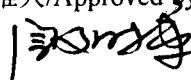


中国民用航空总局
GENERAL ADMINISTRATION OF CIVIL AVIATION OF CHINA

编号/No.: VTC 0193E 型号/Type: D-136 修订/Rev. 0 批准人/Approved by:  日期/Date: 2007-8-1
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型号认可证数据单编号: VTC 0193E
Validation Type Certificate Data Sheet No. VTC0193E

本数据单, 作为型号认可证编号: VTC0193E 的一部分, 规定了一些条件和限制, 在此条件和限制下, 获得本型号认可证的产品满足下述“认可审定基础”段落给出的适航要求。

This data sheet which is a part of Validation Type Certificate No. VTC0193E prescribes conditions and limitations under which the product for which the Validation Type Certificate was issued meets the airworthiness requirements indicated in the paragraph “Validation Basis”.

俄罗斯 APAR 型号合格证 No.53-D、数据单第 0 版, 批准日期: 1994 年 4 月 5 日

CAAC 型号认可证 VTC0193E 颁发日期: 2007 年 8 月 1 日。

Type Certificate No. 53-D, Data Sheet Revision 0, approved by APAR RUS on april 5, 1994

CAAC Validated Type Certificate Datasheet No. VTC0193E, date of issue: August 1, 2007

型号合格证持有人: 乌克兰摩托西驰股份公司

Type Certificate Holder: PROGRESS Engineering Design Bureau, Zaporozhye, Ukraine

1. D-136 型

1. MODEL D-136

1、型式

双轴轴流式燃气涡轮轴发动机, 13 级压气机, 环形燃烧室, 1 级涡轮转子, 2 级自由涡轮, 输出轴, 排气口。

发动机系统:

- 润滑- 自身;

- 燃油供油和控制—液压机械调节器和电子极限参数限制器;

- 防冰-热空气;

- 启动-空气。

1、Type

Turboshaft gas engine with an axial-flow twin-spool 13-stage compressor, annular combustion chamber, compressor 1-stage turbine rotor, 2-stage free turbine, output shaft, exhaust nozzle.

Engine systems:

- oiling – self-contained;

- fuel supply and control – with hydro-mechanical governor and electronic extreme parameters limiter;

- anti-icing – hot air;

- starting – air.

2、发动机组件, 特别的改进。

934

-燃油控制组件,	
-自由涡轮速度调节器,	
-限制调节器,	
-空气转换器管组件,	
-燃-滑油散热器	
2. Engine components, developed specially for it:	
- fuel pumps unit;	934
- fuel control unit;	4018
- free turbine speed governor;	
- limit governor;	4019
- air transfer valves pneumatic units;	BPR-2, ser.2 (installed on the helicopter)
-fuel-oil heat exchanger;	4017-6 (of HP compressor)
3、驱动直升机发动机组件	4017-12 (of LP compressor)
3. Driven by engine helicopter units:	5660T
4、设计标准	
4. Standard design:	
4.1.技术标准	
-1.02.82 以来新系列发动机	136.00.00.000-01
发动机维修	TY6.136-0021-84
-大修和中修维修技术标准	1360000000-80
4.1. Technical Specifications:	136.00.00.000-01 YK
- for new serial engines manufactured since 1.02.82	
- for repairable engines	136.00.00.000-01
-technicalspecifications oh overhaul and mid-life repair	TY6.136-0021-84
4.2.发动机维护手册	1360000000-80
4.2. Engine Maintenance Manual	136.00.00.000-01 YK
4.3. 中修手册 (1.02.82 后生产的发动机)	136.00.00.000 PЭ
4.3. Mid-life Repair Manual (for engines repaired after 1.02.82)	136.00.00.000 PЭ
4.5.大修手册	136.00.00.000-80-PC
4.6. 低压涡轮后轴图纸	136.00.00.000-80-PC
4.6. LP turbine rear shaft drawing	136.00.00.000-81 PK
5.审定基础	136.00.00.000-81 PK
	36.04.04.070-02
	36.04.04.070-02

