COMANDO DA AERONÁUTICA
DEPARTAMENTO DE PESQUISAS E DESENVOLVIMENTO
CENTRO TÉCNICO AEROESPACIAL

TYPE CERTIFICATE DATA SHEET Nº EM-2005T01

Type Certificate Holder:

KLIMOV CORPORATION
St. Petersburg
194100, Russian Federation

EM-2005T01
Sheet 01
KLIMOV

TB3-117BM
TB3-117BM Series 02
TB3-117BMA
TB3-117BMA Series 02

February 2005

Engines of models described herein conforming with this data sheet, which is part of Type Certificate No.2005T01, meet the minimum standards for use in certificated aircraft in accordance with pertinent aircraft data sheets and applicable portions of the Brazilian Aeronautical Regulations provided they are installed, operated, and maintained as prescribed by the approved manufacturer's manuals and other instructions.

MODELS TB3-117BM, TB3-117BM series 02, TB3-117BMA and TB3-117BMA series 02

TYPE The turboshaft engine with a free turbine. The engine comprises a twelve-stage, axial-flow compressor featuring variable inlet guide vanes of the first, second, third and fourth stages, and an annular combustion chamber. The compressor rotor is driven by an axial-flow, two-stage turbine. The free turbine is of an axial-flow, two-stage type. The free turbine rotor is a cantilever unit. The compressor turbine and free turbine are coupled by gas dynamics only. The automatic control system consists of electromechanical and electronic governors.

RATINGS
(See Note 1)

	TB3-117BM and TB3-117BM Series 02	TB3-117BMA and TB3-117BMA Series 02
Maximum continuous, not less than: kW (shp)	1 250 (1 700)	1 250 (1 700)
Takeoff, not less than: kW (shp)	1 471 (2 000)	1 618 (2 200)
30 minutes OEI, kW (shp)	1 471 (2 000)	1 618 (2 200)
2.5 minute OEI, kW (shp)	1 618 (2 200)	1 765 (2 400)

CONTROL SYSTEM

The control system is duplicated. The main speed governor is hydraulic. The electronic limits the fuel supply at the engine ratings increasing the control accuracy, shut down the engine after the free turbine and gearbox uncoupling. The temperature regulator is of the electronic type, it limits the turbine inlet temperature at takeoff and OEI.

Accessories of the engine control system:

Hydraulic fuel control unit HP-3BM.	Hydraulic fuel control unit HP-3BM.
Electronic regulator ЭРД-3BM series 2.	Electronic regulator ЭРД-3BMA series 2.
Temperature regulator PT-12-6 series 02.	Temperature regulator PT-12-6 series 02.

STARTING

The engine is started automatically with the air starter. The engine starting at the turbocompressor windmilling is allowed at the rotational speed lower than 7%.

Maximum starting altitude, m:	4000
Air starter:	СВ-78БА
Air starter control panel – one for tow engines:	АПД-78А

FUEL / ADDITIVES

See Note 2

OIL, LUBRICATION / ADDITIVES

See Note 3

IGNITION

High voltage ignition:
- Ignition unit: СК-22-2К
- Ignition plug - 2 pieces: СП-26П3Т

TEMPERATURE LIMITS

See Note 4

PRESSURE LIMITS

See Note 5

DIMENSIONS

Length, mm (in):	2 055 (80.91)
Width , mm (in):	728 (28.66)
Height, mm (in):	650 (25.59)

WEIGHT

Weight / Dry / Maximum / kg (lb):	293.76 (647.63)

CENTER OF GRAVITY

The engine center of gravity is on the longitudinal axis. The distance to the center of gravity is 690±20 mm from the front face of the engine first support outer flange.

DRIVE SHAFT TYPE

The shaft has the outer splines at its ends. At each end there are 20 splines of the involute profile, the splines outer diameter is 52.5 mm. And the inner diameter is 46.5 mm.

AIR BLEED

Maximum air bleed is made behind the 12 compressor stage
- To the conditioning system, not more on g/s (%): 180 (2.07)
- To the anti-icing system:
  Takeoff: 1% of air flow through the engine
  Idle: 1.5% of air flow through the engine

CERTIFICATION BASIS

The certification basis is RBHA 33, corresponding to FAR Part 33, including Amendments 1 through 14 effective on 10 September 1990. This is met by Special Airworthiness Standard НЛГ-32.33 dated 23 April 1992; and Equivalent level of safety: Ice Ingestion (FCAR HPR-01).

Model	Application	Issued TC
TB3-117BM and TB3-117BM Series 02	10 September 1998	28 February 2005
TB3-117BMA and TB3-117BMA Series 02	10 September 1998	28 February 2005

IMPORT REQUIREMENTS

Each engine imported separately and/or spare parts must be accompanied by an export airworthiness approval issued by IAC-AR, attesting that the particular engine and/or parts were submitted to the governmental quality control before delivery and are in conformity with the CTA approved type design.

