AIRCRAFT TOOLS CONSULTING

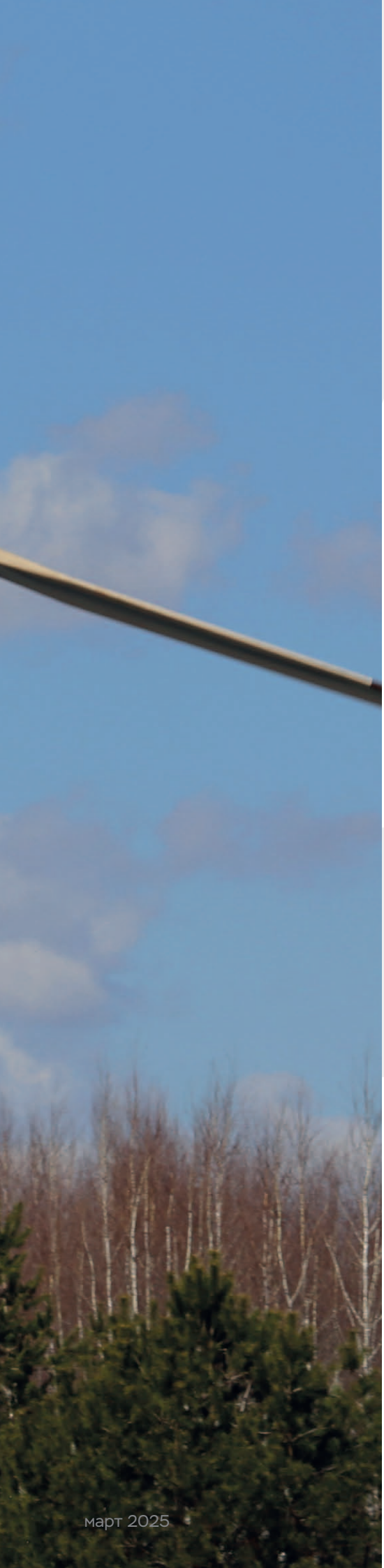
LIGHT MULTIPURPOSE HELICOPTER

ANSAT

Technical description

Contents


AMBULANCE
RA-20002



AIRCRAFT TOOLS CONSULTING

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1. General data

ANSAT light utility helicopter is fit for operation at ambient air temperature range: –45°C ... +50°C from any state of runway: dry, wet, flooded, snow-covered, ice-covered, covered with dust or sand, prepared for takeoff/landing or unprepared (selected in-flight). Operating temperature range is set by the results of tests and will be expanded in the course of further trials. The soil density of the landing pad shall be at least 3 kgf/cm^2, the minimum size of lift-off/landing area shall be 15 x 15 m.

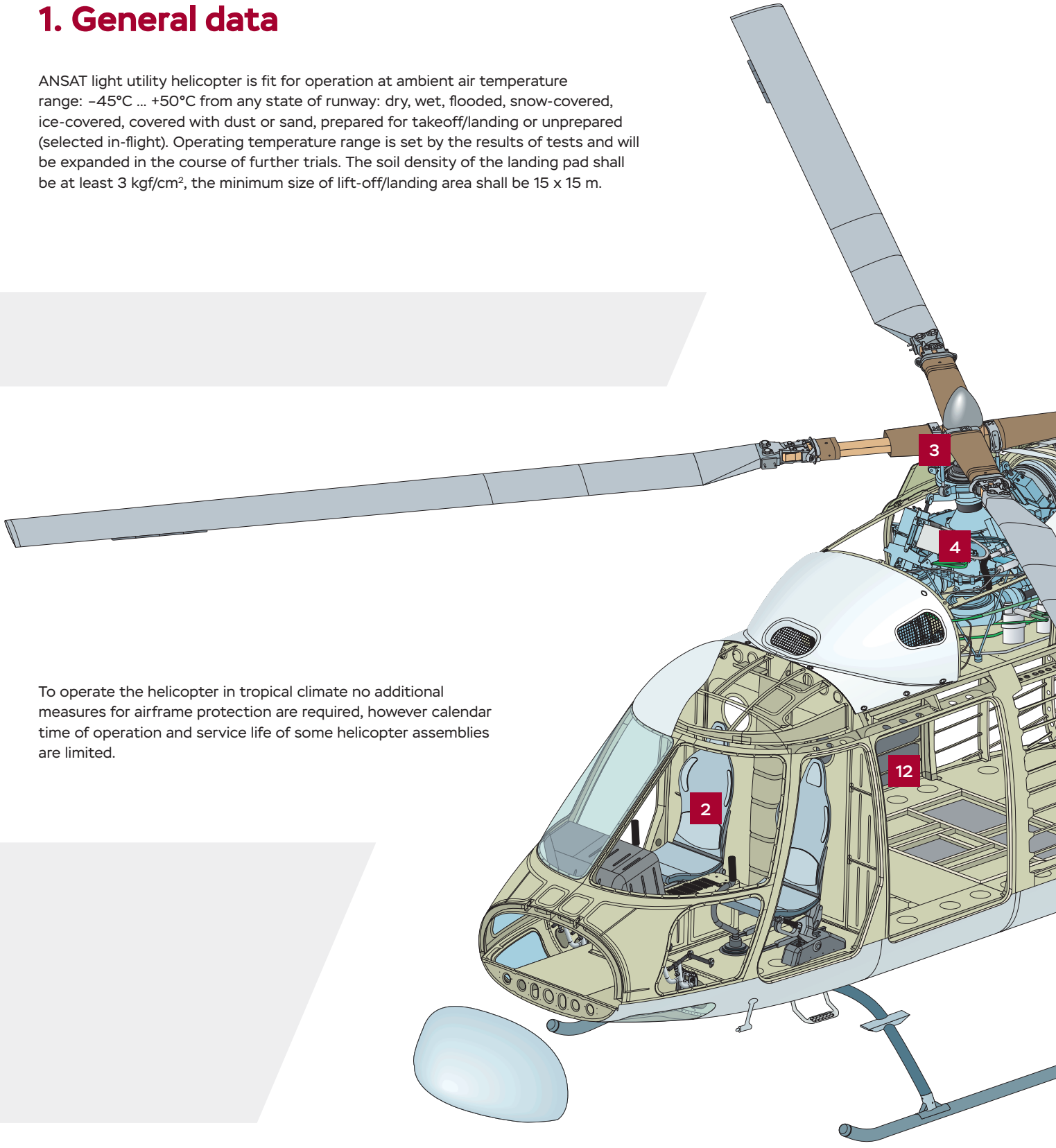
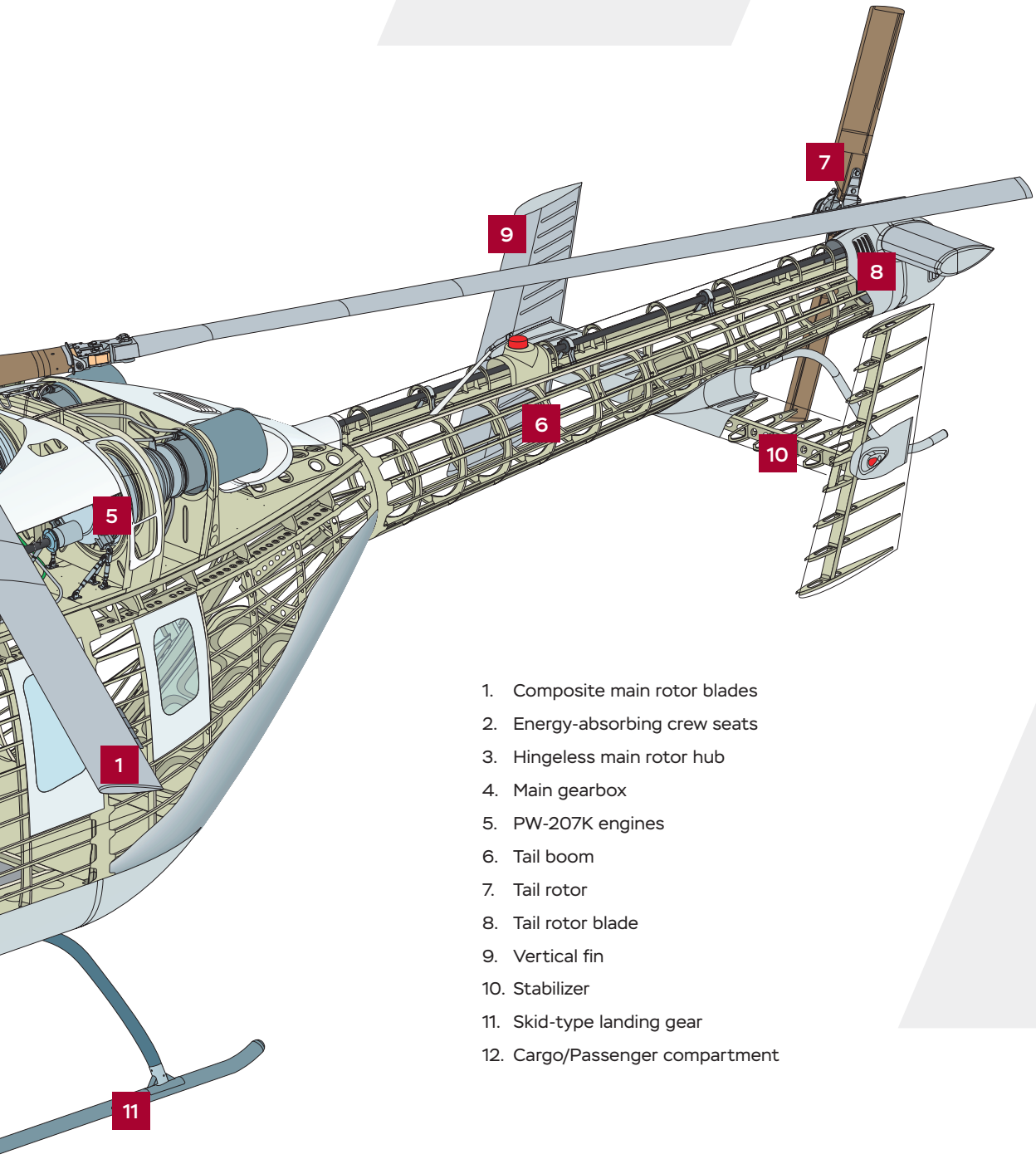


Fig. 1.1.

To operate the helicopter in tropical climate no additional measures for airframe protection are required, however calendar time of operation and service life of some helicopter assemblies are limited.

The helicopter is cleared for VFR flights in normal weather, out of icing conditions, day and night. Type certificate by FATA (Rosaviatsiya) № СТ236-Ансат – edition 14, 23.07.2018.