5. Certification basis:	D-136发动机审定基础26.33.国际航空委员会1994年3月18日航空注册批准
6. 主要数据 (高压轴功率, 高度=0, 速度=0 并直升机进口和出口和除冰系统的空气压力损失为零)	Certification basis 26.33. D-136 engine. Approved by MAK 18.03.94 Aviation Register.
6. Main data (shaft power in h. p. at H=0, V=0 and zero air pressure loss on inlet and air bleeding for helicopter needs and engine anti-icing system):	
6.1. 最大起飞功率	
6.1. Maximum takeoff power:	11400-2%马力, 外界大气温度+15℃, 连续最大 5 分钟
6.2. 一台发动机不工作最大 30 分钟功率	11400-2% at O.A.T.= +15 deg. C, continuously max 5 min.
6.2. Maximum 30-minutes power with one inoperative engine:	11400-2%马力, 外界大气温度+15℃
6.3. 起飞功率	
6.3. Takeoff power:	11400-2% at O.A.T.=+15 deg. C
6.4. 正常功率	10000-2%马力 (爬升至外界大气温度+22℃), 连续最大 5 分钟
6.4. Nominal power:	10000-2% (held up to O.A.T.= +22 deg. C), continuously max 5 min.
7. 主要尺寸 (毫米)	8500-2%马力 (爬升至外界大气温度+26℃), 连续最大 5 分钟
-长	8500-2% (held up to O.A.T.= +26 deg. C), continuously max 5 min.
-高	
-宽	3715
7. Main sizes (mm):	1124
- length	1382
- height	
- width	3715
8. 发动机交付状态重量, 公斤	1124
8. Engine weight in delivery condition, kg:	1382
9. 最大容许转速, %	
-高压转子	1236.5+21.5
-低压转子	
-功率涡轮转子	101.2
9. Maximum admissible RPM of, %:	90.0
- HP rotor	93.0
- LP rotor	
- FT rotor	101.2
	90.0
	93.0
	注: 100%转速相当于高压转子 13978 转/分, 低压转子 12167 转/分, 功率涡轮转子 9375 转/分
10. 最大转速, %	Note: 100% rotor RPM corresponds to 13978 1/min of HP rotor, 12167 1/min of LP rotor, 9375 1/min FT rotor.
-高压转子	
-低压转子	
-功率涡轮转子	104.5

10. Maximum RPM of %:	95.0 109.9
- HP rotor	
- LP rotor	
- FT rotor	104.5
11. 低压涡轮后最大 燃气温度, °C	95.0 109.9
11. Maximum gas temperature after LP turbine, deg. C:	805
12. 低压涡轮启动期 间最大容许燃气温 度, °C	805
12. Maximum admissible gas temperature after LP during starting, deg. C:	600
13. 最大容许滑油进 口温度, °C	600
13. Maximum admissible oil temperature on inlet, deg. C:	+110 最严峻状态期间温度可以升至+120 在 5 分钟内
14. 最小容许滑油进 口温度, °C	+110 During throttling the temperature may rise up to +120 within max 5 min.
-启动之前	
-超过飞行慢车功率 前	-40
14. Minimum admissible oil temperature at inlet, deg. C:	-5
- before starting	
- before setting powers above flight idle to engine	-40 -5
15. 下列发动机组件最 小容许外界大气温度	
- 4018	
- 4019	+80, 瞬时+100
- 934	+80, 瞬时+100
15. Maximum admissible O.A.T. of the following engine components, deg. C:	+80, 瞬时+100
- 4018	
- 4019	
- 934	+80, short-timely +100
16. 最小容许发动机 进口燃油压力, 公斤/ 厘米 ²	+80, short-timely +100 +80, short-timely +100
16. Minimum admissible fuel pressure at engine inlet, kg/cm ²	0.4
17. 最小容许发动机	

