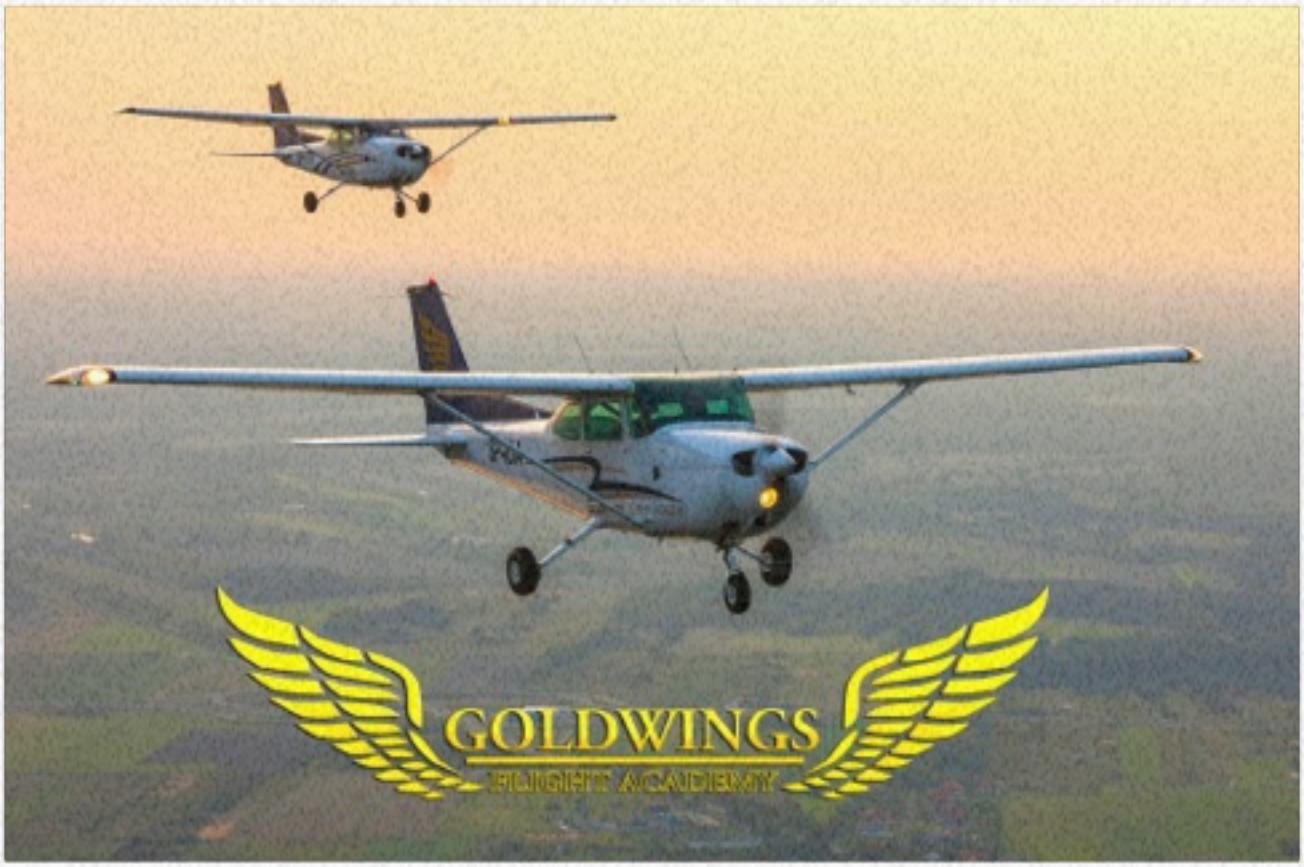

STANDARD OPERATING PROCEDURES

FLIGHT AND GROUND

C152 / C172

GUIDELINES FOR STUDENT PILOTS AND FLIGHT INSTRUCTORS

INTRODUCTION

This publication is not and does not replace the Pilot's Operating Handbook or the flight regulations. It is a logically ordered collection of information, which should assist in everyday use of a single engine piston land airplane (SEPL). These in-flight procedures, both normal and abnormal, refer to VFR flights in VMC. To a certain extent, they also cover IFR flights.

Every student pilot wishing to obtain a SEPL private pilot licence as well as every licensed pilot should be familiar with the Pilot's Operating Handbook (POH) concerning the type of airplane he or she flies and should comprehend the information contained therein. The checklists provided in this publication are in line with the POH checklists.

This publication is intended to serve a daily reference and resource for student pilots and flight instructors to assist them in performing their duties perfectly.

In any case, the following must be remembered:

- The priority of every pilot should be the rule of Aviate, Navigate, Communicate, Check
- VFR flights make it necessary for the pilot to maintain safe separation from the ground, terrain obstacles and other flying objects
- VFR flights on Single Engine Piston Airplane make it necessary for the pilot to be able to make a safe landing at any phase of flight.
- Checklists are not a guide or the pilot's operating handbook.
- The pilot is only human and might forget the way to perform a procedure. Checklists are there to identify and perform the forgotten procedure.
- Checklists are used to verify the performance of the crucial safety procedures.

1. PRE-FLIGHT BRIEFING

One of the frequently neglected elements of flight operations by General Aviation pilots is the failure to prepare for the flight properly. The pilot often spends too little time analysing factors that affect the flight at any phase. In order to increase safety, the pilot must have the working knowledge of flight preparation. Only regularly repeated relevant and the same elements of light preparations guarantee increased flight safety.

Goldwings Flight Academy requires that its student pilots and flight instructors comply with the following rules of flight preparation.

- flight preparation is performed by the instructor along with the student (in the case of pilots licensed for other flights, apart from training, it is PIC)
- flight preparation must start not less than two hours before the planned flight
- the analysis of Basic elements of flight preparation is conducted by the student pilot under the supervision of the flight instructor
- the student pilot is required to demonstrate relevant theoretical knowledge in every lesson
- prior to the flight preparation procedure described below, the instructor informs the student about the aim of the exercise and checks the self-study work (as long as it was given in the previous Debriefing)

Basic elements of flight preparation

Meteorological situation

Before we start the review of the meteorological situation we obtain necessary data. For VFR flights the basic data are published by IMGW Awiacja in the GAMET section. GAMET codes and abbreviations must be understood to correctly interpret GAMET report. The weather analysis also must be based on the following maps and textual data: Significant SFC-700 hPa and GAMET forecast for the relevant Ax area.

Information provided in METAR and TAF reports are considered additional sources. First, the data and expiration time of the report and the area it refers to must be checked. The student, under the supervision of the flight instructor, analyses the meteorological situation while paying attention to risk factors for the flight and the phenomena that might make it necessary to include more fuel for the flight. In the case of light airplanes which are not equipped with effective anti-icing systems, outside temperature at relevant altitudes is important. For flights in exercise areas, wind direction at relevant altitudes must be remembered/written down. The weather analysis should generate conclusions how to perform the flight along with the go/no-go decision.

Navigation

The student pilot, under the supervision of the flight instructor, based on the official sources such as AIP, aerodrome charts, maps, analyses the following:

- taxiways, aprons, lengths and widths of runways, etc.
- traffic circuits, traffic patterns, location of exercise areas
- altitude limitations
- FIS/CRL frequencies
- AUP, NOTAM reports
- flight route, flight altitudes

and makes necessary navigation calculations. Considering the weather and traffic data the student pilot calculates the amount of fuel needed for the flight by totalling the following components:

- ✓ start, warm-up, taxiing, engine run-up
- ✓ take off and climb to the relevant altitude
- ✓ exercise performance
- ✓ descent, approach and landing
- ✓ mandatory fuel reserve for VFR flights (subject to Chapter 5 Rules of fuelling) and additional fuel (at the student's and flight instructor's own discretion)

then completes the flight log (OPL) and the ATC Flight Plan if necessary. Please not that for IFR flights separate flight planning and fuelling rules apply.

▶ Weight & balance and performance

The student pilot, under the supervision of the flight instructor, makes weight & balance calculations based on the valid weight and balance record. The student calculates the total take-off weight and the moment by considering all the relevant factors such as the amount (weight) of fuel and the number of people on board, including the baggage. By referring to the relevant graphs we determine the position of the centre of gravity in the centre of gravity limits graph and consequently answer the question whether we are able to perform the flight with the given load. After finding out the load and the relevant meteorological data affecting the performance of the airplane we determine the minimum take-off run, take-off distance and emergency distance available in case of an aborted take-off at the departure aerodrome. We also calculate the landing distance and ground roll for the destination aerodrome. We compare the output data with the official data published for the departure and destination aerodrome and consequently make the choice of the right take-off and landing technique, which is related to remembering and writing down speeds and configurations in the flight log, to be discussed later in the Take-off Briefing Chapter.

Discussing the task/exercise

The aforementioned areas of airmanship knowledge are broad and enable the flight instructor to check the current theoretical background of the student pilot. At this point, there is no need to further test the student. The time should be devoted to revise the elements requiring special attention, the elements of the previous flights (exercises), which were not performed correctly. We explain carefully what we are going to do and how to perform new elements. We pay particular attention to the elements to be assessed and the tolerance limits within which the task/exercises can be considered a pass.

Note for flight instructor: Time devoted to pre-flight briefing must be organized and divided in such ways do that its maximum part covers discussing the exercise. Please note that at the initial stage of the training the involvement of the student in performing the respective tasks by himself or herself is limited and rises as the training progresses.

Note for student pilot: The student pilot shows up for each test flight with initially processed and prepared data referred to in the sections above: Meteorological situation, Navigation as well as Weight & balance and performance.

The final analysis and decisions are made by the student under the supervision of the examiner. Failure to be properly prepared for the test constitutes a fail.

