WALTER a.s.
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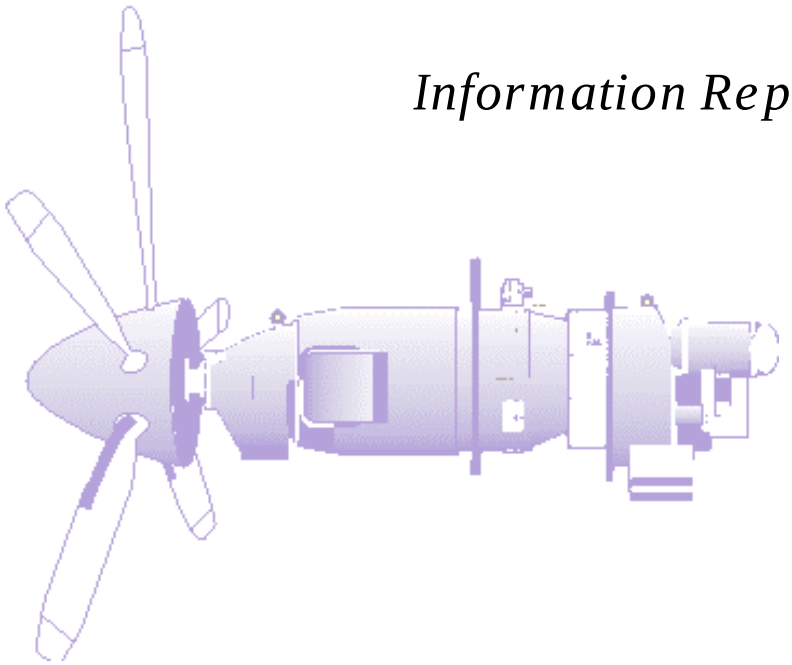
WALTER a.s.

WALTER M601
Certification Status

Information Report



July 2003

80 Years of Aviation Engine Production

Content

Introduction

WALTER a.s. was substantially a European manufacturer of turboprop engines rating from 500 to 800 SHP until the early 1990's when emphasis was placed on expanding the market into other parts of the world. The WALTER turboprop engines are ideally suited for commuter, agricultural, training, utility and general aviation aircraft as well as ground power units.

The main activity of WALTER a.s. factory is focused on the production of the M601 turboprop engines for civil aircraft and ground power applications.

WALTER a.s. has produced more than 4,500 M601 series engines. Many of which are in operation in the LET L-410 and L-420 commuter and utility aircraft operating in Eastern Europe today. The M601 is CAA and FAA certified for use in Western Europe, Australia, New Zealand, Africa, North and South America. The engine has a proven reliability record for operations in a wide range of applications from the extreme cold of Siberia to the extreme heat of the deserts of Africa. The engine has been installed in all types of aircraft.

During the nineties, when the production of the L-410 had reduced, the attention of WALTER a.s. was focused to new installations of M601 into many different aviation types. High reliability, low maintenance demands and competitive price make this engine especially suitable also for agricultural aircraft installation (Czech Z-137T; Polish PZL-106; U.S. Ayres Turbo Thrush, Air Tractor, AG Cat; New Zealand Fletcher etc.) The M601T aerobatic model has been successfully installed in the military PZL Orlik Turbo. The M601E-11 engines were installed and FAA certified on a King Air C90 business aircraft and certification is in the process on the Piper Malibu. In the past 5 years more than 15 new applications of the M601 have been introduced.

WALTER a.s. has a powerplant installation team with the experience and knowledge to assist the company desiring to install the M601 in an airplane. WALTER still share this experience and knowledge with the customer to optimize the installation for the best performance and reliability.

Since first being introduced into service in 1975 the M601 has been successfully operating in over 50 counties world wide, having flown more than 14.3 million flight hours in around 30 different aircraft types.

Short History of WALTER

The Company was established in 1911 as WALTER and Co., Ltd. to develop and manufacture vehicles – motorcycles, motor-tricycles, cars, lories, buses etc. Since 1923 the Company has been active also in the design, development, production and overhauling of aircraft engines, which gradually became the main thrust of the business. Turbine engine production began by licensing of M05 and M06 military engines in fifties followed by a company designed M701 jet engine for military trainers. Total production of the M701 engine exceeded more than 9,250 units. In 1946 the WALTER Company was nationalized and with the new name Motorlet n.p. (national enterprise) it was incorporated in the Czechoslovak Aerospace Group named later AERO. In March 1995 the original name of the Company – WALTER a.s. (joint-stock company) – has been restored.

WALTER a.s. is presently substantial European manufacturer of the turboprop engines ranging from 380 to 600 kW (500 to 800 shp). WALTER engines are primarily designed for small commuter, agricultural, training and other general aviation aircraft. The industrial modifications of WALTER turboprop engines are used in various products.

WALTER a.s. established world class capacities in parts production for leading manufacturers both in aircraft engine sector and other industries with similar level of requirements.

The Company has produced mare than 37,500 aircraft engines bearing the trade mark WALTER – 17,000 piston, 16,000 jet and more than 4,500 turboprop. WALTER aircraft engines have gained a worldwide reputation for their simple maintenance and high reliability, leading to the low operational and maintenance costs, as well as their very competitive purchase prices and guaranteed operational support.

WALTER a.s. is ISO 9001 certified by BVQI. WALTER a.s. combines highly experienced and well skilled personnel (total 700) with the equipment necessary for both development and production and an effective total quality management system capable to satisfy all customer's demands.

You can rely on WALTER quality.

Review of The WALTER M601 Development History

Development of the M601 engine has been carried out in Motorlet (former name of WALTER a.s.) since 1971. Development activities followed the previous research performed in Aeronautical Research and Test Institute (ARTI), Prague.

The basic model - M601A turboprop - was certificated in accordance with L8/C Czechoslovak Regulation (corresponding to the BCAR, Section C) in 1975. Initial time between overhauls (TBO) was 500 hours and total service life 1,500 hours. Take-off power was 515 kW (690 SHP). The engine was intended for the LET L-410 commuter airplane. Among the basic goals of the design were low maintenance demands and high resistance against climatic and human factors. All the M601 series models up to current time have been following this strategy.

The M601A model was followed by M601B engine. The M601B of extended TBO on 750 hours (1,000 hours at M601B-1) and better operating characteristics had also take-off power of 515 kW. The engine was fitted with water injection system and autofeathering system. Design modifications included application of materials of higher heat resistance and other changes for TBO extending. The M601B engine was certificated in compliance with L8/C by the Czechoslovak (since 1993 Czech) Civil Aviation Inspectorate - CAI (since 1997 Czech Aviation Authority - CAA) in 1977. The engine was installed in L-410 UVP commuter. On the basis of Soviet customer requirement a supplementary certification was carried out in 1977 according to NLGS-2 Soviet Airworthiness Regulations.

Requirements for increased take-off power of 540 kW (724 shp) and prolonged TBO (1,500 hours) resulted in development of M601D model. The following significant design modifications were carried out: combustion chamber parts are made of better heat resistant material, nozzle guide vane ring of the gas generator turbine is an integral casting, gas generator turbine disk is redesigned for higher number of blades, and free turbine blades are made from material of higher plasticity.

The M601D engine type airworthiness was substantiated in compliance with L8/C and NLGS-2 in 1981 and 1982 respectively. M601D engines were installed in the L-410 UVP commuter. Intermediate model - M601DB - was fully interchangeable with M601B model.

Slightly modified M601D-1 model powers Polish PZL-106BT-601 Turbo Kruk agricultural airplane. The CAI issued a Type Certificate (in accordance with FAR 33) in 1994 and validation process has been already completed in Spain and Argentine. This model was also certified by CAA in December 1999 according to JAR-E.

M601Z model has been derived from M601D model. M601Z is modified for specific conditions of Z-137T agricultural airplane installation. Take-off power is derated to 382 kW (512 shp), TBO is 1,500 hours. The engine is equipped with a mechanical drive for agricultural devices and the accessory gearbox is modified for small piston compressor installation. The engine was certificated by the CAI in compliance with L8/C and FAR 33 in 1984 and 1994 respectively.

Another derivative of M601D engine is the M601D-2. This derated engine of 400 kW (536 shp) take-off power is intended for Dornier Do 28-G92 STOL transport and utility aircraft. This engine has been certified by the CAA in December 1999 according to JAR-E. Aircraft are used for paragliding where the main accent is on the high number of take-offs which is demanding task proofing reliability of the engine. This engine model was later successfully installed in SMG 92 Turbo Finist and its power was increased up to 450 kW (603 shp) for both aircraft.

For similar type of flight envelope are designed M601D-11/D-11NZ engine models to power agricultural aircraft in the USA and in New Zealand. Both models were certified by CAA in June 1999 according to FAR 33. Certification of the M601D-11 model has been launched by FAA in the USA. Fleet of these engines on New Zealand have been making more than 22,000 take-offs per one TBO for several years – in extreme conditions, operating in the hilly country with no special demands on maintenance.

Following development of M601E model was launched to meet requirements for increased take-off power of 560 kW (751 shp) and TBO of 2,000 hours. The M601E engine is equipped with an electric alternator of 5 kW (6.7 shp) output, which is used for de-icing of the five bladed Avia propeller.

Air bleed for airframe purposes was increased. The following significant design changes were also carried out: the compressor was modified for increased pressure ratio and mass flow, a gearbox for electric alternator was installed, propeller speed governor was redesigned, width of the free turbine disk was increased to extend fatigue life.

M601E engine powers L-410 UVP-E commuter airplane. The engine was certificated according to L8/C in 1985 and later according to NLGS-2. The CAI issued a type certificate also in compliance with JAR-E and FAR in 1988 and 1989 respectively. This engine was also certificated in compliance with FAR 33 in Brazil and together with the airplane in Chile.

Slightly modified M601E-11 model (first installation - Ayres Turbo Thrush) was certificated by the FAA in 1995. The same engine model powers also modified Air Tractor and AG Cat agricultural airplanes. The agricultural aircraft fly M601E-11 in USA, Canada, Philippines and in states of Africa.

Since 1998 the number of flight hours increases up to 3,000 flight hours for the M601E and M601E-11 of all versions (i.e. from the product number 981001). In addition, the M601E-11 has extensive number of cycles up to 6,600 for agricultural aircraft only. The next development is directed to the same range of cycles for airline operators. For airline operators which fly more shorter flights the producer has offered upgrade of 2,000 hours life up to 4,000 cycles.

The M601E-11A model is intended for aircraft with pressurized cabin, for example King Air. This engine was initially derated to the shaft power of 485 kW (650 SHP). Later, the take-off power increases up to 526 kW (705 SPH) for installation in heavier aircraft. The same power was available for both take-off and max. continuous rating. This model was certified by CAA in compliance with FAR in January 2001. As far as the WALTER M601E-11 or M601E-11A engine models are equipped with single acting propeller, the engine performance remains the same as with the double acting propeller, but the designation of the engine model is changed to M601E-11S and M601E-11AS. The certification program in compliance with FAR is in progress at the present time.

M601E-21 model was developed in 1994; the engine is intended for the hottest climate areas. The engine was certificated by the CAI in compliance with JAR-E in 1994.

Aerobatic M601T model was derived from M601E engine and modified to match increased demands of aerobatics and flight in higher altitudes. Design changes of compressor casing, propeller shaft, accessory gearbox and engine mounting system were carried out. A new redesigned exhaust duct of lower pressure loss was used. Take-off power is 560 kW and TBO is 1,000 hours. The engine was intended to fly in the PZL-130TB Orlik Turbo military trainer which is carried every day demanding training operations with Polish army. The CAI issued type certificate according to FAR in 1993. The newest installation of the M601T was realized in 2000 when the Sukhoi Su-26 sport aerobatic was fitted with this version, whereas, operation load factors remained on +9/-6 Gs.

