MI-8MSB
MEDIUM CLASS TRANSPORT HELICOPTER
In 2011, the State Aviation Administration of Ukraine issued to Motor Sich JSC Certificate CP No. 0009 for designer of aviation equipment and Additional type certificate No. ДТВ-0003 for the Mi-8MSB helicopter.

Helicopters Motor Sich Ltd was founded for promotion of own aviation products and mastering of new business activity. The main function of this specialized subdivision consists in organization of production of own high-performance helicopter. In 2012 the helicopters production was certified by the State Aviation Administration of Ukraine.
### MAIN CHARACTERISTICS OF TV3-117VMA-SBM1V, SERIES 4E, ENGINE

The turboshaft engine with one-shaft gas-generator and free turbine maintains power flat rated to high values of ambient air temperature, deployment and flight altitudes comparing with existing TV2-117 helicopter engines.

#### 2.5-min OEI power rating,
Continuous OEI 1 power rating – 60 minute (Cont 1)
\( (H=0, M_n=0, ISA +20^\circ\text{C}) \):
- Power, hp (kW): \( 1,700 (1,251) \)

Continuous OEI 2 power rating – 60 minute (Cont 2)
Take-off power rating
Continuous take-off power rating (30 min)
\( (H=0, M_n=0, ISA) \):
- Power, hp (kW): \( 1,500 (1,104) \)
- flat rated up to \( t_{\text{amb}} \), °C: \( +55 \)
- Specific fuel consumption, kg/hp-h: \( 0.251 \)

Maximum continuous power rating
\( (H=0, M_n=0, ISA) \):
- Power, hp (kW): \( 1,200 (883) \)
- flat rated to \( t_{\text{amb}} \), °C: \( +60 \)
- Specific fuel consumption, kg/hp-h: \( 0.266 \)

Cruise power rating
\( (H=0, M_n=0, ISA) \):
- Power, hp (kW): \( 1,000 (736) \)
- flat rated up to \( t_{\text{amb}} \), °C: \( +60 \)
- Specific fuel consumption, kg/hp-h: \( 0.280 \)
- Engine dry weight, kg: \( 295 \)
OUTLINE DRAWING AND PRINCIPAL DIMENSIONS
COMPARATIVE CHARACTERISTICS OF ENGINES

Environmental conditions at which engine takeoff power is flat-rated

- **TV2-117**
- **TV3-117VM**
- **TV3-117VMA-SBM1V Series 4E**

**Maximum ambient air temperature, °C**

- **TV2-117**: 35
- **TV3-117VM**: 40
- **TV3-117VMA-SBM1V Series 4E**: 45

**Altitude at which specified engine takeoff power is flat-rated, m**

- **TV2-117**: 2,000
- **TV3-117VM**: 3,000
- **TV3-117VMA-SBM1V Series 4E**: 4,600
COMPARATIVE CHARACTERISTICS OF ENGINES

