This replacement Flight Manual supersedes any previous Flight Manual issued for this aircraft.

AIRCRAFT

FLIGHT MANUAL

REIMS/CESSNA F 152

THIS PAGE MUST NOT BE REMOVED FROM THIS FLIGHT MANUAL/PILOTS OPERATING HANDBOOK TO RETAIN THE CAA CERTIFICATION DETAILS.

Manufacturer : REIMS AVIATION
Aérodrome de REIMS PRUNAY
B.P. 2745 51062 REIMS CEDEX

French Type Certificate No. 38

Serial Number : 1663 Registration Number : ~~G-BGLR~~ G-HFCL

This is the Flight Manual which forms part of the Certificate of Airworthiness for aircraft ..... G-HFCL EGTU

Sections : 2 - 3 - 5

Pages : 2.1 à 2.7
3.1 à 3.8
5.1 à 5.3

Ce manuel est la traduction en langue anglaise du manuel de vol français approuvé.

P.O.

DGAC Visa 03.06.77

This is the exact translation of the F 152 French Flight Manual approved by DGAC.

This aircraft must be operated in accordance with the limits specified in this Flight Manual.

THIS DOCUMENT MUST BE CARRIED IN THE AIRCRAFT AT ALL TIMES.

Aircraft serial No. F15201429 on.

TABLE OF CONTENTS

SECTION 5 - PERFORMANCES

SECTION 6 - APPENDIX

LIST OF REVISED PAGES

N°	Revised pages	Nature of Change	Approval	
			Date	Visa
1	/	Original Document	03.06.77	P.O.
2	0-2 thru 0-4 1-6 thru 1-8, 1-10, 1-12 thru 1-16 2-2 thru 2-7 3-1 thru 3-8 4-7 thru 4-28 5-3 6-1-0, 6-2-1 and 6-2-2, 6-6-1 and 6-7-1	1979 Model beginning with Serial Number N° F 1501529	06.09.78	P.O.

CAA APPROVED CHANGE SHEETS & SUPPLEMENTS
FOR EMBODIMENT IN THIS MANUAL

DATE	ORIGIN AND TITLE	APPROVAL AUTHORITY	POSITION IN MANUAL
21/11/18	CAA Supplement 1 Issue 2 ('Limitations')	CAA	End of manual
18/6/03	CAA CS 101 Issue 2	CAA	SECTION 5 ~~END OF MANUAL~~

SECTION 1

GENERAL

NOTIFICATION

This manual contains the instructions for use, and the list of Servicing and periodic inspections, as well as the performance data of the Model F152 "Standard", "Ecole" and "Liaison".

DOCUMENTS AVAILABLE

The following is a check list of the data, information and licenses that are part of the aircraft file and required by Regulations. They should be made available at all times to relevant Authority.

(1) Airworthiness Certificate.

(2) Registration Certificate.

(3) Radio Installation License (if radio installed).

(4) Log Books.

(5) Flight Manual.