2. TAKE-OFF BRIEFING

Take-off briefing should be conducted before any flight. It can be skipped in the case of repeated operation such as touch & goes from the same airfield in the same weather. Take-off briefing should be done after getting familiar with the current meteorological situation and specifics of the aerodrome. The briefing should be short, concise and should contain the elements presented below. It must be said loud and clear. Take-off briefing should be said as close to the actual take-off as possible; however, it must not be done while taxiing onto the runway.

Take-off briefing elements:

1. Runway heading
2. Take-off configuration
3. Airspeeds
4. Normal take-off procedure
5. Emergency procedure

Przykład Take-off Briefing:

1. *Runway in use….. surface…….. changes to runway dimensions ……..*
2. *Flaps ……. degrees – for take-off*
3. *Speeds: Rotation ….. knots, Climb ….. knots*
4. *Normal departure: After take-off climb straight ahead to …… feet, then turn right(left), right(left) circuit to runway …..*
5. *Emergencies:*
    6. *Any malfunction during take-off run – abort take-off*
    7. *Engine failure after take-off up to …… feet – land ahead within 30 degrees either side of the airplane with power remaining and speed…..*
    8. *Above…… feet land in a safe location ……..".*

Any additional factors affecting the take-off safety such as weather, aerodrome specifics, take-off run and emergency distances available and the resulting application of flaps as well as the take-off technique should be carefully analysed at the flight preparation stage (Pre-flight Briefing).

5. NORMAL PROCEDURES

Why use the Standard Operating Procedures? The answer is straightforward: they make it possible to perform any flight in an organized, repeated and therefore safe manner. It helps to 'overtake the airplane' i.e. to know what to do and in what sequence.

One of the well-known and sound ideas to organize your time and necessary activities to be done in flight is saying aloud what we are doing and what we are going to do (next-step principle).

That is why, both in the description and manner of going through the checklist as well as in this chapter we encourage and recommend saying aloud specific expressions or when marked by inverted commas.

All the procedures described herein apply to any phase of flight; however, detailed descriptions of the pilot's actions are provided in the following chapters:

Take-off Briefing, Approach Briefing, Normal checklists, Expanded Checklists and Abnormal Checklists.

Attention must also be paid to the variations among types of airplanes and type of flight regulations..

Rules of using PROCEDURES, CHECKLISTS, CALLOUTS

PROCEDURES are actions to be performed at any phase of flight. We follow them during Normal phases of flight and in Emergencies. **PROCEDURES MUST BE MEMORIZED**.

Normal CHECKLISTS DO NOT HAVE TO BE MEMORIZED. The rule of using checklists is the following:

While on the plane on the ground we read the checklist aloud item by item and at the same time check the items read. While on the plane in flight, first we follow the memory procedure after take-off and then read aloud the AFTER TAKE-OFF CHECKLIST and check the items respectively.

CALLOUTS are phrases to be used in procedures of high importance to the flight. That is why they must be spoken aloud.

Remember the FOLLOWING order of using checklists:

FLY ▶ NAVIGATE ▶ COMMUNICATE ▶ CHECKLIST

Rules of fuelling

GOLDWINGS recommends that the airplane planned for a cross-country flight or a flight to the exercise area have one-hour fuel reserve (general VFR regulations require a 45-minute reserve). The reserve is calculated based on the POH Chapter 5 Performance, Cruise Performance Table for Standard Temperature, 55% BHP and Pressure Altitude 2000 ft.

No flight can be performed unless the PIC manually checks the fuel level in the tanks by means of a calibrated fuel dipstick. The measurement serves as the basis for comparison of the planned fuel quantity with the actual level in the fuel tanks.

Rules of using COM1/COM2

The COM1 transceiver is intended for AIR-to-AIR communication, which means contacting FIS and air traffic services.

The COM2 transceiver (if installed) is intended for receiving ATIS reports and monitoring the 121.5 MHz frequency.

The above guidelines do not preclude using COM1 and COM2 for AIR-to-AIR communication in justified cases, e.g. poor reception or transmission.

Please remember that (if possible) we select **STAND-BY** when tuning into the new frequency and then after reading the tuned frequency we report to a given service. If it is not possible, we set the new frequency and then while reading it we report to a given service.

Applying CARBURETOR HEAT

Airplanes equipped with Carburetors are particularly (under certain conditions) vulnerable to icing. That is why, when the outside temperature falls below 10 centigrade and/or the following conditions occur: drizzle, rain or snow or other high humidity, Carburetor heat must be applied. The following rules must be followed:

- In straight-and-level flight – always when the abovementioned conditions occur
- Before long (related to reduced power) descent – Carburetor heat ON, regardless of the weather conditions

HANDLING THE AIRPLANE WITH CONTROL WHEEL

The following rules are recommended while handling the airplane with the control wheel:

- Taxiing: during taxi the pilot holds the wheel with one hand; the other hand holds the Throttle control in order to be ready to set the throttle to IDLE at any moment. Activities during taxi must be minimized; however, if the pilot, for example, needs to change the radio frequency then as soon as this is finished the hand gets back on the Throttle control.
- Take-off run: During take-off run the pilot must hold the Throttle control with one hand so that the run can be immediately aborted at any time. At rotation speed (Vlof) use both hands to rotate and lift off.
- In flight: in stabilized flight, in VMC and smooth air it is recommended that the pilot handle the airplane with one hand. In case of strong turbulence it is recommended that the airplane be handled with both hands; however, if the pilot needs to use one hand, for example, to change the radio frequency then as soon as this action is finished the hand gets back on the control wheel.
- Approach and landing: at this phase of flight the pilot must have full control of the airplane concerning its position (course and glidepath) and speed, that is why the airplane must be handled with one hand on the control wheel and the other on the throttle control until effecting/retaining stabilized flight. During strong turbulence both hands on the control wheel are allowed.
- Go-Around: please remember that before adding power you must set/check Carburetor heat – COLD, Mixture – RICH. We set take-off power with the right hand while simultaneously raising the nose to the take-off attitude. After setting take-off power, use both hands to handle the airplane until the climb is stabilized.

POWER SETTING

At any phase of flight whenever flight transitions are necessary we act as follows (except slight altitude corrections within the range of 100ft when it is enough to use the Throttle only).

Reducing power:

- ☑ Throttle – reduce power to desired level
- ☑ Mixture – lean (according to AFM/POH)

Adding power:

- ☑ Mixture – RICH
- ☑ Throttle – add power to desired level, or apply full power

FLIGHT TRANSITIONS

The rules provided above must always be followed whenever the phase of flight is changed. The exception are minor altitude corrections within the range of 100ft.

LEVEL FLIGHT TO DESCENT TRANSITION

- ☑ Carburetor heat – ON
- ☑ Reduce power (never reduce power to IDLE)
- ☑ Lower the nose
- ☑ Establish and maintain desired descent airspeed

DESCENT TO LEVEL FLIGHT TRANSITION

- ☑ Before reaching desired altitude (recommended 20ft to go) add power to straight-and-level flight power
- ☑ Carburetor heat – COLD
- ☑ Raise the nose to straight-and-level flight and maintain desired straight-and-level flight airspeed

LEVEL FLIGHT TO CLIMB TRANSITION

- ☑ Carburetor heat – COLD
- ☑ Add power to desired climb power or apply full power
- ☑ Raise the nose to climb attitude
- ☑ Establish and maintain desired climb airspeed

CLIMB TO LEVEL FLIGHT TRANSITION

- ☑ Lower the nose to straight-and-level flight after reaching desired altitude
- ☑ Reduce power to desired straight-and-level flight power after establishing desired straight-and-level flight airspeed

PILOTAGE/EXERCISE AREA

To enter the exercise area the following procedures must be followed:

- ☑ Make sure that the area is free from other users: make left/right turns with a bank of 60 degrees in order to examine the airspace vertically and horizontally.
- ☑ Determine the main direction of starting and finishing manoeuvres. To this end we should know the wind direction (Pre-flight Briefing data), we position the airplane into the wind and
- ☑ Determine the middle point of the are – choose a linear structure on the left side of the airplane (abeam) where we are going to start the manoeuvres
- ☑ Check your position in the area at all times

WAYPOINT

While passing a waypoint on your route the following rules must be observed (4xT rule):

1. TWIST – twist your map so that it shows next stretch
2. TIME – reset the stopwatch (and memorize Actual Time Over)
3. TURN – make a turning and stabilize the airplane on new heading
4. TABULATE – write down the memorized Actual Time Over as well as fuel level

TRIM

One of the more important things in flight is trimming. The pilot must remember that this function serves to reduce the force on the control wheel and not to change the attitude of the airplane. The pilot must always act according to

the following rules:

- introduce a change
- check the correctness of the introduced change
- maintain or adjust the desired attitude
- trim until the force on the control wheel is reduced to zero

UNUSUAL ATTITUDES

Unusual attitudes of the airplane are vertical and lateral positions of the airplane that are not normally exercised. They are classified as follows:

- Airplane Nose Down (AND) with airspeed rising
- Airplane Nose Up (ANU) with airspeed falling
- Airplane Nose High Up (ANU) with airspeed rapidly approaching stall speed

Such attitudes might be the result of e.g. turbulence, pilot error or spatial disorientation. Regardless of the cause of the unusual attitude, the pilot should always take appropriate and immediate steps in order to bring the airplane back to its normal attitude. The recommended attitude after recovering from the unusual attitude is straight-and-level flight. The procedures presented below must be used for both VFR and IFR flights.

Airplane Nose Down with speed rising

With the airplane nose down the airspeed rises fast. In an extreme situation it might lead to straight or spiral descent. There is a high risk of exceeding V_{ne}. We act decisively as follows; however, we avoid quick and abrupt movements:

- Reduce power to IDLE
- Wings level
- Pitch level
- Add power to straight-and-level flight power

Airplane Nose Up with speed decreasing

With the airplane nose up the airspeed falls. In an extreme situation it might lead to a stall and altitude loss:

- Apply full power
- Wings level
- Pitch level
- Add power to straight-and-level flight power

Airplane Nose High Up with airspeed rapidly approaching stall speed

Such attitude might lead to a stall. Altitude loss following a stall is significant and might exceed 150ft.
The following procedure is recommended:

- Apply full power
- Pitch level or below level, if necessary
- Use opposite rudder to counteract yawing
- Reduce power to straight-and-level flight power

Another category of unusual or dangerous attitude is a spin.
The procedures of acting and recovering from a spin are provided in the AFM/POH for a given type of airplane.

