CIVIL AVIATION AUTHORITY
OF THE CZECH REPUBLIC

77-01
Revision 9
MORAVAN – AEROPLANES a.s.
Model Z 50 L
Model Z 50 LA
Model Z 50 LS
Model Z 50 M
Model Z 50 LX
11.04.2007

TYPE CERTIFICATE DATA SHEET No. 77-01

This data sheet which is a part of Type Certificate No. 77-01 prescribes conditions and limitations under which the product for which the type certificate was issued meets the airworthiness requirements of the Czech Republic.

Model	Application Date	Certification Date
Z 50 L	-	12.10.1977
Z 50 LA	-	25.11.1980
Z 50 LS	-	10.05.1982
Z 50 M	-	28.02.1989
Z 50 LX	-	14.10.1991

Page No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Revision No.	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Page No.	17	18	19	20	21	22	22	23	24	25	26	27	28	29	30	31
Revision No.	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Page No.	32	33	34	35												
Revision No.	9	9	9	9												

Model Z 50 L

I. General

1.	Data Sheet No.:	77-01
2.	Model:	Z 50 L
3.	Airworthiness category:	Normal (N) Acrobatic (A)
4.	Type Certificate Holder:	MORAVAN – AEROPLANES, a.s. Letiště 1578, 765 81 Otrokovice.
5.	Manufacturer:	Moravan, n.p. Letiště 1578, 765 81 Otrokovice.
6.	Application Date:	-
7.	Certificate Date:	12.10.1977

II. Certification Basis

1.	Certification Basis:	FAR PART 23, Amdt 23-14 including	
2.	Special Conditions:	None.	
3.	Exemptions:	§ 23.177(a)(3)	Static directional and lateral stability
		§ 23.207(c)	Stall warning
		§ 23.613(c)	Material strength properties and design values
		§ 23.967(d)	Fuel tank installation
		§ 23.971	Fuel tank sump
		§ 23.993(d), (e)	Fuel system lines and fittings
		§ 23.1093(a)(4)	Induction system icing protection
		§ 23.1351(d)	General
		§ 23.1381 – 1401	Lights
4.	Equivalent Safety Findings:	§ 23.177(a)(3) – Requirement upon the control force characteristic in relation to the aileron angle is not completely met. In steady, right slips at 1.2 V_{S1}, the aileron control force and corresponding aileron movement in relation to the angle of skid has not a stable characteristic. It is admitted under the provison that the special acrobatic airplane is concerned; the rate of unstability is outweighed by a good controllability; neither dangerous tendency nor exceptional requirements upon piloting skill occur.	
		§ 23.207(c) – The difference between the stalling speed	

and the stall warning speed is lesser than the value required in the Regulation. It is admitted under the proviso that the special acrobatic airplane is concerned where the later warning enables the pilot to use a wider range of speed polar.

§ 23.613(c) – Materials and design values used for aircraft design and construction comply with the Czechoslovak State Standard and specifications valid for the Czechoslovak aviation industry. It is admitted with regard to the fact that the requirement sense is met.

§ 23.967(d) – The fuel tank is located in the pilot´s compartment and is not isolated by an impermeable partition. It is admitted under the proviso that the instructions for tank tightness test are included in the Flight Manual.

§ 23.971 – In the normal ground attitude, fuel tank sump cannot be completely discharged. It is admitted because the fuel system construction arrangement avoids water entry into the power plant fuel system.

§ 23.993(d), (e) – Of the fire resistance of hoses is not complied with. It is admitted with regard to operating experiences.

§ 23.1093(a)(4) – Requirement upon temperature of air inducted by the alternate air intake system is not completely met. Induction air temperature is lesser than temperature of cooling air at engine outlet. It is admitted under the proviso that flying in icing conditions is prohibited.

§ 23.1351(d) – For the electrical power supply to be checked, the airplane is equipped with a check light signalling the alternator is out of operation. It is admitted under the proviso that the airplane is equipped with a storage battery securing the electrical power supply for necessary time.

§ 23.1381 – 1401 The airplane is no equipped with light system for night operation. Night flight and IFR flight are not permitted.

5. Environmental Standards: None.

III. Technical Characteristics and Operational Limitations

1. Type Design Definition:	The specification list of Aircraft S-150.1.000.000.	
2. Description:	The Z 50 L aircraft is a single-engine, single-seater, low-wing, cantilever monoplane fitted with a closed cockpit and a fixed gear.	
3. Equipment:	List of the basic aircraft equipment is in Flight Manual, section 6.	
4. Dimensions:	Span:	8.580 m (9.030 m with wing tip tanks)
	Length:	6.620 m
	Height:	1.985 m
	Wing Area:	12.500 m^2
5. Engine:		
5.1. Model:	LYCOMING AEIO-540-D4B5	
5.2. Type Certificate:	No. 1 E 4, Issued by FAA	
5.3. Limitations:	Take-off power	
	Max. Power	191 kW (260 HP)
	Max. Engine speed	2 700 RPM
	Max. Consuption	90.84 l/h
	Max. Manifold pressure	max.
	Continuous cruising power (75 %)	
	Max. Power	144 Kw (195 HP)
	Max. Engine speed	2 450 RPM
	Max. Consuption	68.13 l/h
	Max. Manifold pressure	80 kPa
	Economic cruising power (60 %)	
	Max. Power	114 Kw (155 HP)
	Max. Engine speed	2 350 RPM
	Max. Consuption	48.45 l/hod
	Max. Manifold pressure	70 kPa
6. Propeller:		
6.1.1. Model:	HOFFMANN HO-V 123 K-F/200 AH	
6.1.2. Type Certificate:	LBA No. 32.130/17; FAA No. P 5 EU	
6.1.3. Number of blades:	3	
6.1.4. Diameter:	2 000 mm	
6.1.5. Sense of Rotation:	Right, in flight direction.	
	or	

6.2.1.	Model:	MÜHLBAUER MTV-9-B-C/C 200-15
6.2.2.	Type Certificate:	LBA No. 32.130/65
6.2.3.	Number of blades:	3
6.2.4.	Diameter:	2 000 mm
6.2.5.	Sense of Rotation:	Right, in flight direction.

