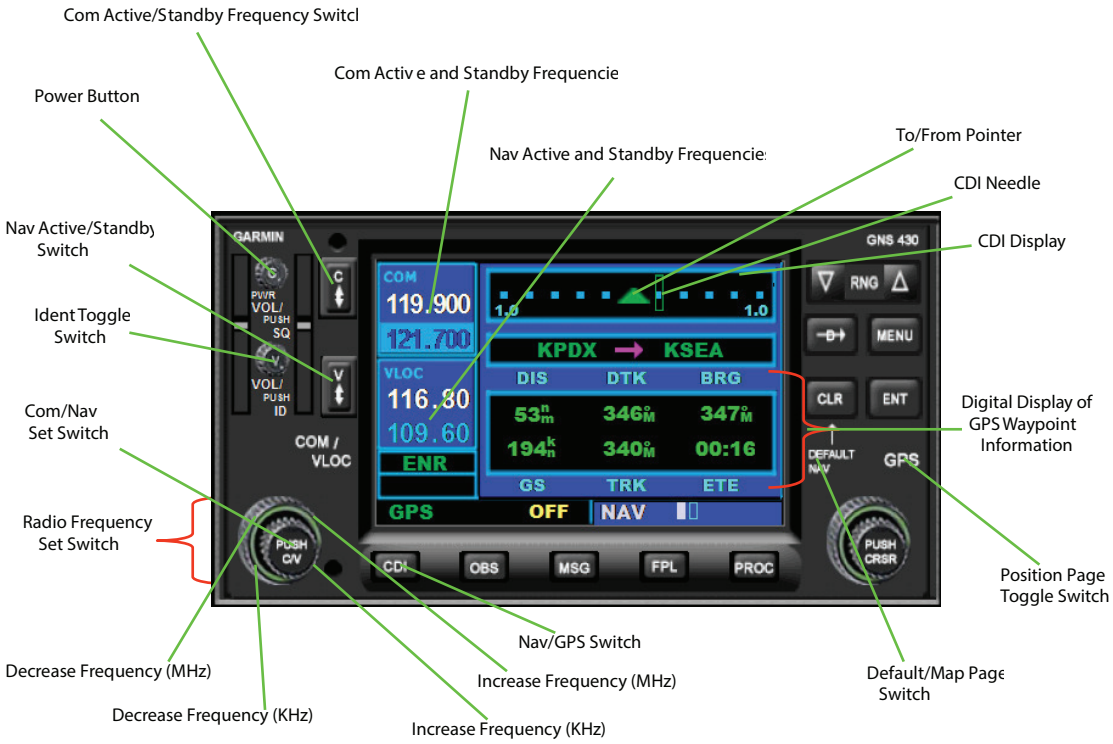
Alabeo GNS430



1. The power button turns the unit on and off.
2. The top number in each radio box corresponds to the active frequency, the bottom number corresponds to the standby frequency.
3. The active/standby switches toggle the active frequency to standby and the standby frequency to active.
4. The radio frequency set switch is used to tune the radios.The click areas are shown in the figure above.
5. The Com/Nav set toggle switch is used to toggle between tuning the Com and Nav radios.
6. The CDI switch (Nav/GPS switch) toggles between GPS and Nav 1 navigation modes.
7. The map page bar switch displays a moving map and various flight information in a boxed rectangle along the right side of the screen.
8. Clicking on the GPS icon will bring up the position page which contains information boxes displaying information relating to the position of the aircraft and its relative position to the next waypoint. A clock displays local or Greenwich mean time.

9. The digital display of GPS waypoint information shows values only for GPS waypoints (excluding TRK and GS). If no waypoint is set in the GPS, the readout will not display. The values will be displayed whether in the Nav 1 or GPS navigation mode.
10. The CDI at the top of the page shows course deviation information in either Nav 1 or GPS navigation modes. In the Nav 1 mode, the CDI works exactly like the standard CDI display found on most aircraft. The deflection distance of the CDI needle corresponds to 1 mile on each side of the desired track in the Nav 1 mode. It corresponds to a 5 mile distance on each side when tracking a waypoint in the GPS mode.
11. All other buttons and their functions are the same as in the FSX default GPS500 unit and are described in the help section of the simulator. Please refer to this section for information on the functions.
12. Com/Nav standby frequencies are highlighted in cyan when setting frequency.

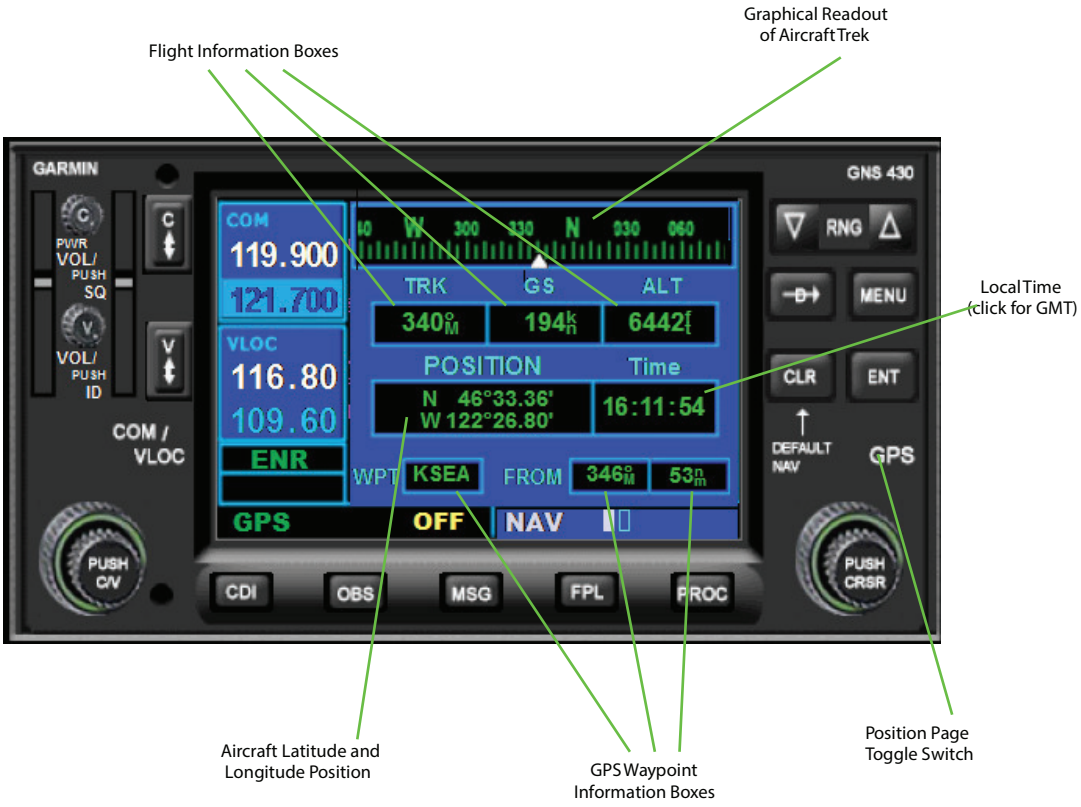
Alabeo GNS430 NAV Map Page



13. Clicking on the "DEFAULT NAV" logo toggles the Map page on or off.

14. The information bar lists the aircraft ground speed, and the distance and direction (magnetic) of the GPS waypoint identified in the WPT box.
15. The Nav bar is only available on the map pages.
16. The Map page is only available from the default Navpage. It is not available directly from the position page.

Alabeo GNS430 Position Page



17. Flight information boxes contain information related to the aircraft position in the real world.
18. Trek graphical readout is self-explanatory. Shows the same information given in the TRK box as a sliding scale representation.
19. The position box lists the latitude and longitude of the aircraft.
20. Local or mean time listed, default is local time.
21. The waypoint boxes contain information relating to the aircraft position relative to the next GPS waypoint identified.
22. The position page is toggled on or off by clicking on the GPS logo as shown.
23. The position page can be toggled directly from the default Nav or Map pages
24. The default Nav and Map pages cannot be toggled on directly from the position page.
25. You must exit the position page before toggling between these 2 pages (re-click on GPS).

ALABEO

Autopilot (AP) Flight System

This instrument is a recreation of a KFC225 Bendix King autopilot. Some of the features were eliminated or slightly modified in order to have a simpler instrument suitable for the simulator.

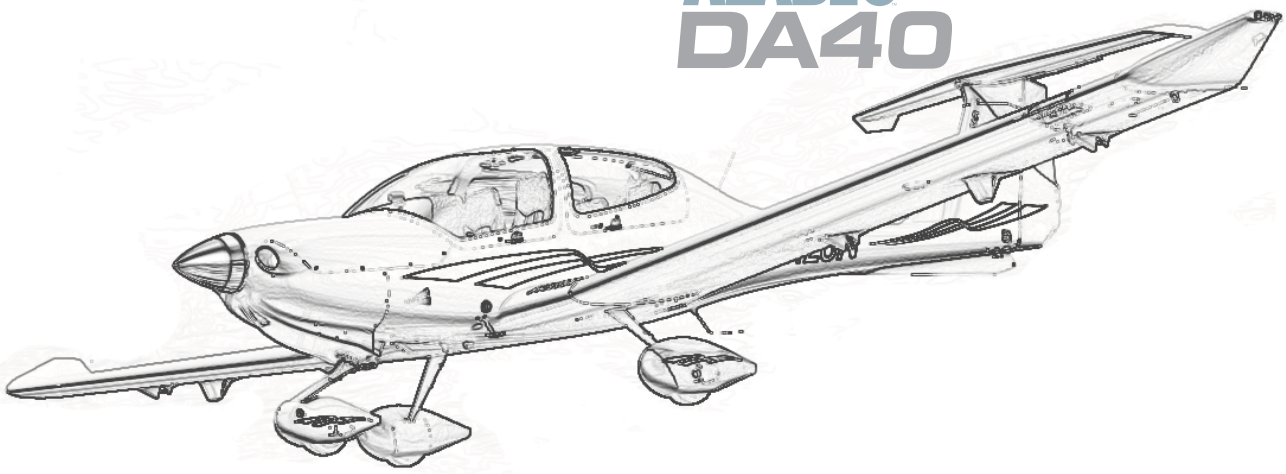
Autopilot Engage/Disengage Button 	This button should be the first to be pressed before pressing any other button of the AP. When AP is ON a red light will light up just above the button and the AP signal on the screen will appear. Turning off the AP will produce an alert sound, indicating that the aircraft is free.
Flight Director 	This button activates/deactivates the Flight director. There is no indicator on the screen about the Flight Director, only a back white light will illuminate the button.
Heading Mode 	In "heading mode" the autopilot will try to maintain the heading selected by the heading bug on the directional gyro or HSI. The HDG signal will appear on the upper left screen when this mode is on.
Heading Bug Indicator 	The Heading Bug indicator provides a fully visible course indicator around the normal directional gyro. To move the arrow around the gyro, click and drag on the knob on the bottom right of the instrument or roll the mouse wheel. Dragging up or right will move the arrow clockwise, dragging down or left will move the arrow counter-clockwise.

