

# HOFFMANN AIRCRAFT

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## FLIGHT MANUAL

### H36 DIMONA

This Flight Manual must be carried on board of the motorglider at all times.

Reg.No.: HA-1216 Ser.No.: 3666  
Owner: ~~OLDTIMER AERO CLUB~~ AEROKLUB KESKED  
~~2800 TATAKMYA~~ 2852 KESKED  
~~BEN FOSSET U.I.~~ 06 HES

Austrian edition of operating instructions is approved under § 33 ZLLV, Bundesgesetzblatt 415, Aug 17 1983

Published Nov 15 1985

BAZ-approved on Nov. 22 1985



Approval of translation has been done by best knowledge and judgement. In any case the original text in German language is authoritative.

Section 0

Hoffmann Flugzeugbau

Revisions

H 36 Dimona

### PILOTS OPERATING HANDBOOK

### LOG OF REVISIONS

| Revision Number and Date | Revised Pages  | Description of Revision  |
|--------------------------|----------------|--|
| Rev. 1.<br>REV 2.        | 6, 8, 36<br>0, | Changing engine parameters for approved STUR SS2100 H15.<br>CHANGING OWNER NAME AND ADDRESS. |

All manuals for the Hoffmann H 36 can be ordered from:  
 Hoffmann Aircraft, Richard - Neutra - Gasse 5, P.O.Box 100,  
 A - 1214 Vienna / Austria

#### WARNING!

This handbook should not be used for operational purpose unless it is maintained in a current status.

15. Nov. 1985

BAZ-approved on Nov. 22 1985



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H 36 DIMONA

1  
General

THIS HANDBOOK CONTAINS IMPORTANT INFORMATION FOR THE  
PILOT!

This information is broken down into informative sections  
in the order shown below.

Section 0 ..... Revisions  
Section 1 ..... General  
Section 2 ..... Limitations  
Section 3 ..... Emergency Procedures  
Section 4 ..... Normal Procedures  
Section 5 ..... Performance data  
Section 6 ..... Weight and Balance/Equipment List  
Section 7 ..... Motor Glider and Systems Descriptions  
Section 8 ..... Aircraft Handling, Service & Maintenance  
Section 9 ..... Supplements

15. Nov. 1985

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H 36 DIMONA

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General

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### General

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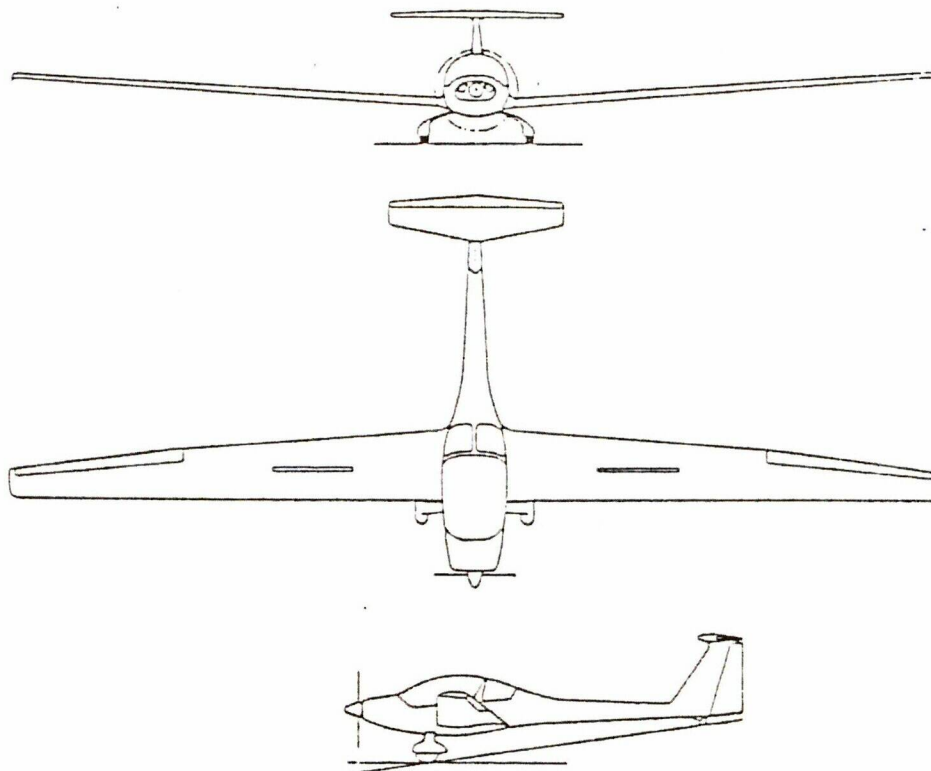
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General

### 1.1 Introduction:

This handbook contains material required to be furnished to the pilot by JAR 22. It also contains supplemental data supplied by the airframe manufacturer. Each section is divided by tab markers with Emergency Procedures tabbed in red.

### 1.2 Three View Drawings:



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1  
General

### TECHNICAL DATA

Wing Span ..... 16,0 Meters ( 52 ft.)  
 Length..... 6,85 Meters ( 22 ft.)  
 Wing Area ..... 15,20 m<sup>2</sup> ( 164 sq.ft.)

Wing Ratio ..... 16,8  
 Maximum Gross Weight ..... 770 kg (1698 lbs. )  
 Maximum Wing Loading ..... 50,7 daN/m<sup>2</sup> (10,38 lbs/sq.ft.)  
 Airfoil ..... Wortman FX 63-137  
 Engine ..... ~~Limbach L 2000 EB LC (59 kw/80 hp.  
 rated at 3.400 Rpm)~~  
 Sauer S2100-1-SS1  
 50 kW 8000 at 3000 RPM  
 Propeller: ..... Hoffmann Ho-V 62 R/L 160 T od. L 160 BT

#### Description:

The Hoffmann H 36 DIMONA is a two seat motor glider constructed from glass fiber. Design features are unbraced wing, T-type stabilizer, fixed landing gear with steerable tail wheel. All three wheels are covered with fairings. Seating arrangement is side-by-side. Air brakes are provided in the wings upper surface. The aircraft is certified in accordance with JAR 22 in the UTILITY CATEGORY.

#### 1.4 Engine:

~~Limbach L 2000 EB LC~~, Four cylinders, opposed, aircooled, direct drive. The engine produces 59 KW/80 Hp at ~~3.400 RPM~~  
 3.000 RPM

#### 1.5 Propeller:

Hoffmann Ho-V 62 R/L 160 T or . L 160 BT, two blade with a diameter of 160 cm ( 63 inches). The propeller has three pitch positions, controlled by the pilot.

#### 1.6 Fuel:

The approved fuels are Aviation Grade 100 LL or Automotive fuel "Super". The capacity of the fuel tank is 83 liters ( 22 gal.). The total usable fuel is 83 liters ( 22 gal.).

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H 36 DIMONA

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General

1.7 Approved Lubricants: Any engine oil under the classification of (API-classification) (API SH/CE) or higher. Don't use any synthetic lub oil.

~~Automotive lubricants with SAE ratings compatible with the seasonal temperatures. Refer to Section 8, Servicing for lubrication usage chart.~~

See Maintenance manual S-2100-1551

#### C A U T I O N

Under no circumstances should Aviation Grade oil be used!

1.8 Maximum Certified Weights:

The maximum allowable take off weight is 770kg (1698lbs.)

Maximum weight for non-lifting parts is 560 kg (1236lbs.)

1.9 Symbols, Abbreviations and Terminology:

|                                    |          |                       |
|------------------------------------|----------|-----------------------|
| Liters                             | Ltr.     |                       |
| Kilogramms                         | Kg       |                       |
| Indicated airspeed                 | IAS      |                       |
| Indicated airspeed in Knots        | KIAS     |                       |
| Manoeuvring Speed                  | $V_a$    |                       |
| Max. speed in rough air            | $V_b$    |                       |
| Stalling Speed                     | $V_{so}$ | (Airbrakes retracted) |
| Max. speed not to be exceeded      | $V_{ne}$ | (calm air)            |
| Max. speed with flaps extended     | $V_{fe}$ |                       |
| Stalling speed                     | $V_{s1}$ | (Airbrakes extended)  |
| Max. speed with airbrakes extended | $V_{le}$ |                       |

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Limitations

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LIMITATIONS

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Limitations

## 2. Operating Limitations

### 2.1 Category of Airworthiness

Utility (U) according to JAR 22  
Certifications basis: JAR 22 (Joint Airworthiness Re-  
quirements for gliders and motorgliders) effective 15.3.82

### 2.2 Permitted Operations:

The H 36 DIMONA is certified for VFR flights .

Flights into known icing conditions are prohibited.  
Approved aerobatic manoeuvres are:

~~Inside loops  
Spins  
Vertical turns  
Lazy Eights~~

All aerobatic manoeuvres inclusive  
spin and flights in clouds are  
forbidden see 4.13.

### 2.3 Minimum Equipment:

1 Airspeed indicator  
1 Altimeter  
1 RPM counter with hour-meter  
1 Oil pressure indicator  
1 Oil temperature indicator  
1 Voltmeter  
1 Fuel quantity indicator  
1 Magnetic compass  
1 Cylinderhead temperature  
2 Seat Belts  
Loading Placard  
Data Plate  
Flight Manual (Approved)  
1 Warning light for energised starter circuit.

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Limitations

## 2.4 Engine Limitations

Engine Type: ~~Limbach L 2000 EB 1.6~~ **Saues S2100-1-SS1**

RPM Limitations (Indicator Markings)

Maximum take off RPM (maximum 5 minutes) ~~59 KW (80 hp.)~~  
~~3.400 RPM~~ **3000 RPM**

Maximum ambient atmospheric temperatur - + 38 °C (+100° F)

Maximum RPM (METO) ~~53 KW (72 hp.)~~ ~~3.000 RPM~~ **2700 RPM**

Red Line ~~3.400 RPM~~ **Maximum speed 3200 RPM**

Caution Range - Yellow Arc ~~3.000 - 3.400 RPM~~ **2700 - 3000 RPM**

Operating RPM - Green Arc ~~700 - 3.000 RPM~~ **700 - 2700 RPM**

CAUTION

Avoid RPM during cruise below 2300 min<sup>-1</sup> !

## 2.5 Oil Pressure:

Maximum Oil Pressure (red line) ~~4 bar (55.8 psi)~~ **4.5 bar**

Minimum Oil Pressure (red line) ~~1 bar (13.9 psi)~~ **2 bar No load 1 bar**

Operating Range (green arc) ~~1 - 4 bar (13.9 - 55.8 psi)~~ **1 - 4.5 bar**

## 2.6 Oil Temperature:

Maximum Oil Temperature (red line) 120° C (248° F)

Operating Range (green arc) 50 - 120° C (122 - 248° F)

Minimum Temperature (red line) 50° C (122° F)

## 2.7 Cylinder Head Temperature:

Maximum Cylinder head temperature (red line) **200° C**  
~~250° C. (482° F)~~

## 2.8 Voltmeter:

Maximum voltage with engine running: 14 VDC (red line)

14.5 May 1987

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Limitations

2.9 Airspeed limitations and load factor limits:

Maximum allowable airspeed (calm air)

$V_{ne} = 275 \text{ km/h}$       149 kts      170 mph

Maximum allowable airspeed (turbulent)

$V_b = 210 \text{ km/h}$       113 kts      130 mph

Manoeuvring speed

$v_a = 176 \text{ km/h}$       95 kts      109 mph

Maximum speed with airbrakes extended

$V_{1e} = 275 \text{ km/h}$       149 kts      170 mph

Stall speed with airbrakes extended

$V_{S1} = 70 \text{ km/h}$       38 kts      44 mph

Stall speed with airbrakes retracted

$V_{S0} = 70 \text{ km/h}$       38 kts      44 mph

Load Limit Factors:

The following accelerations may not be exceeded  
(airbrakes retracted, normal manoeuvres)

At Manoeuvring speed:      + 5.3      - 2.65

At Maximum speed,  $V_{ne}$ :      + 4.0      - 1.5

C A U T I O N

When flying in areas where turbulent weather may be encountered i.e. thunder clouds, wind rotors, standing waves and mountainous terrain, airspeeds between 210 - 275 km/h (113 - 149 kts) are to be avoided (Caution range in yellow colour on the Airspeed indicator).

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2.9 Cont.

To reduce the risk of encountering control flutter at  $V_{ne}$  the following table should be used to determine  $V_{ne}$  at various altitudes.

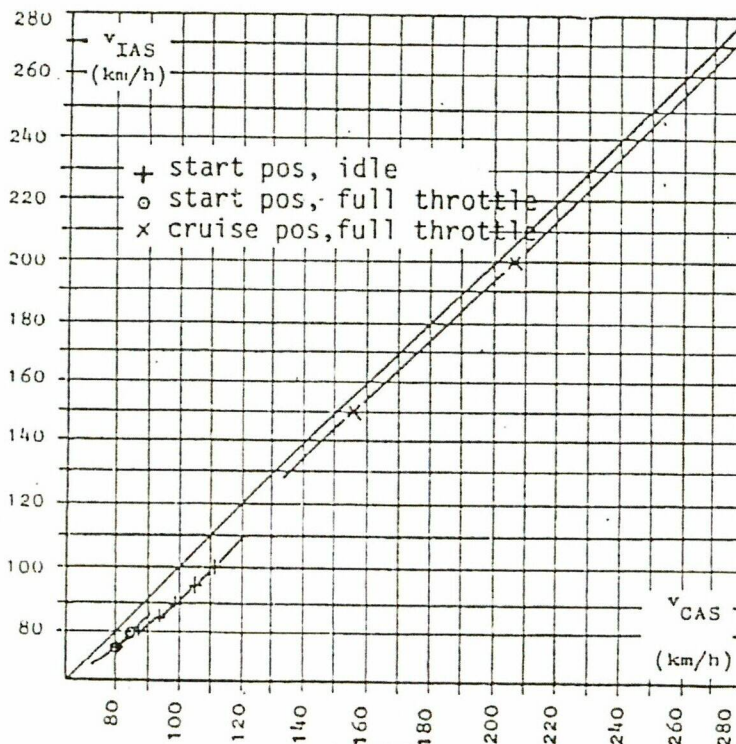
| ALTITUDE |        | (m)  | 0 - 2000 | 3000  | 4000  | 5000  | 6000  |
|----------|--------|------|----------|-------|-------|-------|-------|
|          |        | (ft) | 0 - 6500 | 10000 | 13000 | 16500 | 20000 |
| $V_{ne}$ | (km/h) |      | 275      | 259   | 246   | 233   | 221   |
|          | (kts)  |      | 149      | 140   | 133   | 126   | 119   |

NOTE

Manoeuvring speed ( $V$ ) is the maximum speed at which application of full available aerodynamic control will not overstress the airplane. Increasing altitude increases True Air Speed (TAS).

