

CONTENTS

INTRODUCTION	1.2
GENERAL	
AIRPLANE	1.2
Fuselage	1.2
Wing	1.2
Tail	1.2
PROPELLER TIP CLEARANCE	1.2
LANDING GEAR STRUT EXTENSION (NORMAL)	1.2
FLIGHT CHARACTERISTICS.....	1.3
Stability	1.3
Trim	1.3
Stalls	1.3
Spins	1.3
Acrobatics	1.3
Diving	1.3
DIMENSIONS AND AREAS	1.3
OPERATIONS	
SPEEDS	1.3
LIMITATIONS	
SPEEDS	1.4
CROSSWIND LIMITS	1.4
TAILWIND LIMITS	1.4
DIAGRAMS	
SIDE PROFILE	1.5
FRONT PROFILE	1.6
TURNING RADIUS DIAGRAM	1.7
CARGO COMPARTMENTS	1.8

INTRODUCTION

This Chapter provides a general overview of the systems and the structural makeup of the airplane.

GENERAL

AIRPLANE

The Douglas DC-3 is an all-metal, low wing airplane. The airplane utilizes two Pratt and Whitney 1830-92 engines, each capable of delivering 1200 Shaft Horsepower each. The airplane is certified for both day and night operations under either VFR or IFR. Some DC-3 aircraft are also certified for flight in known icing conditions.

Fuselage

The fuselage is of semi-monocoque construction and is 64 feet, 5 inches long. It is partitioned as follows:

- Cockpit (compartments A – B)
- Forward cargo compartment (compartment C)
- Main cabin (compartments D – G)
- Rear cargo (compartment H)

Wing

The wing is all aluminum consisting of a center section and two outer wing panels. The center section is attached to the fuselage by eight vertical fittings. The outer panels are attached to the center section with steel bolts and elastic stop nuts. A floating rib is placed between the center section and each outer panel to convey the stresses evenly. The tips of the outer panels are attached with machine screws. The center section contains three main spars and an auxiliary spar. The outboard panels contain three spars.

Two nacelles are permanently attached to the center section. Incorporated in each nacelle are two rubber fittings against which the landing gear axle rests when the landing gear is retracted. These provide support for the landing gear and protect the nacelle structure if a landing is made with the landing gear retracted.

The primary flight controls (ailerons, elevators, and rudder) consist of aluminum alloy frames covered with treated poly-fiber fabric.

Tail

The empennage consists of the vertical and horizontal stabilizers, the elevators, and the rudder. The total height of the tail assembly is 14 feet, 11 inches with the aircraft tail on the ground and normal strut extension.

The horizontal stabilizer is aluminum and consists of two interchangeable halves, each having a removable tip. The elevators are bolted to the stabilizer ribs with four hinge brackets.

The vertical stabilizer is aluminum and has a removable tip. The rudder is bolted to the vertical stabilizer with two hinged fittings.

PROPELLER TIP CLEARANCE

Propeller tip clearance from the ground is approximately 16 inches with normal tire pressures and strut extension.

NORMAL LANDING GEAR STRUT EXTENSION



Main Landing Gear Strut

- Normal main gear strut extension - approximately 8 inches.



Tail Wheel

- Normal Tail gear strut extension - Approximately 4 1/2 inches (measured from the bottom of fuselage to the top of the tire).

FLIGHT CHARACTERISTICS

Stability

Under all loading conditions the aircraft is stable.

Trim

Elevator trim is sensitive and should be used with caution.

Any of the following conditions creates a tendency for the aircraft to be nose heavy:

- Flaps down
- Landing gear down
- Cowl flaps OPEN
- Single engine operations (also requires 2 1/2 to 3 degrees of rudder trim)

Stalls

Characteristics

- General buffeting warns of an impending stall.
- When stalled, the aircraft has no tendency to roll, and recovery is normal.
- Maintaining the aircraft in a stall will result in severe tail buffeting.
- The aircraft will stall with power on at speeds considerably below those given in the Stalling Speed Chart, and has a definite tendency to roll or snap roll.

Note: If Cowl Flaps are OPEN, early buffeting due to Cowl Flap drag may be confuse with the stall buffet.

Recovery

- Recover from a stall using normal stall recovery procedures.
- Accomplish the recovery gently but firmly.

Spins

If an inadvertent spin occurs, recovery is normal.

Acrobatics

Acrobatics are prohibited.

Diving

Diving is prohibited.

DIMENSIONS AND AREAS

Fuselage length 64 ft 5 inches
 Tail height 14 ft 11 inches
 Fuselage height (tail down) .. 16 ft 11 1/2 inches

MLG tire pressure 55 - 60 psi
 Tail wheel strut clearance (approx.) 4-1/2 inches
 Tail wheel tire pressure 45 - 50 psi

Wing span 95 feet
 MAC 138.1 inches
 Total wing area (including ailerons) ... 987 sq. ft.
 Wing flap area (total) 83.5 sq. ft.
 Wing loading at MTOW 25.5 lb./ sq. ft.

