

Auster Autocrat

PILOTS NOTES

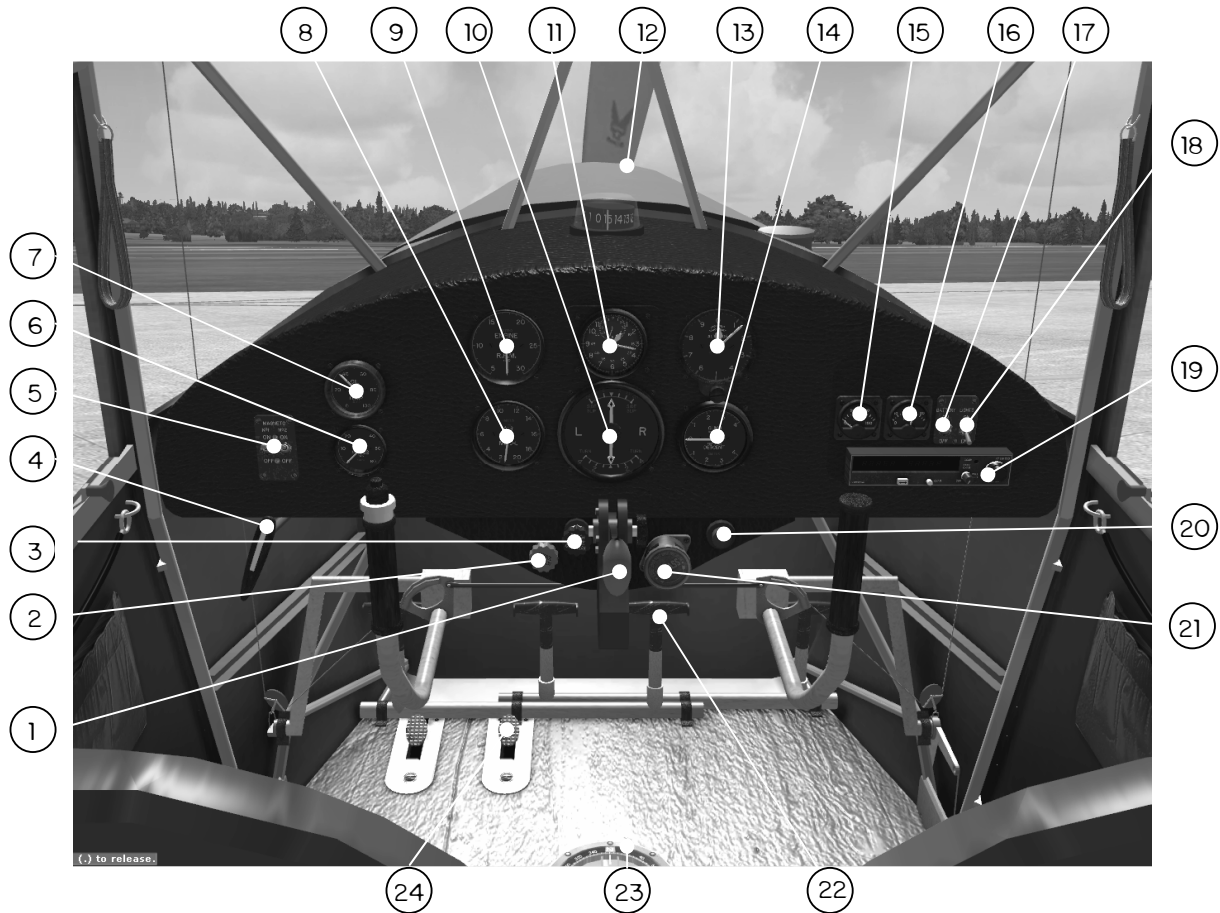
Introduction

To assist the crew to operate the aeroplane safely the following details are included regarding the limitations in the use of the aeroplane, details of performance, recommended handling and emergency procedures.

The contents are divided into the following sections containing information necessary to ensure safe operation as warranted by design features, operating or handling characteristics.