Indicated Airspeed Errors

The following table illustrates airspeed errors (IAS) due to positioning of the pitot pressure and pitot static sources. Pitot and Static Pressure source: Leading edge Horizontal Stabilizer.



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Limitations

### 2.10 Airspeed Indicator Markings (IAS):

|                                 |                              |               |               |
|---------------------------------|------------------------------|---------------|---------------|
| Red Line                        | (Maximum allowable Airspeed) |               |               |
|                                 | 275 km/h                     | 149 kts       | 170 mph       |
| Yellow arc                      | (Caution range)              |               |               |
|                                 | 210 - 275 km/h               | 113 - 149 kts | 130 - 170 mph |
| Green arc                       | (Normal range)               |               |               |
|                                 | 78 - 210 km/h                | 42 - 113 kts  | 48 - 130 mph  |
| Yellow Triangle                 | (approach speed)             |               |               |
|                                 | 95 km/h                      | 51 kts        | 59 mph        |
| Blue Line (Best climb Airspeed) |                              |               |               |
|                                 | 95 km/h                      | 51 kts        | 59 mph        |

#### C A U T I O N

|                                       |        |        |
|---------------------------------------|--------|--------|
| Airspeed for the best climb Ratio is: |        |        |
| 85 km/h                               | 46 kts | 53 mph |

### 2.11 Crew:

Minimum Crew - One Person (min. weight 70 kp = 155 lbs)

#### C A U T I O N

|   |
|---|
| Solo flights may be conducted from the left seat only ! |
|---|

### 2.12 Weights:

Empty Weight: refer to section 6-3, Weigh ing report

|   |        |          |
|---|--------|----------|
| Max. Gross Weight:                        | 770 kg | 1698 lbs |
| Min. Wt. in pilots seat (incl. parachute) | 70 kg  | 155 lbs  |
| Max. Wt. in each seat (incl. parachute)   | 110 kg | 243 lbs  |
| Max. Wt. in baggage compartment           | 12 kg  | 27 lbs   |

#### C A U T I O N

|   |
|---|
| Do no overstep the maximum payload stated on p.43 |
|---|

For more detailed loading information refer to section 6, Weight and Balance/Equipment list.

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Limitations

### 3.13 Center of Gravity Limitations

The Center of Gravity ranges are:

Forward: 270 mm aft of leading edge,  
wing root rib

Aft : - Up to 740 kg :  
385 mm aft of leading edge,  
wing root rib

- At 770 kg :  
370 mm aft of leading edge,  
wing root rib

- Between 740 and 770 kg :  
linear run between  
370 and 385 mm

For more detailed Center of Gravity information  
refer to section 6, Weight and Balance/Equipment list.

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2  
Limitations

#### 2.14 Placards:

##### Translation of original placards in German language:

|                         |                             |
|-------------------------|-----------------------------|
| Gepäck max 12 kg        | - Baggage max 12 kg         |
| Störklappen - Radbremse | - Airbrake ... Wheel brake  |
| Vollgas-Gas-Leerlauf    | - Full - throttle - idle    |
| Brandhahn               | - Fuel shut off valve       |
| auf ... zu              | - open - closed             |
| ein ... aus             | - on ... off                |
| Lüftung                 | - Cabin Air                 |
| Heizung                 | - Cabin Heat                |
| Zündung                 | - Ignition                  |
| Kraftstoffpumpe         | - Fuel pump                 |
| Hauptsicherung          | - Main fuse                 |
| Kopflastig ... Trimmung | - Nose down ... trim        |
| ... Schwanzlastig       | - nose up                   |
| Haubennotabwurf         | - Canopy emergency jettison |
| Parkbremse              | - Parking brake             |
| Choke                   | - Choke                     |

Text and position of placards in english language:  
see following pages.

Limitations

N - 12345

Registration Call Sign in  
Center of Instrument panel

Canopy Jettison and Emergency Exit  
 Pull RED handle on center console  
 Pull both RED handles on Canopy frame AFT  
 Push canopy up and away  
 Release safety harness  
 Stand up and exit aircraft from  
 left or right sides respectively  
 When using a manual parachute  
 release, wait 2 seconds prior to  
 pulling D-ring.

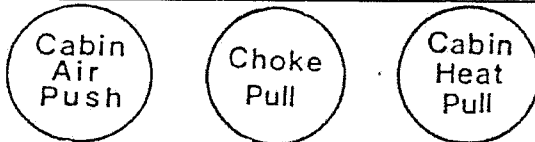
On lower center console

| Airspeed Limits                |                 | km/h   | kts      | mph |
|--------------------------------|-----------------|--------|----------|-----|
| Never Exceed                   | V <sub>NE</sub> | 275    | 149      | 170 |
| Rough Air                      | V <sub>B</sub>  | 210    | 113      | 130 |
| Maneuvering                    | V <sub>A</sub>  | 176    | 95       | 109 |
| max Gross Weight               |                 | 770 kg | 1698 lbs |     |
| min Payload (in<br>pilot seat) |                 | 70 kg  | 154 lbs  |     |
| max Payload (in<br>any seat)   |                 | 110 kg | 245 lbs  |     |
| Baggage Maximum                |                 | 12 kg  | 26,5 lbs |     |
| max Payload see Flight manual  |                 |        | page 43  |     |

Below Canopy Frame  
Left side

| Altitude in ft.        | 0-6500 | 10.000 | 13.000 | 16.500 | 20.000 |
|------------------------|--------|--------|--------|--------|--------|
| V <sub>ne</sub> (KIAS) | 149    | 140    | 133    | 126    | 119    |

Below Canopy  
Frame  
Left side



Labels on operating  
Handles Upper center  
Console

Nose up — Trim — Nose down

Next to operating Handle

Parking brake - Pull Air Brake  
Lever then move parking brake  
lever aft

Next to Operating Handle

Baggage Maximum  
12 kg 26,5 lbs

In Baggage compartment



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Limitations

Fuel Shut Off  
Open -----

Closed

Center Console

**CAUTION**  
CANOPY MUST BE CLOSED AND  
LOCKED BEFORE STARTING ENGINE

Canopy Frame - Both Sides

Oil Temp.

Oil Pressure

Engine Instruments Right Hand  
Panel

Cylinder Head Temp.

Ignition

ON

OFF

Starter

Main Switch

ON

OFF

Fuel Pump

ON

OFF

Next to applicable switch

Main Fuse

Propeller Pitch  
2200 RPM -----  
Take Off and Cruise  
----- 1200 RPM  
Feather

Next to Propeller Control knob

Strobe Light

Landing Light

Intercom

Position Lights

Instrument Lights

ON

OFF

Next to applicable switch  
when installed as optional  
equipment

Tire Pressure  
2,1 bar .  
30 PSI

Outboard side of wheelfairings

OIL  
SAE 15W-40

Next to oil filler neck

Fuel  
AVGAS 100 LL or  
MOGAS SUPER (ROZ 97 OCZ)  
Fuel Capacity  
80 Ltr 21.1 US GAL

Next to Fuel filler neck

AIRBRAKE - PULL  
Wheelbrake at end of travel

On airbrake handle

Canopy Jettison

Next to Canopy Jettison handle

NO STEP

Main Wheel Fairings

NO PUSH

Ailerons, Rudder and Elevator

OPEN - CLOSED

Next to Canopy Handles

FULL - THROTTLE - IDLE

next to throttle

Tachometer indicates  
RPM to high  
to low

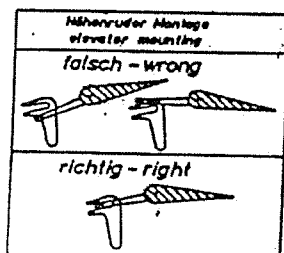
next to Tachometer

Before removing  
battery insulate  
Rudder cable

next to battery storage

approved aerobatic manoeuvres:  
ALL AEROBATIC MANOEUVRES  
INCLUSIVE SPIN AND  
FLIGHTS IN CLOUDS  
ARE FORBIDDEN!

Below Canopy Frame  
Left Side



left side of vertical fin

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H 36 DIMONA

3  
Emergency Procedures

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EMERGENCY PROCEDURES

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### 3.1 Stalls, Power On:

On coming stall warning can be recognized by buffeting on the aircraft and a loss of positive control in the stick and pedals. If permitted to continue, the aircraft will stall and roll over on the stalled wing. A spin may result. When buffeting is encountered relax back pressure on the stick, and if available, add power. Recovery from a clean stall will result in an altitude loss of about 40 meters (130 ft).

### 3.2 Stalls, Power Off, Prop Feathered:

On coming stall warning is buffeting as with power on, however, the aircraft will not roll on a wing and can be held level with aileron and rudder control. The aircraft will sink vertically at a rate of 700 fpm. Stall recovery in this mode is to relax back pressure on the stick.

### 3.3 Spin Recovery:

Reduce power and push control stick full forward. Apply full rudder opposite to spin rotation. Recover smoothly from the dive.

#### C A U T I O N

The aerodynamic clean form of the DIMONA permits speed to build rapidly.  $V_{ne}$  must not be exceeded. Immediate spin recovery will result in an altitude loss of 280 ft.

#### C A U T I O N

If, under unfavourable circumstances with engine idle a flat spin will result, recover immediately as above but add power.

3.4 Engine Failure during Take-Off:

Check immediately      Fuel valve - ON position  
                                 Fuel pump - ON position

If these are not the cause of engine failure, and the altitude is less than 300 ft, land straight ahead. If more than 300 ft altitude are available, a 180° turn in the glider mode can be made. The propeller should be feathered to reduce drag.

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H 36 DIMONA

Emergency Procedures<sup>3</sup>

### 3.5. Engine Failure during flight:

Check immediately : Fuel Valve - ON position  
Fuel pump - switch ON

If the engine does not start or run, feather prop and establish a glide. Best glide ratio will be accomplished at an airspeed of 105 km/h (57 kts).

### 3.6 Emergency Landing:

Choose a suitable field while altitude is available. Once you have made your decision, stick to it! Observe wind direction and on final approach position the aircraft to land into the wind. Attempt to land to a point with minimum ground roll. Prior to touchdown, all switches - OFF.

Should engine power still be available, the selected landing site should be surveyed while airborne to see if obstacles exist.

After landing - Throttle - Closed, all switches - OFF.

### 3.7 Icing

Attempt to leave the icing area as soon as possible. If necessary, change altitude to escape icing layer. Continue to move controls to prohibit lockage from ice. When the canopy is iced over, the weather window may be opened.

### 3.8 Carburetor Icing

Throttle - FULL POWER.  
Attempt to leave icing area as soon as possible, if necessary, change altitude.

### 3.9 Water Landing:

Stop engine and feather propeller. On final approach jettison canopy. Land with minimum airspeed. On touchdown protect your face with the left arm. After touchdown release seat harness and exit aircraft.

3.10 Engine fire during flight:

Throttle - full power  
 Fuel Valve - OFF  
 Cabin Heat - Push , Cabin air - Pull  
 Ignition - OFF when engine stops  
 Slipping the aircraft can keep smoke and flames from the cockpit  
 Execute normal landing from a glide

3.11 Electrical Fire during flight:

Main Switch - OFF  
 Circuit breakers - PULL OFF

The engine will continue to run. Land as soon as practical or at the next airfield

3.12 Canopy Jettison - Aircraft exiting during flight:

With engine running - Throttle CLOSED  
 Ignition OFF

With engine stopped - Prop feathered - Turn prop feather handle to START

Red Canopy jettison knob on lower console - PULL  
 Red Canopy locks, left and right - swing AFT

Place both hands above your head against canopy - PUSH

Release safety harness, evacuate the aircraft, left and right

When using a manual parachute release, wait two seconds before activating parachute.