7. Fuel:

AVGAS 100L

AVGAS 100LL

8. Oil:

During first 50 operation hours, only mineral oil of viscosity class according to engine maintenance manual is used.

Either mineral or dispersant aviation oils of viscosity class according to engine maintenance manual can be used.

Determination of relevant viscosity class depends on average outside air temperature.

By average outside air temperature above + 16°C are recommended mineral oils with SAE 50 or dispersant oils with SAE 50 or 40.

By average outside air temperature from - 1°C to + 32°C are recommended mineral oils with SAE 40 or dispersant oils with SAE 40.

By average outside air temperature from - 18°C to + 21°C are recommended mineral oils with SAE 30 or dispersant oils with SAE 40 or 30.

9. Air Speeds:

Never exceed speed limit V_{NE}	
category A, N	328 km/h IAS
Normal operating speed limit V_{NO}	
category A, N	263 km/h IAS
Design manoeuvring speed limit V_A	
category A	274 km/h IAS
category N	193 km/h IAS
Stall speed V_{SO}	
category A	104 km/h IAS
category N	102 km/h IAS
Maximum speed limit for flicked figures	
category A, N	234 km/h IAS

10. Load factors:

For category Acrobatic (A)	+9.0 g, -6.0 g
For category Normal (N)	+3.8 g, -1.5 g

11. Maximum Operating Altitude: 7 000 m

12. Weights:	Max. Take-off weight:			
	- For category Acrobatic (A)		720 kg	
	- For category Normal (N)		800 kg	
	Max. Variable weight:			
	- For category Acrobatic (A)		150 kg	
	- For category Normal (N)		220 kg	
	Standard empty weight:			
	- For category Acrobatic (A)		570 kg ± 3 %	
	- For category Normal (N)		580 kg ± 3 %	
13. Centre of Gravity Range:	22.5 % – 28.5 % MAC			
14. Datum:	Reference point – upper part of the firewall plane – vertical at horizontal position of the aircraft.			
15. Mean Aerodynamic Cord (MAC):	1 485 mm			
16. Leveling Means:	There is min. 500 mm below basic level (basic level is determinated by levelling points 1 and 4 on the fuselage).			
17. Minimum Flight Crew:	1			
18. Number of seats:	1			
19. Baggage/Cargo Compartments:	Max. 10 kg (only for category Normal).			
20. Control surface deflections:	Elevator deflection	up	28.5°	+ 1°,- 0°
		down	31°	+ 1°,- 0°
	Elevator trim L	up	10°	+ 2°,- 0°
		down	30°	+ 1°,- 0°
	Elevator trim R	up	27°	± 2°
		down	27°	± 2°
	Rudder deflection	right and left	30°	+ 2°, -0°
	Rudder trim	left and right	30°	± 1°
	Ailerons deflection	up	20°	+ 1°, -0°
		down	20°	+ 1°, -0°
	Aileron trim L	up	17°	+ 3°, -0°
		down	17°	+ 3°, -0°
	Aileron trim R	up	27°	± 3°
		down	27°	± 3°

21. Wheels and Tyres:	Wheels of main landing gear K 29-0100.00 with tyre Mitas (Barum) 350 x 135.
	Tail wheel S/N 150.0.559.000 with tyre 200 x 80.
22. Other Limitations:	The aircraft is approved for VFR Day flights.

IV. Operating and Service Instructions

1. Flight Manual:
   - In Czech language
     Letová příručka Z 50L, LA, issued 1981
   - In English language
     Flight Manual Z 50L, LA, issued 1981
   - In German language
     Flughandbuch Z 50L, LA, issued 1981
2. Technical Manual:
   - In Czech language
     Technický popis Z 50L, LA, issued 1981
   - In English language
     Technical Manual Z 50L, LA, issued 1981
3. Catalogue of Spare Parts:
   - In Russian, Czech, German and English language, issued 1981
     Katalog náhradních dílů Z 50L, LA
     Katalog der Ersatzteile Z 50L, LA
     Catalogue of Spare Parts Z 50L, LA

V. Notes

1. EASA TC No. EASA.A.108 was issued for model Z 50 L aircraft on 27.08.2006.

VI. Model Z 50 LA

I. General

1. Data Sheet No.:	77-01	
2. Model:	Z 50 LA	
3. Airworthiness category:	Normal (N)	
	Acrobatic (A)	
1. Type Certificate Holder:	MORAVAN – AEROPLANES, a.s. Letiště 1578, 765 81 Otrokovice.	
2. Manufacturer:	Moravan, n.p. Letiště 1578, 765 81 Otrokovice.	
4. Application Date:	-	
5. Certificate Date:	25.11.1980	

II. Certification Basis

1. Certification Basis:	FAR PART 23, Amdt 23-14 including	
2. Special Conditions:	None.	
3. Exemptions:	§ 23.177(a)(3)	Static directional and lateral stability
	§ 23.207(c)	Stall warning
	§ 23.613(c)	Material strength properties and design values
	§ 23.967(d)	Fuel tank installation
	§ 23.971	Fuel tank sump
	§ 23.993(d), (e)	Fuel system lines and fittings
	§ 23.1093(a)(4)	Induction system icing protection
	§ 23.1351(d)	General
	§ 23.1381 – 1401	Lights
4. Equivalent Safety Findings:	§ 23.177(a)(3) – Requirement upon the control force characteristic in relation to the aileron angle is not completely met. In steady, right slips at 1.2 V_{S1}, the aileron control force and corresponding aileron movement in relation to the angle of skid has not a stable characteristic. It is admitted under the proviso that the special acrobatic airplane is concerned; the rate of unstability is outweighed by a good controllability; neither dangerous tendency nor exceptional requirements upon piloting skill occur.	

§ 23.207(c) – The difference between the stalling speed and the stall warning speed is lesser than the value required in the Regulation. It is admitted under the proviso that the special acrobatic airplane is concerned where the later warning enables the pilot to use a wider range of speed polar.