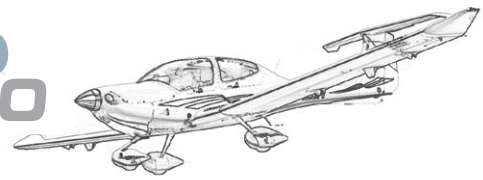
Navigation Mode 	The NAV button pursues the selected course in the directional gyro/HSI. Once the course is caught, the AP will hold it. NAV mode will follow NAV1. The NAV signal will appear on the left bottom screen plus an ARM signal when the AP pursues the selected course. Once the course is caught the signal will move to the upper left corner and the ARM signal will turn off.
Approach Mode 	The approach mode is used for automatic approach. When the APR button is pressed, the AP will follow the ILS signal of the NAV 1. This mode is recommended for instrument approach. The APR signal will appear on the upper left screen when this mode is on.
Reverse Mode 	Reverse mode permits automatic back-course approaches and for tracking outbound on the Front Course prior to a procedural turn. When using this mode, the Course Selector of the directional gyro needs to be set to the opposite direction of the Front-Course heading. There is no indicator on the screen about the Reverse Mode, only a back white light will illuminate the button.
Pitch Command Function 	The pitch command feature is on only when the VS mode is off. An arrow pointing up plus a PT signal and an arrow pointing down plus a PT signal will appear in the middle of the screen when pressing the UP and DN buttons respectively.

Altitude Hold 	Engagement of the altitude hold button will maintain the altitude at the moment the ALT button is pressed. Using the mouse wheel over the knob you can set the desired altitude. The AP will start a smooth transition to the pressure altitude at which it was selected. The desired altitude will appear in the upper right corner of the screen. The FT (feet) signal just below the numbers confirms you are watching the altitude. The ALT signal will appear on the middle bottom of the screen plus an ARM signal. Once the altitude is reached the signal will move to the upper middle of the screen and the ARM signal will turn off. The ALERT signal, below the altitude numbers, will turn on in the region from 1000 to 200 feet from the selected altitude.
Vertical Speed Function 	When pressed will engage the vertical speed hold mode. You can modify the vertical speed using the UP and DN buttons. Desired vertical speed will appear in the upper right corner of the screen replacing the desired altitude with the FPM signal below. After 3 seconds of inactivity the desired altitude will replace the desired vertical speed. Pressing either the UP or DN button will again cause the desired vertical speed reference to be displayed while causing it to increase or decrease.
Yaw Damper Button 	This button activates/deactivates the Yaw Damper function.

Emergency Procedures

ALABEO
DA40





CERTAIN AIRSPEEDS IN EMERGENCIES

Event	Flight Mass	850 kg 1874 lb	1000 kg 2205 lb	1150 kg 2535 lb	1200 kg 2646 lb
Engine failure after take-off (Flaps T/O)		59 KIAS	66 KIAS	72 KIAS	74 KIAS
Airspeed for best glide angle (Flaps UP)		60 KIAS	68 KIAS	73 KIAS	76 KIAS
Emergency landing with engine off	Flaps UP	60 KIAS	68 KIAS	73 KIAS	76 KIAS
	Flaps T/O	59 KIAS	66 KIAS	72 KIAS	74 KIAS
	Flaps LDG	58 KIAS	63 KIAS	71 KIAS	73 KIAS

ENGINE PROBLEMS

ENGINE PROBLEMS ON THE GROUND

1. Throttle .....IDLE
2. Brakes .....as required
3. Engine .....switch off, if considered necessary; otherwise establish the cause of the problem and re-establish engine performance

CAUTION

If the oil pressure is below the green sector, the engine must be switched off immediately.

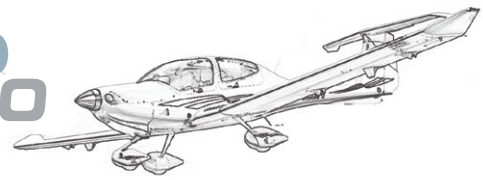
WARNING

If the problem cannot be cleared, the airplane must not be flown.

END OF CHECKLIST

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ENGINE PROBLEMS DURING TAKE-OFF

(a) Take-Off Can Still Be Aborted (Sufficient Runway Length Available)

Land Straight Ahead:

1. Throttle.....IDLE

On the Ground:

2. Brakes .....as required

CAUTION

If sufficient time is remaining, the risk of fire in the event of a collision can be reduced as follows:

- Fuel tank selector .....OFF
- Mixture control lever .....LEAN - shut engine off
- Ignition switch .....OFF
- Master switch (ALT/BAT) .....OFF

(b) Take-Off Can No Longer Be Aborted

1. Airspeed .....74 KIAS (1200 kg, 2646 lb)
72 KIAS (1150 kg, 2535 lb)
66 KIAS (1000 kg, 2205 lb)
59 KIAS (850 kg, 1874 lb)

WARNING

If, in the event of an engine problem occurring during take-off, the take-off can no longer be aborted and a safe height has not been reached, then a straight-ahead emergency landing should be carried out. Turning back can be fatal.

If Time Allows:

2. Fuel tank selector .....check selected tank
3. Electrical fuel pump .....check ON
4. Ignition switch .....check BOTH
5. Throttle .....check MAX PWR
6. RPM lever .....check HIGH RPM
7. Mixture control lever .....check RICH (leaner above 5000 ft)
8. Alternate Air .....OPEN

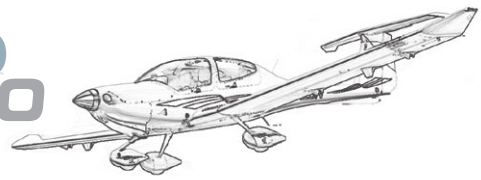
WARNING

If the problem does not clear itself immediately, and the engine is no longer producing sufficient power, then an emergency landing must be carried out.

END OF CHECKLIST

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ENGINE PROBLEMS IN FLIGHT

(a) Engine Running Roughly

WARNING

An engine which is running very roughly can lead to the loss of the propeller. If the engine is running roughly operation should only be continued if there is no other alternative.

1. Airspeed .....76 KIAS (1200 kg, 2646 lb)
   73 KIAS (1150 kg, 2535 lb)
   68 KIAS (1000 kg, 2205 lb)
   60 KIAS (850 kg, 1874 lb)
2. Electrical fuel pump .....check ON
3. Fuel tank selector .....check selected tank
4. Engine instruments .....check
5. Throttle.....check
6. RPM lever .....check
7. Mixture control lever .....set for smooth running
8. Alternate Air .....OPEN
9. Ignition status light .....check (only if the electronic ignition control unit is installed)
10. Ignition switch .....check BOTH

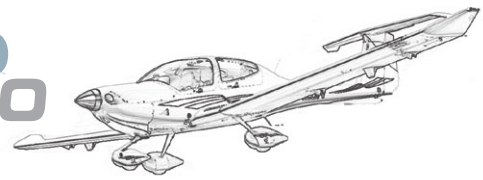
11. Ignition circuit breaker (IGN) .....pull (only if the electronic ignition control unit is installed); if rough running is cleared by doing this, the circuit breaker should remain open
12. Throttle/RPM/Mixture .....try various settings

WARNING

If the problem does not clear itself immediately, and the engine is no longer producing sufficient power, then an emergency landing should be carried out.

END OF CHECKLIST

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(b) Loss of Oil Pressure

1. Check oil pressure warning light and oil pressure indicator.
2. Check oil temperature.

2a. If the oil pressure indication drops below the green sector and the oil temperature is normal (oil pressure warning light does not illuminate or flash):
* Monitor the oil pressure warning light: it is probable that the oil pressure indication is defective.
* Monitor the oil and cylinder head temperatures.

2b. If the oil pressure indication drops below the green sector while the oil or cylinder head temperature is rising, or If the oil pressure warning light illuminates or flashes, or If both of these occur together:
* Reduce engine power to the minimum required.
* Land as soon as possible.
* Be prepared for engine failure and emergency landing.

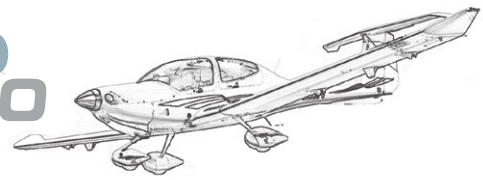
2c. Oil pressure tending to zero combined with: Vibration, loss of oil, possibly unusual metallic noise and smoke:
* A mechanical failure in the engine is apparent.
* Shut off engine immediately and
* Carry out emergency landing in accordance with

EMERGENCY LANDING WITH ENGINE OFF.

END OF CHECKLIST

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(c) High Oil Pressure

Check oil temperature.

* If the oil temperature is normal, it is probable that the fault lies in the oil pressure indication, which should thus be ignored (the airplane should be serviced).

END OF CHECKLIST

(d) High Oil Temperature

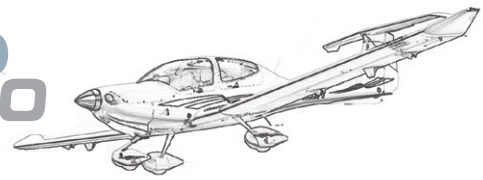
Check cylinder head and exhaust gas temperature.

* If neither of these is high, it is probable that the fault lies in the oil temperature indication. The airplane should be serviced. A stable oil temperature indication of 26 °F (-3 °C) or 317 °F (158 °C) suggests a failure of the oil temperature sensor.

* If the cylinder head temperature or exhaust gas temperature is also high:
  - Check oil pressure.
  - If the oil pressure is in the green sector:
  - Check mixture setting, enrich mixture if necessary.
  - Reduce power; if this produces no improvement, land at the nearest appropriate airfield.

END OF CHECKLIST

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(e) High Cylinder Head Temperature

Cylinder head temperature in yellow sector or above:

1. Check mixture setting, enrich mixture if necessary.
2. Check oil temperature.

* If the oil temperature is also high:
  - Check oil pressure. If the oil pressure is low, proceed - LOSS OF OIL PRESSURE.
  - If the oil pressure is in the green sector:
  - Reduce power; if this produces no improvement, land at the nearest appropriate airfield.
  - Be prepared for possible emergency landing.

END OF CHECKLIST

(f) High RPM

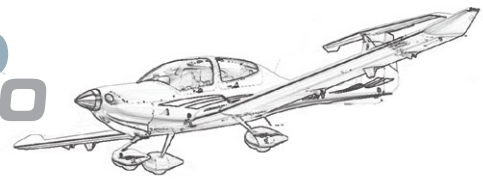
RPM moves on its own into the yellow sector, or is in the red sector:

1. Check friction adjuster for throttle quadrant.
2. Check oil pressure: Following a loss of oil or oil pressure, the propeller governor sets a high RPM. In this case the RPM should be regulated using the throttle. Proceed - LOSS OF OIL PRESSURE.
3. If oil pressure is normal:

* Pull RPM lever back and listen for an associated drop in RPM:
  - If the indication does not change in spite of an audible drop in RPM, it is probable that the RPM indication is defective, which should thus be ignored (the airplane should be serviced).
  - If there is no audible drop in RPM, it is probable that the governor system is defective. In this case the RPM should be regulated using the throttle.

END OF CHECKLIST

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(g) Loss of RPM

1. Electrical fuel pump .....check ON
2. Fuel tank selector .....check
3. Friction adjuster for throttle quadrant .....check sufficiently tight
4. RPM lever .....HIGH RPM

* Listen for rise in RPM.
  - If there is no audible rise in RPM, it is probable that the governor system is defective. In this case the RPM can be regulated within certain limits using the throttle.
    - Land at the nearest appropriate airfield.
    - Be prepared for possible emergency landing.
  - If the indication does not change in spite of an audible rise in RPM, it is probable that the RPM indication is defective, which should thus be ignored (the airplane should be serviced).

END OF CHECKLIST

(h) High Fuel Flow

Fuel flow in the red sector:

1. Electrical fuel pump .....ON
2. Fuel pressure .....check after 10 - 15 sec:

* If the fuel pressure is low - LOW FUEL PRESSURE WITH THE ELECTRICAL FUEL PUMP SET TO ON.

