

Diamond DA40-TDI G1000





Dimensions





Dimensions





Diamond DA40-TDI G1000





ELT and VHF COM 1 Antenna





VHF COM 2 antenna





VHF NAV + GP Antennas





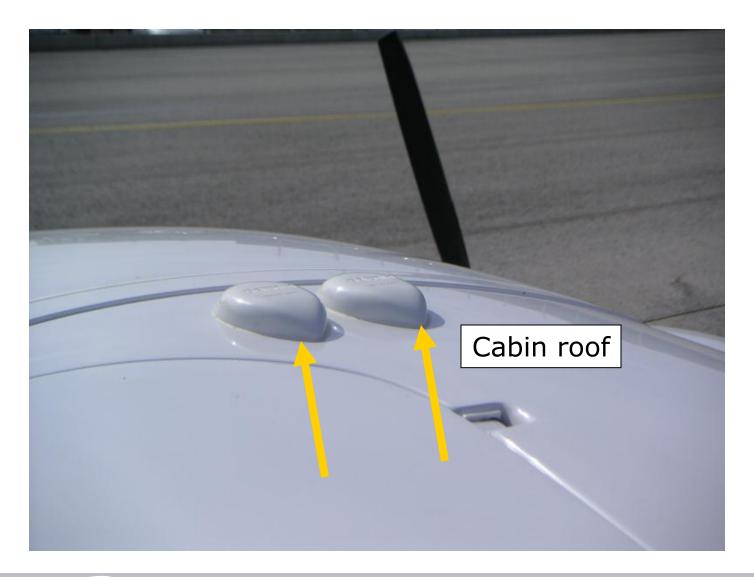
Marker Antenna





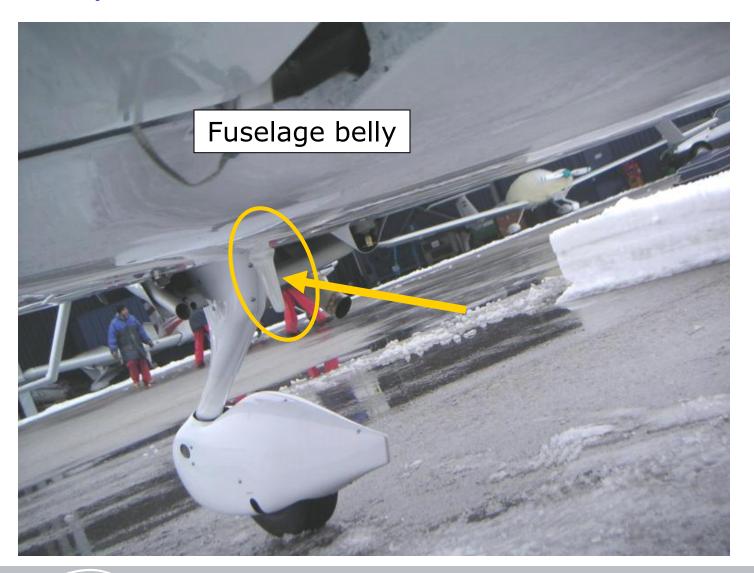
GPS Antennas





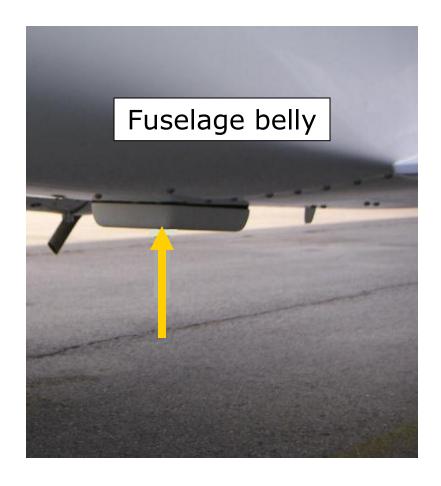
DME, TXPDR Antenna





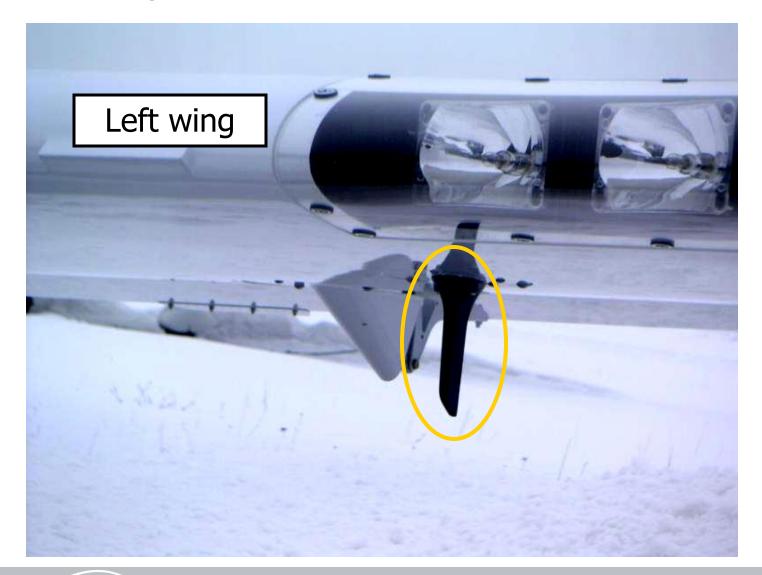
ADF antenna





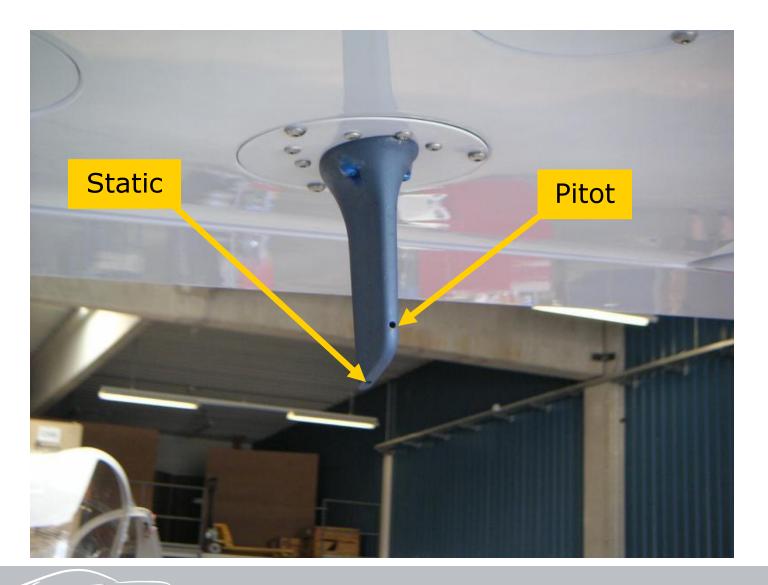
Pitot/Static Probe





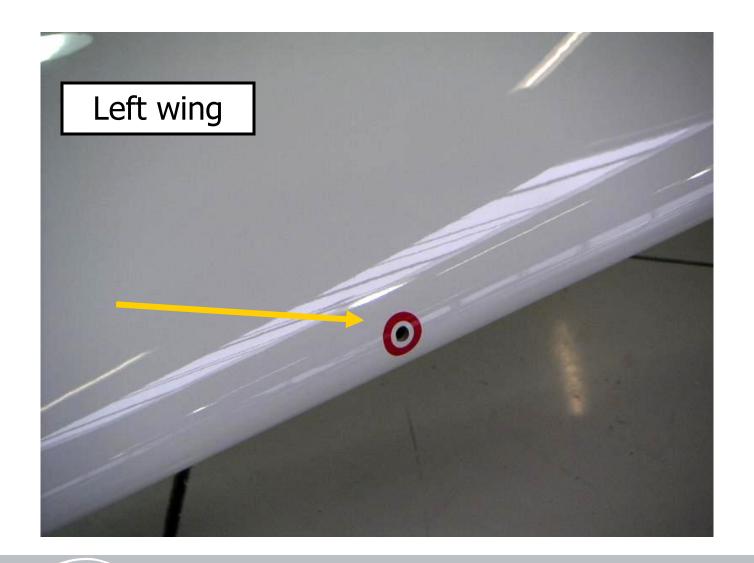
Pitot/Static Probe





Lift Detector (Stall Warning)





Engine Oil





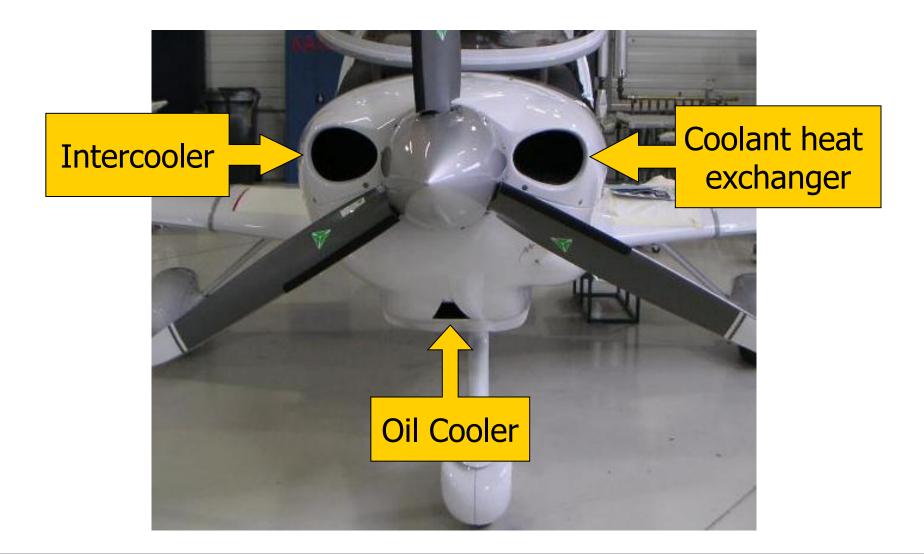
Engine Oil





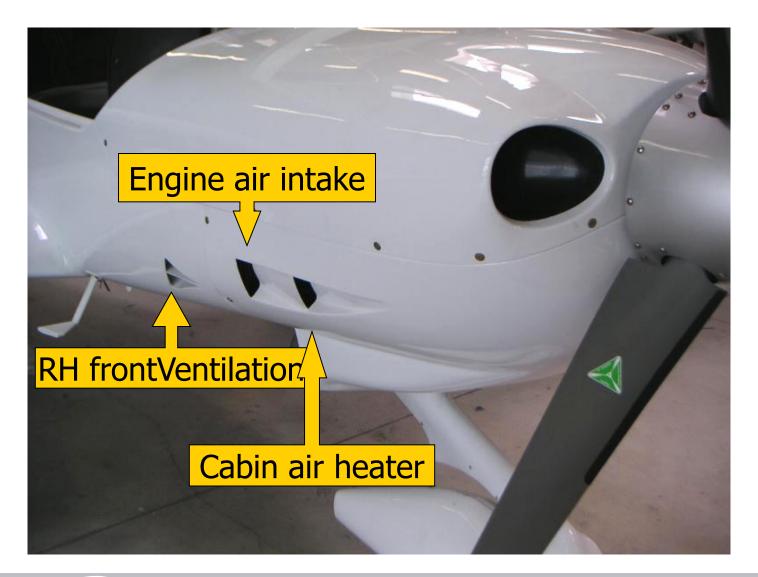
Air Inlets





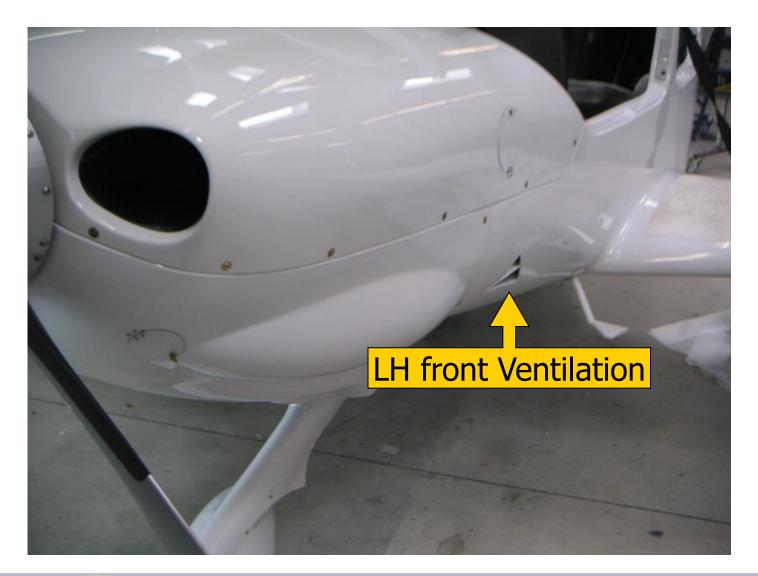
Air Inlets





Air Inlets





Diamond DA40-TDI G1000





Mass (Weight)



Empty (typical)	830 kg		
Max TKOF	1150 kg		
Max LDG	1150 kg		
Max Baggage	30 kg		
Max Baggage with "Baggage Extension"	45 kg (max 18 kg ii aft compartment)		

Mass (Weight)



Attention!

JET fuel and Diesel are heavier than AVGAS!

Typical fuel weight:

JET A1:	Diesel:
0,8 kg/ltr	0,84 kg/ltr
3,03 kg/USG	3,2 kg/USG

Diamond DA40-TDI G1000







Vno	129 KIAS
VNE	178 KIAS
V A 780-980 kg	94 KIAS
V A 980-1150 kg	108 KIAS



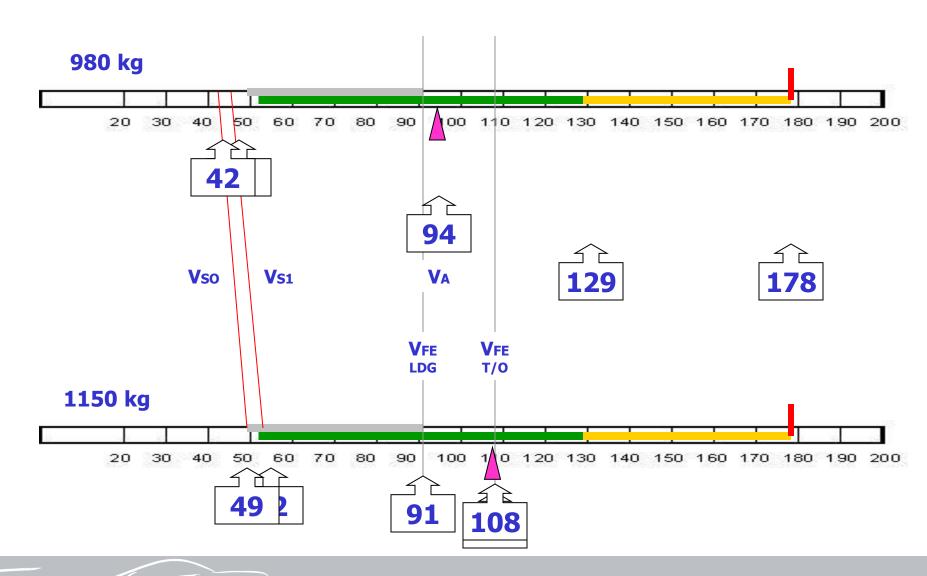
Vso	49 KIAS
Vs1	52 KIAS

VFE (Flaps T/O)	108 KIAS
VFE (Flaps LDG)	91 KIAS

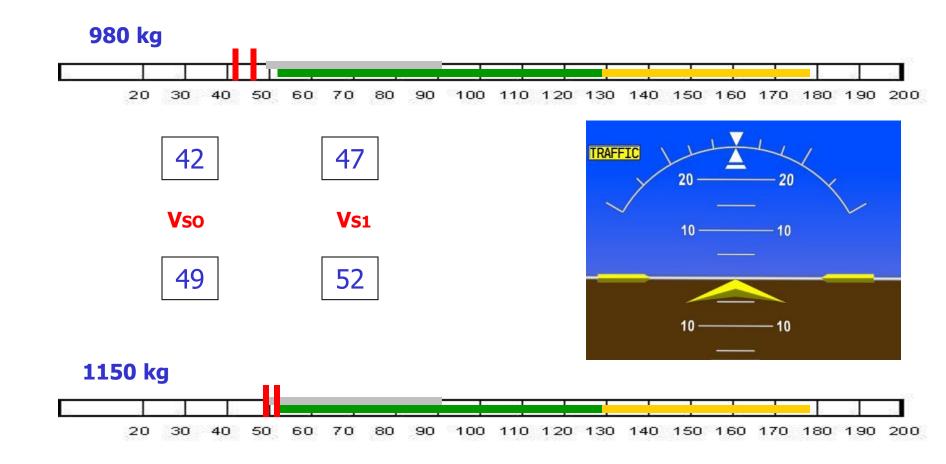


	850 kg	1000 kg	1150 kg
Vx = Vy	54 KIAS	60 KIAS	66 KIAS
V climb	60 kias	68 KIAS	73 KIAS
VLDG Flaps UP	60 KIAS	68 KIAS	73 KIAS
VLDG Flaps LDG	58 KIAS	63 KIAS	71 KIAS

