

MINISTRY OF TRANSPORT AND COMMUNICATIONS OF UKRAINE

STATE AVIATION ADMINISTRATION

Helicopter Type A109

TYPE CERTIFICATE DATA SHEET No. TB 0012

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A109 helicopter models covered by the Type Certificate No.TB 0012

Date of approval:

model	A109C	December 08, 2006
model	A109E	December 08, 2006
model	A109S	December 08, 2006

Holder of the Type Certificate No.TB 0012

AGUSTA S.p.A., Via Giovanni Agusta
520-21017 Cascina Costa di Samarate (Va)- Italy

This Data Sheet is integral part of Type Certificate No.TB 0012 and prescribes the conditions and limitations, in accordance with which the product(s) for which Type Certificate was issued meet(s) the airworthiness requirements and requirements in relation to an environment, which are indicated in the Certification Basis marked in a clause 1.2. section V Data Sheet.

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- I. General information**
1. **Category of aircraft:** Normal category Helicopter (See point 1 of section VI).
 2. **Type Certificate Holder :** AGUSTA S.p.A., Via Giovanni Agusta, 520-21017 Cascina Costa di Samarate (Va) – Italy
 3. **Manufacturer:**
 - 3.1. **Determination of manufacturer:** AGUSTA S.p.A., Via Giovanni Agusta, 520-21017 Cascina Costa di Samarate (Va) – Italy
 - 3.2. **Approval of manufacturer:** Certificate of manufacturer № IT.21G4240007, issue ENAC.
- II. Model A109C**
1. **General information:**
 - 1.1. **Date of National Type Certificate issue:** 20.06.1989 (ENAC T.C. No. SO/A 156)
 - 1.2. **Date of Application on Type Certificate in Ukraine:** 06.10.2003
 - 1.3. **Date of State Aviation Administration approval:** 08.12.2006
 2. **Type Design:**
 - 2.1. **Type Design Definition:**

Type Design is defined by:

 - 1 Refer to the Drawing 109-9000-01-135 and modifications of base design, which are defined by the drawing 109-9000-01-133 except for configurations with Skid LG;
 2. Operational Documentation, approved by RAI and EASA (See point 5 of this section VI).
- Note:** For Additional information see point 5 section VI.
3. **Certification basis:** See point 1 of section V.
 4. **Technical Characteristics and Operational Limitations:**
 - 4.1. **Engine:**
 - 4.1.1. **Type and quantity:** Two Rolls-Royce (Allison) 250-C20R/1 turbo shaft engines with free turbine
 - 4.1.2. **Type Design Approval by State Aviation Administration of Ukraine:** See Type Certificate No.TD 0034
 - 4.1.3. **Engine Limits:**
 - (a) **Takeoff (5 minutes):** 395shp. at 104% gas producer speed

- (b) Maximum continuous: 380shp. at 100% gas producer speed
(c) Maximum continuous one engine inoperative (emergency): 450shp. at 118% gas producer speed

4.2. Rotor Speed Limitation:

- (a) Power off:
- maximum: 424shp. (110% on tachometer Main Rotor)
- minimum: 346shp. (90% on tachometer Main Rotor)
- (b) Power on AEO:
- maximum: 385 shp. (100% on tachometer Main Rotor)
- minimum: 365 shp. (95% on tachometer Main Rotor)

4.3. Fuels:

- (a) Fuel grades:
- Foreign:
- for all temperatures:
MIL-T-5624 type JP4; ASTM D-1655 Jet B.
- for temperatures above -18°C (0°F):
MIL-T-5624 type JP5; ASTM D-1655 Jet A;
ASTM D-1655 Jet A1.
CIS:
RT and TS-1 (GOST 10227-86).
Ukrainian:
RT (GSTU 320.00149943.007-97) and
TS-1 (GSTU 320.00149943.011-99)
For detailed information see RFM Section 1
(point 5.1.this section).
- (b) Fuel capacities: Total usable 550 l (146 US Gal).
(Two tanks capacity of 275l (73 US Gal) each)
See RFM for unusable fuel (point 5.1.this section).