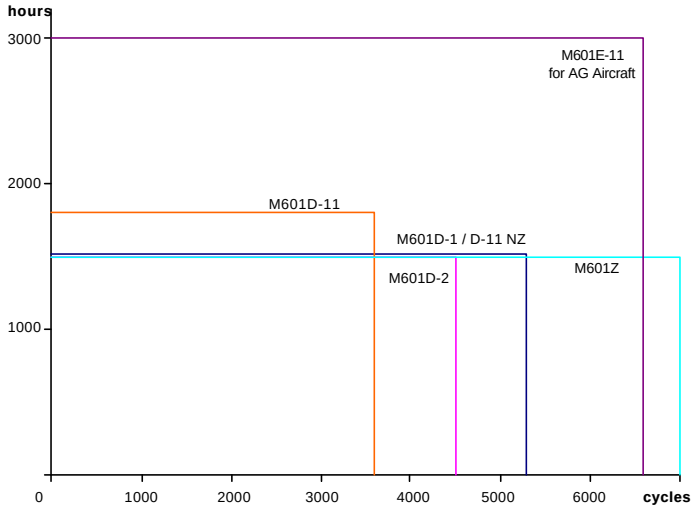
The M601F engine of increased take-off power up to 580 kW (778 shp) is derived from M601E and M601T models. Its development was motivated by demand to meet fully the requirements of FAR for twin engine L-420 commuter. All changes as emerged from validation process of the M601E-11 were introduced into design of the M601F engine. Take-off power increase was enabled by application of lower pressure loss exhaust duct. TBO of this model is 3,000 hours. The engine was certificated in 1993 and 1998 by CAI and FAA respectively. The M601F model was also certified by the CAA in compliance with JAR-E in July 2000 for installation in other types of airplanes.

In addition, there was done modification of the M601F engine model for equipping with single acting propeller. The designation was changed to M601FS but the engine performance remains the same as with double acting propeller.

Modified M601F-22 (F-32) model is intended for single engine M-101T Gzhel multipurpose aircraft. Take-off power is 560 kW (751 shp) and the engine meets requirements for increased air bleed for pressurized cabin. Maiden flight of this airplane was carried out in 1995. This engine was suited to very long flights at higher altitudes and higher cruise regime, so the cycles were decreased. Validation process of the engine according to AP33 requirements at AR MAK (Russian Airworthiness Authority) has been already completed. The M601F installation in Czech Ae 270 multipurpose airplane and further aircraft is also expected.

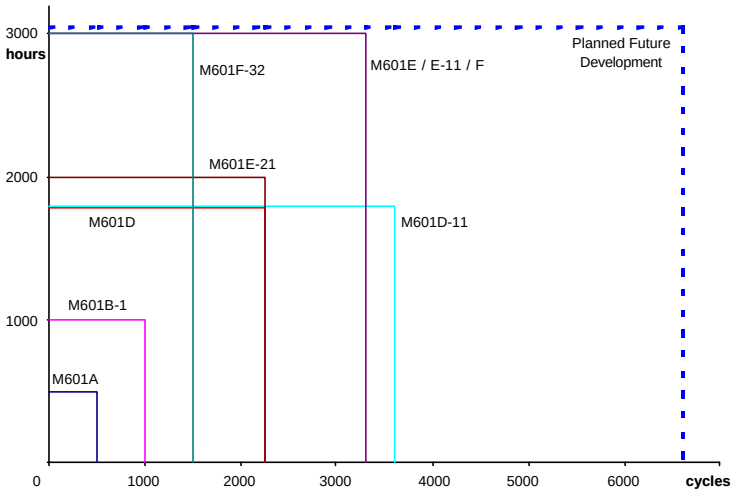
In early 2003, the Italian VF-600W Mission utility aircraft took place its maiden flight with new M601F-11 model. This engine was gone from basic M601F and it was optimized for this aircraft design and single engine configuration. The power of this engine version is the same as the M601F. Both engine and aircraft are currently under evaluation tasks.

This year, there were taken first flights of two versions of Piper Navajo. First of them is conventional conversion of initial piston aircraft and the aircraft is fitted with the M601E-11A engine version. Second conversion of the Navajo was taken as entire rebuilding to single engine configuration. The development of this aircraft was carried out with cooperation of CAGI (Russian Central Aerodynamic Institute in Moscow). This aircraft was designated as GM-17 Viper. In order to specification, the aircraft is intended for long distance flights and it is fitted with wing tip tanks. The aircraft is powered with M601F-32 (M601F-22) model.



History of The M601 Engine for Parachute or AG Installation

M601D-11NZ at max. 22,500 take-offs
M601Z at max. 12,750 take-offs



History of The M601 Engine for Airlines Operator

M601F-32 is designed for operation on long flights at higher cruise rating

Engine General Data for D, T and Z Models

Uninstalled, no air bleed

Model	Rating	Shaft Power [kW (shp)]	Equivalent Power [kW (shp)]	1) ITT max [°C]	Fuel Consumption [kg/h(lb/h)]	ESFC [g/kW.h (lb/shp.h)]	Max. Gas Generator Speed [%]	Propeller Speed [rpm]	Ambient		Max.Time of Continuous Operation	Torque at 100% on Indicator [Nm (lbf ft)]	2) Max. Torque [% / Nm (% / lbf ft)]
									Pressure [kPa]	Temperature [°C (F)]			
M601D	3) Take-Off	540 (724)	574 (770)	710	226.156 (498.6)	394 (.648)	100.4	2080	101.325	+ 15 (59)	5 min	2365 (1744)	106 / 2510 (106 / 1851)
		540 (724)	574 (770)	735	-	-	101.5		101.325	+ 22 (72)			
	Take-Off with Water Inject.	540 (724)	574 (770)	735	-	-	101.5	2080	101.325	+ 35 (95)	5 min		106 / 2510 (106 / 1851)
	5) Max. Continuous	490 (657)	521 (699)	690	211.005 (465.2)	405 (.666)	99	1800-2080	101.325	+ 15 (59)	unlimited		100 / 2365 (100 / 1744)
		490 (657)	521 (699)	690	-	-	99		different from ISA cond.				
	7) Intermed. Contingency	540 (724)	574 (770)	710	226.156 (498.6)	394 (.648)	100.4	2080	101.325	+ 15 (59)	1 hr		106 / 2510 (106 / 1851)
		540 (724)	574 (770)	730	-	-	100.7		101.325	+ 17 (63)			
	Max. Contingency	8) 560 (751)	595 (798)	770	-	-	103	2080	97.325	+ 24 (75)	2.5 min		109 / 2570 (109 / 1896)
		9) 560 (751)	595 (798)						97.325	+ 38 (100)			
M601D-1	4) Take-Off	540 (724)	574 (770)	710	226.156 (498.6)	394 (.648)	100.4	2080	101.325	+ 15 (59)	5 min	2365 (1744)	106 / 2510 (106 / 1851)
		540 (724)	574 (770)	735	-	-	101.5		101.325	+ 22 (72)			
	6) Max. Continuous	490 (657)	521 (699)	690	211.005 (465.2)	405 (.666)	99	1800-2080	101.325	+ 15 (59)	unlimited		100 / 2365 (100 / 1744)
		490 (657)	521 (699)	690	-	-	99		different from ISA cond.				
M601D-2	Take-Off	450 (604)	478 (641)	670	200 (440.9)	418.4 (.688)	97.7	1950	101.325	+ 15 (59)	5 min	2570 (1896)	92 / 2365 (92 / 1744)
		450 (604)	478 (641)	710	-	-	99		101.325	+ 24 (75)			
	Max. Continuous	400 (536)	425 (570)	640	184.85 (407.5)	435 (.715)	96	1700-1950	101.325	+ 15 (59)	unlimited		86 / 2210 (86 / 1630)
		400 (536)	425 (570)	660	-	-	96		different from ISA cond.				
M601D-11	Take-Off	450 (604)	478 (641)	670	200 (440.9)	418.4 (.688)	97.7	1950	101.325	+ 15 (59)	5 min	2570 (1896)	92 / 2365 (92 / 1744)
		450 (604)	478 (641)	735	-	-	100		101.325	+ 31 (88)			
	Max. Continuous	450 (604)	478 (641)	670	200 (440.9)	418.4 (.688)	97.7	1950	101.325	+ 15 (59)	unlimited		86 / 2210 (86 / 1630)
		450 (604)	478 (641)	690	-	-	98.5		101.325	+ 20 (68)			
M601D-11NZ	Take-Off	410 (550)	436 (585)	650	189.2 (417.1)	434 (.714)	96.5	1950	101.325	+ 15 (59)	5 min	2262 (1668)	95 / 2150 (95 / 1586)
		410 (550)	436 (585)	700	-	-	99		101.325	+ 33 (91)			
	Max. Continuous	320 (429)	340 (456)	600	160.2 (353.2)	471.3 (.775)	93	1950	101.325	+ 15 (59)	unlimited		89 / 2010 (89 / 1482)
		320 (429)	340 (456)	650	-	-	95		101.325	+ 29 (84)			
M601T	Take-Off	560 (751)	595 (798)	710	235.025 (518.1)	395 (.649)	98.6	2080	101.325	+ 15 (59)	5 min	2570 (1896)	106 / 2720 (106 / 2006)
		560 (751)	595 (798)	735	-	-	100		101.325	+ 22.5 (73)			
	Max. Continuous	490 (657)	521 (699)	680	213.61 (470.9)	410 (.674)	96.5	1800-1900	101.325	+ 15 (59)	unlimited		100 / 2570 (100 / 1896)
		490 (657)	521 (699)	690	-	-	97		101.325	+ 18 (64)			
M601Z	Take-Off	382 (512)	406 (544)	645	181.45 (400)	15) 475 (.781)	95.5	1900	101.325	+ 15 (59)	5 min	2365 (1744)	90 / 2130 (90 / 1571)
		382 (512)	406 (544)	710	-	-	99		96.611	+ 30 (86)			
	Max. Continuous	245 (512)	260 (349)	585	141.365 (311.7)	15) 577 (.949)	90.5	1800	101.325	+ 15 (59)	unlimited		81 / 1920 (81 / 1416)
		245 (512)	260 (349)	650	-	-	94		96.611	+ 30 (86)			