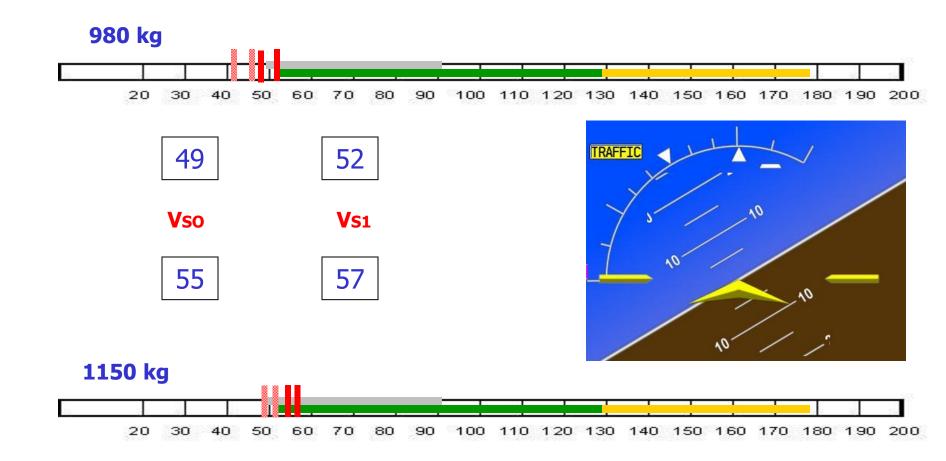




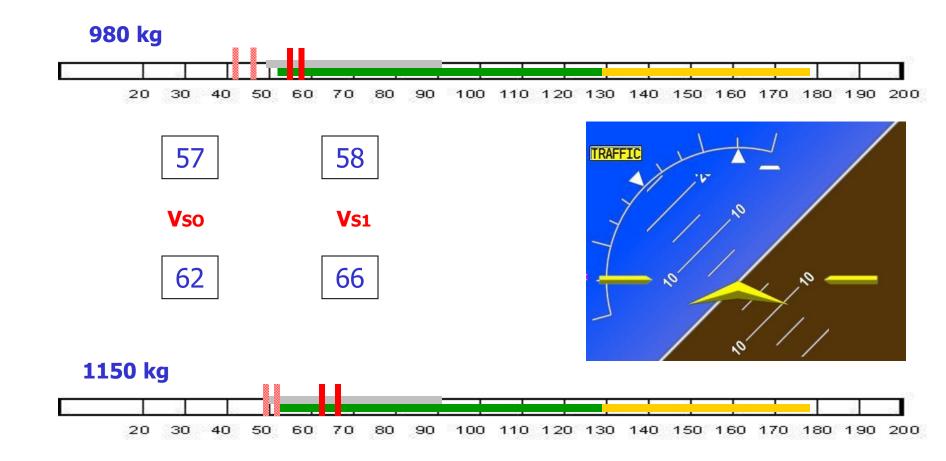




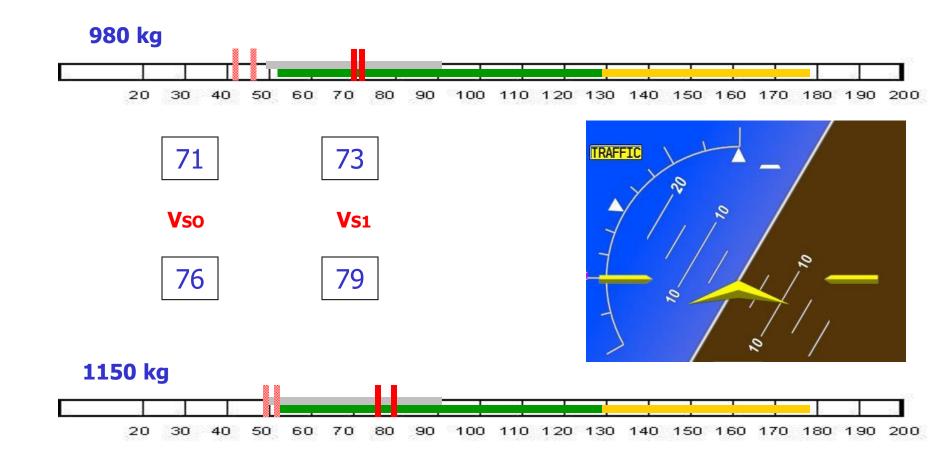












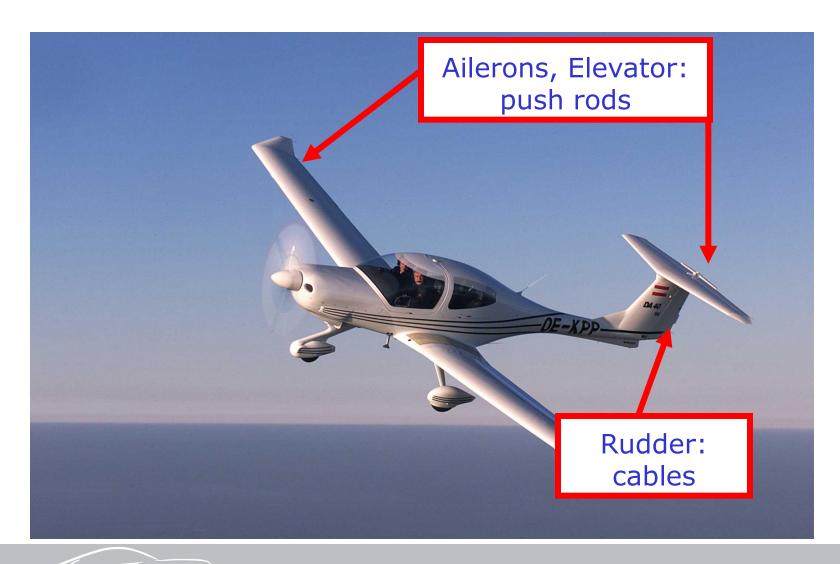
Diamond DA40-TDI G1000





Flight Control Operation





Flight Control Operation





Diamond DA40-TDI G1000









Garmin 1000









Emergency Switch

Emergency Battery (non rechargeable)