§ 23.613(c) – Materials and design values used for aircraft design and construction comply with the Czechoslovak State Standard and specifications valid for the Czechoslovak aviation industry. It is admitted with regard to the fact that the requirement sense is met.

§ 23.967(d) – The fuel tank is located in the pilot´s compartment and is not isolated by an impermeable partition. It is admitted under the proviso that the instructions for tank tightness test are included in the Flight Manual.

§ 23.971 – In the normal ground attitude, fuel tank sump cannot be completely discharged. It is admitted because the fuel system construction arrangement avoids water entry into the power plant fuel system.

§ 23.993(d), (e) – Of the fire resistance of hoses is not complied with. It is admitted with regard to operating experiences.

§ 23.1093(a)(4) – Requirement upon temperature of air inducted by the alternate air intake system is not completely met. Induction air temperature is lesser than temperature of cooling air at engine outlet. It is admitted under the proviso that flying in icing conditions is prohibited.

§ 23.1351(d) – For the electrical power supply to be checked, the airplane is equipped with a check light signalling the alternator is out of operation. It is admitted under the proviso that the airplane is equipped with a storage battery securing the electrical power supply for necessary time.

§ 23.1381 – 1401 The airplane is no equipped with light system for night operation. Night flight and IFR flight are not permitted.

5. Environmental Standards:

None.

III. Technical Characteristics and Operational Limitations

1. Type Design Definition: The specification list of Aircraft S-152.0.000.000.

2. Description: The Z 50 LA aircraft is a single-engine, single-seater, low-wing, cantilever monoplane fitted with a closed cockpit and a fixed gear.

3. Equipment: List of the basic aircraft equipment is in Flight Manual, section 6.

4. Dimensions:

Span:	8.580 m (9.030 m with wing tip tanks)
Length:	6.620 m
Height:	1.985 m
Wing Area:	12.500 m^2

5. Engine:

5.1. Model: LYCOMING AEIO-540-D4B5

5.2. Type Certificate: No. 1 E 4, Issued by FAA

5.3. Limitations:

Take-off power	
Max. Power	191 kW (260 HP)
Max. Engine speed	2 700 RPM
Max. Consuption	90.84 l/h
Max. Manifold pressure	max.
Continuous cruising power (75 %)	
Max. Power	144 kW (195 HP)
Max. Engine speed	2 450 RPM
Max. Consuption	68.13 l/h
Max. Manifold pressure	80 kPa
Economic cruising power (60 %)	
Max. Power	114 kW (155 HP)
Max. Engine speed	2 350 RPM
Max. Consuption	48.45 l/hod
Max. Manifold pressure	70 kPa

6. Propeller:

6.1.1. Model: HOFFMANN HO-V 123 K-V/200 AH

6.1.2. Type Certificate: LBA No. 32.130/17; FAA No. P 5 EU

6.1.3. Number of blades: 3

6.1.4. Diameter: 2 000 mm

6.1.5. Sense of Rotation: Right, in flight direction.

or

6.2.1.	Model:	MÜHLBAUER MTV-9-B-C/C 200-15
6.2.2.	Type Certificate:	LBA No. 32.130/65
6.2.3.	Number of blades:	3
6.2.4.	Diameter:	2 000 mm
6.2.5.	Sense of Rotation:	Right, in flight direction.

7. Fuel:

AVGAS 100L

AVGAS 100LL

8. Oil:

During first 50 operation hours, only mineral oil of viscosity class according to engine maintenance manual is used.

Either mineral or dispersant aviation oils of viscosity class according to engine maintenance manual can be used.

Determination of relevant viscosity class depends on average outside air temperature.

By average outside air temperature above + 16°C are recommended mineral oils with SAE 50 or dispersant oils with SAE 50 or 40.

By average outside air temperature from - 1°C to + 32°C are recommended mineral oils with SAE 40 or dispersant oils with SAE 40.

By average outside air temperature from - 18°C to + 21°C are recommended mineral oils with SAE 30 or dispersant oils with SAE 40 or 30.

9. Air Speeds:

Never exceed speed limit V_{NE}	
category A, N	328 km/h IAS
Normal operating speed limit V_{NO}	
for category A, N	263 km/h IAS
Design manoeuvring speed limit V_A	
category A	274 km/h IAS
category N	193 km/h IAS
Stall speed V_{SO}	
category A	104 km/h IAS
category N	102 km/h IAS
Maximum speed limit for flicked figures	
category A, N	234 km/h IAS

10. Load factors:

For category Acrobatic (A)	+9.0 g, -6.0 g
For category Normal (N)	+3.8 g, -1.5 g

11. Maximum Operating Altitude: 7 000 m

12. Weights:	Max. Take-off weight:			
	- For category Acrobatic (A)		720 kg	
	- For category Normal (N)		800 kg	
	Max. Variable weight:			
	- For category Acrobatic (A)		150 kg	
	- For category Normal (N)		220 kg	
	Standard empty weight:			
	- For category Acrobatic (A)		570 kg ± 3 %	
	- For category Normal (N)		580 kg ± 3 %	
13. Centre of Gravity Range:	22.5 % – 28.5 % MAC			
14. Datum:	Reference point – upper part of the firewall plane – vertical at horizontal position of the aircraft.			
15. Mean Aerodynamic Cord (MAC):	1 485 mm			
16. Leveling Means:	There is min. 500 mm below basic level (basic level is determinated by levelling points 1 and4 on the fuselage).			
17. Minimum Flight Crew:	1			
18. Number of seats:	1			
19. Baggage/Cargo Compartments:	Max. 10 kg (only for category Normal).			
20. Control surface deflections:	Elevator deflection	up	28.5°	+ 1°,- 0°
		down	31°	+ 1°,- 0°
	Elevator trim L	up	10°	+ 2°,- 0°
		down	30°	+ 1°,- 0°
	Elevator trim R	up	27°	± 2°
		down	27°	± 2°
	Rudder deflection	right and left	30°	+ 2°, -0°
	Rudder trim	left and right	30°	± 1°
	Ailerons deflection	up	20°	+ 1°, -0°
		down	20°	+ 1°, -0°
	Aileron trim L	up	17°	+ 3°, -0°
		down	17°	+ 3°, -0°
	Aileron trim R	up	27°	± 3°
		down	27°	± 3°

21. Wheels and Tyres:	Wheels of main landing gear K 29-0100.00 with tyre Mitas (Barum) 350 x 135.
	Tail wheel S/N 150.0.559.000 with tyre 200 x 80.
22. Other Limitations:	The aircraft is approved for VFR Day flights.