Empennage

Total vertical surface area 84.6 sq. ft.
 Total horizontal surface area 179.2 sq. ft.

T/O power loading at MTOW 12.9 lb. per HP

OPERATIONS

SPEEDS

KIAS

Normal climb speed 115
 Single engine cruise speed 115 to 120
 Normal inst. holding speed 105 to 120
 Normal inst. approach speed 105
 Normal inst. final apch. speed 88 to 100
 Normal over the fence speed 84
 1.3 V_{so} (Short field landing) 75

Maximum Endurance Speed

The following indicated airspeeds will provide maximum endurance of fuel on board.

WEIGHT (LBS)

KIAS

22,000 80
 24,000 83
 25,200 85

Notes for maximum endurance:

- Fly at the lowest possible altitude.
- Set power to the lowest practical fuel consumption.
- Check gear and flaps up.
- Keep cowl flaps closed (consistent with adequate cooling).
- Keep airplane trimmed.
- In the event of turbulence or other weather considerations, increase airspeed as necessary to maintain adequate control.

LIMITATIONS

Do not subject the aircraft to high acceleration loading during steep turns.

The following limitations and operational restrictions are duplicated in their respective chapters and repeated here for quick reference. See appropriate chapters for additional information.

SPEEDS

<u>Speed</u>	<u>KIAS</u>
V _{SO}	64
V _{S1}	68
V _{MC}	76
V ₁ / V ₂	84
V _R	84
V _X	84
V _{Xse}	84
V _Y	91
V _{Yse}	95
V _A	120
V _{LO}	126
V _{NO}	158
V _{NE}	190
V _{LE}	148
V _F (one-quarter flaps)	135
V _F (one-half flaps)	99
V _F (full flaps)	97

LOAD LIMITS

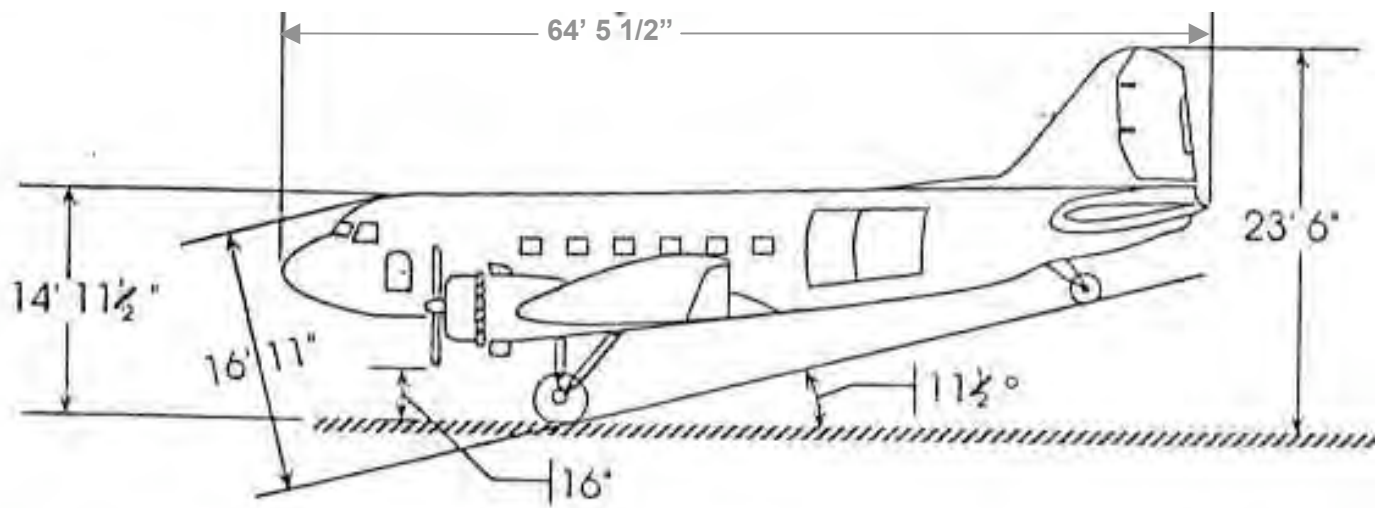
	<u>POSITIVE</u>	<u>NEGATIVE</u>
FLAPS UP	+ 2.83 G	- .83 G
FLAPS DOWN	+ 1.58 G	- .44 G