Engine General Data for E Models

Uninstalled, no air bleed

Model	Rating	Shaft Power [kW (shp)]	Equivalent Power [kW (shp)]	1) ITT_{max} [°C]	Fuel Consumption [kg/h(lb/h)]	ESFC [g/kW.h (lb/shp.h)]	Max. Gas Generator Speed [%]	Propeller Speed [rpm]	Ambient Pressure [kPa]	Ambient Temperature [°C (F)]	Max.Time of Continuous Operation	Torque at 100% on Indicator [Nm (lbf ft)]	2) Max. Torque [% / Nm (% / lbf ft)]
M601E	Take-Off	560 (751)	595 (798)	710	235.025 (518.1)	395 (.649)	98.6	2080	101.325	+ 15 (59)	5 min	2570 (1896)	106.5 / 2737 (106.5 / 2018)
		560 (751)	595 (798)	735	-	-	100		101.325	+ 23 (73)			
	Take-Off with Water Inject.	560 (751)	595 (798)	735	-	-	100	2080	97.325	+ 33 (91)	5 min		106.5 / 2737 (106.5 / 2018)
	Max. Continuous	490 (657)	521 (699)	680	213.61 (470.9)	410 (.674)	96.5	1700-2080	101.325	+ 15 (59)	unlimited		100 / 2570 (100 / 1896)
		490 (657)	521 (699)	690	-	-	97		101.325	+ 18 (64)			
	7) Intermed. Contingency	560 (751)	595 (798)	710	235.025 (518.1)	395 (.649)	98.6	2080	101.325	+ 15 (59)	for finishing the flight		100 / 2570 (100 / 1896)
		560 (751)	595 (798)	760	-	-	100.5		101.325	+ 28 (82)			
	Max. Contingency	8) 595 (798)	630 (845)	780	-	-	102	2080	97.325	8) + 28 (82)	2.5 min		106.5 / 2737 (106.5 / 2018)
		9) 595 (798)	630 (845)	780	-	-	102		97.325	9) + 42 (108)			
M601E-11 / E-11S 16)	Take-Off	560 (751)	595 (798)	710	235.025 (518.1)	395 (.649)	98.6	2080	101.325	+ 15 (59)	5 min	2570 (1896)	106 / 2720 (106 / 2006)
		560 (751)	595 (798)	735	-	-	100		101.325	+ 23 (73)			
	Take-Off with Water Inject.	560 (751)	595 (798)	735	-	-	100	2080	97.325	+ 33 (91)	5 min		106 / 2720 (106 / 2006)
	Max. Continuous	490 (657)	521 (699)	680	213.61 (471.9)	410 (.674)	96.5	1700-2080	101.325	+ 15 (59)	unlimited		100 / 2570 (100 / 1896)
		490 (657)	521 (699)	690	-	-	97		101.325	+ 18 (64)			
M601E-11A / AS 16)	Take-Off	526 (705)	559 (750)	686	222.5 (491)	398 (.654)	97.2	2080	101.325	+ 15 (59)	5 min	2570 (1896)	100 / 2570 (100 / 1896)
		526 (705)	559 (750)	710	-	-	98.5		101.325	+ 24 (75)			
	Max. Continuous	485 (650)	515 (691)	670	210 (463)	407.8 (.652)	96	1700-2080	101.325	+ 15 (59)	unlimited		94 / 2416 (94 / 1782)
		485 (650)	515 (691)	710	-	-	98.5		101.325	+ 31 (88)			
M601 E-21	Take-Off	560 (751)	595 (798)	690	231.455 (510.3)	389 (.640)	98.1	2080	101.325	+ 15 (59)	5 min	2570 (1896)	106.5 / 2737 (106.5 / 2018)
		560 (751)	595 (798)	735	-	-	100		101.325	+ 28 (82)			
	Take-Off with Water Inject.	560 (751)	595 (798)	735	-	-	100	2080	101.325	+ 42 (108)	5 min		106.5 / 2737 (106.5 / 2018)
		560 (751)	595 (798)	735	-	-	100		97.325	+ 37.5 (100)			
	Max. Continuous	490 (657)	521 (699)	660	211.46 (466.2)	405.9 (.667)	96.2	1700-2080	101.325	+ 15 (59)	for finishing the flight		100 / 2570 (100 / 1896)
		490 (657)	521 (699)	690	-	-	97		101.325	+ 21 (70)			
	7) Intermed. Contingency	560 (751)	595 (798)	690	231.455 (510.3)	389 (.640)	98.1	2080	101.325	+ 15 (59)	1 hr		100 / 2570 (100 / 1896)
		560 (751)	595 (798)	760	-	-	100.5		101.325	+ 32 (90)			
	8) Max. Contingency	595 (798)	630 (845)	780	-	-	102	2080	97.325	+ 31.5 (89)	2.5 min		106.5 / 2737 (106.5 / 2018)

Engine General Data for F Models

Uninstalled, no air bleed

Model	Rating	Shaft Power [kW (shp)]	Equivalent Power [kW (shp)]	1) ITT max [°C]	Fuel Consumption [kg/h(lb/h)]	ESFC [g/kW.h (lb/shp.h)]	Max. Gas Generator Speed [%]	Propeller Speed [rpm]	Ambient Pressure [kPa]	Ambient Temperature [°C (F)]	Max.Time of Continuous Operation	Torque at 100% on Indicator [Nm (lbf ft)]	2) Max. Torque [% / Nm (% / lbf ft)]
M601F / FS 14) according to FAR	Take-Off	580 (778)	615 (825)	710	236.775 (522)	385 (.633)	98.6	2080	101.325	+ 15 (59)	5 min	2665 (1966)	106 / 2825 (106 / 2084)
		580 (778)	615 (825)	735	-	-	100		101.325	+ 23 (73)			
	Take-Off with Water Inject.	580 (778)	615 (825)	735	-	-	100	2080	97.325	+ 33 (91)	5 min		106 / 2825 (106 / 2084)
	Climb and Max. Cruise	500 (671)	530 (711)	675	214.65 (473.2)	405 (.666)	96.5	1700-2080	101.325	+ 15 (59)	unlimited		100 / 2665 (100 / 1966)
		500 (671)	530 (711)	690	-	-	97		101.325	+ 19 (66)			
	7) Max. Continuous	580 (778)	615 (825)	710	236.775 (522)	385 (.633)	98.6	2080	101.325	+ 15 (59)	for finishing the flight		100 / 2665 (100 / 1966)
		580 (778)	615 (825)	760	-	-	100.5		101.325	+ 28 (83)			
	10) Max. Take-Off	580 (778)	615 (825)	780	-	-	102	2080	101.325	+ 38 (101)	5 min		106 / 2825 (106 / 2084)
M601F / FS 14) according to JAR-E	Take-Off	580 (778)	615 (825)	710	236.775 (522)	385 (.633)	98.6	2080	101.325	+ 15 (59)	5 min	2665 (1966)	106 / 2825 (106 / 2084)
		580 (778)	615 (825)	735	-	-	100		101.325	+ 23 (73)			
	Take-Off with Water Inject.	580 (778)	615 (825)	735	-	-	100	2080	97.325	+ 33 (91)	5 min		106 / 2825 (106 / 2084)
	Max. Continuous	500 (671)	530 (711)	675	214.65 (473.2)	405 (.666)	96.5	1700-2080	101.325	+ 15 (59)	unlimited		100 / 2665 (100 / 1966)
		500 (671)	530 (711)	690	-	-	97		101.325	+ 19 (66)			
	7) Intermed. Contingency	580 (778)	615 (825)	710	236.775 (522)	385 (.633)	98.6	2080	101.325	+ 15 (59)	for finishing the flight		100 / 2665 (100 / 1966)
		580 (778)	615 (825)	760	-	-	100.5		101.325	+ 28 (83)			
	Max. Contingency	8) 595 (798)	630 (845)	780	-	-	102	2080	101.325	8) + 36 (97)	2.5 min		106 / 2825 (106 / 2084)
		9) 595 (798)	630 (845)	780	-	-	102		101.325	9) + 52 (126)			
M601F-22 M601F-32	Take-Off	560 (751)	595 (798)	11) 705	231.28 (519.9)	12) 413 (.679)	98.1	2080	101.325	+ 15 (59)	5 min	2570 (1896)	106 / 2720 (106 / 2006)
		560 (751)	595 (798)	735	-	-	99.8		101.325	+ 25.2 (77)			
	Max. Continuous	490 (657)	521 (699)	11) 670	211.19 (465.6)	13) 431 (.709)	96.1	max. 1900	101.325	+ 15 (59)	unlimited		100 / 2570 (100 / 1896)
		490 (657)	521 (699)	710	-	-	97		101.325	+ 19.6 (67)			

1) Inter-turbine temperature measured by aircraft indicator.

2) Max. torque value includes torque growth during take-off roll.

3) Performance in accordance with Technical Specifications TPF 01-2116-81. When the engine is installed in the L-410 UVP commuter the shaft power is limited to 515 kW. This power is flat-rated up to +27 °C at p_0 = 101.325 kPa.

4) Performance in accordance with Technical Specifications TPF 01-2165-89. When the engine is installed in the PZL-106BT Kruk agricultural aircraft the shaft power is limited to 515 kW. This power is flat-rated up to +27 °C at p_0 = 101.325 kPa.

5) Performance in accordance with Technical Specifications TPF 01-2116-81. When the engine is installed in the L-410 UVP commuter the shaft power is limited to 452 kW. This power is flat-rated up to +23 °C at p_0 = 101.325 kPa.

6) Performance in accordance with Technical Specifications TPF 01-2165-89. When the engine is installed in the PZL-106BT Kruk agricultural aircraft the shaft power is limited to 452 kW. This power is flat-rated up to +23 °C at p_0 = 101.325 kPa.

7) This rating is exclusively intended for one engine inoperative (OEI) flight.

8) This rating is exclusively intended for OEI take-off. Presented performance is available without water injection.

9) This rating is exclusively intended for OEI take-off. Presented performance is available with water injection.

10) This rating is exclusively intended for OEI flight, when it is necessary to reach safe altitude during repeated take-off after aborted landing. Presented performance is available without water injection.

11) Presented inter-turbine temperature is valid for brand new engine. At the end of TBO it can be by 5 °C higher.

12) Specific fuel consumption is related to shaft power. Presented value is valid for brand new engine. At the end of TBO it can be by 3 g/kW.h higher

13) Specific fuel consumption is related to shaft power. Presented value is valid for brand new engine. At the end of TBO it can be by 4 g/kW.h higher

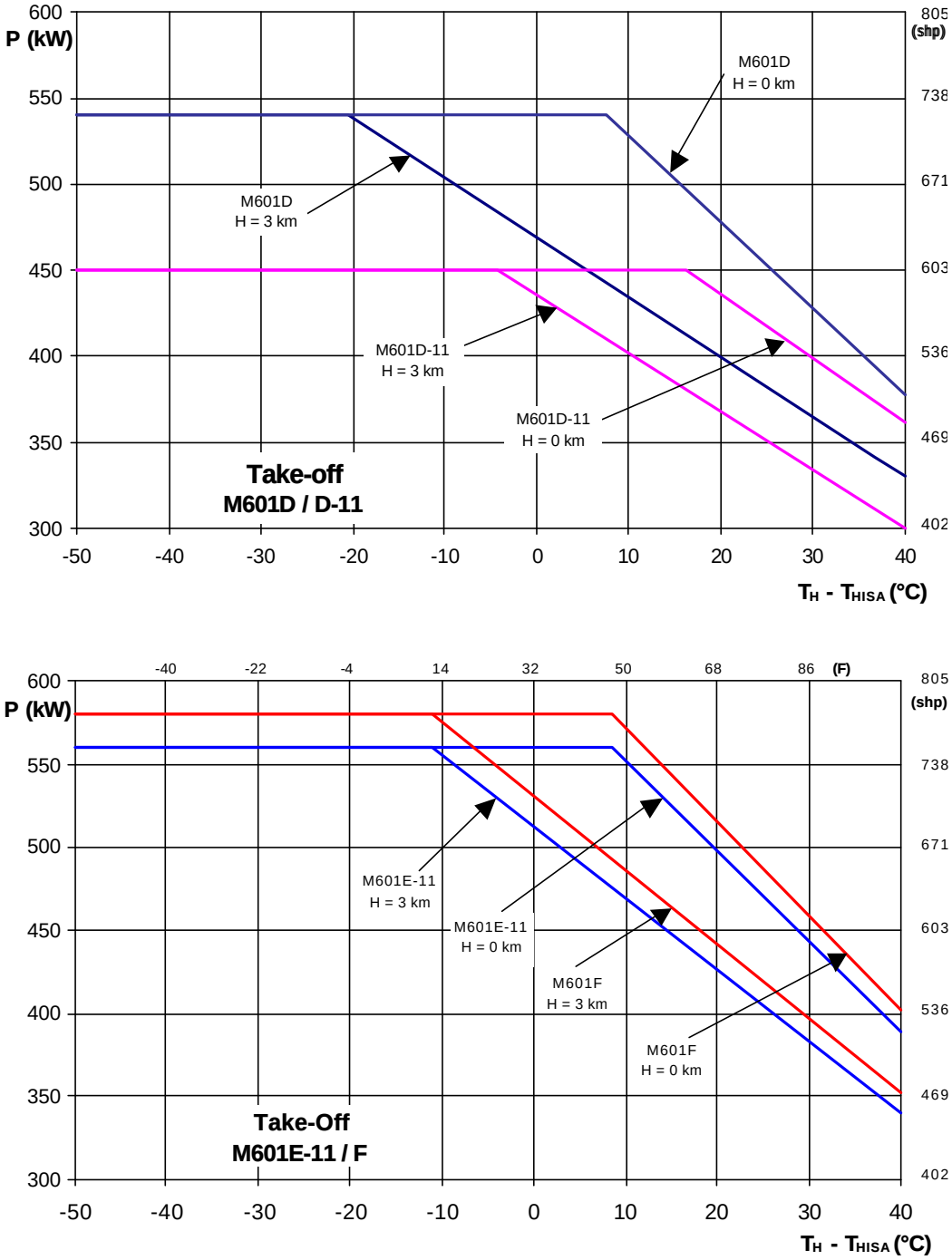
14) The M601FS engine model is equipped with single acting propeller.

