ERA22FA279

OPERATIONAL FACTORS

Group Chair's Factual Report – Attachment 9

Army UH-1B Pilot Checklist

November 2, 2022

TM 55-1520-211-10CL

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

125

OPERATOR'S MANUAL
ARMY MODELS
UH-1A AND UH-1B
HELICOPTERS

Pilot's Checklist

HEADQUARTERS, DEPARTMENT OF THE ARMY

JUNE 1964

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *18 June 1964*

TM 55–1520–211–10CL is published for the use of all concerned.

By Order of the Secretary of the Army:

EARLE G. WHEELER,
General, United States Army,
Chief of Staff.

Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

Distribution:

To be distributed in accordance with DA Form 12–31 requirements for Operator and Crew, UH–1, Aircraft.

*This manual supersedes TM 55–1520–211–10CL, 31 December 1963.

BEFORE EXTERIOR CHECK.

1. DA From 2408A - CHECK.
2. Battery switch - OFF.

EXTERIOR CHECK.

1. Fuselage front - CHECK.
2. Fuselage cabin right side and top - CHECK.
3. Fuselage aft of cabin right side - CHECK.
4. Aft fuselage right side - CHECK.
5. Fuselage full aft - CHECK.
6. Aft fuselage left side - CHECK.
7. Fuselage aft of cabin left side - CHECK.
8. Fuselage cabin left side - CHECK.

EXTERIOR CHECK - NIGHT FLIGHT.

1. Mirror covered or removed.

INTERIOR CHECK ALL FLIGHTS.

1. Cabin doors - SECURED.
2. Blade mooring block, pitot cover, tailpipe cover - STOWED.
3. Seat and pedals - ADJUSTED.
4. Safety belt and shoulder harness - FASTEN.
5. Shoulder harness lock - CHECK.
6. Cyclic, pitch, pedals - CHECK.
7. Circuit breakers - CHECK.
8. Electrical switches - OFF.
9. Inverter - OFF.
10. Battery - OFF.
11. Instruments, static position - CHECK.
12. Compass slaving - IN.
13. ALTIMETER - SET.
14. Clock - SET.
15. Force trim - ON.
16. Fuel Main ON - OFF switch - OFF.
17. Fuel Start ON - OFF switch - OFF.
18. OIL VALVE - OPEN.
19. Fuel Transfer Pump - OFF.
B 20. Hot Air Valve - OFF.
21. Hydraulic boost switch - ON.
22. Radio equipment - OFF.

INTERIOR CHECK (NIGHT FLIGHTS).

1. Cockpit lights - CHECK.
2. Instrument lights - CHECK.
3. Dome lights - CHECK.
4. Navigation lights - CHECK.
5. Anti-collision light - CHECK.
6. Landing and search lights - CHECK.
7. Flashlight - CHECK.

A ENGINE PRE-START CHECK.

1. Collective - DOWN and LOCKED.
2. Ignition and starter circuit breakers - IN.
3. Inverter switch - SPARE.
4. Battery switch - ON (OFF for APU start).
5. Starter generator - START position.
6. Fire warning light - CHECK.
7. Fuel gage - CHECK.
8. Caution panel warning light - CHECK.
9. Fuel valve - OPEN.
10. Fuel boost pump - ON (if applicable).
11. Oil valve - OPEN.
12. Governor - AUTO.
13. RPM Incr-Decr switch - DECREASE.
14. Throttle - CLOSED.
15. Cyclic - CENTERED.

Note

A minimum of 24 volts is required for battery start.

B ENGINE PRE-START CHECK.

1. Collective - DOWN and LOCKED.
2. Throttle - CLOSED.
3. Ignition System - IGNITOR SOL circuit breaker - IN.
4. Starter relay circuit breaker - IN.
5. Inverter - MAIN.
6. Battery - ON (OFF for APU start).
7. Starter generator - START position.
8. Main generator - ON.
9. Fire warning light - CHECK.
10. Fuel gage - CHECK.
11. Caution panel warning LT - CHECK.
12. Force trim - ON.
13. Cyclic - CENTERED.

Note

A minimum of 24 volts is required for battery start.

A ENGINE STARTING.

1. Fire guard - POSTED.
2. Rotor blades - CLEAR.
3. Throttle - FLIGHT IDLE.
4. Fuel valve - OPEN.
5. Fuel boost pump - ON (if applicable).
6. Governor - AUTO.
7. Oil valve - OPEN.
8. RPM Incr-Decr switch - DECREASE to MINIMUM rpm.
9. Starter - Ignition switch - Pull ON and HOLD.
10. Starter - Ignition switch - Release at 28% rpm gas producer speed or 400°C/ EGT whichever occurs first.
11. Main generator - ON.
12. Starter - generator switch - STANDBY after main GEN is activated.
13. Fuel boost pump switch - OFF approximately 30 seconds, then ON.

B ENGINE STARTING.

1. Fire Guard - POSTED.
2. Rotor Blades - CLEAR.
3. Battery - ON (OFF for APU Start).
4. Fuel MAIN ON-OFF Switch - ON.
5. Fuel START ON-OFF Switch - ON.
6. Governor - AUTO.
7. Throttle - FLIGHT IDLE position, then back off 5° to 10° to decrease side of detent for abort starting purposes.
8. RPM INCR-DECR Switch - DECREASE and HOLD to MINIMUM RPM position.
9. Energize Starter, Starting Fuel and Ignition Spark Simultaneously. (Pull Starter Switch and Hold.)
10. Fuel START ON-OFF Switch - OFF at 25% nI Speed, or 400°C E.G.T., whichever occurs first.
11. Release Starter Switch at 35% to 42% nI speed.

CAUTION

In extreme ambient temperature conditions, desirable starts will be made by following the above procedure, with the exception that starting fuel may be cut off at the following speeds:

23% nI (Minimum) at very high ambient temperatures.

28% nI (Maximum) at very low ambient temperatures.

CAUTION

In the event of a hot aborted start, shut off fuel by closing throttle, continue to energize starter, and motor the engine until temperature drops to an acceptable level.

12. Starter-Generator Switch - STANDBY. After main generator is activated.
13. Fuel START ON-OFF Switch - ON.

ENGINE RUN UP.

1. Engine Speed, 56% to 58% RPM.
2. Oil Pressure - Minimum 25 PSI.
3. Engine Tachometer - Note Reading.
4. Engine Oil Temperature -

A 88°C MAXIMUM
B 93°C MAXIMUM

5. Radio - ON.
6. Headset - ON.
7. AC Phase Selector - CHECK.
8. Slowly accelerate and note Exhaust Temperature, Oil Pressure and Torquemeter
9. Throttle - FULL OPEN.
10. E.G.T. - Allowable Range.