STALLS

Power-Off Stall

Stalls should be performed at altitudes high enough to guarantee recovery not lower than 1500ft AGL. The stall entry and recovery procedures are the following:

- Reduce power to IDLE
- Maintain steady altitude and keep raising the nose
- Wings level
- When stall occurs, reduce angle of attack by pushing the control wheel forward. After gaining airspeed apply full power smoothly (if necessary, use rudder to counteract yawing)
- Level off

PRE-DESCENT/APPROACH, FINAL and LANDING

Prior to landing it is necessary to properly prepare the airplane and the crew. The principles of Approach Briefing are detailed in a separate chapter. This preparation should be made before any landing after a cross-country flight, except touch and goes performed at the same aerodrome. The Approach Briefing should be done after receiving current meteorological conditions and the traffic (pattern) information. If it is known we set the pressure on the altimeter and identify the heading for the runway in use on the directional gyro. To prepare the airplane for landing we check the fuel level and determine the landing flaps configuration.

Remember that we always join the traffic circuit along a tangent and that we are obliged to watch for other aircraft in mid-air. While joining the circuit, make sure that the entry sector is free. Before turning base leg set/check the following setting: Mixture-RICH, Carburetor heat-ON (these procedures must also be followed before long descent).

Upon turning base, initiate descent. The first step is to reduce power while maintaining straight-and-level flight in order to reach airspeed necessary to extend flaps. Make sure that the airspeed is below Vfe (Maximum Flap Extended Speed) and extend Flaps 10 degrees. Switch on landing light. Establish constant approach speed and constant rate of descent. Turning final should not be done lower than 100m (350ft) AGL. Extending landing flaps should be performed upon establishing on final.

If at 200ft AGL or lower FINAL CHECKLIST is not completed and power is reduced to IDLE, for safety reasons GO-AROUND procedure must be initiated. That is why, we recommend that any landing approach be executed with sufficiently long final. Maintain constant airspeed on final and reduce the airspeed accordingly over the runway threshold. Every time the flaps configuration and approach speed must be relevant to the existing weather and traffic conditions. In case of reported gusts, the approach speed must be increased. On final make sure you do not press your feet on the brakes. During landing approach maintain wind correction angle until over the threshold. Upon passing the threshold reduce power to IDLE and start flaring. Apply rudder to align the longitudinal axis of the airplane parallel to the direction of flight. Land without crabbing! If using the crab method to land it is often enough to apply rudder to align the longitudinal axis of the airplane with the centreline of the runway. If it is necessary, in strong crosswind "lower the wing" into the wind. After touchdown apply rudder to stay aligned with the runway centreline and hold aileron into the wind. Brake carefully to prevent wheels from blocking. It is unacceptable to vacate the runway during ground roll e.g. into a taxiway. We vacate the runway only upon establishing taxi speed.

Note 1: Touch&Go must be executed at Flaps 0 or 10. After touchdown and retracting flaps to 0 or 10, wait before applying take-off power until the flap pointer indicates flap position 0. Apply take-off power and follow the procedure described in the **TAKE-OFF** section.

Note 2: In IFR flights follow the Approach Briefing relevant to IFR flights.

BALKED LAND (GoAround)

Aborted landing and the necessity to go around immediately is one of the most challenging elements of flight. This phase deserves maximum concentration due to the close proximity of the ground and likely low airspeed flight. Controlling an airplane requires precisions. In case the go-around decision is made one must smoothly, yet decisively, apply take-off power (before adding power remember to set Carburetor heat-ON and Mixture-RICH) while simultaneously raising the nose, next initiate a climb by setting Flaps 10 and initiate a climb. Keep the nose over the horizon in order to maintain a safe take-off speed, which is 15-20 knots higher than the stall speed. Summing up, we perform respective actions in the following order:

- while raising the nose (ANU just as after lift-off) we check/set:
- Carburetor HEAT–COLD,
- MIXTURE–RICH,
- THROTTLE–FULL FORWARD,
- FLAPS-10

  After effecting take-off power check and confirm aloud: "Take-Off Power SET". The safe take-off speed is approx. 10-15 knots over the stall speed. At minimum 50m (150ft) AGL and reaching climb speed we set flaps to 0.
- FLAPS – UP
- LANDING LIGHT - OFF

After performing all actions necessary to continue flight safely report your decision and intention to ATC (if such service is available). Remember that during this phase of flight, V_x (Best Angle-of-Climb Speed) or V_y (Best Rate-of-Climb Speed) might apply, e.g. in order to clear obstacles. Next, we perform the remaining procedures. Always remember not to make turns with banks of more than 15 degrees.

After performing all the procedures, which mean effecting clean configuration, climb speed and safe altitude, do AFTER-TAKE-OFF CHECKLIST.

Note! Once you decide to go around, never change your decision.

The go-around decision should be made in case of any doubts about the safety of the landing.

6. USING CHECKLISTS

In aviation three types of checklist are used: NORMAL, ABNORMAL and EMERGENCY. Generally, the recommended sequence of performing different types of checklist is the following:

- ☑ EMERGENCY
- ☑ NORMAL
- ☑ ABNORMAL

NORMAL checklists - General remarks:

Normal checklists presented herein should be used in any flight at indicated phases or following a given action. The description of the respective items of checklists and procedures is provided in the section Expanded Normal Checklists.

FLYING IS THE FIRST PRIORITY - monitor the aircraft position when using the checklist.

1. Procedures: AFTER TAKE-OFF, CRUISE, PRE DESCENT/ APPROACH, OUTER MARKER and FINAL should be memorized
2. In local flights (circuits, areas) CRUISE and APPROACH CHECKLIST can be ignored.
3. Checklist items and answers should always be said must be said loud and clear no matter if the flight instructor or a passenger is present on board. This rule particularly applies to solo flights.
4. Each checklist must be clearly started e.g. "LINE-UP CHECKLIST".
5. Completing each checklist must be confirmed with the phrase "Checklist completed". We do not start another checklist if the previous one has been completed. In case of missing an item while doing checklists listed under section A we get back to the missed item and continue from there. In case of missing an item while doing checklists listed under section B we start the whole checklist anew.
6. If an item on the checklist is not applicable at a given phase of flight, we say aloud "NOT APPLICABLE".
7. If for some reason, we are unable to check an item on the checklist, we clearly state when we are going to check it.
8. All items with the answer "AS REQUIRED" allow system/instrument settings at the pilot's discretion. The pilot has a choice and must clearly express his/her decision e.g.:

Primer	x times / LOCKED
Statement as follows:	
Primer	AS REQUIRED – is unacceptable.

Rules of using

Normal Checklists are divided into ground and in-flight checklists.
Ground checklists are the following:

- ☑ PREFLIGHT
- ☑ OUTSIDE
- ☑ BEFORE STARTING ENGINE
- ☑ STARTING ENGINE
- ☑ AFTER STARTING ENGINE
- ☑ TAXI
- ☑ RUN UP
- ☑ BEFORE TAKE-OFF

- ☑ BEFORE LINE UP
- ☑ AFTER LANDING
- ☑ SHUT DOWN
- ☑ SECURING THE AIRPLANE

The above Checklists are to be conducted as follows: "read item – execute instruction – confirm the execution".

In-flight Checklists are the following:

- ☑ AFTER TAKE-OFF
- ☑ CRUISE
- ☑ PRE-DESCENT/APPROACH
- ☑ FINAL

The above checklists must be performed only after the conditions listed below have been met, then the checklist must be read out loud to check if all the items have been correctly executed.

AFTER TAKE-OFF checklist to be followed when:

1. Flaps set to "0" and
2. Landing light/s off and
3. Safe altitude has been reached, recommended height at least 100m (300ft) AGL.

CRUISE checklist to be followed when:

1. Safe cruise altitude has been reached and
2. Throttle set to "cruise" parameters and
3. Mixture set (if adjustment needed).

PRE-DESCENT checklist to be followed when:

1. Mixture – RICH
2. Carburetor heat – ON

APPROACH checklist to be followed when:

1. Current destination aerodrome QNH set
2. Approach Briefing completed

FINAL checklist to be followed when:

1. Landing light/s on and
2. MIXTURE – RICH and
3. Flaps set to "xx" position for landing
4. Carburetor Heat – COLD

Note!: In case of aborted take-off roll for reasons other than emergency, perform AFTER-LANDING checklist.

7. EXPANDED NORMAL CHECKLIST AND PROCEDURES

Below you will find an expanded Normal Checklist for both C152 and C172. Variations between the airplane types are included in the description. Not all items require commentary.

PREFLIGHT CABIN

Before flight the pilot is obliged to perform outside check of the airplane and the cabin in line with the AFM. Please remember that no actions outside the airplane can be started if the PRE-FLIGHT CABIN CHECKLIST has not been completed. Especially do not manually rotate the propeller! After the checklist is completed we accept the airplane for flight with a signature in the airplane technical logbook (PDT). All loose objects should be secured. After taking seats, the seat should be adjusted (seat height – reference eye position) in order to ensure full and free control wheel movements. Fasten seat belts. Please remember that during flight, starting from taxi, no items can be placed on the instrument panel under the windshield.

1. Control wheel lock **REMOVE**

Remove control wheel lock in the pocket behind the seat. Control wheel lock properly put on prevents access to ignition switch and inserting the key

2. Master Switch **OFF**

3. Ignition switches **OFF**

Check the position of ignition switch – OFF in order to ground the magnetos. The key during the pre-flight check should not be inserted in the ignition switch to prevent accidental setting to any other position than OFF. Ignition switch OFF and key out.

