; rotorcraft B64C 27/00; air-cushion vehicles B60V; details of jet-engine plants, e.g. of nozzles or jet pipes, F02K)
- 29/02
  - having its flight directional axis vertical when grounded
- 29/04
  - characterised by jet-reaction propulsion
- 30/00
  - **Supersonic type aircraft [3]**
- 31/00
  - **Aircraft intended to be sustained without power plant; Powered hang-glider-type aircraft; Microlight-type aircraft**
- 31/02
  - Gliders, e.g. sailplanes (hang-gliders B64C 31/028) [6]
- 31/024
  - with auxiliary power plant [6]
- 31/028
  - Hang-glider-type aircraft; Microlight-type aircraft [6]
- 31/032
  - having delta shaped wing [6]
- 31/036
  - having parachute-type wing (parachutes B64D 17/00) [6]
- 31/04
  - Man-powered aircraft (ornithopters B64C 33/00)
- 31/06
  - Kites (hang-gliders B64C 31/028; toy aspects A63H 27/08; towed targets F41J)
- 33/00
  - **Ornithopters**
- 33/02
  - Wings; Actuating mechanisms therefor
- 35/00
  - **Flying-boats; Seaplanes** (alighting gear B64C 25/00)
- 35/02
  - Flying-boat hulls [3]
- 37/00
  - **Convertible aircraft** (vehicles capable of travelling in or on different media B60F)
- 37/02
  - Flying units formed by separate aircraft (towing, air-refuelling, or aircraft-carrying aircraft B64D)
- 39/00
  - **Aircraft not otherwise provided for**
- 39/02
  - characterised by special use
- 39/04
  - having multiple fuselages or tail booms [3]
- 39/06
  - having disc- or ring-shaped wings [3]
- 39/08
  - having multiple wings [3]
- 39/10
  - All-wing aircraft [3]
- 39/12
  - Canard-type aircraft [3]

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**99/00 Subject matter not provided for in other groups of this subclass [2010.01]**