IV. Operating and Service Instructions

1. Flight Manual:
   - In Czech language
     Letová příručka Z 50 L, LA, issued 1981
   - In English language
     Flight Manual Z 50 L, LA, issued 1981
   - In German language
     Flughandbuch Z 50 L, LA, issued 1981
2. Technical Manual:
   - In Czech language
     Technický popis Z 50 L, LA, issued 1981
   - In English language
     Technical Manual Z 50 L, LA, issued 1981
3. Catalogue of Spare Parts:
   - In Russian, Czech, German and English language, issued 1981
     Katalog náhradních dílů Z 50 L, LA
     Katalog der Ersatzteile Z 50 L, LA
     Catalogue of Spare Parts Z 50 L, LA

V. Notes

1. EASA TC No. EASA.A.108 was issued for model Z 50 LA aircraft on 27.08.2006.

Model Z 50 LS

I. General

1. Data Sheet No.:	77-01	
2. Model:	Z 50 LS	
3. Airworthiness category:	Normal (N)	
	Acrobatic (A)	
4. Type Certificate Holder:	MORAVAN – AEROPLANES, a.s. Letiště 1578, 765 81 Otrokovice.	
5. Manufacturer:	Moravan, n.p. Letiště 1578, 765 81 Otrokovice.	
6. Application Date:	-	
7. Certificate Date:	10.05.1982	

II. Certification Basis

8. Certification Basis:	FAR PART 23, Amdt 23-14 including	
9. Special Conditions:	None.	
10. Exemptions:	§ 23.177(a)(3)	Static directional and lateral stability
	§ 23.207(c)	Stall warning
	§ 23.613(c)	Material strength properties and design values
	§ 23.967(d)	Fuel tank installation
	§ 23.971	Fuel tank sump
	§ 23.993(d), (e)	Fuel system lines and fittings
	§ 23.1093(a)(4)	Induction system icing protection
	§ 23.1351(d)	General
	§ 23.1381 – 1401	Lights
11. Equivalent Safety Findings:	§ 23.177(a)(3) – Requirement upon the control force characteristic in relation to the aileron angle is not completely met. In steady, right slips at 1.2 V_{S1}, the aileron control force and corresponding aileron movement in relation to the angle of skid has not a stable characteristic. It is admitted under the proviso that the special acrobatic airplane is concerned; the rate of unstability is outweighed by a good controllability; neither dangerous tendency nor exceptional requirements upon piloting skill occur.	
	§ 23.207(c) – The difference between the stalling speed	

and the stall warning speed is lesser than the value required in the Regulation. It is admitted under the proviso that the special acrobatic airplane is concerned where the later warning enables the pilot to use a wider range of speed polar.

§ 23.613(c) – Materials and design values used for aircraft design and construction comply with the Czechoslovak State Standard and specifications valid for the Czechoslovak aviation industry. It is admitted with regard to the fact that the requirement sense is met.

§ 23.967(d) – The fuel tank is located in the pilot´s compartment and is not isolated by an impermeable partition. It is admitted under the proviso that the instructions for tank tightness test are included in the Flight Manual.

§ 23.971 – In the normal ground attitude, fuel tank sump cannot be completely discharged. It is admitted because the fuel system construction arrangement avoids water entry into the power plant fuel system.

§ 23.993(d), (e) – Of the fire resistance of hoses is not complied with. It is admitted with regard to operating experiences.

§ 23.1093(a)(4) – Requirement upon temperature of air inducted by the alternate air intake system is not completely met. Induction air temperature is lesser than temperature of cooling air at engine outlet. It is admitted under the proviso that flying in icing conditions is prohibited.

§ 23.1351(d) – For the electrical power supply to be checked, the airplane is equipped with a check light signalling the alternator is out of operation. It is admitted under the proviso that the airplane is equipped with a storage battery securing the electrical power supply for necessary time.

§ 23.1381 – 1401 The airplane is no equipped with light system for night operation. Night flight and IFR flight are not permitted.

12. Environmental Standards:

None.

III. Technical Characteristics and Operational Limitations

1. Type Design Definition: The specification list of Aircraft S-153.0.000.000.

2. Description: The Z 50 LS aircraft is a single-engine, single-seater, low-wing, cantilever monoplane fitted with a closed cockpit and a fixed gear.

3. Equipment: List of the basic aircraft equipment is in Flight Manual, section 6.

4. Dimensions:

Span:	8.580 m (9.030 m with wing tip tanks)
Length:	6.620 m
Height:	1.985 m
Wing Area:	12.500 m^2

5. Engine:

5.1.1. Model: LYCOMING AEIO-540-L1B5D

5.1.2. Type Certificate: No. 1 E 4, Issued by FAA

5.1.3. Limitations:

Take-off power	
Max. Power	220 kW (300 HP)
Max. Engine speed	2 700 RPM
Max. Consuption	90.84 l/h
Max. Manifold pressure	max.
Continuous cruising power (75 %)	
Max. Power	165 kW (225 HP)
Max. Engine speed	2 450 RPM
Max. Consuption	68.13 l/h
Max. Manifold pressure	85 kPa
Economic cruising power (60 %)	
Max. Power	132 kW (180 HP)
Max. Engine speed	2 350 RPM
Max. Consuption	48.45 l/hod
Max. Manifold pressure	73 kPa

or

5.2.1.	Model:	LYCOMING AEIO-540-L1B5
5.2.2.	Type Certificate:	No. 1 E 4, Issued by FAA
5.2.3.	Limitations:	Take-off power
		Max. Power 220 kW (300 HP)
		Max. Engine speed 2 700 RPM
		Max. Consuption 90.84 l/h
		Max. Manifold pressure max.
		Continuous cruising power (75 %)
		Max. Power 165 kW (225 HP)
		Max. Engine speed 2 450 RPM
		Max. Consuption 68.13 l/h
		Max. Manifold pressure 85 kPa
		Economic cruising power (60 %)
		Max. Power 132 kW (180 HP)
		Max. Engine speed 2 350 RPM
		Max. Consuption 48.45 l/hod
		Max. Manifold pressure 73 kPa

