

**FAA APPROVED
R44 II PILOT'S OPERATING HANDBOOK
UKRAINIAN SUPPLEMENT**

This supplement must be included in the FAA-approved Robinson R44 II Pilot's Operating Handbook for Ukrainian-registered aircraft.

The information contained herein supplements or supersedes the basic manual only in those areas listed in this supplement. For limitations, procedures, and performance information not contained in this supplement, consult the basic R44 II Pilot's Operating Handbook.

This supplement is approved by the United States Federal Aviation Administration on behalf of the State Aviation Administration of Ukraine.

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**SECTION 1: GENERAL
INTRODUCTION**

This supplement contains the changes and additional data applicable when the R44 II helicopter is registered in Ukraine.

Ukrainian-registered R44 IIs are equipped with an altimeter calibrated in meters and include an artificial horizon, analogue clock, VHF radio, transponder, and an accessory box for first-aid kit stowage.

SECTION 2: LIMITATIONS

AIRSPEED LIMITATIONS

NEVER-EXCEED AIRSPEED (Vne)

Up to 900 meters density altitude:

2200 lb TOGW & below	130 KIAS
Over 2200 lb TOGW	120 KIAS
Autorotation	100 KIAS

Above 900 meters density altitude: See placard on page 5.

POWERPLANT LIMITATIONS

Manifold Pressure: See placard on page 5 for MAP schedule.

FLIGHT AND MANEUVER LIMITATIONS

Maximum operating density altitude is 4270 meters.

Maximum operating altitude is 2700 meters AGL to allow landing within 5 minutes in case of fire.

Maximum operating pressure altitude without supplemental oxygen is 2400 meters with passengers on board or 3000 meters without passengers. Portable oxygen equipment must be State Aviation Administration of Ukraine-approved.

SECTION 2: LIMITATIONS (Cont'd)

FLIGHT AND MANEUVER LIMITATIONS (Cont'd)

Maximum hover yaw rate is 60 degrees per second.

Flight when surface winds exceed 13 m/s (25 knots), including gusts, is prohibited.

Flight when surface wind gust spreads exceed 8 m/s (15 knots) is prohibited.

Continued flight in moderate, severe, or extreme turbulence is prohibited.

NOTE

Adjust forward airspeed to between 60 KIAS and $0.7 V_{ne}$, but no lower than 60 KIAS, upon inadvertently encountering moderate, severe, or extreme turbulence.

Moderate turbulence is turbulence that causes: (1) changes in altitude or attitude; (2) variations in indicated airspeed; and (3) aircraft occupants to feel definite strains against seat belts.

Flight above 60 degrees north latitude is prohibited without an approved GPS installed.

Flight in remote areas without VHF emergency radio or emergency locator beacon capable of transmitting on 121.5 MHz or COSPAS-SARSAT emergency locator beacon is prohibited.

Flight in areas without VHF communication is prohibited.

Flight in ambient temperatures below -30°C and above $+40^{\circ}\text{C}$ is prohibited.

NOTE

In ambient temperatures below -5°C , refer to cold weather operation procedures in Section 8 of this supplement.

SECTION 2: LIMITATIONS (Cont'd)

KINDS OF OPERATION LIMITATIONS

For aircraft not equipped with floats, over-water operations beyond safe power-off landing distance from land are prohibited.

FUEL LIMITATIONS

Approved Fuel Grades:

Б95/130 grade aviation fuel.

CAUTION

Make sure spark plugs are operating properly. If fouling of spark plugs is suspected, perform maintenance as prescribed in Lycoming Operator's Manual No.60297-10 (Section 4) and in Lycoming Service Instruction 1070.

SECTION 2: LIMITATIONS (Cont'd)

PLACARDS

In clear view and readable by pilot in flight:

LIMIT MANIFOLD PRESSURE – IN. HG

MAXIMUM CONTINUOUS POWER									
PRESS	OAT - °C								
ALT-M	-30	-20	-10	0	10	20	30	40	
SL	21.5	21.8	22.1	22.4	22.6	22.9	23.1	23.3	
500	21.0	21.3	21.6	21.8	22.1	22.3	22.6	22.8	
1000	20.5	20.8	21.1	21.4	21.6	21.9	22.1	22.3	
1500	20.1	20.4	20.7	21.0	21.2	21.5	21.7	21.9	
2000	19.7	20.0	20.3	20.6	20.8	21.1	21.3	21.5	
2500	19.4	19.7	19.9	20.2	20.5	20.7	20.9		
3000	19.0	19.3	19.6	FULL THROTTLE					
3500									
FOR MAX TAKEOFF POWER (5 MIN), ADD 2.8 IN.									