Accelerating time, s

- TV2-117
- TV3-117VM
- TV3-117VMA-SBM1V Series 4E

First overhaul period and TBO, hrs

- TV2-117
- TV3-117VM
- TV3-117VMA-SBM1V Series 4E
# COMPARISON OF OPERATIONAL PARAMETERS OF HELICOPTERS

<table>
<thead>
<tr>
<th>Operational parameters</th>
<th>MI-8T</th>
<th>MI-8MSB</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Engine type</td>
<td>TV2-117A</td>
<td>TV3-117VMA-SBM1V, series 4E</td>
</tr>
<tr>
<td>2 Engine take-off power rating, hp</td>
<td>2 x 1,500</td>
<td>2 x 1,500</td>
</tr>
<tr>
<td>3 Engine starting system</td>
<td>electric</td>
<td>electric</td>
</tr>
<tr>
<td>4 Service ceiling, m</td>
<td>4,500</td>
<td>7,300</td>
</tr>
<tr>
<td>– with take-off weight of 9,000 kg or less</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Hourly fuel consumption with standard take-off weight at 1,000 m (at indicated airspeed of 180 km/h)</td>
<td>580</td>
<td>500</td>
</tr>
<tr>
<td>6 Maximum take-off weight, kg</td>
<td>12,000</td>
<td>12,500</td>
</tr>
<tr>
<td>7 Standard take-off weight, kg</td>
<td>11,100</td>
<td>11,100</td>
</tr>
<tr>
<td>8 Maximum weight of cargo transported in the compartment (due to fuel quantity reduction), kg</td>
<td>4,000</td>
<td>4,000</td>
</tr>
<tr>
<td>9 Maximum weight of cargo transported on external load, kg:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– hinge-pendulum</td>
<td>2,500</td>
<td>2,500</td>
</tr>
<tr>
<td>– rope</td>
<td>3,000</td>
<td>3,000</td>
</tr>
<tr>
<td>10 Cruise speed at a height up to 1,000 m, km/h:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– with standard take-off weight</td>
<td>220-230</td>
<td>220 to 250</td>
</tr>
<tr>
<td>– with maximum take-off weight</td>
<td>205-215</td>
<td>205 to 215</td>
</tr>
<tr>
<td>11 Maximum speed at a height up to 1,000 m, km/h</td>
<td>250</td>
<td>280</td>
</tr>
<tr>
<td>12 Practical range with 10,000 kg take-off weight at 3,000 m (with fuel weighing 1,450 kg), km</td>
<td>470</td>
<td>550</td>
</tr>
<tr>
<td>13 Practical range with standard take-off weight at 3,000 m with two extra fuel tanks (with fuel weighing 2,500 kg), km</td>
<td>1,060</td>
<td>1,210</td>
</tr>
</tbody>
</table>

**Note:** With regard to operational flight range the Mi-8MSB helicopter is highly competitive with the Mi-8MT (mi-17) and Mi-8MTV (Mi-17V-1) versions.
Everest (Chomolungma) is the highest peak in the world. Altitude attained by the **Mi-8MSB** helicopter powered by the **TV3-117VMA-SBM 1V series 4E** engines.
In August 2013, Mi-8MSB helicopter powered by TV3-117VMA-SBM1V Series 4E new generation engines established a set of world records (per FAI classification) at Kirovskoye airfield, Autonomous Republic of Crimea, city of Feodosiya:

1. **Absolute world record in E-1 class (helicopters):**
   - maximum altitude at level flight – 9,150 m;

2. **Records in E-1g subclass of E-1 class (weight from 6,000 kg to 10,000 kg):**
   - maximum altitude reached without cargo – 9,150 m;
   - maximum flight altitude with a payload of 100 kg – 9,150 m;
   - maximum flight altitude with a payload of 200 kg – 8,420 m;
   - maximum flight altitude with a payload of 1,000 kg – 8,420 m;
   - maximum flight altitude with a payload of 2,000 kg – 7,525 m;
   - maximum flight altitude with a payload of 2,000 kg lifted to an altitude of 2,000 m – 3,019 kg.

3. **Records in E-1h subclass of E-1 class (weight from 10,000 kg to 20,000 kg):**
   - maximum flight cargo lifted to an altitude of 2,000 m – 5,566 kg;
   - maximum flight altitude with a payload of 5,000 kg – 5,440 m.
AIRCRAFT EQUIPMENT COMPLEX

The complex electronic hardware provides an opportunity for making day and night flights under ordinary and difficult meteorological conditions according to the instrument flight rules (IFR) taking into account the effective ICAO requirements.

Resolved issues:

- navigation by ground beacons VOR, DME, NDB;
- landing according to the 1-st category using systems NDB, ILS, VOR, DME and marker beacon.
- non-precision approach according to satellite navigation data GPS;
- making flights under area navigation conditions B-RNAV (RNP-5);
- making flights in vertical separation system with warning indication of deviations from selected altitude;
- preprogramming of flight plan;
- making flights according to search-and-rescue operations;
- making low-altitude day and night flights in unknown unmarked areas, including mountainous areas, under ordinary and difficult meteorological conditions using the information received from HTAWS;
- automatic flight data transmission to AT controller;
- automatic flight data transmission to air traffic participants to take joint measures for prevention of collisions;
- providing external communication in the VHF range with frequency spectrum of 8.33/25 kHz, internal communication between crew members, public address and talks between passengers and crew members;
- providing external communication in the HF range;
- providing monitoring of helicopter position and satellite communication.
The Supplementary Type Certificates (STC) were obtained for all equipment of the Mi-8MSB helicopter.