A 385°C to 570°C
B-5 385°C to 610°C
B-9 390°C to 638°C
B-11 390°C to 638°C

11. Engine and Xmsn Instruments - Check within allowable limits.

A Engine Oil Press., 60 to 80 PSI.
Engine Oil Temp., 88°C MAX.
Xmsn Oil Press., 40 to 60 PSI.
Xmsn Oil Temp., 110°C MAX.

B Engine Oil Press., 60 to 80 PSI.
Engine Oil Temp., 93°C MAX.
Xmsn Oil Press., 50 plus or minus 5 PSI.
Xmsn Oil Temp., 110°C MAX.

12. Torquemeter - Check for indication.
13. DC Voltmeter - Approximately 28.0 volts.

14. Engine Fuel System Check - Throttle. FLIGHT IDLE, place governor switch in EMERgency position and observe gas producer deceleration. Switch back to AUTOmatic and check for increase to original RPM.

15. RPM INCR-DECR Switch - Check through range -

A 5800 to 6700 rpm plus or minus 50 rpm set at 6400 rpm

B 6000 to 6700 rpm plus or minus 50 rpm

16. Hydraulic Servo Control Switch - OFF. Check controls, then ON.
17. Force Trim - OFF. Check controls, then ON.

BEFORE TAKE-OFF.

1. Collective - MINIMUM pitch, adjust friction.
2. Cyclic - Neutral or slightly into wind.

B Adjust friction.

3. Flight instruments - CHECK.
4. Pitot heater - ON if required.
5. Cabin heater - As required.
6. Throttle - FULL OPEN.

7. Tachometer - CHECK synchronization of needles.
8. Engine oil pressure -

A 60 to 80 psi.
B-5 60 to 80 psi.
B9/11 60 to 80 psi.

9. Engine oil temperature -

A 88°C MAXIMUM.
B 93°C MAXIMUM.

10. XMSN oil pressure -

A 40 to 60 psi.
B 45 to 55 psi.

11. XMSN oil temp - 110°C MAXIMUM.
12. Fuel pressure:

A 5 to 20 psi.
B-5 Approximately 13 psi.
B9/11 Approximately 20 psi.

ENGINE FAILURE.

1. Collective Pitch Control - Adjust as required to maintain rotor RPM.

Note

Rotor RPM, when maintained at the high end of the operating range, will provide maximum rotor energy to accomplish the landing.

2. Establish an autorotative glide at minimum airspeed of 55 knots for less than 7500 pounds gross weight to 60 knots for gross weights above 7500 pounds.
3. Execute a flare by application of aft cyclic control at an altitude of 35 to 45 feet, dependent on gross weight, to reduce rate of descent and forward speed.
4. At an altitude of ten (10) feet above surface, level flare sufficiently to allow helicopter to land in a near level attitude.
5. At about four feet above surface, increase collective pitch to cushion landing.

ENGINE RESTART DURING FLIGHT.

CAUTION

When cause of engine failure is obviously mechanical, DO NOT attempt an engine restart.

1. Establish an autorotative glide.
2. Throttle - CLOSED.
3. GOVernor Switch - EMERGency.
4. Starter-Generator Switch - START position.

A 5. Fuel Boost Pump Switch - ON.

A Fuel Valve Switch - OPEN.

B Fuel START ON-OFF Switch - START ON.

B Fuel MAIN ON-OFF Switch - ON

6. Battery Switch - ON.
7. Starter-Ignition Switch - PULL and HOLD and simultaneously open throttle slowly to supply sufficient fuel for start.

ENGINE RESTART DURING FLIGHT Cont.

CAUTION

Monitor exhaust gas temperature to avoid a hot start.

8. Gas producer tachometer - Observe for engine start indication.
9. B Fuel START ON-OFF Switch - OFF at 400°C E.G.T.
10. Starter Switch - Release at 35% to 42% RPM nI Speed.
11. Fuel Pressure - Check within operating limits.
12. Starter-Generator Switch - STANDBY position.

ENGINE FIRE DURING STARTING.

1. Throttle - CLOSE, continue to crank engine.

A 2. Fuel boost pump switch - OFF.

A Fuel valve switch - CLOSE.

B Fuel Main ON-OFF switch - OFF.

3. Battery switch - OFF.

ENGINE FIRE IN FLIGHT.

1. Throttle - CLOSED.
2. Enter autorotation.

A 3. Fuel boost pump switch - OFF.

A Fuel valve switch - CLOSE.

B Fuel Main ON-OFF switch - OFF.

4. Battery switch - OFF.
5. Generator switch - OFF.
6. Shoulder harness - LOCK.
7. Autorotative descent and landing.

FUSELAGE FIRE.

1. Airspeed - REDUCE.
2. Doors and windows - OPEN.
3. Battery switch - OFF.
4. Generator switch - OFF.
5. Land - Use fire extinguisher.

ELECTRICAL FIRE.

1. Instruments - CHECK.
2. Battery and Generator Switches - OFF.
3. Shoulder Harness - LOCK.
4. Land as soon as practicable.

SMOKE ELIMINATION.

1. Windows - OPEN.
2. Cabin ventilators - OPEN.
3. Cargo doors - OPEN.

BAIL OUT.

1. Warn passengers and radio position.
2. Reduce airspeed to approximately 20 knots to jettison doors.
3. Release jettisonable doors and slide cargo doors open, as required.
4. Set controls to establish CRUISE forward speed, nose slightly down flight attitude.
5. Bail out when ready through nearest exit.

HELICOPTER FUEL BOOST PUMP FAILURE.

A
1. If altitude permits, descend to pressure altitude of 4600 feet or less.
2. Fuel boost pump switch - ON.
3. Fuel Valve Switch - ON.
4. Fuel, oil valve and fuel pump circuit breakers - IN.
5. Attempt, if necessary, ENGINE RESTART DURING FLIGHT.
6. If trouble is not corrected, follow ENGINE FAILURE procedure.

Note

UH-1B helicopters are equipped with two separate fuel boost pumps, either one is capable of sustaining normal flight. Upon landing, however, both pumps should be put in working condition before new flight.