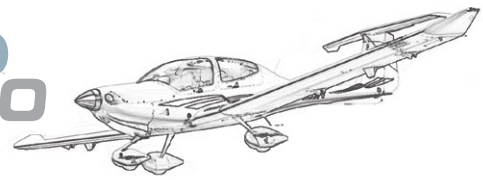
* If the fuel pressure is in the green sector, or the fuel pressure warning light is not illuminated, the likely cause is a defective fuel flow indication, which should thus be ignored (the airplane should be serviced). Fuel flow data should be taken from the engine performance table.

3. Check fuel quantity. A rapid reduction in fuel quantity confirms a high fuel flow.

END OF CHECKLIST

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(i) Low Fuel Pressure with the Electrical Fuel Pump Set to ON

Fuel pressure warning light illuminates, or fuel pressure indication below the green sector:

1. Fuel flow .....check:
   * If the fuel flow is high, there is possibly a leak (between the injection system and the injectors). Land on the nearest suitable airfield.

   * If the fuel flow is in the green sector and the engine is running smoothly, the likely cause is a defective fuel pressure indication, which should thus be ignored (the airplane should be serviced).

     Monitor engine for power loss and rough operation that could indicate fuel starvation. If the engine is no longer producing sufficient power, then an emergency landing should be carried out.

END OF CHECKLIST

RESTARTING THE ENGINE WITH WINDMILLING PROPELLER

NOTE

Restarting the engine is possible at all airspeeds above 70 KIAS up to vNE and up to the maximum demonstrated operating altitude.

NOTE

As long as an airspeed of at least 65 KIAS is maintained, and there is no major engine failure, the propeller will continue to windmill.

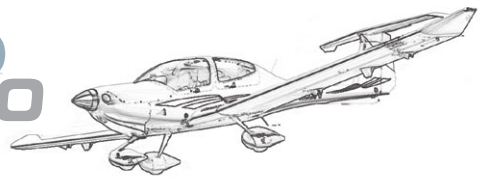
1. Airspeed .....80 KIAS
2. Fuel tank selector .....fullest tank
3. Ignition switch .....check BOTH
4. Mixture control lever .....check appropriate position
5. Electrical fuel pump .....check ON
6. Alternate air .....OPEN

If Engine Does Not Start:

7. Mixture control lever .....LEAN
8. Mixture control lever .....push forward slowly until engine starts

END OF CHECKLIST

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DEFECTIVE ENGINE CONTROLS

Defective Mixture Control Cable

(a) Flight and Landing:

1. Maintain altitude to the nearest airfield.
2. During descent, test the reaction of the engine to a higher power setting. A lean mixture can lead to engine roughness and a loss of power. The landing approach must be planned accordingly.

WARNING

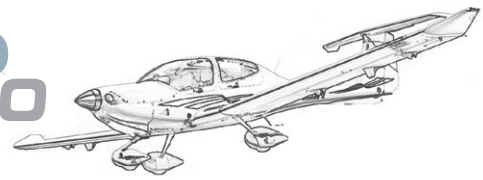
Go-around may become impossible with the remaining power.

(b) Engine Shut-Down:

1. Parking brake .....set
2. Engine instruments .....check
3. Avionics master switch .....OFF
4. All electrical equipment .....OFF
5. Throttle.....IDLE
6. Ignition switch .....OFF
7. Master switch (ALT/BAT) .....OFF

END OF CHECKLIST

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Defective Throttle Control Cable

(a) Sufficient Engine Power Available to Continue Flight:

1. Approach nearest airfield, control engine power with RPM lever.
2. Perform landing with shut-down engine.

(b) No Sufficient Engine Power Available to Continue Flight:

1. Carry out emergency landing - EMERGENCY LANDING WITH ENGINE OFF.

END OF CHECKLIST

Defective RPM Lever Control Cable

(a) Sufficient Engine Power Available to Continue Flight:

1. Approach nearest airfield, control engine power with throttle.
2. Perform normal landing.

WARNING

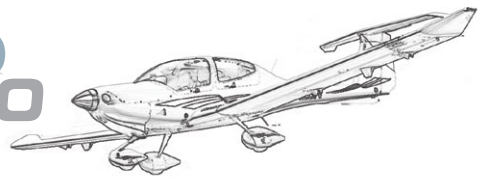
Go-around may become impossible with the remaining power.

(b) No Sufficient Engine Power Available to Continue Flight:

1. Carry out emergency landing - EMERGENCY LANDING WITH ENGINE OFF.

END OF CHECKLIST

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RESTARTING THE ENGINE WITH STATIONARY PROPELLER

NOTE

Restarting the engine is possible at all airspeeds above 80 KIAS up to vNE and up to the maximum demonstrated operating altitude.

1. Airspeed .....80 KIAS
2. Electrical equipment.....OFF
3. Avionics master switch .....OFF
4. Master switch (BAT) ..... check ON
5. Mixture control lever .....check
6. Fuel tank selector .....check
7. Electrical fuel pump .....check ON
8. Alternate air .....OPEN
9. Ignition switch .....START

NOTE

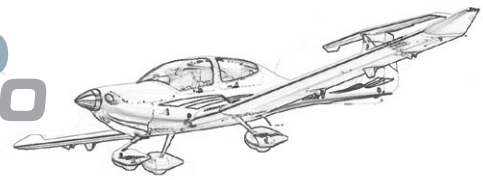
By increasing the airspeed above approximately 130 KIAS, the propeller will begin to rotate and the engine can thus be started. For this, the Ignition switch should be set at BOTH. An altitude loss of at least 1000 ft (300 meter) must be allowed for.

CAUTION

Engine restart following an engine fire should only be attempted if it is unlikely that a safe emergency landing can be made. It must be expected that engine restart is impossible after an engine fire.

END OF CHECKLIST

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SMOKE AND FIRE

SMOKE AND FIRE ON THE GROUND

(a) Engine Fire When Starting on the Ground

1. Fuel tank selector .....OFF
2. Cabin heat .....OFF
3. Brakes .....apply

After Standstill:

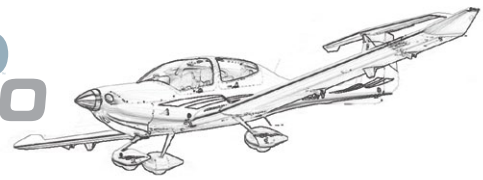
4. Throttle.....MAX PWR
5. Master switch (ALT/BAT) .....OFF

When the Engine Has Stopped:

6. Ignition switch .....OFF
7. Canopy .....open
8. Airplane .....evacuate immediately

END OF CHECKLIST

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(b) Electrical Fire with Smoke on the Ground

1. Master switch (ALT/BAT).....OFF

If the Engine is Running:

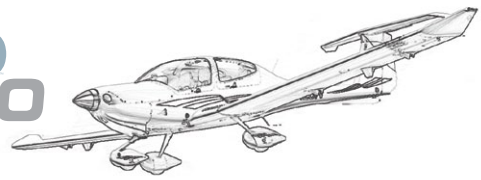
2. Throttle .....IDLE
3. Mixture control lever .....LEAN - shut off engine

When the Engine Has Stopped:

4. Ignition switch .....OFF
5. Canopy .....open
6. Airplane .....evacuate immediately

END OF CHECKLIST

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SMOKE AND FIRE DURING TAKE-OFF

(a) If Take-Off Can Still Be Aborted

1. Throttle.....IDLE
2. Cabin heat .....OFF
3. Brakes .....apply - bring the airplane to a stop
4. After stopping .....SMOKE AND FIRE ON THE GROUND

END OF CHECKLIST

(b) If Take-Off Cannot Be Aborted

1. Cabin heat .....OFF
2. If possible, fly along a short-cut traffic circuit and land on the airfield.

WARNING

If, in the event of an engine problem occurring during take-off, the take-off can no longer be aborted and a safe height has not been reached, then a straight-ahead emergency landing should be carried out. Turning back can be fatal.

3. Airspeed .....74 KIAS (1200 kg, 2646 lb)
   72 KIAS (1150 kg, 2235 lb)
   66 KIAS (1000 kg, 2205 lb)
   59 KIAS (850 kg, 1874 lb)

After Climbing to a Height From Which the Selected Landing Area Can Be Reached Safely:

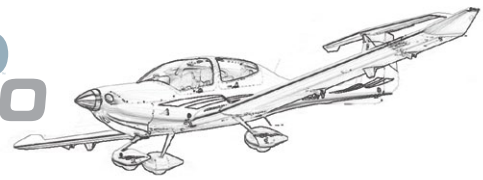
4. Fuel tank selector .....OFF
5. Electrical fuel pump .....OFF
6. Cabin heat .....OFF
7. Master switch (ALT/BAT).....OFF
8. Emergency window(s) .....open if required
9. Carry out emergency landing with engine off. Allow for increased landing distance due to the flap position.

CAUTION

In case of extreme smoke development, the front canopy may be unlatched during flight. This allows it to partially open, in order to improve ventilation. The canopy will remain open in this position. Flight characteristics will not be affected significantly.

END OF CHECKLIST

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SMOKE AND FIRE IN FLIGHT

CAUTION

In the event of smoke or fire, prepare to land the airplane without delay while completing fire suppression and/or smoke evacuation procedures. If it cannot be visually verified that the fire has been completely extinguished, whether the smoke has cleared or not, land immediately at the nearest suitable airfield or landing site.

(a) Engine Fire in Flight

1. Cabin heat .....OFF
2. Select appropriate emergency landing field.

When it Seems Certain that the Landing Field Will Be Reached:

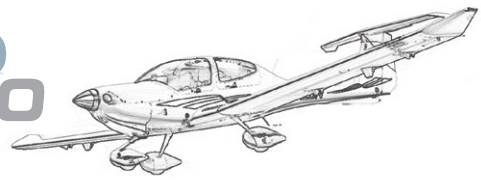
3. Fuel tank selector .....OFF
4. Throttle.....MAX PWR
5. Electrical fuel pump .....OFF
6. Master switch (ALT/BAT) .....ON
7. Emergency window(s) .....open if required
8. Carry out emergency landing with engine off.

CAUTION

In case of extreme smoke development, the front canopy may be unlatched during flight. This allows it to partially open, in order to improve ventilation. The canopy will remain open in this position. Flight characteristics will not be affected significantly.

END OF CHECKLIST

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(b) Electrical Fire with Smoke in Flight

1. Emergency switch .....ON if installed
2. Master switch (ALT/BAT).....OFF
3. Cabin heat .....OFF
4. Emergency window(s) .....open if required
5. Land at an appropriate airfield as soon as possible.

CAUTION

Switching OFF the Master switch (ALT/BAT) will lead to total failure of all electronic and electric equipment. Also affected from this are - if installed - the attitude gyro (artificial horizon) and the directional gyro.

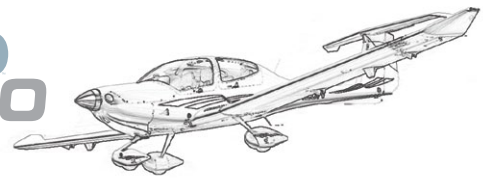
However, by switching the Emergency switch ON (only installed in the IFR model), the emergency battery will supply power to the attitude gyro (artificial horizon) and the flood light.

CAUTION

In case of extreme smoke development, the front canopy may be unlatched during flight. This allows it to partially open, in order to improve ventilation. The canopy will remain open in this position. Flight characteristics will not be affected significantly.