Section

1. General descriptive information
2. Operating limitations, upon a basis of which the “Certificate of Airworthiness” is issued
3. Recommended procedures and handling
4. Performance information of a kind necessary for the preparation of flight plans



1. Throttle
2. Fuel cock control
3. Mixture control
4. Parking brake
5. Magneto switches
6. Oil pressure
7. Oil temperature
8. A.S.I.
9. Engine R.P.M.
10. Turn and Slip indicator
11. Clock
12. Fuel contents indicator
13. Altimeter
14. V.S.I.
15. Ammeter (models with electrical fit only)
16. Voltmeter (models with electrical fit only)
17. Battery master switch (models with electrical fit only)
18. Navigation lights switch (models with electrical fit only)
19. Radio (models with electrical fit only)
20. Starter switch
21. Ki-Gass Primer
22. Rudder pedals
23. Compass
24. Brake pedals

Section 1 – Description

Cabin layout

The cabin interior is illustrated on page 2 and shows the various controls and items of equipment.

Flying controls

Each control column is mounted on an arch of steel tubing extending across the width of the cabin. During operation of the elevators, the arch rocks in a fore and aft direction, at the same time allowing the control column to swing laterally for aileron operation. The rudder pedals are not adjustable for length.

Trimming

There is a fixed trimming tab attached to the trailing edge of the rudder which can only be adjusted when the aircraft is on the ground. A trimming tab is fitted to the port elevator and is operated by a small crank leaver mounted in the centre of the cabin roof. Only a small movement of the crank is necessary to correct for trim. Violent movement of the trimmer should be avoided. Turning the handle clockwise makes the aircraft nose heavy, and vice-versa. An indicator is incorporated in the crank assembly.