NEVER EXCEED SPEED - KIAS

2200 LB TOGW & BELOW

PRESS	OAT - °C							
ALT-M	-30	-20	-10	0	10	20	30	40
SL								
500							128	124
1000	130				129	125	121	117
1500				126	121	117	114	109
2000	127		123	119	115	110	105	100
2500	125	120	116	111	106	101	96	91
3000	117	113	107	102	96	91	86	
3500	109	103	98	93	88	NO FLIGHT		
4000	100	94	89					
OVER 2200 LB TOGW, SUBTRACT 10 KIAS FOR AUTOROTATION, SUBTRACT 30 KIAS								

Near main fuel tank filler cap:

USABLE CAP. 116 LITRES

Near aux fuel tank filler caps:

USABLE CAP. 69 LITRES

Near both fuel tank filler caps:

CIS FUEL GRADES:
Б95/130

SECTION 3: EMERGENCY PROCEDURES

NOTE

The following procedures are unchanged from those of the basic manual. Altitudes are converted to meters only.

POWER FAILURE ABOVE 150 METERS AGL

1. Lower collective immediately to maintain RPM and enter normal autorotation.
2. Establish a steady glide at approximately 70 KIAS (See "Maximum Glide Distance Configuration", page 7).
3. Adjust collective to keep RPM in green arc or apply full down collective if light weight prevents attaining above 97%.
4. Select landing spot and, if altitude permits, maneuver so landing will be into wind.
5. A restart may be attempted at pilot's discretion if sufficient time is available (See "Air Restart Procedure", page 8).
6. If unable to restart, turn off unnecessary switches and shut off fuel.
7. At about 12 meters AGL, begin cyclic flare to reduce rate of descent and forward speed.
8. At about 2.4 meters AGL, apply forward cyclic to level ship and raise collective just before touchdown to cushion landing. Touch down in level attitude with nose straight ahead.

NOTE

If power failure occurs at night, do not turn on landing lights above 300 meters AGL to preserve battery power.

SECTION 3: EMERGENCY PROCEDURES (Cont'd)

POWER FAILURE BETWEEN 2.4 METERS AND 150 METERS AGL

1. Takeoff operation should be conducted per the Height-Velocity Diagram in Section 5.
2. If power failure occurs, lower collective immediately to maintain rotor RPM.
3. Adjust collective to keep RPM in green arc or apply full down collective if light weight prevents attaining above 97%.
4. Maintain airspeed until ground is approached, then begin cyclic flare to reduce rate of descent and forward speed.
5. At about 2.4 meters AGL, apply forward cyclic to level ship and raise collective just before touchdown to cushion landing. Touch down with skids level and nose straight ahead.

POWER FAILURE BELOW 2.4 METERS AGL

1. Apply right pedal as required to prevent yawing.
2. Allow rotorcraft to settle.
3. Raise collective just before touchdown to cushion landing.

MAXIMUM GLIDE DISTANCE CONFIGURATION

1. Airspeed approximately 90 KIAS.
2. Rotor RPM approximately 90%.
3. Best glide ratio is about 4.7:1 or one nautical mile per 400 meters AGL.

MINIMUM RATE OF DESCENT CONFIGURATION

1. Airspeed approximately 55 KIAS.
2. Rotor RPM approximately 90%.
3. Minimum rate of descent is about 7 meters per second. Glide ratio is about 4:1 or one nautical mile per 450 meters AGL.

CAUTION

Increase rotor RPM to 97% minimum when autorotating below 150 meters AGL.

SECTION 3: EMERGENCY PROCEDURES (Cont'd)

AIR RESTART PROCEDURE

CAUTION

Do not attempt restart if engine malfunction is suspected or before safe autorotation is established. Air restarts not recommended below 600 meters AGL.

1. Mixture - Off.
2. Throttle - Closed.
3. Starter - Engaged.
4. Mixture - Move slowly rich while cranking.

DITCHING

Not applicable.

SECTION 4: NORMAL PROCEDURES

AIRSPEEDS FOR SAFE OPERATION

At altitudes above 2000 meters, minimum recommended airspeed is 50 KIAS except for takeoff and landing.

PITCH AND BANK ANGLES

The maximum recommended pitch angle is 20 degrees nose down or nose up except during flare in autorotation.

The maximum recommended bank angle is 45 degrees with passengers on board or 60 degrees without passengers.

NOTE

The following procedures are unchanged from those of the basic manual. Altitudes are converted to meters only.

SECTION 4: NORMAL PROCEDURES (Cont'd)

PRACTICE AUTOROTATION - POWER RECOVERY

1. Lower collective to down stop and adjust throttle as required for small tachometer needle separation.

CAUTION

To avoid inadvertent engine stoppage, do not roll throttle to full idle. Roll throttle off smoothly only enough for a small visible needle split.

NOTE

Governor is inactive below 80% engine RPM regardless of governor switch position.

NOTE

When entering autorotation from above 1800 meters, reduce throttle slightly before lowering collective to prevent engine overspeed.

2. Raise collective as required to keep rotor RPM from going above green arc and adjust throttle for small needle separation.
3. Keep RPM in green arc and airspeed 60 to 70 KIAS.
4. At about 12 meters AGL, begin cyclic flare to reduce rate of descent and forward speed.
5. At about 2.4 meters AGL, apply forward cyclic to level aircraft and raise collective to control descent. Add throttle if required to keep RPM in green arc.

SECTION 4: NORMAL PROCEDURES (Cont'd)

PRACTICE AUTOROTATION - WITH GROUND CONTACT

If practice autorotations with ground contact are required for demonstration purposes, perform in same manner as power recovery autorotations except:

Prior to cyclic flare, roll throttle off into detent spring and hold it against the hard stop until autorotation is complete. (This prevents throttle correlator from adding power when collective is raised.)