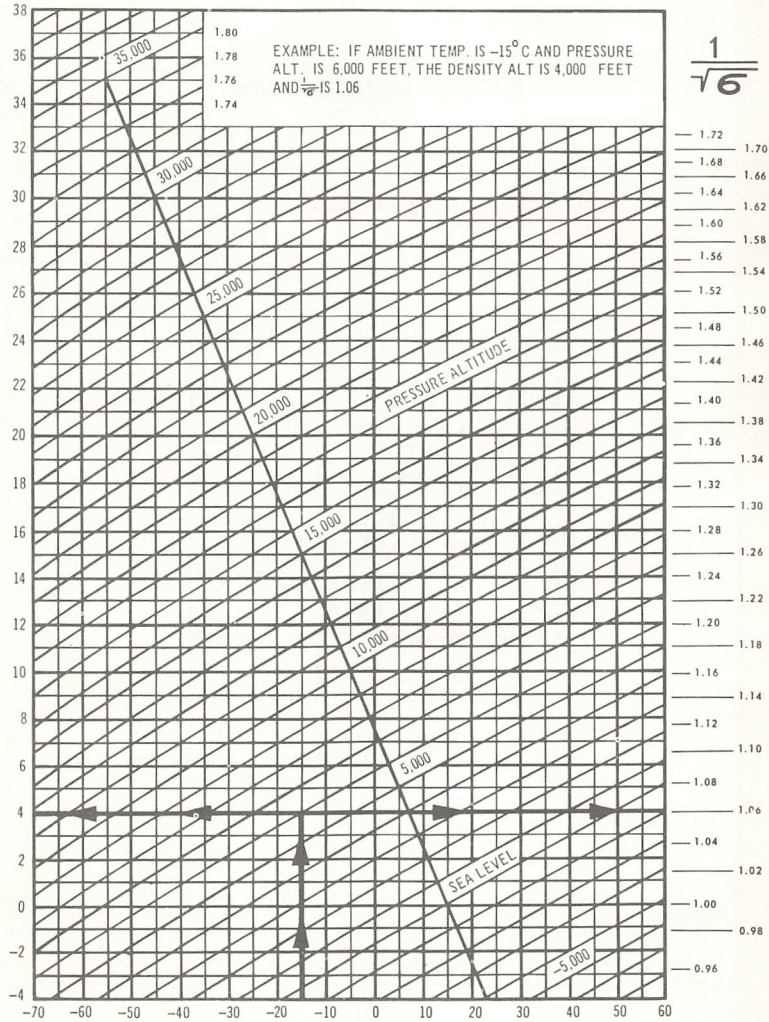
ENGINE FUEL CONTROL MALFUNCTION.

Malfunction of the engine fuel control unit will be evident by an abnormal change in rpm or power, due to the lack of fuel or feeding too much fuel into the engine. In the event of a control unit malfunction, proceed as follows:

1. Collective - Down to maintain rotor RPM.
2. Throttle - RETARD to FLIGHT IDLE.
3. Governor Switch - EMERGency position.
4. Throttle - ADVANCE slowly and firmly to obtain engine operating rpm.

WARNING

When operating on the EMERGENCY fuel system, the throttle must be manually adjusted to maintain engine rpm. Throttle movement shall be performed at a slow rate to minimize the possibility of flameout or compressor stall.


EXAMPLE: IF AMBIENT TEMP. IS −15° C AND PRESSURE ALT. IS 6,000 FEET, THE DENSITY ALT IS 4,000 FEET AND $\frac{1}{\sqrt{\sigma}}$ IS 1.06
$\frac{1}{\sqrt{\sigma}}$
PRESSURE ALTITUDE
35,000
30,000
25,000
20,000
15,000
10,000
5,000
SEA LEVEL
−5,000
1.80
1.78
1.76
1.74
1.72
1.70
1.68
1.66
1.64
1.62
1.60
1.58
1.56
1.54
1.52
1.50
1.48
1.46
1.44
1.42
1.40
1.38
1.36
1.34
1.32
1.30
1.28
1.26
1.24
1.22
1.20
1.18
1.16
1.14
1.12
1.10
1.08
1.06
1.04
1.02
1.00
0.98
0.96
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
−2
−4
−70
−60
−50
−40
−30
−20
−10
0
10
20
30
40
50
60
DENSITY ALTITUDE - 1000 FT
TEMPERATURE - °C

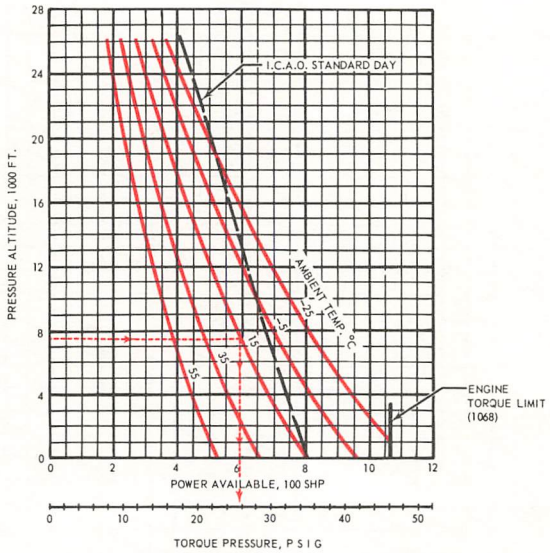
ENGINE OPERATING LIMITS

NORMAL POWER

B-5

ARMY MODEL(S): UH-1B
DATA AS OF: September 1962
DATA BASIS: Calculated from Lycoming Engine Specification No. 104.16-B, Dated 10 December 1959

ENGINE: LYCOMING T53-L-5
ENGINE SPEED: 6600 RPM
FUEL GRADE: JP-4
FUEL DENSITY: 6.5 Lbs/Gal.



REMARKS:

Data does not include ram, and has been corrected for the 2°C inlet temperature rise noted in FTC-TDR-62-21, "YUH-1B Category II Performance Tests". Hovering in ground effect (IGE) other than during transient conditions will reduce power available.

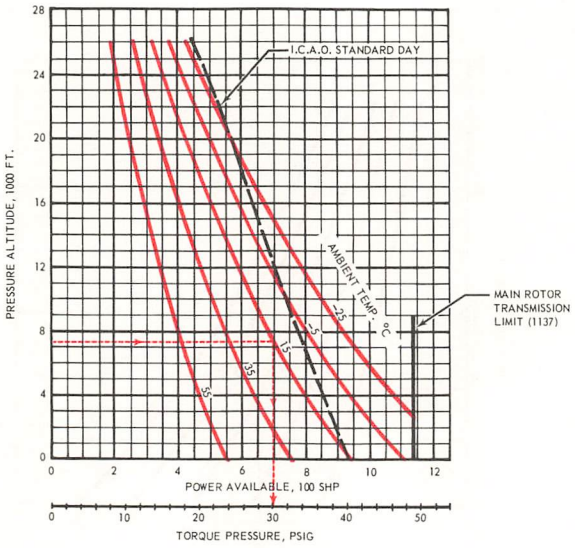
ENGINE OPERATING LIMITS

B-5

TAKE-OFF POWER

ARMY MODEL(S): UH-1B
DATA AS OF: September 1962
DATA BASIS: Calculated from Lycoming Engine Specification No. 104.16-B, Dated 10 December 1959

ENGINE: LYCOMING T53-L-5
ENGINE SPEED: 6600 RPM
FUEL GRADE: JP-4
FUEL DENSITY: 6.5 Lbs/Gal.



