

## CHAPTER 6

### MASS AND BALANCE

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## 6.1 INTRODUCTION

In order to achieve the performance and flight characteristics described in this Airplane Flight Manual and for safe flight operation, the airplane must be operated within the permissible mass and balance envelope.

The pilot is responsible for adhering to the permissible values for loading and center of gravity (CG). In this, he should note the movement of the CG due to fuel consumption. The permissible CG range during flight is given in Chapter 2.

The procedure for determining the flight mass CG position is described in this chapter. Additionally a comprehensive list of the equipment approved for this airplane exists (Equipment List). The set of items marked as 'installed' constitutes the *Equipment Inventory*.

Before the airplane is delivered, the empty mass and the corresponding CG position are determined and entered in Section 6.3 - MASS AND BALANCE REPORT.

### **NOTE**

Following equipment changes the new empty mass and the corresponding CG position must be determined by calculation or by weighing.

Following repairs or repainting the new empty mass and the corresponding CG position must be determined by weighing.

Empty mass, empty mass CG position, and the empty mass moment must be certified in the Mass and Balance Report by authorized personnel.

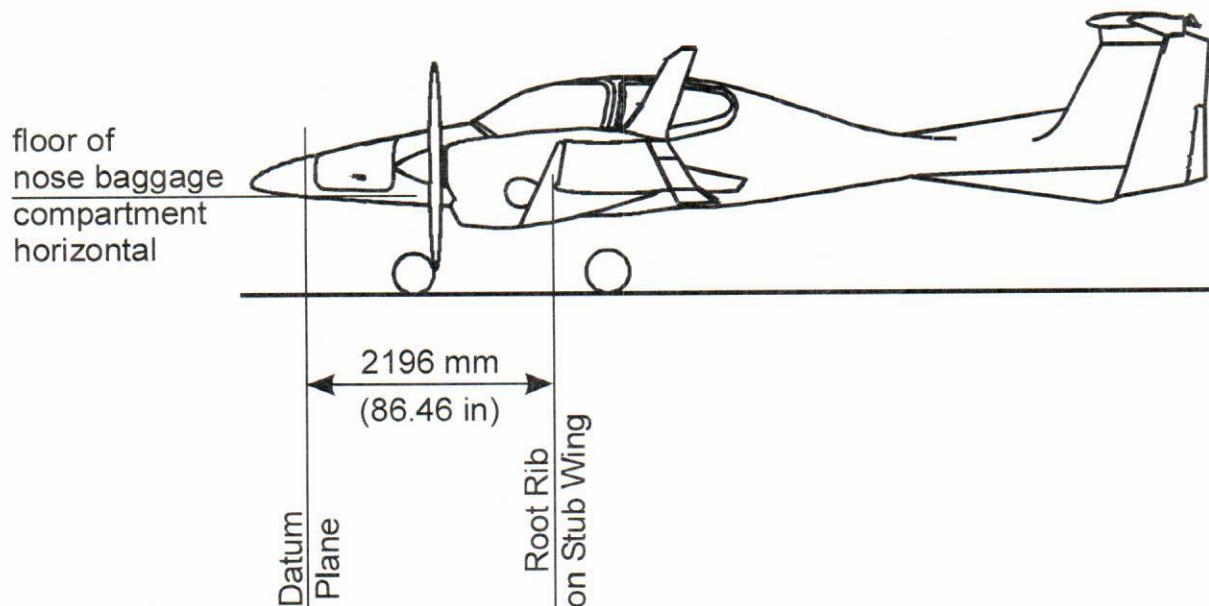
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**NOTE**

Refer to Section 1.6 - UNITS OF MEASUREMENT for conversion of SI units to US units and vice versa.

**6.2 DATUM PLANE**

The Datum Plane (DP) is a plane which is normal to the airplane's longitudinal axis and in front of the airplane as seen from the direction of flight. The airplane's longitudinal axis is parallel with the floor of the nose baggage compartment. When the floor of the nose baggage compartment is aligned horizontally, the Datum Plane is vertical. The Datum Plane is located 2.196 meters (86.46 in) forward of the most forward point of the root rib on the stub wing.



### **6.3 MASS AND BALANCE REPORT**

The empty mass and the corresponding CG position established before delivery are the first entries in the Mass and Balance Report. Every change in permanently installed equipment, and every repair to the airplane which affects the empty mass or the empty mass CG must be recorded in the Mass and Balance Report.

For the calculation of flight mass and corresponding CG position (or moment), the *current* empty mass and the corresponding CG position (or moment) in accordance with the Mass and Balance Report must always be used.

Condition of the airplane for establishing the empty mass:

- Equipment as per Equipment Inventory (see Section 6.5)
- Including the following operating fluids:
  - Brake fluid
  - Hydraulic fluid (for the retractable gear)
  - Engine oil ( $2 \times 6.0 \text{ liter} = 2 \times 6.3 \text{ qts}$ )
  - Coolant ( $2 \times 6.0 \text{ liter} = 2 \times 6.3 \text{ qts}$ )
  - Gearbox oil ( $2 \times 0.9 \text{ liter} = 2 \times 0.95 \text{ qts}$ )
  - Unusable fuel in main fuel tanks ( $2 \times 1.0 \text{ US gal} = 2 \times 3.8 \text{ liter}$ )
  - Unusable fuel in auxiliary fuel tanks (if installed,  $2 \times 0.5 \text{ US gal} = 2 \times 1.9 \text{ liter}$ )

DA 42 AFM



## Mass and Balance

## **MASS AND BALANCE REPORT**

## **6.4 FLIGHT MASS AND CENTER OF GRAVITY**

The following information enables you to operate your DA 42 within the permissible mass and balance limits. For the calculation of the flight mass and the corresponding CG position the following tables and diagrams are required:

- 6.4.1 - MOMENT ARMS
- 6.4.2 - LOADING DIAGRAM
- 6.4.3 - CALCULATION OF LOADING CONDITION
- 6.4.4 - PERMISSIBLE CENTER OF GRAVITY RANGE
- 6.4.5 - PERMISSIBLE MOMENT RANGE

The diagrams should be used as follows:

1. Take the empty mass and the empty mass moment of your airplane from the Mass and Balance Report, and enter the figures in the appropriate boxes under the column marked 'Your DA 42' in Table 6.4.3 - CALCULATION OF LOADING CONDITION.
2. Read the fuel quantity indicators to determine the fuel quantity in the main fuel tanks.
3. Determine the fuel quantity in the auxiliary fuel tanks (if installed).

To verify an empty auxiliary fuel tank, set the ELECT. MASTER switch and the FUEL TRANSFER switch to ON and check the PFD for the L/R AUX FUEL E caution message.

To verify a full auxiliary fuel tank open the auxiliary fuel tank filler and check fuel level.

If the auxiliary fuel tank quantity is in between empty and full, the exact quantity cannot be determined. If possible transfer all fuel to the main fuel tank by setting the ELECT. MASTER switch and the FUEL TRANSFER switch to ON until the L/R AUX FUEL E caution message appears on the PFD. During this procedure ground power must be used or at least one engine must be running. The fuel transfer will take a maximum of 10 minutes.