15) Specific fuel consumption is related to shaft power.

16) The M601E-11S and M601E-11AS engine models are equipped with single acting propellers.

Diagrams of Shaft Power vs. Difference between Ambient and ISA Temperature and Flight Altitude

Uninstalled, no air bleed



T_{HISA} = 15 °C (59 F) at alt. H = 0 km ; T_{HISA} = -4.5 °C (29.3 F) at alt. H = 3 km (914.4 ft)

WALTER M601E-11A is derated to the shaft power of 485 kW which is kept in high altitudes. The power increases up to 526 kW for take-off.

Time Till Overhaul [1]

Model	Hours	Equivalent Cycles	Years	Note
D	1,800	2,250	8	
D-1	1,500	5,300	8	
D-2	1,500	4,500	8	
D-11	1,800	3,600	8	
D-11NZ	1,800	*5,300	8	*at max. 22,500 take-offs[2]
E / E-11	2,000	2,250	8	produced till 1997[3] [4]
	3,000	3,300	8	produced from 1998[4]
E-11A	3,000	4,500	8	
E-21	2,000	2,250	8	
F	3,000	3,300	8	
F-22	2,000	1,000	8	typical flight time is 150 min
F-32	3,000	1,500	8	typical flight time is 150 min
T	1,000	1,500	8	
Z	1,500	**7,000	8	**at max. 12,750 take-offs[2]

[1] Time till overhaul is limited by flight hours, cycles or calendar time, whatever limit comes sooner.

[2] TBO in terms of flight hours and cycles in special cases can be customized in accordance with flight envelope consulted with WALTER a.s. specialists.

[3] Upgrade up to 3,000 hours and 3,300 cycles status available as an option during overhaul or shop revision.

[4] The number of cycles has been extensiving up to 6,600 cycles. Upgrade is available as an option during overhaul or shop revision.

If Time Between Overhauls (TBO) is exhausted in terms of calendar life, but some hours and cycles are still available, shop revision should take place – this provides another full TBO in terms of calendar life with the resulting cycles and flight hours kept. If TBO is exhausted in terms of flight hours or cycles, the engine must be sent to IRAN overhaul. The IRAN (Inspect and Repair As Necessary) overhaul presents disassembly, inspection, repair or exchange of all the worn or destroyed parts to get them on to the status to be able to pass another one TBO in terms of cycles, flight hours and calendar. The engine regains full TBO.

Shop revision presents disassembly, inspection, necessary repair or exchange of expired parts, assembly and tests runs including performance characteristics measurements.

IRAN overhauls and shop revisions can only take place in WALTER a.s. Prague. Standard IRAN overhaul delivery time is 3 months and its warranty is 1,100 hours; 1,100 cycles or a calendar limit (what happens sooner).

Example of Using Avia Propellers for M601 Engine

Model *Take-Off Power (kW / shp)*	***Propeller***	***Propeller Unit***	***Aircraft***
M601D 540 / 724	V508D	VJ8.508D	LET L-410UVP, -410T, -410FG PZL-106BT-601 Experimental
M601D-1 540 / 724	V508D-AG V508E-AG	VJ8.508D-AG VJ8.508E-AG	Ayres Turbo Trush PZL-106BT-601 Turbo Kruk
M601D-2 400 / 536	V508D-2	VJ8.508D-2	Dornier Do 28-G92 SMG 92 Turbo Finist
M601D-11 450 / 604	V508D-AG V508E V508E-AG	VJ8.508D-AG VJ8.508E VJ8.508E-AG	AG aircraft Experimental
M601D-11NZ 410 / 550	V508D-AG V508E-AG	VJ8.508D-AG VJ8.508E-AG	Fletcher FU-24
M601E 560 / 751	V508E V508E-84 V510E	VJ8.508E VJ8.508E VJ8.510E	LET L-410UVP Lancair IV-P LET L-410UVP-E
M601E-11 560 / 751	V508E V508E-AG V510AG	VJ8.508E VJ8.508E-AG VJ8.510AG	Air Tractor Ayres S2R Turbo Thrush Schweizer AG Cat, Fat Cat Experimental
M601E-11A 485 / 650	V510*	VJ8.510	Beech King Air C90 Piper PA-31 Navajo
M601E-21 560 / 751	V508E V510E	VJ8.508E VJ8.510E	LET L-410UVP-E
M601F 580 / 777	V508 V510*	VJ8.508 VJ8.510	Experimental LET L-420
M601F-22 **M601F-32** 560 / 751	V510	VJ8.510 VJ8A.510	Experimental M-101T Gzhel GM-17 Viper
M601T 560 / 751	V510T	VJ8.510T	PZL-130TB Orlik Turbo Experimental
M601Z 382 / 512	V508Z	VJ8.508Z	Z-137T Bumble Bee

*De-icing 28 V(DC)

Mass of the AVIA propellers are following: of three blade propellers is 69 kg (152 lb), the weight is reduced to 66.8 kg (147 lb) for agricultural aircraft; of five blade propellers is 81.7 kg (180 lb), and the weight of the propeller fitted with de-icing system is 83.7 kg (185 lb). All AVIA propellers are made from metal.

The engines are furnished a manual feathering, emergency feathering or autofeathering system on custom requirement. Further equipment includes water injection, reverse and de-icing on custom requirement too.

Suitable Propellers

		Number of Blades	*Propeller Diameter (mm)*	*Note*
Avia Propeller	V 508	3	2,500 or 2,134 (98.4 in or 84.0 in)	
	V 510	5	2,300 (90.5 in)	
Hartzell	HC-B3TW-3( ) T10282N+4	3	2,705 (106.5 in)	AG aircraft
	HC-E4W-3( ) D9511F	4	2,438 (96 in)	King Air
Mc Cauley	C700	3	on requested	
	C750	4		
	C1000	5		

Max. rotation speed is 2,080 rpm for all propellers.

Reliability of The M601 Engine

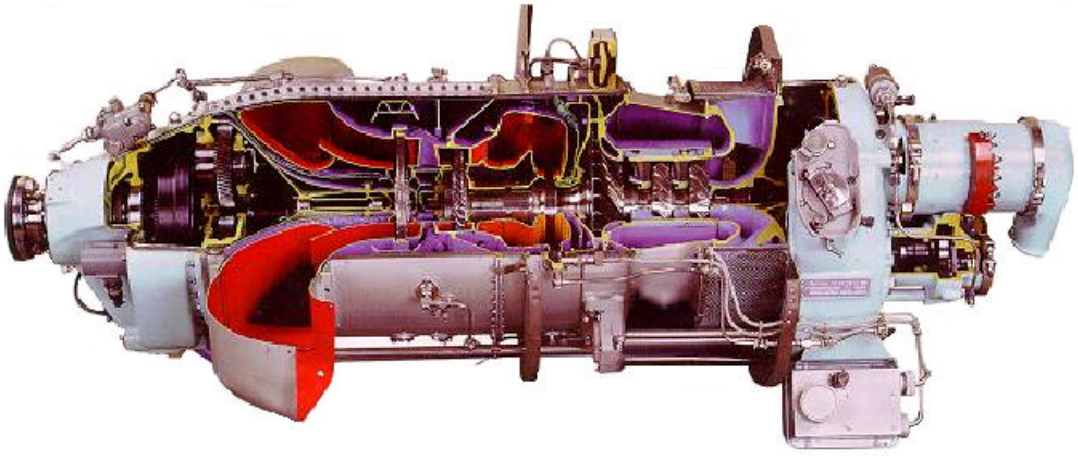
The M601 engine was intended initially for one type of aircraft – LET L-410 commuter. These aircraft, powered by the M601 engines, have operated in the coldest regions of Siberia same as in hottest parts of Africa. During more than quarter-century operation the M601 engine have became very popular. Increasing number of operators proves the reliability of the M601 in recent time.

Total flight hours exceeded nearly 15 millions flight hours. The reliability factors were reduced on 0.0075 per 1,000 flight hours for UER (Unscheduled Engine Removal) and 0.0025 per 1,000 flight hours for IFSD (In Flight Shut Down) in last year 2002. These data are fully comparable with any competitor engines of comparable performance class.

Description of The WALTER M601E-11/F Engine

The M601 series engines have been designed for commuter, single engine multipurpose aircraft agricultural, and trainer aircraft. The M601 engine is a free turbine turboprop engine. The engine is equipped with water injection and thus take-off power is flat rated into higher ambient temperatures.

The M601 engine features two independent parts: the gas generator and the propulsor. The gas generator and free turbine shafts are arranged in a tandem layout. Air enters the engine in the rear part, flows forward through the compressor, combustion chamber, and turbines and exits through exhaust nozzles near the front of the engine.



Gas Generator

Air enters the compressor in a radial direction via a protecting screen and annular plenum. The air is axially directed in front of the compressor. The compressor consists of two axial stages followed by one centrifugal stage. The combustion chamber is of annular configuration. Part of the primary air enters the flarne tube through the perforations in the walls, the remainder passes through the hollow nozzle guide vanes of the gas generator turbine. The fuel is atomized by a special spray ring rotating with the gas generator shaft. The one stage gas generator turbine drives the compressor via the compressor shaft. The interturbine temperature (ITT) is measured by 9 thermocouples installed in the flow path at the gas generator turbine outlet.

Propulsor

The tip shrouded one stage axial-flow turbine drives the propeller via two stages countershaft reduction gearbox. The reduction gearbox embodies an integral torquemeter, which provides for indication of engine power. The exhaust gases from the free turbine pass through the annular plenum to the atmosphere via two opposed exhaust nozzles. Exhaust gases provide for additional jet thrust.

Fuel System

The fuel system of the engine is a low pressure system with a gear fuel pump. The engine is started by an electric starter/generator and two torch igniters.