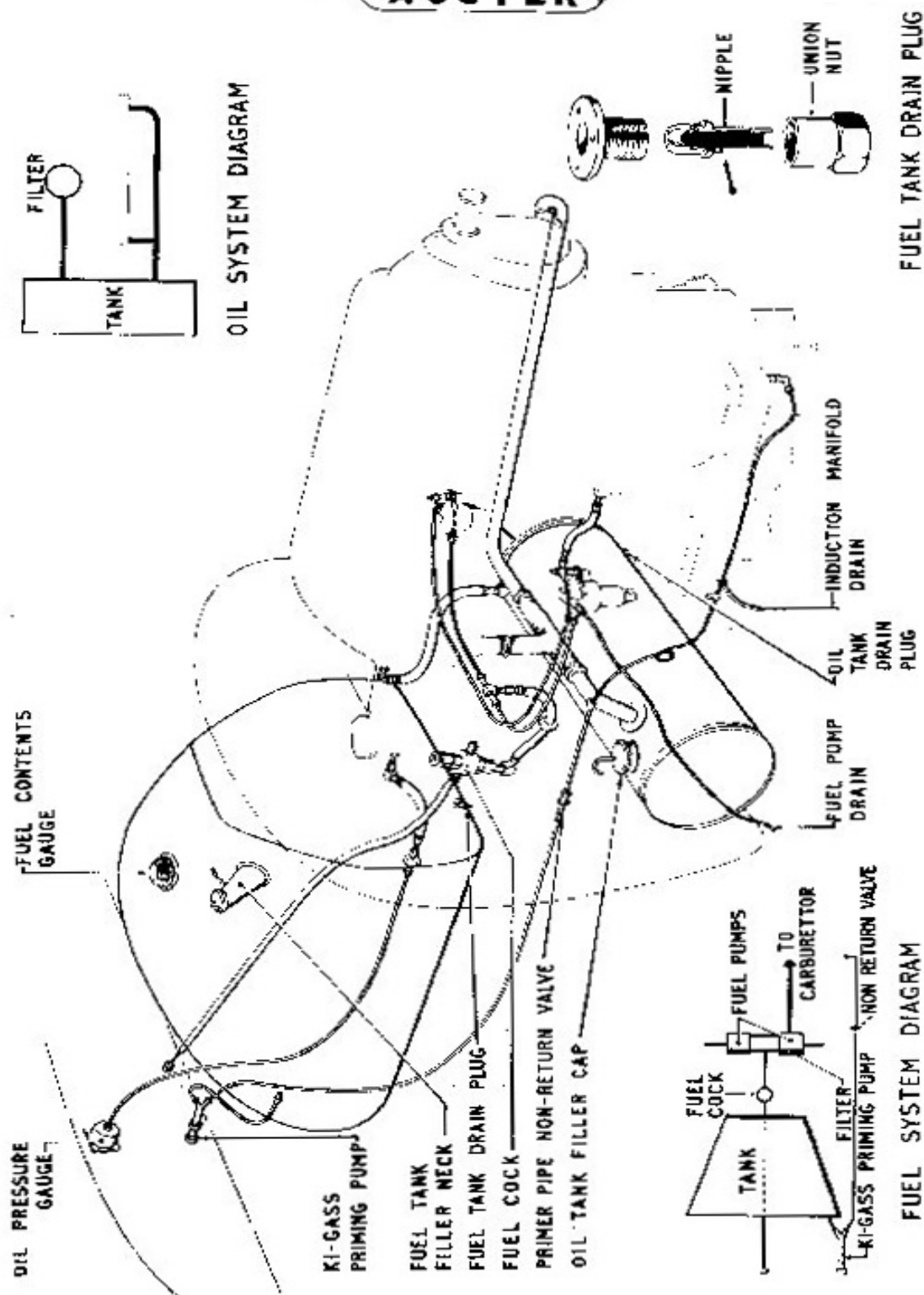
Flaps

The flap operating lever is situated just above the cabin door on the port side, and may be set in four different positions by means of a ratchet, which is disengaged by sliding the handle forward on its shaft. Flap settings are given in the “Flying and Landing” notes.