6. Propeller:

6.1.1.	Model:	HOFFMANN HO-V 123 K-V/200 AH
6.1.2.	Type Certificate:	LBA No. 32.130/17; FAA No. P 5 EU
6.1.3.	Number of blades:	3
6.1.4.	Diameter:	2 000 mm
6.1.5.	Sense of Rotation:	Right, in flight direcion.
		or
6.2.1.	Model:	MÜHLBAUER MTV-3-B-C/200-01
6.2.2.	Type Certificate:	LBA No. 32.130/54
6.2.3.	Number of blades:	3
6.2.4.	Diameter:	2 000 mm
6.2.5.	Sense of Rotation:	Right, in flight direcion.
		or
6.3.1.	Model:	MÜHLBAUER MTV-9-B-C/C 200-15
6.3.2.	Type Certificate:	LBA No. 32.130/65
6.3.3.	Number of blades:	3

6.3.4. Diameter:	2 000 mm	
6.3.5. Sense of Rotation:	Right, in flight direcion.	
7. Fuel:	AVGAS 100L	
	AVGAS 100LL	
8. Oil:	During first 50 operation hours, only mineral oil of viscosity class according to engine maintenance manual is used.	
	Either mineral or dispersant aviation oils of viscosity class according to engine maintenance manual can be used.	
	Determination of relevant viscosity class depends on average outside air temperature.	
	By average outside air temperature above + 16°C are recommended mineral oils with SAE 50 or dispersant oils with SAE 50 or 40.	
	By average outside air temperature from - 1°C to + 32°C are recommended mineral oils with SAE 40 or dispersant oils with SAE 40.	
	By average outside air temperature from - 18°C to + 21°C are recommended mineral oils with SAE 30 or dispersant oils with SAE 40 or 30.	
9. Air Speeds:	Never exceed speed limit V_{NE}	
	category A, N	328 km/h IAS
	Normal operating speed limit V_{NO}	
	category A, N	263 km/h IAS
	Design manoeuvring speed limit V_A	
	category A	259 km/h IAS
	category N	193 km/h IAS
	Stall speed V_{SO}	
	category A	104 km/h IAS
	category N	102 km/h IAS
	Maximum speed limit for flicked figures	
	category A, N	215 km/h IAS
10. Load factors:	For category Acrobatic (A)	+8.0 g, -6.0 g
	For category Normal (N)	+3.8 g, -1.5 g
11. Maximum Operating Altitude:	8 000 m	
12. Weights:	Max. Take-off weight:	
	- For category Acrobatic (A)	760 kg
	- For category Normal (N)	840 kg
	Max. Landing weight:	
	- For category Acrobatic (A)	760 kg
	- For category Normal (N)	800 kg
	Max. Variable weight:	

	- For category Acrobatic (A)	160 kg
	- For category Normal (N)	230 kg
	Standard empty weight:	
	- For category Acrobatic (A)	600 kg ± 3 %
	- For category Normal (N)	610 kg ± 3 %

13. Centre of Gravity Range: 21.5 % – 28 % MAC

14. Datum: Reference point – upper part of the firewall plane – vertical at horizontal position of the aircraft.

15. Mean Aerodynamic Cord (MAC): 1 485 mm

16. Leveling Means: There is min. 500 mm below basic level (basic level is determinated by levelling points 1 and4 on the fuselage).

17. Minimum Flight Crew: 1

18. Number of seats: 1

19. Baggage/Cargo Compartments: Max. 10 kg (only for category Normal).

20. Control surface deflections:

Elevator deflection	up	28.5°	+ 1°,- 0°
	down	31°	+ 1°,- 0°
Elevator trim L	up	10°	+ 2°,- 0°
	down	30°	+ 1°,- 0°
Elevator trim R	up	27°	± 2°
	down	27°	± 2°
Rudder deflection	right and left	30°	+ 2°, -0°
Rudder trim	left and right	30°	± 1°
Ailerons deflection	up	20°	+ 1°, -0°
	down	20°	+ 1°, -0°
Aileron trim L	up	17°	+ 3°, -0°
	down	17°	+ 3°, -0°
Aileron trim R	up	27°	± 3°
	down	27°	± 3°

21. Wheels and Tyres: Wheels of main landing gear K 29-0100.00 with tyre Mitas (Barum) 350 x 135.

    Tail wheel S/N 150.0.559.000 with tyre 200 x 80.

22. Other Limitations: The aircraft is approved for VFR Day flights.

IV. Operating and Service Instructions

13. Flight Manual:
    - In Czech language
      Letová příručka Z 50 LS, issued 1984
    - In English language
      Flight Manual Z 50 LS, issued 1984
    - In German language
      Flughandbuch Z 50 LS, issued 1984
14. Technical Manual:
    - In Czech language
      Technický popis a návod k obsluze Z 50 LS, issued 1984
    - In English language
      Technical Manual Z 50 LS, issued 1984
    - In German language
      Technische Beschreibung und Bedienungsleitung Z 50 LS, issued 1984
15. Catalogue of Spare Parts:
    - In Russian, Czech, German and English language, issued 1984
      Katalog náhradních dílů Z 50 LS
      Katalog der Ersatzteile Z 50 LS
      Catalogue of Spare Parts Z 50 LS