REMARKS:

Data does not include ram, and has been corrected for the 2°C inlet temperature rise noted in FTC-TDR-62-21, "YUH-1B category II performance Tests". Hovering in ground effect (IGE) other than during transient conditions will reduce power available.

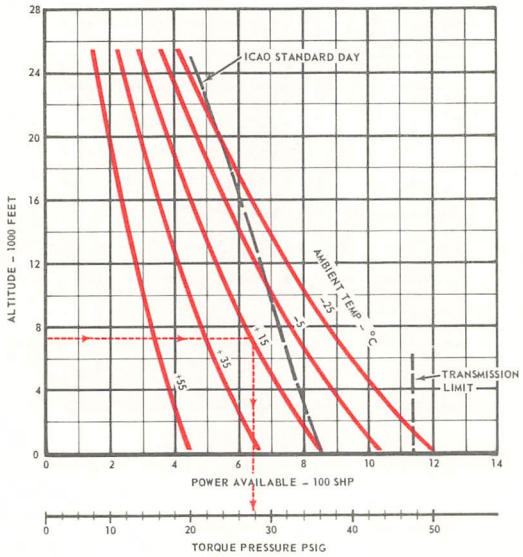
ENGINE OPERATING LIMITS

B-5

TAKE-OFF POWER AVAILABLE
10°C INLET TEMPERATURE RISE

ARMY MODEL(S): UH-1B
DATA AS OF: September 1962
DATA BASIS: Calculated from Lycoming Engine Specification No. 104.16-B

ENGINE: Lycoming T53-L-5
ENGINE SPEED: 6600 RPM
FUEL GRADE: JP-4
FUEL DENSITY: 6.5 Lbs/Gal.



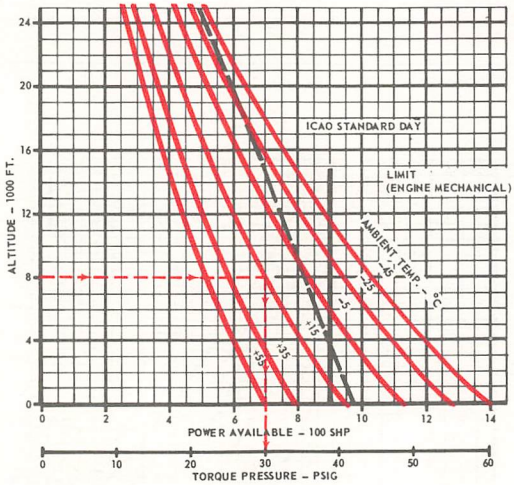
REMARKS:

ENGINE OPERATING LIMITS

NORMAL POWER AVAILABLE
2°C INLET TEMPERATURE RISE

ARMY MODEL(S): UH-1B
DATA AS OF: SEPTEMBER 1962
DATA BASIS: CALCULATED FROM FTC-TDR-62-21 "YUH-1B CATAGORY II PERFORMANCE TESTS" AND LYCOMING ENGINE SPECIFICATION NO. 104.28

ENGINES: T53-L-9/9A/11
ENGINE RPM: 6600
FUEL GRADE: JP-4
FUEL DENSITY: 6.5 LBS/GAL.



REMARKS:

B9/11

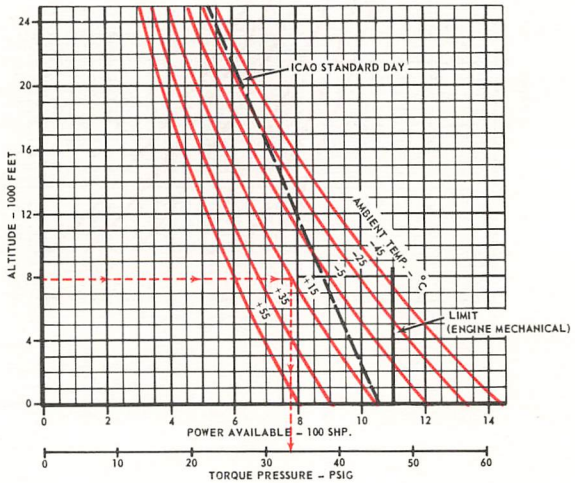
ENGINE OPERATING LIMITS

B9/11

TAKE-OFF POWER AVAILABLE
2°C INLET TEMPERATURE RISE

ARMY MODEL(S): UH-1B
DATA AS OF: SEPTEMBER 1962
DATA BASIS: CALCULATED FROM FTC-TDR-62-21 "YHU-1B CATAGORY II PERFORMANCE TESTS" AND LYCOMING ENGINE SPECIFICATION NO. 104.22B (1) & 104.28

ENGINES: T53-L-9/9A/11
ENGINE RPM: 6600
FUEL GRADE: JP-4
FUEL DENSITY: 6.5 LBS/GAL.



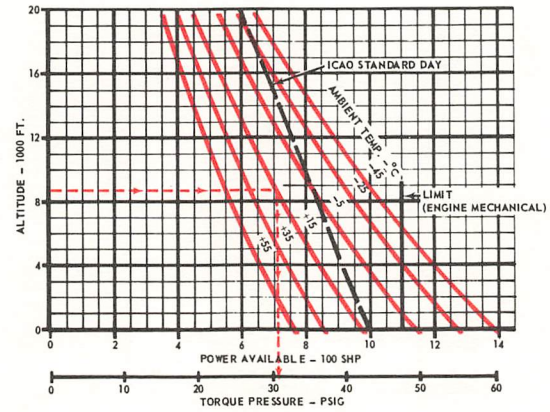
REMARKS:

ENGINE OPERATING LIMITS

TAKE-OFF POWER AVAILABLE
10°C INLET TEMPERATURE RISE

ARMY MODEL(S): UH-1B
DATA AS OF: SEPTEMBER 1962
DATA BASIS: CALCULATED FROM FTC-TDR-62-21 "YUH-1B CATAGORY II PERFORMANCE TESTS" AND LYCOMING ENGINE SPECIFICATION NO. 104.28

ENGINES: T53-L-9/9A/11
ENGINE RPM: 6600
FUEL GRADE: JP-4
FUEL DENSITY: 6.5 LBS/GAL.