Circuit breakers









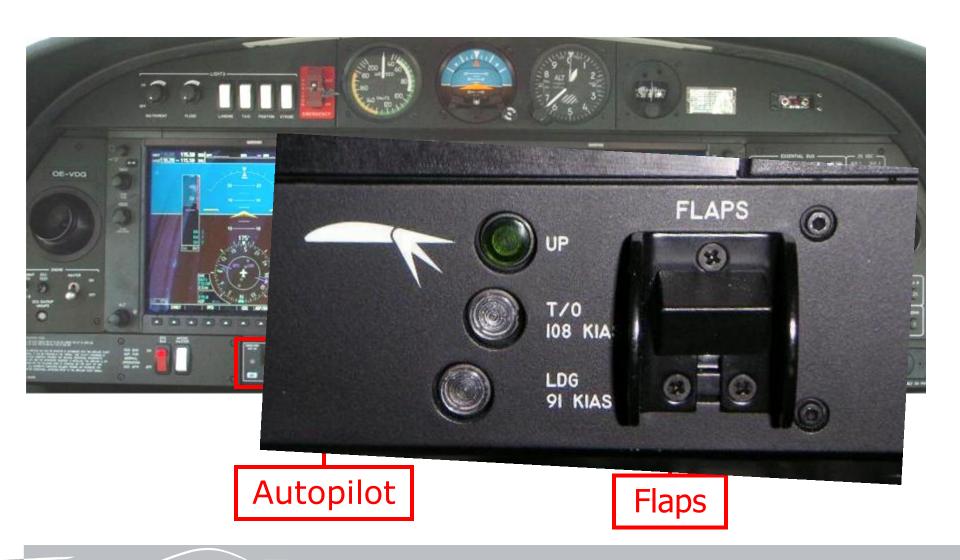












Alternate Static Valve





Alternate Static Valve





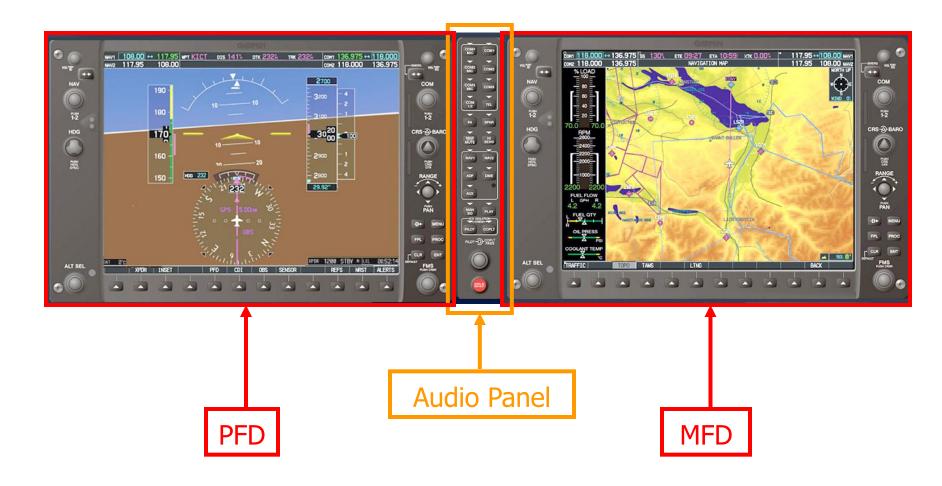
Diamond DA40-TDI G1000





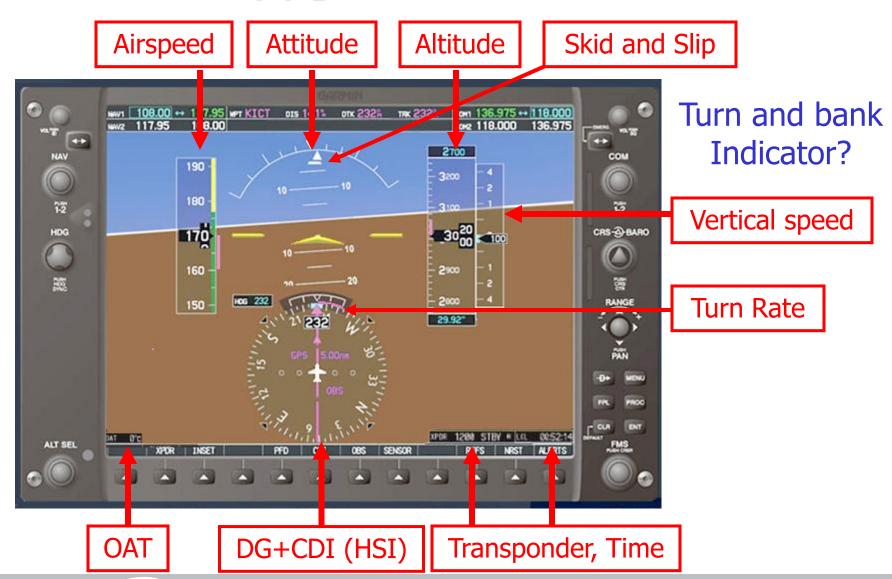
DA 42 Garmin 1000





PFD





Garmin 1000 MFD



EIS / Engine Indication System

Multi Function Display



Engine Indication System



Default page



Display when pushing the SYSTEM button

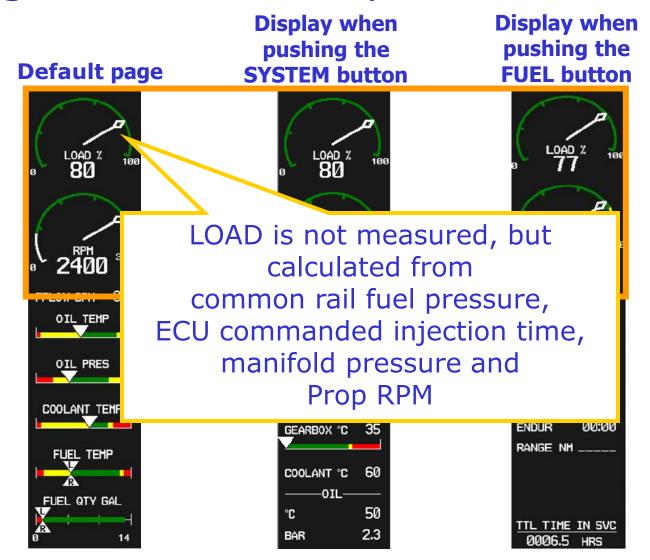


Display when pushing the FUEL button



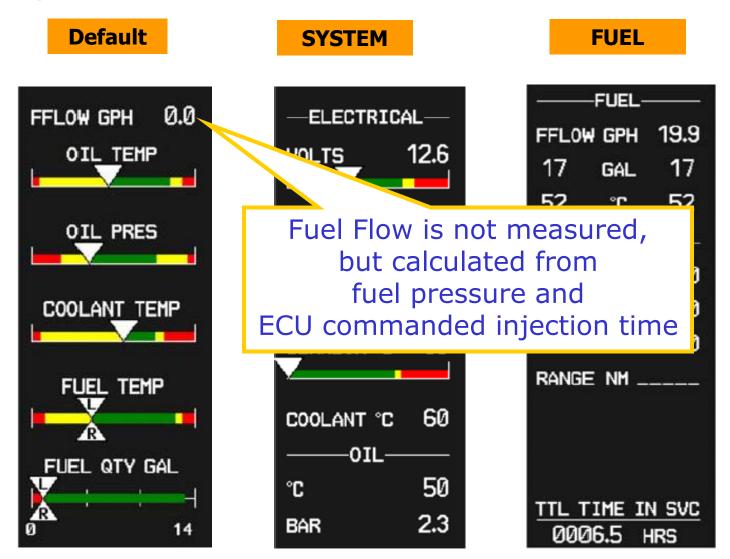
Engine Indication System





Engine Indication System





NAV and COM Tuning



LH identical RH



NAV and COM Tuning

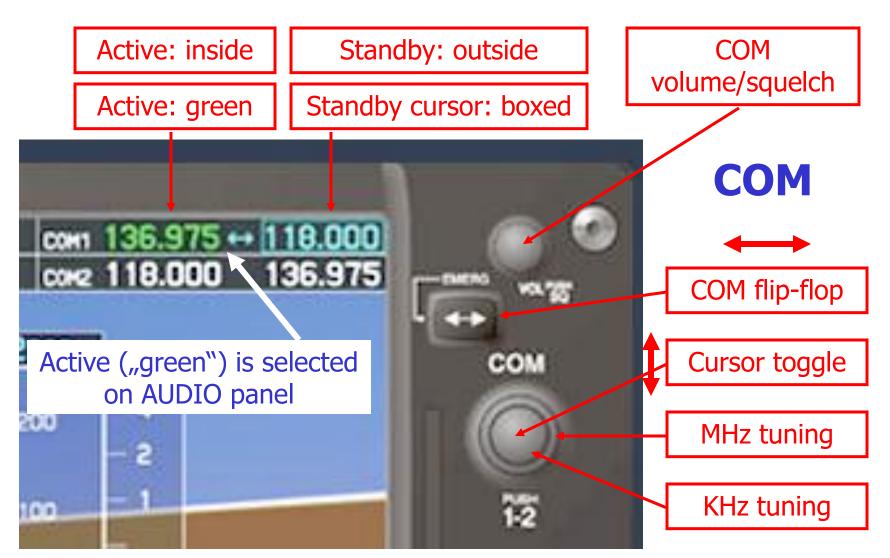


NAV COM



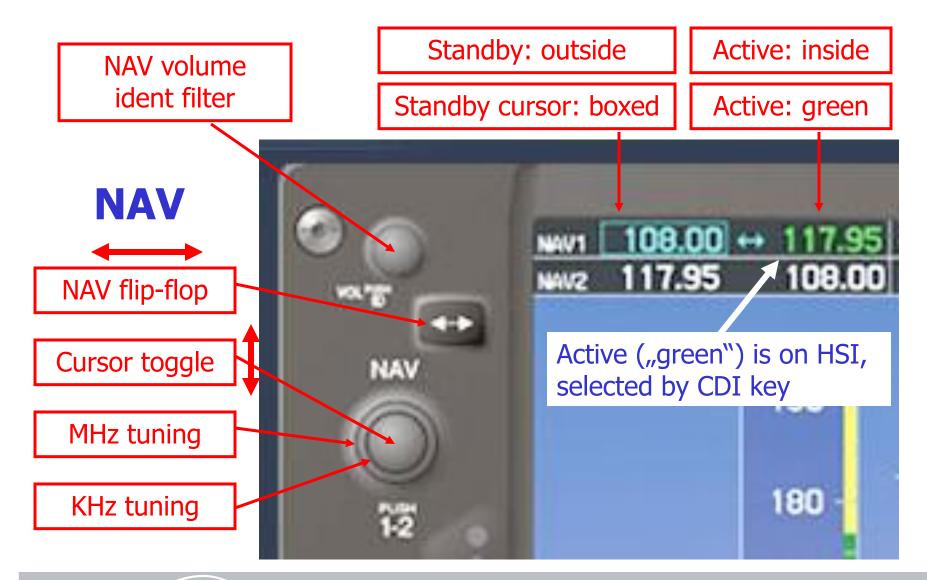
Garmin 1000





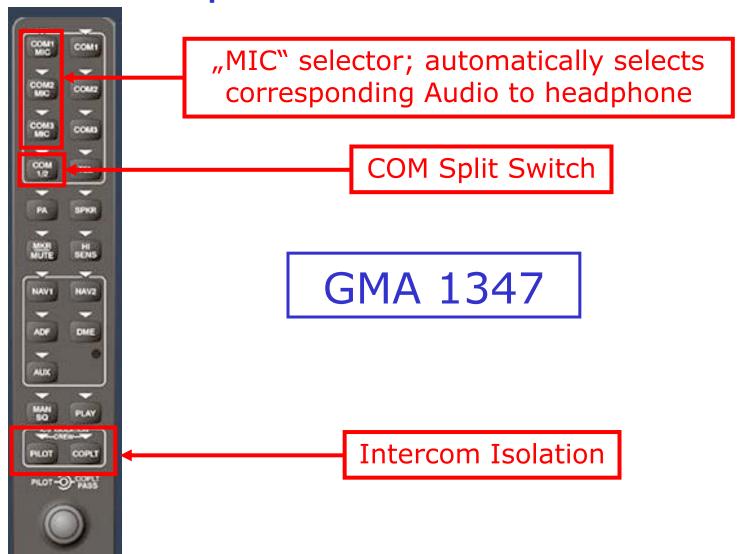
Garmin 1000





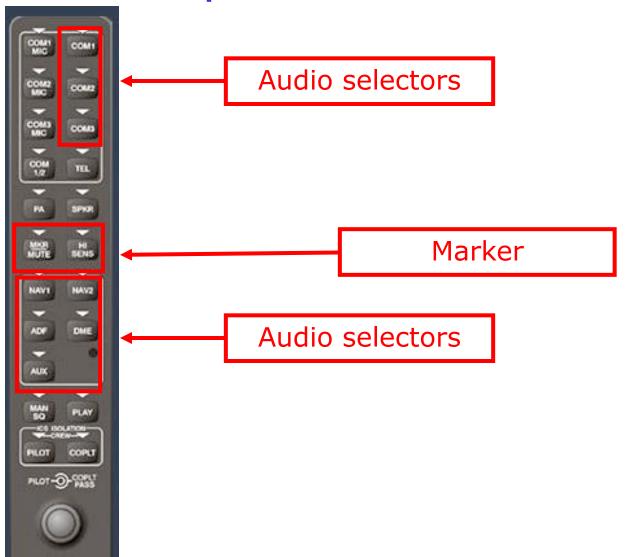
Audio panel





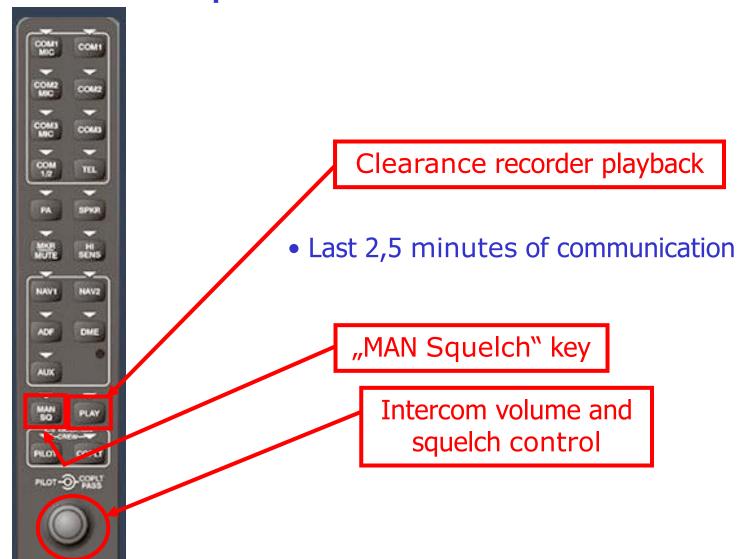
Audio panel





Audio panel





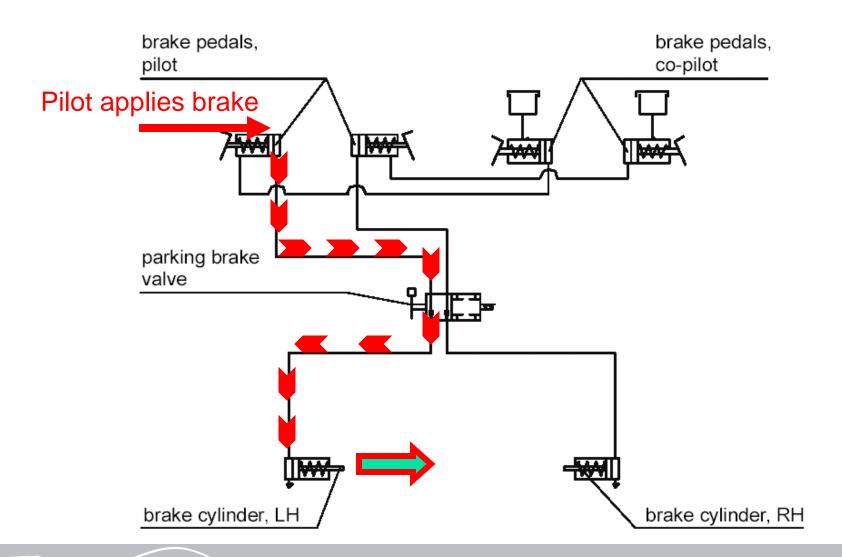
Diamond DA40-TDI G1000





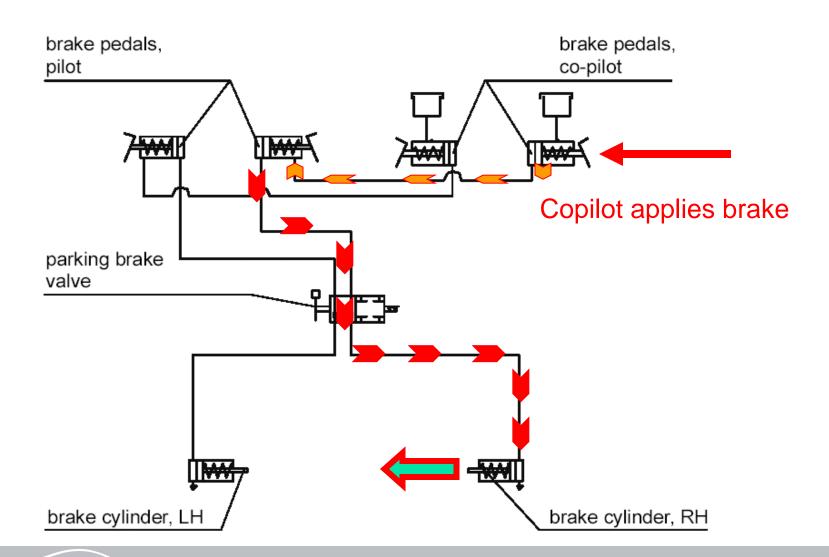
Hydraulic brakes





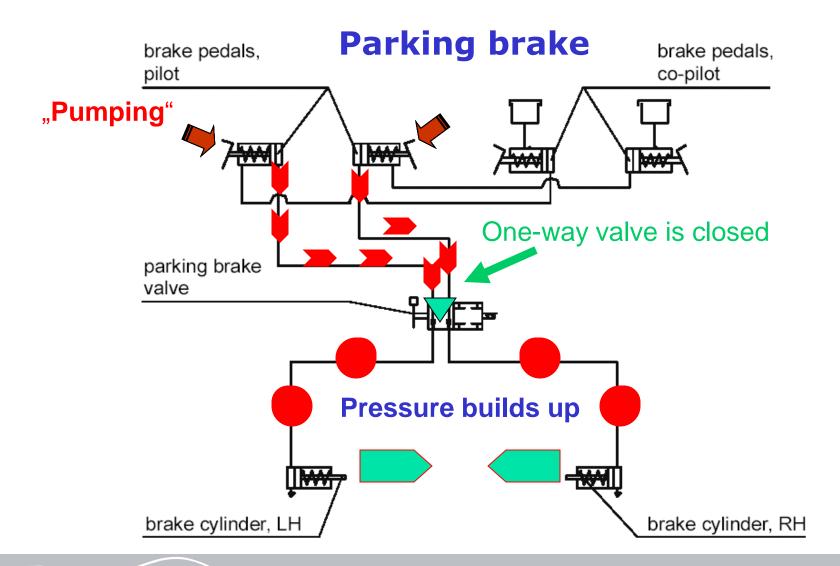
Hydraulic brakes





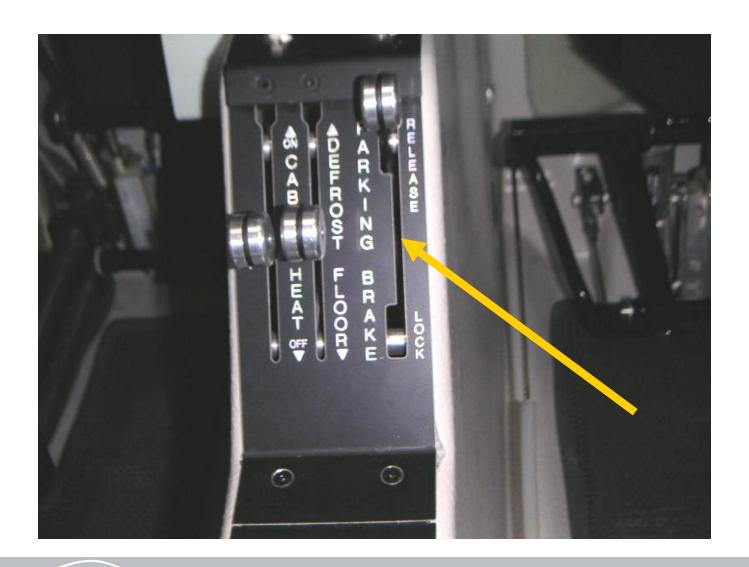
Hydraulic brakes





Parking brake





Diamond DA40-TDI G1000



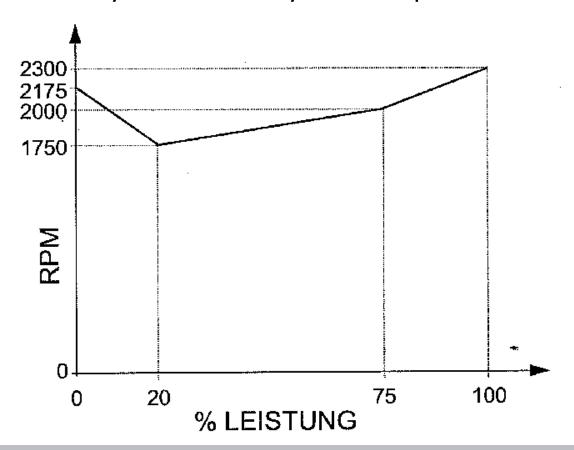




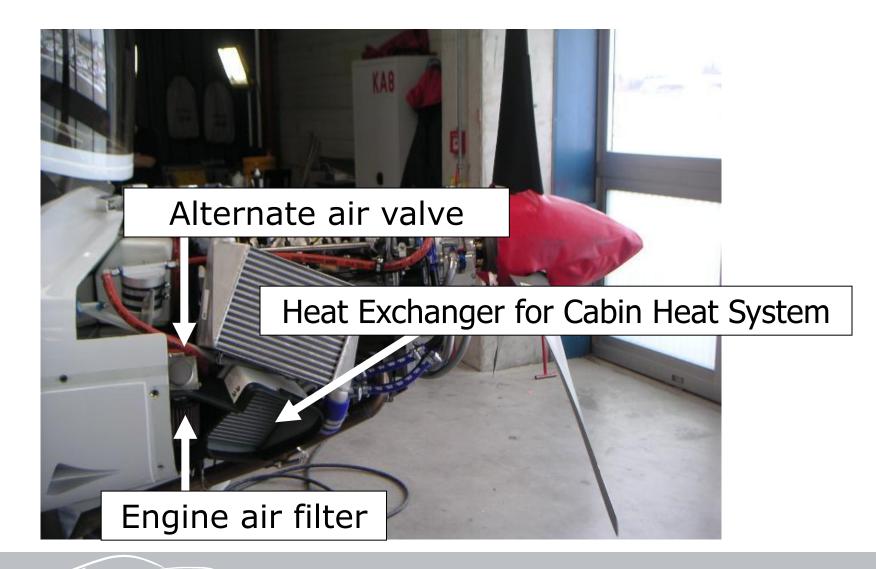
- Thielert Aircraft Engines TAE125
- Four cylinders, liquid-cooled, 1689 ccm
- Common-rail direct injection
- Reduction gear 1:1,69
- Digital engine control
- Turbocharger
- Max. power 99kW (135 PS) at 2300 RPM
- Max cont. power 99kW (135 PS) at 2300 RPM



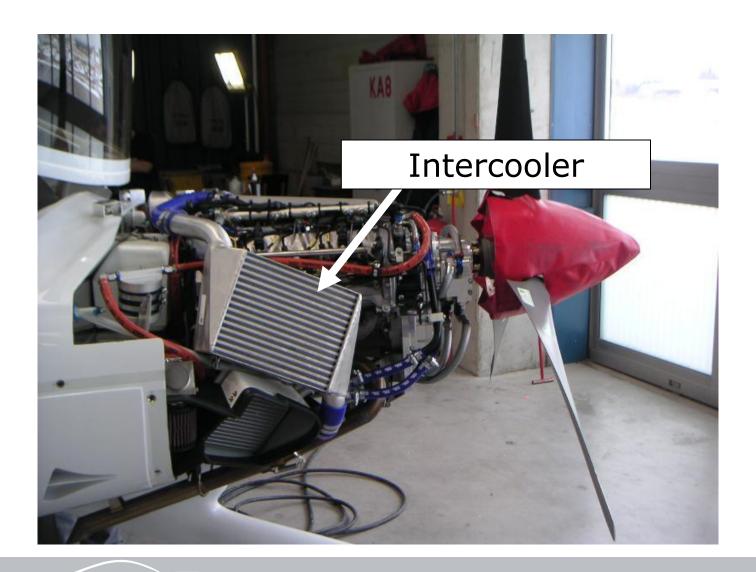
- Power lever selects power (LOAD in %)
- RPM automatically determined by selected power



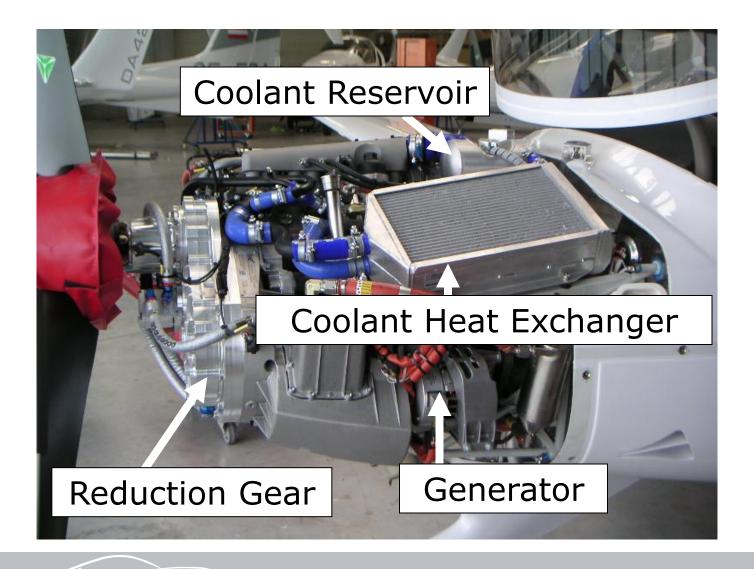












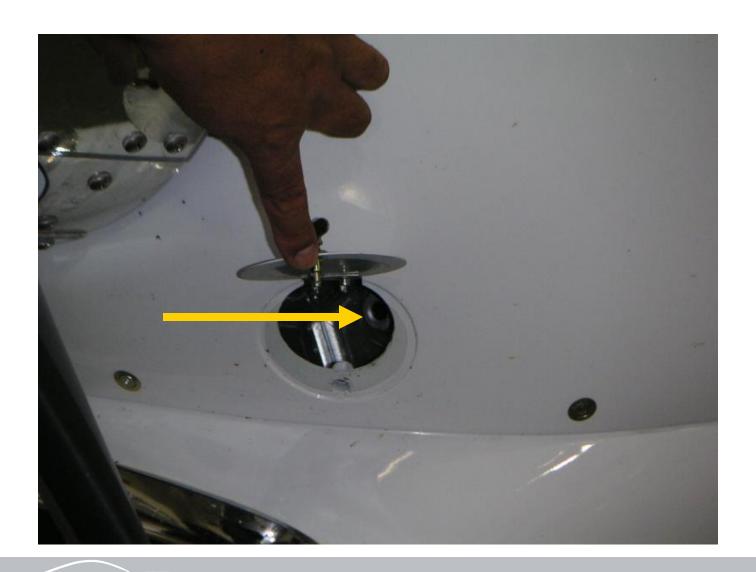
Power plant - Gear oil





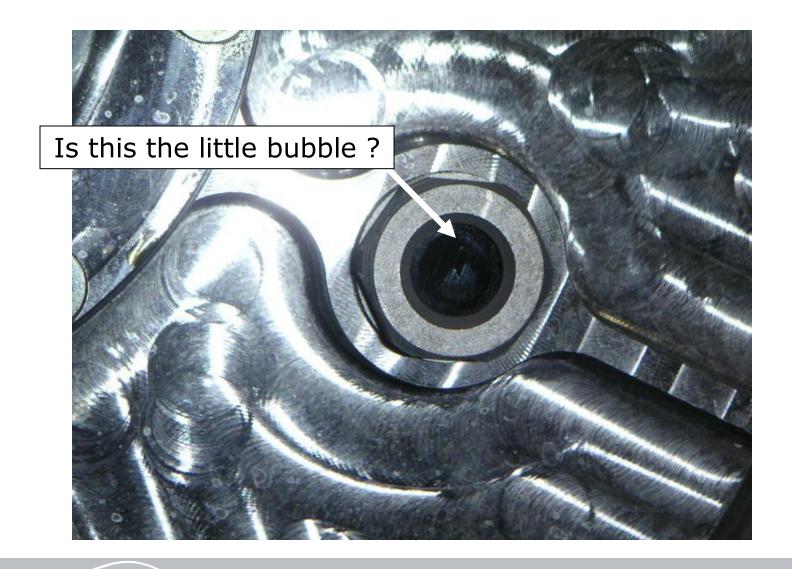
Power plant - Gear oil





Power plant - Gear oil





Power plant limitations



- Max overspeed: 2500 RPM, max 20 sec.
- Oil pressure: 1.0 6.5 bar
- Oil quantity: 4.5 6.0 liters
- Max. oil consumption: 0.1 liters/hr
- Oil temperature: -32 °C 140 °C
- Gearbox temperature: max. 120 °C
- Coolant temperature: -32 °C 105 °C
- Max. restart altitude: 6500 ft, 73-120 KIAS