4. Avionics Master Switch **OFF**

Not applicable to C 152

5. Avionics **OFF**

Includes all devices: Transponder, Nav, Radio

6. All electr. equipment **OFF**

7. A/C papers, mikes. headsets **ON BOARD**

Make sure all required documents are on board. The airplane folder should include the following:

- ✓ *maintenance statement MS*
- ✓ *valid CRS*
- ✓ *registration certificate*
- ✓ *insurance*
- ✓ *certificate of airworthiness*
- ✓ *radio license*
- ✓ *weight and balance*
- ✓ *noise certificate, microphone and headset on board*

8. Master Swith **ON**

9. Hobbs/Tach **CHECK/RECORD**

Read and record engine hours indicated on the tachometer counter. At the same time compare the value from the counter with the value at which the next maintenance inspection is due

10. Master Switch **ON**

11. Fuel quantity indicators **CHECK**

Check fuel levels on fuel quantity indicators and compare them with the manual inspection and the calculated minimum fuel for the flight

12. Flaps **FULL DOWN**

Note!!! After extending flaps do not leave the airplane. If you want to leave the airplane, retract flaps

13. Master Switch **OFF**

14. Mixture **CUT OFF**

15. Trimmer **CHECK / SET FOR TAKE-OFF**

Check the full and free movement of the trim wheel up and down and set for Take-off

16. Flight Controls **FREE**

Check the full and free movement of all controls

OUTSIDE

The rules of training flights require complete knowledge of all elements of the outside check according to the AFM/POH. OUTSIDE section of normal checklists contains basic information. Every flight starts with the PRE-FLIGHT CABIN checklist followed by the outside check, which is always conducted in the same manner as described below.
The PRE-FLIGHT CABIN checklist is described above. Do not start the Outside check if the PRE-FLIGHT CABIN checklist has not been completed!

FUSELAGE AND EMPENAGE

1. Rivets **CHECK**

Leave the cabin and start the outside check along the port side towards the tail section by carefully inspecting rivets (RIVETS – CHECK) on the skin of the fuselage and the empennage. Any paint cracks on rivets might suggest that the airplane might have been exposed to considerable stress and will require a detailed structural inspection.
We visually check the skin of the airframe

2. Tail Tie-Down **DISCONNECT**

While approaching the elevator check whether the airplane is tied down to the ground and if so, disconnect and leave the ropes or chains on the ground (TAIL TIE-DOWN - DISCONNECT). Any dent or paint scratch of the metal loop tie-down point might suggest that during take-off or landing the airplane tail struck the ground and considerable stresses occurred resulting in the need to conduct a structural inspection.

3. Control surfaces **FREE & SECURE**

Vertical stabilizer – leading edge – visually check the skin of the airframe.
Horizontal stabilizer – leading edge – hold the stabilizer by the blade (not by the plastic cover but the part near the plastic cover) and lift the stabilizer. Audible short sounds of bowed metal indicate the correctness of the stabilizer mounting. Then walk around the horizontal stabilizer to check the full and free movement of the elevator and the presence of bolts, nuts and split pins. Next focus on the rudder on the vertical stabilizer. Check the attachment (bolts and nuts) of the rudder to the stabilizer. Also check the rudder cables and tension.

4. Trim Tab **CHECK**

The right horizontal elevator is checked the same way as the left side. However, on the right side the trim tab is located. Check the attachment of the trim tab to the elevator and the hinge line.

5. Antennas **CHECK**

Another element of the outside check are antennas. Check the condition of VOR antennas on the vertical stabilizer. The antennas must be mounted along the axis of fuselage, make a steep angle and be locate on both sides of the stabilizer. The COM antenna should be present over the cabin and under the fuselage there should the transponder antenna. It might be a fin or a short, classic antenna.

RIGHT WING

1. Flaps **SECURE**

Check the correct mounting of flaps – check for the presence of nuts, bolts and tracks along which the flap is extended from the wing. Next, shake the flap and check for the standard play. In case of the lack of play the flap might get blocked and not extend during flight.

2. Aileron **FREE & SECURE**

Move the aileron up and down to check whether the left wing aileron deflects the opposite direction. Raise the aileron to see if the hinges and hinge cables are complete. Leading edge – check the navigation and strobe lights for damage. Leading edge – check if there are any dents.

WING TIE-DOWN – if the airplane is tied down we disconnect the rope or chain and leave it on the ground (for easy location of the of the tie-down points on the ground and to prevent uncontrolled movement of the buckles around the baggage area).

3. Main wheel tire **INFLATED**

Check tyre for correct inflation, position of the valve and tread of the main wheel (any wear to the fabric requires tyre replacement)

4. Brakes **NOT LEAKING**

Check hydraulic lines (for leaks of brake fluid) and brake pads (thickness).

5. Fuel tank sump **SAMPLE**

6. Fuel Quantity **CHECK**

Climb the upper wing by means of a ladder or the fuselage and strut-mounted steps and by using a fuel dipstick visually check the fuel level in the right tank. It is important to insert the dipstick vertically and the airplane sit level.

7. Fuel Filler cap **SECURE**

After visually checking the fuel level we replace the fuel caps and check that the fuel cap is secure. Remember (record) the fuel level.

NOSE

1. Engine oil level **CHECK**

The right side of the engine – open the upper cowling inspection hatch to check the engine oil level. To this end use a dipstick and read the oil level. Required oil levels for flight are detailed in the AFM and Normal Checklist

Ważne! - dolewając olej robimy to stopniowo.

2. Fuel strainer **SAMPLE**

Pull out the fuel strainer drain control to collect a fuel sample by putting a sampler cup under the fuel strainer near the nose gear. Handle this fuel sample the same way as with the wing fuel sample.

3. Under fuselage strainer **CHECK**

Collect a fuel sample from the lowest part of the fuel system – the valve under the fuselage. Handle the fuel sample as the previous ones checking for contamination and water.

4. Propeller and spinner **CHECK**

Check leading and trailing edges of the propeller for nicks and chips. Check the security of the spinner (no play).

5. Alternator belt **CHECK**

Check the tension of the alternator belt in the left air intake opening behind the propeller. Carry out this action smoothly and swiftly in order to prevent prolonged hand transitions around the prop. To this end a fuel dipstick might come in handy.

6. Air intake **CHECK**

visually assess whether there are any foreign objects inside..

7. Landing/Taxi lights **CHECK**

Another element to check is the taxi and landing lights for C 152. In case of stains, wipe the lamp. If the filament can be seen, check if it is not burnt (for C 172 these actions are performed on the left wing). Please, perform these checks with extra care.

8. Carburetor air filter **CHECK**

Check the air filter for contamination. The filter is especially vulnerable to mowed grass on grass airfields. If necessary, decontaminate while exercising extra caution due to the close proximity of the propeller.

9. Nose wheel strut & tire **CHECK**

Check the pressure of the nose tyre and the condition of the tyre. Then check the state of the shock absorber. The "three-finger rule" applies.

10. Static source port **CHECK**

The last element of the nose section is static source port. Check whether it is clean and unobstructed.

Note! All actions described above are performed in the plane of the propeller rotation. They must be performed with special care and the performance time must be limited to the necessary minimum!

LEFT WING

1. Main wheel tire **INFLATED**

Repeat the actions performed for the right wing.

2. Brakes **NOT LEAKING**

Repeat the actions performed for the right wing.

3. Fuel tank sump **SAMPLE**

By means of a sampler cup collect a fuel sample from the valve under the wing. Handle the sample as previously.

4. Fuel Quantity **CHECK**

Climb the upper wing by means of a ladder or the fuselage and strut-mounted steps and by using a fuel dipstick visually check the fuel level in the left tank.

5. Fuel Filler cap **SECURE**

After visually checking the fuel level we replace the fuel caps and check that the fuel cap is secure. Remember (record) the fuel level and total up the levels for both tanks and then compare with the calculated fuel quantity for the flight.

6. Pitot tube **UNCOVER & CHECK**

Approach the Pitot tube and remove the cover. Check the tube for any sign of blockage.

7. Stall warning **CHECK**

Approach the stall warning horn and check for any sign of blockage.

8. Fuel tank vent **CHECK**

Check the fuel vent pipe for any sign of blockage. With a high level of fuel in the tanks the vent will be dripping, which is normal; however, great caution should be exercised as the fuel vapours are highly flammable!!!
Approach WING TIE-DOWN point – if the airplane is tied down we disconnect the rope or chain and leave it on the ground. LEADING EDGE – check for dents. At the outer end of the wing check the navigation and strobe lights for damage.

9. Aileron **FREE & SECURE**

Move the aileron up and down to check whether the right wing aileron deflects the opposite direction. Raise the aileron to see if the hinges and hinge cables are complete.

Before the next stage – BEFORE-STARTING ENGINE:

- Check the baggage and loose object for secure placement, prepare personal equipment
- Passenger briefing – this is passenger information about the way to behave during flight, location and use of emergency equipment and conduct procedure in emergencies
- Adjust the seat height, distance from the controls and the reach of hands
- Fasten and adjust seat belts
- Finally, place personal equipment (e.g. map holder, maps, etc.) so that no item is placed on the shelf under the windshield.

Note!: Before a night or IFR flight additionally check the outside and inside lighting. Always keep the windows clean.

BEFORE STARING ENGINE

Before starting engine, a relevant checklist should be followed. Moreover, Beacon light should be switched on. While starting the engine, keep the main gear breaks pressed. Before start-up, make sure that the area in front of the plane is clear and then shout "CLEAR PROP".
The engine must always be started with avionics off.

1. Preflight check **COMPLETED**

2. PAX. Briefing **COMPLETED**

It is passenger information on how to behave during flight, location and use of emergency equipment and conduct procedure in emergencies.

3. Seat belts,harness **ADJUSTED / FASTENED**

Always fasten and adjust all seat belts/harnesses.