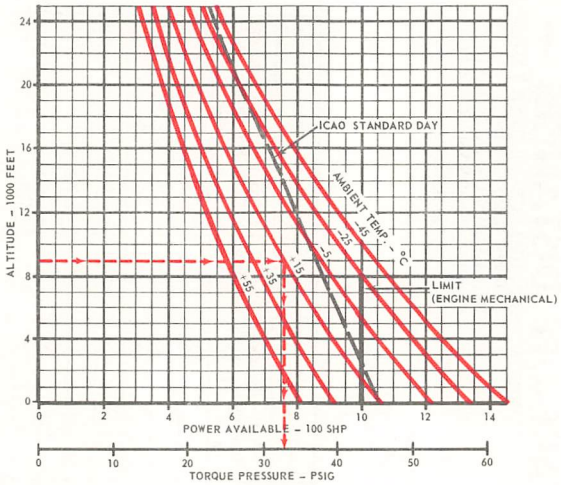
REMARKS:

ENGINE OPERATING LIMITS

MILITARY POWER AVAILABLE
2°C INLET TEMPERATURE RISE

ARMY MODEL(S): UH-1B
DATA AS OF: SEPTEMBER 1962
DATA BASIS: CALCULATED FROM FTC-TDR-62-21 "YUH-1B CATAGORY II PERFORMANCE TESTS" AND LYCOMING ENGINE SPECIFICATION NO. 104.28

ENGINES: T53-L-9/9A/11
ENGINE RPM: 6600
FUEL GRADE: JP-4
FUEL DENSITY: 6.5 LBS/GAL.



REMARKS:

TAKE-OFF DISTANCES — FEET

A

MAXIMUM PERFORMANCE - HOVER TECHNIQUE
FIRM DRY SOD
MAXIMUM POWER - NO WIND
CONFIGURATION: CLEAN
6400 RPM

MODEL(S): UH-1A
DATA AS OF: January 1961
DATA BASIS: AFFTC Phase IV
Flight Test of YH-40

ENGINE: Lycoming T53-L-1A
FUEL GRADE: JP-4
FUEL DENSITY: 6.5 LB/GAL

GROSS WEIGHT LB	CLIMB OUT CAS KTS.	PRESSURE ALTITUDE 1000 FEET	−25°C (−13°F)		−5°C (+23°F)		+15°C (+59°F)		+35°C (+95°F)		+55°C (+131°F)	
			ACCEL-ERATING RUN	CLEAR 50′	ACCEL-ERATING RUN	CLEAR 50′	ACCEL-ERATING RUN	CLEAR 50′	ACCEL-ERATING RUN	CLEAR 50′	ACCEL-ERATING RUN	CLEAR 50′
5800	28	SL	0	0	0	0	0	0	0	0		630
	-	2,000	0	0	0	0	0	0	0	0	-	-
	26	4,000	0	0	0	0	0	0		515	-	-
	-	6,000	0	0	0	0	0	0	-	-	-	-
	24	8,000	0	0	0	0		415	-	-	-	-
	-	10,000	0	0	0	0	-	-	-	-	-	-
	23	12,000	0	0		410	-	-	-	-	-	-
	-	14,000	0	0	-	-	-	-	-	-	-	-
	24	16,000		670	-	-	-	-	-	-	-	-

6100	-	SL	0	0	0	0	0	0	0	0	-	-
	26	2,000	0	0	0	0	0	0		430	-	-
	-	4,000	0	0	0	0	0	0	-	-	-	-
	23	6,000	0	0	0	0		345	-	-	-	-
	26	8,000	0	0	0	0		615	-	-	-	-
	21	10,000	0	0		325	-	-	-	-	-	-
	25	12,000	0	0		760	-	-	-	-	-	-
	24	14,000		460	-	-	-	-	-	-	-	-
6600	28	SL	0	0	0	0	0	0		440	-	-
	-	2,000	0	0	0	0	0	0	-	-	-	-
	24	4,000	0	0	0	0	-	350	-	-	-	-
	27	6,000	0	0	0	0		630	-	-	-	-
	22	8,000	0	0		325	-	-	-	-	-	-
	26	10,000	0	0		760	-	-	-	-	-	-
	25	12,000		460	-	-	-	-	-	-	-	-
	-	14,000	-	-	-	-	-	-	-	-	-	-
	-	16,000	-	-	-	-	-	-	-	-	-	-

REMARKS: (1) No take-off distance is shown where 300 ft/min rate of climb is not possible where hovering in ground effect (skid height = 2.0 ft) is not possible.

(2) No accelerating run distance are shown since the take-off distances are based on flight test and no accelerating-run distances were determined.

TAKE-OFF DISTANCES — FEET

B-5

MAXIMUM PERFORMANCE - TWO FEET SKID HEIGHT HOVERING TECHNIQUE

TAKE-OFF POWER - 6600 RPM

ARMY MODEL(S) UH-1B
DATA AS OF: September 1962
DATA BASIS: Flight Test (FTC-TDR-62-21, "YUH-1B Catagory II Performance Test") and Lycoming Engine Specification No. 104.16-B

ENGINE: Lycoming T53-L-5
FUEL GRADE: JP-4
FUEL DENSITY: 6.5 Lb/Gal.

GROSS WEIGHT LB	PRESSURE ALTITUDE 1000 FEET	−25°C (−13°F)		−5°C (+23°F)		+15°C (+59°F)		+35°C (+95°F)		+55°C (+131°F)	
		CLIMB OUT SPEED TAS KNOTS	DISTANCE TO CLEAR 50'	CLIMB OUT SPEED TAS KNOTS	DISTANCE TO CLEAR 50'	CLIMB OUT SPEED TAS KNOTS	DISTANCE TO CLEAR 50'	CLIMB OUT SPEED TAS KNOTS	DISTANCE TO CLEAR 50'	CLIMB OUT SPEED TAS KNOTS	DISTANCE TO CLEAR 50'
7000	SL	0	0	0	0	0	0	20	363	-	-
	2	0	0	0	0	0	0	24	558	-	-
	4	0	0	0	0	0	0	-	-	-	-
	6	0	0	0	0	20	348	-	-	-	-
	8	0	0	20	246	-	-	-	-	-	-
	10	0	0	20	346	-	-	-	-	-	-
	12	20	261	-	-	-	-	-	-	-	-
	14	20	404	-	-	-	-	-	-	-	-
	16	-	-	-	-	-	-	-	-	-	-
	18	-	-	-	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-	-	-	-

7500	SL	0	0	0	0	0	0	23	507	-	-
	2	0	0	0	0	0	0	-	-	-	-
	4	0	0	0	0	20	328	-	-	-	-
	6	0	0	20	239	26	640	-	-	-	-
	8	0	0	20	329	-	-	-	-	-	-
	10	20	253	-	-	-	-	-	-	-	-
	12	20	382	-	-	-	-	-	-	-	-
	14	-	-	-	-	-	-	-	-	-	-
	16	-	-	-	-	-	-	-	-	-	-
	18	-	-	-	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-	-	-	-

REMARKS:

1. No wind.
2. No take-off distance is shown where hovering in ground effect (skid height = 2 foot) is not possible.
*3. Possible to hover in ground effect, but flight test data indicates take-off distance would exceed 1000 feet.
4. Speed over the 50 foot obstacle is in true airspeed (TAS) because values of indicated airspeed (IAS) below 20 knots may not be reliable.
5. Take-off distances will exceed those shown if hovering in ground effect is performed for over one minute immediately prior to take-off.
6. Take-off distance is zero when hovering out of ground effect is possible.