**CAUTION**

If the auxiliary tanks are in use, both tanks must be refueled to the maximum level to provide proper information for the pilot about the fuel quantity in the auxiliary fuel tanks.

If the auxiliary tanks are not in use, the pilot must ensure that they are empty.

4. Multiply the individual masses by the moment arms quoted to obtain the moment for every item of loading and enter these moments in the appropriate boxes in Table 6.4.3 - CALCULATION OF LOADING CONDITION.
5. Add up the masses and moments in the respective columns. The CG position is calculated by dividing the total moment by the total mass (using row 8 for the condition with empty fuel tanks, and row 11 for the pre take-off condition). The resulting CG position must be inside the limits.

As an illustration the total mass and the CG position are entered on Diagram 6.4.4 - PERMISSIBLE CENTER OF GRAVITY RANGE. This checks graphically that the current configuration of the airplane is within the permissible range.

6. Graphical method:

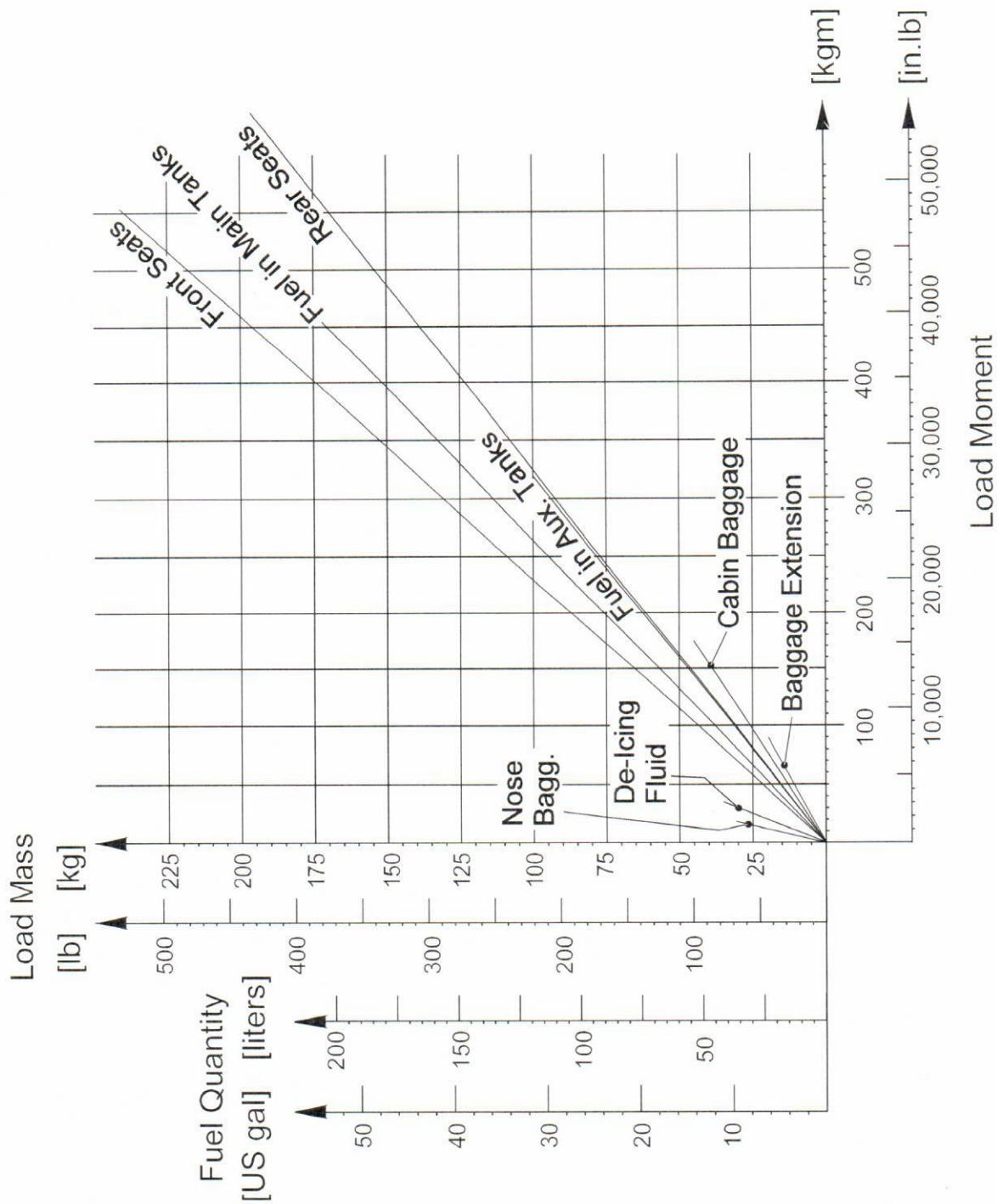
Diagram 6.4.2 - LOADING DIAGRAM is used to determine the moments. The masses and moments for the individual items of loading are added. Then Diagram 6.4.5 - PERMISSIBLE MOMENT RANGE is used to check whether the total moment associated with the total mass is in the permissible range.

The result found with the graphical method is however inaccurate. In doubtful cases the result must be verified using the exact method given above.

**6.4.1 MOMENT ARMS**

The most important lever arms aft of the Datum Plane:

Item	Lever Arm	
	[m]	[in]
Occupants on front seats	2.30	90.6
Occupants on rear seats	3.25	128.0
Fuel	In main tanks	2.63
	In auxiliary tanks	3.20
De-Icing Fluid (if equipment installed, OÄM 42-053 or OÄM 42-054)	1.00	39.4
Baggage in Compartments	Nose	0.60
	Cabin	3.89
	Extension	4.54

**6.4.2 LOADING DIAGRAM**

### **6.4.3 CALCULATION OF LOADING CONDITION**

#### **NOTE**

If the optional de-icing system (OÄM 42-053 or OÄM 42-054) is installed, the following must be observed:

The consumption of fuel causes a forward movement of the CG. The consumption of de-icing fluid causes a rearward movement of the CG. Depending on the fuel flow and de-icing fluid flow, the overall movement of the CG can be a forward or a rearward movement. In order to cover all possible cases, the following table must be completed twice: with (as shown in the example) and without considering the on-board de-icing fluid. All four CG positions (fuel tank full/empty, de-icing fluid tank full/empty) must fall into the permitted area.

1. Complete the form on the next page.
2. Divide the total moments from rows 8 and 11 by the related total mass to obtain the CG positions.