Power plant fluid specifications

• Fuel: JET A-1 or JET A (ASTM D 1655)

JET No. 3 (GB6537-94)

Diesel (EN 590)

Oil: SHELL Helix Ultra 5W30 synth. API SL/CF

SHELL Helix Ultra 5W40 synth. API SL/CF

AERO SHELL Diesel 10W-40

Gearbox oil: SHELL EP 75W90 API GL-4

Coolant: DAI-G30-MIX

special water (TAE-125-OM-02-01)

+ cooler protection 1:1

(BASF Glysantin Alu Protect Plus/G30)

(freezing point -36 °C)

"Diesel" limitations



- Temperature limits
 - Below -5° C no engine start
 - Below +5° C no take-off
- Be sure that no diesel fuel is in the tanks – otherwise temp limitations for diesel ops must be observed

"Diesel" limitations



- When is no more diesel in the tanks?
 - each tank to be refilled at least twice with more than
 - 10,6 USG (40 ltrs) (normal tanks)
 - 17,2 USG (65 ltrs) (long range tanks)

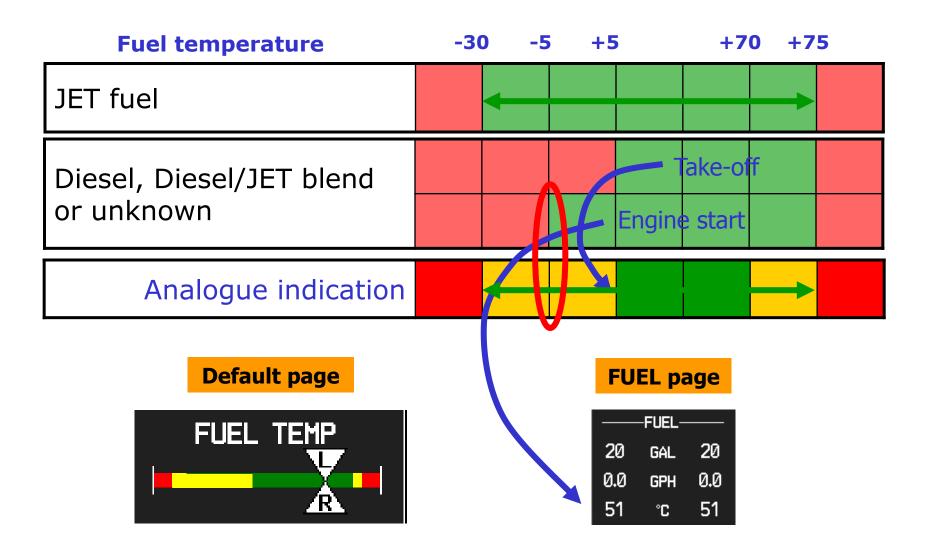
of Jet fuel

otherwise

tank must be drained

"Diesel" limitations



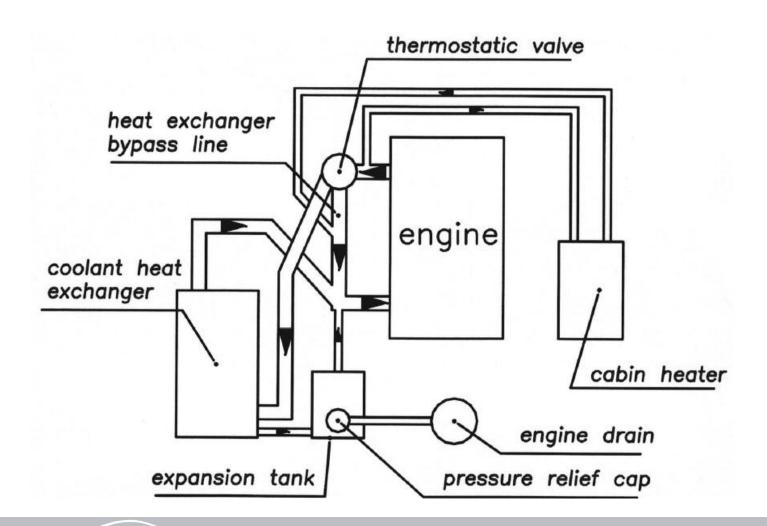


Diamond DA40-TDI G1000

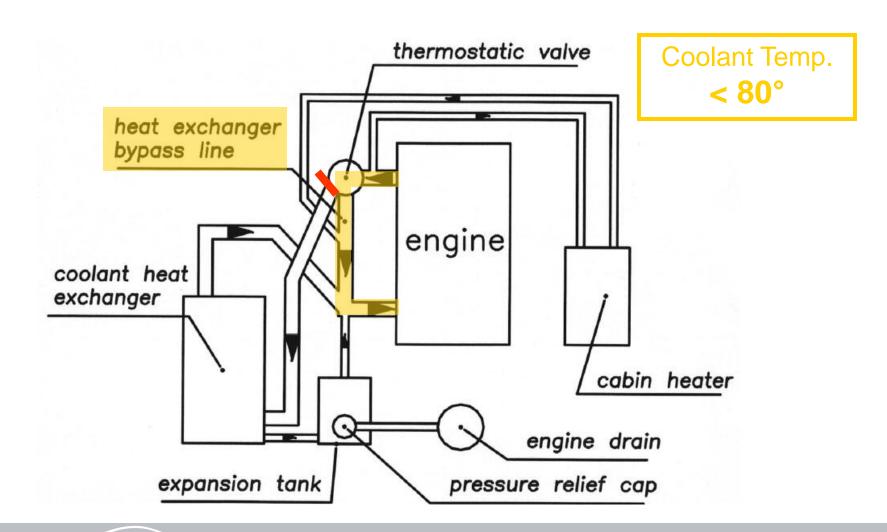




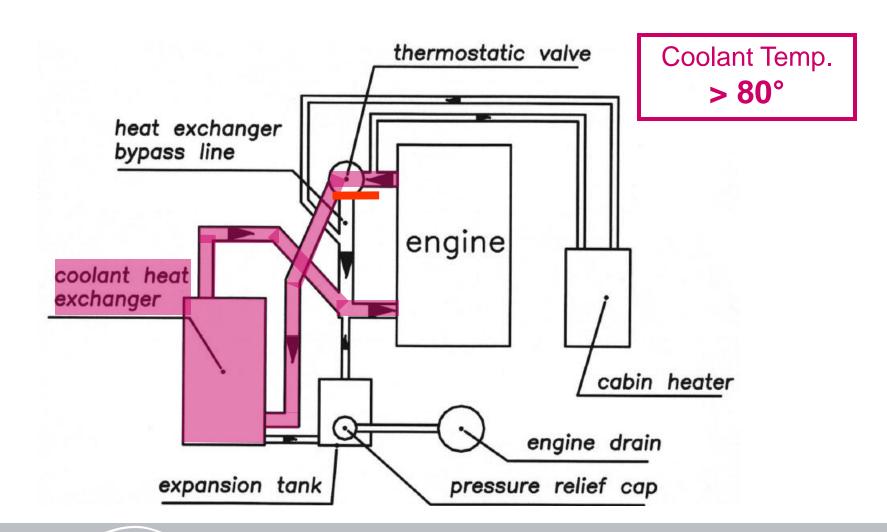




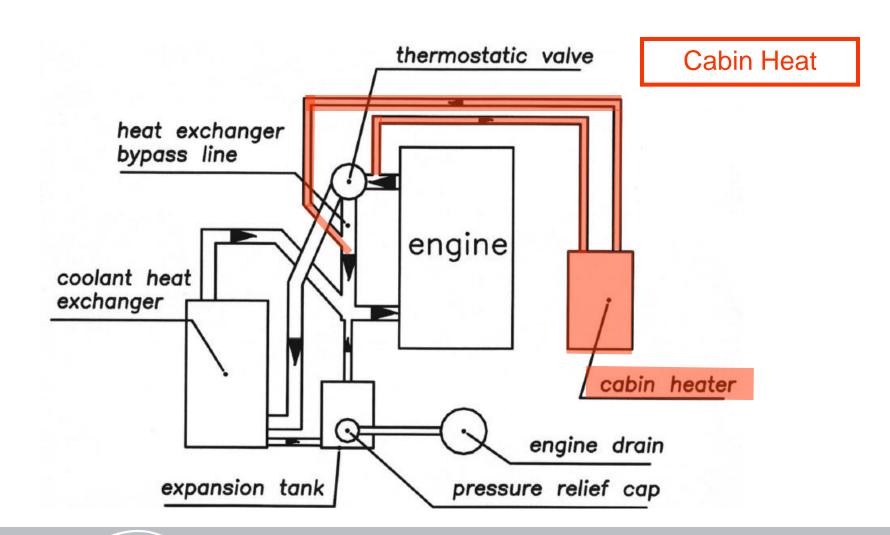






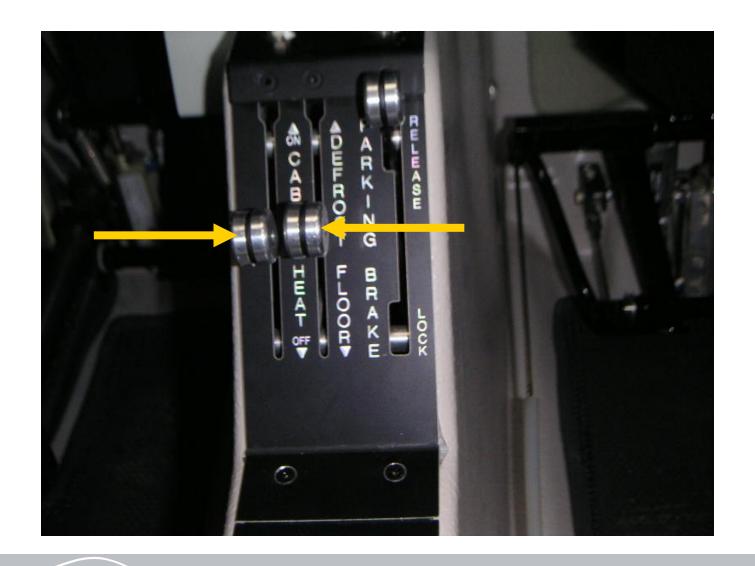






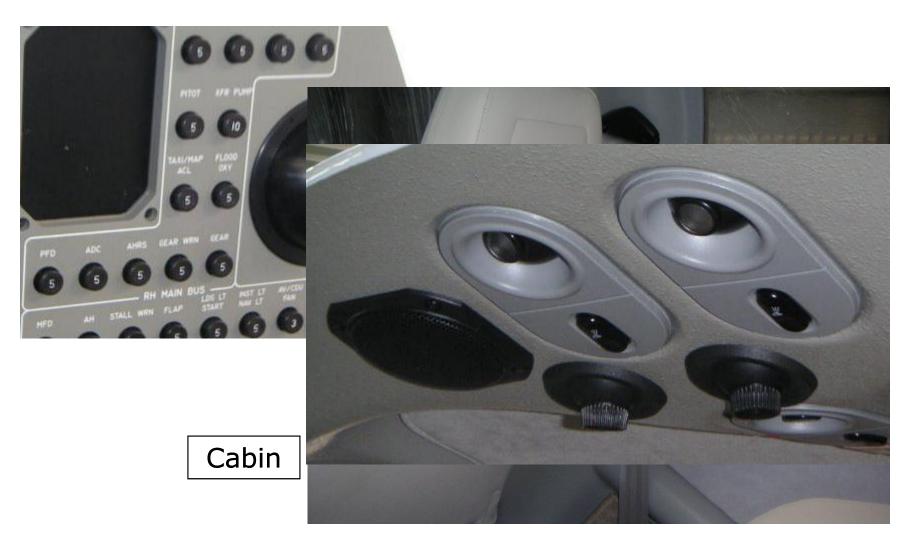
DA 40 TDI Cabin Heat





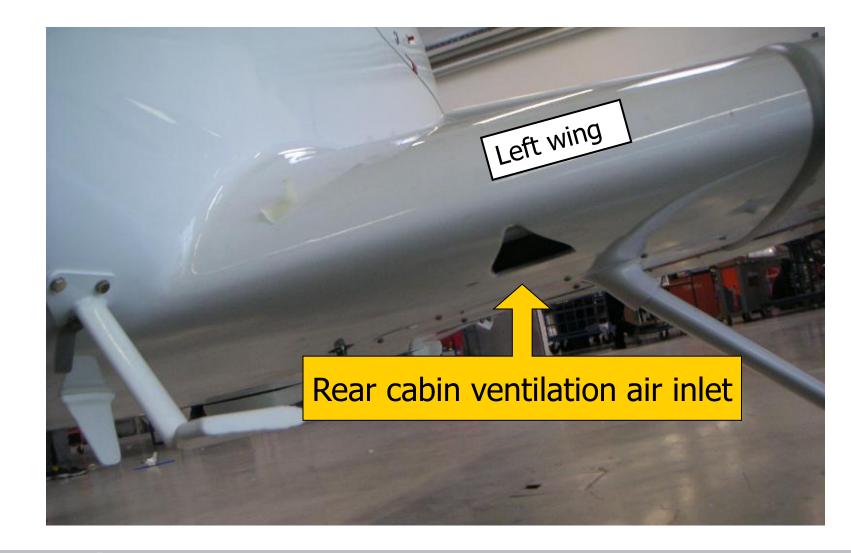
DA 40 TDI Ventilation





DA 40 TDI Ventilation





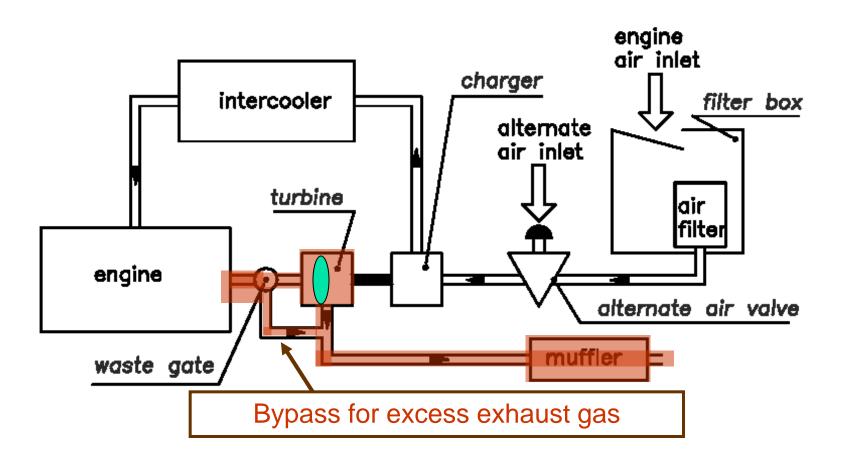
Diamond DA40-TDI G1000





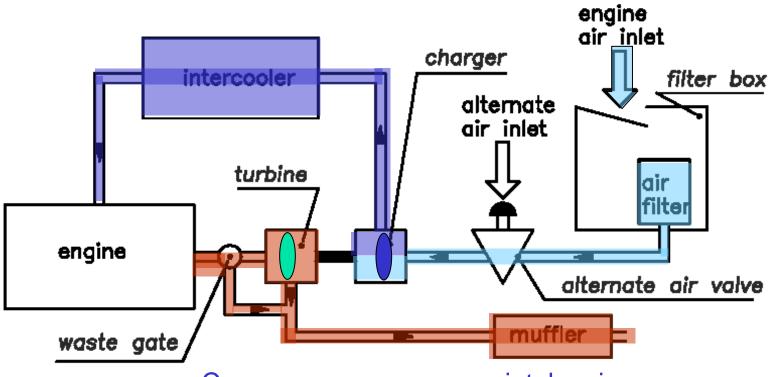
DA 40 TDI Turbo Charger





DA 40 TDI Turbo Charger





Compressor compresses intake air

Diamond DA40-TDI G1000





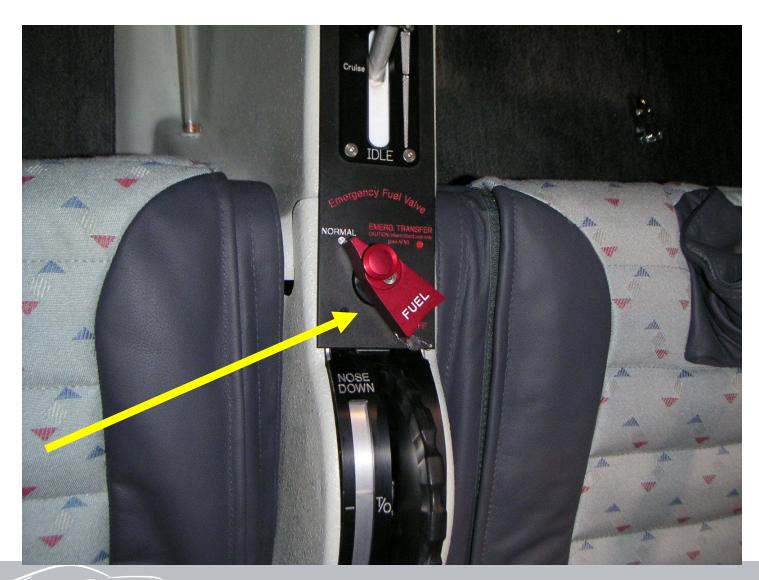


- 2 x 14 USG usable
- = 28 USG
- = 85 kg
- At 70% power: ~ 5 USG/hr



- Long Range Tanks:2 x 19,5 USG usable
- = 39 USG
- = 120 kg
- Max indicated fuel per tank: 15 USG
- Max. unbalance: 9 USG





