0 General

0.1 Manual amendments

No.	Page	Description	Date
0.1	all	Combination of the initial Maintenance Manuals of the Variants DG-500/22 ELAN, DG-500 ELAN Trainer, DG-500/20 ELAN and DG-500 ELAN Orion, new standardized format	December 2009
0.2	0,8, 1.9, 1.14, 4.2, 5.1, 6.1, 6.2	Miscellaneous changes to the contents of the latest amendments of the initial maintenance manuals	December 2009
1	0.3, 0.4, 0.7, add diagram 7a	Wheel brake TN500/03	July 2011
2	0.3, 0.4, 0.7, 1.11, 2.1, 2.3, 2.4, 4.5, 4.6, file working instruction No. 1 for TN348/20 issue 3 at the end of the MM	Headrest securing ropes in the rear cockpit, manual amendments TN500/05	September 2011
3	0.1, 0.3, 0.4, 1.4, 1.12, 1,16, 2.1 – 2.4, 6.3, diagrams 9 and 9b	TN500/13 Canopy lock, rear locking rods, manual revision	July 2019

0.2 List of effective pages

Section	page	issued	replaced /	replaced /	replaced /
0	0.0	December 09			
	0.1	See manual amendments			
	0.2	See manual amendments			
	0.3	See manual amendments			
	0.4	See manual amendments			
	0.5	December 09			
	0.6	"			
	0.7	"	July 11	September 11	
	0.8	"			
1	1.1	December 09			
	1.2	"			
	1.3	"			
	1.4	"	July 19		
	1.5	"			
	1.6	"			
	1.7	"			
	1.8	"			
	1.9	"			
	1.10.	"			
	1.11.	"	September 11		
	1.12.	"	July 19		
	1.13.	"			
	1.14.	"			
	1.15.	"			
	1.16.	"	July 19		
	1.17.	"			
2	2.1	December 09	September 11	July 19	
	2.2	"	July 19		
	2.3	"	September 11	July 19	
	2.4	"	September 11	July 19	
	2.5	"			
3	3.1	December 09			
	3.2	"			
	3.3	"			
	3.4	"			
4	4.1	December 09			
	4.2	"			
	4.3	"			
	4.4	"			
	4.5	"	September 11		
	4.6	"	September 11		
	4.7	"			

Section	page	issued	replaced /	replaced /	replaced /
5	5.1	December 09			
	5.2	"			
6	6.1	December 09			
	6.2	"			
	6.3	"	July 19		
	6.4	"			
7	7.1	December 09			

Diagram	issued	replaced	replaced	replaced
1	April 90			
2	April 90			
3 DG-500/22 and /20	April 90			
3a DG-500 Trainer and Orion	January 1999			
4 DG-500/22 and /20	April 90			
4a DG-500 Trainer and Orion	April 90			
5	April 90			
6 DG-500/22 and /20	April 90			
6a DG-500 Orion	July 1995			
7	June 1993			
7a	July 2011			
8	April 90			
9 DG-500/22 and /20	April 90	July 19		
9a DG-500 Trainer	March 1992			
9b DG-500 Orion	July 1995	July 19		
10 only DG-500 Trainer	April 90			

Enclosure	issued	replaced	replaced	replaced
Equipment list	December 09			
5EP30 Installation ELT	27.02.91			
5EP34 Installation Dräger oxygen system	25.01.90			
Working instruction No. 1 for TN348/20 issue 3	22.10.2008			
Only DG-500/20, Trainer, Orion				
Instruction for inspection DG-500 airbrakes	December 09			
Questionnaire for TN 348/4	October 94			
Working instruction No. 1 for TN 348/4	October 94			
Working instruction No. 2 for TN 348/4	October 94			
5V18 Tool for airbrake adjustment	14.10.94			

1.3 Rudder control

1.3.1 Rudder control circuit - see diagram 2

1.3.2 Rudder deflections and tolerances

217-5 mm (+ 30°) (8.54 - .2 inch)
measured at 420 mm (16.5 inch) from the hinge axis.