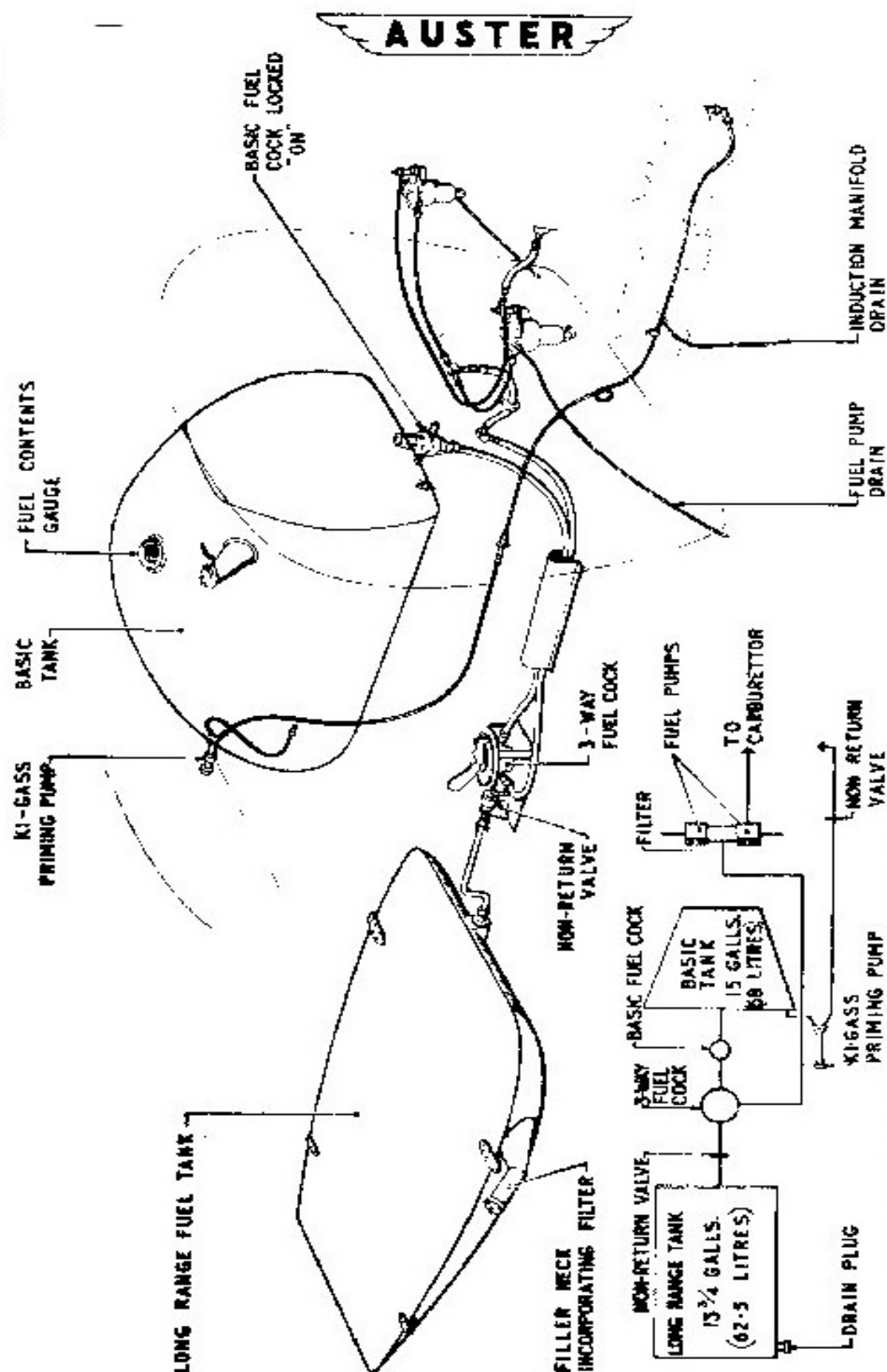
Brakes

Heel brakes are normally provided for the occupant of the port seat only, those being operated by cables, and each wheel brake is controlled individually by a pedal situated below the rudder pedals. The parking brake handle is situated underneath the instrument panel on the port side. To park the aircraft it is necessary to depress both foot pedals before pulling out the parking brake handle. The parking brake is released by depressing the ratchet catch and pushing the handle in.

FUEL AND OIL SYSTEMS



AUSTER



LONG RANGE FUEL SYSTEM DIAGRAM

Fuel contents gauge

A direct-reading, float-operated type fuel contents gauge is built into the top of the tank so that the indicator protrudes through the decking forward of the instrument panel.

A fuel contents gauge is NOT provided for the long range tank, and remaining fuel must be calculated on a gallons gone basis.

Fuel cock

The fuel cock, in the basic system, is of the PUSH-PULL type and is marked "PETROL-PUSH ON". It is mounted to the port of the throttle lever, the knob being pushed in for "ON". In the event of a long range fuel system being installed, the basic system fuel cock is wire-locked in the "ON" position and a three-way fuel cock is fitted centrally on the cabin floor just forward of the seats, its cock is marked "FRONT-REAR-OFF".

Throttle control

A throttle control of the lever and quadrant type is fitted at the bottom centre of the instrument panel. The lever is moved forward to open the throttle.

Mixture control

This is a small knob of the PUSH-PULL type, situated to the port of the throttle lever. The knob is marked "IN-RICH MIXTURE OUT-WEAK". The knob must be pulled out for WEAK, but is automatically pushed in when the throttle is closed.

Ignition switches

The magneto switches are mounted on the port side of the instrument panel. The left hand switch is for the port magneto and the right hand switch is for the starboard magneto. With switches "UP" ignition is "ON".

The Ki-Gass priming pump

A Ki-Gass priming pump is fitted to starboard of the throttle lever. To operate the primer it is first necessary to unscrew the cover. Particular care must be taken to replace the cover immediately after priming is completed.

Section 2 – Limitations

The following limitations are those which, if exceeded will render the “Certificate of Airworthiness” invalid until the aircraft is again proved to be in an airworthy condition.