Crosswind Limits

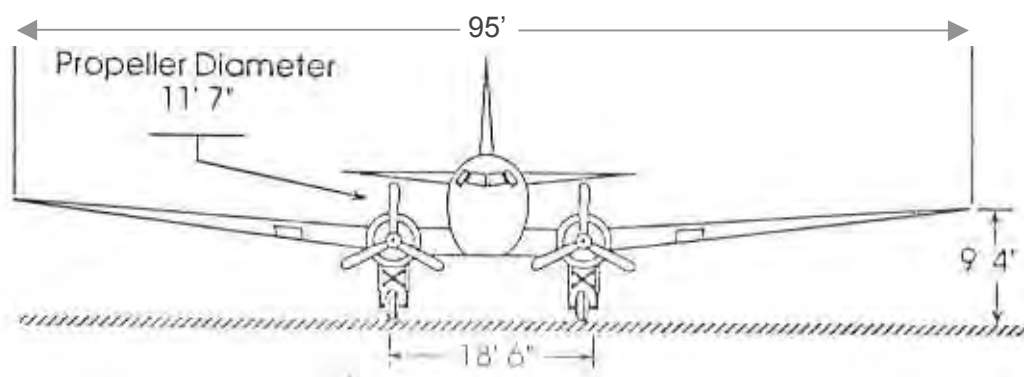
The critical crosswind component for this airplane has not been determined. The maximum crosswind component under normal conditions is 13 knots.

Tailwind Limits

This airplane has been demonstrated and approved for landings with tailwind components of up to 9 knots.