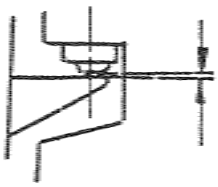
1.3.3 Rudder stops

The rudder stops are located at the lower hinge of the rudder.

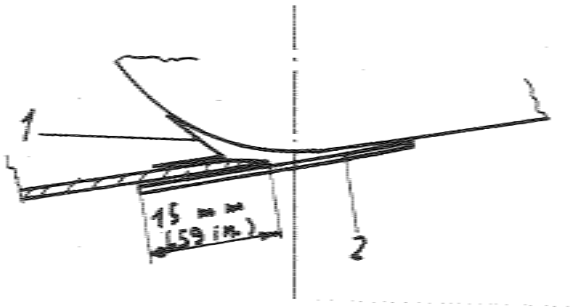
1.3.4 Axial free play

The maximum allowable free play at the upper hinge point is 1 mm (0.04 inch)

1.3.5 Sealing the rudder



maximum
1 mm



axial free play

sealing the rudder

The rudder is sealed on both sides. Inside the fin with a V sealing tape (3 M Scotch Flexodicht Band 2743 white) which is attached at the fin trailing edge. If damaged it should be replaced and sprayed with Teflon spray.
On the outside a combo sealing (flexible sealing with turbulator zig-zag dents at its leading edge) is installed.
Prior to installation of this sealing clean the glue area of the fin with Acetone.

Caution: Acetone may damage competition no's. or the colour scheme.
Warning: These sealings are not to be removed. If damaged or if the flexible sealings does not touch the rudder any more, the sealing have to be exchanged. Use only original material.

These materials should be purchased from DG.

item	part.-no.	amount	
1	70000295	2 x 1.5 m(59 in.)	V sealing tape
2	30003130	2 x 1.48 m (58 in.)	combi sealing 30/15

1.3.6 Retaining spring for the pedal adjustment handle

A rubber cord with 2 mm (0.08 in.) diameter which pulls the pedal adjustment cable tight is installed in the console below the instrument panel. If this rubber cord is defective the handle of the pedal adjustment cable won't be pulled to the front so that it may hook into the trim release lever at the control stick with pedals in a rear position.

1.7 Tow hooks

1.7.1 Tow release circuit see diagram 5

1.7.2 Adjustment

Check if both tow releases open fully.
Adjustment at the bellcrank 5R32 in the rear cockpit.

Caution: The ring muzzle of the C.G. hook should not be bent or ground down and move easily. If the muzzle is damaged, the tow release has to be exchanged and repaired by the manufacturer (Tost).

1.7.3 Removing the tow hooks

C.G. tow hook

Remove the mounting bolts and the actuating lever. Don't remove the bolt which carries the actuating lever.
Move the tow hook some mm in an upward direction (use a piece of hard wood and a hammer). Then move it to the front and rotate it so far that the ring muzzle of the hook is located between the stands for the mounting bolts. Then pull the hook upwards.

Nose tow hook

Remove the tow hook with the fittings 5 R 3/2 and 3.

1.7.4 Rubber cords

To keep the actuating cables tight there is a rubber cord at both of the cables in front of the bellcrank 5 R 32.
Replace the rubber cords if worn.

For further information refer to the operating and maintenance instructions for the release mechanism. (See sect. 0.4 of this maintenance manual)

Note: Before any changes to the massbalance weights are made, contact the DG factory.

Method for determining control surface moments

Rudder

Disconnect rudder cables, lay the fuselage on its side so that the fin is horizontal. Attach (by tape) a spring balance to the lower end of the rudder 200 mm (7.9 in.) behind the hinge axis.

All other control surfaces

Other control surfaces

Remove the control surface and hang it frictionfree on two hinge points.