In our example:    empty tanks:     $3625.1 \text{ kgm} / 1527.5 \text{ kg} = 2.373 \text{ m}$   
 $314,656 \text{ in.lb} / 3368 \text{ lb} = 93.43 \text{ in}$

                      full tanks:     $4312.1 \text{ kgm} / 1770.5 \text{ kg} = 2.436 \text{ m}$   
 $374,295 \text{ in.lb} / 3904 \text{ lb} = 95.87 \text{ in}$

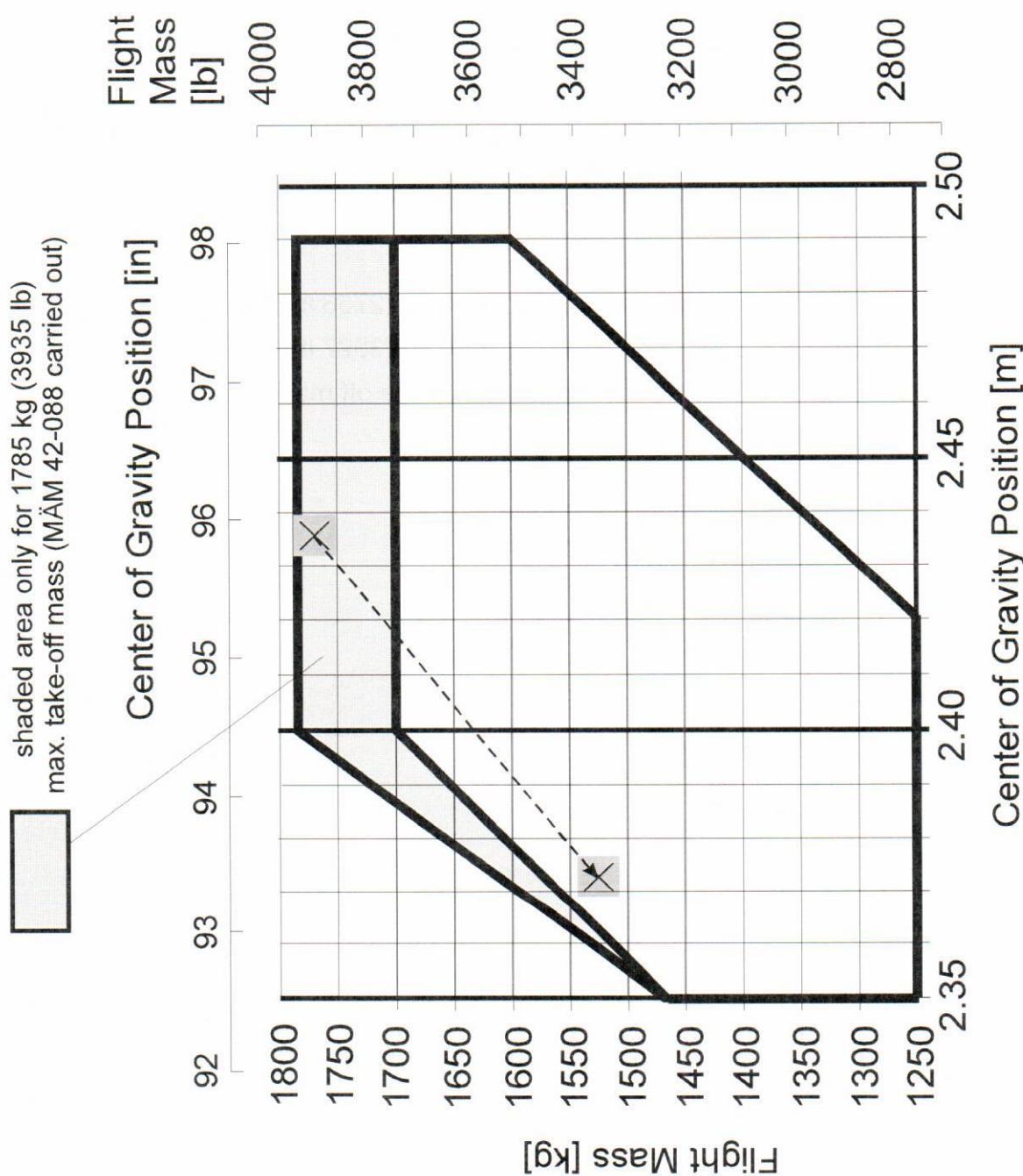
3. Locate the values in the diagram in Section 6.4.4 - PERMISSIBLE CENTER OF GRAVITY RANGE. If the CG positions and related masses fall into the permitted area, the loading condition is allowable.

Our example shows allowable loading conditions (for 1785 kg take-off mass, i.e., MÄM 42-088 carried out).

CALCULATION OF LOADING CONDITION	DA 42 (Example)		Your DA 42	
	Mass [kg] [lb]	Moment [kgm] [in.lb]	Mass [kg] [lb]	Moment [kgm] [in.lb]
1. Empty mass (from Mass and Balance Report)	1250 2756	2937.5 254,965	1328	3201.6
2. Front seats Lever arm: 2.30 m (90.6 in)	160 353	368.0 31,982		
3. Rear seats Lever arm: 3.25 m (128.0 in)	70 154	227.5 19,712		
4. Nose baggage compt. Lever arm: 0.60 m (23.6 in)	5 11	3.0 260		
5. Cabin baggage compt. Lever arm: 3.89 m (153.1 in)	10 22	38.9 3,368		
6. Baggage extension Lever arm: 4.54 m (178.7 in)	5 11	22.7 1,966		
7. De-icing fluid (if installed; see NOTE on previous page) (1.1 kg/liter) (9.2 lb/US gal) Lever arm: 1.00 m (39.4 in)	27.5 61	27.5 2,403		
8. Total mass & total moment with empty fuel tanks (Total of 1. through 7.)  Note: Maximum zero fuel masses: -1650 kg (3638 lb) -1674 kg (3690 lb) if OÄM 42-188 is carried out -1730 kg (3814 lb) if OÄM 42-188 and OÄM 42-195 are carried out	1527.5 3368	3625.1 314,656		
9. Usable fuel, main tanks (0.84 kg/liter) (7.01 lb/US gal) Lever arm: 2.63 m (103.5 in)	159 351	418.2 36,329		

<b>CALCULATION OF LOADING CONDITION</b>	<b>DA 42 (Example)</b>		<b>Your DA 42</b>	
	<b>Mass</b> <b>[kg]</b> <b>[lb]</b>	<b>Moment</b> <b>[kgm]</b> <b>[in.lb]</b>	<b>Mass</b> <b>[kg]</b> <b>[lb]</b>	<b>Moment</b> <b>[kgm]</b> <b>[in.lb]</b>
10. Usable fuel, auxiliary tanks (if installed; OÄM 42-056) (0.84 kg/liter) (7.01 lb/US gal) Lever arm: 3.20 m (126.0 in)	84 185	268.8 23,310		
11. Total mass & total moment with fuel & de-icing fluid (Total of 8. through 10.)	1770.5 3904	4312.1 374,295		

The CG's shown in the following diagrams are those from the example in Section 6.4.3 - CALCULATION OF LOADING CONDITION, rows 8 and 11.