4.4. Oils:

- (a) Oil grades:
- for engine: MIL-L-7808G and subsequent or MIL-L-23699 (for ambient temperature above -40°C);
- for transmission MIL-L-7808G and subsequent or MIL-L-23699 (for ambient temperatures above -40°C).
For detailed information see RFM (point 5.1.this section).
- (b) Oil capacities:
- engine: 7,7 l (2 US Gal) each;
- transmission: 12 l (3,2 US Gal)

4.5. Indicated Airspeed Limits at sea level:**4.5.1. V_{NE} - never exceed airspeed:**

- (a) Power on AEO: 168 Kts (310 km/h IAS);
(b) Power Off/ OEI 128 Kts (237 km/h IAS).

For detailed information see RFM Section 1(point 5.1.this section).

4.6. Weight Characteristics:

4.6.1. Maximum Certified Weight: 2720 kg (6000 lbs)

4.7. Center of Gravity Range:

4.7.1. Center of Gravity Datum: Longitudinal Station “0” is 1835 mm(72 in) forward of the front jack point

4.7.2. Center of Gravity Limitation: In accordance with RFM Section 1 (point 5.1. this section).

4.8. Operational Altitude:

4.8.1. Maximum pressure altitude: 4572 m (15000 ft.).

4.8.2. Maximum pressure altitude of flight without oxygen equipment:

- without passengers: 3000 m (9850 ft.)
- with passengers: 2400 m (7900 ft.)

Note: In the case of oxygen equipment, utilization it’s installation on helicopter must be approved by State Aviation Administration.

4.9. Ambient air Temperature: from -25°C to +38°C.

4.10. Minimum Flight Crew: 1 pilot in forward right seat.

4.11. Maximum Occupants: 8 (1 pilot included).

- 4.12. Placards and marking:** All placards and markings must be made in accordance with Drawing No. 109-B701-11.
- 5. Operational Documentation:**
- 5.1. For flight operation:**
- Rotorcraft Flight Manual as approved by Register Aeronautics of Italy (Flight Manual Helicopter Agusta A109C Approved Registro Aeronautico Italiano with Letter No. 256.357/SCMA dated 19th June 1989), at Revision No.12 of 22.11.1995 or late approved Revision, and
 - Light brown pages as Supplements to Rotorcraft Flight Manual dedicated for Ukraine, Approved by EASA with Letter dated 11 December 2006 No. EASA D(2006) CPRO/MMA/53554.
- 5.2. Airworthiness Instructions :**
- the A109C Maintenance Manual, Basic Issue: 26th September 1994, Revision: No 10-30th November 2001, or late approved Revision;
 - Supplements to Maintenance Manual for Ukraine.
- 5.3. For technical service:** See Note 3 section VI.
- 6. Notes:**
- 1) Eligible serial numbers:** from 7601 to 7800 inclusive.

III. Model A109E

1. General information

- 1.1. Date of National Type Certificate issue:** 31.05.1996 (ENAC T.C. No. SO/A 156)
- 1.2. Date of Application on Type Certificate in Ukraine:** 29.07.2005
- 1.3. Date of State Aviation Administration approval:** 08.12.2006
- 2. Type Design:**
- 2.1. Type Design Definition:** Type Design is defined by:
 1 Refer to Drawing 109-9000-01-151 and modifications of base design, that are definite by the drawing 109-9000-01-149, except for configurations with installed engines Arrius-2K1 (Turbomeca) and Skid LG;
 2. Operational documentation, approved by EASA (See point 5 this section).
- Note:** For Additional information see point 5 section VI.
- 3. Certification basis:** See point 1 of section V.
- 4. Technical Characteristics and Operational Limitations:**
- 4.1. Engines:**
- 4.1.1. Type and quantity:** Two Pratt & Whitney Canada PW206C gas-turbine engines with FADEC
- 4.1.2. Type Design Approval by State Aviation Administration of Ukraine:** See Type Certificate No. TD 0030
- 4.1.3. Engine Limits:**
 Shaft Power:
- (a) Take Off Power:** 450 shp. at 100% gas producer (Nr 100%)
- (b) Maximum continuous:** 450 shp. at 100% gas producer (Nr100%)
- (c) 2,5 minute one engine inoperative (OEI) Power:** 640 shp. at 142% gas producer (Nr100%)