3.13 Jamming of Starter Relay Contacts:

- While airborne - Main Switch - Off  
                           Circuit breakers - Off  
                           After 30 seconds - Main Switch - On  
                           Circuit breakers - On  
                           If red Warning Light flashes up again proceed with 3.11, Electrical Fire during flight
- On ground - Don't attempt a take-off  
                           Main Switch - Off  
                           Ignition - Off

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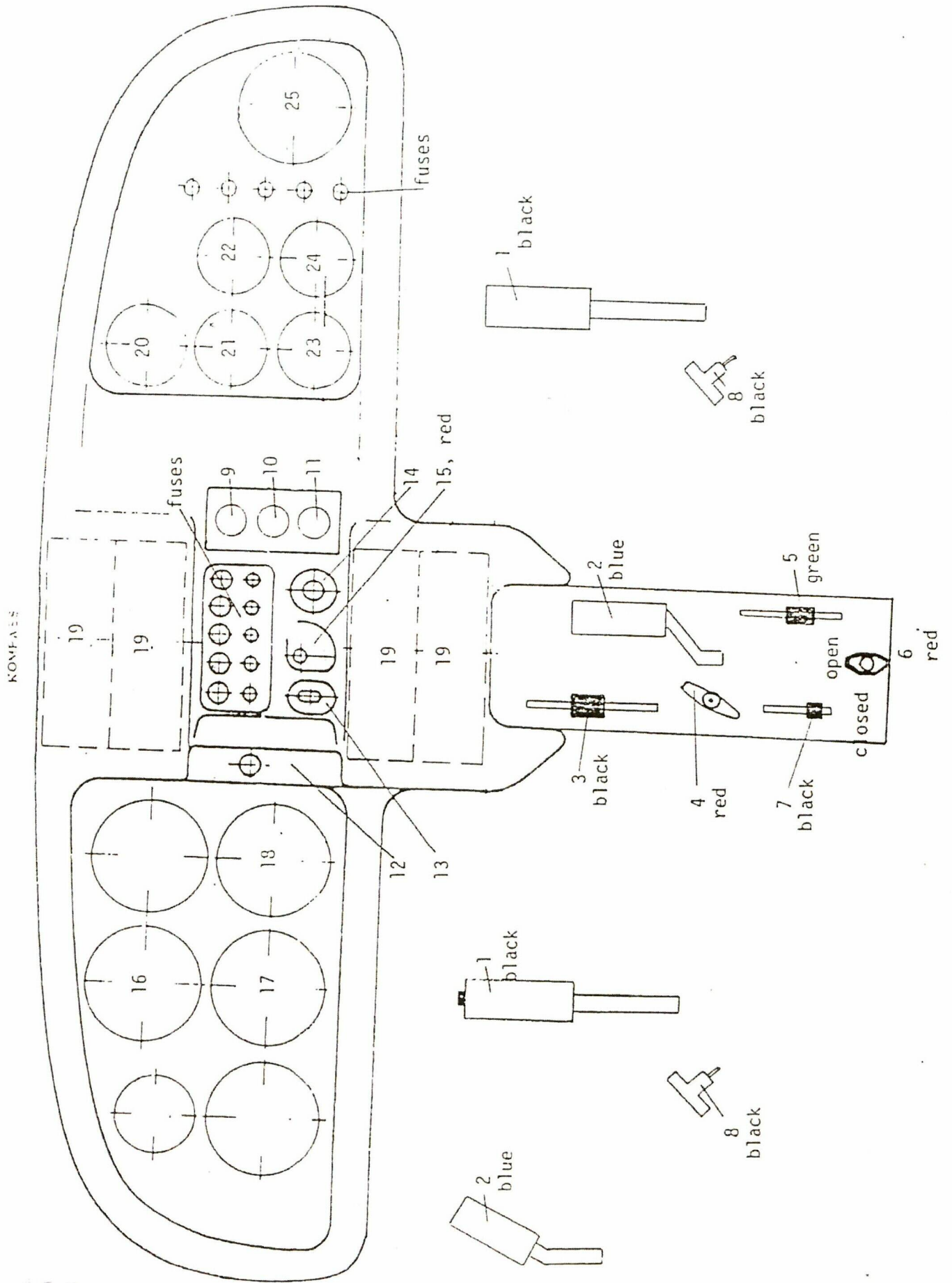
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## Normal Procedures

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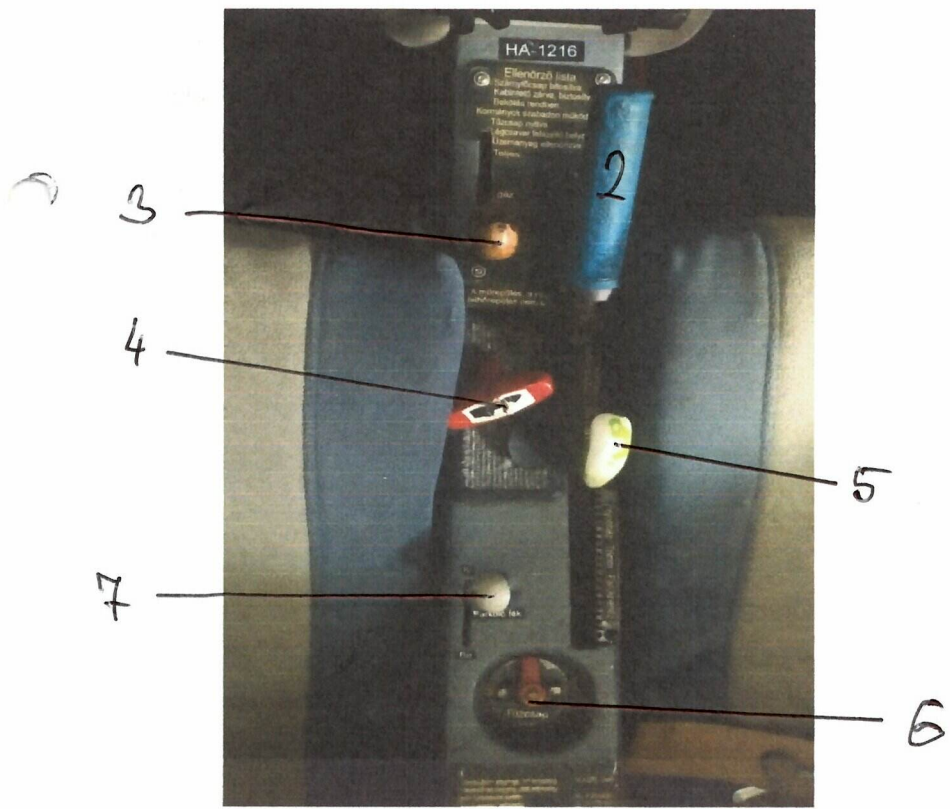
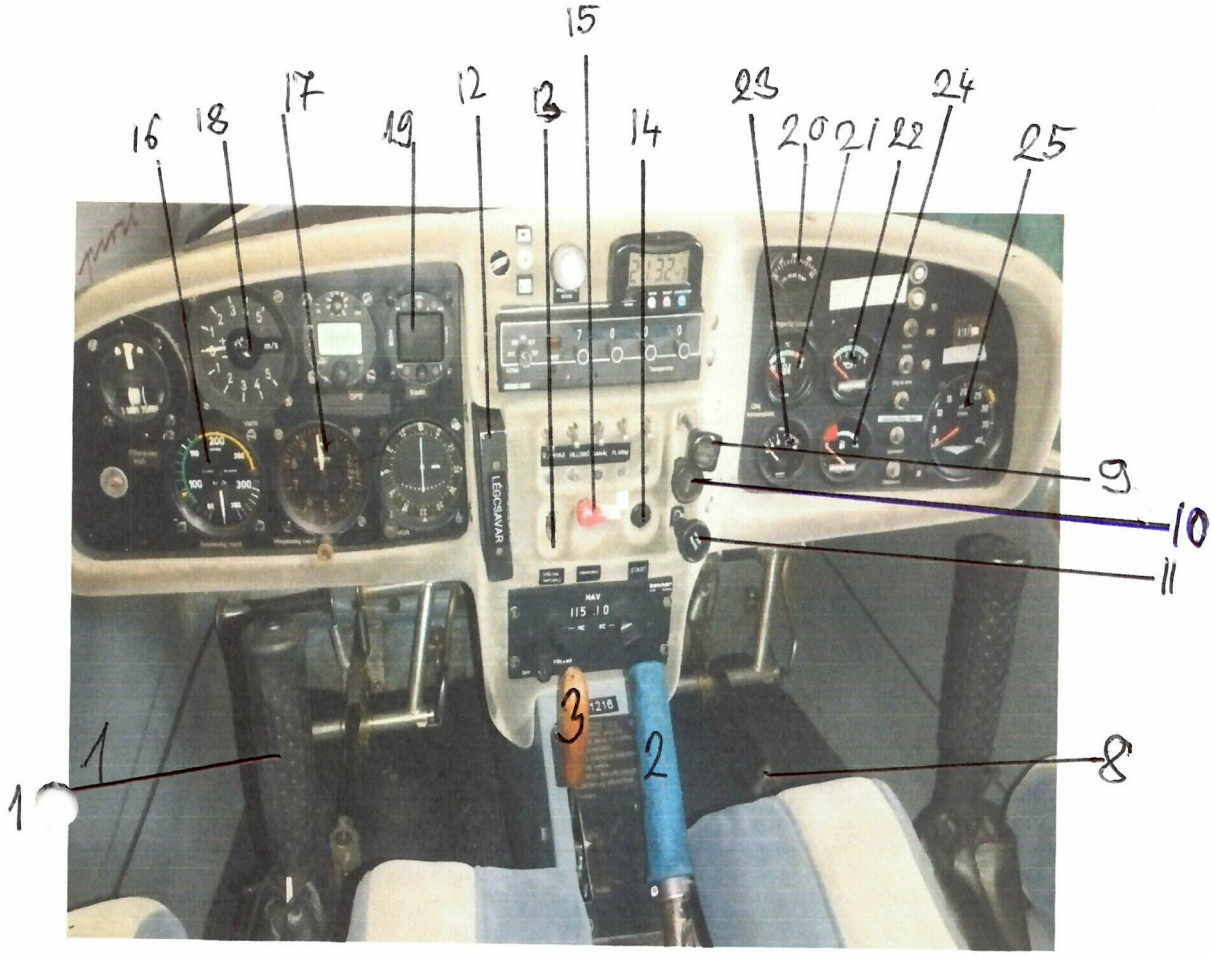
5. Nov. 1965

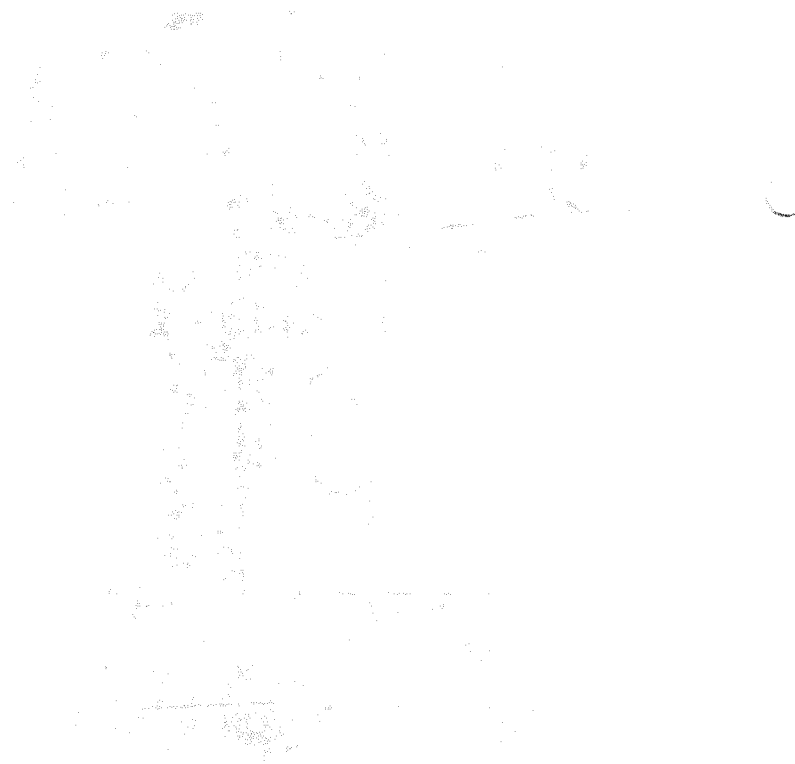
4.1 Cockpit Layout and Controls Illustration:

- 1 - stick
- 2 - airbrake lever
- 3 - throttle
- 4 - canopy emergency jettison
- 5 - trim
- 6 - fuel shut off valve
- 7 - parking brake
- 8 - Rudder ped. adj.
- 9 - cabin air
- 10 - cabin heat
- 11 - choke
- 12 - Propeller lever
- 13 - Ignition switch
- 14 - Starter button
- 15 - main switch

4.2 Instrument Console Layout:

- 16 - airspeed indicator
- 17 - altimeter
- 18 - climb speed indicator
- 19 - COM/AVIONIC
- 20 - cyl. head temp.
- 21 - oil temp
- 22 - oil press
- 23 - voltmeter
- 24 - fuel
- 25 - RPM indicator & hourmeter





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H 36 Dimona

4  
Normal Procedures

#### 4.3 Lower Console Layout:

- 2 - airbrake
- 3 - throttle
- 4 - canopy emergency jettison
- 5 - trim
- 6 - fuel shut off valve
- 7 - parking brake

#### 4.4 Preflight Inspection: (The areas where these visual checks are to be performed are illustrated in 4.5 "Walk around Guide").

1. Ignition OFF - Main Switch OFF
2. Open engine cowling - CHECK:
  - Oil Level
  - Security of engine controls
  - Engine and engine parts for security and damage
  - Foreign objects in engine compartement
  - Close engine cowling
3. Main Landing Gear - CHECK:
  - For excessive wear, cuts, abraisions
  - Wheel fairings for condition and security
  - Tire Pressure 2.1 bar (30 psi)
4. Right Wing - CHECK
  - Fiber Glass Skin for damage or cracks
  - Ailerons and push pull tubes for security and condition
  - Air Brakes and torque tube for security and condition
  - Wing Tip and position light for security and condition
5. Aft Fuselage - CHECK
  - Fiber Glass Skin for damage or cracks

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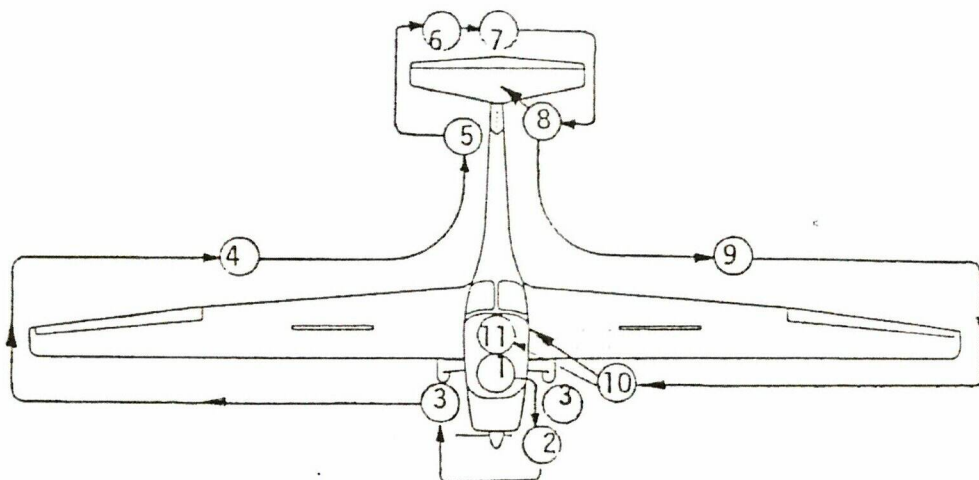
4  
Normal Procedures

6. Elevator and Horizontal Stabilizer - CHECK:  
Fiber Glass Skin for damage or cracks  
Excessive play in mounting lugs  
Mounting lugs safetied?
7. Rudder and Fin - CHECK:  
Fiber Glass skin for damage or cracks  
Excessive play in mounting lugs  
Rudder connected?  
Remove Pitot tube cover!
8. Tailwheel assembly - CHECK:  
Fairing for condition  
Tire pressure 2.1 bar (30 psi)
9. Left wing - CHECK:  
Perform same check as right wing
10. Fuel Tank Drain - CHECK:  
Drain for two seconds. Inspect for dirt or water
11. Cockpit - CHECK:  
Wing quick disconnects LOCKED?  
Controls for freedom of movement  
Required documents
12. Latching hook - CHECK:  
hooks hooked into links and secured ?

