

5. AIR SPEED LIMITS

- A. The sea level never exceed speed (V_{NE}) is listed in the following table. Above 2000 feet decrease V_{NE} 2.3 MPH (2.0 knots) per each 1000 feet increase in altitude.

<u>Model</u>	<u>V_{NE} from Sea Level to 2000 Feet</u>
UH-12B	84 MPH (73 knots)
UH-12B with float gear	78 MPH (68 knots)
UH-12B with float gear and litters	72 MPH (63 knots)

6. FLIGHT LIMITS

- A. Avoid low speed flight between 10 and 325 feet. (See Height-Velocity Chart for safe autorotative landings, Figure 2.)
- B. Instrument flight prohibited.
- C. Do not exceed load factors of 2.8 and -0.5g.
- D. Avoid protracted rearward flight.
- E. No acrobatic maneuvers approved.
- F. Do not stand while rotor is turning with canopy removed.
- G. Do not repeatedly reverse rudders at rates higher than one cycle per sec. This in no way restricts abrupt use of rudders as required for control in flight.
- H. With litters installed, C.G. must not be aft of Station 84.5 with 8° hub, or Station 83.6 with 12° - 9° hub.
- I. Night flight is prohibited when either landing, navigation, map and instrument lights, or glare shield is removed.
- J. With battery in forward position and doors installed, battery vent line must be connected. (See page 21.)

Note: Operation at high speed with 8° hub (round flapping stops) should be avoided during turbulent air conditions. (See page 16, "Turbulent Air Conditions".)

7. HORIZONTAL STABILIZER

- A. The horizontal stabilizer must be used with settings as indicated below:

<u>UH-12B</u>	<u>Setting - Minus 19°</u>
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8. PARKING BRAKE AND TAXIING LIMITATIONS

- A. Not applicable with skid or float gear.
- B. For the four-wheel gear helicopter, the parking brake should not be used for landing roll deceleration.

3) Fuel Pressure:

Red lined at 2.0 and 9.0 psi (min. and max.).
Green arc 2.0 to 9.0 psi.

c. Air Speed Indicator:

Red line at 84 TIAS.
Green arc 35 to 84 TIAS.
Yellow arc 0 to 35 TIAS.

d. Carburetor Air Temperature Gage:

Red lined at 50° (max.)
Green arc 25° C. to 50° C.
Yellow arc 0° to 25° C. (CAUTION - Possible icing.)

e. Warning Light - Transmission Temperature:

This light warns of excessive transmission temperature.

11. NIGHT LIMITATIONS

- a. Operation is authorized at night under visual contact flight conditions, defined as visual reference flight, whereby orientation is maintained by ground reference and a ceiling of not less than 500 feet and visibility of not less than two miles.

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CHECKED			TITLE:	MODEL UH-12B
APPROVED			FLIGHT MANUAL	REPORT NO.

UH-12B

HEIGHT-VELOCITY CHART FOR
SAFE AUTOMOTATION LANDING

1000

800

600

400

200

0

80

70

60

50

40

30

20

10

0

Height above terrain ~ ft.

Avoid operation in
cross-hatched areas

True Indicated Airspeed ~ MPH

FIGURE 2

main rotor RPM is 9.17 to 1.0 and to tail rotor RPM, 1.59 to 1.0. Flexible push-pull controls are used to control engine operation. These consist of the throttle, starter, mixture and carburetor air controls.

2. Throttle Control:

To maintain constant engine rpm during normal flight, the throttle control is integral with the collective pitch system, and the throttle setting is automatically adjusted as the position of the collective pitch stick is varied. If desired, or if flight conditions warrant, the throttle may be operated independently of the collective pitch system. A twist-type grip handle on the forward end of each collective pitch stick provides throttle control. Rotating the grip toward the pilot reduces the power. A knurled ring in back of the right-hand throttle grip provides a means of adjusting the friction for both throttle grips.

3. Starter Control:

The starter lever is located below the right-hand collective pitch stick and is mounted by a bracket to the lower seat structure. It may be actuated either by hand or by foot. The starter lever is connected by a cable to the spring-loaded actuating arm of the starter unit. When the starter lever is moved, forward and down, the actuating arm depresses the starter contact switch, closing the circuit to the starter motor and enabling the starter gear to engage the engine drive gear. The spring-loaded actuating arm will return the starter lever to its normal position immediately after the lever is released.

4. Mixture Control:

A manual mixture control is provided for fuel-air ratio control with the manual carburetor installation. This control has rich, lean and idle cut-off positions.

The mixture control is removed when the MA-4-5AA altitude compensating carburetor is installed since fuel-air ratio control is automatic.

5. Carburetor Air Heat Control:

The carburetor air heat control quadrant is located on the tunnel, forward of the center seat, adjacent to the mixture control. Pulling the handle fully aft introduces the maximum amount of heated air into the carburetion system. The handle may be placed in any intermediate position between full forward, for cold air, and full aft for heated air, in order to maintain desired carburetor air temperature.

6. Ignition System:

The ignition system used in the helicopter is a conventional installation which is controlled by a four-position switch located in the center of the instrument panel, and wired directly to both engine magnetos.