1. Aerobatics

The basic “AUTOCRRAT” is normally classified in the “NORMAL CATEGORY” and aerobatics are not permitted. The aircraft may be given a “SEMI-AEROBATIC CATEGORY” classification provided the all-up-weight does not exceed 1700lbs (771 kg) and aerobatic front seats are installed. In this event and subject to the qualifications quoted above, aerobatic manoeuvres are permitted as listed in the “Certificate of Airworthiness” documents.

2. Speed limitations

- 2.1 The maximum permissible diving speed is 160m.p.h (258Km/h) IAS.
- 2.2 The maximum speed for either extending the flaps or flying with flaps extended is 70m.p.h (113Km/h) IAS.

3. Engine limitations

- 3.1 Take-off
 - 3.1.1 Minimum oil temperature
For take-off 30 C.
 - 3.1.2 Maximum crankshaft speed ... 2600 r.p.m.
(for 5 mins.)
 - 3.1.3 Minimum crankshaft speed
(full throttle) 2050 r.p.m.
 - 3.1.4 Maximum oil pressure 50 p.s.i.
(3.5Kg/sq.cm.)
 - 3.1.5 Minimum oil pressure 30 p.s.i.
(2.1Kg/sq.cm.)

3.2 Continuous operation

3.2.1 Maximum crankshaft speed ... 2300 r.p.m.

3.3 Diving

The engine r.p.m. in the dive must not exceed the maximum permissible r.p.m., i.e. 2600 at full throttle for 5 minutes duration.

4. Fuel and oil

4.1 Minimum fuel octane rating 73, fuels containing up to 4 c.c. tetra ethyl lead per Imperial gallon can be used.

4.2 Oil Specification

Tropical	D.E.D.2472 C/O	e.g. Ragosine “Minix”(A)	15
Summer	D.E.D.2472 B/O	e.g. Ragosine “Minix”(A)	90
Winter	D.E.D.2472 A/O	e.g. Ragosine “Minix”(A)	75

or any approved alternative.

5. Loading limitations

5.1 Maximum total weight authorised for take-off and landing (NORMAL CATEGORY) ... 1850 lbs. (839kg)

5.2 Maximum total weight authorised for take-off and landing (SEMI-AEROBATIC CATEGORY) ... 1700 lbs. (771kg)

5.3 C.G. limits for any weight up to 1850 lbs (839kg) are 12.5in (.318 metres) to 22.0in (.559 metres) aft of datum (the main plane leading edge at the root)

5.4 General

If the luggage is spread over the whole of the floor space of the rear cabin (moment arm 52.5in (1.334 metres)), the quantity must be restricted to 220 lb. (99.79kg) to prevent exceeding the C.G. moment arm of 22.0 in (.559 metres)

If it is necessary to carry more than the aforementioned quantity of freight, it is permissible to carry up to a total of 200lbs (90.7kg) on the second pilot's seat, (moment arm 20 in (.508 metres)) provided that it is securely fixed.

It will be observed from the above mentioned examples that under certain circumstances, when electric starting equipment is fitted, it is possible to carry a more useful load in the rear cabin since the extra weight in front of the datum line moves the aircraft C.G. forward.

NOTE:- It is not permissible to carry more than 300 lbs (136kg) on the front half of the rear floorboard owing to strength limitations.

The Auster "AUTOCRAT" aircraft complies with British Civil Airworthiness Requirements as shown below. In addition attention is drawn to any requirements concerning the carriage of instruments and devices current in the Air Registration Order or Regulation:-

1. Flight by night:- Complies when Mod. 1894 is incorporated.
2. Flights at altitudes necessitating the use of oxygen:- Compliance not established.
3. Flight in icing conditions:- Compliance not established.