B9/11

TAKE-OFF DISTANCES — FEET

B9/11

MAXIMUM PERFORMANCE - HOVERING TECHNIQUE - TWO FOOT SKID HEIGHT

TAKE-OFF POWER - 6600 ENGINE RPM

ARMY MODEL(S) UH-1B
DATA AS OF: SEPTEMBER, 1962
DATA BASIS: FLIGHT TESTS (FTC-TDR-62-21, "YUH-1B CATEGORY II PERFORMANCE TESTS") AND LYCOMING ENGINE SPECIFICATION NO. 104.22B (1) & 104.28

ENGINE(S): LYCOMING T53-L-9/9A/11
FUEL GRADE JP-4
FUEL DENSITY: 6.5 LB/GAL.

GROSS WEIGHT LB	PRESSURE ALTITUDE 1000 FEET	−25°C (−13°F)		−5°C (+23°F)		+15°C (+59°F)		+35°C (+95°F)		+55°C (+131°F)	
		CLIMB OUT SPEED TAS KNOTS	DISTANCE TO CLEAR 50'	CLIMB OUT SPEED TAS KNOTS	DISTANCE TO CLEAR 50'	CLIMB OUT SPEED TAS KNOTS	DISTANCE TO CLEAR 50'	CLIMB OUT SPEED TAS KNOTS	DISTANCE TO CLEAR 50'	CLIMB OUT SPEED TAS KNOTS	DISTANCE TO CLEAR 50'
7000	SL	0	0	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0	20	311
	4	0	0	0	0	0	0	20	258	22	471
	6	0	0	0	0	0	0	20	355	-	-
	8	0	0	0	0	20	256	-	-	-	-
	10	0	0	0	0	20	394	-	-	-	-
	12	0	0	20	276	-	-	-	-	-	-
	14	20	256	26	655	-	-	-	-	-	-
	16	23	513	-	-	-	-	-	-	-	-
	18	-	-	-	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-	-	-	-

7500	SL	0	0	0	0	0	0	20	211	20	311
	2	0	0	0	0	0	0	20	252	22	471
	4	0	0	0	0	0	0	20	345	-	-
	6	0	0	0	0	20	256	-	-	-	-
	8	0	0	0	0	20	355	-	-	-	-
	10	0	0	20	267	-	-	-	-	-	-
	12	20	239	22	485	-	-	-	-	-	-
	14	20	426	-	-	-	-	-	-	-	-
	16	-	-	-	-	-	-	-	-	-	-
	18	-	-	-	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-	-	-	-

REMARKS:

1. No wind.
2. Take-off distance is zero when hovering out-of-ground effect is possible.
3. No take-off distance is shown where hovering at 2 foot skid height is not possible.
4. Take-off distance will exceed those shown if hovering in-ground effect is performed for over one minute immediately prior to take-off.
5. Speed over the 50 foot obstacle is in true airspeed (TAS) because values of indicated airspeed (IAS) below 20 knots may not be reliable.

LANDING DISTANCE - FEET

POWER ON

A

MODEL(S): UH-1A
DATA AS OF: February 1961
DATA BASIS: AFFTC Phase IV Flight Test of YH-40

FIRM DRY SOD
No Wind - Engine RPM 6400

ENGINE: Lycoming T53-L-1A
FUEL GRADE: JP-4
FUEL DENSITY: 6.5 LB/GAL
CONFIGURATION: CLEAN

GROSS WEIGHT LB	PRESSURE ALTITUDE	BEST IAS APPROACH		−25°C (−13°F)		−5°C (+23°F)		+15°C (+59°F)		+35°C (+95°F)		+55°C (+131°F)	
		M.P.H.	KN	GROUND ROLL	CLEAR 50′	GROUND ROLL	CLEAR 50′	GROUND ROLL	CLEAR 50′	GROUND ROLL	CLEAR 50′	GROUND ROLL	CLEAR 50′
5800	SL		55	0	0	0	0	0	0	0	0	20	346
	2,000		55	0	0	0	0	0	0	0	328	20	350
	4,000		54	0	0	0	0	0	0	0	329	20	335
	6,000		52	0	0	0	0	0	328	20	330	20	286
	8,000		49	0	0	0	0	0	306	20	272	20	201
	10,000		48	0	0	0	302	20	263	20	184		
	12,000		45	0	0	0	235	20	173				
	14,000		42	0	233	20	166						
	16,000		39	0	142								

6100	SL		56	0	0	0	0	0	0	0	324	20	350
	2,000		56	0	0	0	0	0	0	0	330	20	343
	4,000		55	0	0	0	0	0	330	20	340	20	306
	6,000		50	0	0	0	0	0	317	20	296	20	230
	8,000		48	0	0	0	0	0	269	20	215	20	147
	10,000		46	0	0	0	264	20	204	20	134		
	12,000		43	0	264	20	197	20	162				
	14,000		43	0	175								
	16,000												
6600	SL		58	0	0	0	0	0	0	0	330	20	341
	2,000		56	0	0	0	0	0	330	20	338	20	302
	4,000		54	0	0	0	0	0	316	20	293	20	225
	6,000		50	0	0	0	0	0	266	20	212	20	143
	8,000		48	0	0	0	262	20	202	20	145		
	10,000		48	0	262	20	197						
	12,000		45	0	177								
	14,000												
	16,000												

REMARKS: (1) IAS are average values for air temperatures shown & represent velocity over 50 ft. obstacle.
(2) Ground run limited to 20 ft. by skid gear.
(3) Ground roll distances are given as zero when this helicopter can hover either in or out of ground effect at 6400 RPM.

LANDING DISTANCE - FEET

B-5

POWER ON

ENGINE SPEED - 6600 RPM

ARMY MODEL(S): UH-1B
DATA AS OF: September 1962
DATA BASIS: Flight Test (FTC-TDR-62-21 "YUH-1B Category II Performance Test") and Lycoming Engine Specification No. 104.16B

ENGINE: Lycoming T53-L-5
FUEL GRADE: JP-4
FUEL DENSITY: 6.5 Lb/Gal.