1. Composite main rotor blades
2. Energy-absorbing crew seats
3. Hingeless main rotor hub
4. Main gearbox
5. PW-207K engines
6. Tail boom
7. Tail rotor
8. Tail rotor blade
9. Vertical fin
10. Stabilizer
11. Skid-type landing gear
12. Cargo/Passenger compartment

Helicopter crew consists of one or two pilots.

The helicopter in various modifications is capable of carrying out the following missions:

- transportation of cargoes;
- transportation of passengers, including in the conditions of enhanced comfort;
- emergency medical evacuation;
- flight personnel training.

2. Flight performance

Flight performance in metric system

WEIGHT PARAMETERS	
Max take-off weight, kg	3 600
Normal take-off weight, kg	3 300
Max payload, kg	1235
POWERPLANT (2 x PW-207K by Pratt & Whitney with FADEC) Output shaft power	
Take-off rating (5 min), kW	2 x 463
Maximum continuous rating, kW	2 x 470
Power with one engine inoperative (2.5 min), kW	1 x 522
Power with one engine inoperative (continuous rating), kW	1 x 477

FLIGHT PERFORMANCE (ISA conditions)	normal take-off weight	maximal take-off weight
V_{NE}, km/h	275	260
Flight speed at maximum continuous power, km/h	260	250
Maximum rate of climb, m/s	14	12
Service ceiling, m	5 500	5 000
Hover ceiling OGE, m	2 220	1340
Hover ceiling IGE, m	2 530	1665
Maximum flight range (dry-tank range), km	525	505
Maximum flight range with 5 % fuel reserve, km	505	480
Max flight endurance, h	3,12	2,87
Maximum flight endurance with 5% fuel reserve, h	2,78	2,53
Fuel consumption per hour with full commercial load, maximum range flight, sea level, kg/h	216	220
Operating temperature range, °C	–45 ... +50	

FUEL AMOUNT	
Portside service tank, l	79
Starboard service tank, l	79
Front tank, l	336
Rear tank, l	196
Total capacity, l	690
Unusable fuel, l	21

FUEL	
Fuel brand	Standard
RT-1 6	GOST-10227-86
TS-1	GOST-10227-86
Jet a-1	DEF STAN 91-91
No.3 Jet Fuel	GB 6537-2006

Flight performance in imperial system

WEIGHT PARAMETERS	
Max take-off weight, lb	7 937
Normal take-off weight, lb	7 275
Max payload, lb	2 723
POWERPLANT (2 x PW-207K by Pratt & Whitney with FADEC) Output shaft power	
Take-off rating (5 min), hp	2 x 630
Maximum continuous rating, hp	2 x 554
Power with one engine inoperative (2.5 min), hp	1 x 710
Power with one engine inoperative (continuous rating), hp	1 x 648

FLIGHT PERFORMANCE (ISA conditions)	normal take-off weight	maximal take-off weight
V_{NE}, kts	148,5	140,4
Flight speed at maximum continuous power, kts	140,4	135
Maximum rate of climb, ft/min	2 755,9	2 362,2
Service ceiling, ft	13 780	13 123
Hover ceiling OGE, ft	7 283	4 396
Hover ceiling IGE, ft	8 301	5 463
Maximum flight range (dry-tank range), nm	283,5	272,68
Maximum flight range with 5 % fuel reserve, nm	270	259,2
Max flight endurance, h	3,12	2,87
Maximum flight endurance with 5% fuel reserve, h	2,78	2,53
Fuel consumption per hour with full commercial load, maximum range flight, sea level, lb/h	476,2	485,0
Operating temperature range, °F	–49 ... +122	

FUEL AMOUNT	
Portside service tank, gal	21
Starboard service tank, gal	21
Front tank, gal	88
Rear tank, gal	52
Total capacity, gal	182
Unusable fuel, gal	5

FUEL	
Fuel brand	Standard
RT-1 6	GOST-10227-8
TS-1	GOST-10227-86
Jet a-1	DEF STAN 91-91
No.3 Jet Fuel	GB 6537-2006

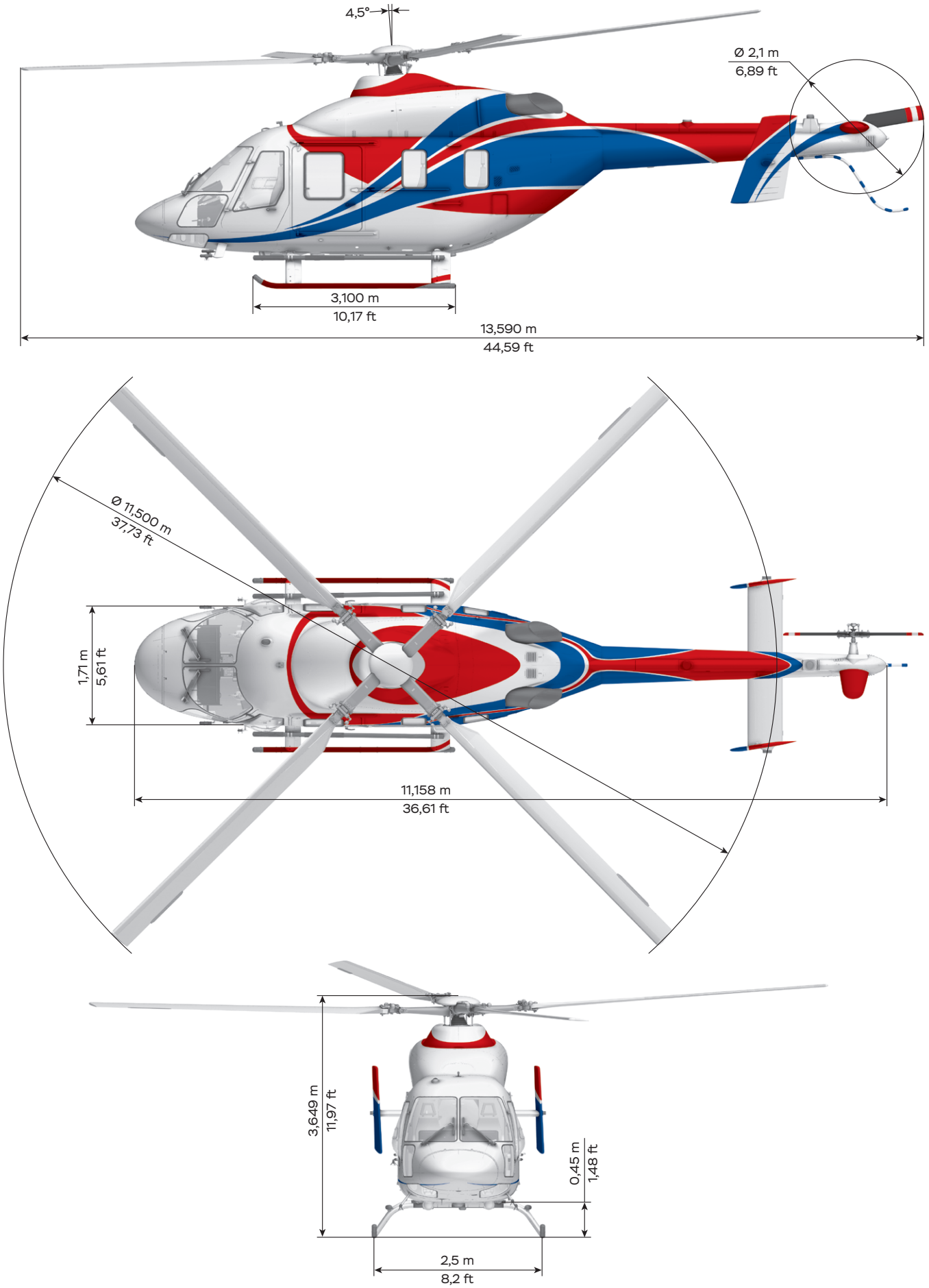


Fig. 2.1. Ansat helicopter. Principal dimensions

3. Fuselage, cabin, landing gear

Ansat helicopter fuselage is a traditional well-proven design of a semi-monocoque:longitudinal and lateral structural frame with load-carrying skin. Such design enables light, durable and spacious fuselage.

Fuselage sports modular design ensuring maintainability of assembly and possibility of replacing individual units or elements without having to disassemble the fuselage completely. Key elements of fuselage are made of Aluminum alloys. Also, many non-bearing elements are used of composite materials.

The fuselage has the most spacious cargo/passenger cabin among the helicopters with take-off weight below 4 tons: around 6,5 m^3 of floor area of cargo/passenger cabin and 9,8 m^3 of fuselage total net volume.

The fuselage consists of nose section, central part and tail boom with empennage and tail skid. Nose section is permanently connected to central fuselage. Tail boom and central fuselage feature detachable connection (screw bolts).

Baseline configuration boasts skid-type landing gear, elastic deflections of which absorb velocity energy of the helicopter during landing.