END OF CHECKLIST

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GLIDING

1. Flaps .....UP
2. Airspeed .....76 KIAS (1200 kg, 2646 lb)
   73 KIAS (1150 kg, 2535 lb)
   68 KIAS (1000 kg, 2205 lb)
   60 KIAS (850 kg, 1874 lb)

NOTE

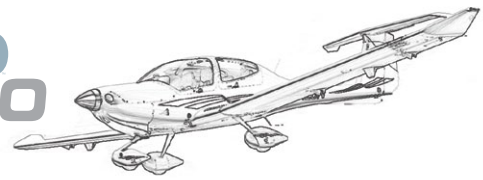
The glide ratio is 8.8; i.e., for every 1000 ft (305 meter) of altitude loss the maximum horizontal distance traveled in still air is 1.45 NM (2.68 km). During this the propeller will continue to windmill.

With a stationary propeller the glide ratio is 10.3; this corresponds to a maximum horizontal distance of 1.70 NM (3.14 km) for every 1000 ft altitude. In consideration of a safe airspeed however, this configuration may not be attainable.

END OF CHECKLIST

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EMERGENCY LANDINGS

EMERGENCY LANDING WITH ENGINE OFF

CAUTION

For emergency landing the adjustable backrests (if installed) must be fixed in the upright position.

1. Adjustable backrests (if installed) .....adjust to the upright position described by a placard on the roll-over bar and verify proper fixation.
2. Select suitable landing area. If no level landing area is available, a landing on an upward slope should be sought.
3. Consider wind.
4. Approach: If possible, fly along a short-cut rectangular circuit. On the downwind leg of the circuit the landing area should be inspected for obstacles from a suitable height. The degree of offset at each part of the circuit will allow the wind speed and direction to be assessed.
5. Airspeed .....76 KIAS (1200 kg, 2646 lb)
73 KIAS (1150 kg, 2535 lb)
68 KIAS (1000 kg, 2205 lb)
60 KIAS (850 kg, 1874 lb)
6. If time allows .....advise ATC
7. Fuel tank selector .....OFF

When It Is Certain That the Landing Field Will Be Reached:

8. Flaps ..... LDG
9. Safety harnesses .....tighten

CAUTION

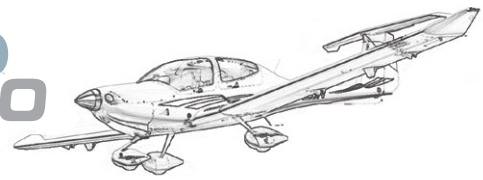
If sufficient time is remaining, the risk of fire in the event of a collision with obstacles can be reduced as follows:

- Ignition switch .....OFF
- Master switch (ALT/BAT) .....OFF

10. Touchdown with the lowest possible airspeed

END OF CHECKLIST

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LANDING WITH A DEFECTIVE TIRE ON THE MAIN LANDING GEAR

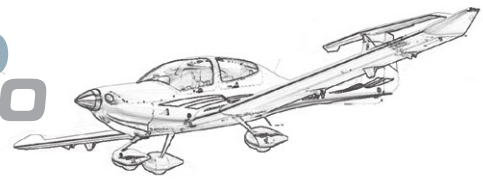
CAUTION

A defective (e.g. burst) tire is not usually easy to detect. The damage normally occurs during take-off or landing, and is hardly noticeable during fast taxiing. It is only during the roll-out after landing or at lower taxiing speeds that a tendency to swerve occurs. Rapid and determined action is then required.

1. Advise ATC.
2. Land the airplane at the edge of the runway that is located on the side of the intact tire, so that changes in direction which must be expected during roll-out due to the braking action of the defective tire can be corrected on the runway.
3. Land with one wing low. The wing on the side of the intact tire should be held low.
4. Direction should be maintained using the rudder. This should be supported by use of the brake. It is possible that the brake must be applied strongly -if necessary to the point where the wheel locks. The wide track of the landing gear will prevent the airplane from tipping over a wide speed range. There is no pronounced tendency to tip even when skidding.

END OF CHECKLIST

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LANDING WITH DEFECTIVE BRAKES

In general, a landing on grass is recommended in order to reduce the landing run by virtue of the greater rolling resistance.

CAUTION

If sufficient time is remaining, the risk of fire in the event of a collision can be reduced as follows:

- Fuel tank selector .....OFF
- Mixture control lever .....LEAN - shut off engine
- Ignition switch .....OFF
- Master switch (ALT/BAT) .....OFF

END OF CHECKLIST

RECOVERY FROM AN UNINTENTIONAL SPIN

CAUTION

Steps 1 to 4 must be carried out immediately and simultaneously.

1. Throttle .....IDLE
2. Rudder .....full deflection against direction of spin
3. Elevator (control stick) .....fully forward
4. Ailerons ..... neutral
5. Flaps .....UP

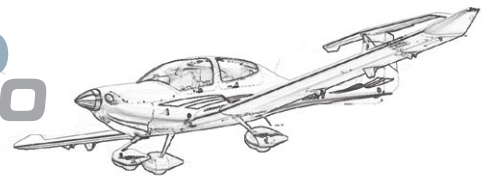
When Rotation Has Stopped:

6. Rudder .....neutral
7. Elevator (control stick) .....pull carefully
8. Return the airplane from a descending into a normal flight attitude. In so doing do not exceed the 'never exceed speed', vNE.

END OF CHECKLIST

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OTHER EMERGENCIES

ICING

Unintentional Flight Into Icing Conditions

1. Leave the icing area (by changing altitude or turning back, in order to reach zones with a higher ambient temperature).
2. Pitot heating .....ON
3. Cabin heat .....ON
4. Air distributor lever .....• (up)
5. RPM ..... increase, in order to prevent ice build-up on the propeller blades
6. Alternate air .....OPEN
7. Emergency window(s) .....open if required

CAUTION

Ice build-up increases the stalling speed. If required for safety reasons, engine speeds up to 2700 RPM are admissible without time limit.

8. ATC .....advise if an emergency is expected

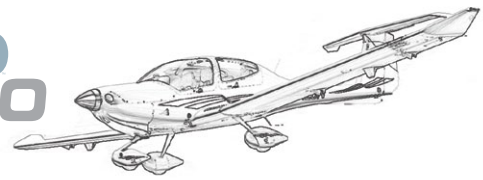
CAUTION

When the Pitot heating fails, and the alternate static valve is installed:

- Alternate static valve .....OPEN
- Emergency window(s) .....close

END OF CHECKLIST

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FAILURES IN THE ELECTRICAL SYSTEM

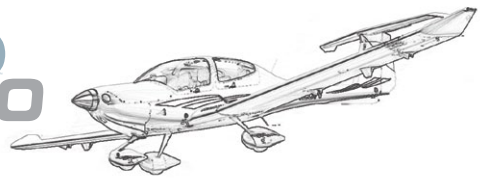
(a) Complete Failure of the Electrical System

Due to the strong mechanical design as well as due to the required check of the system during scheduled inspections, a total failure of the electrical system is extremely unlikely. If, nevertheless, a total failure should occur, all circuit breakers should be checked, pulled and re-set. If this does not help:

- Set Emergency switch to ON (if installed).
- When necessary, use the flood light for lighting the instruments as well as levers and switches, etc.
- Set power based on lever positions and engine noise.
- Prepare landing with flaps in the given position.
- Land on the nearest appropriate airfield.

END OF CHECKLIST

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(b) Alternator Failure

An alternator failure is indicated by an illuminated or flashing alternator warning light (ALT or ALTERNATOR) on the annunciator panel and a flashing ammeter on the Vision Microsystems VM 1000 engine instrument.

(i) Alternator Failure During Flight

1. Circuit breakers .....check; if all are OK, proceed with step 2
2. Electrical equipment.....switch OFF all equipment which is not needed
3. Voltmeter .....check regularly

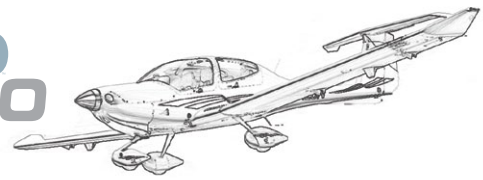
CAUTION

Those items of equipment which are not needed for the safe operation and secure landing of the airplane can be switched off with the Essential Bus switch (if installed). When the essential bus is switched ON, only the following items of equipment are supplied with power:

- NAV/COM 1.
- Transponder (XPDR).
- Flood light.
- Attitude gyro (artificial horizon).
- VM 1000 engine instrument.
- Annunciator panel.
- GPS (if installed).
- Landing light.
- Pitot heating system.
- Flaps.

CONTINUED

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These items of equipment can be supplied with power by the battery for at least 30 minutes. Economical use, in particular of the Pitot heating, and switching off equipment that is not needed extends the time during which the other equipment remains available. During the 30 minutes period, the airplane must be landed at a suitable airfield.

For cases in which the battery capacity is not sufficient to reach a suitable airfield, an emergency battery is installed in the IFR model, serving as an additional back-up system for the attitude gyro (artificial horizon) and flood light. This battery is switched on with the Emergency switch. It lasts for 1 hour and 30 minutes when the flood light is switched on.

(ii) Alternator Failure on the Ground

NOTE

An alternator failure may also be indicted on ground with the engine running on IDLE.

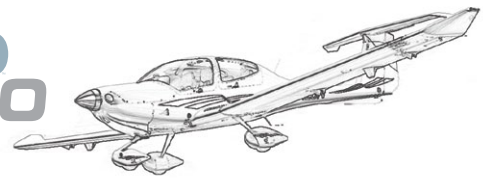
1. Engine speed .....1200 RPM
2. Electrical equipment .....OFF
3. Ammeter .....check

If the caution light does not extinguish, and the ammeter flashes and reads zero:

- Terminate flight preparation.

END OF CHECKLIST

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(c) Starter Malfunction

If the starter does not disengage from the engine after starting (starter warning light (START) on the annunciator panel remains illuminated or flashing after the engine has started):

1. Throttle.....IDLE
2. Mixture control lever .....LEAN - shut off engine
3. Ignition switch .....OFF
4. Master switch (ALT/BAT) .....OFF

Terminate flight preparation!

END OF CHECKLIST

(d) Overvoltage

If a voltage in the upper red sector (above 32 Volts) is indicated:

1. Essential bus .....ON, if installed
2. Master switch (ALT) .....OFF

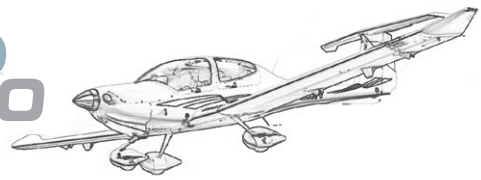
WARNING

Leave Master switch (BAT) ON!

3. Equipment that is not needed, in particular Pitot heating .....OFF
4. Land on the nearest appropriate airfield.

END OF CHECKLIST

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SUSPICION OF CARBON MONOXIDE CONTAMINATION IN THE CABIN

Carbon monoxide (CO) is a gas which is developed during the combustion process. It is poisonous and without smell. Since it occurs however usually together with fuel gases, it can be detected. Increased concentration of carbon monoxide in closed spaces can be fatal. The occurrence of CO in the cabin is possible only due to a defect. If a smell similar to exhaust gases is noticed in the cabin, the measures in the checklist below should be taken:

The DA 40 may be equipped with a CO detector. If the visual alert annunciator illuminates in flight, press the TEST/RESET button. If the alert continues with the remote light staying ON or a smell similar to exhaust gases is noticed in the cabin, the following measures should be taken:

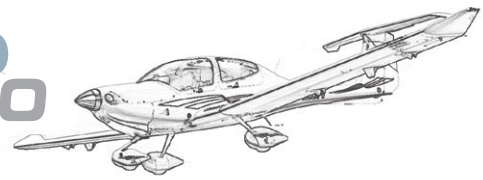
1. Cabin heat .....OFF
2. Ventilation .....open
3. Emergency window(s) .....open
4. Forward canopy .....open

CAUTION

In case of suspicion of carbon monoxide contamination in the cabin, the front canopy may be unlatched during flight. This allows it to partially open, in order to improve ventilation. The canopy will remain open in this position. Flight characteristics will not be affected significantly.