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4  
Normal Procedures

4.5 Walk around guide:



4.6 Before starting engine:

1. Canopy ---- LOCKED
2. Rudder Pedals ----ADJUSTED
3. Fuel Shutoff Valve-----OPEN
4. Controls -----FREE
5. Airbrakes -----Extend - Retract
6. Parking Brake - ON
7. Prop Control -----MOVE ONE CYCLE
8. Altimeter -----SET
9. Master Switch-----ON
10. Fuel Quantity -----CHECK
11. Baggage -----SECURE
12. Seat Harness ---- ON and LOCKED
13. Canopy -----RECHECK LOCKED

4.7 Starting Engine:

1. All Switches except Master - Off
2. Choke - Pull
3. Throttle - Open one inch
4. Boost Pump - On
5. Ignition - On
6. Propeller Area Clear - Check
7. Starter Button - Press
8. Red Warning Light - Check
9. Oil Pressure - Check, Oil pressure should be in Green Range in 10 seconds

After Engine starts release Starter Button. If Red Warning Light continues to burn after releasing Starter Button proceed with 3.13, Jamming of Starter Relay Contacts. Adjust Throttle to 1000 RPM. When engine is running smoothly - close the choke.

10. Voltmeter - Check for 14 VDC
11. Radio and NAV. Equipment - On after engine runs

Allow engine to run for two minutes at 1000 RPM, then increase RPM to 1500 until the oil temperature indicates 50°C. The 1500 RPM phase can take place during taxiing.



4.8 Before Take-Off Check:

1. Parking Brake ---ON
2. Throttle----OPEN to 2200 RPM
3. Propeller Lever----PULL and RELEASE  
The propeller should now change to Cruise pitch
4. Throttle ----OPEN --MAX POWER MAX RPM 2300 !
5. Throttle-----IDLE RPM
6. Propeller Lever ----PULL AND RELEASE  
The propeller should now switch back to Take-Off position
7. Throttle ----OPEN ----MAX POWER--- RPM 2700 - 2900

## C A U T I O N

If the RPM setting is not obtained repeat steps 5 and 6. If a take-off is attempted with the propeller in cruise position, a significantly longer take-off roll will result!

4.9 Take-Off and Climb:

1. Parking brake --- release
2. Fuel pump --- on
3. Line up in Position
4. Trim ---SET
5. Throttle -----FULL POWER (Not less than 2700 RPM)
6. Control Stick --- Light forward pressure, steer with rudder at about 80 km/h (50 mph). The aircraft will fly itself from the runway.
7. Controls & Trim ---ADJUST to obtain climb speed of 95 km/h (59 mph) (Blue line)
8. Fuel Pump ---At 350 feet ---OFF
9. Engine instruments ----CHECK

4.10 Cruise:

To change propeller position from Take-Off to Cruise the RPM must be between 2000 and 2200. Pull and release the propeller control. A 500 RPM drop should occur without throttle adjustment. The throttle can then be opened for Cruise power (2500 - 3000 RPM) as required.

NOTE

In the cruise mode the throttle can be reduced by 1/3 for fuel economy without a noticeable loss of airspeed.

4.11 Engine Shut-down and Restart in flight:

SHUT-DOWN

1. Throttle ---Close to IDLE (for 2 minutes)
2. All electrical equipment not needed --- OFF
3. Propeller control PULL - TURN LEFT  
The propeller is now feathered and the windmilling effect on the engine will cease.
4. Ignition - OFF

RESTART

1. Choke (with cold engine) ---PULL
2. Ignition ---- ON
3. Propeller Control --- TURN TO START POSITION  
The windmilling effect should cause the engine to start. Should the speed not produce the windmilling use the starter to effect RPM.
4. Red Warning Light - CHECK  
If the Red Warning Light continues to burn after releasing the starter button proceed 3.13. Jaming of Starter Relay Contacts.
5. Throttle ---IDLE (until oil temperature indicates 50° C). To return to cruise flight the propeller control must be again set as in Par. 4.10.

4.12 Soaring:

When updrafts are encountered reduce power to idle. If positive vertical velocity, shutt off engine as in Par. 4.11

Circle climb while maintaining a speed of 90- 95 km/h (56 - 60 mph). To return to powered flight refer to Par. 4.11.

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Normal Procedures

4.13 Permitted Aerobatic Manoeuvres:

ALL AEROBATIC MANOEUVERS INCLUSIVE SPIN AND FLIGHTS IN  
CLOUDS ARE FORBIDDEN

4-10

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4  
Normal Procedures

#### 4.14 Decent and Approach:

Decent with power as required to obtain 180 km/h (112 mph). When entering pattern the propeller should be switched to START position. When turning base leg reduce power to bring the RPM under 1500 RPM. On final electric Boost Pump - ON, Airspeed - 95 km (60 mph), Yellow Triangle.

#### 4.15 Landing:

Airspeed - Reduce  
Airbrakes - as required  
Throttle - Closed  
Touchdown - Back pressure on stick to produce  
3 point attitude

#### C A U T I O N

Do not apply full airbrake at touchdown. The coupling with the brake system will result in landing with blocked wheels!

#### 4.16 Engine Shut-Down:

Parking Brake - As required  
Throttle - closed (idle engine for 2 minutes for cooling)  
Radios and NAV. Equipment - Off  
Electrical Switches - Off  
Ignition - Off  
Master switch - Off

#### C A U T I O N

If, due to taxiing the brakes have been used excessively, over-heating may result. Do not set the parking brakes until the brakes have cooled.

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4  
Slip

#### 4.17 Slip:

##### 4.17.1 Entry and Recovery:

Slip is practicable from 80 km/h (43 kt) (50 mph) to 120 km/h (65 kt) (75 mph).

- Throttle idle
- Apply aileron control in direction of intended slip.
- Apply opposite rudder simultaneous.
- To maintain desired airspeed apply aft stick.
- Use airbrakes additionally if required.

Recover:

- Reset controls in neutral position.

##### 4.17.2 Characteristics:

Yaw up to  $35^{\circ}$  and bank up to  $10^{\circ}$  are practicable with full rudder and suitable aileron control. High yaw angles require extensive elevator deflections up to the rear stop of the stick.

#### N O T E

|  |
|--|
| Stall is not possible in the slip. At rear C.G. positions, nose pitches down slowly. Speed after recovery is not less than 80 km/h (43 kt) (50 mph). |
|--|

Rates of descent from 3 m/s (600 ft/min) to 8 m/s (1600 ft/min) are attainable dependent on airspeed and yaw.

#### 4.17.2 Characteristics cont.:

At low airspeeds and high yaw angles rudder control force reversal may occur. Recover force does not exceed 20 N (4 pounds). If aileron control is reset to neutral, rudder returns to neutral without assistance.

#### N O T E

Bank angles above  $10^{\circ}$  cause a turn in slip direction. Airspeeds above 120 km/h (65 kt) (75 mph) cause the same effect.

#### C A U T I O N

Due to high rates of descent recover from slip at least 20 m (60 ft) above ground level !

#### 4.17.3 Indicated Airspeed Errors:

At yaw angles below  $25^{\circ}$  indicated airspeed error does not exceed 12% of CAS.

At higher yaw angles airspeed indication is no longer interpretable due to wing wake on the pitot static tube.

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5  
Performance Data

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Section 5

PERFORMANCE DATA

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Performance Data

### 5.1 Take-Off Distance:

All figures are based on ICAO standard atmosphere, Gross Weight of 770 kg (1698 lbs). Airfield conditions: calm wind, dry flat surface with short grass.

Take-Off speed: 80 km/h IAS (50 mph)  
Climb speed: 85 km/h IAS (53 mph)

| Field<br>Elev.   |       | Outside Air Temp. C |         |      |      |      |
|--|-------|---------------------|---------|------|------|------|
|  |       | -15                 | 0       | +15  | +30  |      |
| Take-Off roll<br>until lift off                                | (mtr) | ft.                 | m       |      |      |      |
|  | 0     | 0                   | 185     | 196  | 207  | 218  |
|  |       |                     | ft 607  | 643  | 679  | 715  |
|  | 250   | 810                 | m 191   | 202  | 213  | 224  |
|  |       |                     | ft 267  | 663  | 699  | 735  |
| 500  | 1625  | m 197               | 208     | 220  | 231  |      |
|  |       | ft 646              | 682     | 722  | 758  |      |
| 750  | 2438  | m 203               | 215     | 227  | 238  |      |
|  |       | ft 666              | 705     | 745  | 781  |      |
| 1000   | 3250  | m 209               | 221     | 234  | 246  |      |
|  |       | ft 686              | 725     | 768  | 807  |      |
| Take-Off<br>Distance to<br>clear 15 mtr<br>(50 ft)<br>obstacle | 0     | 0                   | m 305   | 333  | 361  | 389  |
|  |       |                     | ft 1001 | 1043 | 1184 | 1276 |
|  | 250   | 810                 | m 320   | 348  | 375  | 403  |
|  |       |                     | ft 1050 | 1142 | 1230 | 1322 |
|  | 500   | 1625                | m 334   | 362  | 391  | 419  |
|  |       | ft 1096             | 1188    | 1283 | 1375 |      |
| 750  | 2438  | m 349               | 378     | 406  | 434  |      |
|  |       | ft 1145             | 1240    | 1322 | 1424 |      |
| 1000   | 3250  | m 363               | 394     | 426  | 457  |      |
|  |       | ft 1191             | 1293    | 1398 | 1499 |      |

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Performance Data

### 5.2 Landing Distances:

All figures are based on ICAO atmosphere, Gross Weight of 770 kp ( 1698 lbs). Airfield conditions: Calm wind, dry, flat surface, with short grass.

Approach speed - 95 km/h (60 mph) Yellow Triangle Marking

Touchdown speed - 70 -75 km/h (44 -46 mph)

Landing Roll - 198 mtr (643 ft)

Landing Distance

(over 50 ft obstacle) - 378 mtr (1.228 ft)

### 5.3 Rate of Climb:

Rate of climb, propeller in START position

95 km/h (60 mph) IAS 2.8 m/s 532 fpm

Rate of climb, propeller in CRUISE position

120 km/h (75 mph) IAS 2.0 m/s 394 fpm

### 5.4 Cruise speed:

At maximum continous RPM ~~(3000 RPM)~~ 2700 RPM

Straight and Level Flight - 190 km/h (118 mph)

### 5.5 Range:

At a cruise speed of 180 km/h

the range is 960 km

with no reserve.

Wind factor is not considered.

At a cruise speed of 160 km/h

of 1.500 mtr (5000 ft) the range is 1000 km

at an altitude with no reserve. Wind factor is not considered.

### 5.6 Fuel Consumption:

At an altitude of 1.500 m (5.000 ft) the fuel consumption

is: 150 km/h - 12 l/h (3.16 US Gal)

180 km/h - 15 l/h (3.95 US Gal)

### C A U T I O N

The fuel quantity indicator has an error factor of  $\pm 10\%$ . Take-Off with less than 1/4 tank indication is prohibited!

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Performance Data

5.7 Maximum Altitude:

Aircraft weight; 770 kg, ICAO standard atmosphere.

The DIMONA has demonstrated the ability to climb  
to 5.500 m NN (18.045 ft).

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H 36 DIMONA

6  
Weight & Balance  
Equipment list

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Section 6

WEIGHT AND BALANCE  
EQUIPMENT LIST

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| 6.5 Additional Equipment list .....                | 44      |

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H 36 DIMONA

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Weight & Balance  
Equipment list

6.1 Empty Weight:

The DIMONA is weighed at the factory after the minimum equipment and extra accessories have been installed. The weight and the empty weight CG is entered upon the weight report found in Par. 6.3. Should, at some time the aircraft be repaired, or additional equipment added, the aircraft should be reweighed to adjust the weight report accordingly. After removing or adding equipment a sample weight & balance problem should always be performed to insure the CG limits have not been exceeded.

6.2 Reference Datum Line (RDL) and CG Limits:

The reference datum line (RDL) is the leading edge of the wing at the wing root rib. The aircraft leveling point is the underside of the wing, mid chord.. The CG Limits are measured in mm from the RDL aft.