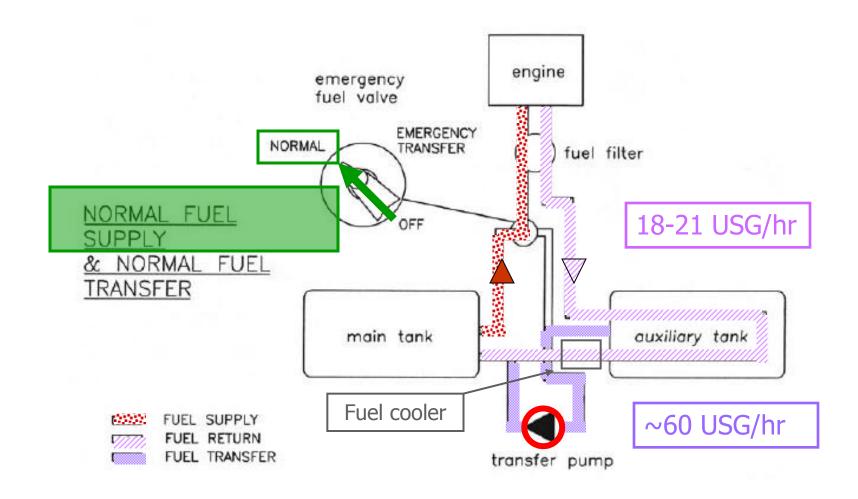
@ Reter Schmidleitment





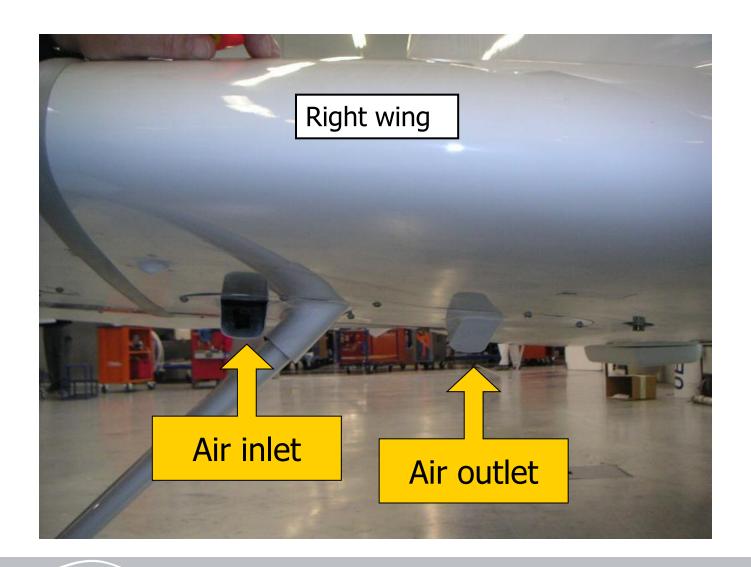
@ Pletter SchmidleitmenH



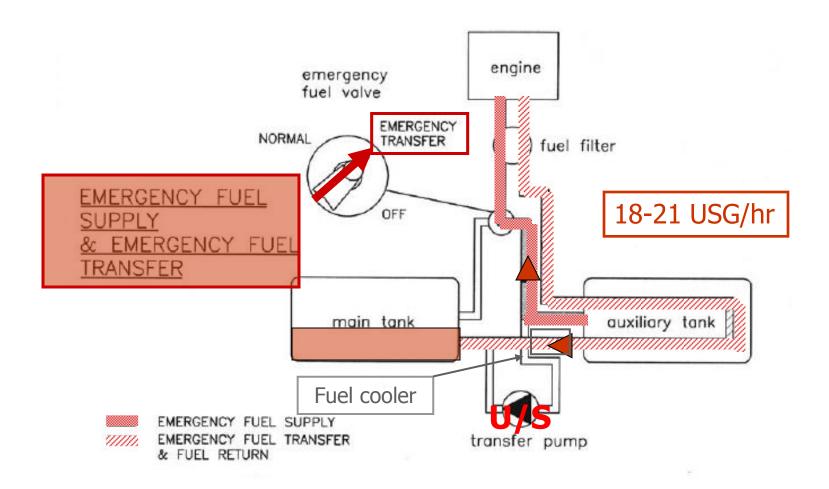


Fuel cooler



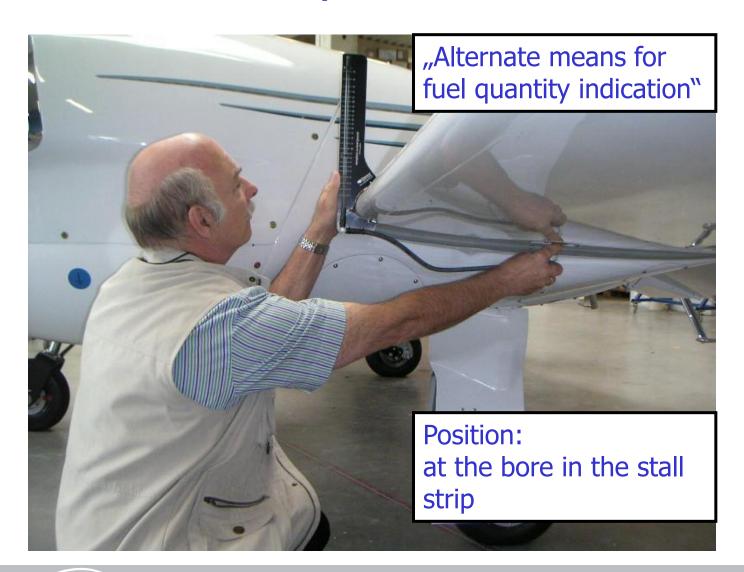






DA 42 Fuel system





Fuel vents





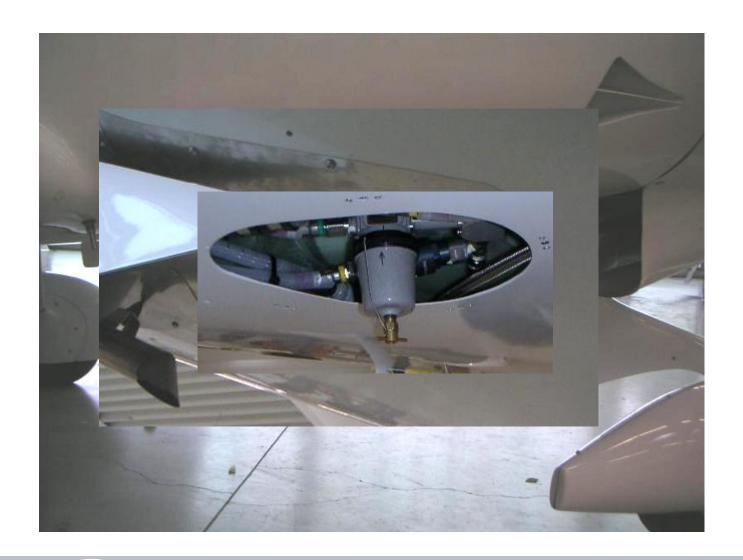
Fuel tank drain





Fuel gascolator drain





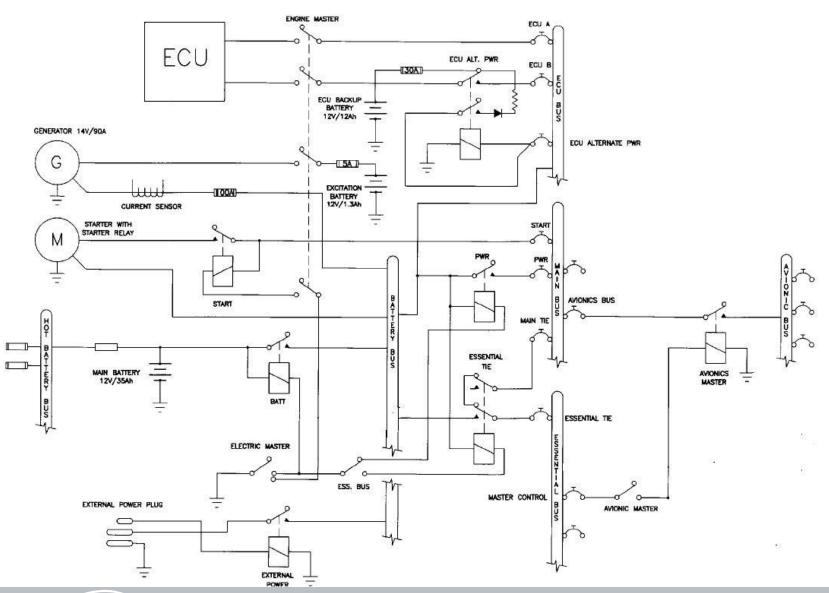
Diamond DA40-TDI G1000





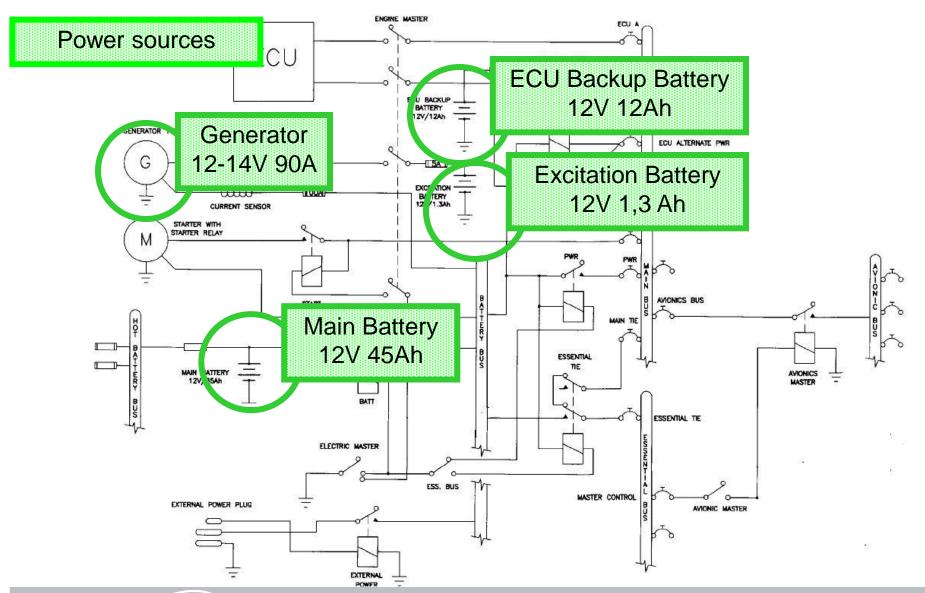
DA40 TDI G1000 Electrical System





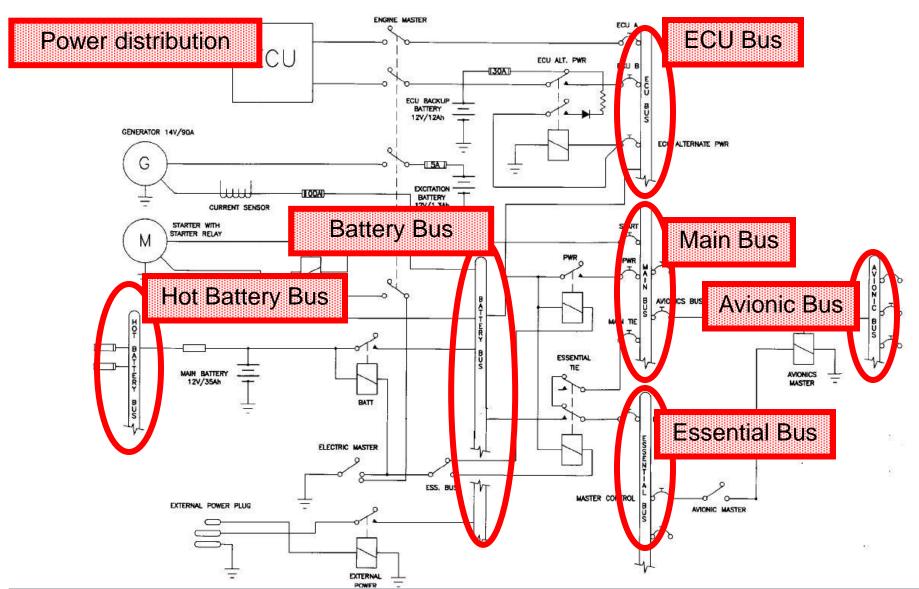
DA40 TDI G1000 Electrical System





DA40 TDI G1000 Electrical System







Electric Master, Essential Bus



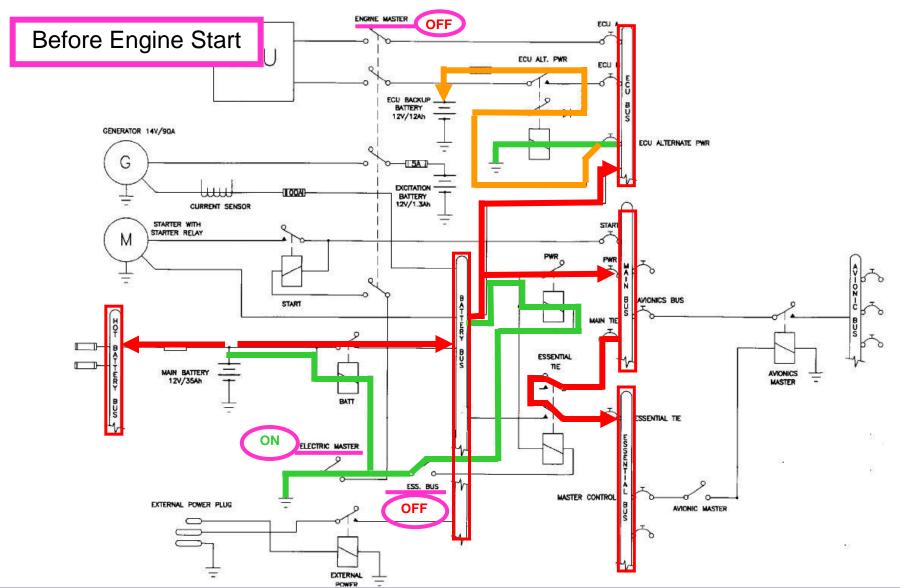


Engine Master

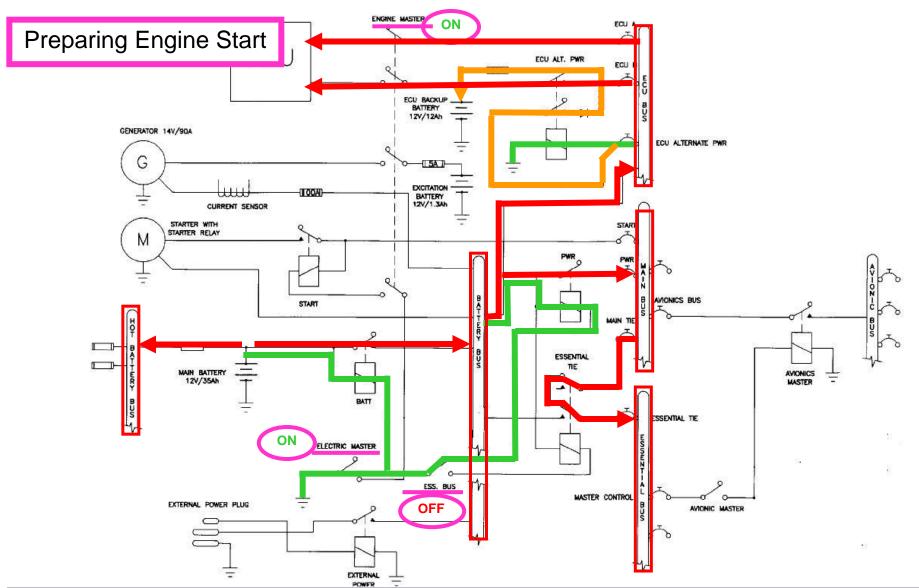




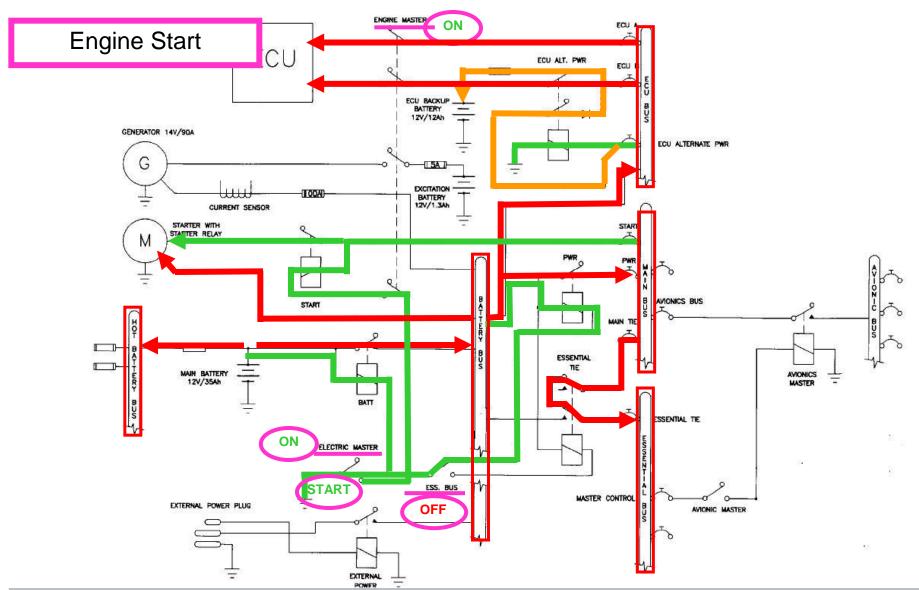




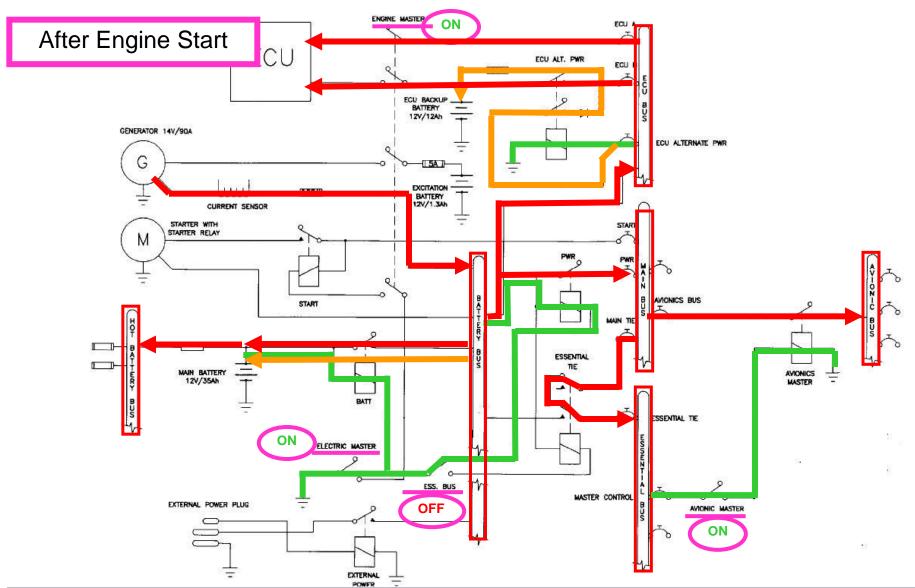












External Power Receptable



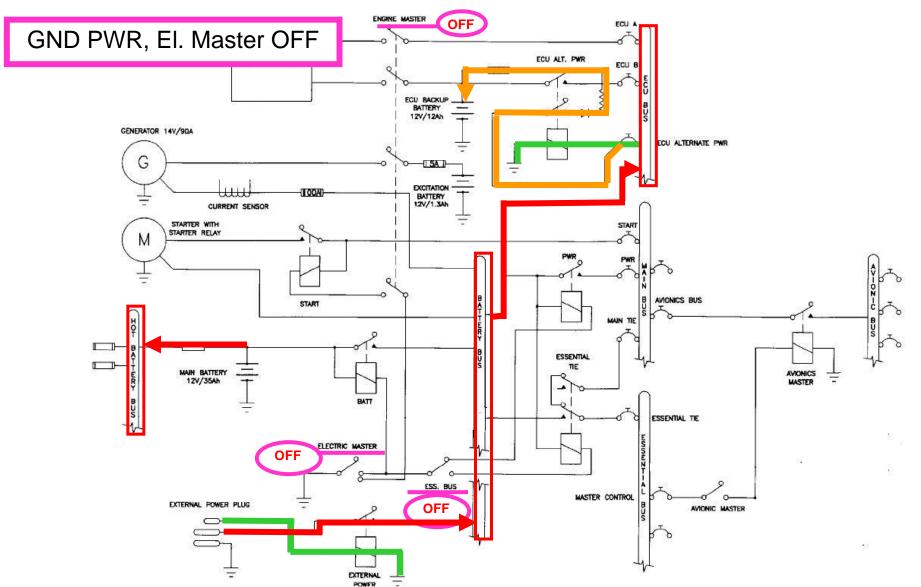


External Power Receptable

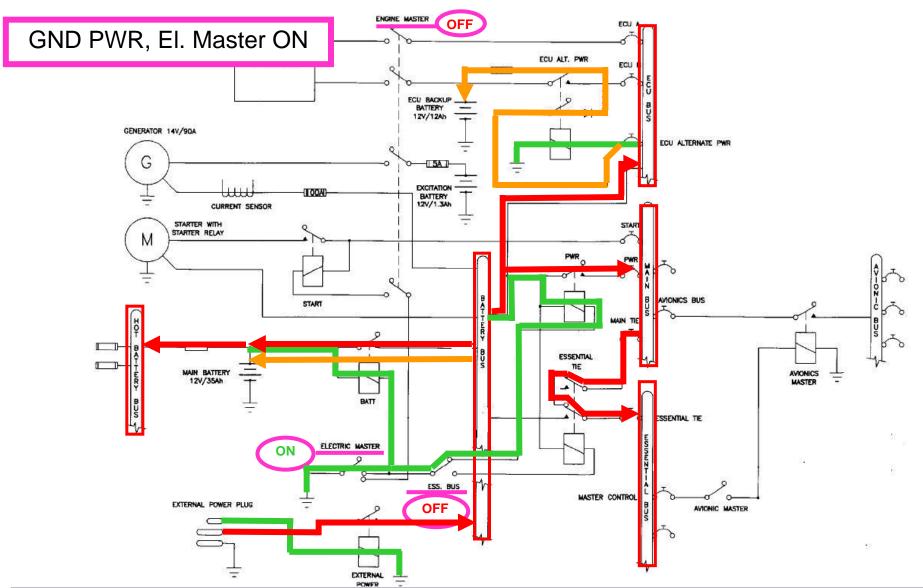












Emergency Switch





DA40-TDI G1000





Switch location





When is it used?



- When the generator fails
- to disconnect unnecessary electrical consumers