Control surface	**measuring point**	**behind hinge axis mm (in.)**
DG-500/20:		
Elevator	center	227 (8,94)
DG-500/22:		
Elevator	center	227 (8,94)
Wing flaps	root	218 (8,58)
Inboard ailerons	root	182 (7,17)
Outboard ailerons	root	147 (5,79)
Wing flaps	1. hinge outb. from root	212 (8,35)
Inboard ailerons	root	182 (7,17)
Outboard ailerons	2. hinge	139 (5,47)
DG-500 TRAINER:		
Elevator	center	227 (8,94)
Ailerons	2. hinge	177 (6,97)
DG-500 Orion:		
Elevator	center	227 (8,94)
Inboard ailerons	2. hinge	177 (6,97)
Outboard ailerons	root	112 (4,49)

2 Inspections

2.1 Daily inspection

see flight manual section 4.3

2.2 Regular inspections

A After 200 flight hours and during the annual inspection

Check the rudder cables for wear especially around the "S" tubes on the rudder pedals. Worn rudder cables should be replaced (see section 4.2).
Check the sealing of the rudder (see section 1.3.5).

B Annual inspection (and 100hr inspection only for USA)

- Execute all items of the daily inspection (see flight manual section 4.3). Check especially the headrest securing ropes in the rear cockpit according to "Working instruction No. 1 for TN348/20 issue 3" (attached to this manual) for correct assembly and for wear.
- Inspect all bolted connections and locking devices ie. locknuts, split pins etc.
- Check all metal parts for adequate greasing and rust prevention. (see section 3.3).
- Check the control surface deflections (see sections 1.2 up to 1.4).
- Check the free play in all control circuits (see section 1.2 up to 1.6)
- Check the fore and aft play of the wings (see section 1.10).
- Check the canopy emergency releases according to section 7.15 of the flight manual.
- Check if the rear locking rods of front and rear canopy are screwed in tightly. To accomplish this close the locking mechanism with canopy open and try to rotate the locking rod clockwise using small pipe pliers and a piece of abrasive paper 240 grid around the rod to protect the rod from damage.

Caution: Don't rotate counter-clockwise, otherwise you may rotate the rod out of the thread and destroy the Loctite and lock nut securing.

If you are able to rotate the rod proceed with TN500/13 instruction 3.

- Check the rubber cords in the control system (see sections 1.2.7, 1.4.1.6 (only DG-500/22 and /20) and 1.7.4.
- Check the thickness of the wheel brake linings and the thickness of the wheel brake disc (see section 1.6.1.4).
- Check if the brake fluid has to be exchanged (see section 1.6.1.4).
- Check the airbrakes according to "Instruction for inspection DG-500 airbrakes" (attached to this manual) (not necessary for DG-500/22).
- **Tow hooks:** The operating and maintenance instructions for the release mechanisms, see sect. 0.4 of this maintenance manual have to be followed.

- **All-up weight and centre of gravity:** These should be checked at least every 4 years.

C Every 3 months

Check the tension of the lines of the waterbag attachment (see section 4.1).

D Special inspections

Tow hook:

After a wheel-up landing, the C.G. tow hook is to be cleaned. Check tow hook and tow hook bulkheads carefully for any damage.

C.G. weighing:

After all work which may influence the C.G..

2.3 Inspections after a heavy landing

The whole aircraft

Check that the tailplane is still properly aligned in the vertical and horizontal axis.

Check the wing oscillating frequency with respect to previous checks.

Wings

Spar ends:

Check the wing pins and bushes for any deformation - are there any white areas around the bushes?

Root ribs:

Are there any cracks at the rib/wing skin joint or rib/spar joint? If so, remove any paint or filler to see if the crack continues into the structure. Any white areas around the bushes?

Outer skins:

Crushing, cracks, delaminations?

Note: hairline cracks from the edges of the airbrake housing and on the wing leading edge running along the span are harmless, if these don't enlarge when you press on the wing shells.

Wingflaps and ailerons:

Crushing, cracks, delaminations?

Hinge mounts checked? - Control circuit drives checked?