(d) Continuous OEI Power: 560 shp. at 124% gas producer (Nr100%)

4.2. Rotor Speed Limitation (Nr):

(a) Power off:

- maximum: 422 rpm. (110% on a tachometer Nr)
- minimum: 346 rpm. (90% on a tachometer Nr)

(b) Power on AEO:

- maximum: 394 rpm. (102% on a tachometer Nr)
- minimum: 380 rpm. (99% on a tachometer Nr)

(c) Power on OEI:

- maximum: 394 rpm. (102% on a tachometer Nr)
- minimum: 346 rpm. (90% on a tachometer Nr)

4.3. Fuels:

(a) Fuel grades:

Foreign: According to RFM Section 1 (point 5.1.this section).

CIS: RT and TS-1* (GOST 10227-86)

Ukrainian:

PT (ГCTY 320.00149943.007-97) та

TC-1* (ГCTY 320.00149943.011-99).

*Fuel TS-1 is satisfactory for occasional use only and can be used in an engine for not more than 1000 hours.

For detailed information see RFM Section 1 (point 5.1.this section).

(b) Fuel capacities:

Total usable 595 l (157 US Gal);

See RFM for unusable fuel and for fuel capacity when installed auxiliary tanks.

4.4. Oils:

(a) Oil grades:

- for engine MIL-PRF-23699F (MIL-L-23699) or PWA-521;

- for transmission DOD-L-85734 or MIL-PRF-23699 (MIL-L-23699).
For detailed information see RFM, Section 1.

(b) Oil capacities:

- engine: 5,12 l (1,35 US Gal) each engine;
- transmission: 11 l (2,9 US Gal).

4.5. Indicated Airspeed Limits at sea level:

4.5.1. V_{NE} – never exceed airspeed:

(a) Power on: 168 Kts (310 km/h IAS);

(b) Power off / OEI: 128 Kts (237 km/h IAS).

For detailed information see Rotorcraft Flight Manual Section 1 (p.5.1. section III this of Data Sheet).

4.6. Weight Characteristics:

4.6.1. Maximum Certified Weight: 2850 kg (6283 lb);

See Note 7 of section VI.

4.6.2. Minimum weight: 1850 kg (4078 lb).

4.7. Center of Gravity Range:

4.7.1. Center of Gravity Datum: Longitudinal Station “0” is 1835 mm(72 in) forward of the front jack point.

4.7.2. Centre of Gravity Limitation: In accordance with the section 1 Rotorcraft Flight Manual (see p.5.1. section III this of Data Sheet).

4.8. Operational Altitude:

4.8.1. Maximum pressure altitude : 6095 m (20000 ft.);

4.8.2. Maximum pressure altitude for takeoff and landing: 4572 m (15000 ft.);

4.8.3. Maximum pressure altitude of flight without oxygen equipment:

- without passengers: 3000 m (9850 ft.);

- with passengers: 2400 m (7900 ft.).

Note: In the case of oxygen equipment, utilization it's installation on helicopter must be approved by State Aviation Administration.

- 4.9. Ambient air Temperature:** from -25°C to +45°C.
- 4.10. Minimum Flight Crew:** 1 pilot on right seat.
- 4.11. Maximum Occupants:** 8 (1 pilot included).
- 4.12. Placards and marking:** All placards and markings must be made in accordance with Drawing No. 109-0812-66-119.
- 5. Operational Documentation:**
- 5.1. For flight operation:**
- Rotorcraft Flight Manual is approved by Register Aeronautics of Italy (Rotorcraft Flight Manual Agusta A109E Approved by Registro Aeronautico Italiano Issue: 30th July 1997), at Revision No.44 of 27.09.2005, or late approved Revision, and
 - Light brown pages as Supplements to Rotorcraft Flight Manual dedicated for Ukraine, Approved by EASA with Letter dated 11 December 2006 No. EASA D(2006) CPRO/MMA/53554.
- 5.2. Airworthiness Instructions:**
- the A109E Maintenance Manual, Issue: 1 July 1999, Revision: No10-17 November 2004 or late approved Revision;
 - Supplement to Maintenance Manual for Ukraine.
- 5.3. For technical service:** See Note 3 section VI.
- 6. Notes:**
- 1) Eligible serial numbers:** From 11001 to 11999 inclusive.