Always contact ground with skids level and nose straight ahead.

CAUTION

During simulated engine failures, a rapid decrease in rotor RPM will occur, requiring immediate lowering of collective control to avoid dangerously low rotor RPM. Catastrophic rotor stall could occur if rotor RPM ever drops below 80% plus 1% per 300 meters of altitude.

NOISE ABATEMENT

To improve the quality of our environment and to dissuade overly restrictive ordinances against helicopters, it is imperative that every pilot minimize noise irritation to the public. Following are several techniques which should be employed when possible.

1. Avoid flying over outdoor assemblies of people. When this cannot be avoided, fly as high as practical, preferably over 600 meters AGL.

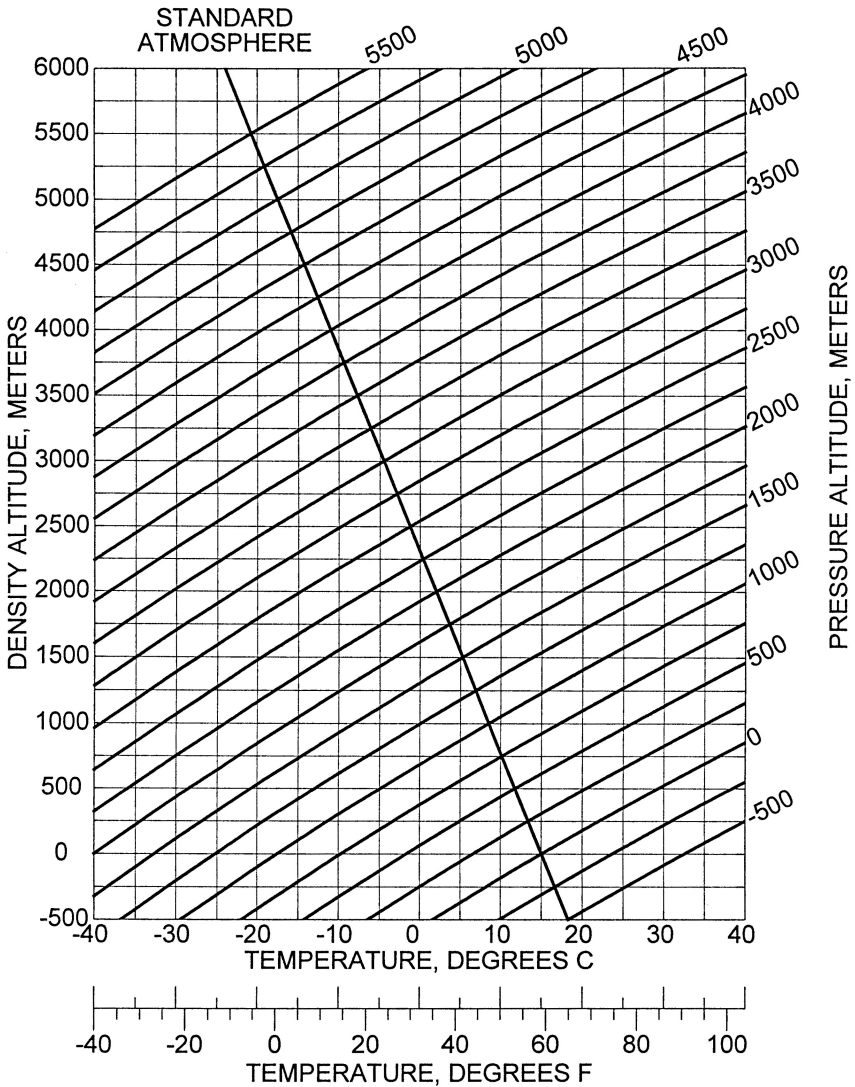
SECTION 4: NORMAL PROCEDURES (Cont'd)

2. Avoid blade slap. Blade slap usually occurs during shallow high-speed descents, especially during turns. It can be avoided by using slower, steeper descents. With the right door removed, the pilot can easily determine those flight conditions which produce blade slap and develop piloting techniques to eliminate or reduce it.
3. When departing from or approaching a landing site, avoid prolonged flight over noise sensitive areas. Always fly above 150 meters AGL and preferably above 300 meters AGL.
4. Repetitive noise is far more irritating than a single occurrence. If you must fly over the same area more than once, vary your flight path to not overfly the same buildings each time.
5. When overflying populated areas, look ahead and select the least noise sensitive route.

NOTE

Above recommended procedures do not apply where they would conflict with Air Traffic Control clearances or instructions or when, in the pilot's judgment, they would result in an unsafe flight path.