Section 3

1. Before entering the aircraft

- 1.1 Ensure that external control locks are removed
- 1.2 Ensure that pickets are untied
- 1.3 Ensure that pitot head cover is removed
- 1.4 Ensure that there is no accumulation of hoarfrost on the control surfaces
- 1.5 Check that tyre pressures appear normal
- 1.6 Check contents of fuel and oil tanks
- 1.7 Check cowlings secure and panels closed

2. After entering aircraft

- 2.1 Ensure equipment is bagged and stowed
- 2.2 Check flying controls for full and free movement
- 2.3 Check brakes “ON”
- 2.4 Set altimeter
- 2.5 Fasten lap straps

3. Preparation for starting

- 3.1 Magneto switches “OFF”
- 3.2 Fuel “ON”
- 3.3 Throttle “CLOSED”
- 3.4 Mixture “RICH”

4. Starting

- 4.1 Check ignition “OFF” and with throttle nearly “CLOSED” have the propeller pulled round in the direction of rotation (anti-clockwise when viewed from the cabin) to carry the engine over four compressions to eliminate the risk of hydraulic shock damage, to draw mixture into the cylinders and to shear the initial oil film.
 - 4.1.1 Set the throttle in the recommended starting position (approx $\frac{1}{4}$ in open)
 - 4.1.2 Fuel cock “ON” (if auxiliary fuel tank fitted, cock at “FRONT”)
 - 4.1.3 Switch “ON” starboard magneto
 - 4.1.4 Mixture “RICH”
 - 4.1.5 Have propeller swung sharply, and when engine fires, switch on port magneto

Or

- 4.2 When starting the engine after it has been standing for some considerable period, the procedure in para 4.1 may not be effective, in this event the procedure is:-
 - 4.2.1 Increase throttle setting by approx $\frac{1}{4}$ in
 - 4.2.2 Unscrew Ki-Gass priming pump cover and operate pump until resistance is felt.
 - 4.2.3 Have the propeller pulled round in direction of rotation (anti-clockwise when viewed from cabin) and at the same time operate primer pump until fuel drains from the induction manifold.

The following table will serve as a guide to the number of strokes of the primer necessary to start the engine at various temperatures:-

Air Temp. deg.C	+30	+20	+10	0	-10	-20
Using 73 Octane fuel	0	1	2	3	4	6

- 4.2.4 Replace primer pump cover and screw down.
- 4.2.5 Allow sufficient time for fuel to drain away.
- 4.5.6 Switch on starboard magneto
- 4.5.7 Have the propeller swung sharply in direction of rotation (anti-clockwise when viewed from cabin) and as engine fires switch on port magneto.

4.3 Failure to start

If the engine fails to start after either of the previous operations and the mixture appears too rich, the following procedure should be adopted:-

4.3.1 Switch "OFF" both magnetos.

4.3.2 Fuel cock "OFF".

4.3.3 Fully "OPEN" throttle.

4.3.4 Pull the propeller backwards though about six revolutions.

4.3.5 "CLOSE" throttle and repeat starting drill.

4.4 To start the engine with electric starter

The same instructions as given in the preceding paragraphs can be generally applied when an electric starter is fitted but instead of having the propeller swung by hand, the starter isolation switch must be switched "ON" and the starter button pressed. The starter isolation switch being switched "OFF" directly the engine starts. When the engine is running:-

4.5 Check the oil pressure and if 30 to 40 lb.sq.in. (2 to 3 Kg.sq.cm.) does not show within one minute shut off the engine and investigate the cause.

4.6 If an oil pressure of 30 to 40 lb.sq.in. (2 to 3 Kg.sq.cm.) is recorded, the engine should be run at 800 to 1000 r.p.m. for 5 minutes to allow the oil to warm up and circulate freely.

4.7 Accelerate the engine until full throttle is reached.
A minimum of 2050 r.p.m. must be reached.

4.8 With the engine running steadily at full throttle, switch "OFF" each magneto in turn, and the resulting drop in r.p.m. noted. This drop should not exceed 100 r.p.m.

Note:- In no circumstance must the engine be run on the ground at full throttle for a period exceeding 30 seconds, or less in tropical conditions.