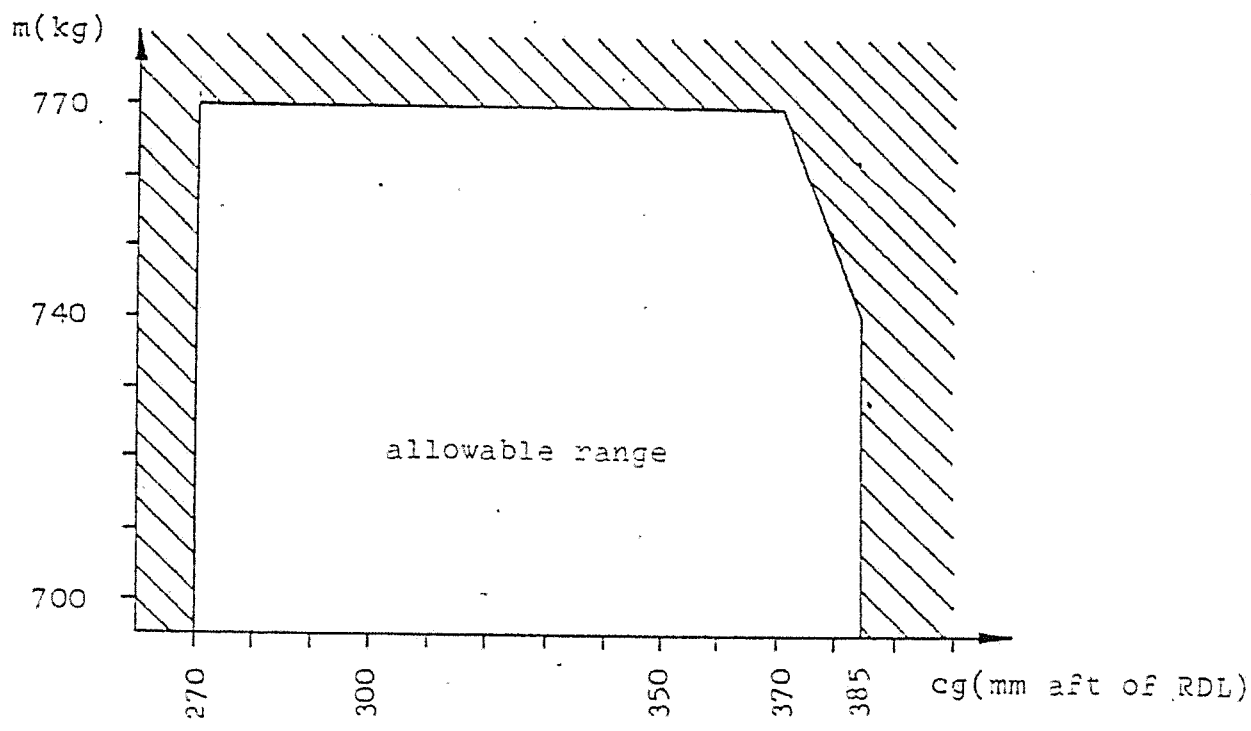
Forward CG Limit: 270 mm

Aft CG Limit :

- Up to 740 kg: 385 mm

- At 770 kg: 370 mm

Between 740 and 770 kg linear run between 385 and 370 mm.



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Weight & Balance  
Equipment list

Sample Problem: Pilot 80 kg, Co-Pilot 100 kg,  
Baggage 10 kg, Empty Weight 520kg  
Empty Weight CG 340 mm, Fuel 80ltr/57,6kg

|              | Arm<br>(mm) | Weight<br>(kg) | Moment<br>(kg.mm) |
|--------------|-------------|----------------|-------------------|
| Empty Weight | 340         | 520            | 176.800           |
| 1. Pilot     | 143         | 80             | 11.440            |
| 2. Pilot     | 143         | 100            | 14.300            |
| Baggage      | 834         | 10             | 8.340             |
| Fuel         | 834         | 57,6           | 48.038            |
|              |             | 767,6          | 258.918           |

The result of the above problem places the CG at 337,3 mm which is within the allowable range. An additional problem may be calculated, for example, that all the fuel is consumed and the aircraft will continue to fly and land as a glider. By removing the 57,6 kg of fuel and the moment, the resultant CG will be 297 mm, still within the allowable CG range.

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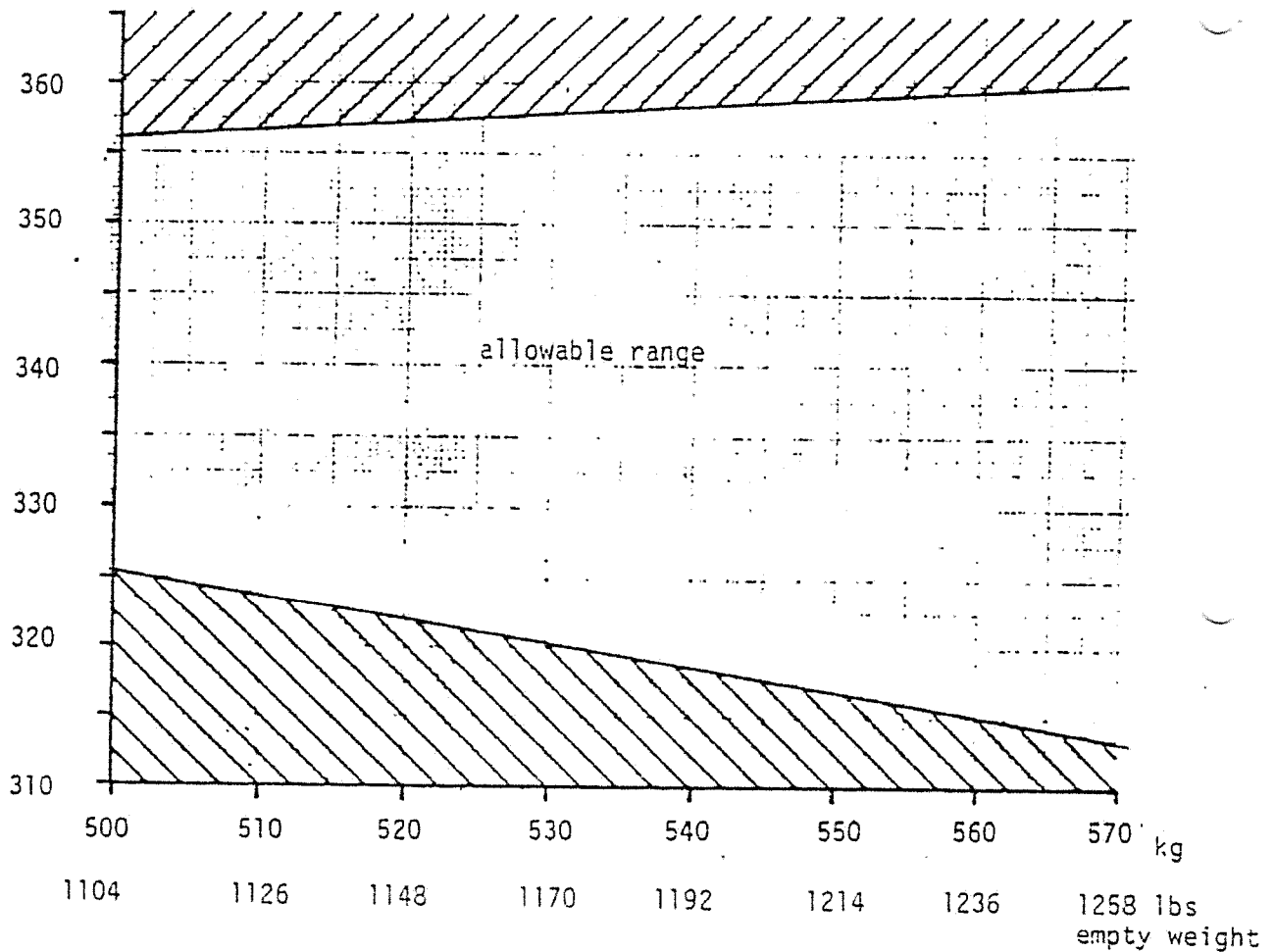
Weight & Balance  
Equipment list

6.2. cont.

Empty weight CG limits:

With a min. weight of 70 kg (155 lbs) in pilot's seat, the CG will be within the allowable range, if the empty weight CG is within the limits shown below:

Empty weight CG  
(mm aft of RDL)



125 May 1988

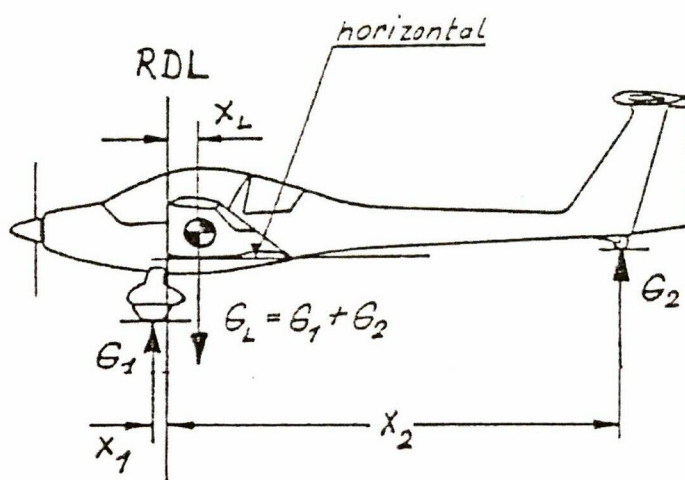
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Weight & Balance  
Equipment list

6

6.2. cont

Determination of empty weight CG position:



Put  $x_1$  and  $x_2$  with their absolute value in mm into the formula :

$$x_L = \frac{x_2 \cdot G_2 - x_1 \cdot G_1}{G_1 + G_2} \quad [\text{mm}]$$

where:

$x_L$  is the empty weight CG position in mm aft of RDL (reference datum line).

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6.3 Weighing Report:

| Date of weighing carried out by: | Equipment first used for weigh. (date) | Empty weight kg(lbs) | Empty C of G (behind datum) mm/in. | Empty weight moment. | Max. Payload kg(lbs) | Sign |
|----------------------------------|--|----------------------|------------------------------------|----------------------|----------------------|------|
|                                  |  |                      |                                    |                      |                      |      |

The empty weight momentum is necessary to calculate the CG for flight (load table).



Datum: 2017.08.13

Muster: H-36 DIMONA

Wert-Nr.: 3666

Kennz.:

Gewichte/Beladeplan

Leergewicht 574,8 kg  
 Gewicht der nichttr. Teile (einschließlich Zuladung) \_\_\_\_\_ kg  
 Mindestzuladung in Führersitz 70 kg  
 Höchstzuladung auf den Sitzen \_\_\_\_\_ kg  
 Höchstzulässige Gesamtzuladung einschl. Treibstoff \_\_\_\_\_ kg  
 Höchstzulässiges Fluggewicht \_\_\_\_\_ kg

| Einzelteilgewicht       | kg | Gew. der ntr. Teile |
|-------------------------|----|---------------------|
| Tragfläche links        |    |                     |
| Tragfläche rechts       |    |                     |
| Rumpf                   |    |                     |
| Höhenleitwerk           |    |                     |
| Haube                   |    |                     |
| Treibstoff              |    |                     |
| Trimmgewicht            |    |                     |
| Zuladung                |    |                     |
| Leergew./Gew.ntr.-Teile |    |                     |

Schwerpunktlagen:  
 $X_v$  = vordere zul. Grenze  
 $X_h$  = hintere zul. Grenze  
 Bei einem Leergewicht GL

von \_\_\_\_\_ kg  
 $X_v$  = \_\_\_\_\_ mm  
 $X_h$  = \_\_\_\_\_ mm

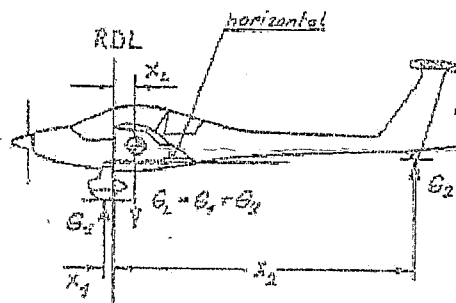
Hinter BE  
 Bei Fluggewicht:

$X_v$  = \_\_\_\_\_ mm  
 $X_h$  = \_\_\_\_\_ mm

Bezugspunkt (BP) \_\_\_\_\_

Horizont. Bezugslinie \_\_\_\_\_

BE



$$x_L = \frac{x_1 \cdot G_1 + x_2 \cdot G_2}{G_1 + G_2} \quad [mm]$$

| Auflage        | Bruttogewicht (kg) | Tara (kg) | Nettogewicht (kg) | Hebelarm (mm) | Moment (mmkg) |
|----------------|--------------------|-----------|-------------------|---------------|---------------|
| G1 (vorne)     |                    |           | 506,3             | $x_1 = 230$   | 116449        |
| G2 (hinten)    |                    |           | 68,5              | $x_2 = 4690$  | 321265        |
| Treibstoff (-) |                    |           |                   | $x_T =$       |               |
|                |                    |           |                   |               |               |
| Gesamt         |                    |           | 574,8             | $x_L = 356,3$ |               |

**Die errechnete Schwerpunktlage liegt im zulässigen Bereich!**

Der Trimmplan wurde berichtigt.