IV. Model A109S

1. **General information:**
 - 1.1. **Date of National Type Certificate issue:** N.A.
 - 1.2. **Date of Application on Type Certificate in Ukraine:** 16.09.2005
 - 1.3. **Date of State Aviation Administration approval:** 08.12.2006
2. **Type Design:**
 - 2.1. **Type Design Definition:** Type Design is defined by:
 - 1 Doc.109G0000X006-07 Rev.B and modifications of base design, that are definite by the drawing 109-9000-01-101 and approved EASA (ENAC);
 2. Operating by document, approved EASA.
 (See point 5 this section).
 - Note:** For Additional information see point 5 section VI.
3. **Certification basis:** See point 1 of section V.
4. **Technical Characteristics and Operational Limitations:**
 - 4.1. **Engines:**
 - 4.1.1. **Type and quantity:** Two Pratt & Whitney Canada PW207C gas-turbine engines.
 - 4.1.2. **Type Design Approval by State Aviation Administration of Ukraine:** See Type Certificate No. TD 0030.
 - 4.1.3. **Engine Limits:**

Power (thermodynamics/mechanical):

 - (a) Take Off Power(5 minute): 735 shp./572 shp. (102% NR)
 - (b) Maximum continuous: 625 shp./572 shp. (102% NR)
 - (c) 2,5 minute OEI Power: 815 shp./745shp. (102% NR)
 - (d) Continuous OEI Power: 735shp./646shp. (102% NR)

4.2. Rotor Speed Limitation (NR):**(a) Power off:**

- maximum: 110% (on tachometer NR)
- minimum: 95% (on tachometer NR)

(b) Power on AEO:

- minimum: 99% (on tachometer NR)
- maximum continuous: 101% (on tachometer NR)
- take-of and landing: 102% (on tachometer NR)

4.3. Fuels:**(a) Fuel grades:**

Foreign: According to RFM

CIS: RT and TS-1* (GOST 10227-86)

Ukrainian: According to Ukrainian RFM

*Fuel TS-1 is satisfactory for occasional use only and can be used in an engine for not more than 1000 hours.

See Ukrainian RFM for details.

(b) Fuel capacities:

Total usable 575 l (151,9US Gal);

See RFM for unusable fuel.

4.4. Oils:**(a) Oil grades:**

- for engine: MIL-PRF-23699F (MIL-L-23699);
- for transmission: MIL-PRF-23699 (MIL-L-23699); DOD-L-85734

See RFM for details, Section 1.

(b) Oil Capacities:

- engine: 5,25 l (1,38 US Gal) for each engine;

- transmission: 11,71 (3,09 US Gal).

4.5. Indicated Airspeed Limits at sea level:

4.5.1. V_{NE} – never exceed airspeed:

(a) Power on AEO: 168 Kts (310 km/h IAS);

(b) Power off: 128 Kts (237 km/h IAS).

For detailed information see Rotorcraft Flight Manual Section 1 (p.5.1. section IV this of Data Sheet).

4.6. Weight Characteristics:

4.6.1. Maximum Certified Weight: 3175 kg (7000 lb);

4.7. Center of Gravity Range:

4.7.1. Center of Gravity Datum: Longitudinal datum line (STA 0) is located 1635mm (64,4 in) forward of the front jack point.

4.7.2. Centre of Gravity Limitation: In accordance with the section 1 Rotorcraft Flight Manual (see p.5.1. section IV this of Data Sheet).

4.8. Operational Altitude:

4.8.1. Maximum pressure altitude : 6095 m (20000 ft.);

4.8.2. Maximum pressure altitude of flight without oxygen equipment:

- without passengers: 3000 m (9850 ft.)

- with passengers: 2400 m (7900 ft.).

Note: In the case of oxygen equipment, utilization it's installation on helicopter must be approved by State Aviation Administration.