GROSS WEIGHT LB	PRESSURE ALTITUDE	−25°C (−13°F)		−5°C (+23°F)		+15°C (+59°F)		+35°C (+95°F)		+55°C (+131°F)	
		BEST APPROACH TAS KNOTS	DISTANCE AFTER CLEARING 50'	BEST APPROACH TAS KNOTS	DISTANCE AFTER CLEARING 50'	BEST APPROACH TAS KNOTS	DISTANCE AFTER CLEARING 50'	BEST APPROACH TAS KNOTS	DISTANCE AFTER CLEARING 50'	BEST APPROACH TAS KNOTS	DISTANCE AFTER CLEARING 50'
7000	SL	0	0	0	0	0	0	9	11	28	141*
	2,000	0	0	0	0	0	0	17	40	34	191*
	4,000	0	0	0	0	0	0	23	103*	-	-
	6,000	0	0	0	0	15	33	29	144*	-	-
	8,000	0	0	5	4	22	98*	-	-	-	-
	10,000	0	0	18	46	28	141*	-	-	-	-
	12,000	13	24	25	114*	-	-	-	-	-	-
	14,000	22	67	-	-	-	-	-	-	-	-
	16,000	29	151*	-	-	-	-	-	-	-	-
	18,000	-	-	-	-	-	-	-	-	-	-
	20,000	-	-	-	-	-	-	-	-	-	-

7500	SL	0	0	0	0	0	0	16	39	34	200*
	2,000	0	0	0	0	0	0	22	103	-	-
	4,000	0	0	0	0	14	31	28	146*	-	-
	6,000	0	0	0	0	22	70	-	-	-	-
	8,000	0	0	17	43	28	144*	-	-	-	-
	10,000	12	22	24	118*	-	-	-	-	-	-
	12,000	21	66	31	171*	-	-	-	-	-	-
	14,000	28	148*	-	-	-	-	-	-	-	-
	16,000	-	-	-	-	-	-	-	-	-	-
	18,000	-	-	-	-	-	-	-	-	-	-
	20,000	-	-	-	-	-	-	-	-	-	-

REMARKS: 1. No wind.

2. Distances to clear 50 ft. are given as zero when the helicopter can hover out-of-ground effect. When the helicopter cannot hover out-of-ground effect minimum possible distances and speeds to clear a 50 ft. obstacle are given. These are minimum values and require good pilot technique for a normal landing, the distance and speeds given for power off landings will provide safer operation within the height - Velocity diagram for the helicopter.

*3. Landing distance includes a 30 foot estimated skid distance where it is not possible to hover at a 2 foot skid height.

4. Speed over the 50 foot obstacle is in true airspeed (TAS) because values of indicated airspeed (IAS) below 20 knots may not be reliable.

5. Landing distance not shown above 20,000 feet or cruise ceiling.

B9/11

LANDING DISTANCE - FEET

B9/11

POWER ON

ARMY MODEL(S): UH-1B
DATA AS OF: SEPTEMBER, 1962
DATA BASIS: FLIGHT TESTS (FTC-TDR-62-21, "YUH-1B CATEGORY II PERFORMANCE TESTS") AND LYCOMING ENGINE SPECIFICATION NO. 104.22B (1) & 104.28

6600 RPM

ENGINE(S): LYCOMING T53-L-9/9A/11
FUEL GRADE: JP-4
FUEL DENSITY: 6.5 LB/GAL.

GROSS WEIGHT LB	PRESSURE ALTITUDE	−25°C (−13°F)		−5°C (+23°F)		+15°C (+59°F)		+35°C (+95°F)		+55°C (+131°F)	
		BEST APPROACH TAS KNOTS	DISTANCE AFTER CLEARING 50'	BEST APPROACH TAS KNOTS	DISTANCE AFTER CLEARING 50'	BEST APPROACH TAS KNOTS	DISTANCE AFTER CLEARING 50'	BEST APPROACH TAS KNOTS	DISTANCE AFTER CLEARING 50'	BEST APPROACH TAS KNOTS	DISTANCE AFTER CLEARING 50'
7000	SL	0	0	0	0	0	0	0	0	0	0
	2000	0	0	0	0	0	0	0	0	12	20
	4000	0	0	0	0	0	0	7	7	20	56
	6000	0	0	0	0	0	0	18	46	26	125*
	8000	0	0	0	0	12	21	24	113*	-	-
	10000	0	0	0	0	22	65	-	-	-	-
	12000	0	0	18	43	-	-	-	-	-	-
	14000	16	36	26	122*	-	-	-	-	-	-
	16000	28	89	-	-	-	-	-	-	-	-
	18000	-	-	-	-	-	-	-	-	-	-
	20000	-	-	-	-	-	-	-	-	-	-

7500	SL	0	0	0	0	0	0	0	0	12	21
	2000	0	0	0	0	0	0	3	1	20	59
	4000	0	0	0	0	0	0	18	48	26	129*
	6000	0	0	0	0	12	22	24	116*	-	-
	8000	0	0	0	0	21	64	-	-	-	-
	10000	0	0	17	41	28	145*	-	-	-	-
	12000	14	30	25	91	-	-	-	-	-	-
	14000	24	87	-	-	-	-	-	-	-	-
	16000	-	-	-	-	-	-	-	-	-	-
	18000	-	-	-	-	-	-	-	-	-	-
	20000	-	-	-	-	-	-	-	-	-	-

REMARKS:
1. No wind.
2. Distances to clear 50 feet are given as zero when the helicopter can hover O.G.E. When the helicopter cannot hover O.G.E., minimum possible distances and speeds to clear a 50 foot obstacle are given. These are minimum values and require good pilot technique. For a normal landing, the distances and speeds given for power off landings will provide safer operation, within the height-velocity diagram for the helicopter.

*3. Landing distance includes a 30 foot estimated skid distance where it is not possible to hover at a 2 foot skid height.

4. Speed over the 50 foot obstacle is in true airspeed (TAS) because values of indicated airspeed (IAS) below 20 knots may not be reliable.

5. Landing distance not shown above 20,000 feet or cruise ceiling.

LANDING DISTANCE - FEET

A

POWER OFF

MODEL(S): UH-1A
DATA AS OF: February 1961
DATA BASIS: AFFTC Phase IV Flight Test of YH-40

FIRM DRY SOD

ENGINE: Lycoming T53-L-1A
FUEL GRADE: JP-4
FUEL DENSITY: 6.5 LB/GAL
CONFIGURATION: CLEAN

GROSS WEIGHT LB	PRESSURE ALTITUDE	BEST IAS APPROACH		−25°C (−13°F)		−5°C (+23°F)		+15°C (+59°F)		+35°C (+95°F)		+55°C (+131°F)	
		M.P.H.	KN	GROUND ROLL	CLEAR 50′	GROUND ROLL	CLEAR 50′	GROUND ROLL	CLEAR 50′	GROUND ROLL	CLEAR 50′	GROUND ROLL	CLEAR 50′
5800	SL		55	20	293	20	308	20	323	20	336	20	346
	2,000		55	20	307	20	326	20	337	20	348	20	350
	4,000		54	20	322	20	337	20	348	20	349	20	335
	6,000		52	20	337	20	349	20	348	20	330	20	286
	8,000		49	20	349	20	348	20	326	20	272	20	201
	10,000		48	20	348	20	322	20	263	20	184		
	12,000		45	20	322	20	255	20	173				
	14,000		42	20	255	20	166						
	16,000		39	20	162								