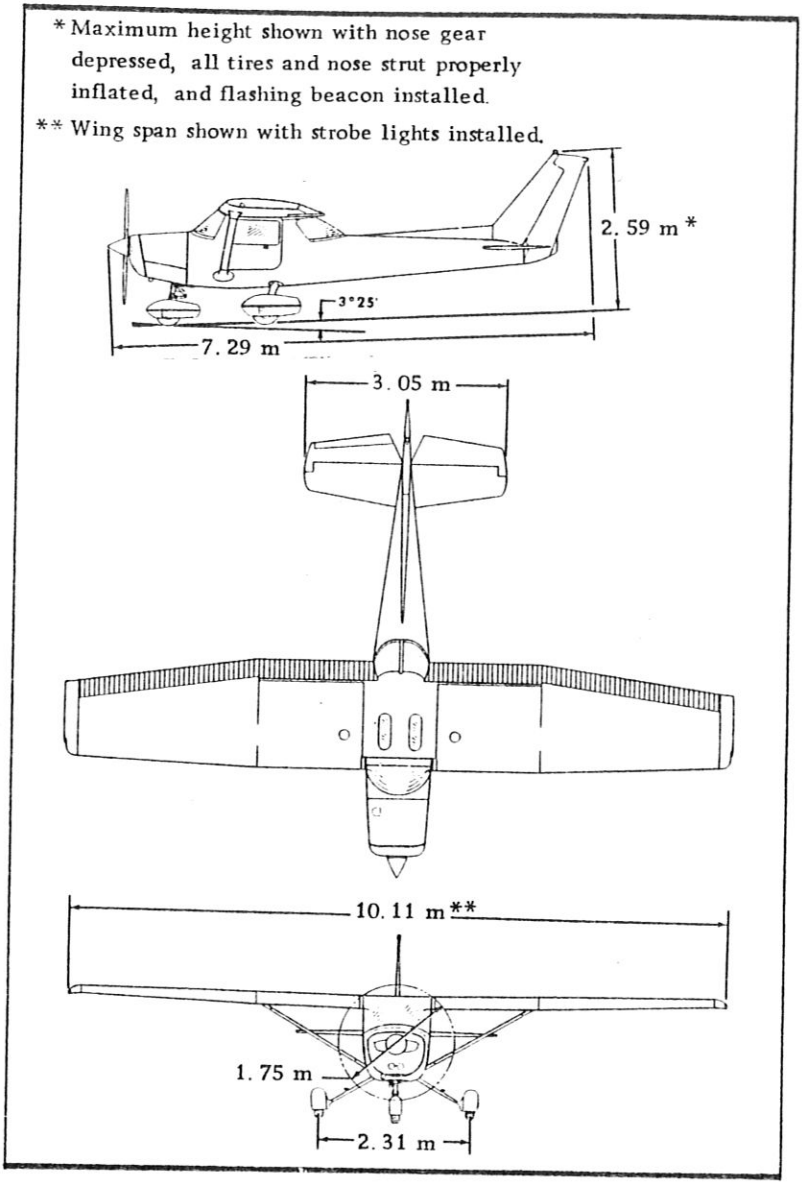

* Maximum height shown with nose gear depressed, all tires and nose strut properly inflated, and flashing beacon installed.
** Wing span shown with strobe lights installed.
2. 59 m *
3°25'
7. 29 m
3. 05 m
10. 11 m **
1. 75 m
2. 31 m

Figure 1-1

DESCRIPTION AND CHARACTERISTIC DIMENSIONS

OVER-ALL DIMENSIONS

Wing Span (With Strobe Lights)		10.11 m
Maximum Length		7.29 m
Maximum Height		2.59 m With Flashing Beacon and Nose Strut Depressed

WING

Airfoil Type		NACA2412
Wing Area		14.9 m2
Dihedral Angle		+ 1° (at 25 % chord)
Angle of Incidence,	Wing Root	+ 1°
	Wing Tip	0°

AILERONS *

Area		1.7 m2
Control Travel,	Up	20° ± 1°
	Down	15° ± 1°
	Droop	1° ± 1/2°

WING FLAPS

Method of Actuation	Electric/Cable
Area	1.72 m2
Control Travel	0° to 30° ± 2°

HORIZONTAL STABILIZER AND ELEVATOR

Stabilizer Area		1.58 m2
Angle of Incidence		- 3°
Elevator Area (Including Tab Area)		1.08 m2
Control Travel,	Up	25° ± 1°
	Down	18° ± 1°

*Cable control systems

ELEVATOR TRIM TAB

Control Travel,	Up	$10° \pm 1°$
	Down	$20° \pm 1°$

VERTICAL FIN AND RUDDER*

Fin Area		0. 83 m2
Rudder Area		0. 65 m2
Control Travel, (perpendicular to hinge line)	Left	$23° \begin{smallmatrix} +0° \\ -2° \end{smallmatrix}$
	Right	$23° \begin{smallmatrix} +0° \\ -2° \end{smallmatrix}$

LANDING GEAR

Type		Fixed, Tricycle	
Shock Absorber,	Nose Gear	Air - Oil	
	Main Gear	Tubular Spring	
Tread		2. 31 m	
Nose Wheel Tire and Pressure	5. 00 x 5	2. 10 bar	30 psi
Main Wheel Tire and Pressure	6. 00 x 6	1. 45 bar	21 psi
Nose Gear Shock Strut Pressure		1. 40 bar	20 psi

POWER PLANT

Engine	AVCO LYCOMING 0-235-L2C, 110BHP (82 kW) at 2550 RPM
Fuel	100 LL Grade Aviation Fuel (Blue)

NOTE

100 (Formerly 100/130) Grade Aviation Fuel (Green) with maximum lead content of 4. 6 cm3 per gallon is also approved for use.