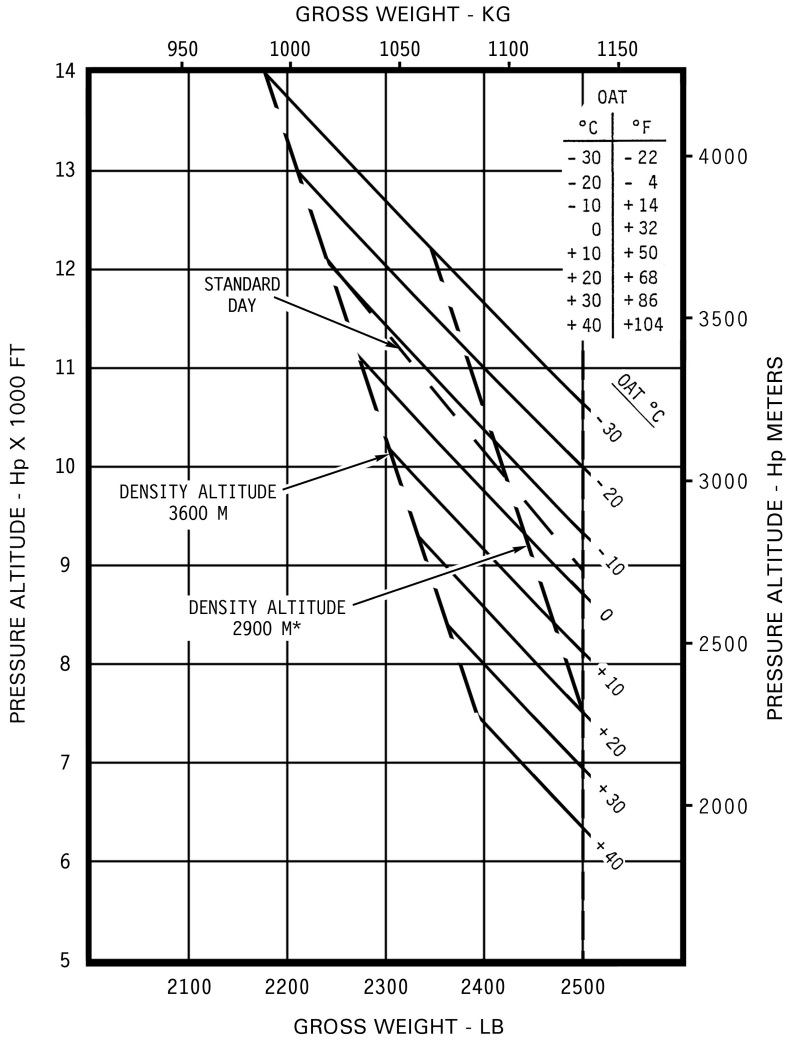
SECTION 5: PERFORMANCE



DENSITY ALTITUDE CHART

SECTION 5: PERFORMANCE (Cont'd)