Fuselage

Fuselage wing connection:

White areas, increased free play, bent lift pin tubes, difficult assembly?

Torsion check:
Hold the fuselage fixed and from the top of the fin try to turn the fin around the fuselage. While applying this torsion are any cracks made visible? Does the fuselage shell show any uncommon deformations?

Fuselage - fin intersection:
Check for cracks.
Remove gelcoat and any filler along the cracks. Apply pressure to the fin (push the fin towards the nose as well as applying torsion). Do the cracks penetrate the glass fibre structure?
Disassemble the rudder and check the glued connection of the fuselage end bulkhead and the fin trailing edge web.

To check the elevator control circuit and the bulkhead attachments in the fin area, the tail-wheel and the cover plate in the wheel box should be removed.

Tailplane attachment:
Increased free play? Cracks in the fin top rib? Check if the aluminium parts of the tailplane attachment are bent or loose, check the tailplane locking device

Rudder mounts:
Increased free play? White areas in the glass fibre, bent rudder hinge pin supports?

Fuselage skin:
outside: cracks, nicks, folds? Any separation of the skin from the core?
inside: white spots, zig zag white lines, cracks?
Has any bulkhead become loose?

C.G. tow release:
Especially after a wheel up landing, check for dirt etc., check for proper functioning. Has the tow release housing become detached from the fuselage?

Seat back bulkhead:
Cracks? Shoulder strap attachment point?

Belly harness attachment points:
Check for cracking around the mountings in the seat.
Check the safety harness assembly.

Controls:
Check for proper functioning and condition of all controls and adjustment mechanisms (i.e. rudder pedal adjustment, tow release, air brake, control column and trim etc.).

Instruments:
Proper functioning? Dirt in the static ports or in the pitot probe?

Landing gear :
Check to insure if properly aligned? No bent forks? Proper extension and retraction? Any dirt in the forward fork pivot?
Any white areas or cracks in the wheel box? Remove the baggage area floor panels and inspect the wheel box from above.
Landing gear control circuit condition. Is there free play between actuating lever and rear upper fork?

Horizontal tailplane-stabilizer:
Outer skins: Crushing, cracks, delaminations?
Mounting: Glued joint of the bushes, white areas around bushes, cracks in shear webs, cracks around locking plate?
Hinge mounts: checked?

Elevator:
Crushing, cracks, delaminations?
Hinge mounts checked? - Control surface horn bent or loose?

Nose wheel and tail wheel
Any cracks or white patches around the attachment?

Do all **checks of the daily inspection** (see flight manual section 4.3).

6.6 Variometer

Manufacturer	Type	Certification No.
Winter 5 St VM5 (dia.58 mm)		TS 10.230/14
	±5 m/sec Ident.No.5451	
	±1000 ft/min ident.No.5452	
	±10 knts Ident.No.5453	
Winter 5 StV5 (dia.80 mm)		TS 10.230/13
	±5 m/sec Ident.No.5251	
	±1000 ft/min Ident.No.5252	
	±10 knts Ident.No.5253	