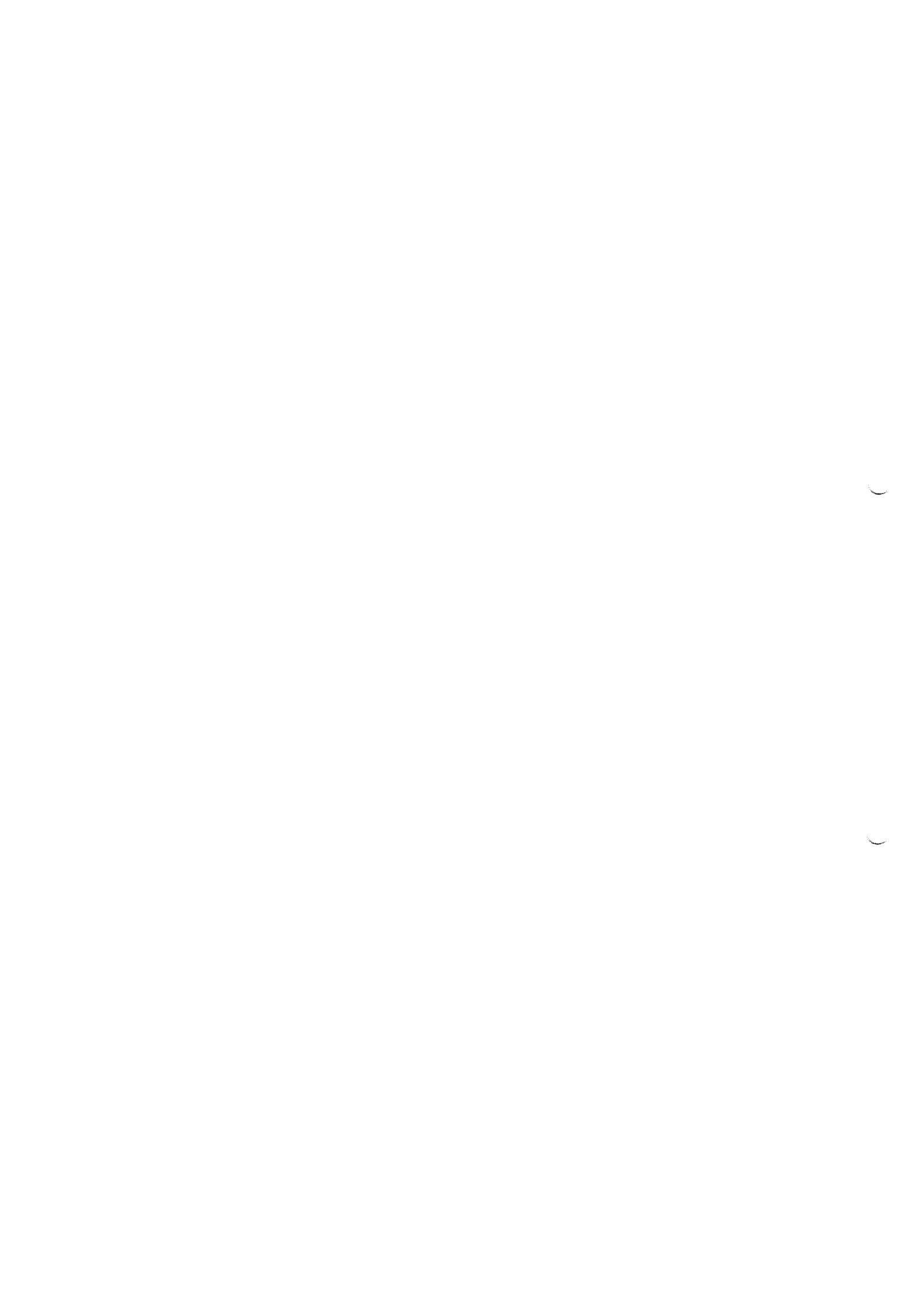
Ausrüstung des Motorseglers bei der Wägung gemäß Ausrüstungsverzeichnis vom :

Stempel

*D. G. M. C.*  
 Unterschrift

Anmerkung: Öl und Kraftstoff sind abzulassen oder in den Rechnungsgang einzubeziehen. Wägung ist nach den Weisungen des Herstellers auszuführen!

HV. 66. 2852



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Weight & Balance  
Equipment List

6.4 Minimum equipment List:

The minimum installed equipment, installed at the factory consists of the following:

1. Airspeed indicator
2. Altimeter
3. RPM indicator with hourmeter
4. Oil Pressure Indicator
5. Oil Temperatur Indicator
6. Cylinder Head Temperatur Gauge
7. Fuel Quantity Indicator
8. Voltmeter
9. Standby Compass
10. Two seats, restraint harness
11. Loading Plan
12. Data Plate
13. Flight Handbook

6.5 Additional Equipment List:

| Item | Arm (mm) | Weight (kg) | Moment (kg.m) |
|------|----------|-------------|---------------|
| 1.   |          |             |               |
| 2.   |          |             |               |
| 3.   |          |             |               |
| 4.   |          |             |               |
| 5.   |          |             |               |
| 6.   |          |             |               |
| 7.   |          |             |               |
| 8.   |          |             |               |
| 9.   |          |             |               |
| 10.  |          |             |               |
| 11.  |          |             |               |

4 E. 1005

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H 36 DIMONA

Systems Discription

SECTION 7

7.1 Cockpit Discription:

1. Instrument board:

Is in three sections, the flight instruments are on the left, engine instruments on the right, and tilted for better viewing. The center console is for the installation of COM and NAV equipment. The main switch ON position is down and OFF when turned to the right.

2. Control Stick:

One stick for each seat, with built-in microphone switch.

3. Air Brakes:

The airbrake levers are colored blue and are on the left cockpit side and the middle console. The levers have no down lock due to spring loading.

4. Rudder Pedals:

Two seats, left and right. Pulling the adjusting handle forward of the control stick, and pushing with the feet against the pedals permits forward adjustment. To move pedals aft, pull handle and let pedals snap into the desired rear position.

5. Cockpit Heat:

Pulling the knob permits heat entry thru the cabin heat duct.

6. Choke:

The choke knob closes butterfly valves in both carburetors thru cables. It must not be used to shut down the engine, and under no circumstances should a takeoff be attempted when the choke knob is activated!

7. Throttle Lever:

The throttle lever is on the lower middle console next to the Air Brake Lever. Full throttle = Lever full forward.

8. Trim:

The trim lever (coloured green) is behind the throttle on the middle lower console. To effect trim move lever to the left to clear locking lugs and move in desired trim direction, i.e. lever forward - nose down, lever aft - nose up.

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7  
System Description

8. Parking Brake:

Is located next to the trim lever on the lower middle console. To engage parking brakes pull firmly on the air brake lever, and move then park brake lever aft. Release air brake lever. To release the park brake, again pull firmly on the air brake lever and move the park brake lever forward. Pulling on the airbrake lever alone will not engage or disengage the brakes and will damage the partening brake mechanism!

9. Canopy Lock:

Are red levers located left and right on the canopy frame. To close the canopy push shut with the black grips located on the canopy frame, then turn the red levers to lock the canopy. To open the canopy reverse the sequence.

10. Emergency jettison:

The red knob is on the lower middle console next to the air brake lever. For use review Emergency Procedures, Par. 3.12.

11. Propeller Control:

The propeller control lever is on the upper middle console. For use review Normal Operations, Par. 4.8.

12. Fuel Shut-Off:

Located on the lower rear, middle console. The valve is open when positioned to line of flight (fore and aft).

13. Seat Adjustment (special equipment)

To adjust for height, pull seat up and reset in lugs to the desired height. To adjust for tilt, seatback pulled forward, and reset the horizontal tube in the desired lugs. Push seat back to original position.

25 Nov. 1945

Hoffmann  
H 36 DIMONA

Aircraft Handling<sup>8</sup>  
and Servicing

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Section 8

AIRCRAFT HANDLING  
AND SERVICING

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1 1 Apr 1955

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Aircraft Handling  
and Servicing

8.1 AIRCRAFT ASSEMBLY:

1.

Inspect all bolts and bushings for condition and apply a light coat of grease.

- WINGS -

2.

Move the trim lever to full NOSE DOWN position  
Open latching - hooks.

3.

Place the mounting lever on the mounting lug, located in the rear middle console

4.

Unhook the wing (either wing) from its hanging mount. By holding it by the wing tip pull the wing outboard on its carrying tube

5.

Then walk forward until the wing is 90° from line of flight

6.

Rotate the wing until the root ribs are parallel and push wing into fuselage. An assistant at the wing trailing edge should observe the smooth insertion of the two shear bolts. Let latching - hooks snap into links !

7.

Move the wing tip up and down lightly while the assistant locks the main mounting bolt by pushing up on the mounting lever. The aileron and airbrake drive units are automatically hooked up.

8.

Install the other wing in a similar manner. The wide tread of the DIMONA landing gear allow the mounted wing to support itself and it requires no outside support.

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9.

After both wings have been mounted remove the mounting lever and install the safety clip in the main mounting bolts.

- HORIZONTAL FIN & ELEVATOR -

1.

Position Fin above Vertical Fin

2.

Raise Elevator slightly and firmly, push fin aft against the stop

3.

As you push the fin aft guide the elevator drive fork into the elevator lug

4.

Lock safety pin and secure with a cotter pin

- FINAL ASSEMBLY -

1.

Plug in compensation nozzle - if desired

2.

Apply tape, if desired to gap between wing and fuselage

CAUTION

Check elevator control for proper connection and inspect elevator actuator inserted in driving fork



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## 8.2 AIRCRAFT DISASSEMBLY:

1.

Aircraft dis assembly is performed by reversing the steps outlined in 8.1

## 8.3 TRANSPORTING THE AIRCRAFT:

1.

For road transportation a closed trailer should be used. The components should be cushioned and protected against slippage or free movement. Chocks for all three wheels are excellent for this purpose.

2.

The fuselage is transportable on the main gear and tail wheel. The fuselage unit should be tied down or blocked to prevent fore and aft and vertical movement. The propeller should be checked to insure enough clearance in the trailer.

3.

The wings do not have to be removed for road transportation. The wing remains attached to the fuselage by the telescopic tube. When folded, the wing should be cushioned by a 400 mm wide profile cushion under the butt rib. This will prevent the telescopic tube from damage. An additional profile cushion should be placed about 4 m (13 ft) outboard of the butt rib. The cushion should be at least 300 mm (14 in) high.

The wing should be tied down to prevent rearward movement. The rear shear bolt on the fuselage should be padded to prevent damage to the wing skin.

The horizontal fin and elevator can be placed in the trailer flat or vertically. The retaining straps or profile cushions must be cushioned or padded to prevent damage to the unit.

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#### 8.4 STORAGE:

For hangar storage the wings can be folded as in Par. 8.2. The wing tips can be hung from the horizontal fin with the provided support fixtures. The rear shear bolts on the fuselage should be padded to protect the wing skin.

Should the aircraft be placed in extended storage, it is recommended that profile cushions be placed under the wing as in Par. 8.3.3.

The storage room or hangar should have good air circulation in order to preclude moisture build-up.

#### 8.5 CLEANING THE AIRCRAFT:

The entire surface of the DIMONA is painted with a weather proof two component paint. Regardless, the aircraft should be protected against excessive moisture or dampness. The aircraft should not be placed in open or unprotected storage for long periods of time.

Dirt, insects etc. can be removed by washing, using warm water and a mild detergent.

For stubborn spots an automotive paint cleaner can be used.

For best result the aircraft should be cleaned after the day's flying is ended.

The lower fuselage surfaces should be inspected for oil and exhaust stains. These can be removed with a cloth moistened with stoddard solvent or dry cleaning fluid. The areas where oil is present, i.e. breather tubes should be inspected to insure that the oil has not damaged the paint finish.

Polishing the aircraft can be done by using a good quality automotive wax. The plexiglass canopy should be washed with warm water and a mild detergent. Final cleaning is done with a chamoix or a soft cotton cloth. Do not rub or polish dry plastic!

Several good anti-static plastic cleaners are available at Aviation Supply Houses, and can be used.

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9  
Supplements

Table of Contents

Section 9

SUPPLEMENTS

Paragraph:

Page

SUPPLEMENT NO. 1  
(INDIVIDUAL WHEEL BRAKING SYSTEM)

SEE SB 42



# Maintenance-Instruction Manual Sauer-Engine S 2100-1-SS1

## Attention

1. Please notice this manual is very essential for safety and security run of this engine.
2. This engine is hydrotapped-actuated (hydrolifter)  
Tapped adjusting screw with lockunit is permanent fixed and **not** to be adjusted !

Approval of translation has been done by best knowledge.

In any case the original text in german language is mandatory !



## Operating Manual S 2100-1-SS1

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**1. General**

## 1.1 Status of correction:

| <u>Nr.</u> | <u>Page</u> | <u>Reference</u> | <u>Date</u> | <u>Signature</u> |
|------------|-------------|------------------|-------------|------------------|
| 1          | 5/6         | TM Nr.9          | 11.11.1996  |                  |
| 2          | 5/6         | TM Nr.9          | 11.11.1996  |                  |
| 3          | all         | TM Nr.15 B       | 19.05.2003  |                  |





## 1.2 Register of valid pages

| Page | Edition    |
|------|------------|
| 1    | 01.03.2003 |
| 2    | 01.03.2003 |
| 3    | 01.03.2003 |
| 4    | 01.03.2003 |
| 5    | 01.03.2003 |
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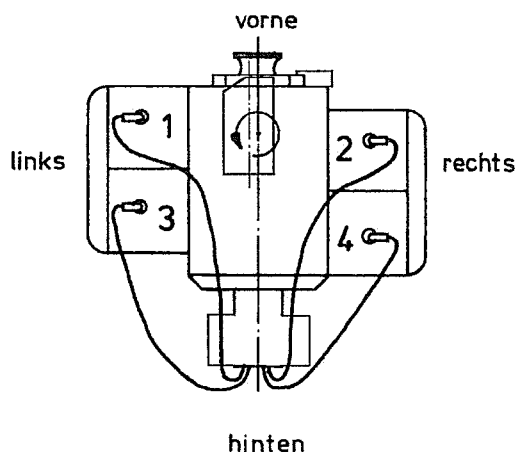
## 2. Structural description of engine

- aircooled four stroke „otto“-engine
- sequence of cylinder: horizontal, two cylinder each, opposite
- oil pressure lubrication by gearpump
- ignition by magnet
- ignition equipment: System Sauer
- Propeller actuation direct
- electr. starter
- A.C. voltage generator
- mechanical fuel pump
- two carburettor