Oil System

The oil system is a circulatory pressure system with integral oil tank incorporated in the accessory gearbox. The oil system provides lubrication for all areas of the engine and further the pressure oil for the torquemeter and propeller pitch control.

System of Limiters

The engine is equipped with limiters, which prevent from overheating and overspeeding during start and reverse rating and in BETA control. The limiters indicate the exceeding of permitted values of the torque, speed of gas generator and propeller and interturbine temperature at other ratings.

Engine Control

The power plant controls are actuated by three levers. One controls the shaft power at positive and reverse propeller blade angles. The second actuates the fuel shut-off valve and if an emergency circuit is on, it controls the engine power. The third actuates the controlled propeller speed and emergency feathering.

Engine Mounting

The engine is mounted to the engine mount ring by three elastically supported pins, which are located on the centrifugal compressor casing.

Leading Particulars

Engine type:	free turbine, two shafts tractor turboprop	
Sense of rotation:	Gas generator	- CCW
(looking forward)	propeller turbine	- CCW, propeller shaft - CW

Dimensions:	max. height	650 mm (2 ft 1.59 in)
	max. width	590 mm (exhaust nozzles removed) (1.5 ft 5.23 in)
	max. length (app.)	1,675 mm (5 ft 5.95 in)

Engine mass: 203 kg (fully fitted with the instruments) (447.5 lb)
Mass of oil charge: 7 kg (15.4 lb)
Oil consumption: 0.1 l/hr (.22 lb/hr)
Air bleed: 62 g/s at flight altitude of 4,200 m and V TAS of 400 km/hr (2.19 oz/s @ 1,280 ft and 216 knots)

Lubrication oil:

1. AERO SHELL TURBINE OIL 500 acc. to MIL-L 23699C
2. AERO SHELL TURBINE OIL 555 acc. to MIL-L 23699C
3. AERO SHELL TURBINE OIL 560 acc. to MIL-L 23699C
4. MOBIL JET OIL II according to MIL-L 23699C
5. Synthetic oil B3V according to TU 38-101295-85
6. BP TURBO OIL 2380 (EXXON TURBO OIL 2380)
7. CASTROL 599

Approved fuel types:

1. JET A-1 acc. to ASTM D 1655-89 or DERD 2494
2. RT acc. to ST SEV 5024-85 or GOST 10227-86 or CSN 65 65220
3. TS-1 acc. to CSN 65 6520 or ST SEV 5024-85 or GOST 10227-86
4. PSM2 acc. to PN-86 / C - 96026
5. T-1 acc. to ST SEV 5024-85 or GOST 10227-86
6. PL-6 acc. to PND 25 005-76
7. PL-7 acc. to PND 25 005-92
8. JET A acc. to ASTMD 1655-89

Instruments and Equipment for The Engine

Instruments and Equipment Installed on the Engine M601

		M601D	M601E	M601F	M601T	M601Z
1.01	Fuel Control Unit	LUN 6590.03-8 for D-2 LUN 6590.06-8	LUN 6590.05-8	LUN 6590.04-8	LUN 6590.05-8	LUN 6590.06-8
1.02	Fuel Pump	LUN 6290.03-8	LUN 6290.04-8	LUN 6290.04-8	LUN 6290.04-8	LUN 6290.04-8
1.03	Starter / Generator	LUN 2132.01-8	LUN 2132.02-8	LUN 2132.02-8 for F-22/32 is the SG 250	LUN 2132.02-8	LUN 2132.01 / .02-8
1.04	Ignition Unit JT 607D (2 pcs)	LUN 2201.03-8 interchangeable with 1.22	LUN 2201.03-8 interchangeable with 1.22	LUN 2201.03-8 interchangeable with 1.22	LUN 2201.03-8 interchangeable with 1.22	LUN 2201.03-8 interchangeable with 1.22
1.05	Speed Transmitter	LUN 1333.12-8	LUN 1333.22-8	LUN 1333.12-8	LUN 1333.22-8	LUN 1333.12-8
1.06	ITT Transmitter	LUN 1371-8	LUN 1377-8	LUN 1377-8	LUN 1377-8-PZL	LUN 1371-8
1.07	Torque Transmitter	LUN 1540.01-8	LUN 1540.02-8	LUN 1540.02-8	LUN 1540.02-8	LUN 1540.01-8
1.08	Min. Oil Pressure Signaler	1.25K LUN 1469.32-8	1.25K LUN 1469.32-8	1.25K LUN 1469.32-8	1.25K LUN 1469.32-8	1.25K LUN 1469.32-8
1.09	Min. Oil Quantity Signaler		LUN 1581-8	LUN 1581-8		
1.10	Oil Filter Impending by-pass Signaler		LUN 1493.03-8 except E and E-21	LUN 1493.03-8		
1.11	Oil Temperature Transmitter	LUN 1358-8	LUN 1358-8	LUN 1358-8	LUN 1358-8	LUN 1358-8
1.12	Pressure Switch of Autofeathering System	LUN 3280-8 twin engined aircraft	LUN 3280-8 twin engined aircraft	LUN 3280-8 twin engined aircraft and autofeathering system		
1.13	Torque Limiter Pressure Switch	LUN 1476-8	LUN 1476-8	LUN 1476-8	LUN 1476-8	
1.14	Propeller Speed Governor *	LUN 7815.02-8 for D-2 LUN 7815.03-8	LUN 7816-8 double acting propeller	LUN 7816-8 double acting propeller	LUN 7816-8	LUN 7815.03-8
			LUN 7817 ** single acting propeller	LUN 7817 ** single acting propeller		
1.15	Electrohydraulic Actuator	LUN 7880.01-8	LUN 7880.01-8 manual (switch) and autofeathering	LUN 7880.01-8 manual-push button and autofeathering		
1.16	Bolt Engine Mount Ring (3 pcs)	M601-907.9	M601-907.9	M601-907.9	M601-184.2	M601-907.9
1.17	Engine Mount Ring	B 061 001N airframe part	B 061 001N airframe part	B 061 001N for F-22/32 Ring PO.1-6400-10	EM601.95-815	
1.18	Propeller Controls		B 560 993N	B 560 993N	B 560 993N	
1.19	Electrical Harnes	M601-810.72	B 570 500N for LET L-410, other installation interchangeable with 3.36 item	B 572 519N for LET L-420, other installation interchangeable with 3.36 item		
1.20	Cabin Ventilation Air Pipeline	B 560 992N on special order	B 560 992N	B 560 992N		B 560 992N on special order
1.21	Engine Limiter Unit	LUN 5224.02 on special order interchangeable with 3.21 included testing box DZ-8056	LUN 5224 on special order interchangeable with 3.21 included testing box DZ-8056	LUN 5224 interchangeable with 3.21 included testig box DZ-8056 (item 3.20)		
1.22	Unison Exciter	UNISON 9049765-1 interchangeable with 1.04	UNISON 9049765-1 interchangeable with 1.04	UNISON 9049765-1 interchangeable with 1.04	UNISON 9049765-1 interchangeable with 1.04	UNISON 9049765-1 interchangeable with 1.04

Instruments and Parts Delivered with the Engine

		M601D	M601E	M601F	M601T	M601Z
2.01	Torque Indicator	LUN 1539.01-8 for D-2 LUN 1539.08-8 for D-11 LUN 1539.07-8 for D-11NZ LUN 1539.33-8	LUN 1539.02-8 for E-11A LUN 1539.09-8	LUN 1539.02-8	LUN 1539.02-8	LUN 1539.10-8
2.02	Oil Pressure Transmitter	LUN 1558-8	LUN 1558-8	LUN 1558-8	LUN 1558-8	LUN 1558-8
2.03	Fuel Pressure Transmitter	LUN 1559-8	LUN 1559-8	LUN 1559-8 the indication of fuel pressure parameter is not required according to the FAR of FAA	LUN 1559-8	LUN 1559-8
2.04	ITT Indicator					LUN 1370.03-8
2.05	Exhaust Stub (nozzle) L.H.	M601-418.7 part number M601-439.6	M601-418.7 part number M601-439.6	M601-418.7 part number M601-439.6	M601-418.7 part number M601-439.6	
2.06	Exhaust Stub (nozzle) R.H.	M601-419.7 part number M601-439.6	M601-419.7 part number M601-439.6	M601-419.7 part number M601-439.6	M601-419.7 part number M601-439.6	
2.07	Climatization Valve	UK 1 (8) part number B 560 946N	UK 1 (8) part number B 560 946N		UK 1 (8) part number B 560 946N	
2.08	Electric Harnes Socket Connector				2RM 30BPN 32 G1V1	
2.09	Electric Harnes Socket Connector				2RM 33BPN 20 G4V1	

* For M601D-11: 7815.03-8 (V508D-AG)
7816-8 (V508E/E-AG)

** Propeller Speed Governor includes the LUN 7818 speed limiter and the LUN 7882 BETA control switch

Instruments and Equipment necessary for Engine Operation (on Special Order)