- to supply battery power to essential electrical consumers

Essential Electrial Power



Essential Bus

- PFD
- Horizon *)
- AHRS
- ADC
- Flaps
- Landing light
- Pitot Heating
- Landing Light
- Flood Light *)

- COM 1
- GPS / NAV Receiver 1
- Transponder
- Engine instruments
- Hot Battery Bus
 - (Essential Bus)
 - Pilot's map/reading light
 - Auxiliary jack

^{*)} Emergency Battery



Essential Electrial Power

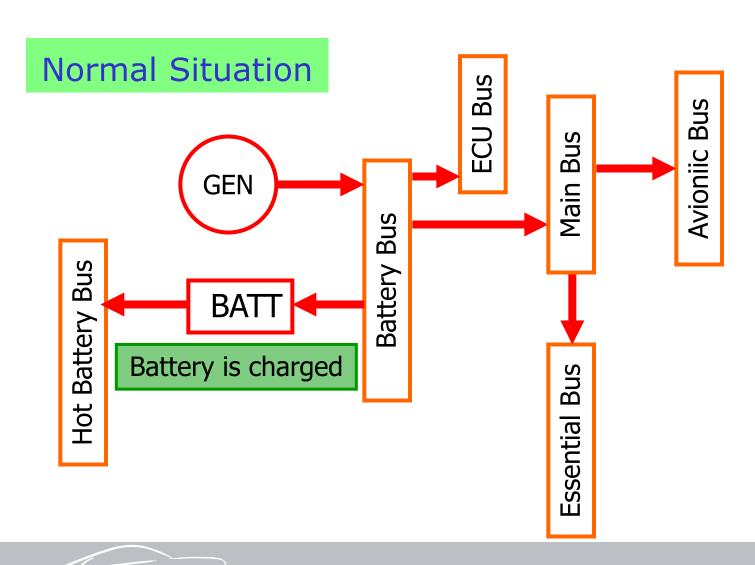
- Main unserviceable systems
 - Fuel x-fer pump
 - MFD
 - Acionic / CDU fan
 - Position light, Strobe lights, Taxi light
 - Instrument lights, Map light
 - Starter
 - (Avionics Bus)
 - COM2, NAV/GPS2, ADF, DME, WX500, Audio, Autopilot

What happens ...

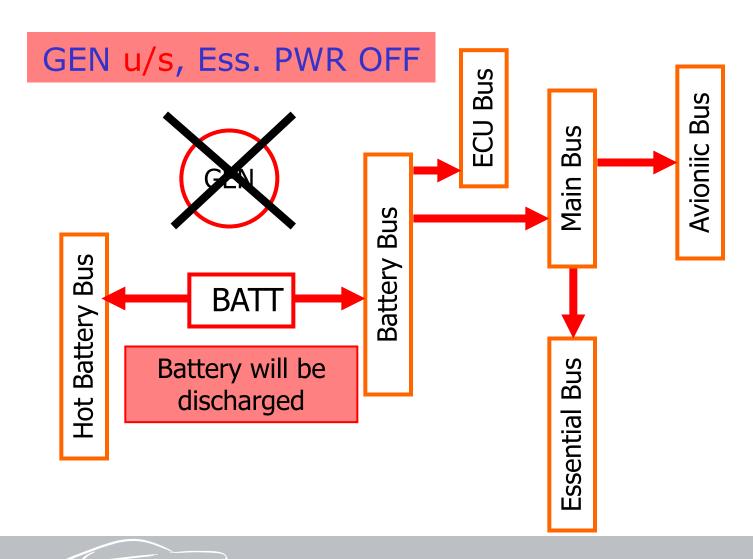


- ... if it is switched ON during normal operation?
- Will the battery be discharged?
 - NO !

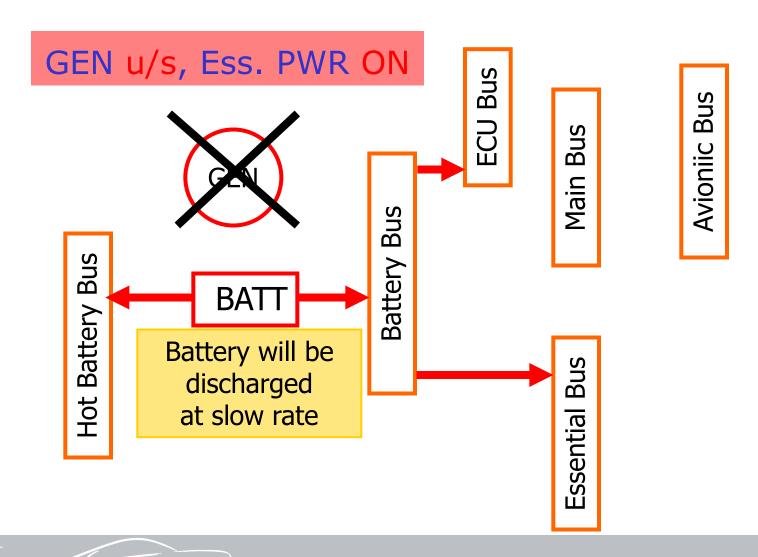




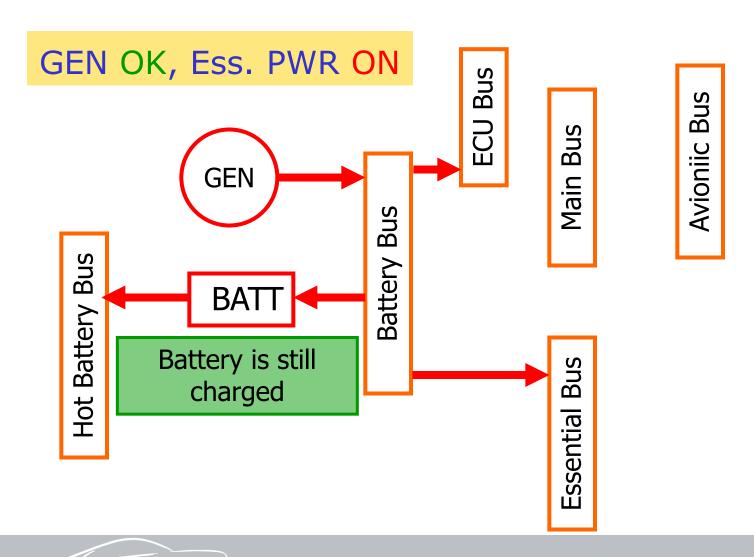




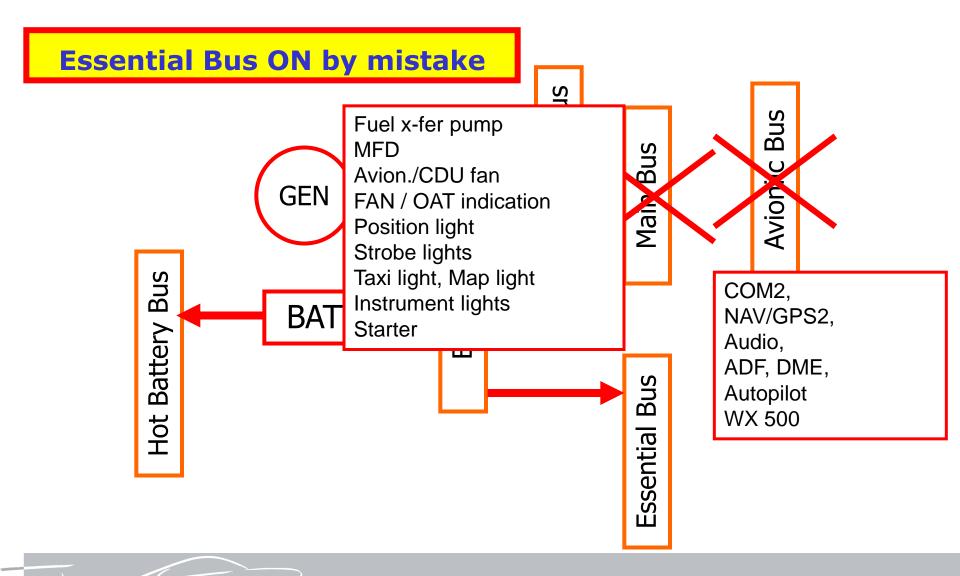








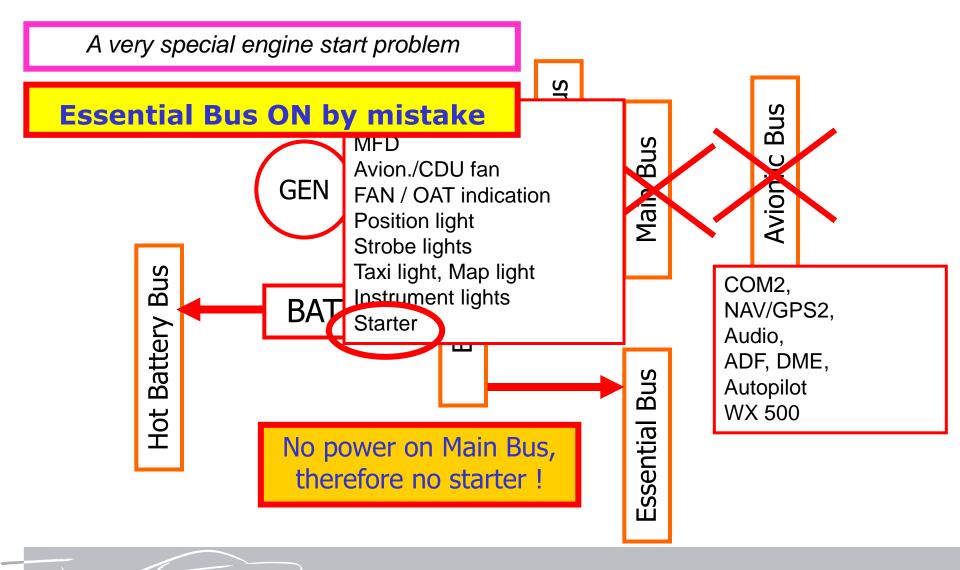




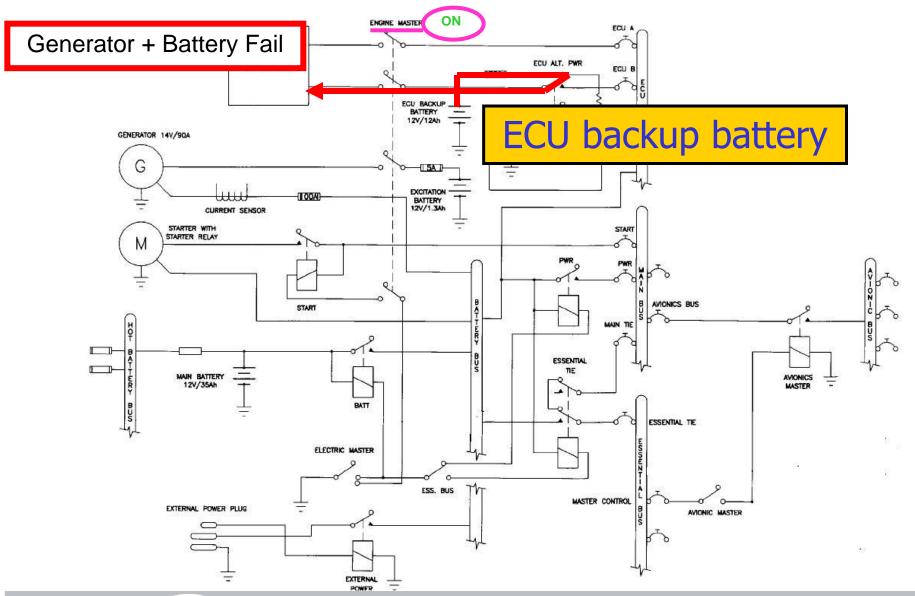


- A very special engine start problem:
 - Start witch ON
 - Nothing happens!
- Why?
 - Essential Bus switch ON by mistake!