**6.4.4 PERMISSIBLE CENTER OF GRAVITY RANGE**

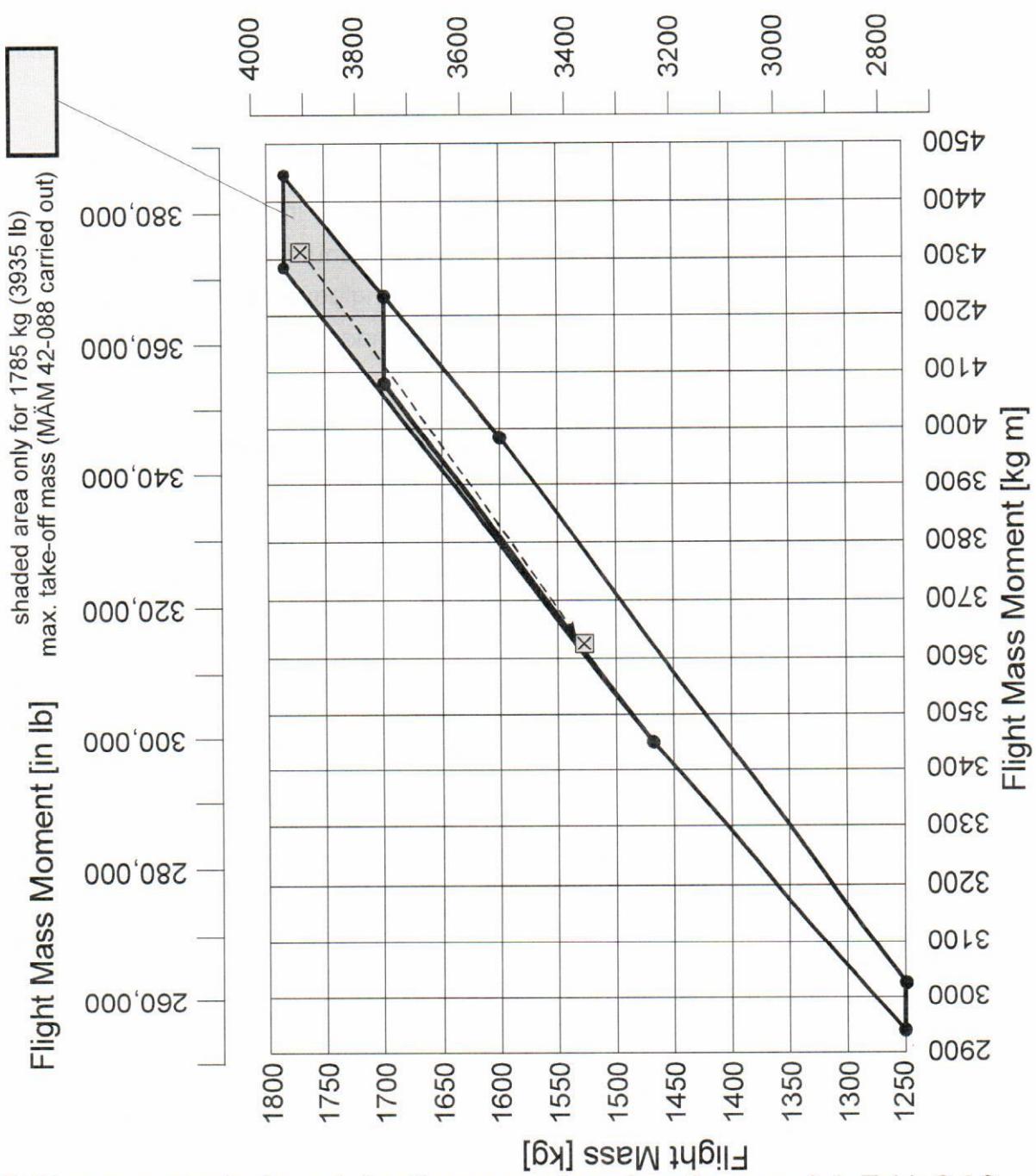
The flight CG position must be within the following limits:

Most forward flight CG:

- 2.35 m (92.52 in) aft of Datum Plane at 1250 kg (2756 lb)
- 2.35 m (92.52 in) aft of Datum Plane at 1468 kg (3236 lb)
- 2.40 m (94.49 in) aft of Datum Plane at max. take off mass (see Section 2.7)  
linear variation in between

Most rearward flight CG:

- 2.42 m (95.28 in) aft of Datum Plane at 1250 kg (2756 lb)
- 2.49 m (98.03 in) aft of Datum Plane at 1600 kg (3527 lb)
- 2.49 m (98.03 in) aft of Datum Plane at max. take off mass (see Section 2.7)  
linear variation in between

**6.4.5 PERMISSIBLE MOMENT RANGE**

The flight mass moments shown in the diagram are those from the example in Table 6.4.3  
 (a) 'CALCULATION OF LOADING CONDITION', rows 8 and 11.

## **6.5 EQUIPMENT LIST AND EQUIPMENT INVENTORY**

All equipment that is approved for installation in the DA 42 is shown in the *Equipment List* below.

### **NOTE**

The equipment listed below cannot be installed in any arbitrary combination. The airplane manufacturer must be contacted before removing or installing equipment, with the exception of replacing an unit by an identical unit.

The items of equipment installed in your particular airplane are indicated in the appropriate column. The set of items marked as 'installed' constitutes the *Equipment Inventory*.

Description	Type	Part No.	Manufacturer	S/N	inst'd	lbs	kg	in	m
<b>AVIONICS COOLING</b>									
Avionics Cooling Fan	SAFE 328	305 467-00	Sandia Aerospace						
PFD Cooling Fan	SAFE 128	305 468-00	Sandia Aerospace						
MFD Cooling Fan	SAFE 128	305 468-00	Sandia Aerospace						
<b>AUTOPILOT SYSTEM</b>									
Flight Computer	KC 140	065-00176-7904	Bendix/King		V	2,040	930	70,080	1,780
Pitch servo	KS 270 C	065-00178-2500	Bendix/King		V	2,290	1,040	175,400	4,455
Pitch servo mount	KM 275	065-00030-0000	Bendix/King		V	1,077	489	175,400	4,455
Roll servo	KS 271 C	065-00179-0500	Bendix/King		V	2,290	1,040	124,800	3,170
Roll servo mount	KM 275	065-00030-0000	Bendix/King		V	1,077	489	124,800	3,170
Trim servo	KS 272 C	065-00180-3500	Bendix/King		V	2,290	1,040	88,190	2,240
Trim servo mount	KM 277	065-00041-0000	Bendix/King		V	1,097	498	88,190	2,240
Configuration module	KCM 100	071-00073-5000	Bendix/King		V				
Sonalert		SC 628	Mallory		V				
Control stick		DA4-2213-12-90	Diamond Aircraft		V				
CWS switch		031-00514-0000	Bendix/King		V				
AP-Disc switch		031-00428-0000	Bendix/King		V				
Trim switch assy		200-09187-0000	Bendix/King		V				