		M601D	M601E	M601F	M601T	M601Z
3.01	Speed Indicator (gas generator)	LUN 1347.01-8 for D-2 LUN 1347.53-8 for D-11 LUN 1347.43-8 for D-11NZ LUN 1347.33-8	LUN 1347.03-8 for E-11A LUN 1347.63-8	LUN 1347.23-8	LUN 1347.01-8	LUN 1347.73-8
3.02	Speed Indicator (propeller)	LUN 1348.01-8 for D-2, D-11 LUN 1348.43-8 for D-11NZ LUN 1348.33-8	LUN 1348.02-8 for E-11A LUN 1348.43-8	LUN 1348.02-8	LUN 1348.01-8	LUN 1348.73-8
3.03	ITT Indicator	LUN 1370.01-8 for D-2 LUN 1370.12-8 for D-11 LUN 1370.11-8 for D-11NZ LUN 1370.33-8	LUN 1370.02-8 for E-11A LUN 1370.13-8	LUN 1370.08-8	LUN 1370.02-8	
3.04	Triple Indicator (oil temp.,oil press.,fuel press.)	LUN 1538.12-8 for D-1 LUN 11538.01-8	LUN 1538.01-8	LUN 1538.06-8 PSI - pressure unit	LUN 1538.01-8	LUN 1538.12-8
				LUN 1538.09-8 ISO - pressure unit		
3.05	Fuel Filter	LUN 7691.04-8	LUN 7691.04-8	LUN 7691.04-8 delivered for each aircraft with the first engine only	LUN 7691.04-8	LUN 7691.04-8
3.06	Fuel Filter Impending by-pass Signaler	LUN 1493.04-8	LUN 1493.04-8	LUN 1493.04-8	LUN 1493.04-8	LUN 1493.04-8
3.07	Booster Pump Fuel Pressure Signaler	LUN 1492.04-8 0.7S	LUN 1492.01-8	LUN 1492.01-8		
3.08	Pressure Switch				0.4K LUN 1469.11-8	
3.09	Oil Cooler		443512506705			
3.10	Thermostatic Valve		TPV 1 (7)			
3.11	Alternator		LUN 2102-8 for V510 propeller deicing	LUN 2102.01 for V510 propeller deicing and any airframe necessity		
3.12	Regulator (delivered with the alternator)		ØJG 3 /3.7 kVA for propeller deicing	LUN 2147.01-8 for propeller deicing		
3.13	Circuit Breaker		V016 for starter/generator	V016 for starter/generator	V016 for starter/generator	
3.14	Slip Ring		LUN 7850-7 for V510 propeller deicing	LUN 7850-7 for V510 propeller deicing		
				P 3560-7 for V508E propeller deicing		
3.15	Fuel / Oil Heat Exchanger		44398219001		443958219001	
3.16	Feathering Auxiliary Pump	LUN 7840-8	LUN 7840-8 for V510 manual and autofeathering	LUN 7840-8 for V510 manual and autofeathering		
3.17	Feathering Switch Signaler	0.7S LUN 1492.04-8	0.7S LUN 1492.04-8 for V510 manual-push button and autofeathering	0.7S LUN 1492.04-8 for V510 manual-push button and autofeathering		
3.18	Hydraulic Pump	LUN 6201 for aircraft hydraulic system	LUN 6102 for aircraft hydraulic system	LUN 6102.01-8 for aircraft hydraulic system	LUN 6102.01-8 for aircraft hydraulic system	
3.19	Interrupter	LUN 3191-8	LUN 3191-8 for starting of engine	LUN 3191-8 for starting of engine	LUN 3191-8 for starting of engine	LUN 3191-8
3.20	Testing Box	DZ-8056 creates set with the LUN 5224.02	DZ-8056 creates set with the LUN 5224	DZ-8056 creates set with the LUN 5224		
3.21	Integrated Electronic Limiter Unit	LUN 5260.02 interchengeable with LUN 5224-8	LUN 5260.04 interchengeable with LUN 5224.02		LUN 5260.04-8	LUN 5260.03
3.22	Ilumination Source for Indicators	LUN 2412 5 V voltage source	LUN 2412 5 V voltage source	LUN 2412 5 V voltage source		
3.23	Ilumination Intensity Regulator for Indicators	LUN 2412.01 1.8 - 5 V voltage source	LUN 2412.01 1.8 - 5 V voltage source	LUN 2412.01 1.8 - 5 V voltage source		
3.24	Cyclic Switch	LUN 3190-8 for V508E propeller deicing	LUN 3193 for V510 propeller deicing	LUN 3193 for V510 propeller deicing		
			LUN 3190-8 for V508E propeller deicing			
3.25	Ambient Temperature Transmitter	P - 5 (7) for function of signalling IELU or EL	P - 5 (7) for function of signalling IELU or EL	P - 5 (7) for function of signalling MAX NG from ELU at high flight altitudes	P - 5 (7) for function of signalling MAX NG from ELU at high flight altitudes	
3.26	Starter-Generator Plug Connector	Ša56 B4 Š1	Ša56 B4 Š1			
3.27	Electric Harness Socket Connector	2RM 30BPN 32 G1V1	2RM 30BPN 32 G1V1	2RM 30BPN 32 G1V1		
3.28	Electric Harness Socket Connector	2RM 33BPN 20 G4V1	2RM 33BPN 20 G4V1	2RM 33BPN 20 G4V1		
3.29	Compensating Line of ITT	KV - L410(8)	KV - L410(8)			
3.30	Signalling Panel	LUN 2690.67-8	LUN 2690.67-8			

		M601D	M601E	M601F	M601T	M601Z
3.31	Voltage Inverter	LUN 2454-8	LUN 2454-8 single engine A/C	LUN 2454-8 single engine A/C power supply for transmitter/indicator sets of the torquemeter and oil/fuel pressure		LUN 2454-8
			LUN 2450-8 double engine A/C	LUN 2450-8 double engine A/C		
3.32	Voltage Regulator	LUN 2167.03-8	LUN 2167.03-8 for starter/generator	LUN 2167.03-8 for starter/generator	LUN 2167.03-8 for starter/generator	
		VR 1530-3 option	VR 1530-3 option	VR 1530-3 option		
3.33	Metric-Inch Threaded Adapters for Oil and Fuel System	M601-8xx.62 for manual-push button and autofethering of double acting propeller	M601-8xx.62 for manual-push button and autofethering of double acting propeller	M601-8xx.62		
3.34	Bolt to Mounting Engine Bed			EM601.91-244		
				M601-164.61 delivered on special order for reinstalling M601		
3.35	Engine Mount Ring	M601-164.6 compatible with PT-6 engine bed	M601-164.6 compatible with PT-6 engine bed	M601-164.6 compatible with PT-6 engine bed		M601-164.6 compatible with PT-6 engine bed
3.36	Electrical Harness		B 570 510N for engine instruments	B 570 510N for engine instruments		
			B 570 511N for de-icing - alternating 115/400 V or 27 V (DC)	B 570 511N for de-icing - alternating 115/400 V or 27 V (DC)		
3.37	Alternator Gearbox		M60155.6 for V510 propeller deicing	M60155.6 for V510 propeller deicing		
3.38	Engine Load Monitoring Device	ELM601 ELM601AG for AG aircraft (one device / one engine)	ELM601 ELM601AG for AG aircraft (one device / one engine)	ELM601 ELM601AG for AG aircraft (one device / one engine)		ELM601 AG
3.39	ELM601 Propeller Governor Switch/Cable	M601-803.63 for D-11 AG aircraft	M601-803.63 for E-11 AG aircraft	M601-803.63 used on AG aircraft		M601-803.63
				M601-806.63		
3.40	Time Relay	LUN 2601.01-8	LUN 2601.01-8 for starting of engine	LUN 2601.01-8 for starting of engine	LUN 2601.01-8 for starting of engine	LUN 2601.01-8
3.41	Charge up Battery Relay		DMR-400 DSP	DMR-400 DSP		
3.42	Relay Condactor	KP - 50DV for V508E propeller deicing	TKD 501 DOD for V510 manual-push button and autofeathering	KP - 50DV for V508E propeller deicing		
				TKD 501 DOD for V510 manual-push button and autofeathering		
			TKS 401 DOD T for starter/generator	TKS 401 DOD T for starter/generator		
3.43	Relay		TKE 52 PODG for starter/generator for ignition automatic	TKE 52 PODG for starter/generator for ignition automatic		
			TKE 52 PODG for ignition automatic	TKE 54 PODG lenght as specified in order		
3.44	Circuit Breaker	AZRGK - 40 / 5	AZRGK - 40 / 5	AZRGK - 40 / 5		
3.45	Compensating Cable Line for Indicator and ELU	KV - M601 - PLR I / II lenght as specified in order	KV - M601 - PLR I / II lenght as specified in order	KV - M601 - PLR I / II lenght as specified in order	KV - M601 - PLR I / II lenght as specified in order	KV - M601 - PLR I / II lenght as specified in order
3.46	Bushing for Compansating Cable Line	239 S44-D2	239 S44-D2	239 S44-D2	239 S44-D2	239 S44-D2
3.47	The M601/PT6 Exhaust Stub (nozzle) Adapter	M601-439.6 rectangle/circular adapter for the PT6 nozzle 2.992 in of length	M601-439.6 rectangle/circular adapter for the PT6 nozzle 2.992 in of length	M601-439.6 rectangle/circular adapter for the PT6 nozzle 2.992 in of length	M601-439.6 rectangle/circular adapter for the PT6 nozzle 2.992 in of length	M601-439.6 rectangle/circular adapter for the PT6 nozzle 2.992 in of length
		M601-449.6 rectangle/circular adapter for the PT6 nozzle 3.937 in of length	M601-449.6 rectangle/circular adapter for the PT6 nozzle 3.937 in of length	M601-449.6 rectangle/circular adapter for the PT6 nozzle 3.937 in of length	M601-449.6 rectangle/circular adapter for the PT6 nozzle 3.937 in of length	M601-449.6 rectangle/circular adapter for the PT6 nozzle 3.937 in of length
3.48	Pump Drive for PARKER Pump		M601-515.1	M601-515.1		

Instruments designed LUN withrelevant number included in the engine standard equipment are certified together with the power plant. Other instruments designated LUN are certified in accordance with the L8 Airworthiness Code which is equivalent to the British Code

This list is for information only and the instruments can be different by modification of the engine or the conditions in service. An extensive survey of the Metric-Inch Adapters for oil and fuel system with the scheme is sent on customer request.

Maintenance System

WALTER M601 turboprop has been designed for low maintenance demands. Fix time maintenance scheme is used. Life of all parts is guaranteed throughout determined TBO and no hot section inspection or life limited parts replacements are required within TBO.

Usual maintenance and external installation and instrument check is only required during TBO. Engine and maintenance system reliability has been proven during long time heavy duty operation in Siberia and Africa.

TBO is established by the manufacturer by the following:

- number of flight hours
- number of flight cycles
- number of years of service

Life limited parts check and the manufacturer or authorized overhaul shop provides replacement during overhaul.

Maintenance Demands

4 minutes of maintenance per flight hour

Daily inspection:	5 minutes
300; 900 hours inspection:	9.5; 12 hours (at optimal engine installation)
Unscheduled maintenance:	2 hrs per 100 flight hours

Typical times for some maintenance works

Power plant change:	8 hours (two WALTER engineers; including propeller unit, setting, engine test, flight test)

Accessory replacement

Ignition system:	15 minutes
Propeller governor:	25 minutes
Fuel control unit:	1 hour

Certification Status

1.	M601A	Type Certificate No.75-03 dated Apr.29, 1975 (acc. to BCAR, Section C, Subsection C1 and C3 dated May 15, 1971 incl. Supplement issued till Nov.10, 1972 and Blue Paper No.553
2.	M601A	Supplement No.1 dated Mar.30, 1976 to the Type Certificate No.75-03
3.	M601B	Supplement No. 2 dated Jul. 28, 1977 to the Type Certificate No. 75-03
4.	M601A / B	Supplement No. 3 dated Mar. 3, 1978 to the Type Certificate No. 75-03
5.	M601B	Supplement No. 4 dated Mar. 13, 1980 to the Type Certificate No. 75-03
6.	M601D	Supplement No. 5 dated Sep. 30, 1981 (acc. to L8/C, Subsections C1 and C3 dated Mar. 29, 1973 and Change No. 553 dated Jun 29, 1971) to the Type Certificate No.75-03
7.	M601B / D	Supplement No. 6 dated Feb. 16, 1983 to the Type Certificate No. 75-03
8.	M601Z	Supplement No. 7 dated Oct. 31, 1984 (acc. to L8/C, Subsections C1 and C3, Change 553 and Change 680 dated Jan. 29, 1979) to the Type Certificate No. 75-03
9.	M601E	Supplement No. 8 dated Jul. 8, 1985 (acc. to L8/C, Subsections C1 and C3, Change 553 and Change 680) to the Type Certificate No. 75-03
10.	M601E	Supplement No. 9 dated Feb. 18, 1986 to the Type Certificate No. 75-03
11.	M601Z	Supplement No. 10 dated May 15, 1989 to the Type Certificate No. 75-03
12.	M601E	Type Certificate No. 88-02 dated Mar.22, 1988 (L8/C, Subsections C1 and C3, Change 553 and Change 680, JAR-E, Subsections C1 and C3 dated Jan. 24,1986)
13.	M601E	Type Certificate No. 89-03 dated Oct.11, 1989 (acc. to FAR 33, dated Apr. 24, 1986)
14.	M601D	Type Certificate No. 90-04 dated Nov. 12, 1990 (acc. to FAR 33, dated Apr. 24, 1986)
15.	M601D	Supplement No.1 dated March 31, 1993 (acc. to FAR 33, dated Apr. 24, 1986) to Type Certificate No. 90-04
16.	M601T	Supplement No.1 dated May 31, 1993 (acc. to FAR 33, dated Aug. 10, 1990) to Type Certificate No. 89-03
17.	M601E	Supplement No. 2 dated Nov. 18, 1993 to the Type Certificate No. 89-03
18.	M601F	Supplement No. 3 dated Dec. 31, 1993 (acc. to FAR 33, Amdt 33-14 to the Type Certificate No. 89-03
19.	M601E	Brazil, Ministério de Aeronáutica, Centro Técnico Aerospacial, Type Certificate No.9403 dated Mar. 28, 1994 (acc. to RBHA 33)