IN GROUND EFFECT AT 0.6 METER SKID HEIGHT
FULL THROTTLE
ZERO WIND

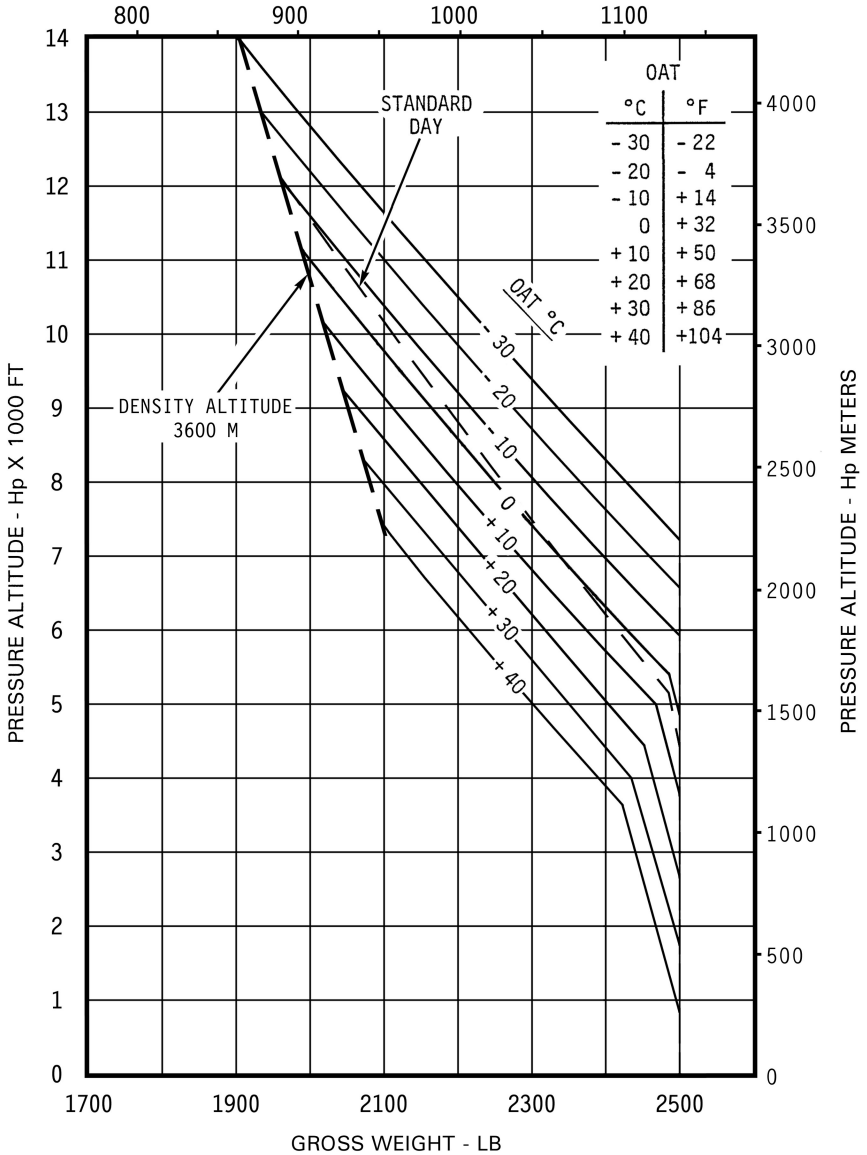


IGE HOVER CEILING VS. GROSS WEIGHT

*Hover controllability with 17 knot wind substantiated up to 2930 meters density altitude.

SECTION 5: PERFORMANCE (Cont'd)

OUT OF GROUND EFFECT, ZERO WIND
TAKEOFF POWER OR FULL THROTTLE
GROSS WEIGHT - KG

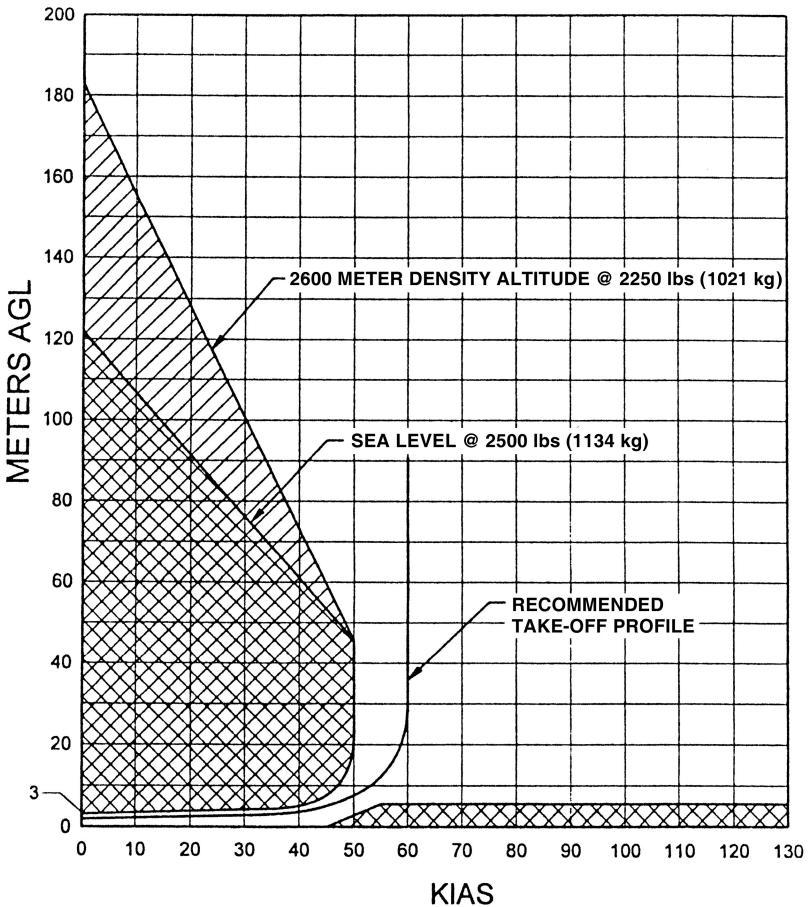


OGE HOVER CEILING VS. GROSS WEIGHT

SECTION 5: PERFORMANCE (Cont'd)

DEMONSTRATED CONDITIONS:
SMOOTH HARD SURFACE
WIND CALM

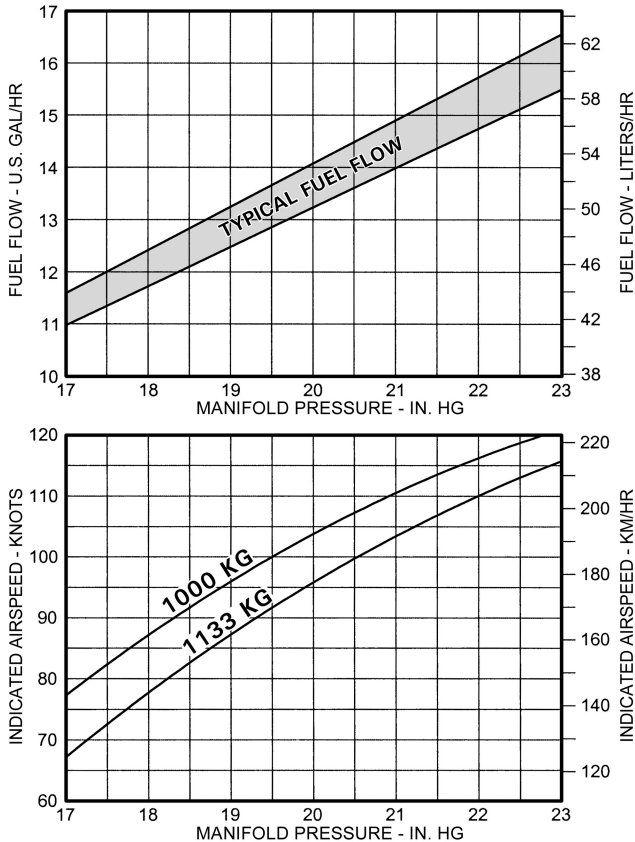
AVOID OPERATION IN SHADED AREAS



HEIGHT - VELOCITY DIAGRAM

SECTION 5: PERFORMANCE (Cont'd)