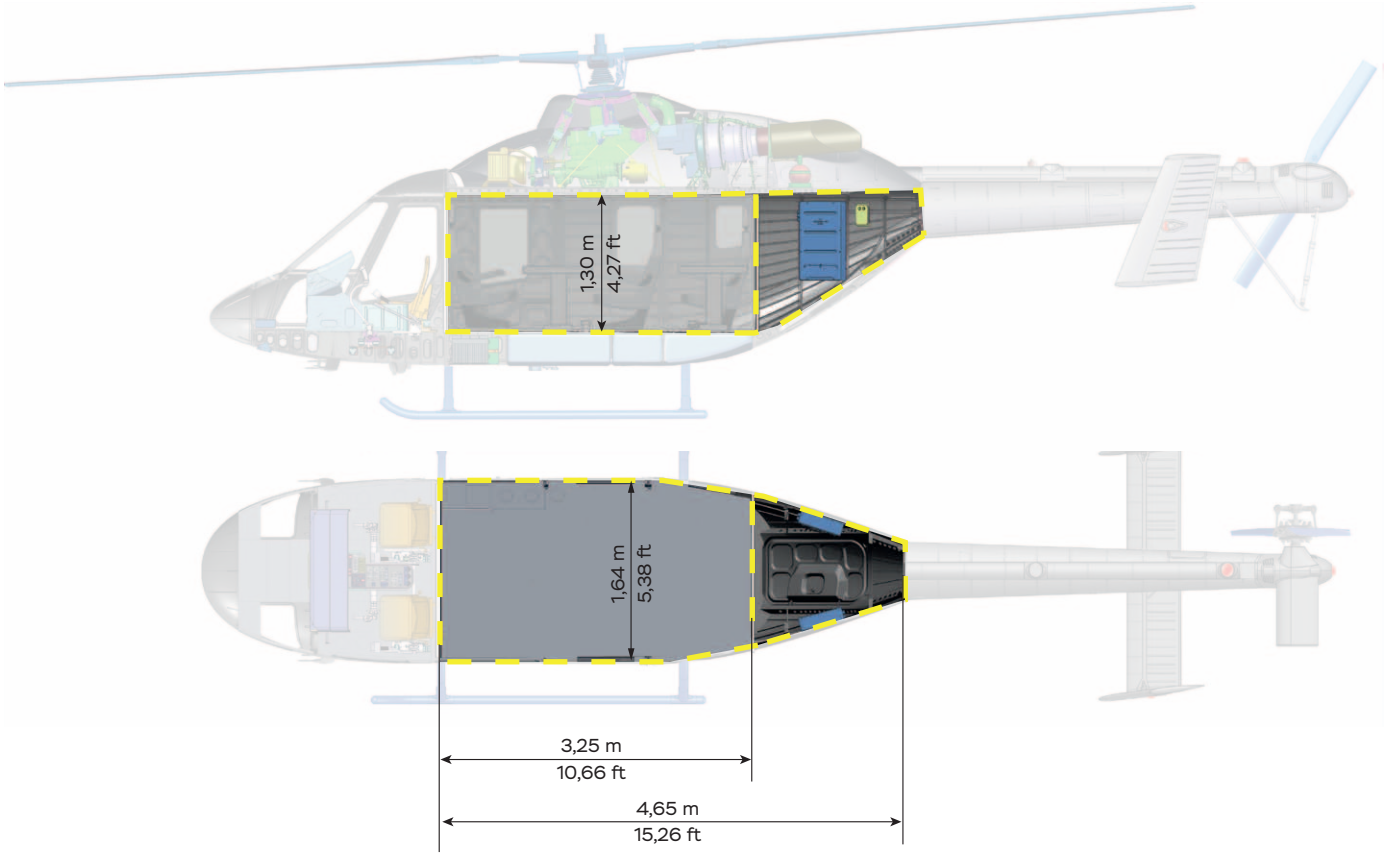


Fig. 3.1. Cargo cabin dimensions

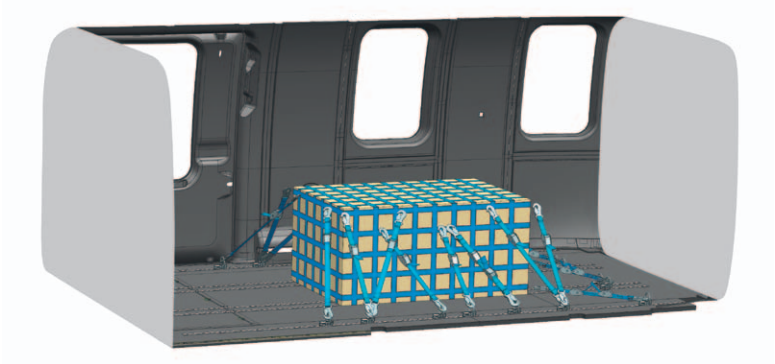


Fig. 3.2.

4. Instruments

The helicopter in baseline configuration is fitted with the avionic suite cleared for VFR operations. Flight and navigation instruments are located on pilots' instrument panels and central console.

Avionic suites differ depending on configuration (one-pilot or two-pilot), including various optional instruments. One-pilot configuration involves the removal of collective pitch stick, cyclic pitch stick and directional control pedals. It entails a possibility to transport one more passenger in the co-pilot seat.

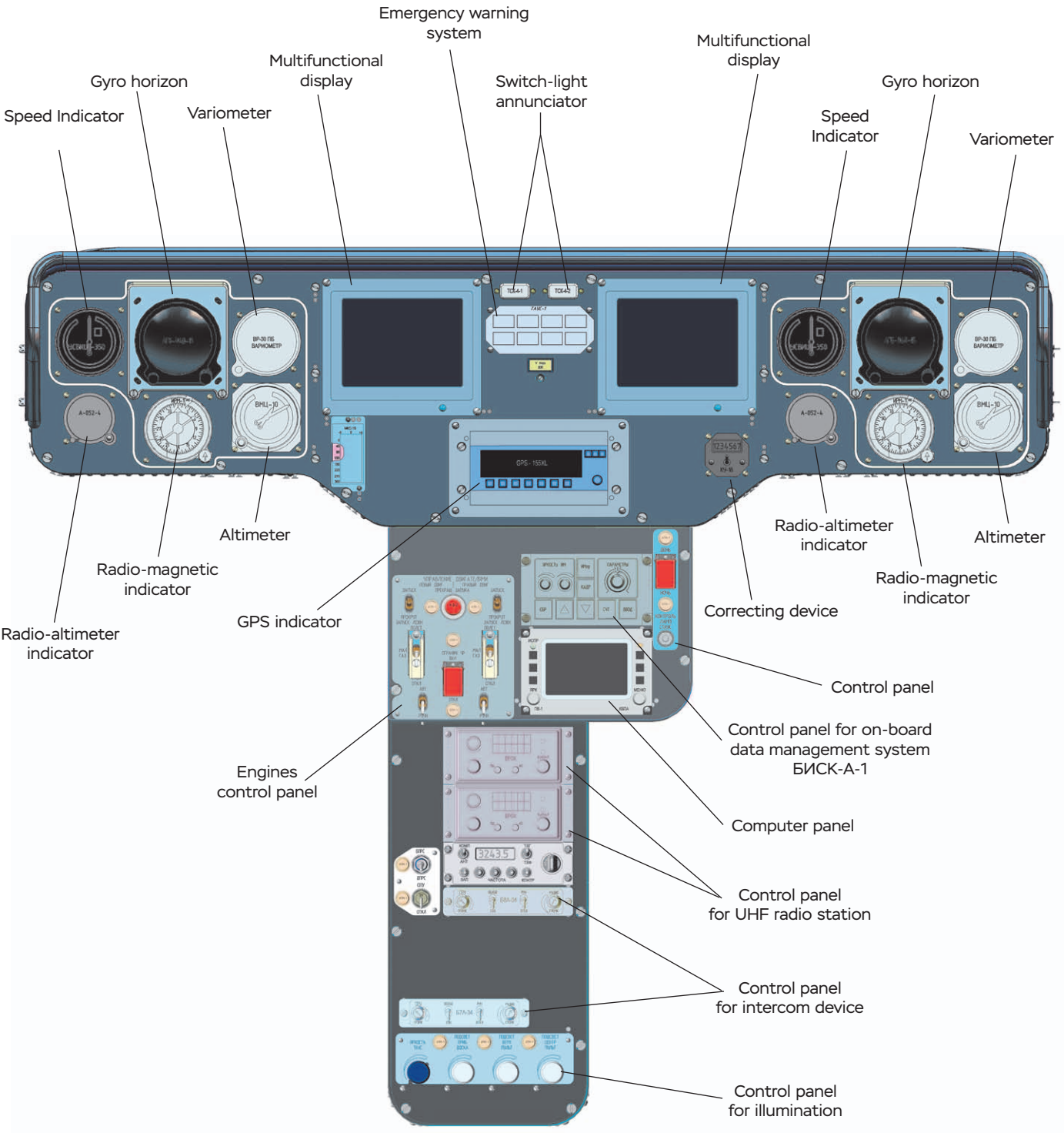


Fig. 4.1. Layout of instrument panel and central console in a two-pilot cockpit

4.1. Cockpit warning equipment (ОВКС)

Warning equipment in the cockpit is designed to provide the crew with visual and sound notifications on the state of helicopter powerplant and systems: control system, transmission, hydraulic system, fuel system, fire extinguishing system, air data system, electric power supply system, flight and navigation equipment, radio communication equipment.

The equipment comprises the following on-board systems:

- on-board data management system (БИСК-А-1);
- emergency warning and annunciation panel system (СТАУС-1-4);
- master warning lights.

4.2. On-board data management system (БИСК-А-1)

On-board data management system БИСК-А-1 is designed for collecting, transferring and displaying information. БИСК-А-1 interacts with the following equipment:

- engine electronic controllers;
- engine sensors and systems (fuel supply system, oil system, rotation speed, pressure and temperature sensors, etc.);
- helicopter systems sensors (power supply system, transmission, hydraulic system, fuel system, etc.).

БИСК-А-1 system includes:

- БВФ-А-1-226Н computing and generating unit;
- Two full-color multifunctional displays ИМ-14-1;
- ПУИ-А-1-226Н display control console.

The system outputs the following information to the display screens:

- current value of parameters and state of engines and helicopter systems;
- emergency, warning and annunciating text messages;
- values of operating parameters (input from system's panel).

On ground the system is intended to provide the crew with the following objective operational data on:

- exceeding standard operating modes of engines and assemblies;
- values of parameters of engines' and systems' operation beyond the acceptable limitations including the time of operation beyond the limitations;
- total running time of major assemblies and units;
- failures of helicopter equipment and systems.

4.3. Emergency warning and annunciation panel system (СТАУС-1-4)

Emergency warning and annunciation panel system is designed to provide light and sound warning of the state of systems and equipment in accordance with discrete analog signals from the respective sensors.

4.4. Flight and navigation equipment

Flight and navigation instruments generate information on the speed, altitude, flight direction and attitude of the helicopter. Flight and navigation equipment may comprise different instruments.

ИРМ-1 radio-magnetic indicator is used on board as a remotereading indicator and operates together with the small-size compass system МКС-1В and radio compass АРК-35-1.

Compass system МКС-1В is intended for measuring the helicopter's gyromagnetic heading and for outputting electric signal on the heading and system's operability signal. It outputs data to indicator ИРМ-1.

Aerometric equipment provides the helicopter crew with altitude and speed data and generates warnings in case of exceeding VNE or assigned flight level.

Aerometric equipment consists of:

- variometer ВР-30ПБ;
- ВМЦ-10 mechanical altimeter with digital jack;
- УСВИЦ-350 helicopter air speed indicator with max speed index and digital jack;
- ПВД-К4-1 pitot (main and stand-by);
- СВС-В2-А air data system;
- ВВС-А-1 air data computer;
- П-104М brake temperature sensor.

КИ-13БС-1 liquid magnetic compass with built-in lighting is designed for determining and indicating helicopter true heading as a stand-by instrument.

ТВ-45К temperature meter is intended for measuring outside air temperature. General information on o the outside air temperature is displayed in the main frame of right-hand display of БИСК-А-1.

4.5. Flight data recorder

Protected flight data recorder ЗБН-АНСАТ is intended for registering, recording and reading flight parameters and audio information, including the cases of air accidents.

Protected flight data recorder ЗБН-АНСАТ interacts with БИСК-А-1 and СПУ-34.

In order to ensure the safety of data in case of air accident ЗБН-АНСАТ unit is installed in the tail boom.

The amount of parametric data recorded by ЗБН-АНСАТ equals at least 25 hours. The amount of recorded voice information equals at least two hours in each channel. Storage time for registered flight data by ЗБН-ПЗ without connecting supply voltage equals at least one year.

4.6. Radio communication equipment

Radio equipment provides for the following:

- two-way VHF radio communication between the helicopter and ground radio stations, as well as other aircraft in the air;
- communication after helicopter landing outside the airfield or transmission of homing signals to search and rescue means;
- generation of data and commands coming via radio and on-board communication channels to be recorded by FDR.