进口滑油压力, 公斤/厘米 ²	0.4
17. Minimum admissible oil pressure at engine inlet, kg/cm ²	2.0
18. 发动机燃油滤, 微米	2.0
18. Fuel filtration in engine, mcm:	16
19. 发动机滑油滤, 微米	16
19. Oil filtration in engine, mcm:	40
20. 最大容许空气流量, 公斤/秒	40
-- 到空调系统和空调防尘罩	
- 到发动机防冰系统和空调防尘罩	0.41
- 一台发动机失效	0.7
20. Maximum admissible air bleeding, kg/f:	0.61
- into air-conditioning system and DPD ejector	
- into engine anti-icing system and DPD	0.41
- in case of failure of one engine	0.7
21. 寿命	0.61
21. Service lives of:	
21.1. 发动机 小时/循环	
- 额定	
- 到第一次大修	
- 大修之间	4000 (5000)
21.2. 主要部件, 循环	2000 (2500)
- 低压压气机 1 级盘 (36.01.03.011)	2000 (2500)
- 低压压气机 1 级盘 (36.01.032.011-01)	3110
- 低压压气机 2 级盘 (36.01.03.200)	10310
- 低压压气机 2 级盘 (36.01.03.200-01)	3800
- 低压压气机 3 级盘 (36.01.03.013)	10060
- 低压压气机 4 级盘 (36.01.03.014)	10910
- 低压压气机 5 级盘 (36.01.03.015)	10910
- 低压压气机 6 级盘	

(36.01.03.016 ; 36.01.03.016-03)	10910
- 低 压 压 气 机 前 轴 (36.01.03.018):	10910
-低压压气机转动轴 (136.01.03.070-01):	24280
-高压压气机 1 级盘 (136.01.06.011)	25360
-高压压气机 2 级盘 (36.01.06.012)	
-高压压气机 3 级盘 (36.01.06.013)	10280
-高压压气机 4 级盘 (36.01.06.124-02)	10280
-高压压气机 5 级盘 (36.01.06.072-02)	10280
-高压压气机 5 级盘凸 缘 (36.01.06.073- 01)	7660
-高压压气机 6 级盘 (36.01.06.116-01)	8980
-高压压气机 6 级盘 (36.01.06.116-04)	
-高压压气机 7 级盘 (36.01.06.117-02)	2510
-高压压气机 7 级盘 (36.01.06.117-04)	6950
- 高 压 压 气 机 前 轴 (36.01.06.129-01)	2680
- 高 压 压 气 机 前 轴 (36.01.06.129-02)	6950
-高压压气机后轴 (36.01.06.065;36.01.06 .065-03; 36.01.06.065- 04):	2680
- 高 压 涡 轮 盘 (36.54.02.012):	21530
-高压涡轮轴 (36.04.02.120-03):	14970
- 低 压 涡 轮 盘 (36.04.04.001-01):	11020
-低压涡轮轴 (35.04.04.070-02; 36.04.04.011-05):	23900
- 自 由 涡 轮 1 级 盘 (136.04.06.001-01):	12030
- 自 由 涡 轮 2 级 盘 (136.04.06.003-02):	
-- 自 由 涡 轮 轴 (136.04.06.050):	13360
- 燃 烧 室 壳 体 (36.03.02.000-06):	8930
-带有支架焊接借口的 燃 烧 室 壳 体	8800
	6640