V. Notes

1. EASA TC No. EASA.A.108 was issued for model Z 50 LS aircraft on 27.08.2006.

Model Z 50 M

I. General

1.	Data Sheet No.:	77-01
2.	Model:	Z 50 M
3.	Airworthiness category:	Normal (N) Acrobatic (A)
4.	Type Certificate Holder:	MORAVAN – AEROPLANES, a.s. Letiště 1578, 765 81 Otrokovice.
5.	Manufacturer:	Moravan, n.p. Letiště 1578, 765 81 Otrokovice.
6.	Application Date:	-
7.	Certificate Date:	28.02.1989

II. Certification Basis

1.	Certification Basis:	FAR PART 23, Amdt 23-14 including	
2.	Special Conditions:	None.	
3.	Exemptions:	§ 23.177(a)(3)	Static directional and lateral stability
		§ 23.207(c)	Stall warning
		§ 23.613(c)	Material strength properties and design values
		§ 23.967(d)	Fuel tank installation
		§ 23.971	Fuel tank sump
		§ 23.993(d), (e)	Fuel system lines and fittings
		§ 23.1093(a)(4)	Induction system icing protection
		§ 23.1351(d)	General
		§ 23.1381 – 1401	Lights
4.	Equivalent Safety Findings:	§ 23.177(a)(3) – Requirement upon the control force characteristic in relation to the aileron angle is not completely met. In steady, right slips at 1.2 V_{S1}, the aileron control force and corresponding aileron movement in relation to the angle of skid has not a stable characteristic. It is admitted under the proviso that the special acrobatic airplane is concerned; the rate of unstability is outweighed by a good controllability; neither dangerous tendency nor exceptional requirements upon piloting skill occur.	
		§ 23.207(c) – The difference between the stalling speed	

and the stall warning speed is lesser than the value required in the Regulation. It is admitted under the proviso that the special acrobatic airplane is concerned where the later warning enables the pilot to use a wider range of speed polar.

§ 23.613(c) – Materials and design values used for aircraft design and construction comply with the Czechoslovak State Standard and specifications valid for the Czechoslovak aviation industry. It is admitted with regard to the fact that the requirement sense is met.

§ 23.967(d) – The fuel tank is located in the pilot´s compartment and is not isolated by an impermeable partition. It is admitted under the proviso that the instructions for tank tightness test are included in the Flight Manual.

§ 23.971 – In the normal ground attitude, fuel tank sump cannot be completely discharged. It is admitted because the fuel system construction arrangement avoids water entry into the power plant fuel system.

§ 23.993(d), (e) – Of the fire resistance of hoses is not complied with. It is admitted with regard to operating experiences.

§ 23.1093(a)(4) – Requirement upon temperature of air inducted by the alternate air intake system is not completely met. Induction air temperature is lesser than temperature of cooling air at engine outlet. It is admitted under the proviso that flying in icing conditions is prohibited.

§ 23.1351(d) – For the electrical power supply to be checked, the airplane is equipped with a check light signalling the alternator is out of operation. It is admitted under the proviso that the airplane is equipped with a storage battery securing the electrical power supply for necessary time.

§ 23.1381 – 1401 The airplane is no equipped with light system for night operation. Night flight and IFR flight are not permitted.

5. Environmental Standards: None.

III. Technical Characteristics and Operational Limitations

1. Type Design Definition:	The specification list of Aircraft S-154.1.000.000.	
2. Description:	The Z 50 M aircraft is a single-engine, single-seater, low-wing, cantilever monoplane fitted with a closed cockpit and a fixed gear.	
3. Equipment:	List of the basic aircraft equipment is in Flight Manual, section 6.	
4. Dimensions:	Span:	8.580 m (9.030 m with wing tip tanks)
	Length:	6.960 m
	Height:	1.985 m
	Wing Area:	12.500 m^2
5. Engine:		
5.1. Model:	M 137 AZ	
5.2. Type Certificate:	No. 69-01, Issued by SLI	
5.3. Limitations:	Take-off power	
	Max. Power	132 kW (180 HP)
	Max. Engine speed	2 750 RPM
	Max. Consuption	63 l/h
	Max. Manifold pressure	100 kPa.
	Max. Continuous power	
	Max. Power	118 kW (160 HP)
	Max. Engine speed	2 680 RPM
	Max. Consuption	55 l/h
	Max. Manifold pressure	95 kPa
	Max. Cruising power	
	Max. Power	103 kW (140 HP)
	Max. Engine speed	2 580 RPM
	Max. Consuption	47 l/hod
	Max. Manifold pressure	87 kPa
6. Propeller:		
6.1. Model:	V 503A, Issued by SLI	
6.2. Type Certificate:	No. 69 – 02	
6.3. Number of blades:	2	
6.4. Diameter:	2 000 mm	
6.5. Sense of Rotation:	Left, in flight direction.	
7. Fuel:	AVGAS 100L	
	AVGAS 100LL	
	BL 78	

8. Oil:	During first 50 operation hours, only mineral oil of viscosity class according to engine maintenance manual is used.	
	AERO SHELL W 100 (temperature climatic zones)	
	AERO SHELL W 120 (tropical climatic zones)	
	AERO SHELL W 80 (winter operation polar climatic zones)	
9. Air Speeds:	Never exceed speed limit V_{NE}	
	category A, N	307 km/h IAS
	Normal operating speed limit V_{NO}	
	category A, N	263 km/h IAS
	Design manoeuvring speed limit V_A	
	for category A	246 km/h IAS
	for category N	191 km/h IAS
	Stall speed V_{SO}	
	category A	101 km/h IAS
	category N	106 km/h IAS
	Never exceed speed for snap maneuvers	
	category A	195 km/h IAS
10. Load factors:	For category Acrobatic (A)	+7.0 g, -4.5 g
	For category Normal (N)	+3.8 g, -1.5 g
11. Maximum Operating Altitude:	5 200 m	
12. Weights:	Max. Take-off weight:	
	- For category Acrobatic (A)	700 kg
	- For category Normal (N)	780 kg
	Max. Variable weight:	
	- For category Acrobatic (A)	160 kg
	- For category Normal (N)	230 kg
	Standard empty weight:	
	- For category Acrobatic (A)	540 kg ± 3 %
	- For category Normal (N)	550 kg ± 3 %
13. Centre of Gravity Range:	24 % – 31 % MAC	
14. Datum:	Reference point – upper part of the firewall plane – vertical at horizontal position of the aircraft.	
15. Mean Aerodynamic Cord (MAC):	1 485 mm	
16. Leveling Means:	There is min. 500 mm below basic level (basic level is determinated by levelling points 1 and4 on the fuselage).	
17. Minimum Flight Crew:	1	
18. Number of seats:	1	
19. Baggage/Cargo Compartments:	Max. 10 kg (only for category Normal).	