Radio communication equipment comprises:

- VHF radio equipment (“Yurok” radio station);
- internal communication equipment (aircraft interphone system СПУ-34);
- switching system and automatic volume adjustment;
- emergency radio station;
- emergency locator transmitter.

Other optional radio equipment may be installed.

4.7. Radio equipment for helicopter piloting

Radio navigation equipment (radio equipment for helicopter piloting) is used for:

- helicopter piloting by homing and broadcasting radio stations with audio indication of their signals;
- helicopter homing to radio beacons of continuous and pulse emission to search helicopters (aircraft) and their crews, as well as other objects;
- helicopter guidance to the landing airfield;
- landing of the helicopter;
- determination of navigation components necessary to perform flight task;
- automatic and continuous measurement and indication of the ground velocity components, drift angle and calculation of helicopter position orthodromic coordinates.

Radio equipment for helicopter piloting in base variant comprises:

- radio equipment to determine relative bearings — radio compass;
- low altitude radio altimeter;
- satellite navigation equipment.

It is possible to install optional weather radar and other approved radio navigation equipment.

5. Baseline version Specifications

Baseline version of ANSAT helicopter is fitted with minimum equipment required for performing safe flights as per VFR.

FUSELAGE	
• Fuselage	• Sliding door (starboard)
• Tail boom	• Sliding door (portside)
• Empennage	• Rear hatch
POWER PLANT, TRANSMISSION	
• Two PW-207K engines	• XP-23 tail gearbox
• Two intermediate shafts CB-23	• XB-23 tail rotor drive shaft
• BP-23A main gearbox	
MAIN ROTORS	
• Main rotor hub	• One set of main rotor fairing
• Four main rotor blades	• One set of pendulous vibration damper
• Tail rotor	
FUEL SYSTEM	
• Main fuel tanks	• Pumps
• Set of alarm sensors for fuel level and pressure	• Complex of pipelines and valves
LANDING EQUIPMENT	
• Skid landing gear	• Tail skid
CONTROL SYSTEM	
• Swashplate	• Three MR control actuators РП-14
• Main rotor hydro mechanical control system	• Tail rotor control actuator РП-14Б
• Actuating mechanisms	
POWER SUPPLY SYSTEM AND ELECTRICAL EQUIPMENT	
• Two starter-generators EMG200LA	• 27 V DC power power distribution system
• Converter ПТС-250АМ	• Emergency warning and annunciation panel system СТАУС-1-4
• Two storage batteries 20FP25H1CT-R	• On-board data management system БИСК-А-1
• AC power supply system 3-400 Hz 36 V	
COCKPIT EQUIPMENT	
• Cockpit's cladding	• Two LED lamps ССД37АУ-01.03
• Lighting in the cockpit	• Two pilot seats Fischer 230/260 H110
EQUIPMENT AND FURNISHING OF PASSENGER CABIN	
• Communication equipment of passenger cabin	• Floor cover
• Passenger cabin lighting	• Ventilation system of passenger cabin
• Sixteen LED lamps ССД140	• Active vibration control system LORD
• ССД37А-01.03 LED light	• Oxygen supply unit БКП-3-2-210
• Three BR9661-103 «Exit» panels	• ОР1-1,0-20-30 «ХЛАДОН» hand-held fire extinguisher
• Heat and sound insulation	• Astronics airborne first aid kit
• Cladding panels	
HYDRAULIC SYSTEM	
• Two 2 hydraulic tanks	• Two plunger pumps НП-130-2 (or НП 1.26А)
ANTI-ICING SYSTEM	
• СО-121ВМ var «а» ice-detecting system	
FIREFIGHTING EQUIPMENT	
• Fire extinguishing system	• ОР1-1,0-20-30 «ХЛАДОН» hand-held fire extinguisher
• Two fire extinguishers 1-2-2-khladon 114B2	
HEATING AND VENTILATION SYSTEM	
• Engine air bleed system АЕА-100-2	• Ventilation system

FLIGHT AND NAVIGATION EQUIPMENT	
• Two АГБ-96Д gyrohorizons	• Air data system СВС-В2-А
• Two altimeters ВМЦ-10	• Two УСВИЦ-350 airspeed indicators
• Two variometers ВР-30МПБ	• УБС-К multipurpose communication unit
• Two radio-magnetic indicators ИРМ-1	• СУУ-А stability augmentation system
• МКС-1В compass system	• Four electromechanical steering mechanisms SEMA 8493
• Three pitots ПВД-К4-1	• КИ-13БС compass
RADIO COMMUNICATION AND ANNOUNCEMENT EQUIPMENT	
• Two sets of “Yurok” radio station	• АРМ-406П automatic locator transmitter
• АРК-35-1 direction finder	• ПАРМ-406А emergency locator transmitter
• А-053-05.02 low altitude radio altimeter	• СО-2010 aircraft transponder, ACS mode
• РМА7000Н audio panel	• Preparation of sites to accommodate СН-4312-02 on-board satellite navigation equipment
• Five headsets David Clark H10-60H	
AIRBORNE FLIGHT DATA RECORDING MEANS	
• Protected flight data recorder ЗБН-АНСАТ	
LIGHTING EQUIPMENT	
• Two anti-collision lights МСЛ-4К	• БАНО-7М-К aircraft navigation light
• Two АРФ-1 lights	• АНО-3-Бл tail navigation light
• БАНО-7М-Зл aircraft navigation light	
Total weight of dry equipped helicopter in baseline configuration is 2 434 kg / 5 366 lb	
Maximum possible fuel amount for flight in standard weather at sea level, VFT, one pilot (85 kg) is 514 kg / 1 133,18 lb	

Additional aggregates, equipment and components of standard helicopter design (options)

	Weight, kg	Weight, lb
Two aircraft clock Mechanical Aircraft Chronograph B18-956.22.05.1.FZ	0,44	0,97
Two LED lamps P/N P2-07-0015-002 (or P/N P2-07-0015-003)	0,54	1,19
СН-4312-02 on-board satellite navigation equipment	7,1	15,65
Pendulous vibration damper	23	50,71
One (two) oxygen supply unit БКП-3-2-210	4,4 (8,8)	9,7 (19,4)
One (two) additional heaters of passenger cabin 7066МА	7,8 (15,6)	17,2 (34,39)
Additional sound insulation	25,9	57,1
Interior finishing of passenger cabin by special film	n/a	n/a
Additional glazing (double)	7,4	16,3
AEAC-110-2 air conditioning system	38	83,78
ATC radar transponder CO-2010 (ATC, ACS modes or ACS mode) • Two modes ATC and ACS (antennas АП(3)-018 and КА-61); • ACS mode (antenna КА-61)	2,9	6,39
ОР1-1,0-20-30-khladon hand-held fire extinguishers	3,03	6,7
Oxygen supply unit БКП-3-2-210	4,4	9,7
Passenger seats Fischer 236/406 P/N 9608-0-100-D1510103	12,6	27,8
Astronics airborne first aid kit	0,41	0,9
Headsets David Clark H10-60H	0,6	1,38
Astronics airborne first aid kit	0,41	0,9
Medical module ММА.9520.000, МММ.9520.3000	115,5	254,63

6. Painting variants

Any configuration is offered with typical painting variants. External surfaces of helicopters shall be painted with polyurethane or acrylic urethane enamels.

Helicopter painting as per a customized scheme is an option and subject to coordination with a representative of JSC “Russian Helicopters”.

Any customer has the opportunity to develop an individual painting scheme jointly with a representative or may submit its own design and color pattern in accordance with Federal Standard 595B Color catalog (1994, July) or catalog «RAL-K1».

To have company name, logo and other elements of external painting applied on the helicopters a customer has to provide information on colors, dimensions and location of such elements by attaching the files in vector format.

When coordinating any painting schemes take note that state registration number, technical warning messages, model of helicopter and OEM logo are to be applied mandatorily at the fixed locations on the fuselage.

Fig. 6.1.

Fig. 6.2.

Fig. 6.3.

Fig. 6.4.

Fig. 6.5.

7. Variants of helicopter application

Passenger

Up to 7 passenger seats may be installed in the passenger cabin onto the floor panel with integrated rails. All seats are fitted with 4-point safety belts. To ensure comfortable conditions the provision is made for the installation of conditioning and heating system in the passenger cabin.

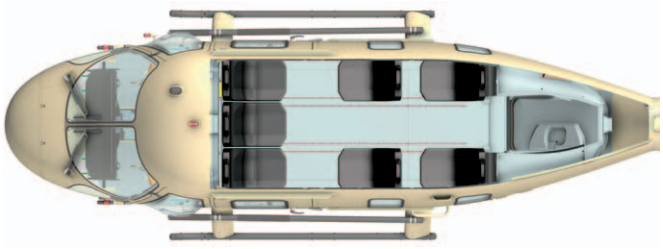


Fig. 7.1. Passenger version layout

Designation	Weig (kg / lb)
Two hand-held fire extinguishers OP1-1,0-20-30-khladon	6,07 / 13,37
Oxygen supply unit БКП-3-2-210 (option)	4,4 / 9,7
Seven passenger seats Fischer 236/406 P/N 9608-0-100-D1510103	88,2 / 194,45
Astronics airborne first aid kit	0,41 / 0,9
Seven headsets David Clark H10-60H	4,38 / 9,66
Total weight of dry equipped helicopter in passenger configuration	2 455,72 / 5 413,94

Weight distribution (with payload and fuel) for passenger variant

Total weight of dry equipped helicopter in passenger configuration, kg / lb	2 455,72 / 5 413,92
One pilot, kg / lb	85 / 187,39
Payload (7passengers), kg / lb	595 / 1311,75
Fuel: max fuel with 5% emergency fuel reserve (altitude 500 m, cruise speed), kg / lb	465 / 1025,15
MTOW, kg / lb	3 600 / 7 936,64

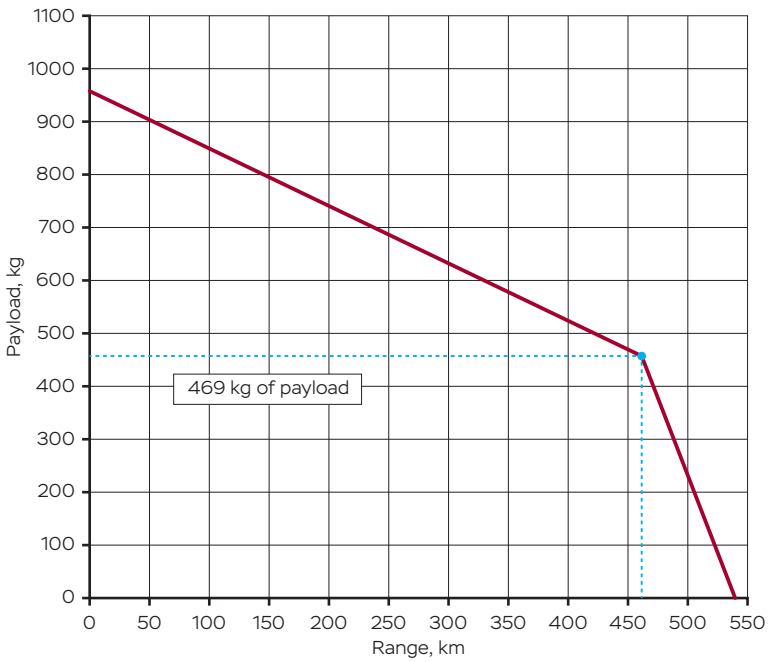


Fig. 7.2. Diagram “Load - Range”, Ansat in passenger configuration, one pilot, take-off weight 3600 kg with 5% emergency fuel reserve

Corporate (VIP)

Corporate configuration of Ansat helicopter is designed for passenger transportation with enhanced comfort. The helicopter is equipped with comfortable shock-absorbing seats made of high-quality leather. The helicopter features storage space for personal belongings, mini-bar, luggage compartment and wardrobe.