Airplane Serial No.:	42-204	Registration:	OF-DTS	Date:	08-12-1/	Mass	Lever Arm		
Description	Type	Part No.	Manufacturer	S/N	inst'd	lbs	kg	in	m
<b>ELECTRICAL POWER</b>									
Main Battery	G-243 (CB24-11M)	Gill (Concorde)		V		28.0	12.7	49.170	1.249
Main Battery	RG24-11M	Concorde				26.5	12.0	49.170	1.249
Main Battery	RG24-15M	Concorde				29.5	13.4	49.170	1.249
Excitation Battery (2 pcs.)	LC-R121R3P	Panasonic		V					
Emergency Battery		D60-2560-91-00	Diamond Aircraft		V				
ECU Backup Battery LH (2 pos.)	LC-R121R3P	Panasonic							
ECU Backup Battery RH (2 pos.)	LC-R121R3P	Panasonic							
ECU Backup Battery LH (2 pos.)	LC-R127R2P	Panasonic							
ECU Backup Battery RH (2 pos.)	LC-R127R2P	Panasonic							
External Power Connector		DA4-2443-10-00	Diamond Aircraft		V				
<b>MISSION EQUIPMENT</b>									
DC-DC Converter		AK 551-5M	Ameri King						



DA 42 AFM

Mass and Balance

Airplane Serial No.: 42-204				Registration: PH-DTS		Date: 08-12-11		Mass		Lever Arm	
Description	Type	Part No.	Manufacturer	S/N	inst'd	lbs	kg	in	m		
<b>EQUIPMENT</b>											
Safety belt, pilot	5-01-() Series	5-01-1C0710	Schroth		V	2.110	0.960	92.520	2.350		
Safety belt, copilot	5-01-() Series	5-01-1C5710	Schroth		V	2.110	0.960	92.520	2.350		
Safety belt, LH pax	5-01-() Series	5-01-1B5710	Schroth		V	2.250	1.020	126.800	3.220		
Safety belt, RH pax	5-01-() Series	5-01-1B0710	Schroth		V	2.250	1.020	126.800	3.220		
Safety belt, pilot	5-01-() Series	5-01-2G0710	Schroth			2.110	0.960	92.520	2.350		
Safety belt, copilot	5-01-() Series	5-01-2G5710	Schroth			2.110	0.960	92.520	2.350		
Safety belt, LH pax	5-01-() Series	5-01-2H5710	Schroth			2.250	1.020	126.800	3.220		
Safety belt, RH pax	5-01-() Series	5-01-2H0710	Schroth			2.250	1.020	126.800	3.220		
Safety belt, pilot	5-01-() Series	5-01-2G0701	Schroth			2.110	0.960	92.520	2.350		
Safety belt, copilot	5-01-() Series	5-01-2G5701	Schroth			2.110	0.960	92.520	2.350		
Safety belt, LH pax	5-01-() Series	5-01-2H5701	Schroth			2.250	1.020	126.800	3.220		
Safety belt, RH pax	5-01-() Series	5-01-2H0701	Schroth			2.250	1.020	126.800	3.220		
ELT unit	C406-1	453-5002-	Artex			4.220	2.774	179.700	4.565		
ELT unit	ME406	453-6603-	Artex		V	2.770	1.260	179.700	4.565		
ELT remote switch		345-6196-04	Artex		V						
ELT antenna		110-338	Artex		V	0.470	0.213	152.800	3.880		
Buzzer		452-6505	Artex		V						

Airplane Serial No.:	42-204	Type	Part No.	Registration:	DH -DTS	Date:	08-12-11	Mass	kg	in	m
Description				Manufacturer	S/N	inst'd	lbs	kg			
<b>SAFETY EQUIPMENT</b>											
Fire extinguisher		HAL 1		AIR Total							
Fire extinguisher, portable		A 620 T		Amerex							
First aid kit											
Emergency axe		G45912		Fiskars							
<b>FLIGHT CONTROLS</b>											
Flaps actuator assy	43055	Kruiz									
Lift detector	C-99701-1	Safe Flight Instr.									
Stall warning buzzer	SC Series	SC 628 ND		Mallory							
Variable elevator stop		D60-2733-12-00		Diamond Aircraft							
<b>HYDRAULIC</b>											
Motor pump unit	X11-0001-00-00R0	Hydraulik Mayer									
Hydraulic fluid tank	X11-0002-00-00R0	Hydraulik Mayer									
Hydraulic control unit	X11-0003-00-00R0	Hydraulik Mayer									
High pressure filter	X11-0004-00-00R0	Hydraulik Mayer									
Hydraulic pressure accumulator	X11-0005-00-00R0	Hydraulik Mayer									
MLG hydraulic cylinder	X11-0006-00-00/1R0	Hydraulik Mayer									
NLG hydraulic cylinder	X11-0006-00-00/2R0	Hydraulik Mayer									

Airplane Serial No.:	Y2 . 254	Type	Part No.	Registration: PH-DTS	Date: 08 - 12 - 11	Mass	Lever Arm
Description				S/N	inst'd	lbs	kg
NLG hydraulic cylinder			D60-9029-03-01_1	Hydraulik Mayer			
Brake master cylinder (2 pcs.)		10-54A	Cleveland		✓		
Parking valve		60-5B	Cleveland		✓		
Brake assembly		30-239A	Cleveland		✓		
Parking valve		60-5BD	Cleveland				
Brake assembly		30-52Z	Cleveland				
<hr/>							
<b>INDICATING / REC. SYSTEM</b>							
Primary Flight Display (PFD)	GDU 1040	011-00972-02	Garmin		6,400	2,910	70,080
Primary Flight Display (PFD)	GDU 1040	011-00972-03	Garmin		✓	6,400	2,910
Multi Function Display (MFD)	GDU 1040	011-00972-02	Garmin		6,400	2,910	70,080
Multi Function Display (MFD)	GDU 1040	011-00972-03	Garmin		✓	6,400	2,910
<hr/>							
<b>LANDING GEAR</b>							
Main landing gear LH		D60-3217-11-00	Diamond Aircraft		✓		
Main landing gear RH		D60-3217-12-00	Diamond Aircraft		✓		
Nose landing gear		D60-3223-10-00	Diamond Aircraft		✓		
Main landing gear LH		D64-3217-11-00	Diamond Aircraft				
Main landing gear RH		D64-3217-12-00	Diamond Aircraft				
Nose landing gear		D64-3223-00-00_1	Diamond Aircraft				

Airplane Serial No.:	42-204	Type	Registration: PH-DTS	Date: 08-12-11	Mass	Lever Arm			
Description		Part No.	Manufacturer	S/N	inst'd	lbs	kg	in	m
<b>LIGHTS</b>									
Map / Reading light assy crew		W1461.0.010	Rivoret		✓				
Cabin Light		W1461.0.010	Rivoret		✓				
Strobe / Pos. light assy LH	A600-PR-D-28	01-0790006-05	Whelen		✓	1.590	0.719	103.800	2.638
Strobe / Pos. light assy RH	A600-PG-D-28	01-0790006-07	Whelen		✓	1.590	0.719	103.800	2.638
Strobe light power supply LH/RH	A490ATS-CF-14/28	01-0770062-05	Whelen		✓				
Taxi light	Xenon D1S		Aero Vision Int.		✓	0.990	0.449	79.920	2.030
Taxi light power supply	XV1-28		Aero Vision Int.		✓	0.880	0.400	82.290	2.090
Landing light	Xenon D1S		Aero Vision Int.		✓	0.990	0.449	79.920	2.030
Landing light power supply	XV1-28		Aero Vision Int.		✓	0.880	0.400	82.290	2.090
Glareshield lamp assy		DAA-3311-10-02	Diamond Aircraft		✓				
Glareshield light inverter		APVL328-4-1-L-5QF	Quantaflex		✓				
Placards inverter		APVL328-4-1-L-15QF	Quantaflex		✓				
<b>COMMUNICATION / NAVIGATION</b>									
COMM #1 antenna	DMC63-1/A		DM		✓	0.400	0.180	177.100	4.500
COMM #2 antenna	DMC63-2		DM		✓	0.400	0.180	155.100	3.940
Audio Panel / Marker / ICS	GMA 1347	011-00809-00	Garmin		✓				