4. Circuit breakers **IN**

Note! At controlled airports before starting engine, start-up clearance must be received. In such an event, proceed as follows!!!

5. Master Switch **ON**

6. Avionics Master Switch **ON**

Not applicable to C 152

7. Com 1 **AS REQUIRED**

In class G airspace "COM 1 – ON" if air traffic service is available and it can provide us with necessary flight data. If no such service is available then "COM 1 – OFF". In class C airspace radio must be always on.

8. ATIS/Take-off data **RECEIVED**

9. Altimeter **SET**

Set QNH (if known) and compare the ALTIMETER reading with the published AIRPORT ELEVATION.

10. Start up clearance **RECEIVED**

For airplanes operating in class G airspace "Start-up clearance received" is always met, in class C airspace", ATC-granted start-up clearance is required

11. Com 1 **OFF**

12. Avionics Master Switch **OFF**

Not applicable to C 152

STARTING ENGINE

1. Master Swith **ON**

2. Fuel shutoff valve **ON**

For C 152 the valve ON, for C 172 BOTH ON

3. Mixture **RICH**

4. Throttle **2 cm ABOVE IDLE**

5. Carburetor heat **COLD**

Control knob fully pressed

6. Primer **AS REQUIRED / LOCKED**

For detailed description see the AFM, recommended number of strokes for a cold engine – 3, for a warm engine – 1

7. Beacon **ON**

8. Proppeller area **CLEAR**

Make sure there is no one in front of the airplane and shout "CLEAR PROP".

9. Starter **ENGAGE**

10.Throttle **1000 rpm**

11.Oil press **CHECK**

Within 10-15 seconds oil pressure should enter green area on the gauge. In case of no indication shut down engine immediately.

AFTER STARTING ENGINE

After starting the engine and during warm-up, take time to record the start-up time, switch on and set COM, NAV and transponder, if it is installed (code 7000 on Stand-By) and receive information on the radio concerning the aerodrome traffic situation, unless this action has already been completed. It is also the right and recommended time to perform Take-Off Briefing. Take-Off Briefing has been described in a separate chapter. Before taxi set the attitude indicator.

1. Flaps **UP**

2. Avionics Master Switch **ON**

Not applicable to C 152

3. Avionics **ON**

Includes all devices: Transponder, NAV, DME, Radio

4. Nav settings **SET**

Get NAV devices ready for flight. Tune VOR/ILS frequencies and enter VOR inbound and outbound tracks.

5. Directional giro **CHECK / SET**

Check directional gyro against magnetic compass

TAXI

Before taxi, make sure the area in front the airplane is unobstructed. This action should be confirmed with "LEFT/RIGHT CLEAR". Next, release parking break and switch on taxi/landing light. Use minimum power to taxi and adjust speed to the terrain. Taxi straight with elevators held fully aft and at aerodromes with the centreline marked hold the nose wheel on the line. During turns, hold the control wheel at neutral in order to fully unblock the front wheel. The first action after the airplane moves is to check the brakes by GENTLY pressing them twice. For taxi, keep the engine running at the recommended 1000 RPM.

During taxi, the pilot holds the Throttle control in order to set IDLE at any time. The actions during taxi must be minimized; however, if the pilot needs to e.g. change a radio frequency then as soon as this action is completed the hand gets back on the throttle. During taxi the following instruments must be checked by applying rudder and

watching for obstacles: Attitude Indicator, Turn Coordinator, Directional Gyro) and Magnetic Compass. During taxi maintain direction by means of rudder and if rudder proves ineffective, use breaks by tapping. Take caution not to press on the upper part of the rudder pedal while controlling direction in order to avoid unnecessary braking.
During crosswind taxi hold aileron into the wind. Change directions by applying rudder and tapping brakes. Do not press brake pedals continuously as it might slow down the airplane and damage the braking system.
During taxi at grass airfields without marked taxiways, pay special attention to the surface in front of the airplane. If necessary, change taxi directions in order to check the surface ahead.
Before crossing another taxiway pay attention to traffic and confirm the clear way by saying out loud "LEFT/RIGHT CLEAR". Upon finishing taxi and pulling up press brakes and switch off taxi/landing light.

1. Parking brakes **OFF**
2. Brakes, steering **CHECKED**
Check brakes by pressing them GENTLY.
3. Airspeed, TC, AI, DG. VSI **CHECKED**
During taxi check instruments by changing directions by approx. 20-30 degrees to the left and right.

RUN UP

Run-Up test should be performed as near the runway in use as possible. It is usually the place from which we will directly roll onto the runway. As Cessna airplanes are high wing, the observation of the approach sector is made difficult or even impossible. To this end, Run-Up test must always be conducted with a 10-15 degree yaw angle into the approach sector to ensure the sector visibility.
Engine warm-up before run-up – according to the Lycoming O-320 instruction:

- Warm up at approximately 1000-1200 RPM.
- Avoid prolonged idling and do not exceed 2200 RPM on the ground.
- Engine is warm enough for take-off when the throttle can be opened without the engine faltering.

Before the run-up we take off one headphone in order to detect possible engine faltering or irregularities.

1. Mixture **RICH**
2. Throttles **1800rpm**
1700 RPM for C 152 – consult Checklist
3. Suction gage **CHECKED**
Check if there is enough suction for the correct operation of the attitude indicator and directional. Readings must fall within the green range.
4. Engine instruments **CHECKED**
Check is the oil pressure and temperature are correct. Readings must fall within the green range
5. Ignition switches (Left/Right) **MAX DROP 125, DIFF 50 RPM**
By turning ignition into "L" and then "R" position you ground (switch off) the other (remaining) magneto. After switching off each magneto it is very important – besides noting the RPM drop – to check for the regular operation of the engine. Switch off one magneto. Remember the drop (should not be more than approx. 125 RPM). Return the switch back to BOTH. Wait for the RPM to get back to previous indication. Switch off the other magneto. The maximum drop (also approx. 125 RPM) should not differ from the previous one by more than 50 RPM. The engine should run smoothly in each position.
6. Carburetor heat **CHECK (for RPM drop) / COLD**
Pulling out the carburetor heat control knob results in allowing hot air to pass from the muffler area directly into the carburetor. Heated and thin air mixes with the fuel, which enriches the mixture. This causes the RPM to drop gradually (by max. 100 RPM). After switching the carburetor heat control to the cold position, the RPM should clearly and swiftly get back to the previous indication. A rise in the RPM after pulling on the carburetor heat might indicate de-icing the

carburetor on the ground. Do not operate the carburetor heat on the ground for a prolonged period of time because the heated air is not filtered. However, this time should be long enough to actually allow the carburetor to become heated.

7. Ammeter **CHECKED**

The hand slightly (1-2 widths) towards plus indicates battery recharging. If the battery was flat, the indications will be higher. They should drop with the recharging time. The check the operation of the voltage regulator you can momentarily burden the electrical system (e.g. by extending flaps) and observe the ammeter (after a slight rise it should get back to the previous position).

8. Throttle **CHECK IDLE / SET 1000 rpm**

Setting Throttle to IDLE should result in the indication of 650-700 RPM

BEFORE TAKE-OFF

In training flights, it is prohibited to receive clearances and line up with the intention of taking off immediately. In each case like this report back "....not ready for immediate take-off"

If so far you have not performed Take-Off Briefing this is the last call to do so. Good practice is to pre-record the take-off time.

1. Run up test **COMPLETED**

2. Take-Off briefing **COMPLETED**

See Chapter 2. Take-Off briefing for details

3. Fuel selector **ON**

For C 152 the valve – ON, for C 172 BOTH ON

4. Flaps **__ SET FOR TAKE-OFF**

The flap configuration to be decided during Pre-flight preparation

5. Mixture **RICH**

6. Doors **LATCHED**

7. Seat belts and harness **FASTEN**

8. Flight Controls **FREE and CORRECT**

BEFORE LINE UP

This procedure is performed just before lining up. Before rolling onto the runway, make sure that the approach sector is free i.e. there is no airplane/glider approaching. If the sector is free we confirm "APPROACH SECTOR FREE". While lining up switch on the transponder (if it is installed – mode ALT).

Once on the runway, check its marking against Magnetic Compass and Directional Gyro. Confirm "RUNWAY IDENTIFIED" Start the stopwatch (unless we have not done it before).

1. Transponder **ALT**

Enter assigned code, in class G airspace – 7000

2. RWY heading, Directional Giro **CHECKED**

Check Directional Gyro indications against Magnetic Compass, check instrument indications against runway heading

3. Time **CHECKED**

4. Parking brake **OFF**

During take-off roll the pilot must keep one hand on the throttle in order to be able to abort take-off at any time. When initiating take-off roll, after reaching take-off power (i.e. maximum RPM) and checking oil pressure call out "TAKE-OFF POWER SET". During take-off roll rest your feet against the rudder pedals to prevent inadvertent braking (heels on the floor). Hold aileron into the wind in case of crosswind take-off roll. Control direction with rudder. Then, check oil pressure and if the readings are in the green call out "OIL PRESSURE CHECK". Then check airspeed on the

indicator. Call out "SPEED RISING". In case of no indications of airspeed, oil pressure or any other malfunction, abort take-off. At rotation speed call out "ROTATE" and use both hands on the control wheel (option) raise the nose wheel. Keep the nose above the horizon in order to reach the safe take-off speed, which is 15-20 knots higher than the stall speed. Then use one hand to control the take-off power.
In the event of any airplane malfunction before lift-off, abort take-off and apply brakes immediately in a way that ensures traction.

Note! Once you decide to abort take-off, never change your decision.

AFTER TAKE-OFF

After lift-off, apply wind correction angle. The safe take-off speed is 15-20 knots higher than the stall speed.
At minimum 150ft AGL and after reaching the climb speed, retract flaps, if they have been used. Maintain heading and airplane nose up (ANU). Check and maintain steady climb speed. Check engine instruments. Determine position and direction of the first turn. The pilot must always have an emergency landing field chosen. During climb at clean configuration (no flaps) maintain Vy +5 to 10 knots in order to have good visibility from the cabin and proper engine cooling. After performing the memory AFTER-TAKE OFF procedure, read out and follow the AFTER TAKE-OFF checklist. It is unacceptable to do the checklist from memory.