6100	SL		56	20	303	20	319	20	333	20	344	20	350
	2,000		56	20	317	20	333	20	346	20	350	20	343
	4,000		55	20	332	20	346	20	350	20	340	20	306
	6,000		50	20	344	20	350	20	337	20	296	20	230
	8,000		48	20	350	20	335	20	289	20	215	20	147
	10,000		46	20	335	20	284	20	204	20	134		
	12,000		43	20	284	20	197	20	162				
	14,000		43	20	195								
	16,000												
6600	SL		58	20	309	20	334	20	346	20	350	20	341
	2,000		56	20	333	20	346	20	350	20	338	20	302
	4,000		54	20	346	20	350	20	336	20	293	20	225
	6,000		50	20	350	20	334	20	286	20	212	20	143
	8,000		48	20	335	20	282	20	202	20	145		
	10,000		48	20	282	20	197						
	12,000		45	20	197								

REMARKS: (1) No wind.
(2) IAS are average values for air temperatures shown and represent velocity over 50 ft obstacle.
(3) Ground run limited to 20 feet by skid gear.

LANDING DISTANCE - FEET

B-5

POWER OFF

ARMY MODEL(S): UH-1B
DATA AS OF: September 1962
DATA BASIS: Flight Test (FTC-TDR-62-21 "YUH-1B Category II Performance Test") and Lycoming Engine Specification No. 104.16-B

ENGINE: Lycoming T53-L-5
FUEL GRADE: JP-4
FUEL DENSITY: 6.5 Lb/Gal.

GROSS WEIGHT LB	PRESSURE ALTITUDE	BEST IAS APPROACH	−25°C (−13°F)		−5°C (+23°F)		+15°C (+59°F)		+35°C (+95°F)		+55°C (+131°F)	
		KNOTS	GROUND ROLL	CLEAR 50′	GROUND ROLL	CLEAR 50′	GROUND ROLL	CLEAR 50′	GROUND ROLL	CLEAR 50′	GROUND ROLL	CLEAR 50′
7000	SL	47	30	463	30	480	30	494	30	511	30	526
	2,000	46	↑	478	↑	494	↑	513	↑	527	30	542
	4,000	45		494		513		531	↓	545	-	-
	6,000	44		511		531		547	30	560	-	-
	8,000	43		529		547	↓	569	-	-	-	-
	10,000	42		549	↓	562	30	565	-	-	-	-
	12,000	41		562	30	563	-	-	-	-	-	-
	14,000	38	↓	563	-	-	-	-	-	-	-	-
	16,000	36	30	549	-	-	-	-	-	-	-	-
	18,000	-	-	-	-	-	-	-	-	-	-	-
	20,000	-	-	-	-	-	-	-	-	-	-	-

7500	SL	48	30	509	30	526	30	545	30	563	30	579
	2,000	47	↑	526	↑	545	↑	565	↕	579	-	-
	4,000	46	|	545	|	565	|	583	30	595	-	-
	6,000	45	|	565	|	583	↓	597	-	-	-	-
	8,000	44	|	583	|	597	30	603	-	-	-	-
	10,000	42	|	597	↓	603	-	-	-	-	-	-
	12,000	40	|	603	30	580	-	-	-	-	-	-
	14,000	37	30	580	-	-	-	-	-	-	-	-
	16,000	-	-	-	-	-	-	-	-	-	-	-
	18,000	-	-	-	-	-	-	-	-	-	-	-
	20,000	-	-	-	-	-	-	-	-	-	-	-

REMARKS:
1. No wind.
2. IAS are representive values for velocity over a 50 ft. obstacle. Best velocity may vary plus or minus three knots.
3. Ground roll limited to 30 feet by skid gear.
4. Landing distance not shown above 20,000 feet or cruise ceiling.
5. Distances are based on limited flight test data.

B9/11

LANDING DISTANCE - FEET

B9/11

POWER OFF

ARMY MODEL(S): UH-1B
DATA AS OF: SEPTEMBER, 1962
DATA BASIS: FLIGHT TESTS (FTC-TDR-62-21, "YUH-1B CATEGORY II PERFORMANCE TESTS") AND LYCOMING ENGINE SPECIFICATION NO. 104.22B (1) & 104.28

ENGINE(S): LYCOMING T-53-L-9/9A/11
FUEL GRADE: JP-4
FUEL DENSITY: 6.5 LB/GAL.

GROSS WEIGHT LB	PRESSURE ALTITUDE	BEST IAS APPROACH	−25°C (−13°F)		−5°C (+23°F)		+15°C (+59°F)		+35°C (+95°F)		+55°C (+131°F)	
		KNOTS	GROUND ROLL	CLEAR 50'	GROUND ROLL	CLEAR 50'	GROUND ROLL	CLEAR 50'	GROUND ROLL	CLEAR 50'	GROUND ROLL	CLEAR 50'
7000	SL	47	30	463	30	480	30	494	30	511	30	526
	2000	46	30	478	30	494	30	513	30	527	30	542
	4000	45	30	494	30	513	30	531	30	545	30	558
	6000	44	30	511	30	531	30	547	30	560	30	564
	8000	43	30	529	30	547	30	560	30	565	-	-
	10000	42	30	549	30	562	30	565	-	-	-	-
	12000	41	30	562	30	563	-	-	-	-	-	-
	14000	38	30	563	30	551	-	-	-	-	-	-
	16000	36	30	549	-	-	-	-	-	-	-	-
	18000	-	-	-	-	-	-	-	-	-	-	-
	20000	-	-	-	-	-	-	-	-	-	-	-

7500	SL	48	30	509	30	526	30	545	30	563	30	579
	2000	47	30	526	30	545	30	565	30	579	30	593
	4000	46	30	545	30	565	30	583	30	595	30	603
	6000	45	30	565	30	583	30	597	30	603	-	-
	8000	44	30	583	30	597	30	603	-	-	-	-
	10000	42	30	597	30	603	30	593	-	-	-	-
	12000	40	30	603	30	580	-	-	-	-	-	-
	14000	37	30	580	-	-	-	-	-	-	-	-
	16000	-	-	-	-	-	-	-	-	-	-	-
	18000	-	-	-	-	-	-	-	-	-	-	-
	20000	-	-	-	-	-	-	-	-	-	-	-

REMARKS:

1. No wind.
2. I.A.S. are representative values for velocity over 50 foot obstacle. Best velocity may vary plus or minus 3 knots.
3. Ground roll limited to 30 foot by skid gear.
4. Landing distance not shown above 20,000 feet or cruise ceiling.
5. Distances are based on limited flight test data.

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