### 2.1 Typedesing

**S 2100-SS1**

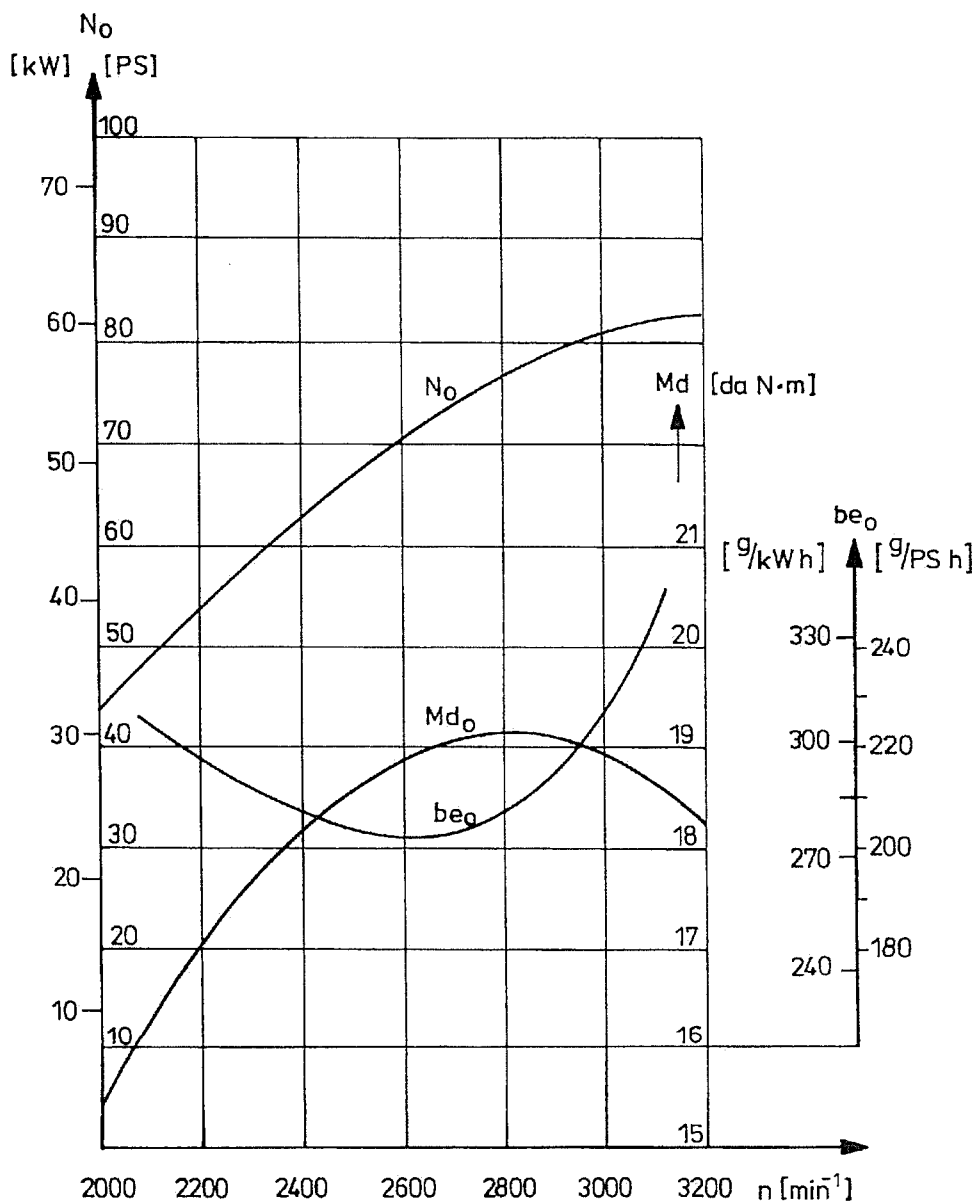
### 2.2 Sequence of cylinder





**4. Powerdiagramm**

**Characteristic of engine S 2100**





## 5. Operating instruction

The described maintenance and running instructions are basic necessity and strictly to be followed to guarantee a long and successful run of the engine!

### 5.1 Before start up:

- Ignition "off"
- daily checkup performed ? (page 13)
- Gaslever area and clearance to be checked
- turn engine by hand, easy going ?
- check funktion of clutch of the ignition magnet.
- Listen for strange and abnormal noise

### 5.2 Start up

- |                              |   |
|------------------------------|---|
| - Brake                      | closed  |
| - Fuelvalve                  | open  |
| - Gaslever                   | locked <b>!!!</b>   |
| - Masterswitch               | on  |
| - Choke                      | pull  |
| - Ignition                   | on  |
| - Starter                    | switch on   |
| - Start engine with 1000 rpm |   |
| - Oilpressure                | after 5 sek. pressure<br>to be indicated on the<br>gauge. |

### 5.3 Warm up and break check:

- Engine to be run for appr. 2 min. with 1000 to 1500 rpm.
- Wait until oiltemperatur reaches 50 degree C.
- Check rpm by 2000 an max. rpm  
(see also flyhandbook of you aircraft)

**Attention! Don't overheat the engine during testrun on the ground**



### 3. Technical specification

#### 3.1 Measurements and weight

|                         |                       |
|-------------------------|-----------------------|
| Bore:                   | 90 mm                 |
| Stroke:                 | 84 mm                 |
| Pisten capacity:        | 534,4 cm <sup>3</sup> |
| Displacement, in CC:    | 2138 cm <sup>3</sup>  |
| Compression Ratio:      | 8,5 : 1               |
| Direction of crankshaft | anti-clockwise        |
| Weight:                 | 69 kg                 |

dry, without airguide sheets exhaust system, but with starter and ignition device..

#### 3.2 Equipment - accessories

|                       |                                |
|-----------------------|--------------------------------|
| Ignition device:      | Slick 4330 oder                |
| Firingtime:           | 25° v. O.T.                    |
| Sequence of firing:   | 1-3-2-4                        |
| Sparkplugs:           | BERU 14-6 DU, NGK BCP 6 E      |
| Clearance electrodes: | 0,5 mm                         |
| Thread of sparkplugs: | M14 x 1,25 x 19, M12 x 1,25    |
| Ignition accessories  | System Sauer                   |
| Caburretor:           | Bing 64/32                     |
| mech. fuel pump:      | BCD                            |
| Generator             | Kubota, o. N/D TEC 31400-72011 |
| Starter               | Valeo                          |
| Oilcooler             | Chausson 1220/4, or variable   |
| Oilfilter             | Mann W77                       |
| Gear for Starter      | 129/st                         |



Operating Manual S 2100-1-SS1

**3.3 Power**

|                      |  |
|----------------------|--|
| Startcapacity (5min) | 80/59 PS/kW bei 3000 min <sup>-1</sup> |
| Permanent capacity   | 73/54 PS/kW bei 2700 min <sup>-1</sup> |

**3.4 Revolution**

|                         |                        |
|-------------------------|------------------------|
| maximal speed           | 3200 min <sup>-1</sup> |
| Startrevolution max     | 3000 min <sup>-1</sup> |
| Permanent speed         | 2700 min <sup>-1</sup> |
| No-load operation speed | 700 min <sup>-1</sup>  |

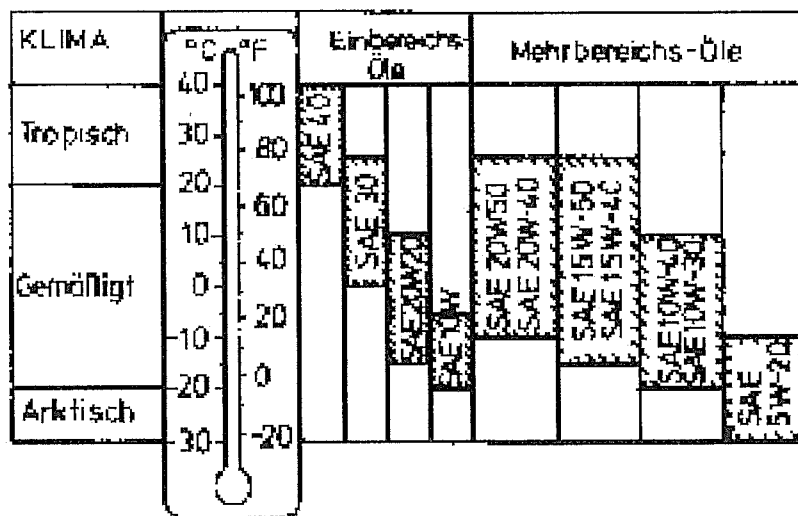
**3.5 Information of fuel and lubricants**

Fuel:

Brand fuel "DIN EN 228 unleaded Super Plus **98 Oktan**" or "AVGAS 100 LL".

Luboil: Any engine oil under the classification of (API-Klassifikation (API SH/CG) or higher. Don't use any syntetic lub oil

The viscosity of the engine lub oil follows the existing airtemperature and accordingly there are different SAE classes.





## Operating Manual S 2100-1-SS1

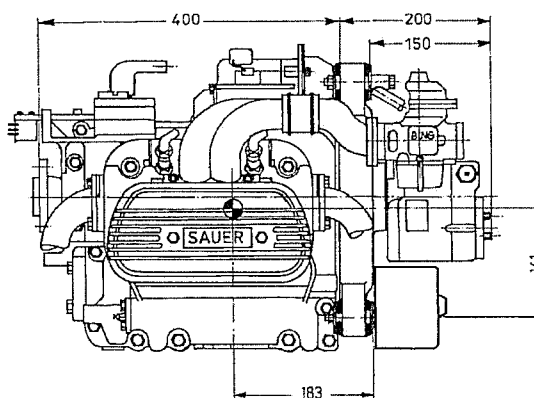
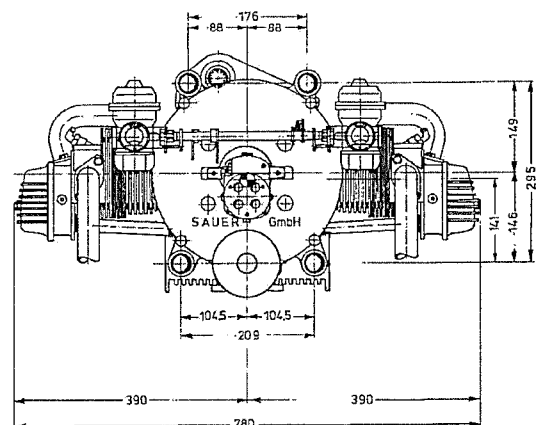
|   |                            |
|---|----------------------------|
| Luboilvolume of engine:   | max. 2,75 l<br>min. 2,15 l |
| incl. oilfilter ca. 0,5 l   |                            |
| Oilstick shows min. and max level. Quantity between min. and max. is 0,75 liter |                            |
| Oilpressure:  | max. 4,5 bar               |
| by 2000 min <sup>-1</sup>   | min. 2,0 bar               |
| by no-load speed  | 1,0 bar                    |
| Oiltemperatur:  | min. 50° C<br>max. 120° C  |
| Favourable temperatur   | 70 - 90° C                 |

**3.6 Cylinder head-temperatur:**

Not to exceed degree C 200° C  
Cylinder Nr.4

**3.7 Instruction and advice for mounting the engine into the hull of the plane and center of gravity.**

For this connection use only DIN-bolts 10mm, quality class 8.8 or 10.9. All bolts are to be secured with safety wire against unforeseen turning. We are providing the complete set for this engine-suspension.

**Backview****Sideview**

Edition 19.05.2003



**Due to unfavorable installation and running conditions there might be engine failure occur.**

- as
- fuel injection
  - cooling
  - carburetor icing

**In this case we suggest:**

- electr. Fuelpump Bosch P/Nr. EA.8642
- Oilcooler Chausson P/Nr. 122

**Carburettor pre-heating-system**

**Can be provided by your plane manufacturer**



**5.4 Start and climbing flight:**

- Push gaslever quick until
- Start now. During the first part of your climbing flight you keep this position, than you reduce power.

**Rpm, oilpressure, oiltemperatur, boostpressure and cylinderhead temperature should not exceed their limiting value !**

**5.5 Cruising**

- |                     |                             |
|---------------------|-----------------------------|
| - Rpm               | max. 3000 min <sup>-1</sup> |
| - Oilpressure       | within green zone           |
| - Oiltemperature    | within green zone           |
| - Cylinderheadtemp. | Within green zone           |

**5.6 Decent**

- |            |                   |
|------------|-------------------|
| - Gaslever | no-load operation |
|------------|-------------------|

**5.7 Shut off engine**

- |  |                      |
|--|----------------------|
| - Engine to be cool down. After running with nigh power, let the engine run approx. 3 minutes by 1000 rpm. |                      |
| - gaslever   | in no-load operation |
| - Ignition   | off                  |

**5.8 Starting in the air follow the same procedure as on the ground.**



**Remarks:**

Please notice if you are using unleaded super gasoline, it might be happen that during very hot outside temperature or night in fluenees steam bubbles within the fuel system can be built up.

During those circumstances we strongly request you to use only AVGAS 100LL

**5.9 Start up under could conditions:**

- Choke to pull
- Gaslever **closed and in no-load position!!!**
- Sart up see 5.2 and 7.1

adjust gaslever and choke according to a smooth run of the engine.



## **6. Maintenance instruction**

### **6.1 Daily checkup**

- Remove engine case (cowling)
- Check engine on missing parts and scratches.
- Check ignition cable.
- Check all connections and tubes for gas, chock, and carburetor.
- Check engine oil by pushing the oilstick until resistance, pull out and check oillevel. If necessary, you add oil. The oillevel in the middle of max. and min.
- Check oil and fuelsystem. Make sure there is no leak.
- Replace cowling.
- Engine testrun.
- Check temperature and pressure of all systems. Watch speed up carefully. For a short period you run the engine full speed. Check cooling system.

### **6.2 Periodical control**

After the first 25 running hours the engine is to be checked as under 6.2.1 described. Maintenance control is to be done every 50 hours. In addition every 100 hours the engine is to be checked as under 6.2.3. Every 250 hours as under 6.2.4



### **6.2.1 Checkup after 25 hours**

- Change engine oil and oilfilter, clean oilstrainer and renew gaskets.
- Check and clean sparkplugs.
- Check exhaust.
- Check all wirering of starter and magnet.
- Check all fastener and clamps of starter and magnet.
- This engine is hydro-tapped-actuated. No valveclearance is to be adjusted!
- Check engine suspension and all bolts and nuts.
- All existing ball and socketed joints are to be greased.
- Fuelsystem is to be checked. Clean all filter and check all joints
- Check all electr. Wirering.
- Testrun of engine acc. To 6.1.

### **6.2.2 Checkup after 50 hours**

- Ignitiontiming to be controlled, event.
- Check lub.-system
- Change oil and Filter
- Check and clean sparkplugs
- No valveclearance to be adjusted valves hydro-tapped-actuated.
- Check all joints, clean engine.
- Check fuel system, clean all filter and check all joints, hoses and tubes.
- Check exhaust (muffler, tubes, clamps)
- Check airguiding sheets
- Check crankcase on cracks or leakage
- Check crankcase ventilation
- Check all electr. Wirering and cable
- Engine test run acc. To 6.1.