CRUISE PERFORMANCE AND FUEL FLOW



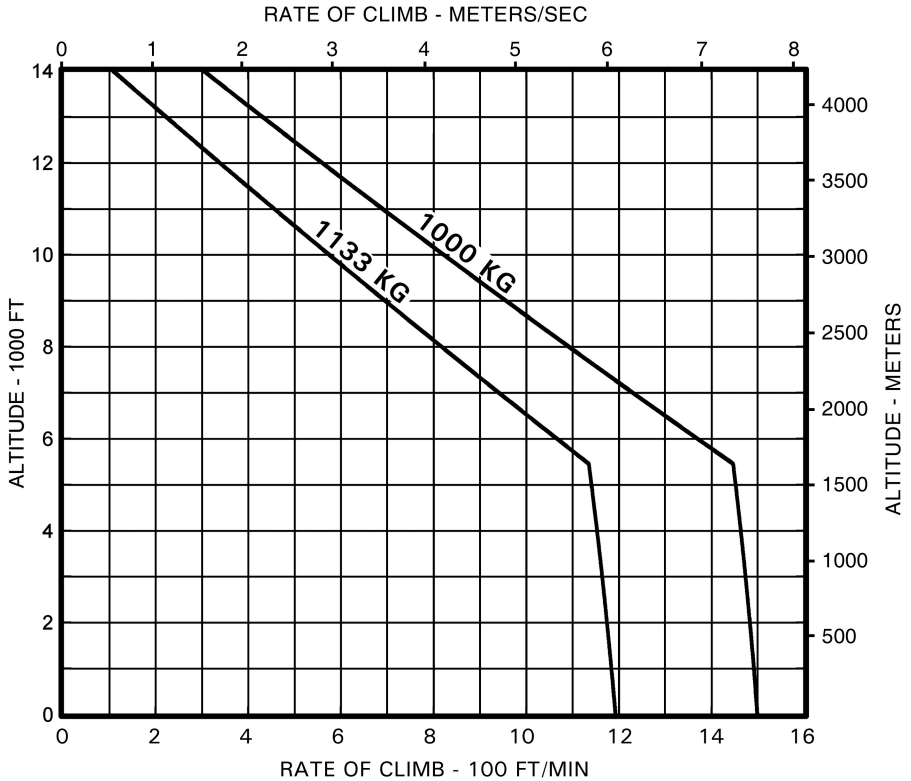
Sea level ISA conditions (increase fuel flow 2% per 300 meters)
 Standard landing gear
 Standard door installed (no bubble windows)
 No external equipment

CAUTION

Data typical for a helicopter under ideal conditions. Variations in aircraft, engines, and operating conditions may significantly affect performance. For improved accuracy, pilots should become familiar with individual aircraft and adjust chart data as required.

SECTION 5: PERFORMANCE (Cont'd)

CLIMB PERFORMANCE



ISA conditions
Takeoff power or full throttle
Airspeed: 55 KIAS
No external equipment

CAUTION

Data typical for a helicopter under ideal conditions. Variations in aircraft, engines, and operating conditions may significantly affect performance. For improved accuracy, pilots should become familiar with individual aircraft and adjust chart data as required.

SECTION 5: PERFORMANCE (Cont'd)

NOISE CHARACTERISTICS

For operating conditions specified in ICAO Annex 16, Chapter 11, the sound exposure level for the R44 II is 81.0 dB(A).

SECTION 6: WEIGHT AND BALANCE No change.

SECTION 7: SYSTEMS DESCRIPTION

EMERGENCY LOCATOR TRANSMITTER

If an ELT is not installed, a P855A1 VHF emergency radio should be placed under pilot's seat.

FLIGHT CONTROLS

The collective stick is conventional with a twist grip throttle control. When the collective control is raised, the engine throttle is opened automatically by an inter-connecting linkage. An electronic governor makes the minor throttle adjustments required to maintain the design RPM.

CAUTION

Above 1800 meters, throttle correlation and governor are less effective. Therefore, power changes should be slow and smooth.

CAUTION

At high power settings above 1800 meters, the throttle is frequently wide open and RPM must be controlled with the collective.

SECTION 8: HANDLING, SERVICING, AND MAINTENANCE

COLD WEATHER OPERATION

Special precautions should be taken if the engine is to be started in ambient temperatures below -5°C . Ensure correct oil grade is utilized. Preheat engine and engine oil to a minimum temperature of -5°C . Preheating can be accomplished by parking the helicopter in a warm enclosure or by using an electrical engine preheat system.