6.7 Turn and bank indicator

Manufacturer	Type	Certification No.
Apparatebau Gauting	WZ-402/31 12 V	10.241/8

6.8 Accelerometer (for Category A Aerobatics)

Only for DG-500 Orion and. TRAINER

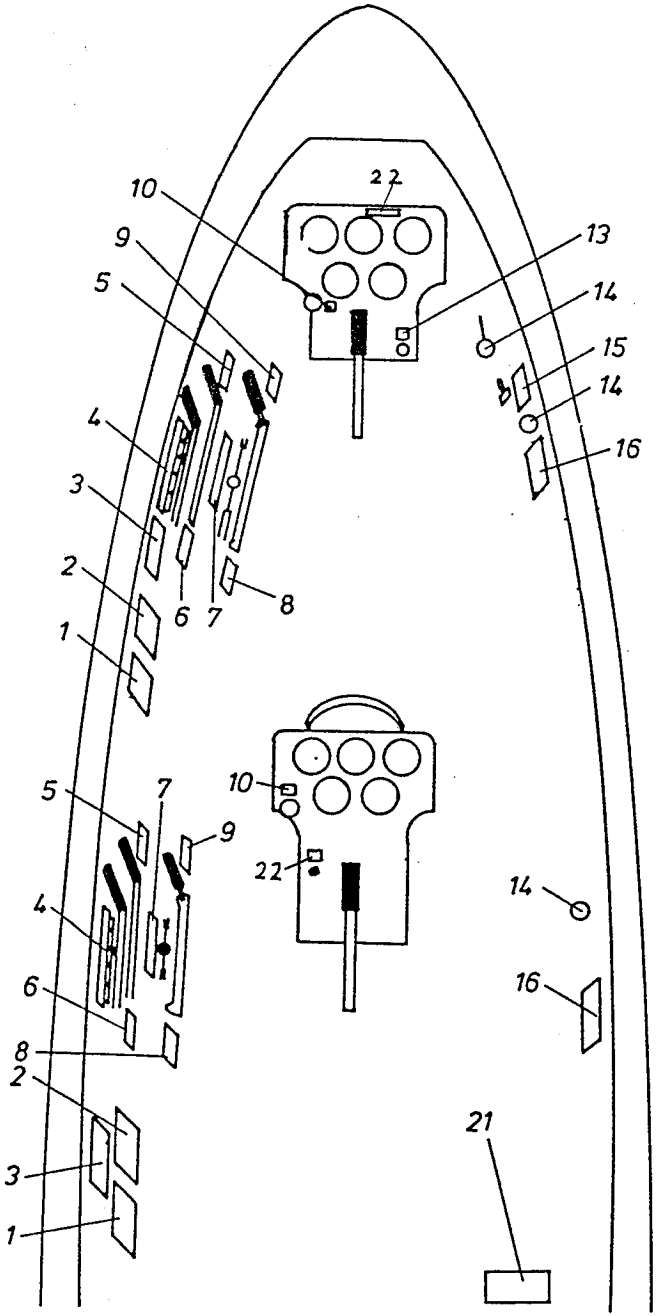
Accelerometer capable of retaining max. And min. g-values with markings red redial lines at +7g and -5g.

Manufacturer	Typ	Standard
AOA Apparatebau Gauting	BM 470-RL/L	MIL-A-5885 A
Bendix	2" 5V LITE	MS 28025-1 MS
Bendix	3419-5A-A1	28025-1 MS
Burton Manufacturing Co.	B-6	280025-1 MS
INSCO	6610	33638
Kelvin & Hughes Ltd.	KAE 0504K	MS 23009-1 MS
Milhard Engineering Co	ABU-4/A	23009-1 MIL-
QED/Inc. (ASG)	ABU-4/A	A-25949 MS
Smiths	KAE 0504/K	23009-1 MIL-
Falcon Gauge	GM5 10-2	A-5885 C

6.9 Outside air temperature gauge

Only for DG-500 Orion

Manufacturer	Typ
Störk	TF 00-059K (-20 - + 40° C)



Alt.	m	0-2000	3000	4000	5000	6000
VNE	Km/h	270	256	243	230	218
Alt.	ft	0-6600	10000	13000	16000	20000
VNE	Kts	146	138	131	124	117

22

2

Cockpit Check

1. Lead ballast (for underweight pilot)?
2. Parachute worn properly?
3. Safety harness buckled?
4. Front seat: pedals adjusted?
   Rear seat: seat height adjusted?
5. All controls and knobs in reach?
6. Altimeter?
7. Dive brakes cycled and locked?
8. Wing flaps in take off position?
9. Positive control check? (One person at the control surfaces)
10. Trim?
11. Both canopies locked?