Diamond DA40-TDI G1000



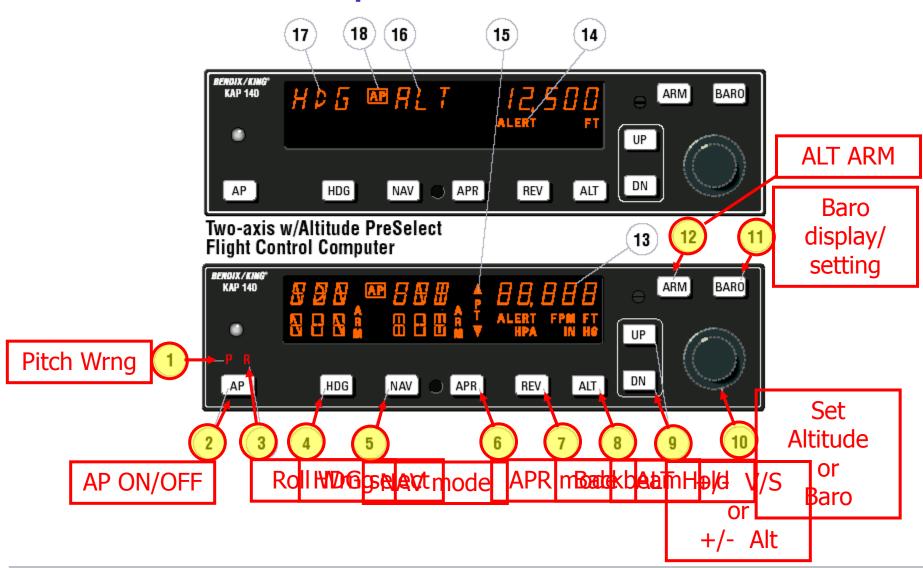


Autopilot limitations

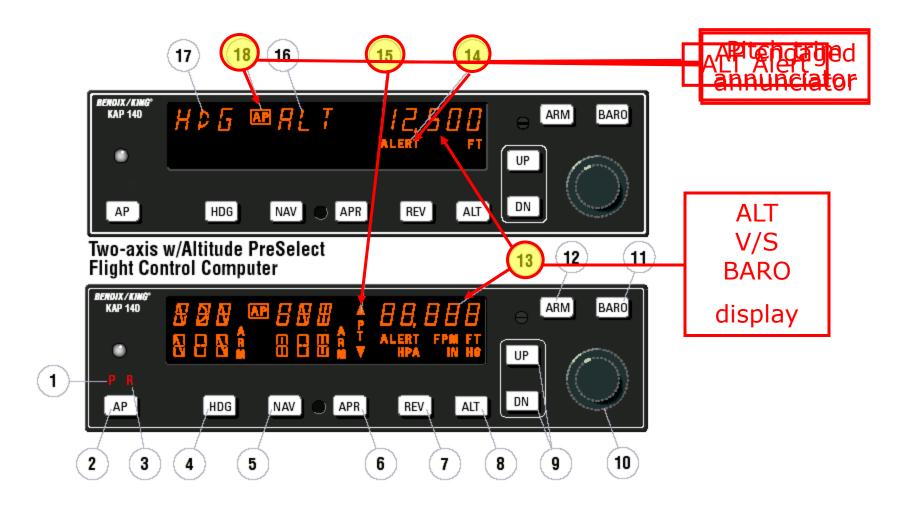


Limitations for KAP 140 Autopilot System:
Do not use AP if "Alternate Static" is open.
Conduct AP and trim check prior to each flight (see AFM).
Autopilot OFF during take-off and landing.
Maximum speed for autopilot operation is 165 KIAS.
Minimum speed for autopilot operation is 70 KIAS.
Minimum altitude for autopilot operation:
Cruise, Climb, Descent and Maneuvering: 800 feet AGL
Approach: 200 feet AGL

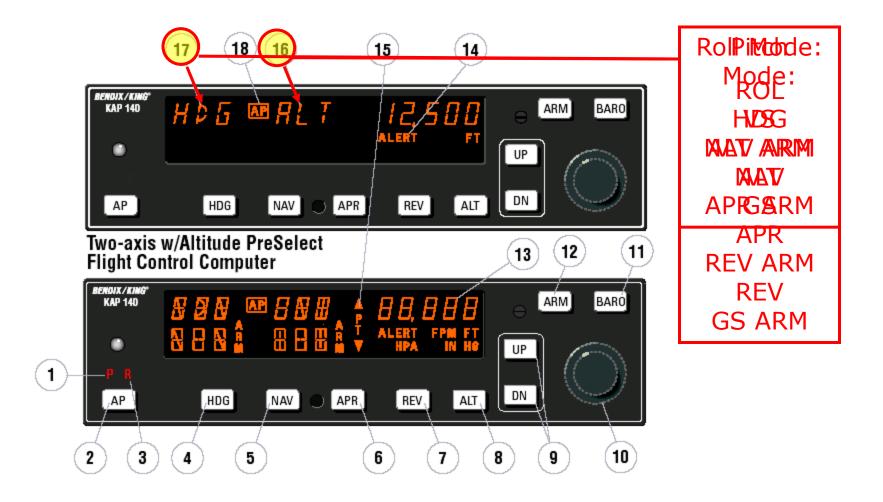














Vertical Speed Mode



Toggles between ALT HLD and V/S



Altitude Hold Mode



Toggles between ALT HLD and V/S



Altitude Preselect







Diamond DA40-TDI G1000







The "DA 40 TDI" and "Density Altitude"

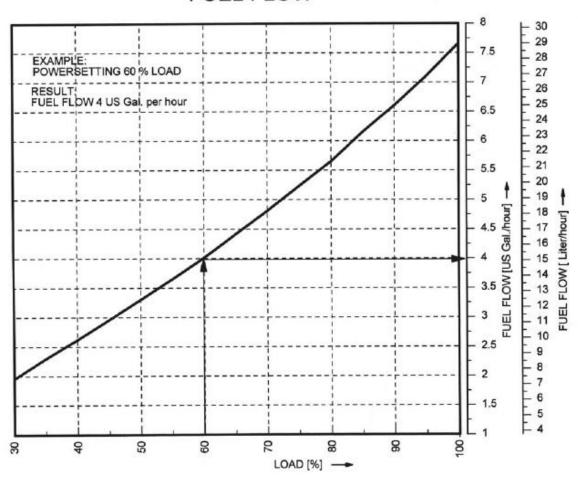
Attention!

- Performance data which are enginepower dependant cannot be determined by just using "Density Altitude"!
- Reason: the engine power output does not correspond to density altitude but pressure and temperature have their own, independent influence
- This is a feature of the ECU controlled, turbocharged Diesel-engine

Cruise Power Setting



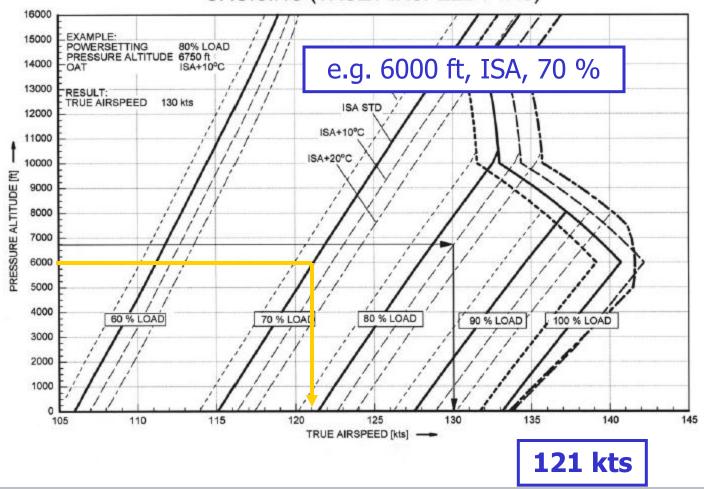
FUEL FLOW



Cruising Speed







TOD, TOR



WARNING

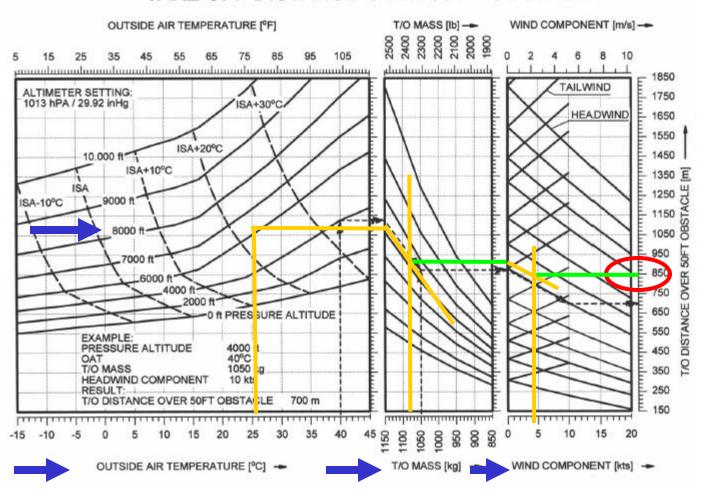
For a safe take-off the available runway length must be at least equal to the take-off distance over a 50 ft (15 m) obstacle.

SL, ISA, 1150 kg: 640 m

TKOF Distance



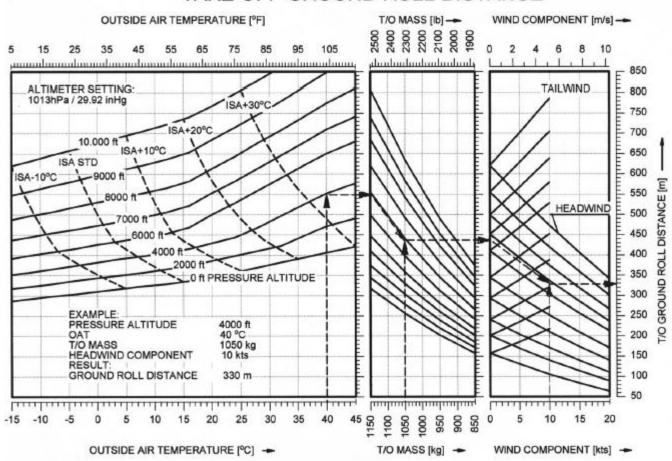
TAKE OFF DISTANCE OVER 50 FT OBSTACLE



TKOF Run



TAKE OFF GROUND ROLL DISTANCE



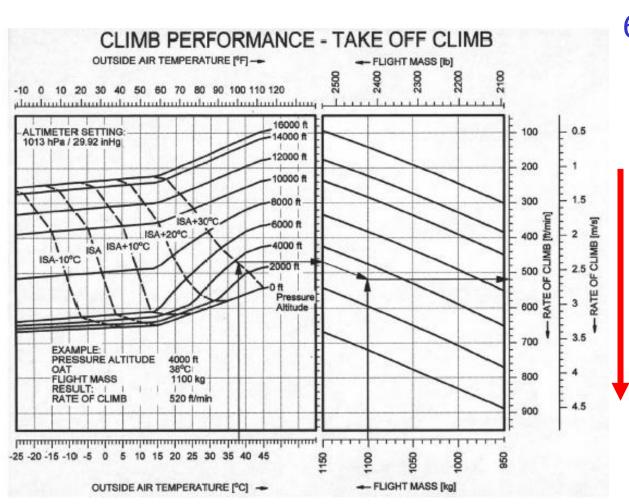
Grass Runway



Length of grass	TKOF roll	Wet grass
- 5 cm	+ 10%	may bo
5 - 10 cm	+ 15%	may be significantly
>10 cm	min + 25%	longer

Take off climb



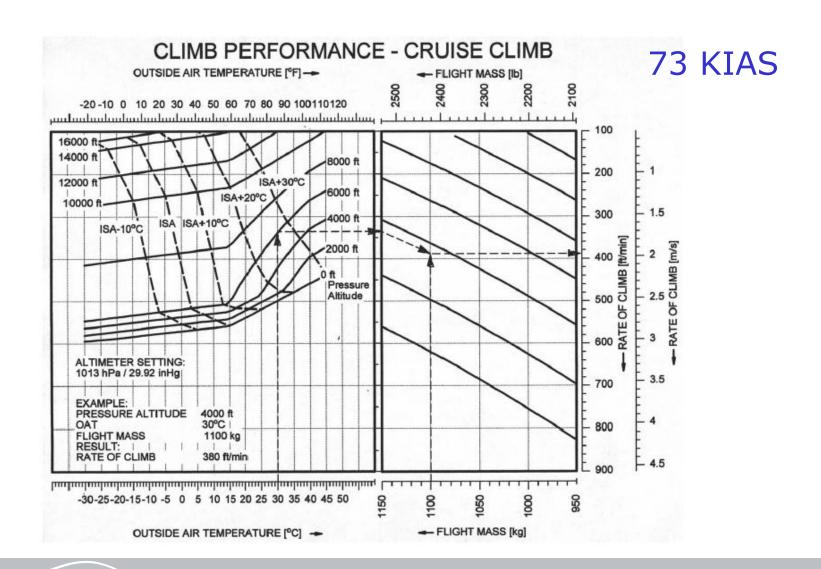


66 KIAS

Attention! Increasing downward

Cruise Climb







ROC to gradient conversion

Gradient [%] =
$$\frac{ROC \text{ [fpm]}}{TAS \text{ [KTAS]}} \cdot 0.95$$

LD, LR tabular format



Flaps LDG VREF 71 KIAS

values for ISA and MSL, at 1150 kg (2535 lb)			
Landing distance over a 50 ft (15 m) obstacle 744 m (2441 ft)			
Ground roll	287 m (942 ft)		

Flaps UP VREF 73 KIAS

values for ISA and MSL, at 1150 kg (2535 lb)			
Landing distance over a 50 ft (15 m) obstacle 916 m (3005 ft)			
Ground roll	304 m (977 ft)		

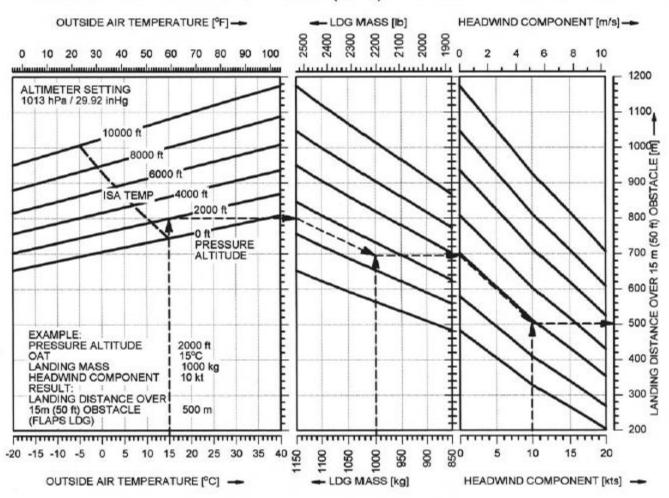
WARNING

For a safe landing the available runway length must be at least equal to the landing distance over a 50 ft (15 m) obstacle.

Landing Distance



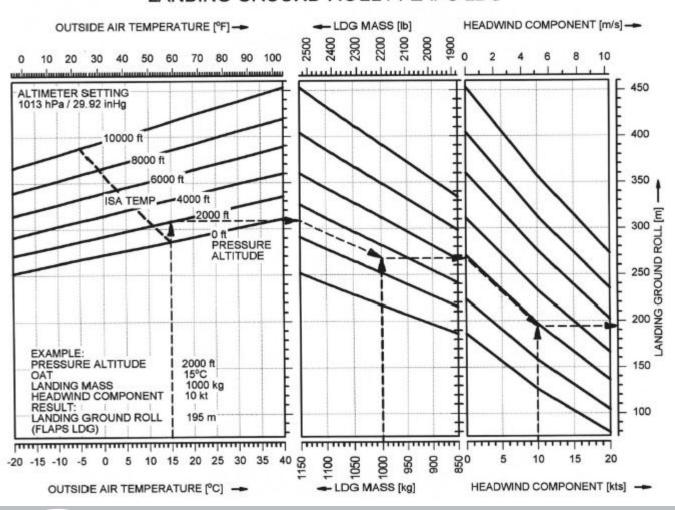
LANDING DISTANCE OVER 15 m (50 ft) OBSTACLE / FLAPS LDG



Landing Run



LANDING GROUND ROLL / FLAPS LDG



Grass Runway



Length of grass	LDG run	Wet grass
- 5 cm	+ 5%	may bo
5 - 10 cm	+ 15%	may be significantly
>10 cm	min + 25%	longer

Go Around



5.3.13 GRADIENT OF CLIMB ON GO-AROUND

The DA 40 D reaches a constant gradient of climb of 4.86 % (conforming to an angle of 2.8°) in the following condition:

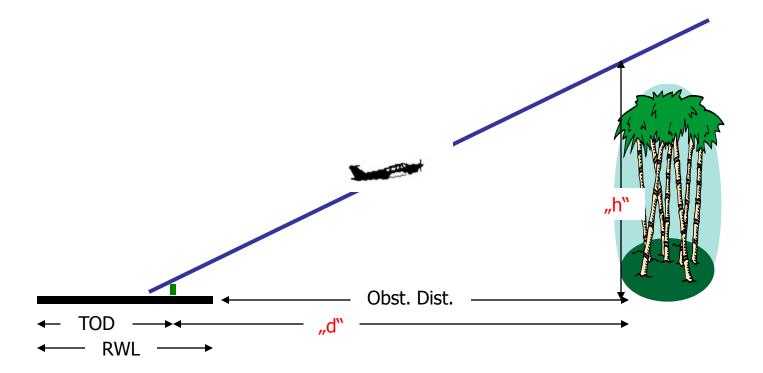
-	Mass	max. flight mass (1150 kg, 2535 lb)
-	Power lever	MAX
-	Flaps	LDG
-	Airspeed	70 KIAS
-	ISA, MSL	

Obstacles?