NOTES

NOTE 1 Power

For the serial and overhauled engines the power values were defined, as it was determined at the acceptance tests.
The specified values are those determined at ISA, sea level and for H=0 km and flight speed = 0 km. The parameters are approved without operation of the helicopter dust protection device, without air bleeding for the helicopter dust protection device and without air bleeding foe the helicopter system and the engine the anti-icing system.

NOTE 2 Fuel to be used

The list of the fuels to be used and their anti-icing additives is given in the engine Maintenance Manual and in the engine Additional Specifications.

NOTE 3 Oil and lubricant to be used

The list of the oil to be used is given in the engine Maintenance Manual and in the engine Additional Specifications.

NOTE 4 Temperature limits

	TB3-117BM and TB3-117BM series 02; TB3-117BMA and TB3-117BMA series 02
a) The turbine inlet temperature is measured at the following power rating:	
- Takeoff, 2.5 minute and 30 minute OEI power rating, °C (°F)	990 (1 814)
- Maximum continuous and OEI continuous power rating, °C (°F)	955 (1 751)
b) The oil temperature is measured at the engine outlet:	
- Minimum temperature before starting, °C (°F)	-38 (-36.4)
- Minimum temperature to set the engine at the rating higher the idle, °C (°F)	30 (86)
- Minimum temperature for the engine operation at the rating not lower the cruise 2, °C (°F)	70 (158)
- Maximum, °C (°F)	150 (302)
c) The engine fuel temperature is not measured	
d) Ambient temperature	
- Minimum, °C (°F)	-38 (-36-4)
- Maximum, °C (°F)	55 (131)

NOTE 5 Fuel and oil limits pressure

A – Fuel pressure at the boost pump inlet	TB3-117BM and TB3-117BM series 02; TB3-117BMA and TB3-117BMA series 02
At starting (excessive) kg/cm^2	0.4 – 1.2
At the engine operative (absolute) not less	
– at H=0 km - kg/cm^2	0.7
– at H=5 km - kg/cm^2	0.3
B – Oil pressure in the engine pressure line	
At idle – kg/cm^2	2.0
At the cruise rating and higher, kg/cm^2	3.5 ± 0.5

NOTE 6 Rotor allowable rotational speed %:

a) 100% turbocompressor rotor rotational speed corresponds to 19 537.48 rpm
b) 100% free turbine rotor rotational speed corresponds to 15 000 rpm

	TB3-117BM and TB3-117BM series 02; TB3-117BMA and TB3-117BMA series 02
A – Maximum rotor rotational speed	
Turbocompressor rotor at takeoff, 2.5 minutes and 30 minutes power rating	101.15
Free turbine rotor	108
B – Minimum free turbine rotor rotational speed	
Short time up to 30 seconds	93
Short time up to 10 seconds four times within the life to the first overhaul	80
Short time up to 5 seconds, four times within the life to the first overhaul	75

Refer to the engine Maintenance Manual issued at Klimov Corporation to get the necessary information if the limits are exceeded.

NOTE 7 The engine accessories the weight of which is included in the engine weight. * Accessory drives gear ratio. Direction of rotation.

Fuel control unit	TB3-117BM and TB3-117BM Series 02 (HP-3BM); TB3-117BMA and TB3-117BMA Series 02 (HP-3BMA)
Fuel control unit drive gear ratio to the turbocompressor	0.20638, counterclockwise
Fuel control unit drive gear ratio to the free turbine	0.26801, counterclockwise
Fuel boost pump	ДЦН-70А
Boost pump drive gear ratio to the turbocompressor, direction of ration.	0.457, counterclockwise
Air starter	СВ-78БА
Air starter drive gear ratio to the turbocompressor, direction of rotation	2.25, counterclockwise

* The drives gear ratio is given as a proportion of the drive shaft rotational speed to the rotational speed of the compressor or free turbine.

NOTE 8 Air intake anti-icing limits:
The engine meets the anti-icing requirement of RBHA/FAR 33.68 throughout the range of the flight modes including idle and engine starting on the ground.

NOTE 9 Requirements to the fuel supply:
The engine fuel filter is installed on the boost pump. The filter mash is 0.016 mm. The cleaning degree of the filling in the helicopter tank is 0.012 – 0.016 mm. The engine has not the anti-icing protection of the filter.

NOTE 10 The engine oil system:
The engine is equipped with the built-in lubrication system. The engine oil system includes: oil pump (scavenge and lubrication); oil filter; pipelines and fittings system. The oil screen mash is 63 mkm. The oil units, installed on the engine, are manufactured at Klimov Corporation.
The oil tank and oil cooler are incorporated in the helicopter oil system.
The maximum oil quantity in the helicopter oil tank is 11 liters when the oil system is filled. Eight liters is the minimum oil quantity in the oil tank allowable to operate the engine. The oil consumption by the engine is not more than 0.3 liters per hour.

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