*Cable control systems

Oil

Recommended Viscosity for Temperature Range :

MIL-L-6082 Aviation Grade Straight Mineral Oil :

SAE 50 above 16°C
SAE 40 between -1°C and 32°C
SAE 30 between -18°C and 21°C
SAE 20 below -12°C

MIL-L-22851 Ashless Dispersant Oil :

SAE 40 or SAE 50 above 16°C
SAE 40 between -1°C and 32°C
SAE 30 or SAE 40 between -18°C and 21°C
SAE 30 below -12°C

Carburetor Heater : Manually Operated

PROPELLER

Propeller Type : McCauley 1A103/TCM 6958

Number of Blades : 2

Propeller Diameter,	Maximum	1.75 m
	Minimum	1.71 m

Fixed pitch

CABIN

Seating	2 (plus optional child seat)
Doors	2
Baggage compartment	

INSTRUMENT PANEL

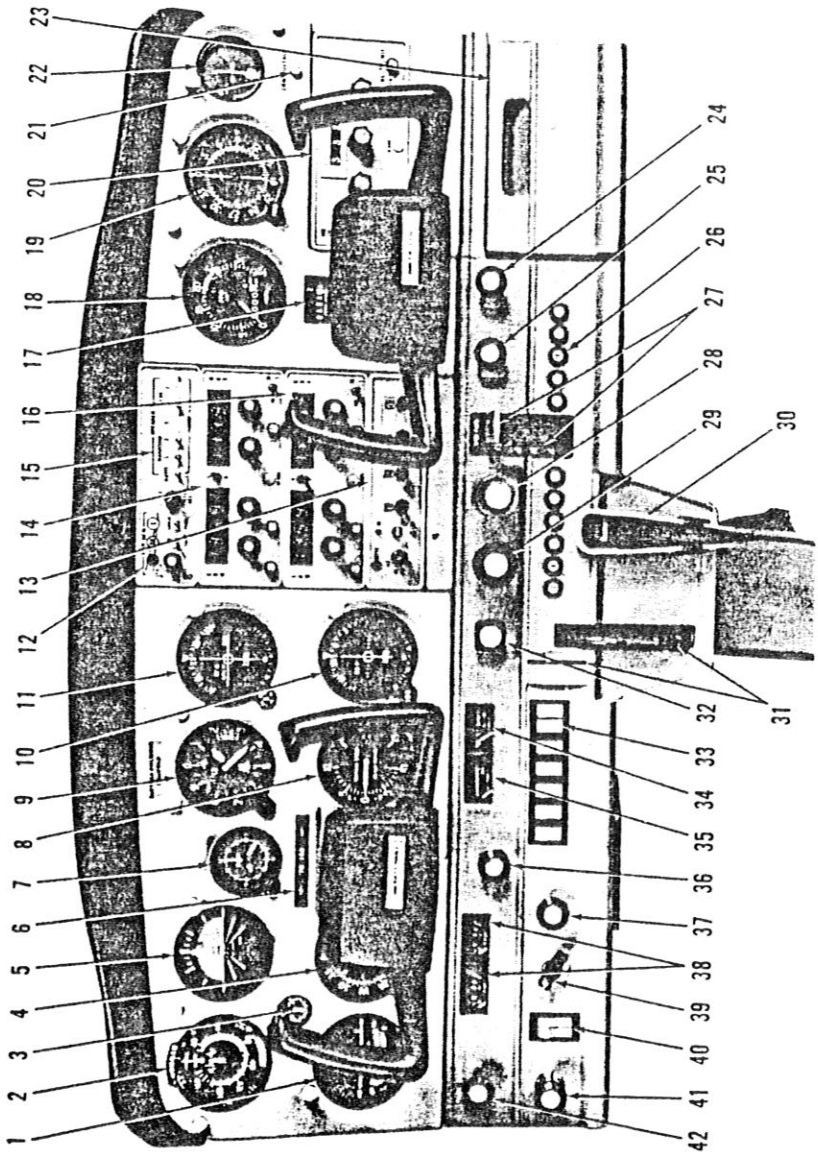


FIGURE 1-2

1. Turn Coordinator
2. Airspeed Indicator
3. Suction Gage
4. Directional Indicator
5. Attitude Indicator
6. Airplane Registration Number
7. Clock
8. Rate-of-Climb Indicator
9. Altimeter
10. Course Deviation Indicator (Number 2 Nav/Com)
11. Course Deviation and ILS Glide Slope Indicators (Number 1 Nav/Com)
12. Marker Beacon Indicator
13. Transponder
14. Number 1 Nav/Com Radio
15. Audio Control Panel
16. Number 2 Nav/Com Radio
17. Flight Hour Recorder
18. Tachometer
19. ADF Bearing Indicator
20. ADF Radio
21. Low-Voltage Warning Light
22. Ammeter
23. Map Compartment
24. Cabin Heat Control
25. Cabin Air Control
26. Circuit Breakers
27. Wing Flap Switch and Position Indicator