Airplane Serial No.: 72-204	Type	Part No.	Registration: D-H-DTS	Manufacturer	S/N	Date: 08-12-11	Mass	Lever Arm
Description					inst'd	lbs	kg	in m
Headset, pilot	Echelon 100		Telex	Sennheiser				
Headset, pilot	HMEC25-KAP-2	025-230-715	Sennheiser					
Headset, copilot	Echelon 100		Telex	Sennheiser				
Headset, copilot	HMEC25-KAP-2	025-230-715	Sennheiser					
Headset, LH pax	Echelon 100		Telex	Sennheiser				
Headset, LH pax	HMEC25-KAP-2	025-230-715	Sennheiser					
Headset, RH pax	Echelon 100		Telex	Sennheiser				
Headset, RH pax	HMEC25-KAP-2	025-230-715	Sennheiser					
Speaker	FRS8 / 4 Ohms		Visaton		✓			
Speaker	100 TRA	62800-001	Telex		✓			
Handmic				Diamond Aircraft				
Pitot/Static probe, heated		DAI-9034-57-00		Diamond Aircraft				
Pitot/Static probe, heated	AN5814-2	PST-305	AeroInstruments		✓			
Alternate static valve		DAI-3111-51-00	Diamond Aircraft		✓			
Backup Altimeter		5934PD-3	United Instruments		✓			
Backup Altimeter	LUN 1128	1128-10B6	Mikrotechna					
Backup Altimeter	LUN 1120	1120-23B2X	Mikrotechna					
Backup airspeed indicator	8030	8030-B-864	United Instruments		✓	0.380	70.080	1.780
Backup airspeed indicator	LUN 1116	1116-L0B3	Mikrotechna					
Backup artificial horizon	4300	4300-206	Mid Continent Instr.		✓	2.500	1.132	70.080
Backup artificial horizon	LUN 1241	1241.G8D0R	Mikrotechna					
Magnetic compass		PG2C-28V	SIRS Navigation		✓			
Turn & Bank indicator	1394T100-[12RZ]		Mid Continent Instr.			1.410	0.640	70.080
Turn & Bank indicator	1394T100-[12RA]		Mid Continent Instr.		✓	1.410	0.640	70.080

Airplane Serial No.: 42-204		Type		Registration: N4-DT3		Date: 08-12-11		Mass		Lever Arm	
Description	Part No.	Manufacturer	S/N	inst'd	lbs	kg	in	m	in	m	
Turn & Bank indicator	1394T100-(12RB)	Mid Continent Instr.			1.410	0.640	70,080	1,780			
OAT probe	GTP 59	Garmin		V							
Digital Air Data System	GDC 74A	Garmin		V	1.580	0.720	70,080	1,780			
Digital Air Data System	GDC 74A	Garmin		V	1.580	0.720	70,080	1,780			
Integrated Avionics #1	GIA 63	Garmin		V	5,290	2,400	154,900	3,935			
Integrated Avionics #2	GIA 63	Garmin		V	5,290	2,400	154,900	3,935			
Transponder	GTx 33	Garmin		V	3,030	1,380	153,100	3,890			
Transponder	GTx 33	Garmin		V	3,030	1,380	153,100	3,890			
Attitude / Heading Reference System GRS 77	GRS 77	Garmin		V	2,540	1,150	154,900	3,935			
Attitude / Heading Reference System GRS 77	GRS 77	Garmin		V	2,540	1,150	154,900	3,935			
Magnetometer	GMU 44	Garmin		V	0.379	0.172	103,800	2,638			
VOR / LOC / GS antenna	CI 157P	Comant		V							
dual VOR/ dual GS duplexer	CI 1125	Comant		V							
LH: VOR / LOC / GS antenna	CI120-1	Comant									
RH: VOR / LOC / GS antenna	CI120-1	Comant									
VOR / LOC / GS PWR combiner	CI120-3	Comant									
Transponder antenna	KA 60	Bendix/King	071-01591-0001		0.220	0.100	91,930	2,335			
Transponder antenna	KA 61	Bendix/King	071-00221-0010	V							
Marker antenna	CI 102	Comant		V							
GPS #1 antenna	GA 56	Garmin	010-10040-01	V	0.400	0.180	104,100	2,645			
GPS #2 antenna	GA 56	Garmin	010-10040-01	V	0.400	0.180	104,100	2,645			
DME	KN 63	Bendix/King	066-1070-01	V	2,480	1,120	141,100	3,580			
DME antenna	KA 60	Bendix/King	071-01591-0001		0.220	0.100	91,930	2,335			