Each element of the interior is the result of meticulous work of designers, engineers, technologists and experts in coloristics. VIP modification of the helicopter sports high-precision details with emphasized singularity of original elements.

Within the certified configuration the OEM is ready to furnish the cabin as per the Customer's preferences. Weight distribution may impose additional constraints.

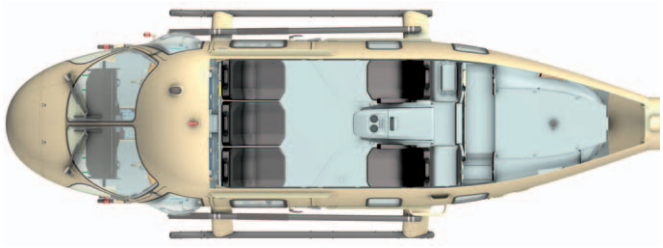


Fig. 7.3. Layout of corporate (VIP) helicopter, "Everest" configuration

Weight distribution (with payload and fuel) for corporate configuration

Total weight of dry equipped helicopter in "Everest" configuration, kg / lb	2 554,72 / 5632,19
One pilot, kg / lb	85 / 187,39
Payload (5 passengers), kg / lb	425 / 936,96
Fuel: max fuel with 5% emergency fuel reserve (altitude 500 m, cruise speed), kg / lb	535,28 / 1180,09
MTOW, kg / lb	3 600 / 7 936,64

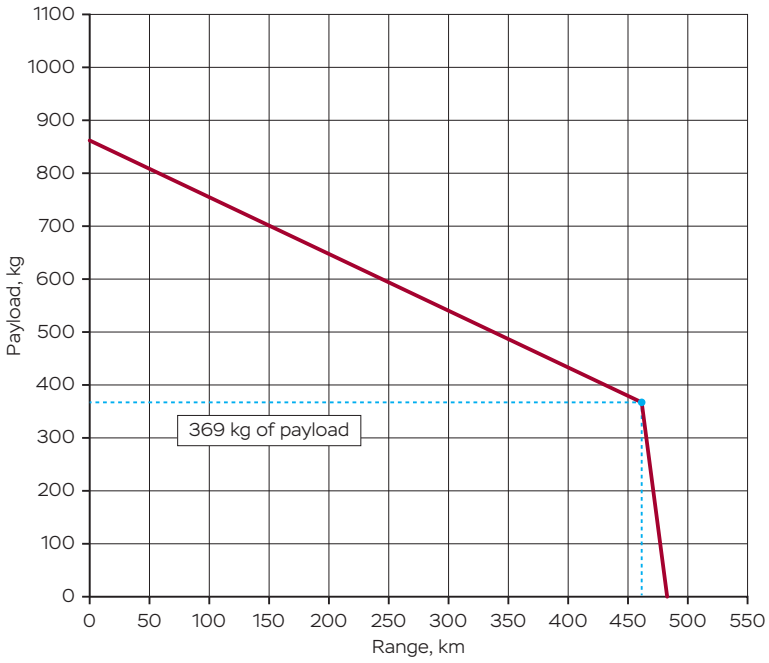


Fig. 7.4. Diagram "Load - Range", Ansat in Corporate (VIP) configuration, one pilot, take-off weight 3600 kg with 5% emergency fuel reserve

EMS

Transportation of one injured patient on stretchers with 2 medical attendants and rendering first aid on board the helicopter on ground and in flight.

EMS variant is completed with medical module MMA 9520.000 providing transportation of one injured patient in need of intensive care or resuscitation. Module is quickly detachable and can be dismantled easily within 15 minutes by two flight engineers. The helicopter is fitted with two shock-absorbing seats for medical personnel. Seats and medical module are installed on rails provided on the floor panel of the helicopter passenger cabin.

Medical equipment installed on medical module was approved by Federal Service for the Supervision of Public Health and Social Development (Roszdravnadzor), Certificate No. РЗН 2013/1191 of 11.02.2019, certified as part of Ansat helicopter for equipping EMS cabin in accordance with major change approval No. СТ236-АНСАТ/ОГИ-05:

Designation	Weight (kg / lb)
Two hand-held fire extinguishers OP1-1,0-20-30-khladon	6,07 / 13,37
Two oxygen supply units БКП-3-2-210	8,8 / 19,4
2 passenger seats Fischer 236/406 P/N 9608-0-100-D1510103	25,2 / 55,56
Astronics airborne first aid kit	0,41 / 0,9
Medical module MMA.9520.000 MMM.9520.3000	115,5 / 254,63
3 David Clark headsets H10-60H	1,87 / 4,12
Total weight of dry equipped helicopter in medical configuration	2 555,41 / 5 633,71

Weight distribution (with payload and fuel) for EMS variant

Total weight of dry equipped helicopter in medical configuration, kg / lb	2 555,42 / 5 633,73
One pilot, kg / lb	85 / 187,39
Payload (one patient, two medical attendants), kg / lb	255 / 562,18
Fuel: max fuel with 5% emergency fuel reserve (altitude 500 m, cruise speed), kg / lb	707,59 / 1559,97
MTOW, kg / lb	3 600 / 7 936,64

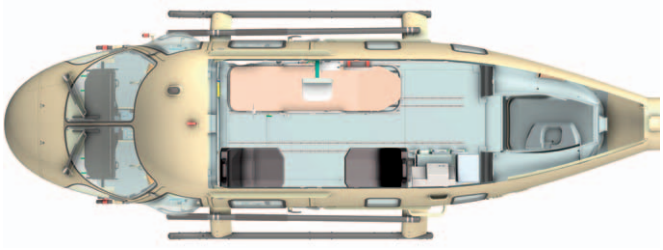


Fig. 7.5. EMS version layout

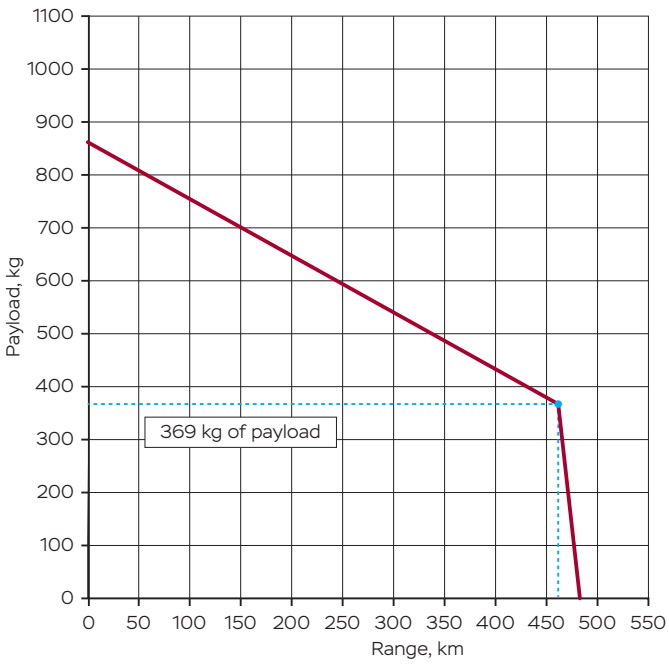


Fig. 7.6. Diagram “Load - Range”, Ansat in EMS configuration, one pilot, take-off weight 3600 kg with 5% emergency fuel reserve