20. Control surface deflections:	Elevator deflection	up	28.5°	+ 1°,- 0°
		down	31°	+ 1°,- 0°
	Elevator trim L	up	10°	+ 2°,- 0°
		down	30°	+ 1°,- 0°
	Elevator trim R	up	27°	± 2°
		down	27°	± 2°
	Rudder deflection	right and left	30°	+ 2°, -0°
	Rudder trim	left and right	30°	± 1°
	Ailerons deflection	up	20°	+ 1°, -0°
		down	20°	+ 1°, -0°
	Aileron trim L	up	17°	+ 3°, -0°
		down	17°	+ 3°, -0°
	Aileron trim R	up	27°	± 3°
		down	27°	± 3°

21. Wheels and Tyres: Wheels of main landing gear K 29-0100.00 with tyre Mitas (Barum) 350 x 135.

Tail wheel S/N 150.0.559.000 with tyre 200 x 80.

22. Other Limitations: The aircraft is approved for VFR Day flights.

IV. Operating and Service Instructions

1. Flight Manual:
   - Czech language
     Letová příručka Z 50 M, issued 1989
   - English language
     Flight Manual Z 50 M, issued 1989
2. Technical Manual:
   - Czech language
     Technický popis Z 50 M, issued 1989
   - English language
     Technical Manual Z 50 M, issued 1989
3. Catalogue of Spare Parts:
   - Czech and english language, issued 1989
     Katalog náhradních dílů Z 50 M
     Spare Parts Catalogue Z 50 M

V. Notes

1. EASA TC No. EASA.A.108 was issued for model Z 50 M aircraft on 27.08.2006.

Model Z 50 LX

I. General

1.	Data Sheet No.:	77-01
2.	Model:	Z 50 LX
3.	Airworthiness category:	Normal (N) Acrobatic (A)
4.	Type Certificate Holder:	MORAVAN – AEROPLANES, a.s. Letiště 1578, 765 81 Otrokovice.
5.	Manufacturer:	Moravan, n.p. Letiště 1578, 765 81 Otrokovice.
6.	Application Date:	-
7.	Certificate Date:	14.10.1991

II. Certification Basis

1.	Certification Basis:	FAR PART 23, Amdt 23-14 including	
2.	Special Conditions:	None.	
3.	Exemptions:	§ 23.177(a)(3)	Static directional and lateral stability
		§ 23.207(c)	Stall warning
		§ 23.613(c)	Material strength properties and design values
		§ 23.967(d)	Fuel tank installation
		§ 23.971	Fuel tank sump
		§ 23.993(d), (e)	Fuel system lines and fittings
		§ 23.1093(a)(4)	Induction system icing protection
		§ 23.1351(d)	General
		§ 23.1381 ÷ 1401	Lights
4.	Equivalent Safety Findings:	§ 23.177(a)(3) – Requirement upon the control force characteristic in relation to the aileron angle is not completely met. In steady, right slips at 1.2 V_{S1}, the aileron control force and corresponding aileron movement in relation to the angle of skid has not a stable characteristic. It is admitted under the proviso that the special acrobatic airplane is concerned; the rate of unstability is outweighed by a good controllability; neither dangerous tendency nor exceptional requirements upon piloting skill occur.	
		§ 23.207(c) – The difference between the stalling speed	

and the stall warning speed is lesser than the value required in the Regulation. It is admitted under the proviso that the special acrobatic airplane is concerned where the later warning enables the pilot to use a wider range of speed polar.

§ 23.613(c) – Materials and design values used for aircraft design and construction comply with the Czechoslovak State Standard and specifications valid for the Czechoslovak aviation industry. It is admitted with regard to the fact that the requirement sense is met.

§ 23.967(d) – The fuel tank is located in the pilot´s compartment and is not isolated by an impermeable partition. It is admitted under the proviso that the instructions for tank tightness test are included in the Flight Manual.

§ 23.971 – In the normal ground attitude, fuel tank sump cannot be completely discharged. It is admitted because the fuel system construction arrangement avoids water entry into the power plant fuel system.

§ 23.993(d), (e) – Of the fire resistance of hoses is not complied with. It is admitted with regard to operating experiences.

§ 23.1093(a)(4) – Requirement upon temperature of air inducted by the alternate air intake system is not completely met. Induction air temperature is lesser than temperature of cooling air at engine outlet. It is admitted under the proviso that flying in icing conditions is prohibited.

§ 23.1351(d) – For the electrical power supply to be checked, the airplane is equipped with a check light signalling the alternator is out of operation. It is admitted under the proviso that the airplane is equipped with a storage battery securing the electrical power supply for necessary time.

§ 23.1381 – 1401 The airplane is no equipped with light system for night operation. Night flight and IFR flight are not permitted.