1

ELAN

Type: DG-500/22 ELAN — Year of construction:

Serial No: 5 E S

Maximum airspeeds	km/h	kts.
Winch launch	140	76
Aero-tow	197	106
Manoeuvring V_A	197	106
Rough air	197	106
Max. flap extended speed +10°, +5°	197	106
Landing gear operating	197	106
Maximum speed V_{NE}	270	146
Max. flap extended speed L	150	81

Approved aerobatic manoeuvres (only without ballast in the wings): pos Loop, Chandelle, Spin

Maximum mass: 750 kg (1653 lbs.)

Loading chart

Cockpit load (parachute included)

	front seat		rear seat	
maximum	110 kg	242 lbs	90 kg	198 lbs
or maximum	105 kg	231 lbs	105 kg	231 lbs
minimum	kg	lbs		

ELAN

TOVARNA ŠPORTNEGA ORODJA
Jugoslavija

Type: DG-500/22 ELAN
Ser: No.----------
Reg: No.----------

fire proof placard at front main bulkhead

Bauteil Nr.:

Part No's of airframe components at the front main bulkhead
at the root ribs of the wings, flaps and ailerons
at the rudder nose
at the shear web of the horizontal stabilizer

8

9

6

7

L + 10 + 5 0 − 5 − 10

5

10

4

16

3

Reifendruck 4 bar
tyre pressure 56 psi

right above the tailwheel

Reifendruck 2,5 bar
Tyre pressure 3 psi

right above the nosewheel

Reifendruck 3 bar
tyre pressure 44 psi
Solibruchstelle 10000 N
rated load 2200 lbs.

at the right landing-gear door

Bremsflüssigkeit
brake fluid
min. DOT 3 / DOT 4

on brake fluid reservoir

Gepäck max. 15 kg
baggage max. 33 lbs.