4.9 Check satisfactory slow running.

FLYING AND LANDING

5. Taxiing

- 5.1 There must be a person holding down each wingtip if it is required to taxi in strong winds.
- 5.2 Do not use brakes more than necessary.

6. Check list for take-off

- 6.1 Trim Control central
- 6.2 Mixture RICH position (push in)
- 6.3 Fuel Check contents
- 6.4 Flaps "TAKE OFF" position

7. Take-off

- 7.1 Open the throttle slowly and lift the tail off the ground as the throttle is opened.
- 7.2 The aircraft may be pulled off the ground at 40 m.p.h. (65km/hr) I.A.S.
- 7.3 To clear boundary obstacles climb with flaps at "TAKE-OFF", at 50 m.p.h. (80km/hr) I.A.S. This will give the steepest angle of climb but not the greatest rate of climb.
- 7.4 Increase speed to 65 m.p.h. (104.6km/hr) I.A.S. and raise flaps. No appreciable sink and little change of trim occurs if the flaps are raised slowly.

8. Climbing

The best climbing speed to the altitude required after flaps have been raised is 65 m.p.h. (104.6km/hr) I.A.S.

9. Stability

- 9.1 The aircraft is quite stable about all axes. If it is found that the aircraft cannot be trimmed to fly hands and feet off at 2300 r.p.m., adjustment should be made on the ground to the fixed trim tab on the rudder.
- 9.2 When the flaps are lowered there is no appreciable change of trim.
- 9.3 The controls are light and effective throughout the speed range.

10. Aerobatics

The basic "AUTOCRRAT" is normally classified in the "NORMAL CATEGORY" and aerobatics are not permitted. The aircraft may be given a "SEMI-AEROBATIC CATEGORY" classification provided the all-up-weight does not exceed 1700lbs (771 kg) and aerobatic front seats are installed. In this event and subject to the qualifications quoted above, aerobatic manoeuvres are permitted as listed in the "Certificate of Airworthiness" documents.

11. Stalling

The stalling speeds, engine off, in m.p.h. I.A.S. are as follows:-

	At 1420lbs (644 kg)	at 1600lbs (725.7 kg)	at 1850lbs (839 kg)
Flaps up	34 (55km/hr)	36 (59km/hr)	38 (62km/hr)
Flaps at take-off	30 (48km/hr)	32 (51km/hr)	34 (55km/hr)
Flaps fully down	24 (39km/hr)	26 (42km/hr)	28 (45km/hr)

There is no warning of an approaching stall.

Recovery is immediate if pressure on the control column is relaxed.

12. Auxiliary fuel tank

- 12.1 When an auxiliary fuel tank is installed, the take-off should be made on the main tank, i.e. the three way fuel cock is in the “FRONT” position, and the change over to the auxiliary tank should not be made until a safe altitude has been reached. Landings should, at all times be made using the main tank. The contents of the auxiliary tank should be calculated on a “gallons gone” basis and a safe margin of fuel allowed when changing back to the main tank, otherwise if the auxiliary tank is allowed to run dry, difficulty may be experienced in re-starting the engine.

13. Flight in rough air

- 13.1 It is important that all safety straps are securely fastened, particularly in the case of the rear seat occupant.

14. Flight in bad visibility

- 14.1 Reduce speed and fly with flaps at “TAKE-OFF” position.

15. Descent

- 15.1 With flaps up the best gliding speed is
65 m.p.h. (104 km/hr) I.A.S.

16. Approach for landing

- 16.1 Change fuel cock over to “FRONT” (if applicable)
16.2 Reduce speed to 55 m.p.h. (88 km/hr) I.A.S. and trim.

17. Check for landing

M...	...	Mixture	...	...	...	...	...	RICH
F...	...	Flaps	...	...	...	...	...	FULLY DOWN

18. Landing

- 18.1 Normal landing. The recommended approach speeds in m.p.h. I.A.S. are:-

	Flaps down	Flaps up
Engine assisted	40(65 km/hr)	45(73 km/hr)
Glide	50(80 km/hr)	55(90 km/hr)

- 18.2 Landing over obstacles in a confined space.