(36.03.02.000-06):	13950
-没有支架焊接借口的 燃 烧 室 壳 体	
(36.03.02.000-04):	6710
21.1. Engine in hours/cycles:	
- assigned	
- till 1-st overhaul	3930
- TBO	
21.2. main parts, cycles:	4000 (5000)
- LPC 1 stage disc	2000 (2500)
(36.01.03.011)	2000 (2500)
- LPC 1 stage disc (36.01.03.011-01):	
- LPC 2 stage disc (36.01.03.200):	3110
- LPC 2 stage disc (36.01.03.200-01),	10310
- LPC 3 stage disc (36.01.03.013):	3800
- LPC 4 stage disc (36.01.03.014):	10060
- LPC 5 stage disc (36.01.06.015):	10910
- LPC 6 stage disc (36.01.03.016;36.01.03 .016-03):	10910
- LPC front shaft (36.01.06.018):	10910
- LPC rotor shaft (136.01.03.070-01):	10910
- HPC 1 stage disc (136.01.06. 011):	24280
- HPC 2 stage disc (36.01.06. 012):	25360
- HPC 3 stage disc (36.01.06.013):	10280
- HPC 4 stage disc (36.01.06.124-02):	10280
- HPC 5 stage disc (36.01.06.072-02):	10280
- HPC 5 stage disc flange (36.01.06.073-01):	10280
- HPC 6 stage disc (36.01.06.116-01):	7660
- HPC 6 stage disc (36.01.06.116-04):	8980
- HPC 7 stage disc (36.01.06. 117-02):	2510
- HPC 7 stage disc (36.01.06. 117-04):	6950
- HPC front shaft (36.04.04.129-01):	2680
- HPC front shaft (36.01.06.129-02):	6950
- HPC rear shaft	

(36.01.06.065;36.01.06.065-03; 36.01.06.065-04):	2680
- HPT disc	21530
(36.54.02.012):	
- HPT shaft	14970
(36.04.02.120-03):	
-LPT disc	
(36.04.04.001-01):	11020
- LPT shaft	
(35.04.04.070-02; 36.04.04.011-05):	23900
- FT 1 stage disc	12030
(136.04.06.001-01):	
- FT 2 stage disc	
(136.04.06.003-02):	13360
- FT shaft	
(136.04.06.050):	8930
- Combustion chamber body (36.03.02.000-06):	8800
- Combustion chamber body (36.03.02.000-06):	6640
- Combustion chamber body (36.03.02.000-04):	13950
22.燃油和添加剂	6710
-国内	
-国外	3930

22. Used grades of fuel and their mixtures:

- domestic
- foreign

No.3 航空燃油
TC-1, PT (ГОСТ 13076-86)
Jet A-1*

23.滑油（等级，技术规范和国家标准）

No.3 Jet Fuel
TC-1, PT (ГОСТ 13076-86)
Jet A-1* according to DEF STAN 91-91
Note: *On condition of performing works under a special program.
ИПМ-10 (ТУ38.1011299-90)б
ВНИИИП 50-1-4Ф (ГОСТ 13076-86)б
ВНИИИП 50-1-4У (ТУ38.401-58-12-91)

注：禁用混合滑油

- Aero Shell Tyrdine Oil 390, DEF STAN 91-94, Shell;
 - BP Turbo Oil 2389, MIL-PRF-7808LCr.3, Air BP
 - Mobil Jet Oil II*, MIL-L-PRF-23699, Mobil Oil;
 - BP Turbo Oil 2380*, MIL-PRF-23699, Air BP;
 - Turbonycil 525-2A*, MIL-PRF-23699, Nyco;
 - Castrol AERO 325, DEF STAN 91-94, Castrol;
 - Avrex S Turbo Oil 256, MIL-PRF-7808 L Cr.3, Mobil Oil,
 - AeroShell Turbine Oil 560*, , DEF STAN 91-94, Shell;
 - Turbonycil 210A, AIR 3514/A, Nyco.
 - Mobil Turbo 319A-2, MIL-PRF-7808L Cr.3, Mobil Oil;
- 注：禁用独联体混合滑油和国外滑油（IPM-10 和 Turbonycil 210A 滑油除外）