1. Flaps	**UP**
2. Mixture	**RICH**
3. Climb power	**T/O POWER SET**
3. Carburetor heat	**COLD**
Carburetor heat control knob fully pressed	
4. Landing and Taxi lights	**OFF**
Only landing light for C 152	
5. Engine instruments	**CHECKED**

CRUISE

During a cross-country flight the pilot is obliged to monitor the situation outside the airplane at all times. The pilot also must frequently check the airplane instruments, especially the fuel gauges. Moreover, the pilot must always keep in mind a field for possible emergency landing within half the maximum glide distance at a given height above terrain. From the safety perspective, it is necessary to be adequately prepared for the flight and be able to use the personal equipment, maps and the flight log properly. Be organized and keep the cabin in order. No items can be placed on the instrument panel shelf under the windshield.

1. Fuel quantity	**CHECK**
2. Radio	**ON SET CHECK**
3. Engine	**CHECK**
4. Direction gyro	**CHECK & SET**
5. Altimeter	**SET**

Set local QNH for class G airspace or check for the 1013 hPa setting for IFR flights

PRE-DESCENT

1. Mixture	**RICH**
2. Carburetor heat	**ON**

The carburetor heat control knob fully pressed

APPROACH

1. Altimeter ***SET***

Set local QNH for class G airspace or check for the 1013 hPa setting for IFR flights

2. Approach Briefing ***COMPLETED***

Approach Briefing is a component that assists in getting prepared for approach and landing both at departure and destination aerodrome. Approach Briefing can be skipped only in the case of touch&go operations at the same aerodrome with steady weather and traffic. Approach Briefing should be completed not later than before joining the traffic circuit in class G airspace and before reaching the last VFR waypoint before class C airspace.

Approach Briefing elements:

- *Runway in use and heading*
- *Direction and speed of surface wind*
- *Landing configuration*
- *Circuit pattern joining procedure*
- *Fuel level*

Example of Approach Briefing:

Runway in use – ……..

Wind …./ ……knots Flaps

Left-hand circuit, joining downwind

Left tank ….., right …….. Total ……GAL" Remaining flight time ……

Any additional factors affecting the landing safety such as weather, aerodrome specifics, available landing distances and the resulting application of flaps as well as the landing technique should be carefully analysed at the flight preparation stage (Pre-flight Briefing).

FINAL

1. Flaps **SET FOR LANDING**

After establishing on final and checking airspeed, extend flaps

2. Mixture **RICH**

Make sure that the Mixture control knob is set in the position RICH

3. Carburetor heat **COLD**

Carburetor heat control knob fully pressed

4. Landing and Taxi lights **ON**

Landing Light for C 152 – consult Checklist

AFTER LANDING

After landing and vacating the runway (or on the runway after reaching the taxi speed if traffic permits) retract flaps, switch off landing (leave taxi light on or landing light, if it is serves as taxi light), switch transponder to Stand-by and record landing time. Taxi according to the guidelines defined under section TAXI.

1. Transponder **STAND-BY**

2. Flaps **UP**

If they have been used

3. Landing light **OFF**

Not applicable to C 152 – consult Checklist

4. Carburetor heat **COLD**

Carburetor heat control knob fully pressed

5. Time **CHECKED**

SHUT DOWN

1. Taxi light **OFF**

Carburetor heat control knob fully pressed

2. Electrical equipment **OFF**

3. Avionics **ALL OFF**

Includes all devices: Transponder, Nav, Radio

4. Avionics Master Switch **OFF**

Not applicable to C 152 – consult Checklist

6. Navigation lights **OFF**

7. Throttle **1000rpm**

8. Mixture **IDLE CUT OFF**

9. Ignition switches **OFF**

Position to OFF and the key out

10. Beacon **OFF**

11. Master Switch **OFF**

SECURING THE AIRPLANE

After the flight the pilot may leave the cabin only after performing all engine shut-down procedures (see Pilot's Operating Handbook – Chapter 4 "Normal Procedures"); however, no sooner than switching magnetos to OFF, taking the key out and switching off Master Switch. Good practice is measuring and recording the actual fuel level. Upon completing all the airplane-securing actions, the pilot must perform Post-flight outside check described in the section of the same title.

1. Hobbs/Tach **CHECK / RECORD**

Read and record engine hours indicated on the tachometer counter.

2. Control wheel lock **INSTALL**

3. Windows/Door **SECURE**

4. Pitot tube,Tie-downs **AFTER LIVING THE PLANE**

8. EMERGENCY & ABNORMAL CHECKLISTS – APPLICATION AND DESCRIPTION

Emergency and Abnormal Checklists presented herein should be used in emergencies and abnormal situations they respectively refer to.

Emergency

Due to the shortage of time, which depends on the altitude, emergency checklists must be memorized and done from memory and only after making sure that there is enough time left the pilot follows the checklist proper. Under the checklist below, meeting the listed conditions is a priority and only then the checklist items should be read out and checked if they have been performed correctly.

ENGINE FIRE IN FLIGHT

1. **Airspeed (in attempt to blowout fire)** **xx KIAS**

   Increasing airspeed is intended to blow out the flames. If this action fails, proceed with the following actions. If the flames have been blown out and the engine keeps running, make a precautionary landing at the nearest suitable aerodrome.

2. **Landing field** **APPOINTED**

   Do not drift away from the selected emergency landing field. Try to land into the wind and not to lose sight of the field. In case of a tree landing, select (if possible) the thickest section of the forest and assume treetops to be the touch-down surface. In case of ditching (water landing) assume the surface of the water to be the touch-down surface and if possible land as near the shore/bank as possible. In both cases try to touch down at minimum speed (stalling the airplane).

3. **Best Gliding Speed** **xx KIAS**

   The speed given in item 3 is the best glide speed. Remember not to make turns with banks of more than 15 degrees.

4. **Mixture** **IDLE CUT- OFF**
5. **Fuel shutoff valves** **OFF**
6. **Ignition switches** **OFF**
7. **Mayday Call** **TRANSMIT**

   Mayday Call should be transmitted at 121.5 MHZ; however, due to the shortage of time this call can be transmitted at the current frequency. The call should contain the following message: "Mayday Mayday Mayday SP-ABC, engine fire, emergency landing three nautical miles north-east of Ditchville

8. **Cabin head/air** **OFF**
9. **Flaps** **AS REQUIRED**

   Klapy wypuszczany na pełne, gdy jesteśmy pewni, że mamy zapewniony dolot do miejsca lądowania.

10. **Master Switch** **OFF**
11. **Doors** **UNLATCH**

    After stopping leave the cabin immediately. If possible, use fire extinguisher to put out fire. Even if the fire has been extinguished in flight and the engine stopped running, do not attempt to re-start the engine.

ENGINE FAILURE - FORCED LANDING

Basically, this procedure is identical to **ENGINE FIRE IN FLIGHT** except items 1 and 8. Additionally, in order to effect the maximum ground distance, use the full remaining engine power.

9. ABNORMAL

In all the cases below after discovering the listed conditions, a relevant checklist musts be taken out and followed.

ENGINE ROUGHNESS

1. Ignitions	**CHECK**
2. Mixture	**LEAN as necessary**

CARBURETOR ICING

1. Throttle	**FULL OPEN**
2. Carburetor heat	**ON**
3. Mixture	**ADJUST**

ELECTRICAL FAILURE

1. Load meter	**VERIFY**
2. Alternator	**OFF**
3. Electrical load	**REDUCE TO MINIUM**
4. Circuit breakers	**CHECK & RESET**
5. Alternator	**ON**

If still no power

1. Alternator	**OFF**
2. Electrical load	**REDUCE TO MINIUM**

Land as soon as possible at the nearest suitable airport

ELECTRICAL OVERLOAD

1. Master Switch	**OFF**
2. Master Switch	**ON**
3. Over-voltage light	**OFF – CONTINUE FLIGHT**
4. Over-voltage light	**ON - Land as soon as possible at the nearest suitable airport**

ENGINE FIRE ON THE GROUND

If fire occurs during start-up, KEEP cranking the engine. If unable to start the engine, Mixture - IDLE CUT OFF, Throttle - OPEN, Starter - CRANK ENGINE, Master Switch – OFF. Lave the cabin as soon as possible and if possible, extinguish fire with available means.

ENGINE FAILURE DURING GROUND ROLL

If fire occurs during take-off run reduce power to minimum, apply full brakes and retract flaps to 0 and make use of the remaining distance. In case of collision risk with an obstacle, switch off magnetos and Master Switch. In order to clear the obstacle apply rudder and use brakes.

ENGINE FAILURE AFTER AIRBORNE

If engine failure occurs after lift-off, the following is recommended:

In case of engine failure up to 500ft AGL, land ahead with within 30 degrees either side of the airplane in order to clear obstacles. First, secure airspeed, which cannot be lower than Best Glide Speed. In order to clear obstacles make turns with a minimum bank. Touch down at a minimum speed.

If engine failure occurs above 500ft AGL, land within 180 either side of the airplane (preferably into the wind) in order to clear obstacles.
In both cases, before touch-down perform **ENGINE FAILURE - FORCED LANDING** procedure, if possible.