8. Performance charts

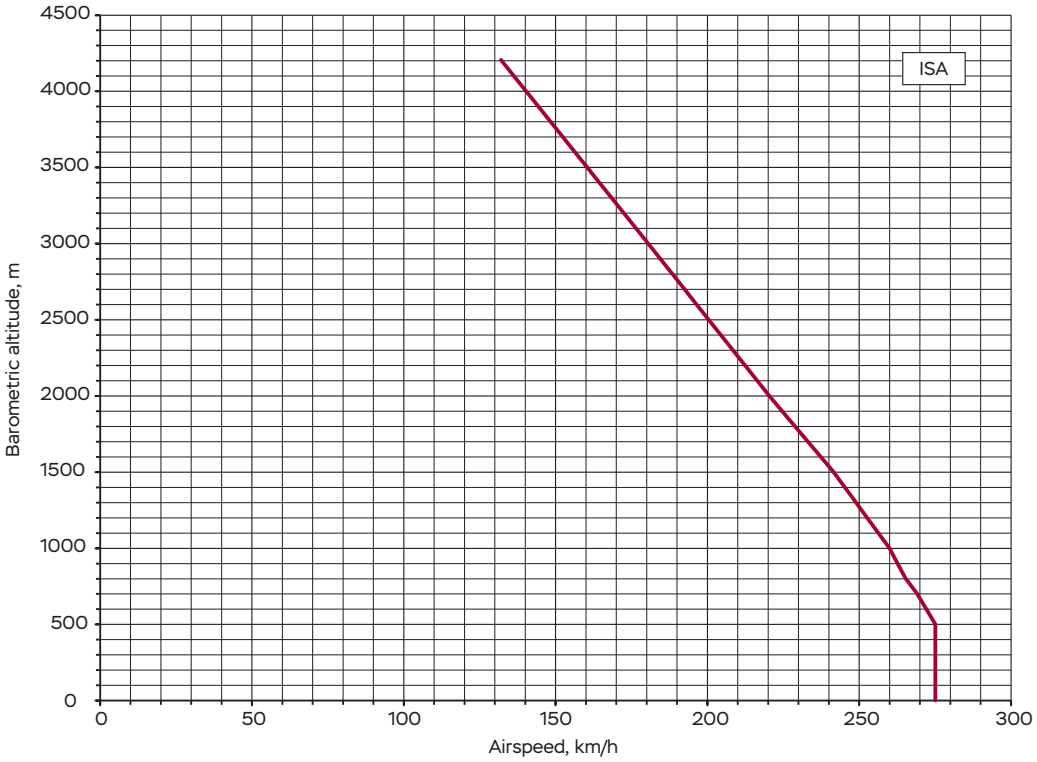


Fig. 8.1. Chart of V_{NE} vs barometric height at in-flight weight 3 300 kg

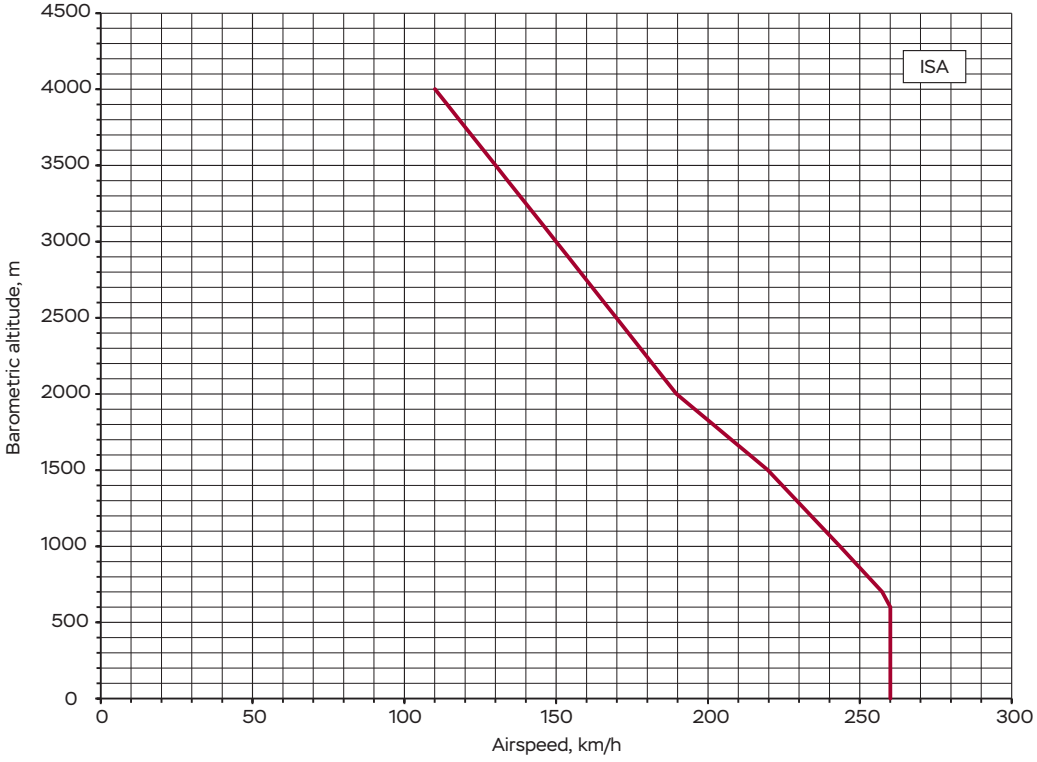


Fig. 8.2. Chart of V_{NE} vs barometric height at in-flight weight 3 600 kg

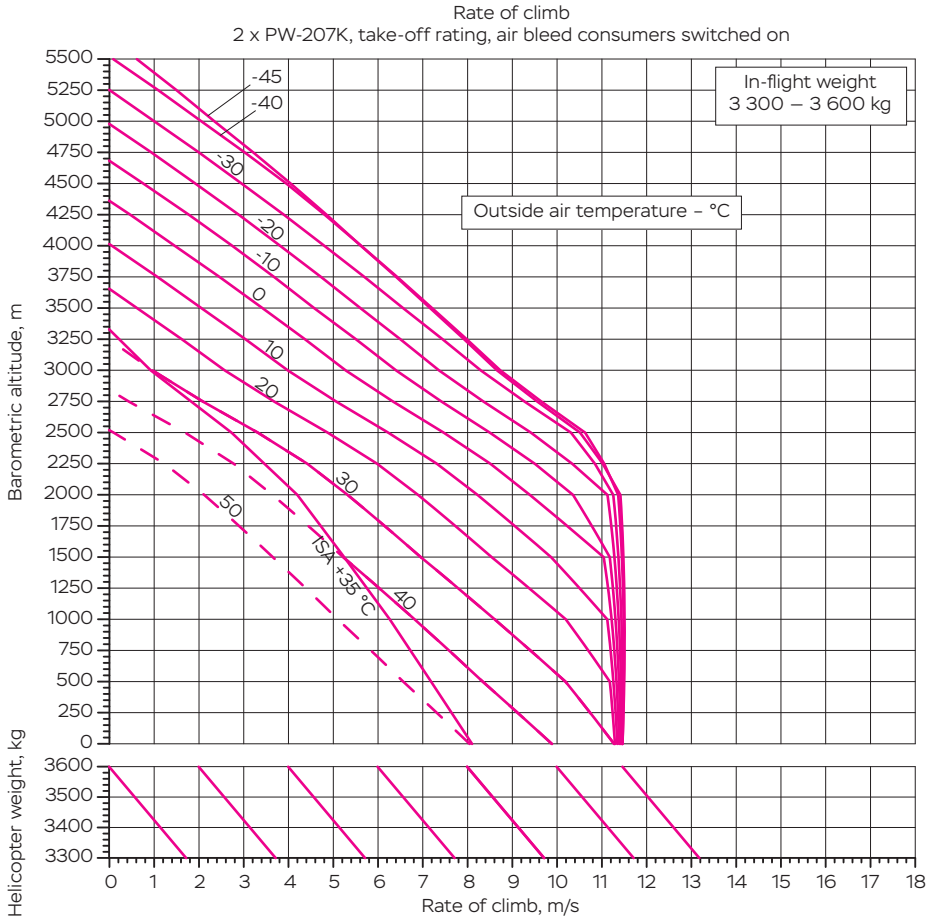


Fig. 8.3. Climb performance chart

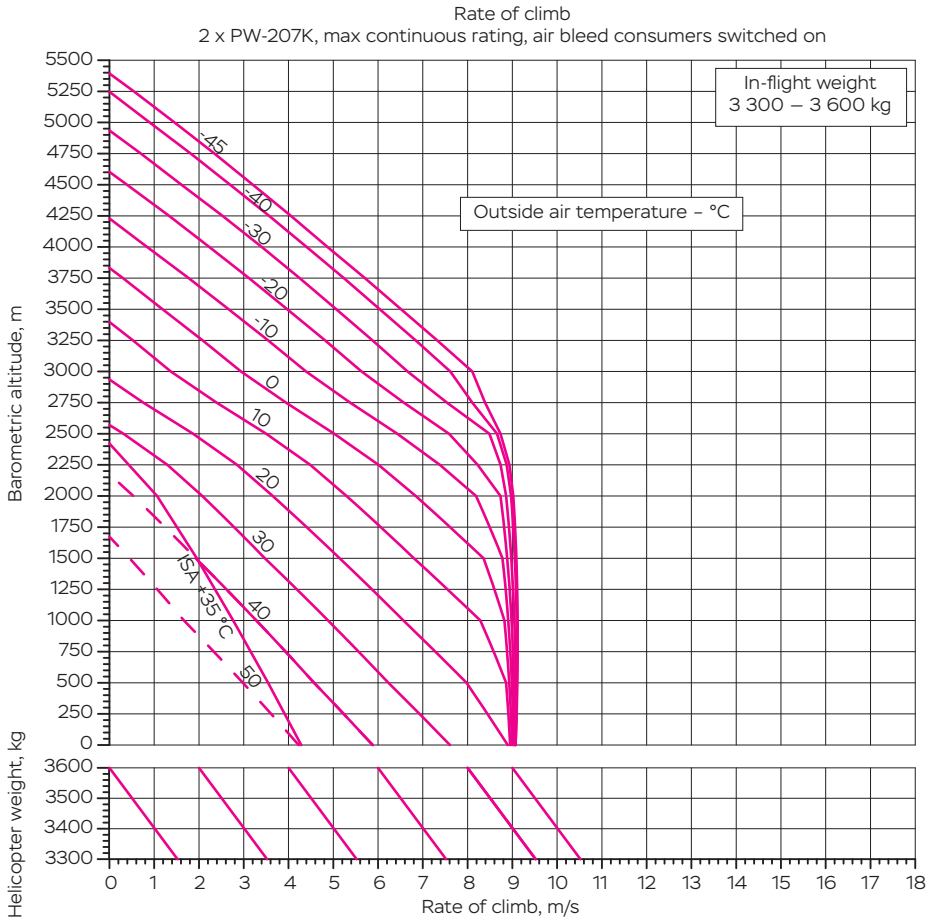


Fig. 8.4. Climb performance chart

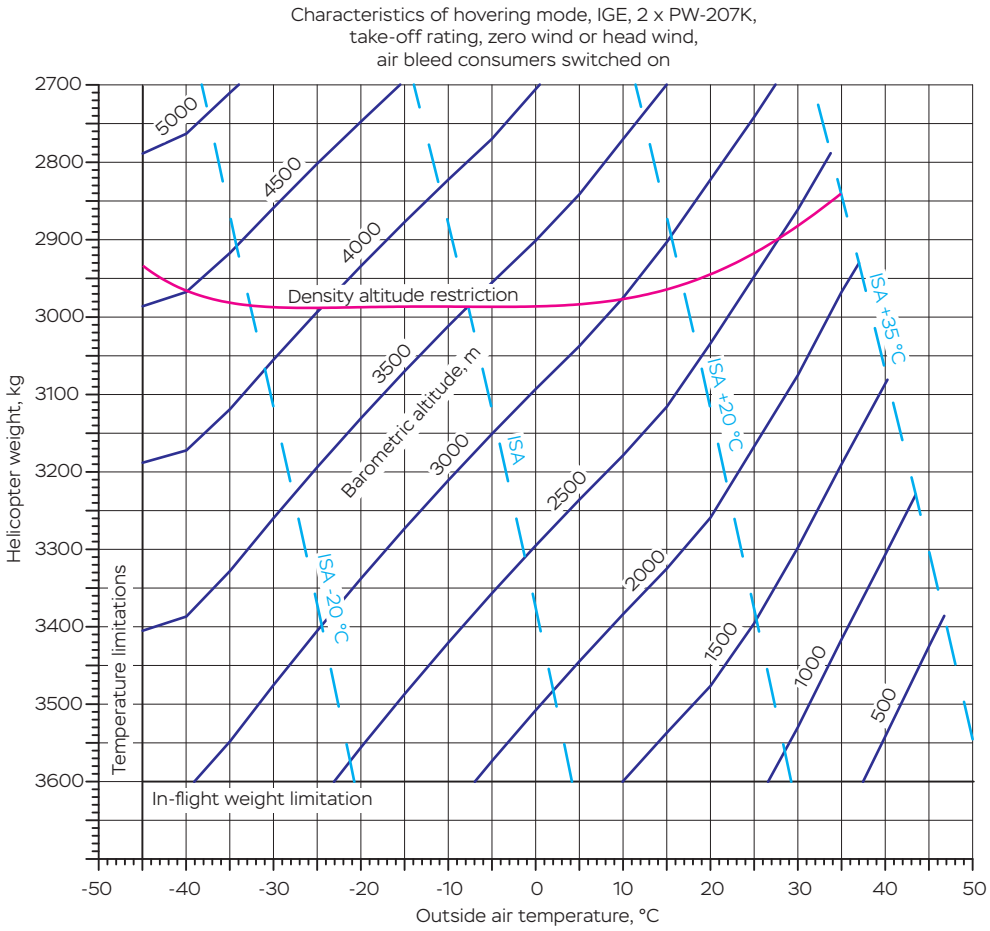


Fig. 8.5. Chart of hovering IGE

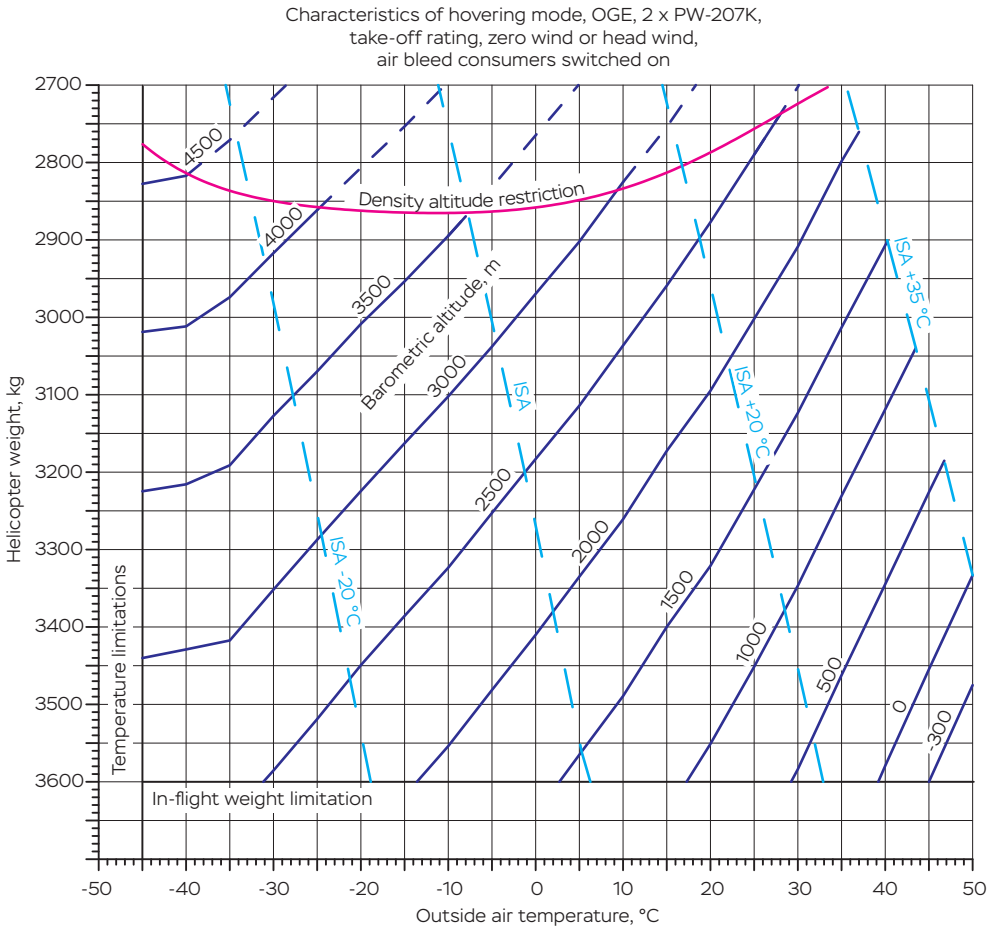


Fig. 8.6. Chart of hovering OGE

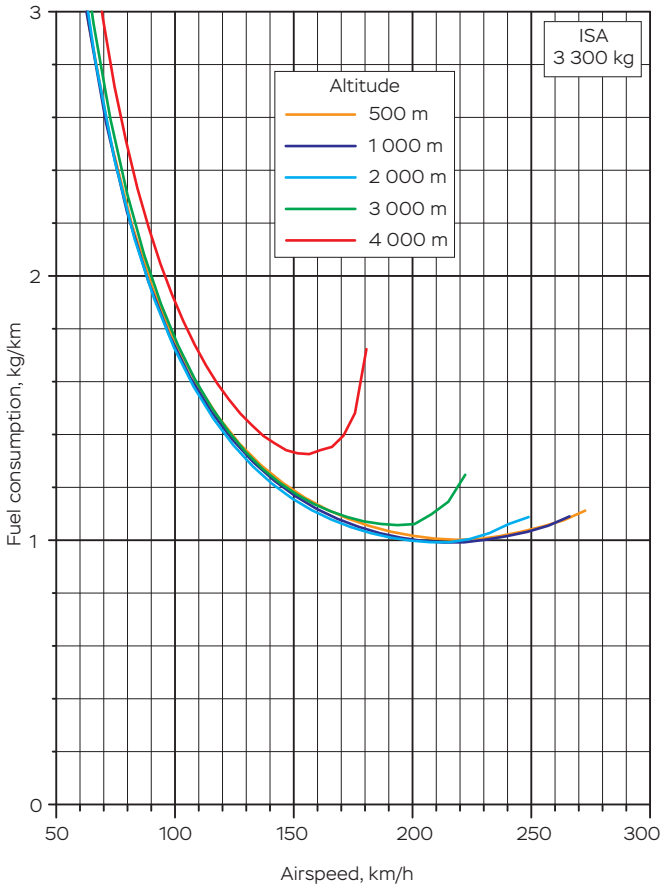


Fig. 8.7. Chart of fuel consumption per kilometer (ISA, 3 300 kg)