CAUTION

Failure to preheat engine before starting may result in internal engine damage.

When landing in areas without preheating equipment, it is advisable to start the helicopter hourly to maintain engine warmth. Be sure to run the helicopter long enough to recharge the battery after each start.

For aircraft equipped with instruments incorporating LCD displays, preheat cabin at least 15 minutes when ambient temperature is -20°C or below.

SECTION 9: SUPPLEMENTS

FIXED FLOATS SUPPLEMENT

GENERAL

This section contains information relevant to Ukrainian-registered helicopters when equipped with optional fixed float landing gear.

Information provided here is for the purpose of providing altitude data in meters and additional limitations, but is otherwise unchanged from that of the basic supplement. See R44 II Pilot's Operating Handbook Fixed Floats Supplement for complete information on this installation.

AIRSPEED LIMITS

NEVER EXCEED AIRSPEED (V_{ne}) WITH FLOATS

Up to 900 meters density altitude:

2200 lb TOGW & below	120 KIAS
Over 2200 lb TOGW	110 KIAS
Autorotation	100 KIAS

Above 900 meters density altitude: See placard on page 21.

FLIGHT AND MANEUVER LIMITATIONS

Water landings for any reason other than an actual emergency are prohibited at weights over 1089 kg.

KINDS OF OPERATIONS LIMITATIONS

Over-water operation prohibited without State Aviation Administration of Ukraine-approved life saving equipment for all occupants.

Over-water operation beyond safe autorotation distance from land is prohibited when wave height is 0.3 meters or greater.

Over-water operation beyond 30 minutes flying time from land is prohibited.

SECTION 9: SUPPLEMENTS (Cont'd)

SUPPLEMENT 5: FIXED FLOATS (Cont'd)

PLACARDS

In clear view and readable by pilot in flight:

**NEVER EXCEED SPEED - KIAS
WITH FLOATS**

2200 LB TOGW & BELOW									
PRESS	OAT - °C								
ALT-M	-30	-20	-10	0	10	20	30	40	
SL									
500							118	114	
1000	120				119	115	111	107	
1500				116	111	107	104	99	
2000			117	113	109	105	100	95	90
2500	115	110	106	101	96	91	86	81	
3000	107	103	97	92	86	81	76		
3500	99	93	88	83	78	NO FLIGHT			
4000	90	84	79	NO FLIGHT					

**OVER 2200 LB TOGW, SUBTRACT 10 KIAS
FOR AUTOROTATION, SUBTRACT 20 KIAS**

**NEVER EXCEED SPEED - KIAS
WITHOUT FLOATS**

2200 LB TOGW & BELOW									
PRESS	OAT - °C								
ALT-M	-30	-20	-10	0	10	20	30	40	
SL									
500							128	124	
1000	130				129	125	121	117	
1500				126	121	117	114	109	
2000			127	123	119	115	110	105	100
2500	125	120	116	111	106	101	96	91	
3000	117	113	107	102	96	91	86		
3500	109	103	98	93	88	NO FLIGHT			
4000	100	94	89	NO FLIGHT					

**OVER 2200 LB TOGW, SUBTRACT 10 KIAS
FOR AUTOROTATION, SUBTRACT 30 KIAS**

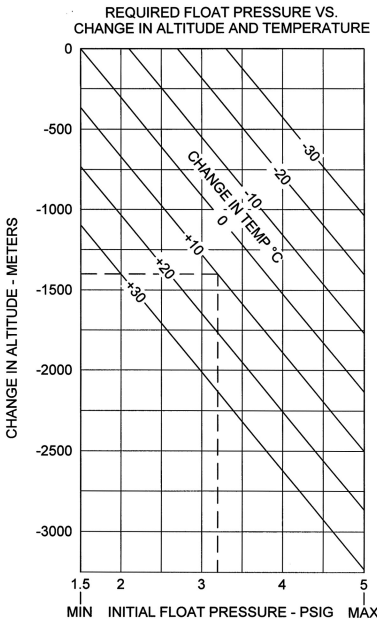
SECTION 9: SUPPLEMENTS (Cont'd)

SUPPLEMENT 5: FIXED FLOATS (Cont'd)

FLOAT PRESSURE LIMITS

Minimum Float Pressure: 1.5 psig (psi gage)
Maximum Float Pressure: 5 psig

The following graph shows minimum float pressure required for a decrease in altitude or temperature. An increase in either altitude or temperature can be ignored as pressure relief valve will limit pressure to 5 psig.



CAUTION

Failure to maintain required pressure can result in inadequate buoyancy or in-flight instability.

SAMPLE CALCULATION:

	Pressure	
Conditions at destination:	<u>Altitude</u>	<u>Temp</u>
	300 m	15°C
Initial conditions:	1700 m	5°C
Subtract to obtain expected change in altitude and temp:	<u> </u>	<u> </u>
	-1400 m	+10°C

Using graph, locate -1400 m line, read across to +10°C line, then down for minimum initial float pressure required, approximately 3.2 psig.