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- 4.9. Ambient air Temperature:** from -25°C to +40°C.
- 4.10. Minimum Flight Crew:** 1 pilot on right seat.
- 4.11. Maximum Occupants:** 8 (1 pilot included).
- 4.12. Placards and marking:** All placards and markings must be made in accordance with Drawing No. 109-0814-86-101.
- 5. Operational Documentation:**
- 5.1. For flight operation:**
- Rotorcraft Flight Manual is approved EASA (A109S Rotorcraft Flight Manual Document No 109G0040A013, Issue 1: 01.06.2005) or late approved Revision, and A109S Rotorcraft Flight Manual Document No 109G0040A014 Optional Equipment supplement, Issue 1: 01.06.2005), or late approved Revision, and
 - Light brown pages as Supplements to Rotorcraft Flight Manual dedicated for Ukraine, Approved by EASA with Letter dated 11 December 2006 No. EASA D(2006) CPRO/MMA/53554.
- 5.2. Airworthiness Instructions:**
- the A109S Maintenance Manual, Doc. No 0B-A-AMPI-00P (Chs 0, 4, 5), Issue: 01.06.2005 or late approved Revision;
 - №0B-A-AMP-00P (Ch 6 and subs), Issue: 31.05.2005, Rev No3, date 14.10.2005) or late approved Revision;
 - Supplements to Maintenance Manual for Ukraine.
- 5.3. For technical service:** See Note 2 section VI.
- 6. Notes:**
- 1) Eligible serial numbers:** from 22001 to 22500 inclusive.

V. General data for models A109C, A109E and A109S

1. Certification basis:

1.1. Certification basis of primary certification:

As definite in Type Certificate Data Sheet A109 EASA No. TCDS R.005.

1.2. Certification basis of Ukraine:

Compliance with Certification basis of primary certification and additional technical conditions of Ukraine to provide accordance by acting in Ukraine:

- Aviation Regulation, part 27.
- Annex 16 of Chicago Convention of International Civil Aviation, volume 1, edition 3, 1993.

VI. Notes

1) Category of aircraft:

The helicopters of models A109C, A109E and A109S are certificated, as helicopters category B.

For model A109E - also equivalent level of safety for flights category A.

2) Flight operation:

On board of every helicopter must be Rotorcraft Flight Manual (see sections II, III and IV).

3) Maintenance Works and Instruction for Continued Airworthiness:

Necessary information for technical maintenance of helicopters is contained in Maintenance Manual and in Service Bulletins issued by Agusta and approved by ENAC or EASA.

4) Conditions of operation:

(a) In case of condition of suspicious of lightning attach it is necessary to reduced speed of flight to 80 KIAS, extreme maneuvers shall be avoided and landing shall be done as soon as possible.

(b) Flights in conditions of forecast or possible icing is prohibited.

(c) If HF system is not installed on helicopter, flight in areas without VHF communications is prohibited.

(d) During over-water flight all persons aboard must be supplied by life vest.

(e) Over-water operation beyond 30minutes flying time from land is prohibited.

(f) Flights to execute on geographical breadths over 60° is allowed under condition of establishment of system GPS.

(g) At flights with 6 (six times) or by a greater passenger seating capacity and 2 (two) pilots a cockpit voice recorder must be set.

5)Obligatory equipment:

Helicopters which are registered in State Civil Aircraft Register of Ukraine should be equipped by:

(a) translation table (feet-meters) for barometric to the altitude-indicator, drawing of Agusta S.p.A. № 999-2000-06 (without illumination from beneath) or № 109-0740L (with illumination from beneath);

(b) clock, that shows hours, minutes and seconds (drawing of Agusta S.p.A. № 109-0812-13);

(c) for regular commercial flights the Flight Data Recorder should be established. In all other cases necessary to be guided by operational requirements of State Aviation Administration of Ukraine;

(d) an accessory box for first-aid kit stowage in an accessible for pilot place (Kit P/N 109-0810-50).

6) Additional Conditions:

On helicopter must be executed all Airworthiness Directive of EASA before issue Type Certificate by State Aviation Administration.

7) Operational limitations extension:

For helicopters of model A109E which Kit No 109-0823-22 implemented maximum take-off Weight can be increased to 3000 kg (6613 lb). Supplement No 45 must be incorporated in approved Rotorcraft Flight Manual.

Deputy Head of Aeronautical products
Type Certification Department

Kostiantyn Kryvodubskyi