END OF CHECKLIST

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‘DOOR’- WARNING LIGHT ON

1. Airspeed .....reduce immediately
2. Canopy .....check visually if closed
3. Rear passenger door .....check visually if closed

Canopy Unlocked

4. Airspeed .....below 140 KIAS
5. Land at the next suitable airfield.

Rear Door Unlocked

4. Airspeed .....below 140 KIAS
5. Land at the next suitable airfield.

WARNING

Do not try to lock the rear door in flight. The safety latch may disengage and the door opens. Usually this results in a separation of the door from the airplane.

NOTE

If the rear door has been lost the airplane can be safely flown to the next suitable airfield.

END OF CHECKLIST

EMERGENCY EXIT

In case of a roll-over of the airplane on ground, it can be evacuated through the rear door. For this purpose release the front hinge of the rear door. The function is displayed on a placard next to the hinge.

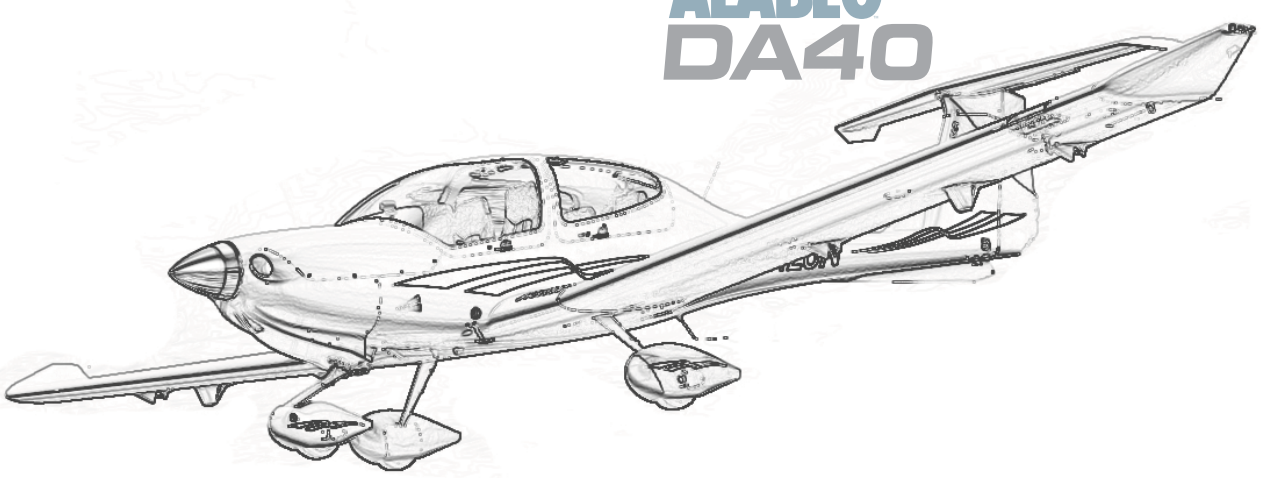
END OF CHECKLIST

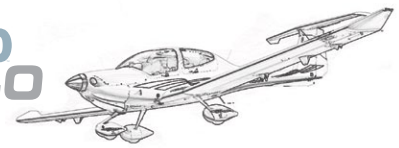
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Normal Procedures

ALABEO

DA40





NORMAL PROCEDURES

CHECKLISTS FOR NORMAL OPERATING PROCEDURES

PRE-FLIGHT INSPECTION

I. Cabin Check

a) MET, NAV, mass & CG .....flight planning completed
b) Airplane documents .....complete and up-to-date
c) Ignition key .....pulled out
d) Front canopy and rear door .....clean, undamaged, check locking mechanism function

e) All electrical equipment .....OFF
f) Circuit breakers .....set in (if one has been pulled, check reason)

g) Engine control levers .....check condition, freedom of movement and full travel of throttle, RPM and mixture levers
h) Throttle .....IDLE
i) Mixture control lever .....LEAN
j) RPM lever .....HIGH RPM
k) Master switch (BAT) .....ON
l) Annunciator panel .....check function
m) Fuel quantity .....check

NOTE

Standard Tank:
Depending on the type of fuel probes installed, the indicator can read a maximum of 15 US gal or 17 US gal. When the fuel quantity indicator reads the maximum amount of fuel detectable, the correct fuel quantity must be determined with the fuel quantity measuring device. If this measurement is not carried out, the fuel quantity available for flight planning is the indicated amount.

Long Range Tank:
At an indication of 16 US gal the quantity of auxiliary fuel can be determined by switching the AUX FUEL QTY switch to the respective position (LH or RH). The auxiliary fuel quantity is added to the 16 US gal.

An auxiliary fuel quantity of less than 3 US gal cannot be indicated by the system. In this case the quantity must be determined by means of the fuel quantity measuring device.

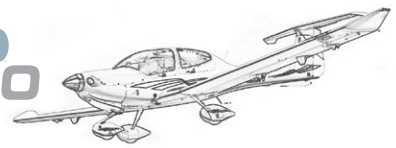
CAUTION

Long Range Tank:

The correct indication of the fuel quantity takes 2 minutes after actuation of the switch.

CONTINUED

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n) Position lights, strobe lights (ACLs) .....check
o) Master switch (BAT) ..... OFF
p) Check for loose items .....complete
q) Flight controls and trim .....free to move and correct
r) Baggage .....stowed and secure
s) Emergency axe .....stowed and secure

END OF CHECKLIST

II. Walk-around check, visual inspection.

CAUTION

A visual inspection means: examination for damage, cracks, delamination, excessive play, load transmission, correct attachment and general condition. In addition control surfaces should be checked for freedom of movement.

CAUTION

In low ambient temperatures the airplane must be completely cleared of ice, snow and similar accumulations.

CAUTION

Prior to flight, remove such items as control surfaces gust lock, Pitot cover, tow bar, etc.

1. Left Main Landing Gear:

a) Landing gear strut .....visual inspection
b) Strut fairing (if installed) .....visual inspection
c) Wheel fairing .....visual inspection
d) Tire inflation pressure (2.5 bar/36 PSI) .....check
e) Wear, tread depth of tire .....check
f) Tire, wheel, brake .....visual inspection
g) Brake line connection .....check for leaks
h) Slip marks .....visual inspection
i) Chocks .....remove

2. Left Wing:

a) Entire wing surface .....visual inspection
b) Step .....visual inspection
c) Air intake on lower surface .....visual inspection
d) Openings on lower surface .....check for traces of fuel (if tank is full, fuel may spill over through the tank vent)
e) Tank drain .....drain off a small quantity, check for water and sediment
f) Stall warning .....check (suck on opening)
g) Tank filler .....visual inspection, fuel quantity must agree with indicator
h) Tank air outlet in lower surface .....visual inspection

CONTINUED

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i) 2 stall strips on wing .....visual inspection
j) Pitot probe .....clean, orifices open
k) Landing/taxi light .....visual inspection
l) Wing tip .....visual inspection
m) Position light, strobe light (ACL) .....visual inspection
n) Mooring .....check, clear
o) Aileron and linkage .....visual inspection
p) Aileron hinges and safety pin .....visual inspection
q) Foreign objects in aileron paddle .....visual inspection
r) Flap and linkage .....visual inspection
s) Flap hinges and safety pin .....visual inspection

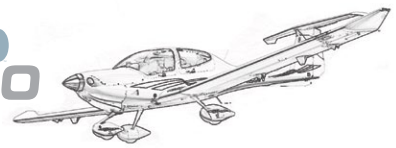
3. Fuselage, Left Side:
a) Canopy, left side .....visual inspection
b) Rear cabin door & window .....visual inspection
c) Fuselage skin .....visual inspection
d) Antennas .....visual inspection

4. Empennage:
a) Stabilizers and control surfaces .....visual inspection
b) Hinges .....visual inspection
c) Elevator trim tab .....visual inspection, check locking wire
d) Rudder trim tab .....visual inspection
e) Mooring on fin .....check, clear
f) Tail skid and lower fin .....visual inspection
g) Towing assembly, if fitted .....visual inspection

CONTINUED

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5. Fuselage, Right Side:

a) Fuselage skin .....visual inspection
b) Window .....visual inspection
c) Canopy, right side .....visual inspection

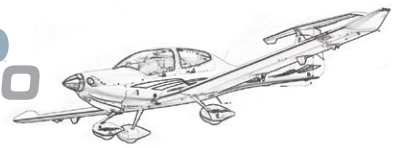
6. Right Wing:

a) Flap and linkage .....visual inspection
b) Flap hinges and safety pin .....visual inspection
c) Aileron and linkage .....visual inspection
d) Aileron hinges and safety pin .....visual inspection
e) Foreign objects in aileron paddle .....visual inspection
f) Wing tip .....visual inspection
g) Position light, strobe light (ACL) .....visual inspection
h) Mooring .....check, clear
i) Entire wing surface .....visual inspection
j) 2 stall strips on wing .....visual inspection
k) Tank air outlet in lower surface .....visual inspection
l) Tank filler .....visual check, fuel quantity must agree with indicator
m) Openings on lower surface .....check for traces of fuel (if tank is full, fuel may spill over through the tank vent)
n) Tank drain .....drain off a small quantity, check for water and sediment
o) Step .....visual inspection

CONTINUED

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7. Right Main Landing Gear:

a) Landing gear strut .....visual inspection
b) Strut fairing (if installed) .....visual inspection
c) Wheel fairing .....visual inspection
d) Tire inflation pressure (2.5 bar/36 PSI) .....check
e) Wear, tread depth of tires .....check
f) Tire, wheel, brake .....visual inspection
g) Brake line connection .....check for leaks
h) Slip marks .....visual inspection
i) Chocks .....remove

8. Front Fuselage:

a) Oil level ..... check dipstick, min. 4 qts for VFR operation min. 6 qts for IFR operation
b) Cowling .....visual inspection
c) 3 air intakes .....clear
d) Propeller .....visual inspection; blade shake: max. 3 mm (1/8 in); angular play of blade: max. 2°

WARNING

Never move the propeller by hand while the ignition is switched on, as it may result in serious personal injury.

e) Spinner including attachment screws.....visual inspection
f) Nose landing gear .....visual inspection
g) Tire and wheel .....visual inspection
h) Slip marks .....visual inspection
i) Nose landing gear strut fairing (if installed).....visual inspection
j) Nose landing gear tie-down (if installed).....check, clear
k) Wear, tread depth of tire .....check
l) Wheel fairing .....visual inspection
m) Tow bar .....removed
n) Tire inflation pressure (2.0 bar/29 PSI) .....check
o) Chocks .....remove
p) Exhaust .....visual inspection
q) Forward cabin air inlets (if installed) .....clear
r) Winter baffle for fresh air inlet (if installed).....visual inspection

WARNING

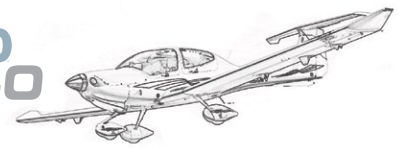
The exhaust can cause burns when it is hot.

Underside:

s) Antennas (if fitted) .....visual inspection
t) Gascolator .....drain off a small quantity of fuel, check for water and sediment
u) Venting pipes .....check for blockage
v) Fuselage underside .....check for excessive contamination particularly by oil, fuel, and other fluids

END OF CHECKLIST

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BEFORE STARTING ENGINE

CAUTION

For take-off the adjustable backrests (if installed) must be fixed in the upright position.

NOTE

The pilot must ensure that a passenger sitting on a front seat is instructed in the operation of the adjustable backrest (if installed).