5. Environmental Standards: None.

III. Technical Characteristics and Operational Limitations

1. Type Design Definition:	The specification list of Aircraft S-156.0.000.000.		
2. Description:	The Z 50 LX aircraft is a single-engine, single-seater, low-wing, cantilever monoplane fitted with a closed cockpit and a fixed gear.		
3. Equipment:	List of the basic aircraft equipment is in Flight Manual, section 6.		
4. Dimensions:	Span:	8.580 m with wing tip tanks	
	Length:	6.620 m	
	Height:	1.985 m	
	Wing Area:	12.500 m^2	
5. Engine:			
5.1.1. Model:	LYCOMING AEIO-540-L1B5		
5.1.2. Type Certificate:	No. 1 E 4, Issued by FAA		
5.1.3. Limitations:	Take-off power		
	Max. Power	220 kW (300 HP)	
	Max. Engine speed	2 700 RPM	
	Max. Consuption	90.84 l/h	
	Max. Manifold pressure	max.	
	Continuous cruising power (75 %)		
	Max. Power	165 kW (225 HP)	
	Max. Engine speed	2 450 RPM	
	Max. Consuption	68.13 l/h	
	Max. Manifold pressure	85 kPa	
	Economic cruising power (60 %)		
	Max. Power	132 kW (180 HP)	
	Max. Engine speed	2 350 RPM	
	Max. Consuption	48.45 l/hod	
	Max. Manifold pressure	73 kPa	
	or		

5.2.1. Model:	LYCOMING AEIO-540-L1B5D	
5.2.2. Type Certificate:	No. 1 E 4, Issued by FAA	
5.2.3. Limitations:	Take-off power	
	Max. Power	220 kW (300 HP)
	Max. Engine speed	2 700 RPM
	Max. Consuption	90.84 l/h
	Max. Manifold pressure	max.
	Continuous cruising power (75 %)	
	Max. Power	165 kW (225 HP)
	Max. Engine speed	2 450 RPM
	Max. Consuption	68.13 l/h
	Max. Manifold pressure	85 kPa
	Economic cruising power (60 %)	
	Max. Power	132 kW (180 HP)
	Max. Engine speed	2 350 RPM
	Max. Consuption	48.45 l/hod
	Max. Manifold pressure	73 kPa

6. Propeller:

6.1.1. Model:	HOFFMANN HO-V 123 K-V/200 AH
6.1.2. Type Certificate:	LBA No. 32.130/17; FAA No. P 5 EU
6.1.3. Number of blades:	3
6.1.4. Diameter:	2 000 mm
6.1.5. Sense of Rotation:	Right, in flight direction.
	or
6.2.1. Model:	MÜHLBAUER MTV-9-B-C/C 200-15
6.2.2. Type Certificate:	LBA No. 32/130/65
6.2.3. Number of blades:	3
6.2.4. Diameter:	2 000 mm
6.2.5. Sense of Rotation:	Right, in flight direction.

7. Fuel: AVGAS 100L
AVGAS 100LL

8. Oil: During first 50 operation hours, only mineral oil of viscosity class according to engine maintenance manual is used.

Either mineral or dispersant aviation oils of viscosity class according to engine maintenance manual can be used.

	Determination of relevant viscosity class depends on average outside air temperature.	
	By average outside air temperature above + 16°C are recommended mineral oils with SAE 50 or dispersant oils with SAE 50 or 40.	
	By average outside air temperature from - 1°C to + 32°C are recommended mineral oils with SAE 40 or dispersant oils with SAE 40.	
	By average outside air temperature from - 18°C to + 21°C are recommended mineral oils with SAE 30 or dispersant oils with SAE 40 or 30.	
9. Air Speeds:	Never exceed speed limit V_{NE} category A, N	 328 km/h IAS
	Normal operating speed limit V_{NO} category A, N	 263 km/h IAS
	Design manoeuvring speed limit V_A category A category N	 259 km/h IAS 193 km/h IAS
	Stall speed V_{SO} category A, N	 104 km/h IAS
	Maximum speed limit for flicked figures category A, N	 215 km/h IAS
10. Load factors:	For category Acrobatic (A) For category Normal (N)	+8.0 g,-6.0 g +3.8 g,-1.5 g
11. Maximum Operating Altitude:	8 000 m	
12. Weights:	Max. Take-off weight: - For category Acrobatic (A) - For category Normal (N)	 760 kg 840 kg
	Max. Landing weight: - For category Acrobatic (A) - For category Normal (N)	 760 kg 800 kg
	Max. Variable weight: - For category Acrobatic (A) - For category Normal (N)	 160 kg 240 kg
	Standard empty weight: - For category Acrobatic (A) - For category Normal (N)	 600 kg ± 3 % 610 kg ± 3 %
13. Centre of Gravity Range:	21.5 % – 28 % MAC	
14. Datum:	Reference point – upper part of the firewall plane – vertical at horizontal position of the aircraft.	
15. Mean Aerodynamic Cord (MAC):	1 485 mm	

16. Leveling Means: There is min. 500 mm below basic level (basic level is determinated by levelling points 1 and4 on the fuselage).

17. Minimum Flight Crew: 1

18. Number of seats: 1

19. Baggage/Cargo Compartments: Max. 10 kg (only for category Normal).

20. Control surface deflections:

Elevator deflection	up	28.5°	+ 1°,- 0°
	down	31°	+ 1°,- 0°
Elevator trim L	up	10°	+ 2°,- 0°
	down	30°	+ 1°,- 0°
Elevator trim R	up	27°	± 2°
	down	27°	± 2°
Rudder deflection	right and left	30°	+ 2°, -0°
Rudder trim	left and right	30°	± 1°
Ailerons deflection	up	20°	+ 1°, -0°
	down	20°	+ 1°, -0°
Aileron trim L	up	17°	+ 3°, -0°
	down	17°	+ 3°, -0°
Aileron trim R	up	27°	± 3°
	down	27°	± 3°

21. Wheels and Tyres: Wheels of main landing gear K 29-0100.00 with tyre Mitas (Barum) 350 x 135.

Tail wheel S/N 150.0.559.000 with tyre 200 x 80.

22. Other Limitations: The aircraft is approved for VFR Day flights.

IV. Operating and Service Instructions

1. Flight Manual:
   - Czech language
     Letová příručka Z 50 LX, issued 1991
   - English language
     Flight Manual Z 50 LX, issued 1991
2. Technical Manual:
   - Czech language
     Technický popis a návod k obsluze Z 50 LX, issued 1991
   - English language
     Technical Manual Z 50 LX, issued 1991

V. Notes

1. EASA TC No. EASA.A.108 was issued for model Z 50 LX aircraft on 27.08.2006.