SECTION 9: SUPPLEMENTS (Cont'd)

SUPPLEMENT 5: FIXED FLOATS (Cont'd)

EMERGENCY PROCEDURES

POWER FAILURE ABOVE 150 METERS AGL

Autorotation to Land: Same as in Ukrainian Supplement Section 3.

Autorotation to Water:

1. Lower collective immediately to maintain RPM.
2. Establish steady glide at approximately 70 KIAS.
3. If altitude permits, maneuver into wind.
4. At about 12 meters AGL, begin cyclic flare.
5. At about 2.4 meters AGL, apply forward cyclic and raise collective just before touchdown. Touch down in slight nose high attitude with nose straight ahead.
6. Maintain cyclic in touchdown position and do not lower collective full down until forward motion has stopped.

CAUTION

Lowering collective or applying forward cyclic while helicopter is moving forward on water can cause floats to submerge and helicopter to nose over.

POWER FAILURE BETWEEN 2.4 METERS AND 150 METERS AGL

Autorotation to Land: Same as R44 II without floats.

Autorotation to Water:

1. Lower collective immediately to maintain RPM.
2. If altitude permits, maneuver into wind.

SECTION 9: SUPPLEMENTS (Cont'd)

SUPPLEMENT 5: FIXED FLOATS (Cont'd)

3. Maintain airspeed until water is approached, then begin cyclic flare.
4. At about 2.4 meters AGL, apply forward cyclic and raise collective just before touchdown. Touch down in slight nose high attitude with nose straight ahead.
5. Maintain cyclic in touchdown position and do not lower collective full down until forward motion has stopped.

CAUTION

Lowering collective or applying forward cyclic while helicopter is moving forward on water can cause floats to submerge and helicopter to nose over.

NORMAL PROCEDURES

OPERATION ON WATER

CAUTION

Except for actual emergencies, maximum weight for water operation is 1089 kg.

SECTION 9: SUPPLEMENTS (Cont'd)

POP-OUT FLOATS SUPPLEMENT

GENERAL

This section contains information relevant to Ukrainian-registered helicopters when equipped with optional pop-out float landing gear.

Information provided here is for the purpose of providing altitude data in meters and additional limitations, but is otherwise unchanged from that of the basic supplement. See Supplement 10 of the R44 II Pilot's Operating Handbook for complete information on this installation.

FLIGHT AND MANEUVER LIMITATIONS

Inflation above 1200 meters AGL is prohibited.

KINDS OF OPERATIONS LIMITATIONS

Over-water operations prohibited without State Aviation Administration of Ukraine-approved life saving equipment for all occupants.

Over-water operation beyond safe autorotation distance from land is prohibited when wave height is 0.3 meters or greater.

Over-water operation beyond 30 minutes flying time from land is prohibited.

POWER FAILURE ABOVE 150 METERS AGL

Autorotation to Water:

1. Lower collective immediately to maintain RPM.
2. Reduce airspeed to below 80 KIAS.
3. If altitude permits, maneuver into wind.
4. Inflate floats.

CAUTION

Do not inflate floats above 80 KIAS. Do not exceed 80 KIAS with floats inflated.

SECTION 9: SUPPLEMENTS (Cont'd)

SUPPLEMENT 10: POP-OUT FLOATS (Cont'd)

5. At about 12 meters AGL, begin cyclic flare.
6. At about 2.4 meters AGL, apply forward cyclic, and raise collective just before touchdown. Touch down in slight nose high attitude with nose straight ahead.
7. Maintain cyclic in touchdown position and do not lower collective full down until forward motion has stopped.

CAUTION

Lowering collective or applying forward cyclic while helicopter is moving forward on water can cause floats to submerge and helicopter to nose over.

POWER FAILURE BETWEEN 2.4 METERS AND 150 METERS AGL

Autorotation to Land: Same as in Ukrainian Supplement Section 3.

Autorotation to Water:

1. Lower collective immediately to maintain rotor RPM.
2. Reduce airspeed to below 80 KIAS.
3. If altitude permits, maneuver into wind.
4. Inflate floats.

CAUTION

Do not inflate floats above 80 KIAS. Do not exceed 80 KIAS with floats inflated.

NOTE

Float inflation may take up to three seconds. Squeeze lever early enough to allow full inflation before water contact.

SECTION 9: SUPPLEMENTS (Cont'd)

SUPPLEMENT 10: POP-OUT FLOATS (cont'd)

5. Maintain airspeed until water is approached, then begin cyclic flare.
6. At about 2.4 meters AGL, apply forward cyclic, and raise collective just before touchdown. Touch down in slight nose high attitude with nose straight ahead.
7. Maintain cyclic in touchdown position and do not lower collective full down until forward motion has stopped.

CAUTION

Lowering collective or applying forward cyclic while helicopter is moving forward on water can cause floats to submerge and helicopter to nose over.

POWER FAILURE BELOW 2.4 METERS AGL

Over land: Same as in basic manual.

Over water:

1. Apply right pedal as required to prevent yawing.
2. Inflate floats.
3. Allow rotorcraft to settle.
4. Raise collective just before touchdown.

NORMAL PROCEDURES

OPERATION ON WATER

CAUTION

Except for actual emergencies, maximum weight for water operation is 1089 kg.