$$"d" = (RWL + Obst.Dist.) - TOD$$

Gradient = $("h" / "d") * 100$

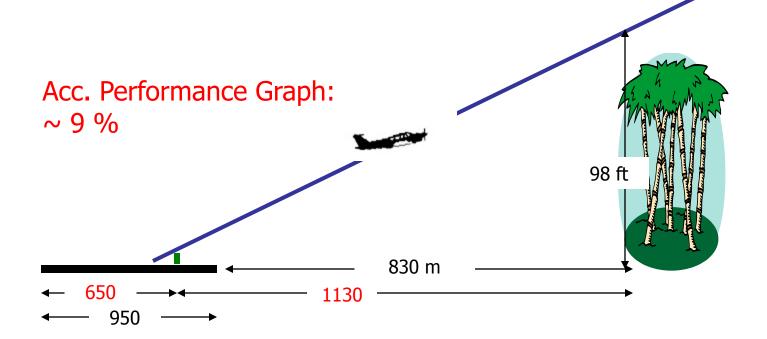


Vöslau RWY 31



"
$$d'' = (950 + 830) - 650 = 1130$$

Gradient = $(30 / 1130) * 100 = 2,65 %$



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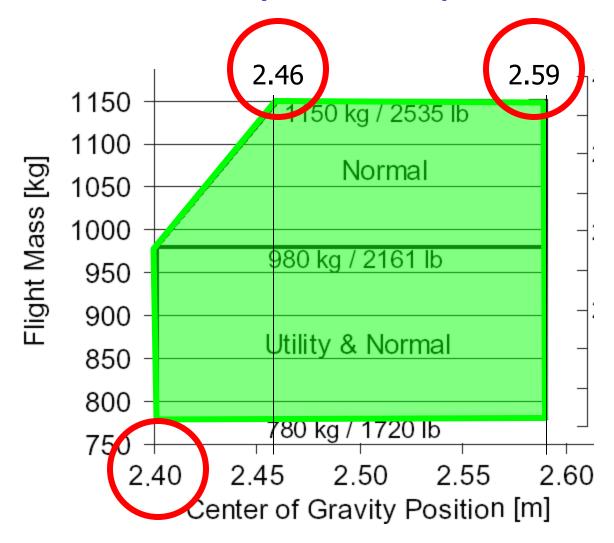
Empty Mass



- Empty Mass includes:
 - Equipment as per Equipment Inventory
 - Brake fluid
 - Coolant fluid
 - Gear oil
 - Engine oil
 - Unusable fuel (2 x 1,0 USG)

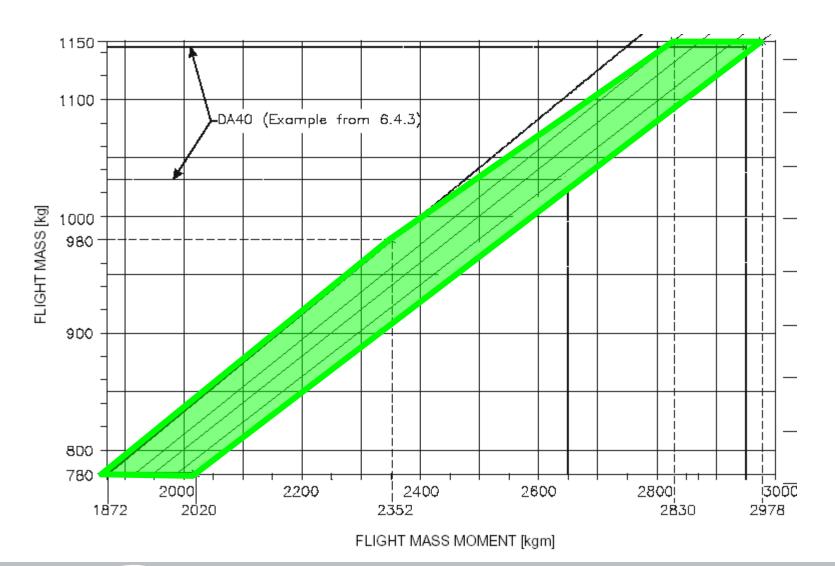
Center of Gravity Envelope





Moment Envelope





Moment Arms



Item	Lever Arm (m)
Front seats	2.30
Rear seats	3.25
Wing tanks	2.63
Fwd. baggage	3.89
Aft baggage	4.54

Typical M+B data



	Empty mass	Moment	CG arm
"IFR"-version (ADF, WX500)	833,5	2057,7	2,469
"N-VFR"-version	826,2	2032,3	2,460

M&B Calculation



	Lever arm	Mass (kg)	Moment (kgm)
Empty mass	2.47	830	2050.1
Front seats	Front seats $170 \times 2.30 = 391.0$		391.0
Rear seats	80 x 3.2	25 = 260.0	260.0
Fwd. Baggage	3.89	10	38.9
Zero Fuel Mass		1090	2740.0
Fuel ~20 USG	2.63	60	157.8
Total TKOF Mass		1150	2897.8

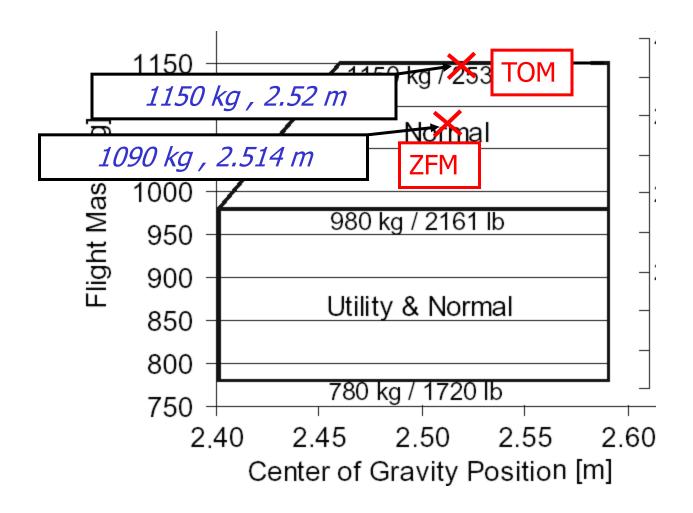
M&B Calculation



	Lever arm	Mass (kg)	Moment (kgm)
Empty mass	2.47	830	2050.1
Front seats	2.30	170	391.0
Rear seats	3.25	80	260.0
Fwd. Baggage	3.89	10	38.9
Zero Fuel Mass	2.514	2740.0:	1090 = 2.514
Fuel	2.63	60	157.8
Total TKOF Mass	2.52	2897.8	1150 = 2.52

Center of Gravity Envelope





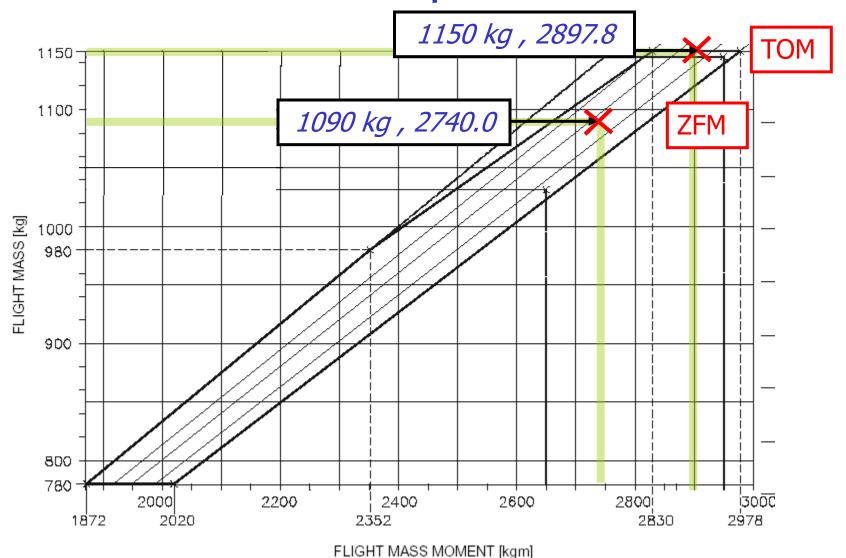
M&B Calculation



	Lever arm	Mass (kg)	Moment (kgm)
Empty mass	2.47	830	2050.1
Front seats	2.30	170	391.0
Rear seats	3.25	80	260.0
Fwd. Baggage	3.89	10	38.9
Zero Fuel Mass		1090	2740.0
Fuel	2.63	60	157.8
Total TKOF Mass		1150	2897.8

Moment Envelope





@ Reten Schmidkeitnen

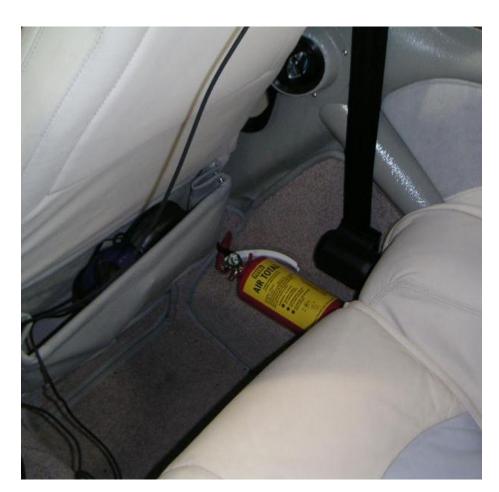
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Emergency equipment

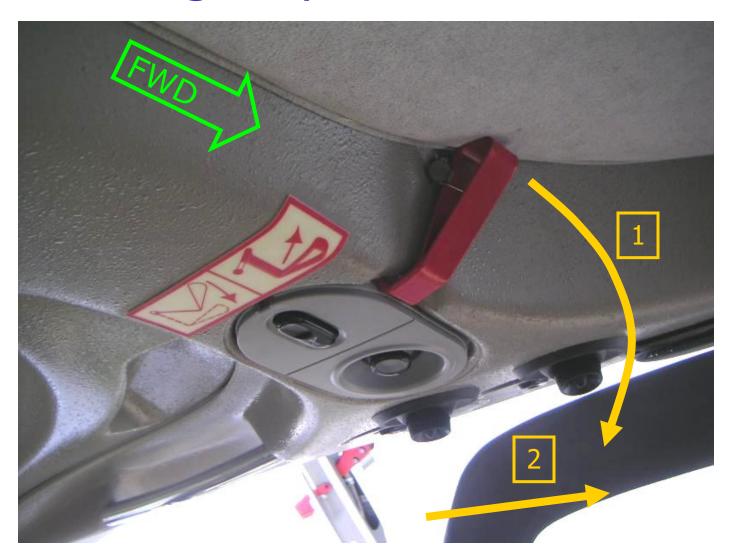






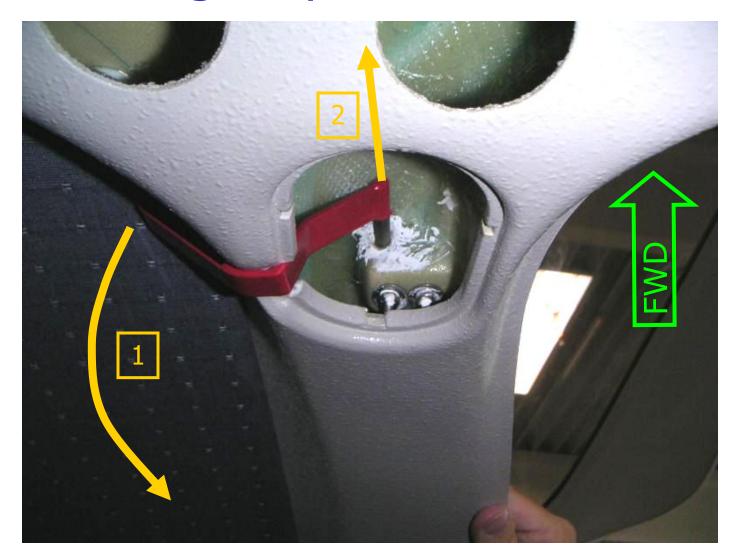
Emergency Exit





Emergency Exit





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	for daytime VFR	in addition	in addition
	flights	for night VFR flights	for IFR flights
Flight & naviga- tion instru- ments	 airspeed indicator (on G1000 PFD or backup) altimeter (on G1000 PFD or backup) magnetic compass 1 headset, used by pilot in command 	 vertical speed indicator (VSI) attitude gyro (artificial horizon; on G1000 PFD or backup) turn & bank indicator directional gyro VHF radio (COM) with speaker and microphone VOR receiver transponder (XPDR), mode A and mode C GPS receiver 	 second airspeed indicator (both, on G1000 PFD and backup) second altimeter (both, on G1000 PFD and backup) second attitude gyro (both, on G1000 PFD and backup) second VHF radio (COM) VOR-LOC-GP receiver second GPS receiver



Kinds of Operation Equipment List KOEL

	for daytime VFR flights	in addition for night VFR flights	in addition for IFR flights
engine	• fuel qty.	•ammeter	
instru- ments	• oil press.	•voltmeter	
I I I I I I I I I I I I I I I I I I I	• oil temp.		
	• coolant temp.		
	coolant level indicator		
	• gearbox temp.		
	• load		
	• prop. RPM		
	 fuel temp. left & right tank 		



Kinds of Operation Equipment List KOEL

	for daytime VFR flights	in addition for night VFR flights	in addition for IFR flights
lighting		•position lights	
		•strobe lights (anti collision lights)	
		•landing light	
		instrument lighting	
		•flood light	
		•flashlight	





	for daytime VFR	in addition	in addition
	flights	for night VFR flights	for IFR flights
other opera- tional mini- mum equip- ment	 stall warning system alternate means for fuel quantity indication (see Section 7.9) safety belts for each occupied seat Airplane Flight Manual 	Pitot heating system alternate static valve	 emergency battery (for backup attitude gyro and flood light) ECU-Backup Unsafe Warning Light





Additional minimum equipment for the intended operation may be required by national operating rules and also depends on the route to be flown.

Diamond DA40-TDI G1000





Scheduled maintenance



- Every
 - 100 hours
 - 200 hours
 - 1000 hours
 - 2000 hours
- Annually

Refuelling





De-icing



- Approved de-icing fluids:
 - Kilfrost TKS 80
 - Aeroshell Compound 07
- Procedure:
 - Remove snow with brush
 - Spray de-icing fluid
 - Wipe dry

Control surfaces gust lock





Mooring





Mooring





Tow bar





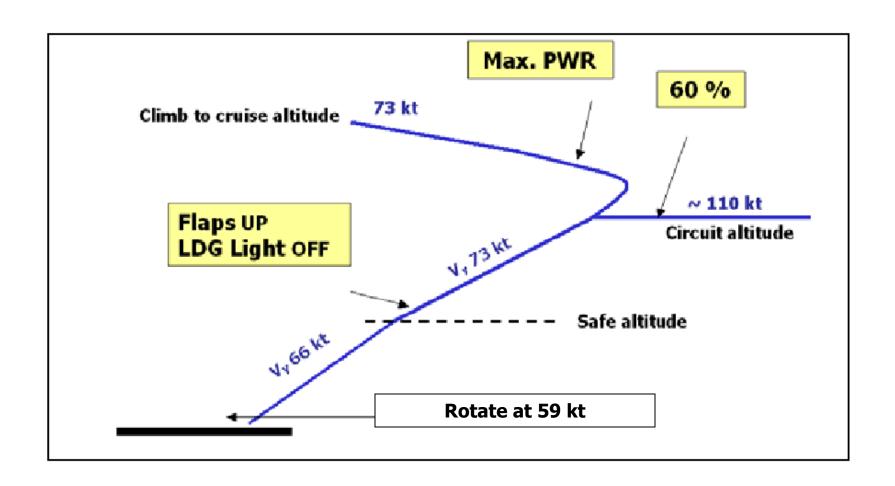
Diamond DA40-TDI G1000





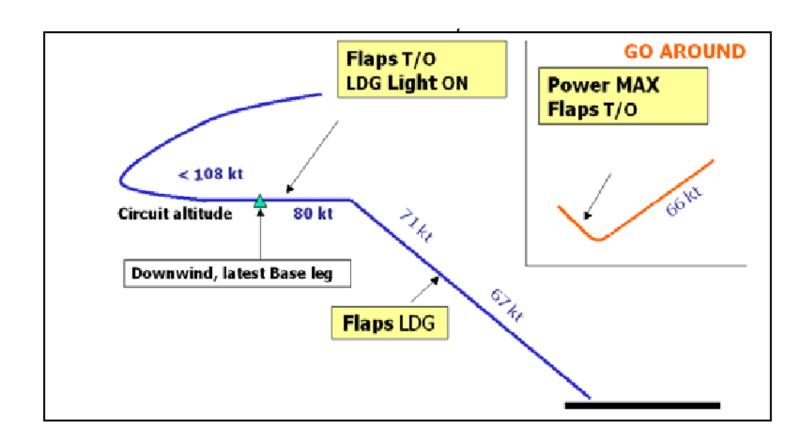
TKOF Profile





LDG Profile





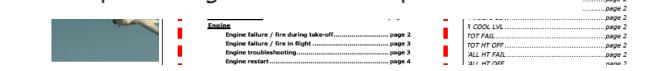
Checklists



This checklist is compiled according the guidelines of GAMA Specification No.1, SECTION 4, para 4.5.

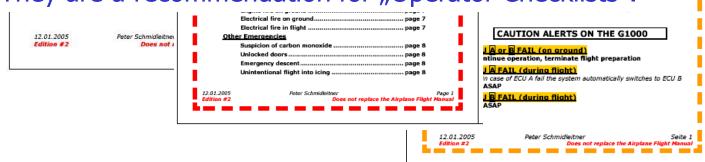
The "Amplified Normal Procedures" according

GAMA Specification No. 1 are in the DA 42 Airplane Flight Manual Chapter 4A.



The checklists are not part of the AFM, and they are not "officially Diamond-endorsed".

They are a recommendation for "Operator Checklists".





Thank you for your attention!