DA 42 AFM



Temporary Revision  
Firmware 2.91 and ECU  
Mapping O28V294DA42

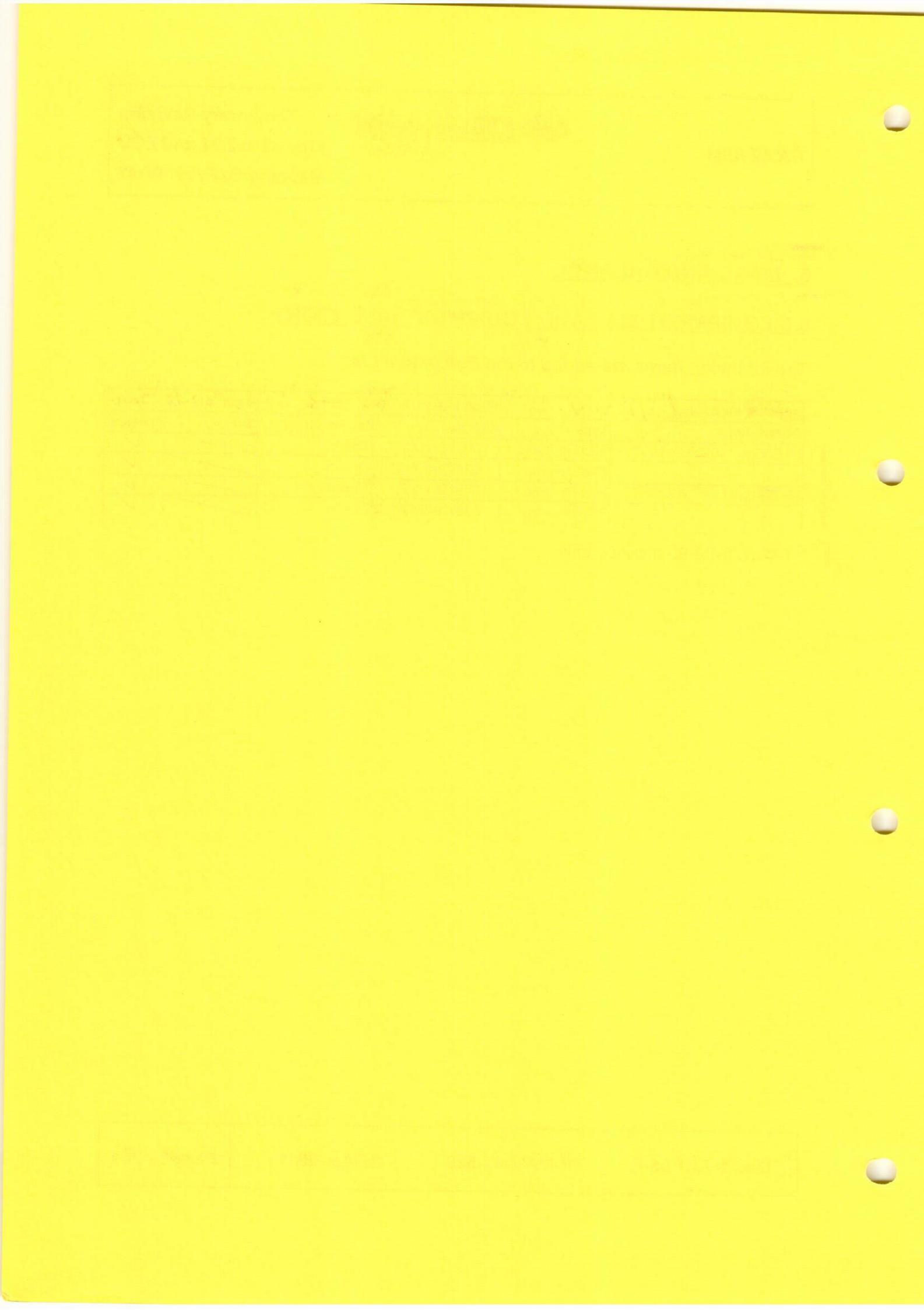
## 6. MASS AND BALANCE

### 6.5 EQUIPMENT LIST AND EQUIPMENT INVENTORY

*The following items are added to the Equipment List:*

Airplane Serial No.: 42.204	Registration: PH-DTS	Date: 08-12-2011			
Description	Type	Part No..	Manufacturer	S/N	Installed
LH ENGINE CONTROL UNIT	ECU Firmware	TAE 125 m2.91*	Thielert		✓
	ECU Mapping	O28V294DA42*	Thielert		✓
RH ENGINE CONTROL UNIT	ECU Firmware	TAE 125 m2.91*	Thielert		✓
	ECU Mapping	O28V294DA42*	Thielert		✓

\* TAE 125-02-99 engines only



DA 42 AFM



Temporary Revision  
TAE 125-02-99  
Alternator

## 6. MASS AND BALANCE

### 6.5 EQUIPMENT LIST AND EQUIPMENT INVENTORY

*The following items are added to the Equipment List:*

Airplane Serial No.: 42-204	Registration: PH-DTS	Date: 08-12-2011			
Description	Type	Part No.:	Manufacturer	S/N	installed
ENGINE					
Thielert TAE 125-02-99 (if installed)					✓
ELECTRICAL POWER					
LH Alternator		05-7150-E0006 02*	Thielert		✓
RH Alternator		05-7150-E0006 02*	Thielert		✓

\* TAE 125-02-99 engines only



Description	Type	Part No.	Registration: PH-DTS	Date: 08-12-11	Mass	kg	in	Lever Arm m
			S/N	inst'd	lbs			
DME antenna	KA 61	071-00221-0010	Bendix/King					
ADF receiver	RA 3502-(01)	0505.757-912	Becker					
ADF / RMI converter	AC 3504-(01)	0856.010-912	Becker					
ADF antenna	AN 3500	0832.601-912	Becker					
Stormscope	WX 500	805-11500-001	L-3 (Goodrich)					
Stormscope antenna	NY-163	805-10930-001	L-3 (Goodrich)					
TAS Processor	TAS 600	70-2420-x TAS600	Avidyne/Ryan					
TAS Processor	TAS 610	70-2420-x TAS610	Avidyne/Ryan					
TAS Processor	TAS 620	70-2420-x TAS620	Avidyne/Ryan					
TAS Processor	9900BX	70-2420-x	Avidyne/Ryan					
Transponder coupler		70-2040	Avidyne/Ryan					
TAS antenna, top		S72-1750-31L	Sensor Systems					
TAS antenna, bottom		S72-1750-32L	Sensor Systems					
Data link processor	GDL69A	011-00987-00	Garmin					
GDL antenna	GA 57	011-01032-00	Garmin					
GDL antenna	GA 37	013-00245-00	Garmin					
<b>OXYGEN SYSTEM</b>								
Oxygen cylinder (empty)		1270152-2	Aerox					
Single outlet manifold LH		4110-401-2	Aerox					
Single outlet manifold RH		4110-401-2	Aerox					

Airplane Serial No.: 42-204		Type	Part No.	Manufacturer	Registration: PHT-DTS		Date: 08-12-11	Mass	Mass	Lever Arm
Description					S/N	inst'd	lbs	kg	in	m
Dual outlet manifold		4110-400-2	Aerox				0.420	0.191	109,300	2,775
Oxygen pressure regulator		4110-110	Aerox				0.740	0.336	21,260	0,540
Filling block		4110-405	Aerox				0.540	0.245	28,150	0,715
Pressure gauge		4110-490	Aerox				0.110	0.050	70,080	1,780
ENGINE										
<i>Thielert TAE 125-01 (if installed)</i>										
LH Engine	TAE-125-01	125-01-0(17)( )	Thielert							
RH Engine	TAE-125-01	125-01-0(17)( )	Thielert							
LH ENGINE CONTROL UNIT	ECU	02-7610-55003R( )	Thielert							
	ECU	02-7610-55181R( )	Thielert							
	ECU Firmware	*	Thielert							
	ECU Mapping	*	Thielert							
RH ENGINE CONTROL UNIT	ECU	02-7610-55003R( )	Thielert							
	ECU	02-7610-55181R( )	Thielert							
	ECU Firmware	*	Thielert							
	ECU Mapping	*	Thielert							
ENGINE STARTING										
Glow Power Control Unit LH/RH		02-7150-55005R1	Thielert							
Starter LH/RH		02-8010-13210R1	Thielert							

Description	Type	Part No.	Registration: P#-DTs	S/N	Manufacturer	Date: 08-12-1/ inst'd	lbs	kg	Mass in kg	Lever Arm in m
ELECTRICAL POWER										
LH Alternator		02-7150-55110R2			Thielert					
LH Alternator		02-7150-55030R1			Thielert					
RH Alternator		02-7150-55110R2			Thielert					
RH Alternator		02-7150-55030R1			Thielert					
LH Alternator Regulator		02-7150-55112R2			Thielert					
RH Alternator Regulator		02-7150-55112R2			Thielert					
LH Alternator Regulator		02-7150-55112R3			Thielert					
RH Alternator Regulator		02-7150-55112R3			Thielert					
<i>Thielert TAE 125-02-99 (if installed)</i>										
LH Engine	TAE-125-02-99	125-02-99-(0003)-(01)			Thielert					
RH Engine	TAE-125-02-99	125-02-99-(0003)-(01)			Thielert					
LH ENGINE CONTROL UNIT	ECU	05-7610-E000201			Thielert					
	ECU Firmware	*			Thielert					
	ECU Mapping	*			Thielert					
RH ENGINE CONTROL UNIT	ECU	05-7610-E000201			Thielert					
	ECU Firmware	*			Thielert					
	ECU Mapping	*			Thielert					