### 6.2.3 Checkup after 100 hours

- Same as under 6.2.2.
- Check diaphragm of carburetor.
- Change airfilter.
- Clean fuelfilter
- Clean lubeoilstrainer, replace all gaskets
- Check start gear
- Check compression by compression monitoring device

### 6.2.4 Checkup after 250 hours

- Same as under 6.2.3.
- check ignition magnet (Slick) according to manufacturer standard
- Check carburettor float spindle

Repair can only be done by authorized workshops and inspectors who are licensed by LBA.



### **6.3 Preserve engine against corrosion:**

If the engine is not running for more than 30 days, preservation against corrosion is to be done.

1. Warmup engine and drain engine-oil.
2. Use 2,5 Liter spezial anticorrosion-oil and run engine for thirty seconds under no-load operation.
3. Remove airfilter, run engine and pour 25 to 30 ccm anti-corrosion-oil into the caburator. Stop engine.
4. Remove all sparkplugs and spray anti-corrosion-oil into the combustion chamber.
5. Turn engine by hand serveral times.
6. Preserve sparkplugs with anti-corrosion-oil and replace.
7. All Carburettor joints are to be preserved
8. All openings as exhaust, crankcase ventilation and airfilter are to be closed.
9. Preserve the engine from outside by using spray gun with anti-corrosion-oil. Be aware that rubberparts, hoses and all non-metallic parts are not in touch with the anti-corrosion-oil. Don`t run the engine after preservation. Otherwise you have to repeat the whole procedure.



### 6.3 Operation during wintertime

In any case maintenance should be done before the beginning of the cold season.

For extrem low temperatures you act as follows:

You cover the oilcooler if the ground temperature is below 10 degree C. Otherwise you will not reach the oiltemp. of 80 degree C.

Maintenance electr. system:

- Avoid corrosion on all elektr. connections otherwise you will have start-problems and line drop in the system
- During winter you check the battery every 6 to 8 weeks.  
Check acid level and density.  
Charge the battery and messure each cell under load.
- Clean and preserve cable connections.  
Use grease without acid, like Vaseline.

### 6.5 Operation in tropical areas:

To protect the engine against heat and dust we suggest as follows:

- Use the right airfilter and cleaning.
- Shorten the time of oilchange and renewing oilfilter.
- Close all openings if you don't operate the engine, to prevent entering dust or sand.



- If you are in an area with high humidity you have to preserve the engine as under 6.3 clean airfilter every day.
- Clean airfilter every day !

## **7. Maintenance**

### **7.1 Luboilchange**

- warmup engine
- drain oil, renew oilfilter, put same oil on the rubber- seal – ring of the new filter
- remove strainer from sump and clean
- replace the drain- screw and use new copper-ring
- refill crankcase with new luboil
- 2,75 Liter pf you change oilfilter  
2,50 Liter pf you don`t change oilfilter

#### Important

After starting the engine observe oil-pressure! see also 3,5

start engine on non – operating speed

- check oil level
- check all over to make sure there is no leak.
- Don`t use any additive into your luboilssystem!





## 7.2 Mounting magnet and reset firing time

Attention! Ignitionkey "off"!

Remove all connecting cable from sparkplug

To avoid electr. sparking connect

Contactspring with mass point.

Remove sparkplug from cyl. 1. Put your thumb on the opening of the sparkplug and turn the crankshaft until you feel the strong pressure of compression. In this position both valves of cyl. 1 are closed. Now you turn the crankshaft the opposite direction 25 degree before dead centre o point. The ignitionmark on the propeller flash. Overlap with the mark on the enginebody. Now ignitionmagnet is to be installed and inserted into the clutch. Clamps are to be fixed. Slick timing light, mod. 2300 with R-or L cable is to be connected to the shortcut connection of the magnet.

Connect the brown cable with masspoint.

Turn magnet by hand in motordirection until the controllamp goes off. Turn magnet back until the controllamp goes off. In this position you fix the magnet (20 Nm).

Adjustment to be controlled as follows:

- Propeller to be turned until magnet react
- Turn propeller backward until lamp goes off
- Turn again in the opposite direction until lamp goes on.
- Check if the two marks are in line

## 7.3 Adjustment of carburettor

Gaslever on non-load position.

Fix synchron-tester connection with both carburettorinlet.

Start engine. Adjust the tester with the synchronising screw in the middle of the throttle until both factors are equal. Now you adjust the no-load operation with the throttle screw on both carburettor on 700 min.

Emission control to be adjusted by no-load operation screw and CO<sub>2</sub>-tester within the range of 2,5-3,5 %.



-

## 7.4. Sparkplugs

Remove sparkplugs only by cold engine.

- Don't use brass-or steel brush for cleaning !
- Don't sandblast!
- Only synthetic fiber brush and degreasing solvent.  
Use only graphit for the threat.
- Check clearance of electrodes (0,7mm)
- Renew sparkplugs after 150 running hours.
- Fasten again after few running hours

The color of the sparkplugs shows:

light brown: sparkplugs and adjustment of carburettor are o.k.

black: clearance of electrodes is to much,  
Airfilter dirty, carburettor is not o.k.  
Engine doesn't reach the running engine  
Temperature.

Oily shining: interruption of ignition, to much oil inside  
combustion chamber.

Pearls: wrong sparkplug, valves are not properly closing,  
Carburettor to meagre

### 7.4.1 Valve adjustment

- Not necessary, the engine is equipped with hydro-actuated valves.



## **7.5 Compressiontest**

### **7.5.1 Compressiontest with printer**

#### **7.5.1 Difference-pressure-methode**

with the system the pressure difference between the given pressure and the shown pressure of the cylinder should not be less than 20% (general given pressure: appr. 5,5 bar (80 PSI))

## **7.6. Mechanical Fuelpump**

within the 100 hours checkup the fuel filter is to be cleaned

- mainvalve "closed"
- all hoses and tubes to be disconnected
- clean filter by airpressure
- connect all hoses and tubes



## **7.7 Exhaust-system**

- Remove heatexchanger
- Visual check on damages and leakage
- Connect to engine and control hot air system

## **7.8. Auxilliary mech.drive**

for gas, choke and preheating for carburettor

- Check easy and smooth movement of all wiring
- Check all safety devices as conternuts and (ball-)joints
- Molykote BR2 will be recommendet

## **8. Overhaul**

### **8.1. General – overhaul (TBO)**

Classification

Will be done by manufacturer only.

### **8.2. Same as under 8.1.**

Ground-touch of propeller. In any case the engine is to be dismantelt.

X-ray of crankshaft is mandatory!



### 8.3 Exchange of lubeoil-and hoses

- Every six years all lubeoil-pressure- and fuel hoses are to be replaced if the material is teflon.

### 9. Chart for torque of screws:

|                              |       |
|------------------------------|-------|
| Sparkplug                    | 20 Nm |
| Collarnuts for ignitioncable | 10 Nm |
| Nut for oilstrainer          | 8 Nm  |
| Stopnut for oildrain         | 25 Nm |

Oilfilter: see seperate instruction !



## 10. Troubleshooting

### 10.1 Engine failure:

| Reason   | Help   |
|--|--|
| Ignition „off“   | Ignition „on“  |
| Gaslever riation no-load operation                     | Pull gaslerver   |
| Mainvalve closed, filter dirty                         | Mainvalve open, clean filter   |
| Fuel tank empty  | Filling fuel tank  |
| Sparkplug cable wrong connect.                         | Ignition sequence 1-3-2-4  |
| Ignition cable loose or damaged                        | Renew cable connection   |
| Mal functioning of magnet                              | Check clutch, clearance of rubber Segment, check sound of magnet                       |
| Condensation inside cover                              | Keep dry   |
| Sparkplugs wet, too much fuel.<br>Overflow carburettor | Keep sparkplugs dry, check fuel system   |
| Carburettor float spindle dirty or dented              | Clean or renew   |
| Carburettor nozzle blocked                             | Cleaning or renew  |
| Distance of electrodes sparkplugs too wide             | Adjust distance, 0,7mm   |
| Low battery  | Charge battery or renew  |
| Water inside carburettor                               | Clean carburettor, filter tubes and separator  |
| Uninsufficient compression                             | Pressure loss-test, see also 7.4   |
| Damages inside crankcase (housing)                     | Check strainer for metal parts. If yes, don't start engine again. Contact manufacturer |



## 10.2 Rough running engine

| Reason  | Help  |
|---|---|
| No-load operation wrong adjustment                                | Adjust carburettor with synchron test device                    |
| Carburettor float spindle dirty or dented                         | Clean or replace  |
| Airintake leakage   | Replace damaged parts<br>Tighten up all bolts and nuts          |
| Ignitioncable loose   | Check cable connection  |
| Disruptive breakdown of ignition cable                            | Check cable or renew  |
| Sparkplugs dirty or defect  | Clean or renew  |
| Firing failure  | Check whole ignitionsystem                                      |
| Disruptive break down because of tracking current due to humidity | Check parts for disruptive breakdown renew and dry up all parts |
| Magnet out of function  | Repair or renew by manufacturer                                 |
| Wrong ignition adjustment   | Check ignition firing   |
| Ceramic-or contact tube damaged                                   | Renew contact tube  |
| Wrong balanced propeller  | Remove propeller for balancing                                  |
| Fuel-intake filter closed   | Remove filter and clean   |

## 10.3 Engine overheated above 120° C

| Reason                                   | Help  |
|--|---|
| Damaged measuring device                 | Replace thermocouple                                |
| Wrong adjustment ignition firing         | Timing of ignition new                              |
| Fuel mixture too maegro                  | Check adjustment and work conditions of carburettor |
| Aircooling sheets, not alined or damaged | Repair or renew, check sealing                      |

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| Reason                        | Help  |
|-------------------------------|---|
| Uninsufficient oil supply     | Check oil level, refill oil   |
| Poor quality                  | Change oil brand to right quality                                   |
| Oilpipesystem or strainer     | Clean the whole system  |
| Damaged bushings and bearings | If metal particle are found in the sump, general overhaul of engine |

#### 10.4 Low lubeoil pressure

| Reason                          | Help                          |
|---------------------------------|-------------------------------|
| Uninsufficient oil in the sump  | Check oil level add oil       |
| Damaged oilgauge                | Renew oilgauge                |
| Oilstrainer dirty               | Take out and clean            |
| Pressureloss due to leakage     | Check the whole lubeoil syst. |
| High oiltemperature             | See 10.1                      |
| Oilgearpump damaged             | Renew oilpump                 |
| Bearing damaged, no oilpressure | General overhaul of engine    |

#### 10.5 Motor bringt nicht die volle Leistung

| Reason                          | Help   |
|---------------------------------|--|
| Wron adjustment of accelerator  | New adjustment of accelerator and throttle                       |
| Failure in the airintoke system | Replace damaged parts tiden up all joints                        |
| Airfilter closed (dirty)        | Clean or renew airfilter   |
| Fuel not as per specification   | Refill fuel tank with gasoline as specified                      |
| Firing interruption             | Check ignition timing all Fs to tiden up us measuring instrument |
| Uninsufficient fuel             | Check fuelfilter, strainer                                       |
| Cabrburettor diaphragm damaged  | Renew diaphragm  |





## 10.6 Rough running engine after or despite stop

| Reason  | Help   |
|---|--|
| Firingtime wrong                                  | Adjust firingtime  |
| Carbon and other remains inside combustionchamber | Check fuelquality<br>Check oilconsumption<br>Check thermalconductivity of sparkplugs |
| Ignitionkey damaged                               | Switch to be renewed<br>Check masscable  |
| Engine overheated                                 | Run engine with approx.<br>1000rpm   |

## 10.7 Oilconsumtion to high

| Reason                        | Help  |
|-------------------------------|---|
| Luboilpipesystem leak         | Check, repair amd test  |
| Less quality of luboil        | Change oil, use oil according to specification  |
| Damaged bushings and bearings | Check oilsump and filter if you find metallpartical, don't start engine<br>GENERAL OVERHAUL |
| Wear and tear on pistonrings  | GENERAL OVERHAUL  |

## 10.8 Engine pinking, knocking

| Reason                                      | Help   |
|---|--|
| Fuel with less oktan                        | Use fuel as per manufacturers recommendation       |
| Thermal conductivity Of spark plugs to low  | Use sparkplugs as per manufacturers recommendation |
| Firingpoint to earty                        | Adjust firingpoint                                 |
| Carbon and other remains inside comberstion | Check for reason                                   |



## 11. Inspection list

### Kind and subject of controll

|  | Intervall: |      |       |
|--|------------|------|-------|
|  | 25 h       | 50 h | 100 h |
| 1. Drain engine oil renew stopp cock<br>copper sealring                              | x          | x    | x     |
| 2. Renew oilfilter   | x          |      | x     |
| 3. Visual check whole luboilssystem  | x          | x    | x     |
| 4. Renew airfilter   |            | x    |       |
| 5. Clean and check sparkplugs  | x          | x    | x     |
| 6. Check motorsuspension, all joints,<br>tubes, hoses cooling and pre-heating system | x          | x    | x     |
| 7. Clean engine  | x          | x    | x     |
| 8. Check fuelsystem, clean filter  | x          | x    | x     |
| 9. Check exaustsystem  | x          | x    | x     |
| 10. Check ignition system  | x          | x    | x     |
| 11. Check clamps and bolts from starter<br>and magnet                                | x          | x    | x     |



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|  | Intervall: |      |       |
|--|------------|------|-------|
|  | 25 h       | 50 h | 100 h |
| 12. Check all cooling sinks  | x          | x    | x     |
| 13. Check diaphragm of carburettor   | x          | x    | x     |
| 14. Check electr. fuel pump of leaks   |            | x    | x     |
| 15. Check ignition timing  | x          | x    | x     |
| 16. Check all electr. wiring and cable   |            | x    | x     |
| 17. Compression test   |            |      | x     |
| 18. Check starter gear   |            |      | x     |
| 19. Check air guiding sheets   | x          | x    | x     |
| 20. Check crankcase-ventilation pipe,<br>for leaks and cracks  | x          | x    | x     |
| 21. Check starter ring gear for any damage   |            |      | x     |
| 22. Check valve displacement 0,3 mm<br>only when mechanical lifters installed<br><b>With hydraulic lifters, no adjustment is require</b> | x*         | x*   | x     |

\* only first inspection, if it is installed mechanical lifters!