AIR START

If engine fails in flight without no apparent reasons such as fire, abnormal vibrations or oil pressure drop, then the first action is maintain safe airspeed, which cannot be lower than **Best Glide Speed**. Next, head for the selected forced landing site. If the height above terrain is sufficient, make an attempt to re-start engine. To this end, check engine instruments and if the readings are correct then:

1. If engine failure occurred after changing fuel tanks, return to the original tank,
2. Carburetor heat - ON
3. Mixture – RICH
4. Throttle set 2cm above IDLE
5. Primer - 2-4 strokes and locked
6. Ignition switches - BOTH (OR START)

NOTE !!! If the propeller is windmilling, DO NOT use ignition switch to start engine!!!
Once the engine start running smoothly, land at the nearest suitable airport, if possible. If the engine fails to run do **ENGINE FAILURE - FORCED LANDING** immediately**.**

Stall warner failure

If the stall warner fails, pay extra attention to airspeed, especially at low altitude

Instrument failure

Continue flight relying on outside indications and land at the nearest suitable airport.

10. POST FLIGHT OUTSIDE CHECK

After completed flight and following the SECURING-THE-AIRPLANE checklist, the pilot-in-command is responsible for performing yet another duty – outside check.
It is a short inspection of the airplane to see whether the airframe (fuselage, wings and controls) has not been damaged (e.g. as a result of bird strike). Then, the remaining fuel level must be checked and recorded in the airplane technical logbook (PDT). Special attention must be paid to dents or paint scratches of the tail tie-down point, which might indicate that during take-off or landing the airplane 'tail struck' the ground and considerable stresses occurred resulting in the need to conduct a structural inspection. If the airplane finished operations for the day, it must be tied down and covers must be put on e.g. Pitot tube cover

11. DEBRIEFING

Debriefing should be conducted in adequate conditions and should last till all issues related to a particular exercise have been clarified; however, it should not be shorter than 30 minutes since the completion of the flight. Debriefing should include the following element

- ☑ Discussing situations which might have affected the flight safety.
- ☑ Discussing respective flight phases, required procedures and standards
- ☑ Discussing the progress of the exercise based on the notes made (remembered) by the instructor in flight with reference to flight parameter deviations from desired tolerance levels.
- ☑ Remarks and guidelines for the student pilot on how to avoid repeating the situations or deviations.
- ☑ Short review of the aim and content of the next exercise.
- ☑ In case of discovering knowledge gaps, the instructor assigns the student the task of making up for the missing knowledge on a self-study basis.

PREFLIGHT CABIN — C152 Normal Checklist

1. Control wheel lock	REMOVE
2. Master Switch	OFF
3. Ignition switches	OFF
4. Avionics	OFF
5. All electr. equipment	OFF
6. A/C papers, mikes, headsets	ON BOARD
7. Hobbs/Tach	CHECK / RECORD
8. Master Switch	ON
9. Fuel quantity indicators	CHECK
10. Flaps	FULL DOWN
11. Master Switch	OFF
12. Mixture	CUT OFF
13. Trimmer	CHECK / SET FOR TAKE-OFF
14. Flight Controls	FREE and CORRECT

OUTSIDE

Fuselage and Empenage

1. Rivets	CHECK
2. Tail Tie-Down	DISCONNECT
3. Control surfaces	FREE & SECURE
4. Trim Tab	CHECK
5. Antennas	CHECK

Right Wing

1. Flaps	SECURE
2. Aileron	FREE & SECURE
3. Main wheel tire	INFLATED
4. Brakes	NOT LEAKING
5. Fuel tank sump	SAMPLE
6. Fuel Quantity	CHECK
7. Fuel Filler cap	SECURE

Nose

1. Engine oil level	CHECK
2. Fuel strainer	SAMPLE
3. Under fuselage strainer	SAMPLE
4. Propeller and spinner	CHECK
5. Alternator belt	CHECK
6. Air intake	CHECK
7. Landing light	CHECK
8. Carburetor air filter	CHECK
9. Nose wheel strut & tire	CHECK
10. Static source port	CHECK

Left wing

1. Main wheel tire	INFLATED
2. Brakes	NOT LEAKING
3. Fuel tank sump	SAMPLE
4. Fuel Quantity	CHECK
5. Fuel Filler cap	SECURE
6. Pitot tube	UNCOVER & CHECK
7. Stall warning	CHECK
8. Fuel tank vent	CHECK
9. Aileron	FREE & SECURE
10. Flaps	SECURE

BEFORE STARING ENGINE

1. Preflight check	COMPLETED
2. PAX. Briefing	AS REQUIRED
3. Seat belts,harness	ADJUSTED / FASTENED
4. Circuit breakers	IN

STARTING ENGINE

1. Master Switch	ON
2. Fuel shutoff valve	ON
3. Mixture	RICH
4. Throttle	2 CM ABOVE IDLE
5. Carburetor heat	COLD
6. Primer	AS REQUIRED / LOCKED
7. Beacon	ON
8. Proppeller area	CLEAR (od śmigła)
9. Starter	ENGAGE
10. Throttle	1000 rpm
11. Oil press	CHECK

AFTER STARTING ENGINE

1. Flaps	UP
2. Avionics	ON
3. Nav settings	SET
4. Directional giro	CHECK / SET

TAXI

1. Parking brakes	OFF
2. Brakes, steering	CHECKED
3. Airspeed, TC, AI, DG. VSI	CHECKED

RUN UP

1. Mixture	RICH
2. Throttle	1700 rpm
3. Suction gage	CHECKED
4. Engine instruments	CHECKED
5. Ignition switches (Left/Right)	MAX DROP 125, DIFF 50 RPM
6. Carburetor heat	CHECK (for RPM drop) / COLD
7. Ammeter	CHECKED
8. Throttle	CHECK IDLE / SET 1000 rpm

BEFORE TAKE-OFF

1. Run up test	COMPLETED
2. Take-Off briefing	COMPLETED
3. Fuel shutoff valve	ON
4. Flaps	__ SET FOR TAKE-OFF
5. Mixture	RICH
6. Doors	LATCHED
7. Seat belts and harness	FASTEN
8. Flight Controls	FREE and CORRECT

BEFORE LINE UP

1. Transponder	ALT
2. Time	CHECKED
3. Directional Giro	CHECKED
4. Parking Brakes	OFF
5. RWY heading	CHECKED

AFTER TAKE-OFF

1. Flaps	UP
2. Mixture	RICH
3. Climb power	T/O POWER
4. Carburetor heat	COLD
5. Landing lights	OFF
6. Engine instruments	CHECKED

CRUISE

1. **F**uel quantity	CHECK
2. **R**adio	ON SET CHECK
3. **E**ngine	CHECK
4. **D**irection giro	CHECK & SET
5. **A**ltimeter	SET

PRE-DESCENT

1. Mixture	RICH
2. Carburetor heat	ON

APPROACH

1. Altimeter	__ SET
2. Approach Briefing	COMPLETED

FINAL

1. Flaps	__SET FOR LANDING
2. Mixture	RICH
3. Carburetor heat	COLD
4. Landing light	ON

AFTER LANDING

1. Transponder	STAND-BY
2. Flaps	UP
3. Carburetor heat	COLD
4. Time	CHECKED

SHUT DOWN

1. Taxi light	OFF
2. Avionics	ALL OFF
3. Avionics Master Switch	OFF
4. Throttle	1000 rpm
5. Mixture	IDLE CUT OFF
6. Ignition switches	OFF
7. Beacon	OFF
8. Master Switch	OFF

SECURING THE AIRPLANE

1. Hobbs/Tach	CHECK/ RECORD
2. Control wheel lock	INSTALL
3. Windows/Door	SECURE
4. Pitot tube,Tie-downs	AFTER LEAVING THE PLANE

C152 EMERGENCY CHECKLIST

ENGINE FIRE ON GROUND

IF ENGINE HAS NOT STARTED:

1.	**Mixture**	**IDLE CUT OFF**
2.	**Throttle**	**OPEN**
3.	**Starter**	**CRANK ENGINE**

IF ENGINE HAS ALREADY STARTED AND IS RUNNING, CONTINUE OPERATING TO TRY PULLING THE FIRE INTO THE ENGINE.

1.	**Throttle (2min)**	**1700 rpm**
2.	**Mixture**	**IDLE CUT-OFF**

IF FIRE CONTINUES, EXTINGUISH WITH THE BEST AVAILABLE MEANS. IF EXTERNAL FIRE EXTINGUISHING IS TO BE APPLIED:

1.	**Fuel shutoff valve**	**OFF**
2.	**Mixtures**	**IDLE CUT-OFF**

For all above: perform SHUT DOWN checklist then inspect the airplane

ENGINE FIRE IN FLIGHT

1.	**Airspeed** (in attempt to blowout fire)	**85 KIAS**
2.	**Landing field**	**APPOINTED**
3.	**Best Gliding Speed**	**60 KIAS**
4.	**Mixture**	**IDLE CUT-OFF**
5.	**Fuel shutoff valve**	**OFF**
6.	**Ignition switches**	**OFF**
7.	**Mayday Call**	**TRANSMIT**
8.	**Cabin heat/air**	**OFF**
9.	**Flaps**	**AS REQUIRED**
10.	**Master Switch**	**OFF**
11.	**Doors**	**UNLATCH**

ENGINE FAILURE - FORCED LANDING

1.	**Landing field**	**APPOINTED**
2.	**Best Gliding Speed**	**60 KIAS**
3.	**Mixture**	**IDLE CUT-OFF**
4.	**Fuel shutoff valve**	**OFF**
5.	**Ignition switches**	**OFF**
6.	**Mayday Call**	**TRANSMIT**
7.	**Flaps**	**AS REQUIRED**
8.	**Master Switch**	**OFF**
9.	**Doors**	**UNLATCH**

C152 ABNORMAL CHECKLIST

AIR START

1. Landing field	APPOINTED
2. Best Gliding Speed	60 KIAS
3. Carburetor heat	ON
4. Primer	PRIME as required / LOCKED
5. Fuel shutoff valve	BOTH / ON
6. Mixture	RICH
7. Ignition switches	BOTH (OR START)

IF ENGINE DOES NOT START

1. Mixture	IDLE CUT-OFF
2. Fuel shutoff valve	OFF
3. Ignition switches	OFF
4. Mayday Call	TRANSMIT
5. Flaps	AS REQUIRED
6. Master Switch	OFF
7. Doors	UNLATCH