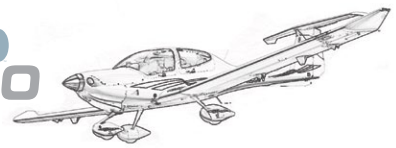
1. Pre-flight inspection .....complete
2. Rudder pedals .....adjusted
3. Passengers .....instructed
4. Adjustable backrests (if installed) .....adjust to the upright position described by a placard on the roll-over bar and verify proper fixation.
5. Safety harnesses .....all on and fastened
6. Baggage .....check, secured
7. Rear door .....closed and locked
8. Door lock (if installed) .....unblocked, key removed

CAUTION

When operating the canopy, ensure that there are no obstructions between the canopy and the mating frame, for example seat belts, clothing, etc. When operating the locking handle do NOT apply undue force. A slight downward pressure on the canopy may be required to ease handle operation.

9. Front canopy .....Position 1 or 2 (“Cooling Gap”)
10. Canopy lock (if installed) .....unblocked, key removed
11. Parking brake .....set
12. Flight controls .....free movement
13. Trim wheel .....T/O
14. Throttle.....IDLE
15. RPM lever .....HIGH RPM
16. Mixture control lever .....LEAN
17. Friction device, throttle quadrant .....adjusted
18. Alternate air .....CLOSED
19. Alternate static valve .....CLOSED, if installed
20. Avionics Master switch .....OFF
21. Essential Bus switch .....OFF, if installed

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CAUTION

When the essential bus is switched ON, the battery will not be charged unless the essential tie relay bypass is installed.

22. Master switch (BAT) .....ON
23. Annunciator panel .....test
24. Fuel tank selector .....on full tank

WARNING

Never move the propeller by hand while the ignition is switched on, as it may result in serious personal injury. Never try to start the engine by hand.

END OF CHECKLIST

STARTING ENGINE

(a) Cold Engine

1. Strobe light (ACL) .....ON
2. Electrical fuel pump .....ON, note pump noise (= functional check of pump)
3. Throttle .....3 cm (1.2 in) forward from IDLE (measured from rear of slot)
4. Mixture control lever .....RICH for 3 - 5 sec, then LEAN
5. Throttle .....1 cm (0.4 in) forward from IDLE (measured from rear of slot)

WARNING

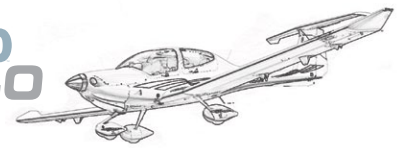
Before starting the engine the pilot must ensure that the propeller area is free, and no persons can be endangered.

CAUTION

Do not overheat the starter motor. Do not operate the starter motor for more than 10 seconds. After operating the starter motor, let it cool off for 20 seconds. After 6 attempts to start the engine, let the starter cool off for half an hour.

CONTINUED

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CAUTION

The use of an external pre-heater and external power source is recommended whenever possible, in particular at ambient temperatures below 0 °C (32 °F), to reduce wear and abuse to the engine and electrical system. Pre-heat will thaw the oil trapped in the oil cooler, which can be congealed in extremely cold temperatures. After a warm-up period of approximately 2 to 5 minutes (depending on the ambient temperature) at 1500 RPM, the engine is ready for take-off if it accelerates smoothly and the oil pressure is normal and steady.

6. Ignition switch .....START

When Engine Fires:

7. Mixture control lever .....rapidly move to RICH
8. Oil pressure .....green sector within 15 sec
9. Electrical fuel pump .....OFF

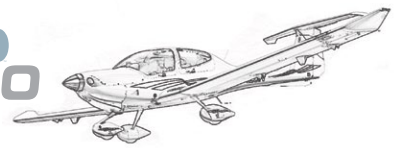
WARNING

If the oil pressure has not moved into the green sector within 15 seconds after starting, SWITCH OFF ENGINE and investigate problem.

10. Master switch (ALT) .....ON
11. Ammeter .....check
12. Fuel pressure .....check (14 PSI to 35 PSI)
13. Annunciator panel .....check

END OF CHECKLIST

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(b) Warm Engine

1. Strobe light (ACL) .....ON
2. Electrical fuel pump .....ON, note pump noise and fuel pressure increase
3. Throttle .....3 cm (1.2 in) forward from IDLE (measured from rear of slot)
4. Mixture control lever .....RICH for 1 - 3 sec, then LEAN

WARNING

Before starting the engine the pilot must ensure that the propeller area is free and no persons can be endangered.

CAUTION

Do not overheat the starter motor. Do not operate the starter motor for more than 10 seconds. After operating the starter motor, let it cool off for 20 seconds. After 6 attempts to start the engine, let the starter cool off for half an hour.

5. Ignition switch .....START

When Engine Fires:

6. Mixture control lever .....rapidly move to RICH
7. Oil pressure .....green sector within 15 sec

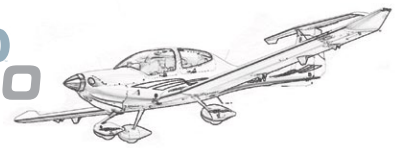
WARNING

If the oil pressure has not moved into the green sector within 15 seconds after starting, SWITCH OFF ENGINE and investigate problem.

8. Electrical fuel pump .....OFF
9. Master switch (ALT) .....ON
10. Ammeter .....check
11. Fuel pressure .....check (14 PSI to 35 PSI)
12. Annunciator panel .....check

END OF CHECKLIST

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(c) Engine Will Not Start After Injection ("Flooded Engine")

1. Strobe light (ACL) .....ON
2. Electrical fuel pump .....OFF
3. Mixture control lever .....LEAN, fully aft
4. Throttle .....at mid position

WARNING

Before starting the engine the pilot must ensure that the propeller area is free and no persons can be endangered.

CAUTION

Do not overheat the starter motor. Do not operate the starter motor for more than 10 seconds. After operating the starter motor, let it cool off for 20 seconds. After 6 attempts to start the engine, let the starter cool off for half an hour.

5. Ignition switch .....START
6. Throttle .....pull back towards IDLE when engine fires

When Engine Fires:

7. Mixture control lever .....rapidly move to RICH
8. Oil pressure .....green sector within 15 sec

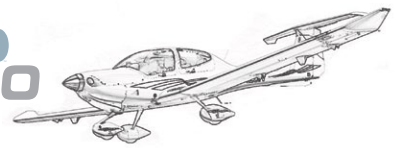
WARNING

If the oil pressure has not moved into the green sector within 15 seconds after starting, SWITCH OFF ENGINE and investigate problem.

9. Master switch (ALT) .....ON
10. Ammeter .....check
11. Fuel pressure .....check (14 PSI to 35 PSI)
12. Annunciator panel .....check

END OF CHECKLIST

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BEFORE TAXIING

1. Avionics Master switch .....ON
2. Electrical equipment .....ON as required
3. Flaps .....UP - T/O - LDG - T/O (indicator and visual check)
4. Flight instruments and avionics .....set, test function, as required
5. Flood light .....ON, test function, as required
6. Ammeter .....check, if required increase RPM
7. Fuel tank selector .....change tanks, confirm that engine also runs on other tank (at least 1 minute at 1500 RPM)
8. Pitot heating .....ON, test function; ammeter must show rise
9. Pitot heating .....OFF
10. Strobe lights (ACLs) .....check ON, as required
11. Position lights, landing and taxi lights .....ON, as required

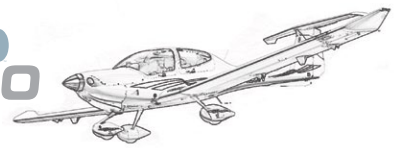
CAUTION

When taxiing at close range to other aircraft, or during night flight in clouds, fog or haze, the strobe lights should be switched OFF. The position lights must always be switched ON during night flight.

12. Idle RPM .....check, 600 to 800 RPM

END OF CHECKLIST

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TAXIING

1. Parking brake .....release
2. Brakes .....test on moving off
3. Flight instrumentation and avionics
   (particularly directional gyro and turn and bank indicator) .....check for correct indications

CAUTION

When taxiing on a poor surface select the lowest possible RPM to avoid damage to the propeller from stones or similar items.

CAUTION

Following extended operation on the ground, or at high ambient temperatures, the following indications of fuel vapor lock may appear:

- Arbitrary changes in idle RPM and fuel flow.
- Slow reaction of the engine to operation of throttle.
- Engine will not run with throttle in IDLE position.

Remedy:

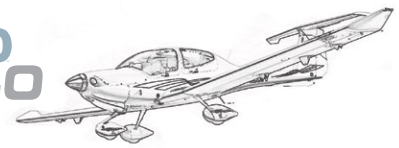
1. For about 1 to 2 minutes, or until the engine settles, run at a speed of 1800 to 2000 RPM. Oil and cylinder head temperatures must stay within limits.
2. Pull throttle back to IDLE to confirm smooth running.
3. Set throttle to 1200 RPM and mixture for taxiing, i.e., use mixture control lever to set the maximum RPM attainable.
4. Immediately before the take-off run set the mixture for take-off, apply full throttle and hold this position for 10 seconds.

NOTE

Vapor lock can be avoided if the engine is run at speeds of 1800 RPM or more. This results in lower fuel temperatures.

END OF CHECKLIST

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BEFORE TAKE-OFF

CAUTION

Before take-off, the engine must run on each tank for at least 1 minute at 1500 RPM.

CAUTION

For take-off the adjustable backrests (if installed) must be fixed in the upright position.

1. Position airplane into wind if possible
2. Parking brake ..... set
3. Adjustable backrests (if installed) .....verify upright position And proper fixation
4. Safety harnesses .....on and fastened
5. Rear door .....check closed and locked
6. Front canopy .....closed and locked

CAUTION

When operating the canopy, ensure that there are no obstructions in between the canopy and the mating frame, for example seat belts, clothing, etc. When operating the locking handle do NOT apply undue force.
A slight downward pressure on the canopy may be required to ease handle operation.

7. Door warning light (DOOR or DOORS) .....check OFF
8. Fuel tank selector .....fullest tank
9. Engine instruments .....in green sector
10. Circuit breakers .....pressed in
11. Fuel pressure indicator .....check (approx. 14 - 35 PSI)
12. Electrical fuel pump .....ON
13. Mixture control lever .....RICH (below 5000 ft)

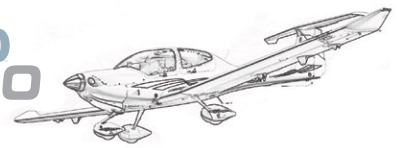
NOTE

At a density altitude of 5000 ft or above or at high ambient temperatures a fully rich mixture can cause rough running of the engine or a loss of performance. The mixture should be set for smooth running of the engine.

14. Flaps .....check T/O
15. Trim .....check T/O
16. Flight controls .....free movement, correct sense
17. Throttle .....2000 RPM
18. RPM lever .....pull back until a drop of 250 to 500 RPM is reached -HIGH RPM; cycle 3 times
19. Magneto check .....L - BOTH - R - BOTH
    Max. RPM drop . . 175 RPM
    Max. difference . . . 50 RPM
    If the electronic ignition control unit is installed, the ignition status light must illuminate and extinguish after approximately 20 to 30 sec

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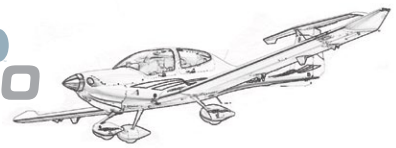
CAUTION

The lack of an RPM drop suggests a faulty grounding or incorrect ignition timing. In case of doubt the magneto check can be repeated with a leaner mixture, in order to confirm a problem. Even when running on only one magneto the engine should not run unduly roughly.