Select flaps “FULLY DOWN” and approach at 40 m.p.h. (65km/hr) I.A.S., at this speed the rate of sink is high. Flattening out may be assisted by a short burst of engine. Immediately after touch down, close the throttle and apply the brakes. In high wind conditions select “FLAPS UP” immediately after touch down.

Note:- When the rear seat is occupied, there is little danger of nosing over, even if the wheels are locked on landing. The brakes should not be used unnecessarily, and should be used with care when flying solo. It is, however, recommended that deliberate landings in a confined space should be attempted only by those pilots having considerable experience with this type of aircraft.

- 18.3 Baulked landing. Open the throttle, raise flaps to “TAKE-OFF” position and climb at 50 m.p.h. (80km/hr) I.A.S. until clear of obstacles. The change of trim can be held on the control column.

19. After landing

- 19.1 Raise flaps before taxiing.
- 19.2 Do not use brakes more than necessary.

20. Stopping the engine

- 20.1 Head the aircraft into wind, throttle back and allow the engine to idle for a short time to enable it to cool down.
- 20.2 Turn “OFF” the fuel cock.

20.3 When the engine begins to splutter, fully “OPEN” the throttle.

20.4 Switch “OFF” both magnetos.

20.5 When the propeller stops rotating, “CLOSE” the throttle.

21. Parking the aircraft

When the aircraft is parked in the open, the parking brake should be set “ON” and the wheels chocked. The aircraft should be parked “head to wind”, securely picketed, and protective coverings fitted if available.

SECTION 4

1. Performance and range

Note:- All speeds quoted below are Indicated Air Speeds, and are for a take-off weight of 1600lb (725.7 kg) unless otherwise stated.

1.1 Maximum speed

At sea level 115 m.p.h. (191 km/hr)

At 5000 ft (15234 m)... ... 106 m.p.h. (171 km/hr)

1.2 Cruising speed

At 1000 ft (305 m) and
2300 r.p.m. 97 m.p.h. (156 km/hr)

1.3 Take-off and landing

Aircraft Loading	1420 lb 636 kg	1600 lb 725 kg	1850 lb 839 kg
Rate of Climb at mean sea level	883ft/min 208m/min	568ft/min 173m/min	408ft/min 124m/min
Take-off run in 5 m.p.h. (8km/h) wind	100 yds 91 m	149 yds 136 m	212 yds 194 m
Distance to clear 50ft (15m) 5 m.p.h. (9km/h) wind	240 yds 219.5 m	316 yds 289 m	454 yds 415 m
Time to clear 5000ft (1524 m)	8 mins 40 secs	10 mins 36 secs	15 mins 23 secs
Distance to rest from height of 50 ft (15m) in 5 m.p.h. (8km/hr) wind	...	...	300 yds (274 m)
Service ceiling	...	14,100 ft (4298 m)	
Absolute ceiling	...	16,600 ft (5060 m)	

1.4 Fuel consumption

	r.p.m.	Galls/hr	Litres/hr	m.p.g
Normal	2200(in still air)	4.3	19.5	21.4
Cruising	2300(in still air)	4.9	22	19.8

1.5 Oil Consumption

At cruising speed 2200/2300 r.p.m. 1 to 2 pints/hr

At cruising speed 2200/2300 r.p.m. .6 to 1.3 litres/hr

1.6 Ultimate range (in still air) with normal tankage (15 galls) fuel

At 2200 r.p.m. 320 miles (514 km)

At 2300 r.p.m. 300 miles (483 km)

1.7 Ultimate range (in still air) with normal and long range tankage (total capacity 28.75 galls)

At 2200 r.p.m. 600 miles (966 km)

At 2300 r.p.m. 565 miles (910 km)

Note:- The above mileage is reckoned on a basis of all the fuel being used.
A safe margin must be allowed when calculating for a journey.

1.8 Cross wind take-off

The aircraft should not be taken off or landed in cross winds greater than 10 m.p.h. (16.4 km/hr)