20.	M601E-21	Supplement No. 1 dated Aug. 18, 1994 to the Type Certificate No. 88-02
21.	M601Z	Supplement No.2 dated Aug.18, 1994 (acc. to FAR 33, Amdt 33-12) to the Type Certificate No. 90-04
22.	M601D-1	Supplement No.3 dated Oct.18, 1994 (acc. to FAR 33, Amdt 33-11) to the Type Certificate No. 90-04
23.	M601F-22	Supplement No. 4 dated Oct. 18, 1994 to the Type Certificate No. 89-03
24.	M601E-11	USA, Federal Aviation Administration, Type Certificate No. E00048EN dated Jan.6, 1995 (acc. to FAR 33, Amdt. 33-12)
25.	M601D-1	Argentine, Dirección Nacional de Aeronavegabilidad, Type Certificate No. MT-9503 dated May 29, 1995 (acc. to DNAR 33, Amdt. 33-11)
26.	M601E-11	Supplement No.5 dated Aug. 15, 1995 (acc. to FAR 33, Amdt 33-12) to the Type Certificate No. 89-03
27.	M601E	Supplement No.2 dated June 27, 1996 (acc. to JAR-E) to the Type Certificate No. 88-02
28.	M601E	Argentine, Dirección Nacional de Aeronavegabilidad, Type Certificate No. MT-9602 dated May 12, 1996 (acc. to DNAR 33, Amdt. 33-11)
29.	M601E	Austria, Austro Control, Certificate of Type Acceptance, Nr TW 022-ACG dated Nov. 7, 1996 (acc. to FAR 33, Amdt. 33-10)
30.	M601F-32	Supplement No.6 dated Dec. 18, 1996 to the Type Certificate No. 89-03
31.	M601E-11	Supplement No.7 dated Mar. 6, 1997 to the Type Certificate No. 89-03
32.	M601F M601F-22 / F-32	Russia, AR MAK, Type Certificate No. 120-D, dated June 6, 1997 (acc. to AP 33)
33.	M601E-11 M601F	Supplement No.8 dated Oct. 31, 1997 to the Type Certificate No. 89-03
34.	M601D / D-1 M601Z	Supplement No.4 dated Oct. 31, 1997 to the Type Certificate No. 90-04
35.	M601E	Philippines, ATO, Type Certificate No. 5VE9700021 dated Jan.12, 1998
36.	M601E-11	Philippines, ATO, Type Certificate No. 5VE9700022 dated Jan.12, 1998
37.	M601F	Supplement No.9 dated Jul.1, 1998 to the Type Certificate No. 89-03
38.	M601F	USA, Federal Aviation Administration, Type Certificate No. E00048EN, revision 1 dated Oct. 2, 1998 (acc. to FAR 33, Amdt. 33 - 12)
39.	M601E	Chile, DGAC, Type Certificate No. A-02 dated Feb.2, 1998 (acc. to FAR, aircraft L-410 UVP-E20)

40. M601D-1 / D-11 M601D-11NZ M601Z — Type Certificate No. 90-04/1, revision 1 dated Jun.10, 1999 (acc. to FAR 33)

41. M601D-1 / D-2 — Type Certificate No. 99-02 dated Dec.15, 1999 (acc. to JAR-E)

42. M601E-11 — Transport Canada, Type Certificate No. IE-40 dated Feb.29, 2000 (acc. to CARV, FAR 33)

43. M601F — Type Certificate No. 00-3 dated Jul.14, 2000 (acc. to JAR-E)

44. M601E-11A — Type Certificate No.89-03, revision 10 dated Jan.10, 2001

45. M601E / E-11 M601E-11A / E-11AS / E-11S M601F / F-22 / F-32 M601T — Type Certificate No. 89-03, revision 11 dated Apr.11, 2001 (acc. to FAR 33)

46. M601D-11 — Type Certificate No. 90-04/1, revision 2, dated Apr. 30, 2001

47. M601E — Germany, LBA, Type Certificate No. 7035 dated Jun. 27, 2001 (acc. to JAR-E)

48. M601E / E-11 / E-21 M601E-11A / E-11AS / E-11S M601F / F-22 / F-32 M601T — Type Certificate No. 89-03, revision 12 dated Jun. 27, 2001 (acc. to FAR 33)

49. M601E-21 — Brazil, Ministério de Aeronáutica, Centro Técnico Aerospacial, Type Certificate No.9403 dated Sep. 13, 2001 (acc. to RBHA 33)

50. M601E / E-11 / E-21 M601E-11A / E-11AS / E-11S M601F / F-22 / F-32 M601T — Type Certificate No. 89-03, revision 13 dated Nov. 2, 2001 (acc. to FAR 33)

51. M601D-2 — Germany, LBA, Type Certificate No. 7035 dated Dec. 10, 2001 (acc. to JAR-E)

52. M601E-11 / E-21 — Brazil, Ministério de Aeronáutica, Centro Técnico Aerospacial, Type Certificate No.9403-01 dated Apr. 19, 2002 (acc. to RBHA 33)

53. M601D-1 — Brazil, Ministério de Aeronáutica, Centro Técnico Aerospacial, Type Certificate No. EM-2002 T05 dated May 24, 2002 (acc. to RBHA 33)

54. M601E / E-11 / E-21 M601E-11A / E-11AS / E-11S M601F / F-22 / F-32 / FS M601T — Type Certificate No. 89-03, revision 14 dated Jun. 14, 2002 (acc. to FAR 33)

55. M601D-11 / E-11 M601E-11A / E-11AS / E-11S M601F — USA, Federal Aviation Administration, Type Certificate No. E00048EN, revision 2 dated Jul. 17, 2002 (acc. to FAR 33)

56.	M601F / F-22 / F-32	Russia, AR MAK, Type Certificate No. 120-D revision 2, dated Oct. 4, 2002 (acc. to AP 33)
57.	M601E / E-11 / E-21 M601E-11A / E-11AS / E-11S M601F / F-22 / F-32 / FS M601T	Type Certificate No. 89-03 revision 15, dated Feb. 24, 2003 (acc. to FAR 33)
58.	M601E / E-21	Type Certificate No. 89-03 revision 16, dated May 30, 2003 (acc. to FAR 33)

Note: The Type Certificate (or Supplement / Revision) is issued by the CAI (since April 1997 CAA of the Czech Republic), if no name of the airworthiness authority is presented.

Type Validation Process Launched for The Following Models

1.	M601F / F-11	Italy, acc. to JAR-E
2.	M601E / E-21	South Korea, CAB, acc. to FAR 33 (certified with the LET L-410 commuter)
3.	M601Z	New Zealand, CAA, acc. to FAR 33 (certified with the Zlin Z-137T agricultural aircraft)
4.	M601E / E-21 M601F	Indonesia, GGAC, acc. to FAR 33

Type Certificates Issued for Aircraft Powered by WALTER M601 Engine

1.	M601D	Czechoslovakia, SAI, Type Certificate No.79-02 of the **LET L-410 UVP** commuter dated Jul. 10, 1979
2.	M601D	USSR, Gosaviaregister, Type Certificate No.08-410 of the **LET L-410 UVP** dated Jan. 1, 1982
3.	M601Z	Czechoslovakia, SAI, Type Certificate No.84-01 of the **Zlin Z-37T** agriculture dated Dec. 29, 1985
4.	M601E	Czechoslovakia, SAI, Type Certificate No.86-01 of the **LET L-410 UVP-E** commuter dated Jan. 1, 1986
5.	M601E	USSR, Gosaviaregistr, Type Certificate No. 12-410-E of the **L-410 UVP-E** commuter dated Mar. 18, 1986
6.	M601E-21	Czechoslovakia, SAI, Type Certificate No.88-01 of the **LET L-410 UVP-E9** commuter dated Mar. 22, 1988
7.	M601Z	Czechoslovakia, SAI, Supplemental Type Certificate No.84-01 of the **Zlin Z-137T** agriculture dated Jun. 15, 1988
8.	M601E	Sweden, Luftfartsverket, Type Certificate No. 14/90 of the **L-410 UVP-E20** commuter dated Jul. 5, 1990
9.	M601E-21	Czechoslovakia, SAI, Type Certificate No.90-03 of **LET L-410 UVP-E20** dated Oct. 30, 1990
10.	M601Z	Republic South Africa, SACAA, Type Certificate No. J15/12/170 of **Zlin Z-37T** and **Z-137T** dated Dec. 3, 1991
11.	M601Z	Hungary, CAA, Type Certificate No.341 of **Zlin Z-137T** dated Feb. 18, 1994
12.	M601D-1	Poland, GILC, Type Certificate No. BB-195 of the **PZL-106BT-601** dated Mar. 17, 1994
13.	M601E-21	Brazil, CTA, Type Certificate No.9401 of the **LET L-410 UVP-E20** dated Jul. 18, 1994
14.	M601D-1	Spain, Dirección General de Aviación Civil, Type Certificate No. 136-I of the **PZL-106BT-601** dated Jan. 23, 1995
15.	M601E-21	Denmark, SLV, Type Certificate No.72 0341-1 LS/ps of the **LET L-410 UVP-E20** dated Mar. 25, 1996
16.	M601D-2	Hungary, CAA, Certificate of Airworthiness No. 1142 of **Dornier Do-28 G-92** dated Apr. 30,1996
17.	M601E-11	USA, FAA, Supplemental Type Certificate No. SA09189AC of **Air Tractor AT-501** and **Air Tractor AT-502** dated May 23, 1996
18.	M601E-21	Argentina, DNA, Type Certificate No. AV-9703 of the **LET L-410 UVP-E20** dated Jun. 30, 1997

19. M601E-21 Philippines, ATO, Type Certificate No. 5VT9800014 of the **L-410 UVP-E9** and L-410 UVP-E20 dated Jan. 12, 1998