20. Circuit breaker .....check in
21. Voltmeter .....check in green range
22. Throttle.....IDLE
23. Parking brake .....release
24. Alternate air .....check CLOSED
25. Landing light .....ON as required
26. Pitot heating .....ON as required

END OF CHECKLIST

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TAKE-OFF

Normal Take-Off Procedure

1. Transponder .....ON/ALT
2. RPM lever .....check HIGH RPM
3. Throttle .....MAX PWR (not abruptly)

WARNING

The proper performance of the engine at full throttle should be checked early in the take-off procedure, so that the take-off can be aborted if necessary.
A rough engine, sluggish RPM increase, or failure to reach take-off RPM (2680 ± 20 RPM) are reasons for aborting the take-off. If the engine oil is cold, an oil pressure in the yellow sector is permissible.

4. Elevator .....neutral
5. Rudder .....maintain direction

NOTE

In strong crosswinds steering can be augmented by use of the toe brakes. It should be noted, however, that this method increases the take-off roll, and should not generally be used.

6. Nose wheel lift-off .....at v = 59 KIAS

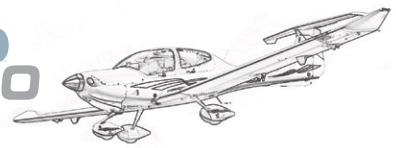
7. Airspeed .....67 KIAS (1200 kg, 2646 lb)
66 KIAS (1150 kg, 2535 lb)
60 KIAS (below 1000 kg, 2205 lb)

Above a Safe Height:

8. RPM lever .....2400 RPM
9. Electrical fuel pump .....OFF
10. Landing light .....OFF

END OF CHECKLIST

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CLIMB

Procedure for Best Rate of Climb

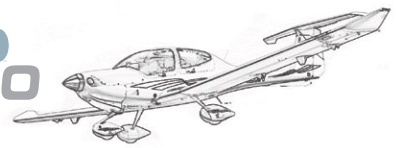
1. Flaps ..... T/O
2. Airspeed ..... 67 KIAS (1200 kg, 2646 lb)
   66 KIAS (1150 kg, 2535 lb)
   60 KIAS (1000 kg, 2205 lb)
   54 KIAS (850 kg, 1874 lb)
3. RPM lever ..... 2400 RPM
4. Throttle ..... MAX PWR
5. Mixture control lever ..... RICH, above 5000 ft hold EGT constant
6. Engine instruments ..... in green sector
7. Trim ..... as required
8. Electrical fuel pump ..... ON at high altitudes

CAUTION

Operation at high altitudes with the electrical fuel pump OFF may cause vapor bubbles, resulting in intermittent low fuel pressure indications, sometimes followed by high fuel flow indications.

END OF CHECKLIST

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Cruise Climb

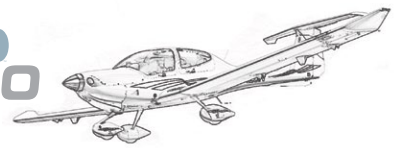
1. Flaps ..... UP
2. Airspeed ..... 76 KIAS (1200 kg, 2646 lb)
   73 KIAS (1150 kg, 2535 lb)
   68 KIAS (1000 kg, 2205 lb)
   60 KIAS (850 kg, 1874 lb)
3. RPM lever ..... 2400 RPM
4. Throttle ..... MAX PWR
5. Mixture control lever ..... RICH, above 5000 ft hold EGT constant
6. Engine instruments ..... in green sector
7. Trim ..... as required
8. Electrical fuel pump ..... ON at high altitudes

CAUTION

Operation at high altitudes with the electrical fuel pump OFF may cause vapor bubbles, resulting in intermittent low fuel pressure indications, sometimes followed by high fuel flow indications.

END OF CHECKLIST

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CRUISE

1. Flaps .....UP
2. Throttle .....set performance according to table
3. RPM lever .....1800 - 2400 RPM

NOTE

Favorable combinations of manifold pressure and RPM are in the Performance tables PDF.

NOTE

To optimize engine life the cylinder head temperature (CHT) should lie between 150 °F (66 °C) and 400 °F (204 °C) in continuous operation, and not rise above 435 °F (224 °C) in fast cruise.

NOTE

The oil temperature in continuous operation should lie between 165 °F (74 °C) and 220 °F (104 °C). If possible, the oil temperature should not remain under 180 °F (82 °C) for long periods, so as to avoid accumulation of condensation water.

4. Mixture.....SET
5. Trim .....as required
6. Fuel tank selector .....as required
   (max. difference 10 US gal with Standard Tank, 8 US gal with Long Range Tank)
7. Electrical fuel pump .....ON at high altitudes

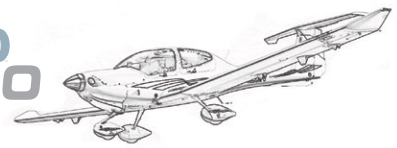
CAUTION

Operation at high altitudes with the electrical fuel pump OFF may cause vapor bubbles, resulting in intermittent low fuel pressure indications, sometimes followed by high fuel flow indications.

NOTE

While switching from one tank to the other, the electrical fuel pump should be switched ON.
END OF CHECKLIST

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MIXTURE ADJUSTMENT

CAUTION

1. The maximum permissible cylinder head temperature (500 °F (260 °C)) must never be exceeded.
2. The mixture control lever should always be moved slowly.
3. Before selecting a higher power setting the mixture control lever should, on each occasion, be moved slowly to fully RICH.
4. Care should always be taken that the cylinders do not cool down too quickly. The cooling rate should not exceed 50 °F (22.8 °C) per minute.

Best Economy Mixture

The best economy mixture setting may only be used up to a power setting of 75 %. In order to obtain the lowest specific fuel consumption at a particular power setting proceed as follows: Slowly pull the mixture control lever back towards LEAN until the engine starts to run roughly. Then push the mixture control lever forward just far enough to restore smooth running. At the same time the exhaust gas temperature (EGT) should reach a maximum.

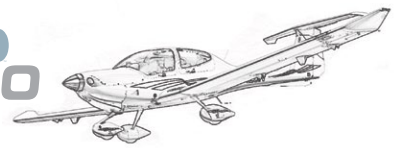
The exact value of EGT can be obtained by pressing the far left button on the engine instrument unit VM 1000. In the Lean mode one bar represents 10 °F (4.6 °C).

Best Power Mixture

The mixture can be set for maximum performance at all power settings. The mixture should first be set as for ‘best economy’. The mixture should then be enriched until the exhaust gas temperature is approximately 100 °F (55 °C) lower.
This mixture setting produces the maximum performance for a given manifold pressure and is mainly used for high power settings (approximately 75 %).

END OF CHECKLIST

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DESCENT

1. Mixture control lever .....adjust as required for the altitude, operate slowly
2. RPM lever .....1800 - 2400 RPM
3. Throttle .....as required
4. Electrical fuel pump .....ON at high altitudes

CAUTION

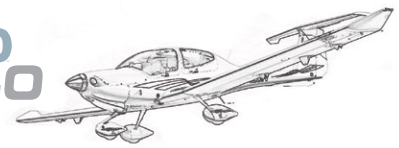
When reducing power, the change in cylinder head temperature should not exceed 50 °F (22.8 °C) per minute. This is normally guaranteed by the 'self adapting inlet'. An excessive cooling rate may occur however, when the engine is very hot and the throttle is reduced abruptly in a fast descent. This will be indicated by a flashing cylinder head temperature indication.

CAUTION

Operation at high altitudes with the electrical fuel pump OFF may cause vapor bubbles, resulting in intermittent low fuel pressure indications, sometimes followed by high fuel flow indications.

END OF CHECKLIST

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LANDING APPROACH

CAUTION

For landing the adjustable backrests (if installed) must be fixed in the upright position.

1. Adjustable backrests (if installed) .....adjust to the upright position described by a placard on the roll-over bar and verify proper fixation.
2. Fuel selector .....fullest tank
3. Electrical fuel pump .....ON
4. Safety harnesses .....fastened
5. Airspeed .....reduce to operate flaps (108 KIAS)
6. Flaps .....T/O
7. Trim .....as required
8. Landing light ..... as required

Before Landing:

9. Mixture control lever .....RICH
10. RPM lever .....HIGH RPM
11. Throttle.....as required
12. Airspeed .....reduce to operate flaps (91 KIAS)
13. Flaps .....LDG
14. Approach speed .....73 KIAS (1200 kg, 2646 lb)
    71 KIAS (1150 kg, 2535 lb)
    67 KIAS (1092 kg, 2407 lb)
    63 KIAS (1000 kg, 2205 lb)
    58 KIAS (850 kg, 1874 lb)

CAUTION

In conditions such as (e.g.) strong wind, danger of wind shear or turbulence a higher approach speed should be selected.

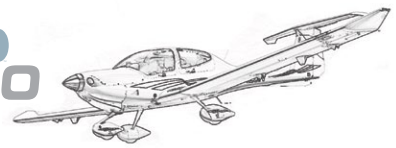
NOTE

In case of airplanes with a maximum landing mass less than the maximum permitted flight mass, a landing with a higher mass constitutes an abnormal operating procedure.

END OF CHECKLIST

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NOT INTENTED FOR REAL FLIGHTS.



GO-AROUND

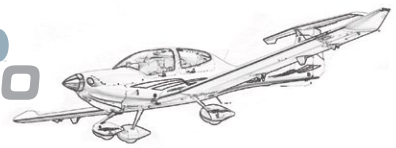
1. Throttle.....MAX PWR
2. Airspeed .....67 KIAS (1200 kg, 2646 lb)
   66 KIAS (1150 kg, 2535 lb)
   60 KIAS (1000 kg, 2205 lb)
   54 KIAS (850 kg, 1874 lb)
3. Flaps .....T/O

Above a Safe Height:

4. RPM lever .....2400 RPM
5. Airspeed .....76 KIAS (1200 kg, 2646 lb)
   73 KIAS (1150 kg, 2535 lb)
   68 KIAS (1000 kg, 2205 lb)
   60 KIAS (850 kg, 1874 lb)
6. Flaps .....UP
7. Electrical fuel pump .....OFF

END OF CHECKLIST

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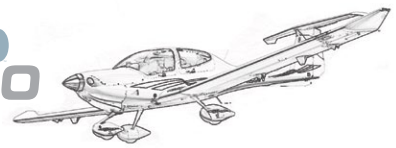


AFTER LANDING

1. Throttle .....IDLE
2. Brakes .....as required
3. Electrical fuel pump .....OFF
4. Transponder .....OFF / STBY
5. Pitot heating .....OFF
6. Avionics .....as required
7. Lights .....as required
8. Flaps .....UP

END OF CHECKLIST

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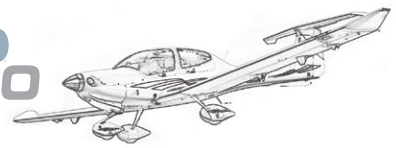


ENGINE SHUT-DOWN

1. Parking brake .....set
2. Engine instruments .....check
3. Avionics Master switch .....OFF
4. All electrical equipment .....OFF
5. Throttle.....1000 RPM
6. Ignition check .....OFF until RPM drops noticeably, then immediately BOTH again
7. Mixture control lever .....LEAN - shut engine off
8. Ignition switch .....OFF
9. Master switch (ALT/BAT) .....OFF