21

13

14

15

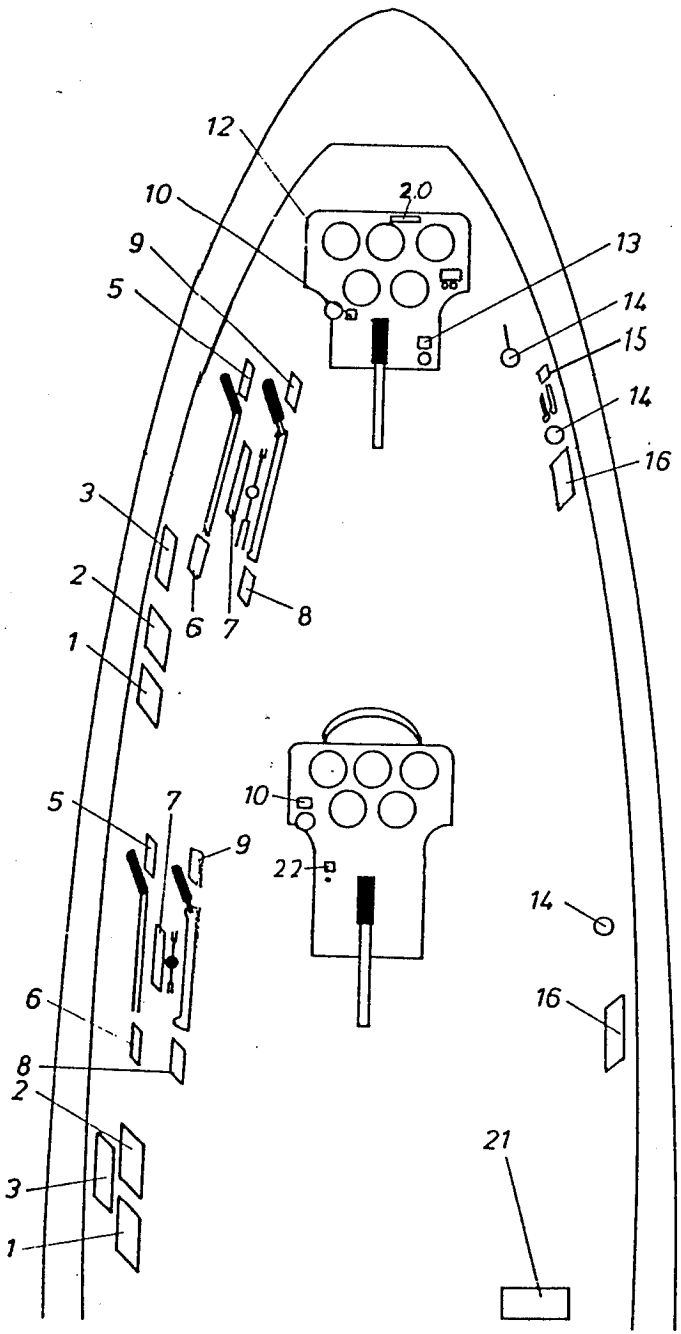
Senden
transmit

22

placards DG-500/22 ELAN

Diagram 9

Issued July 2019



ELAN FLIGHT - Slovenija

Type: DG - 500 ELAN Orion **Year of construction:**

Serial No. 5E X

	km-h	kts.
Maximum airspeeds		
Winch launch	140	76
Aero - tow	190	102
Manoeuvring V_A	190	102
Rough air	190	102
Landing gear operating	190	102
Maximum speed V_{NE}	270	146

Approved aerobatic manoeuvres (category utility U):
pos. Loop, Stall Turn, Chandelle, Spin
In addition category A:
Spans 17,2 or 18 m, only without waterballast
half loop and half roll, half roll and half loop, slow roll, inverted flight.

Maximum mass: 625 kg (1378 lbs.) Category A
750 kg (1653 lbs.) Category U

Loading chart

Cockpit load:
(parachute included)

	front seat		rear seat	
maximum	110 kg	242 lbs	90 kg	198 lbs
or maximum	105 kg	231 lbs	105 kg	231 lbs
	kg	lbs		

1

Cockpit Check
1. Lead ballast (for under weight pilot)?
2. Parachute worn properly?
3. Safety harness buckled?
4. Front seat : pedals adjusted?
   Rear seat: seat height adjusted?
5. All controls and knobs in reach?
6. Altimeter?
7. Dive brakes cycled and locked?
8. Positive control check?
   (One person at the control surfaces)
9. Fin ballast tanks emptied or correct amount filled in?
10. Trim?
11. Both canopies locked?

2

Alt.	m	0-2000	3000	4000	5000	6000
VNE	Km/h	270	256	243	230	218
Alt.	ft	0-6600	10000	13000	16000	20000
VNE	Kts	146	138	131	124	117

20

limits for use of the fin waterballast tank

minimum ground temperature	°C	13,5	17	24	31	38
	°F	56	63	75	88	100
maximum flight/altitude	m	1500	2000	3000	4000	5000
	ft.	5000	6500	10000	13000	16500

23

23 + 24 = optional

Fin ballast tank B
Minimum cockpit load
kg lbs | kg lbs
Tank empty | Tank filled

24

ELAN
TOVARNA ŠPORTNEGA ORODJA
Jugoslavija
Type: DG-500 ELAN ORION
Ser: No.
Reg: No.

fire proof placard at front main bulkhead

Bautell Nr.:

Part No's of airframe components at the front main bulkhead
at the root ribs of the wings, flaps and ailerons
at the rudder nose
at the shear web of the horizontal stabilizer

8

7

5

9

10

6

8. 9 = option

16

3

Reifendruck 4 bar
Tyre pressure 58 psi

right above the tailwheel

Reifendruck 2,5 bar
Tyre pressure 36 psi

right above the nosewheel

Reifendruck bar
Tyre pressure psi

Sollbruchstelle 10000 N
rated load 2200 lbs.

at the right landing-gear door

Bremsflüssigkeit
brake fluid
min. DOT 3 / DOT 4

on brake fluid reservoir

Gepäck max. 15 kg
baggage max. 33 lbs.

21

Senden
transmit

22

13

14

15

Placards DG-500 ELAN ORION

Diagram 9b

Issued July 2019