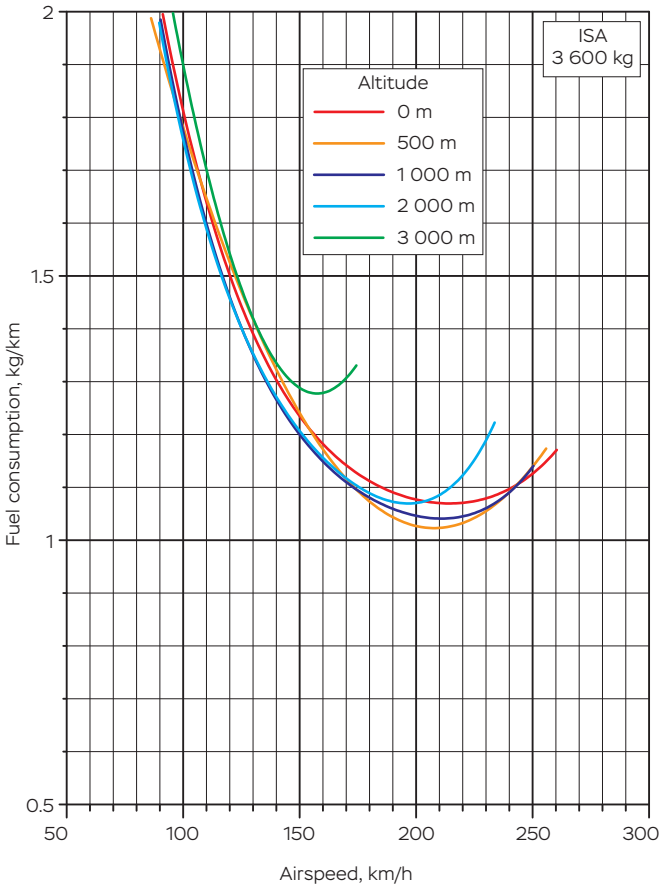


Fig. 8.8. Chart of fuel consumption per kilometer (ISA, 3 600 kg)

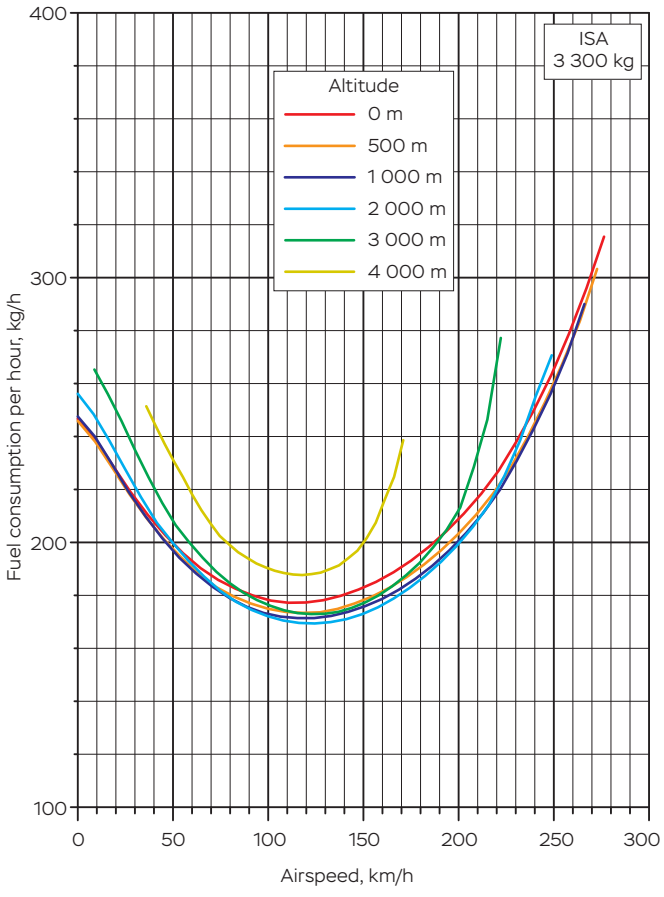


Fig. 8.9. Chart of fuel consumption per hour (ISA, 3 300 kg)

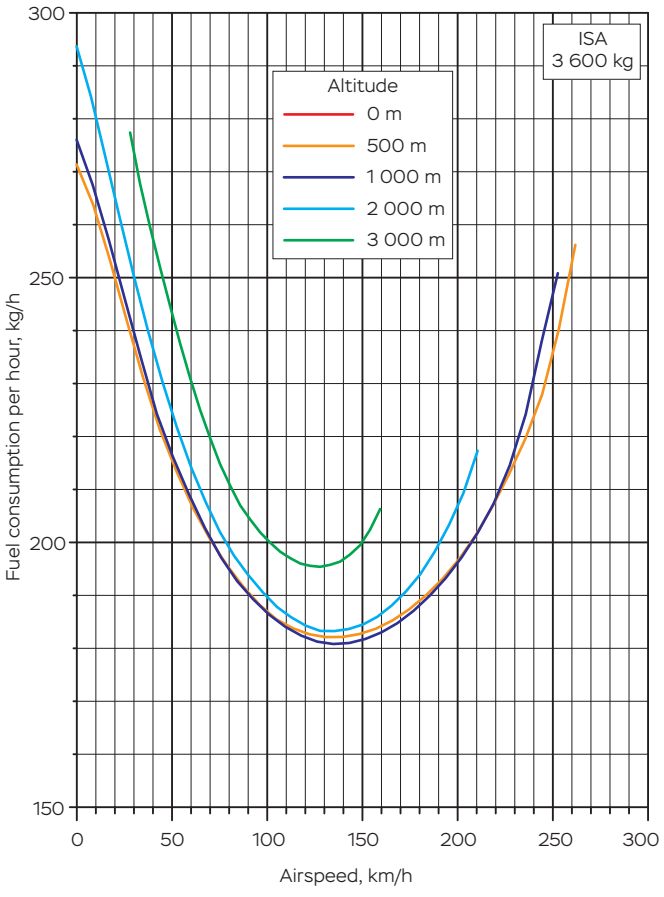


Fig. 8.10. Chart of fuel consumption per hour (ISA, 3 600 kg)

8. Maintenance and repair/overhaul

The following types of preparation and maintenance are provided to ensure continued airworthiness of ANSAT helicopter:

- pre-flight and post-flight preparation;
- line maintenance;
- periodic maintenance;
- seasonal maintenance and mandatory service life activities and maintenance of components;
- storage maintenance;
- special maintenance.