Airplane Serial No.:	42-204	Type	Part No.	Registration: PH-DTS	Date: 08-12-11	Mass lbs	Mass kg	Lever Arm in	Lever Arm m
Description				S/N	inst'd				
ENGINE STARTING									
Glow Plug Control Unit LH/RH			05-7151-E0004 01	Thielert		V			
Starter LH/RH			05-8010-E0028 01	Thielert		V			
ELECTRICAL POWER									
LH Alternator			05-7150-E0006 01	Thielert		V			
RH Alternator			05-7150-E0006 01	Thielert		V			
LH Alternator Regulator			05-7150-E0007 01	Thielert		V			
RH Alternator Regulator			05-7150-E0007 01	Thielert		V			
ENGINE FIRE WARNING									
LH overheat detector			X2003-2	Control Products, Inc.		V			
RH overheat detector			X2003-2	Control Products, Inc.		V			
LH overheat defector			X2003-506	Control Products, Inc.					
RH overheat defector			X2003-506	Control Products, Inc.					
ENGINE INDICATING									
Engine / Airframe Unit	GEA 71		011-00831-00	Garmin		V			

Description	Type	Part No.	Registration: D4-DT5	Date: 08-12-11	Mass kg	Mass lbs	Lever Arm in	Lever Arm m
			S/N	inst'd				
<b>PROPELLER</b>								
Propeller LH	MTV-6-A-C-F/CF187-129							
Propeller RH	MTV-6-A-C-F/CF187-129							
Unfeathering accumulator LH		X11-0007-00-00						
Unfeathering accumulator RH		X11-0007-00-00						
Unfeathering accumulator LH		P-893						
Unfeathering accumulator RH		P-893						
<b>FUEL TANK SYSTEM</b>								
Fuel probe assy., LH inboard		D60-2817-13-00						
Fuel probe assy., LH inboard		D60-2817-13-00_1						
Fuel probe assy., RH inboard		D60-2817-13-00						
Fuel probe assy., RH inboard		D60-2817-13-00_1						
Fuel probe assy., LH outboard		D60-2817-14-00						
Fuel probe assy., LH outboard		D60-2817-14-00_1						
Fuel probe assy., RH outboard		D60-2817-14-00						
Fuel probe assy., RH outboard		D60-2817-14-00_1						
Alternate means for fuel qty.		D60-2817-90-00						

Airplane Serial No.:	42-204	Type	Part No.	Registration:	P4-DTS	Date:	08-12-11	Mass	Lever Arm
Description				S/N	Manufacturer	inst'd	lbs	kg	in
<b>AUX FUEL SYSTEM</b>									
LH auxiliary fuel pump	5100-09		Dukes			✓	1.940	0.878	151.400
RH auxiliary fuel pump	5100-09		Dukes			✓	1.940	0.878	151.400
<b>ICE PROTECTION SYSTEM</b>									
Porous panel, outer wing, LH		12102-21		CAV Aerospace		✓			
Porous panel, outer wing, RH		12102-22		CAV Aerospace		✓			
Porous panel, center wing, LH		12102-23		CAV Aerospace		✓			
Porous panel, center wing, RH		12102-24		CAV Aerospace		✓			
Porous panel, horizontal tail, LH		12102-25		CAV Aerospace		✓			
Porous panel, horizontal tail, RH		12102-26		CAV Aerospace		✓			
Porous panel, vertical tail		12102-27		CAV Aerospace		✓			
Porous panel, outer wing, LH		12102-31		CAV Aerospace					
Porous panel, outer wing, RH		12102-32		CAV Aerospace					
Porous panel, center wing, LH		12102-33		CAV Aerospace					
Porous panel, center wing, RH		12102-34		CAV Aerospace					
Porous panel, horizontal tail, LH		12102-35		CAV Aerospace					
Porous panel, horizontal tail, RH		12102-36		CAV Aerospace					
Porous panel, vertical tail		12102-37		CAV Aerospace					

Airplane Serial No.:	Y2-204	Type	Part No.	Manufacturer	S/N	inst'd	lbs	kg	in	m	Lever Arm
<b>Registration: PH-DTS Date: 08-12-11</b>											
Mod filter assy 1		D60-3013-11-90	Diamond Aircraft								
Mod filter assy 2		D60-3013-11-90	Diamond Aircraft								
Inlet strainer		12121-02	CAV Aerospace		✓						
Spray bar		12124-10	CAV Aerospace		✓						
Metering pump 1		9513A-386	CAV Aerospace		✓		4.180	1.896	40.160	1.020	
Metering pump 2		9513A-386	CAV Aerospace		✓		4.180	1.896	40.160	1.020	
De-icing fluid tank		D60-3013-24-50	Diamond Aircraft		✓		8.140	3.692	38.390	0.975	
Filter 1		F908R	CAV Aerospace		✓		0.680	0.308	40.160	1.020	
Filter 2		F908R	CAV Aerospace		✓		0.680	0.308	40.160	1.020	
Solenoid valve		FV158H-28V	CAV Aerospace		✓		0.870	0.395	40.160	1.020	
Solenoid valve		FV158H-28V	CAV Aerospace		✓		0.870	0.395	40.160	1.020	
High pressure switch		P041ED350	CAV Aerospace		✓						
Proportioning unit, nacelle, LH		PU3000DW142	CAV Aerospace		✓						
Proportioning unit, nacelle, RH		PU3000DW142	CAV Aerospace		✓						
Tail bracket assembly		12132-03	CAV Aerospace		✓		1.070	0.485	278.700	70.80	
Windshield pump 1		WP209A	CAV Aerospace		✓		0.650	0.295	40.160	1.020	
Windshield pump 2		WP209A	CAV Aerospace		✓		0.650	0.295	40.160	1.020	
De-ice control box		DAI-9030-00-01	Diamond Aircraft		✓						



Airplane Serial No.:	#	42-204	Type	Part No.	Manufacturer	Registration: PH-DTS	Date: 08-2011	Mass	Lever Arm
Description					S/N	inst'd	lbs	kg	in
AIRPLANE FLIGHT MANUAL	Doc. No. 7.01.05-E	Diamond Aircraft				V			

\*) Refer to Service Bulletin SB 42-007 latest effective issue for approved ECU firmware and mapping.

1. The Amerex A620T is UL approved and may be used in airplanes registered in Canada and the USA. For airplanes registered in other countries contact the local Airworthiness Authority.

Place: EHA  
Date: 08-12-2011  
Signature:

L.H.J. v. Hoofdank  
UIC-AML NL-10140