23. Used grades of oil
- domestic (grade,

technical specification or State Branch Standard (ГОСТ):	发动机启动滑油温度不能低于 30℃
foreign (grade, specification, manufacturer):	ИПМ-10 (ТУ38.1011299-90)б ВНИИНП 50-1-4Ф (ГОСТ 13076-86)б ВНИИНП 50-1-4У (ТУ38.401-58-12-91) Note: mixing oils is prohibited. - Aero Shell Tyrdine Oil 390, DEF STAN 91-94, Shell; BP Turbo Oil 2389, MIL-PRF-7808LCr.3, Air BP - Castrol AERO 325, DEF STAN 91-94, Castrol; - Avrex S Turbo Oil 256, MIL-PRF-7808 L Cr.3, Mobil Oil, - AeroShell Turbine Oil 560*, , DEF STAN 91-94, Shell; - Turbonycoil 210A, AIR 3514/A, Nycol. - Mobil Turbo 319A-2, MIL-PRF-7808L Cr.3, Mobil Oil;
24.高度范围, 米	Note: mixing oils of CIS countries production and foreign oils is prohibited(excluding IPM-10 oil andTurbonycoil 210A which may be mixed in any proportions).
24. Altitude range of application, m:	
25.地面出发时机场最大高度, 米	*Engine starting without warm-up is permitted at oil temperature not lower minus 30 deg. C. 0 ... 6500
25. Maximum altitude of airdrome during ground starting, m:	0 ... 6500
26.飞行时启动的最大高度, 米	4000
26. Maximum altitude during starting in flight, m:	4000
27.外界气温范围	4000 (仅单发工作的发动机飞行中启动的速度 120 公里/小时)
-地面启动	4000 (starting only from an operating engine at flight speed minimum 120 km/h)
-结冰状态工作	
27. Operating outside air temperature range, deg. C	-50 ... +50
- during starting and ground operation:	在外界气温低于-40℃仅用发动机启动依据维修手册预热 不能低于-13℃
- during operation in icing conditions:	-50 ... +50
28.最大可接受的风速	(at O.A.T. lower than -40 deg. C starting is performed only with engine heating up according to MM)
-地面启动	
-盘旋, 起飞和着陆	not lower than -13
28. Maximum admissible wind speed	
- during ground starting:	侧风-15 米/秒, 后向风-10 米/秒 侧风-10 米/秒, 后向风-10 米/秒
- during hovering, takeoff and landing:	
29.外物损伤防护	
29. Protection against foreign objects damages:	crosswind – 15 m/s, tailwind – 10 m/s crosswind – 10 m/s, tailwind – 10 m/s
30.制造厂	仅防尘罩 (部件号 90-6823-00)
30. Manufacturer:	Operation only with DPD (Part number 90-6823-00)

乌克兰扎波罗日摩托西斯股份公司
Zaporozhskoye Production Association MOTOR SICH, Ukraine, Zaporozhye.

Rating ICAO or
ARDC Standard
Atmosphere
Max. Continuous hp,
RPM,
FT at SL pressure
altitude
Takeoff, 5min., hp,
RPM
FT at SL pressure
altitude

燃油（最小等级航空
汽油）
Fuel(min. grade
aviation gas.)

润滑油
Lubricating Oil

钻孔和冲程
Bore and Stroke

容积 立方英寸
Displacement,cu.
in.

压缩比
Compression ratio

重量（干）磅
Weight(dry), lb.

C.G. 位置（基础发动
机）前表面支撑边缘
后部

曲轴中心线下
曲轴中心线旁边 2-4
个侧面

C.G location (basic
engine) Aft of prop
flange forward face:
Blow crankshaft
centerline
Beside crankshaft
centerline toward 2-4
side:

传动轴
Propeller Shaft

喷注燃油
Fuel Injection

点火
Ignition

定时 °BTC
Timing, °BTC
火花塞
Spark Plugs

滑油槽容积

Oil Sump Capacity

注
NOTES

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