Helicopter preparation:

- Preflight preparation – performed before each flight of the rotorcraft, 0,6 – 1,5 man-hour.
- Post-flight preparation – performed after each flight of the rotorcraft, 0,5 – 1,25 man-hour.

Line maintenance includes:

- service maintenance (0,5 – 5 man-hours) that shall be performed at least each 7 days if the helicopter clocks under 25 flight hours within the specified calendar period;
- activities to be performed each 25±5 flight hours or (6±1) calendar days (whichever occurs earlier) – 2,2 man-hour.

Note: If the helicopter clocks 25 flight hours and more within 7 calendar days, service maintenance shall not be performed.

Periodic maintenance shall be performed as per the standard maintenance model that shall be assigned based on the flight time of the airframe in hours and based on the calendar period of operation (whichever occurs earlier).

Periodic maintenance	Workload, man-hours
(50±5) flight hours // (12±1) calendar months	4
(100±10) flight hours // (24±1) calendar months	25
(300±10) flight hours // (24±1) calendar months	13
(600±10) flight hours // (36±1) calendar months	12
(1200±10) flight hours // (36±1) calendar months	3
(1800±10) flight hours // (36±1) calendar months	4

Checks (50±5) hours//(12±1) months, (100±10) hours// (24±1) months, (300±10) hours//(24±1) months, (600±10) hours// (36±1) months, (1200±10) hours//(36±1) months, (1800±10) hours//(36±1) months include the checks of less periodicity.

Seasonal maintenance (1,6 man hour) shall be performed as part of the helicopter preparation to autumn/ winter and spring/summer operation period in accordance with the requirements of section 012.20.00 of the Helicopter Maintenance Manual and respective clauses of the Maintenance Schedule or instructions of the aviation authorities of the operator's country, if available.

Helicopter maintenance in storage

(1 man-hour) is performed during temporary breaks in operations and includes the following activities:

- preparation and storage of helicopter;
- helicopter servicing after 10±2 days; 30±5 days; 3 months±10 days; 6 months±1 month of storage;
- helicopter preparation for flights after storage.

Special maintenance is performed in cases of:

- flight in turbulent atmosphere (when the allowable operational g-load is exceeded);
- sharp U-turns;
- helicopter struck by lightning;
- flight in icing conditions;
- hard landing;
- resonance phenomena;
- if exposed to storm on ground;
- in cases stipulated by special maintenance of PW-207K engine.

Special maintenance	Labor intensity, man-hours
Technical maintenance performed after the flight in turbulent atmosphere, sharp turns, lightning stroke, flight in icing conditions, after resonance phenomena, exposure to storm on ground, hard landing, increased level of vibrations	10
Special maintenance of stability augmentation system	*
Engine maintenance after lightning stroke, immersion in water, drop of engine or component during handling, hard landing, sharp stop of main rotor, actuation of fire-extinguishers, approach of bypass opening*, engagement of indicator of bypass, prolong use of limited-use fuel, flights in smoke or in clouds of volcanic ashe	*
Maintenance of helicopter with newly-installed assemblies	4
Maintenance of helicopter with newly-installed assemblies after first test-run of engines	*
Maintenance of helicopter with newly-installed assemblies after check flight or maiden flight	3,6
Maintenance of helicopter after maiden flight and initial 100 hours of flight with newly installed aggregates	3,2

* depends on the qualification of technical personnel, conditions and organization of activities with the operator

Minimum labor intensity of ANSAT helicopter preparation and line maintenance:

Type of maintenance	Minimum Labor intensity, man-hours
Pre-flight preparation	0,648 (0,704*)
Post-flight preparation	0,981
Line maintenance	1,3 (3,04**)
25-hour activities	2,147

* – for medical configuration of the helicopter.

** – for the helicopter with organizing parking at the open site.

The duration of complete fueling of main fuel tanks is less than 10 minutes.

Note:

1. Pre-flight and post-flight preparations are performed by one specialist of A, B1 or B2 category.
2. Line maintenance may be performed by two specialists, both of B1 and B2 category.
3. All the other types of activities are performed by specialists of category B1 and B2 under the supervision of specialists of the respective category (B1 or B2).

Maintenance check	Labor intensity, man-hours
(50±5) hrs / (12±1) months	6,033
(100±10) hrs / (24±1) months	27,315
(300±10) hrs / (24±1) months	39,138
(600±10) hrs / (36±1) months	50,819
(1200±10) hrs / (36±1) months	58,828
(1800±10) hrs / (36±1) months	53,319

The table specifies the aggregate values of maintenance labor intensity that include maintenance labor intensity of less periodicity.

Specific indicators of helicopter maintenance types

Type of maintenance	Specific labor intensity (man*hour/flight hour)
Preparation for flights	1,1
Periodic maintenance 0,6	0,6

Note:

The data in the tables corresponds to the following operational conditions:

1. Scheduled inspection and preparation for flights are performed by a technical crew of 4:
   - 2 helicopter and engine specialists;
   - 2 specialists in aircraft electrical and radio equipment.
2. The specified specialists shall have secondary technical qualification and up to 1-year experience in helicopter operation.
3. Initial parameters for calculating specific total duration and labour intensity of maintenance are:
   - duration of 1 flight – 1.5 hrs.;
   - average annual flight hours per one helicopter – 100 hrs.;
   - specific indicators demonstrate a tendency.
4. The values of specific duration and labor intensity of transfer to a seasonal operation are not considered separately because they make part of 6-month scheduled maintenance.

10. Service life of helicopter and its components

DESCRIPTION	Assigned service life	Sheduled service life extension
Helicopter as a whole	16 000 hrs / 16 years	16 000 hrs / 25 years
Fuselage	16 000 hrs / 16 years	16 000 hrs / 25 years
Tail boom	4 000 hrs / 16 years	4 000 hrs / 25 years
Swashplate	6 000 hrs / 16 years	16 000 hrs / 25 years
Years Installation components for control actuators on main gearbox cover	6 000 hrs / 16 years	16 000 hrs / 25 years
Years Aft-booster unit of tail rotor control	4 000 hrs / 16 years	6 000 hrs / 25 years
Power plant	4 000 hrs / 16 years	6 000 hrs / 25 years
Skid landing gear	6 000 пос / 16 years	10 000 пос / 25 years
Main gearbox	4 000 hrs / 16 years	6 000 hrs / 25 years
Tail gearbox	6 000 hrs / 16 years	6 000 hrs / 25 years
Tail transmission shaft	6 000 hrs / 16 years	6 000 hrs / 25 years
Transmission connecting shafts	4 000 hrs / 16 years	6 000 hrs / 25 years
Main rotor blade	4 000 hrs / 12 years	5 000 hrs / 18 years
Main rotor hub	6 000 hrs / 12 years	8 000 hrs / 18 years
Tail rotor (except for tail rotor blade)	2 000 hrs / 8 years	5 000 hrs / 25 years
Tail rotor blade	2 000 hrs / 8 years	5 000 hrs / 18 years
Empennage	4 000 hrs / 12 years	5 000 hrs / 25 years
Hydraulic system	6 000 hrs / 12 years	10 000 hrs / 25 years

11. Warranty

The following warranty periods have been set up:

- for the helicopter – 12 months from the date of signing the Final Acceptance Certificate for the helicopter or 300 flight hours, whichever occurs earlier;
- for the equipment – 12 months from the date of signing the Final Acceptance Certificate for the equipment.

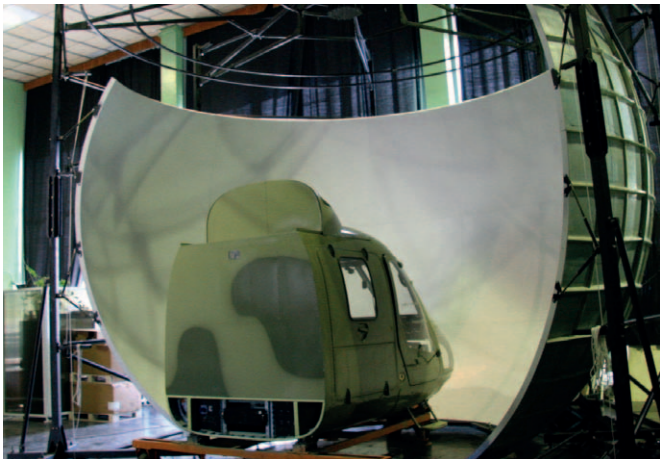
Extension of warranty to 2 years / 600 hrs or to 2 years / 1000 hrs is subject to an agreement at additional cost.

12. Training

The training for Ansat helicopter is performed at the aviation training center of PJSC “Kazan Helicopters” (developer and OEM of the helicopter). The programs for conversion training of engineering and technical personnel in the trades “Helicopter and engine” and “Aircraft equipment and avionics” are approved by FATA (Rosaviatsiya) and make part of Annex to the Certificate of training center. The programs take 128 and 142 training hours respectively. The program of pilot’s conversion training approved by FATA (Rosaviatsiya), takes 172 training hours including 7 hrs 55 min of flight training.

In 2019, under the investment project of development the training center of PJSC “Kazan Helicopters” shall be equipped with additional technical training aids: full flight simulator and computer-aided training course. When the computer-aided training course is completely developed the trainees will be able to undergo a part of theoretical training by distance learning through LMS system at the portal of JSC “Helicopter Service Company”.

More information on the training program, procedure and documents required for enrollment is available at www.hsc-copter.com/training.



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