8. Position Lights:

The helicopter is equipped with position lights in the following conventional manner: A red light on the left side, a green light on the right side, and a white light facing aft from the end of the tail section. Operation of the lights is "flashing". The position lights are controlled by a single "ON-OFF" toggle switch mounted on the pedestal below the instrument panel.

9. Free-Air Temperature Gage:

A free-air temperature gage is installed in the windshield above the instrument panel, slightly to the left of the centerline of the ship. Readings of this gage are given in the centigrade (C) scale.

D. NORMAL OPERATING INSTRUCTIONS

1. BEFORE ENTERING CABIN:

a) Note carefully the following:

FLIGHT LIMITATIONS AND RESTRICTIONS

- 1) The sea level "never exceed speed" (V_{NE}) is given in the following table:

<u>Model</u>	<u>V_{NE} at Sea Level</u>
UH-12B	84 (73 knots)
UH-12B with float gear	78 (68 knots)
UH-12B with floats and litters	72 (63 knots)

- 2) Above 2000 feet decrease V_{NE} by 2.3 MPH (2.0 knots) for each 1000 feet increase in altitude.
- 3) Acrobatic or instrument flight is prohibited.
- 4) Night flying is permitted only under visual contact conditions and with landing, navigation, map and instrument lights, and glare shield installed.
- 5) Avoid low speeds between 10 and 325 feet altitude.
- 6) Avoid overcontrolling when in hovering maneuvers.
- 7) Do not exceed load factors of +2.8g and -0.5g.
- 8) Gross weight is never to exceed 2500 pounds.
- 9) With litters installed, C.G. must not be aft of Station 84.5 with 8° hub, or Station 83.6 with 12° - 9° hub.
- b) Perform thorough external check. Make sure that all mooring equipment is removed.

3. Engine Failure at Low Altitude:

- a) If the engine failure occurs below 10 feet, immediately apply collective pitch to provide cushioning effect before contact is made with the ground.
- b) Flight between 10 and 325 feet and at indicated air speeds of less than 35 mph must be held to a minimum as the possibility of a successful autorotation landing is greatly reduced in the event of engine failure. Extreme caution under these flight conditions must be exercised. If engine failure occurs during such conditions, build up as much forward speed and main rotor rpm as possible with the cyclic and collective pitch controls. Apply the controls as required so that the helicopter is in a level attitude at least 10 feet above the landing surface, at which altitude use collective pitch to ease the landing impact.

WARNING: Altitude and air speed are the most important factors for safe autorotation landings in case of engine failure. See page 6 for safe and unsafe conditions relative to indicated air speed and altitudes below 325 feet.

4. Engine Failure above 325 Feet:

- a) In the event of engine failure during flight above 325 feet, decrease collective pitch as necessary to maintain main rotor speed of 330 rpm and apply forward cyclic stick to obtain a glide speed of 50 to 60 mph. At approximately 75 feet above the ground, pull the cyclic stick steadily back, reducing the rate of descent and increasing the main rotor rpm. When 10 to 15 feet above the landing surface, level the helicopter with forward cyclic stick and then apply collective pitch, as necessary, to cushion the landing impact.

5. Tail Rotor Failure:

In the event of failure of the tail rotor, its drive shaft, or any component part of the tail rotor system, proceed as follows:

- a) Immediately reduce throttle to maintain directional control, evaluate damage, and determine procedure to follow.
- b) Maintain an indicated air speed of at least 45 mph.
- c) Correct torque effect of main rotor by applying cyclic control slightly away from direction in which helicopter tends to turn.
- d) Make a normal autorotation landing into the wind, and, if practical, on a straight flight path.
- e) When making an autorotation landing resulting from tail rotor failure, forward speed at the time of surface contact is desirable, provided landing surface is sufficiently smooth.

WARNING: NEVER apply power during the actual landing operation.

- h) Roll helicopter on its side, so that main rotor blades will strike the water and stop main rotor.
- i) Jettison door on highest side of cabin.
- j) Release safety belt.
- k) Climb out and clear helicopter immediately.

9. Fire During Flight:

- a) Begin emergency landing procedure immediately upon discovery of fire.
- b) Close fuel shut-off valve.
- c) Set all electrical switches, including ignition switch, in "OFF" position.

WARNING: If at sufficient altitude and adequate landing area is available, make the landing by the applicable autorotation procedure given in Paragraphs 3-a) and b) and 4-a), Section E.

10. Carburetor Icing:

- a) To prevent the development of carburetor ice, apply sufficient carburetor heat to maintain a carburetor air temperature of 25°C. to 50° C. (77° F. to 122° F.).

NOTE: Carburetor icing will be indicated first by a loss of manifold pressure followed by a drop in engine rpm.

- b) Use carburetor heat as prescribed for local conditions.

11. Cabin Door Emergency Release:

- a) Each cabin door is equipped with an individual manually-operated emergency release which, when actuated, pulls out the door hinge pins. The release handles are easily and quickly detached from their mounting clips, which are installed just forward of each door frame. Before flight, always inspect release mechanisms for complete and correct installation.

12. Battery Installation:

WARNING:

- a) On helicopters with forward battery installation, external vent and integral vent seals are required when doors are installed and battery is in forward position.