20. M601E Chile, DGAC, Type Certificate No. A-02 of the **LET L-410 UVP-E20** dated Mar. 2, 1998

21. M601F Czech Republic, CAA, Type Certificate No.98-01 of the **LET L-420** dated Mar. 11, 1998

22. M601F USA, FAA, Type Certificate No. A42CE of the **LET L-420** dated Mar. 11, 1998

23. M601E-11 USA, FAA, Supplemental Type Certificate No. SA01440AT of **Ayres Thrush S2R** dated Apr. 17, 1998

24. M601E-11 USA, FAA, Supplemental Type Certificate No. SA01027CH of **Ag-Cat** dated Apr. 15, 1999

25. M601E-21 Cuba, IACC, Type Certificate No.1-99 of the **LET L-410 UVP-E20** dated May 28, 1999

26. M601E-11 USA, FAA, Supplemental Type Certificate No. SA01994AT of **Beech King Air C 90** dated Sep. 16, 1999

27. M601E-11 USA, FAA, Supplemental Type Certificate No. SA00902CH of **Ayres Thrush S2R** dated Nov. 8, 1999

28. M601E-11 USA, FAA, Supplemental Type Certificate No. SA01236CH of **Ag-Cat** dated May 18, 2000

29. M601F Australia, CANA, Type Certificate No. A175 of the **LET L-420** dated Jun. 21, 2000

30. M601E-11 USA, FAA, Supplemental Type Certificate No. SA01281CH of **Air Tractor AT-401** dated Aug. 4, 2000

31. M601D-11NZ New Zealand, CAA, Supplemental Type Certificate No. 98/21E/15 of **Fletcher FU-24** dated Aug. 9, 2000

32. M601D-2 Hungary, CAA, Supplemental Type Certificate No. 66RK93 of **SMG 92 Finist**, dated December 2000

33. M601E-11 USA, FAA, Supplemental Type Certificate No. SA01353CH of **AG-Cat** dated Jan. 23, 2001

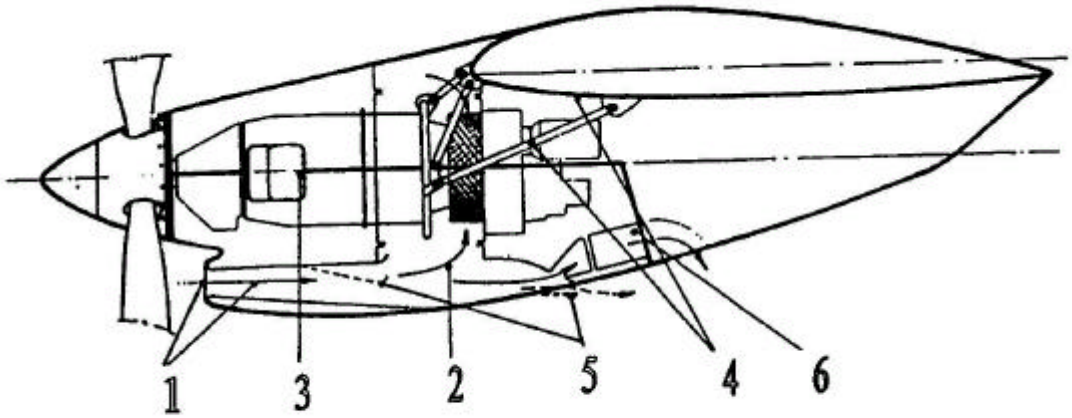
34. M601E-11 USA, FAA, Supplemental Type Certificate No. SA02133AT of **Ayres Thrush S2R** dated Jan. 26, 2001

35. M601E-11 USA, FAA, Supplemental Type Certificate No. SA00888SE of **Air Tractor AT-300** and **AT-301** and **AT-302** dated March 12, 2001

36. M601E-11 USA, FAA, Supplemental Type Certificate No. SA00888SE of **Air Tractor AT-400** and **AT-401** and **AT-402** dated March 12, 2001

37.	M601E-11	USA, FAA, Supplemental Type Certificate No. SA00888SE of **Air Tractor AT-501** and **AT-502** dated March 12, 2001
38.	M601F	Republic South Africa, SACAA, Type Certificate No. LET/001 of the **LET L-420** dated Apr. 2, 2001
39.	M601E-11	USA, FAA, Supplemental Type Certificate No. SA01994AT, rev.1 of **Beech King Air C 90** dated May 17, 2001
40.	M601E-21	Germany, LBA, Type Certificate No.2067 of the **LET L-410 UVP-E20** dated May 28, 2001
41.	M601E-11	USA, FAA, Supplemental Type Certificate No. SA09857SC of **DHC-3 Otter** dated May 31, 2001
42.	M601E-11	USA, FAA, Supplemental Type Certificate No. SA01528CH of **Air Tractor AT-400** and **AT-401** and **AT-402** dated Sep. 10, 2001
43.	M601E-11	Canada, Transport Canada, Supplemental Type Certificate, No. SA01-111 of **DHC-3 Otter** dated Nov. 26, 2001
44.	M601E-11	Brazil, CTA, Supplemental Type Certificate No. 2002S05-01 of the **Beech King Air C 90** dated May 10, 2002
45.	M601D-1	Brazil, CTA, Supplemental Type Certificate No. EM-2002T05 of the **PZL-106BT-601** dated May 24, 2002
46.	M601E-11A	USA, FAA, Supplemental Type Certificate No. SA10071SC of the **Beech King Air A/B/C 90** dated Oct. 4, 2002
47.	M601F-32	Russia, MAK, Type Certificate No. CT 216-M-101T of the **Myasishchev M-101T Gzhel** dated Dec. 30, 2002

1 – air intake in the lower part of the engine nacelle
2 – air enters the compressor from the compartment between front and rear bulkheads
3 – outlet of gas through exhaust nozzle
4 – force talking struts from the engine mounting ring to the wing
5 – the system of de-icing flaps



Condition for mounting the engine to the airframe structure can be met by using the engine B 061 001N mount ring, which is supplied together with the engine (the aerobatic M601T engine is supplied with the EM601.95-815 mount ring). If this mount ring is not used it is necessary to the installation must be consulted with WALTER a.s. producer. An aircraft with PT6 engine is easily rebuilding to M601 by using the M601-164.6 engine mount ring.

Three mounts are located on the centrifugal compressor case support the WALTER M601 engine. Engine vibration should be insulated from aircraft structure by elastic supports.

The M601 engine is used for conversions of piston aircraft or aircraft fitted with PT6 engines as good as for new designed aircraft. The M601 is better in comparison of aircraft installations, which were removed the PT6 engine till performance version of PT6A-28 engine.

	M601D	*M601E*	*M601F*	*M601T*	*M601Z*
Mass (kg)	193 (425.5 lb)	200 (445 lb)	202 (445 lb)	202 (445 lb)	197 (434 lb)
Length (m)	1,675 (5 ft 5.95 in)	1,675 (5 ft 5.95 in)	1,675 (5 ft 5.95 in)	1,675 (5 ft 5.95 in)	1,675 (5 ft 5.95 in)
Width (m)	590 (1.5 t 5.23in)	590 (1.5ft 5.23in)	590 (1.5ft 5.23in)	590 (1.5ft 5.23in)	590 (1.5ft 5.23in)
Height (m)	650 (2 ft 1.59 in)	650 (2 ft 1.59 in)	650 (2 ft 1.59 in)	650 (2 ft 1.59 in)	635 (2 ft 1 in)

these values are meant for fully fitted engine with the instruments

Installation Centers in The ACUA Association

In last time, WALTER engines have expanded around the world so the several various engine installations were created for the same aircraft type. In dependence on this facts, WALTER have initiated the creation of cooperation on the similar projects and further expanding to new wider programs.

The Aircraft Conversions and Upgrade Alliance (ACUA) was created in June 2002 to maximize the potential for growth and profit of the members in similar projects and business of performing aircraft conversions and upgrades. The fifteen companies admitted this cooperation. Two company of them are propellers producers – AVIA Propeller and Hartzell Propeller.

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AOG Air Support *Phone: +800-506-9488* *Fax: +250-765-9271* *Email: aog@aogair.com*	*P.O. Box 2340* *Station R* *Kelowna, B.C.* ***Canada***	*DHC-3 Otter*
Cascade Flying Service *Phone: +509-635-1212* *Fax: +509-635-1477* *Email: cascade@completebbs.com*	*903 Grinnell Road* *Garfield, Washington 99130* ***U.S.A.***	*Air Tractor*
Johnson Airspray, Inc. *Phone: +218-437-6415* *Fax: +218-437-6415* *Email: lindleycj@hotmail.com*	*P.O. Box 27* *Argyle, Minnesota 56713* ***U.S.A.***	*Ag Cat* *Air Tractor* *Ayres Thrush*
LoneStar Propjets, LP *Phone: +615-584-9364* *Fax: +254-752-1698* *Email: JCLUTTRELL@aol.com*	*7727 Karl May Drive* *Waco, Texas 76708* ***U.S.A.***	*King Air 90 lines* *Piper Navajo*
Myrisca Air Corp. *Phone: +254-752-6745* *Fax: +254-752-6749* *Email: myriscaair@aol.com*	*7727 Karl May Drive* *Waco, Texas 76708* ***U.S.A.***	*DHC-3 Otter*
Orsmond Aerial Spray (Pty) LTD *Phone: +27-58-303-5261* *Fax: +27-58-303-5035* *Email: oasadim@dorea.co.za*	*P.O. Box 144* *Betlehm 9700* ***South Africa***	*Ayres Thrush*
Performance Conversions Ltd. *Phone: +775-833-4223* *Fax: +775-833-4225* *Email: david@goldrush.com*	*P.O. Box 8607* *Incline Village, N.V. 89452* ***U.S.A.***	*King Air 90 lines*
Riddell Flying Service, Inc. *Phone: +870-572-9011* *Fax: +870-572-6005* *Email: driddell@cox-internet.com*	*P.O. Box 2482* *West Helena, Arizona 72390* ***U.S.A.***	*Ag Cat, Fat Cat* *Air Tractor* *Ayres Thrush* *Turbo Legend*
Seagull Aviation Parts, Inc. *Phone: +715-823-5020* *Fax: +715-823-8127* *Email: seagull@dotnet.com*	*420 E. 7th Street* *Municipal Airport* *Clintonville, Wisconsin 54929* ***U.S.A.***	*King Air 100 lines* *DHC-6 Twin Otter*
Turbine Conversions LTC (NZ) *Phone: +64-7-843-0855* *Fax: +64-7-849-2083* *Email: thekeens@hnpl.net*	*Rukuhia, R.D. 2* *Hamilton* ***New Zealand***	*Fletcher FU-24*
XIO a.s. *Phone: +420-656-704-952* *Fax: +420-656-704-951* *Email: petr.lahres@jobair.cz*	*Sokolovská 49* *182 00 Praha 8* ***Czech Republic***	*LET L-410*

Let: L-410 T (M601D)

Let: L-410 FG (M601D)

Let: L-410 UVP-E (M601E)

Let: L-420 (M601F)

Business Aircraft

Beechcraft: King Air 90 line (M601E-11) (M601E-11A)

Myasihchev: M-101T Gzhel (M601F-32) (M601F-22)

Piper PA-31 Navajo (M601E-11A)

GM-17 Viper (M601F-32) (M601F-22)

Agricultural Aircraft

PZL: PZL-106BT Kruk (M601D-1)

Ayres: Thrush S-2R (M601E-11)

Zlin: Z-137T (M601Z)

Air Tractor: AT-300 to AT-502

(M601E-11)

Schweizer: AG Cat (M601E-11)

PAC Ltd.: Fletcher FU-24 (M601D-11NZ)

Utility Aircraft

DHC-3 Otter (M601E-11) (M601F)

DHC-3 Otter sea version (M601E-11)

VulcanAir VF-600W Mission (M601F-11)

SMG 92 Turbo Finist (M601D-2)

Dornier: Do 28-G92 (M601D-2)

SM-92T Finist (M601E)

PZL: PZL-130 TB Turbo Orlik (M601T)

Lancair Int.: Lancair Sentry (M601D) (M601T)

Turbine Legend (M601D) (M601T)

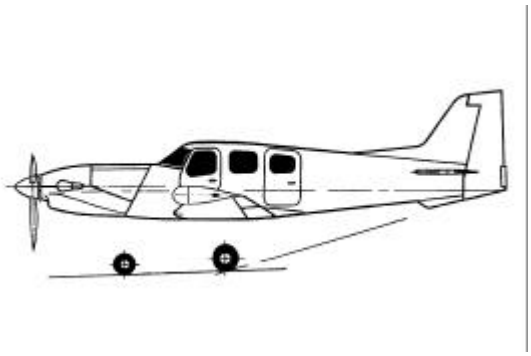
Lancair Int.: Lancair IV P (M601E)

Sukhoi Su-26 (M601T)

Cessna 207 (M601E-11)

Perspective Projects

DHC-6 Twin Otter (M601E-11)
King Air A 100 (M601E-11A)



SM-2000 (M601E)

Note