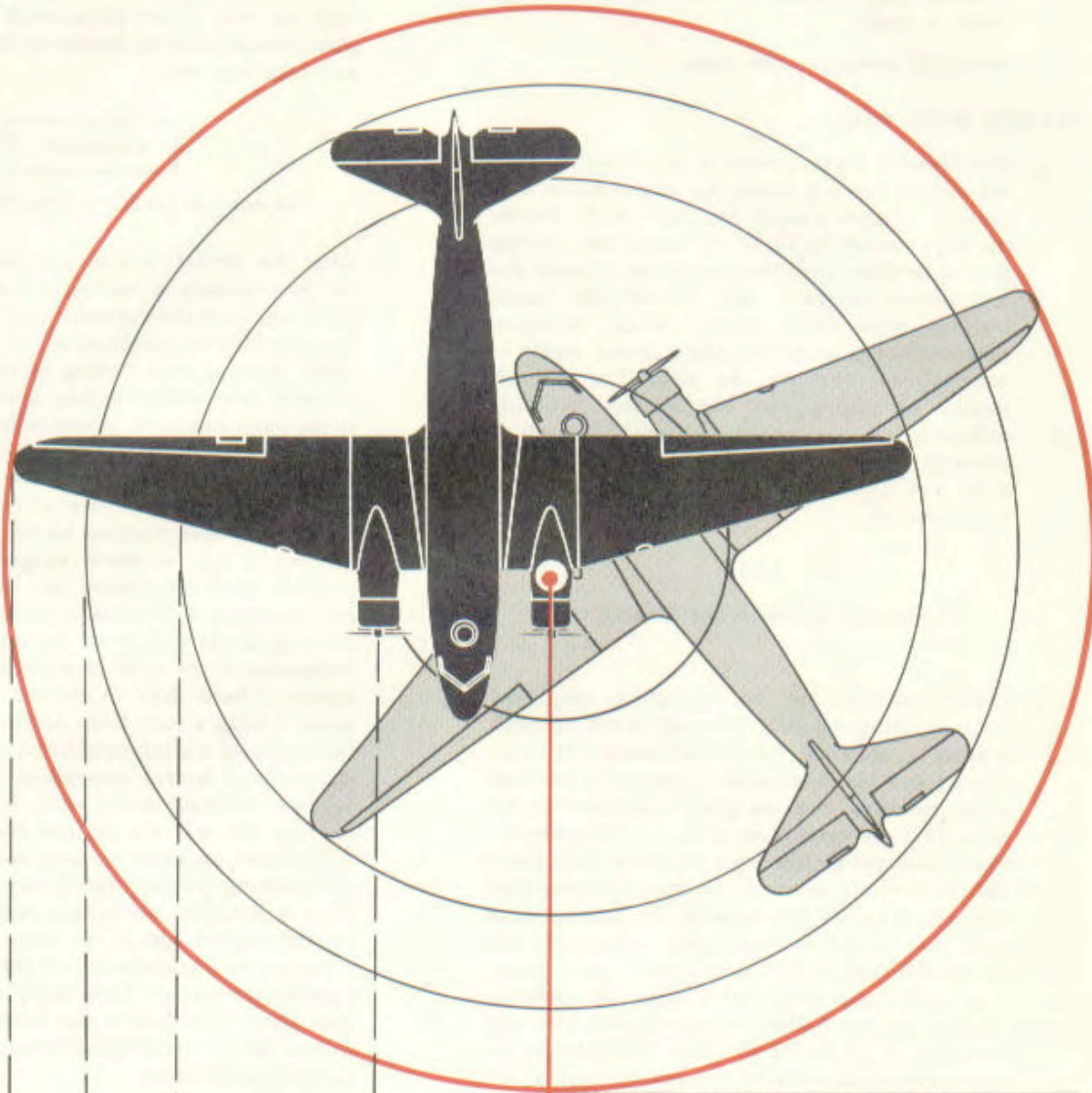


DC-3 SIDE PROFILE



DC-3 FRONT PROFILE

TURNING RADIUS DIAGRAM

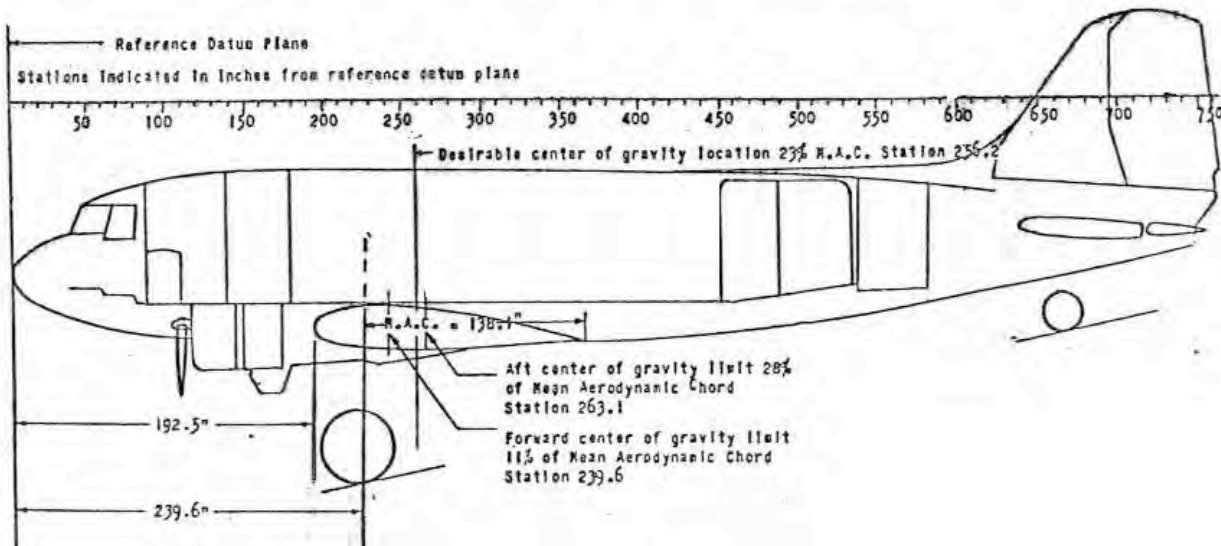
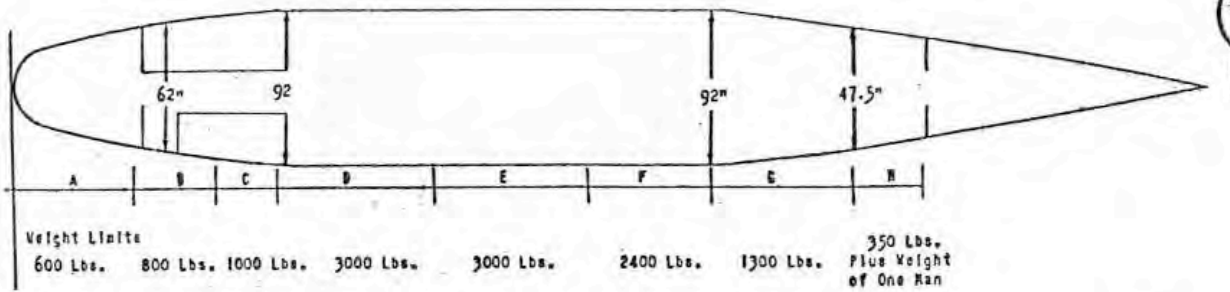


OUTER MAIN GEAR	18 FT 6 IN.
INNER WING TIP	39 FT 8 IN.
HORIZONTAL STABILIZER	49 FT 4 IN.
OUTER WING TIP	57 FT 6 IN.

VERTICAL CLEARANCES

PROPELLERS	12 FT 4 IN.
WING TIP	9 FT 4 IN.
FUSELAGE	16 FT. 11 1/2 IN.

M.A.C. DIAGRAM AND STATION IDENTIFICATION
 for
DC-3 TYPE AIRPLANES



Cargo Compartment Sections

———— End of Chapter ————