ENGINE ROUGHNESS

1. Ignitions	CHECK
2. Mixture	LEAN as necessary

CARBURETOR ICING

1. Throttle	FULL OPEN
2. Carburetor heat	ON
3. Mixture	ADJUST

ELECTRICAL FAILURE

1. Load meter	VERIFY
2. Alternator	OFF
3. Electrical load	REDUCE TO MINIUM
4. Circuit breakers	CHECK & RESET
5. Alternator	ON

IF STILL NO POWER

6. Alternator	OFF
7. load	REDUCE TO MINIUM

Land as soon as possible at the nearest suitable airport

ELECTRICAL OVERLOAD

1. Master Switch	OFF
2. Master Switch	ON
3. Over-voltage light	OFF – CONTINUE FLIGHT
4. Over-voltage light	ON

Land as soon as possible at the nearest suitable airport

PREFLIGHT CABIN

C172 Normal Checklist

1. Control wheel lock	REMOVE
2. Avionics Master Switch	OFF
3. Master Switch	OFF
4. Ignition switches	OFF
5. Avionics	OFF
6. All electr. equipment	OFF
7. A/C papers, mikes. headsets	ON BOARD
8. Hobbs/Tach	CHECK / RECORD
9. Master Switch	ON
10. Fuel quantity indicators	CHECK
11. Flaps	FULL DOWN
12. Master Switch	OFF
13. Mixture	CUT OFF
14. Trimmer	CHECK / SET FOR TAKE-OFF
15. Flight Controls	FREE and CORRECT

OUTSIDE

Fuselage and Empenage

1. Bagage Door	Closed & Locked
2. Rivets	CHECK
3. Tail Tie-Down	DISCONNECT
4. Control surfaces	FREE & SECURE
5. Trim Tab	CHECK
6. Antennas	CHECK

Right Wing

1. Flaps	SECURE
2. Aileron	FREE & SECURE
3. Main wheel tire	INFLATED
4. Brakes	NOT LEAKING
5. Fuel tank sump	SAMPLE
6. Fuel Quantity	CHECK
7. Fuel Filler cap	SECURE

Nose

1. Engine oil level	CHECK
2. Fuel strainer	SAMPLE
3. Under fuselage strainer	SAMPLE
4. Propeller and spinner	CHECK
5. Alternator belt	CHECK
6. Air intake	CHECK
7. Carburetor air filter	CHECK
8. Nose wheel strut & tire	CHECK
9. Static source port	CHECK

Left wing

1. Main wheel tire	INFLATED
2. Brakes	NOT LEAKING
3. Fuel tank sump	SAMPLE
4. Fuel Quantity	CHECK
5. Fuel Filler cap	SECURE
6. Pitot tube	UNCOVER & CHECK
7. Stall warning	CHECK
8. Fuel tank vent	CHECK
9. Landing/Taxi lights	CHECK
10. Flaps	SECURE
11. Aileron	FREE & SECURE

BEFORE STARING ENGINE

1. Preflight check	COMPLETED
2. PAX. Briefing	COMPLETED
3. Seat belts,harness	ADJUSTED / FASTENED
4. Circuit breakers	IN

STARTING ENGINE

1. Master Switch	ON
2. Fuel Selector	BOTH ON
3. Mixture	RICH
4. Throttle	2 CM ABOVE IDLE
5. Carburetor heat	COLD
6. Primer	AS REQUIRED / LOCKED
7. Beacon	ON
8. Proppeller area	CLEAR (od śmigła)
9. Starter	ENGAGE
10. Throttle	1000 rpm
11. Oil press	CHECK

AFTER STARTING ENGINE

1. Flaps	UP
2. Avionics Master Switch	ON
3. Avionics	ON
4. Nav settings	SET
5. Directional giro	CHECK / SET

TAXI

1. Parking brakes	OFF
2. Brakes, steering	CHECKED
3. Airspeed, TC, AI, DG. VSI	CHECKED

RUN UP

1. Mixture	RICH
2. Throttle	1800 rpm
3. Suction gage	CHECKED
4. Engine instruments	CHECKED
5. Ignition switches (Left/Right)	MAX DROP 125, DIFF 50 RPM
6. Carburator heat	CHECK (for RPM drop) / COLD
7. Ammeter	CHECKED
8. Throttle	CHECK IDLE SET 1000 rpm

BEFORE TAKE-OFF

1. Run up test	COMPLETED
2. Take-Off briefing	COMPLETED
3. Fuel Selector	BOTH ON
4. Flaps	__ SET FOR TAKE-OFF
5. Mixture	RICH
6. Doors	LATCHED
7. Seat belts and harness	FASTEN
8. Flight Controls	FREE and CORRECT

BEFORE LINE UP

1. Transponder	ALT
2. Directional Giro	CHECKED
3. Parking Brakes	OFF
4. RWY heading	CHECKED

AFTER TAKE-OFF

1. Flaps	UP
2. Mixture	RICH
3. Climb power	T/O POWER SET
4. Carburetor heat	COLD
5. Landing and Taxi lights	OFF
6. Engine instruments	CHECKED

CRUISE

1. **F**uel quantity	CHECK
2. **R**adio	ON SET CHECK
3. **E**ngine	CHECK
4. **D**irection giro	CHECK & SET
5. **A**ltimeter	SET

PRE-DESCENT

1. Mixture	RICH
2. Carburetor heat	ON

APPROACH

1. Altimeter	__ SET
2. Approach Briefing	COMPLETED

FINAL

1. Flaps	__SET FOR LANDING
2. Mixture	RICH
3. Carburetor heat	COLD
4. Landing and Taxi lights	ON

AFTER LANDING

1. Transponder	STAND-BY
2. Flaps	UP
3. Carburetor heat	COLD
4. Time	CHECKED

SHUT DOWN

1. Taxi light	OFF
2. Avionics	ALL OFF
3. Avionics Master Switch	OFF
4. Throttle	1000 rpm
5. Mixture	IDLE CUT OFF
6. Ignition switches	OFF
7. Beacon	OFF
8. Master Switch	OFF

SECURING THE AIRPLANE

1. Hobbs/Tach	CHECK/ RECORD
2. Control wheel lock	INSTALL
3. Windows/Door	SECURE
4. Pitot tube,Tie-downs	AFTER LEAVING THE PLANE

C172 EMERGENCY CHECKLIST

ENGINE FIRE ON GROUND

IF ENGINE HAS NOT STARTED:

1.	**Mixture**	**IDLE CUT OFF**
2.	**Throttle**	**OPEN**
3.	**Starter**	**CRANK ENGINE**

IF ENGINE HAS ALREADY STARTED AND IS RUNNING, CONTINUE OPERATING TO TRY PULLING THE FIRE INTO THE ENGINE.

1.	**Throttle** (2min)	**1700 rpm**
2.	**Mixture**	**IDLE CUT- OFF**

IF FIRE CONTINUES, EXTINGUISH WITH THE BEST AVAILABLE MEANS.
IF EXTERNAL FIRE EXTINGUISHING IS TO BE APPLIED:

1.	**Fuel shutoff valves**	**OFF**
2.	**Mixtures**	**IDLE CUT- OFF**

For all above: perform SHUT DOWN checklist then inspect the airplane

ENGINE FIRE IN FLIGHT

1.	**Airspeed** (in attempt to blowout fire)	**100 KIAS**
2.	**Landing field**	**APPOINTED**
3.	**Best Gliding Speed**	**65 KIAS**
4.	**Mixture**	**IDLE CUT- OFF**
5.	**Fuel shutoff valves**	**OFF**
6.	**Ignition switches**	**OFF**
7.	**Mayday Call**	**TRANSMIT**
8.	**Cabin heat/air**	**OFF**
9.	**Flaps**	**AS REQUIRED**
10.	**Master Switch**	**OFF**
11.	**Doors**	**UNLATCH**

ENGINE FAILURE - FORCED LANDING

1.	**Landing field**	**APPOINTED**
2.	**Best Gliding Speed**	**65 KIAS**
3.	**Mixture**	**IDLE CUT- OFF**
4.	**Fuel shutoff valves**	**OFF**
5.	**Ignition switches**	**OFF**
6.	**Mayday Call**	**TRANSMIT**
7.	**Flaps**	**AS REQUIRED**
8.	**Master Switch**	**OFF**
9.	**Doors**	**UNLATCH**

C172 ABNORMAL CHECKLIST

AIR START

1. Landing field	APPOINTED
2. Best Gliding Speed	65 KIAS
3. Carburetor heat	ON
4. Primer	PRIME as required / LOCKED
5. Fuel shutoff valves	BOTH / ON
6. Mixture	RICH
7. Ignition switches	BOTH (OR START)

IF ENGINE DOES NOT START

1. Mixture	IDLE CUT- OFF
2. Fuel shutoff valves	OFF
3. Ignition switches	OFF
4. Mayday Call	TRANSMIT
5. Flaps	AS REQUIRED
6. Master Switch	OFF
7. Doors	UNLATCH

ENGINE ROUGHNESS

1. Ignitions	CHECK
2. Mixture	LEAN as necessary

CARBURETOR ICING

1. Throttle	FULL OPEN
2. Carburetor heat	ON
3. Mixture	ADJUST

ELECTRICAL FAILURE

1. Load meter	VERIFY
2. Alternator	OFF
3. Electrical load	REDUCE TO MINIUM
4. Circuit breakers	CHECK & RESET
5. Alternator	ON

IF STILL NO POWER

1. Alternator	OFF
2. load	REDUCE TO MINIUM

Land as soon as possible at the nearest suitable airport

ELECTRICAL OVERLOAD

1. Master Switch	OFF
2. Master Switch	ON
3. Over-voltage light	OFF – CONTINUE FLIGHT
4. Over-voltage light	ON

Land as soon as possible at the nearest suitable airport