END OF CHECKLIST

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POST-FLIGHT INSPECTION

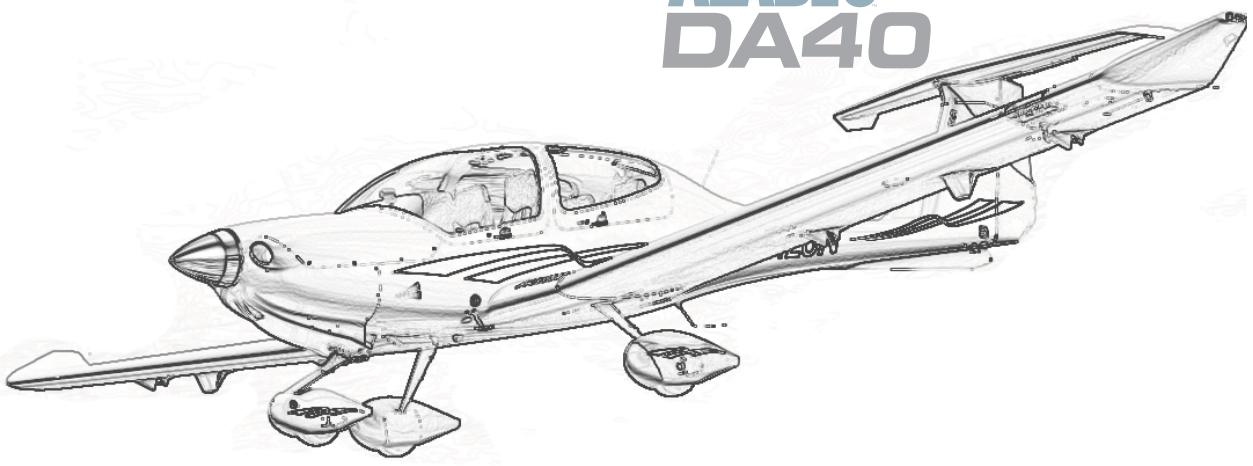
1. Ignition switch .....OFF, remove key
2. Master switch (BAT) .....ON
3. Avionics Master switch .....ON
4. ELT .....check activated: listen on 121.5 MHz
5. Avionics Master switch .....OFF
6. Master switch (BAT) .....OFF
7. Parking brake .....release, use chocks
8. Airplane .....moor, if unsupervised for extended period

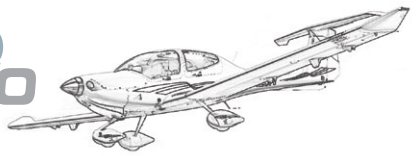
END OF CHECKLIST

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Performance Tables

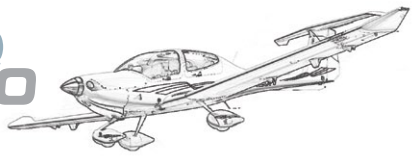
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DA40





			Engine Power as % of Max. Take-Off Power						
			45 %				55 %		
	RPM		1800	2000	2200	2400	2000	2200	2400
Fuel Flow	Best Economy		5.8	6	6.3	6.6	7	7.2	7.5
[US gal/h]	Best Power		-	-	7.3	7.7	-	8.5	8.7
ISA	[°C]	[°F]	Manifold Pressure (MP) [inHg]						
MSL	15	59	22.7	21.3	20.2	19.0	23.9	22.4	21.2
1000	13	55	22.4	21.0	19.9	18.7	23.6	22.2	21.0
2000	11	52	22.1	20.7	19.6	18.4	23.3	21.9	20.7
3000	9	48	21.8	20.4	19.3	18.2	23.0	21.6	20.4
4000	7	45	21.5	20.2	19.0	17.9	22.7	21.2	20.1
5000	5	41	21.2	19.9	18.7	17.6	22.3	20.9	19.8
6000	3	38	20.9	19.6	18.4	17.4	22.0	20.6	19.5
7000	1	34	20.5	19.3	18.2	17.1	21.7	20.3	19.3
8000	-1	31	20.2	19.0	17.9	16.9	21.3	20.0	19.0
9000	-3	27	19.9	18.7	17.6	16.6	21.1	19.7	18.7
10000	-5	23	19.6	18.4	17.3	16.3	-	19.4	18.4
11000	-7	19	19.3	18.2	17.0	16.1		19.1	18.1
12000	-9	16	-	17.9	16.7	15.8		-	17.8
13000	-11	12		17.6	16.4	15.5			17.6
14000	-13	9		-	16.1	15.3			-
15000	-15	6			15.8	15.0			
16000	-17	2			15.5	14.7			
17000	-19	-2			-	14.5			

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			Engine Power as % of Max. Take-Off Power				
			65 %			75 %	
	RPM		2000	2200	2400	2200	2400
Fuel Flow	Best Economy		7.9	8.2	8.5	9.2	9.5
[US gal/h]	Best Power		-	9.5	9.8	10.7	11
ISA	[°C]	[°F]	Manifold Pressure (MP) [inHg]				
MSL	15	59	26.8	**24.9**	23.4	**27.3**	25.8
1000	13	55	26.4	**24.5**	23.2	**26.8**	25.5
2000	11	52	26.0	**24.2**	22.9	**26.5**	**25.2**
3000	9	48	25.7	**23.8**	22.6	**26.1**	**24.8**
4000	7	45	25.4	**23.5**	22.3	-	**24.5**
5000	5	41	-	**23.1**	22.0		**24.1**
6000	3	38		**22.8**	**21.7**		-
7000	1	34		**22.4**	**21.4**		
8000	-1	31		-	**21.0**		
9000	-3	27			**20.7**		
10000	-5	23			-		

The areas shaded grey under each RPM heading are the recommended bands.

Correcting the Table for Variation from Standard Temperature

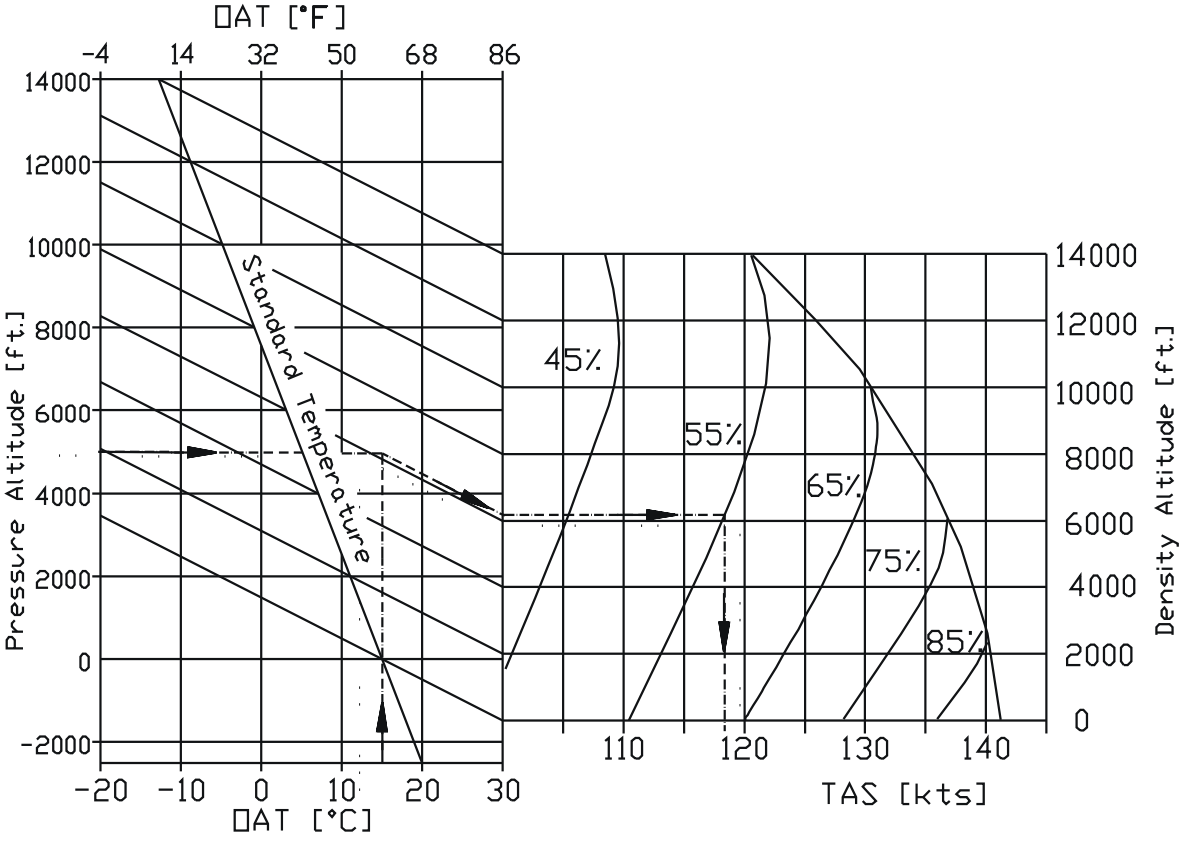
- At ISA + 15 °C (ISA + 27 °F) the performance values fall by approx. 3 % of the power selected according to the above table.

- At ISA - 15 °C (ISA - 27 °F) the performance values rise by approx. 3 % of the power selected according to the above table.

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CRUISING (TRUE AIRSPEED TAS)

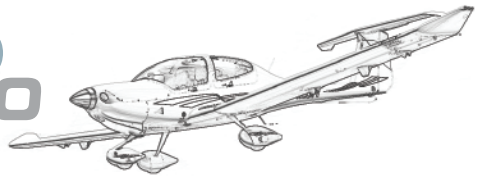
Diagram to establish true airspeed (TAS) at a given power setting.



Example: Pressure altitude ..... 5000 ft
Temperature ..... 15 EC (59 °F)
Power setting ..... 55 %

Result: True Airspeed (TAS) ..... 118 kts

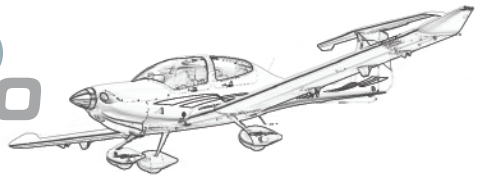
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AIRSPEED

	Airspeed	IAS	Remarks
v_A	Maneuvering speed	108 KIAS (above 980 kg / 2161 lb up to 1150 kg / 2535 lb) 94 KIAS (780 kg / 1720 lb up to 980 kg / 2161 lb) If MÄM 40-227 is carried out: 111 KIAS (above 1036 kg /2284 lb up to 1200 kg / 2646 lb) 94 KIAS (780 kg / 1720 lb up to 1036 kg / 2284 lb)	Do not make full or abrupt control surface movement above this speed.
v_{FE}	Max. flaps extended speed	LDG: 91 KIAS T/O: 108 KIAS	Do not exceed these speeds with the given flap setting.
v_{NO} = v_C	Max. structural cruising speed	129 KIAS	Do not exceed this speed except in smooth air, and then only with caution.
v_{NE}	Never exceed speed in smooth air	178 KIAS	Do not exceed this speed in any operation.

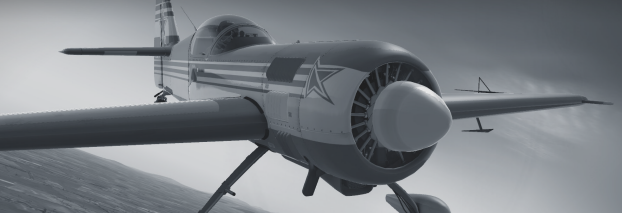
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AIRSPEED INDICATOR MARKINGS

Marking	IAS	Significance
White arc	49 KIAS - 91 KIAS	Operating range with flaps fully extended.
Green arc	52 KIAS - 129 KIAS	Normal operating range.
Yellow arc	129 KIAS - 178 KIAS	'Caution' range - "Only in smooth air".
Red line	178 KIAS	Maximum speed for all operations - v_{NE}.

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