28. Mixture Control
29. Throttle (With Friction Lock)
30. Microphone
31. Elevator Trim Control Wheel and Position Indicator
32. Carburetor Heat Control Knob
33. Electrical Switches
34. Oil Pressure Gage
35. Oil Temperature Gage
36. Cigar Lighter
37. Instrument Panel and Radio Dial Lights Rheostat
38. Left and Right Fuel Quantity Indicators
39. Ignition Switch
40. Master Switch
41. Primer
42. Parking Brake Control Knob

FUEL SYSTEM

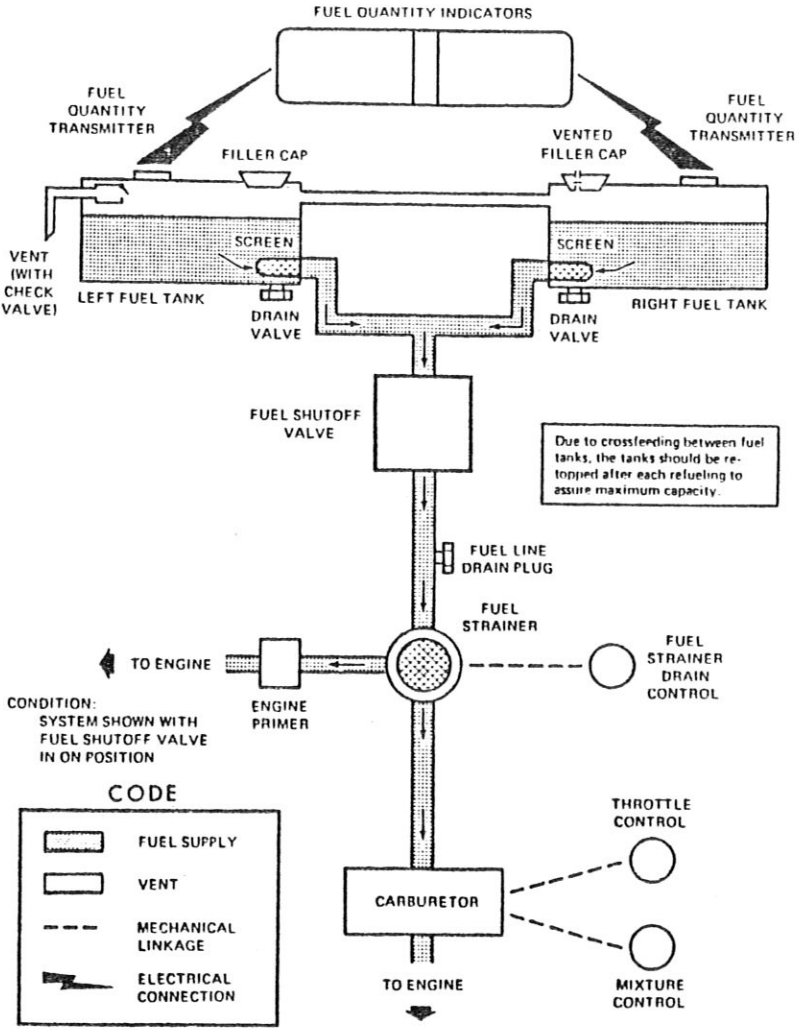


Figure 1-3

FUEL SYSTEM

Fuel is supplied to the engine from two tanks, one in each wing. From these tanks, fuel flows by gravity through a fuel shutoff valve and fuel strainer to the carburetor.

For additional information on Lubrication and Servicing, refer to the maintenance guide of the aircraft.

FUEL QUANTITY DATA			
TANKS	USABLE FUEL ALL FLIGHT CONDITIONS	UNUSABLE FUEL	TOTAL FUEL VOLUME
TWO, STANDARD WING 49 l (13 US Gal) each	93 l 24. 5 US Gal	6 l 1. 5 US Gal	98 l 26. 0 US Gal
TWO, LONG RANGE WING each	142 l 37. 5 US Gal	6 l 1. 5 US Gal	147 l 39 US Gal

FUEL TANK SUMP QUICK-DRAIN VALVES

Each fuel tank sump is equipped with a fuel quick-drain valve which extends through the lower surface of the wing just outboard of the cabin door. A sampler cup stored in the aircraft is used to examine the fuel for the presence of water and sediment. A "STRAINER DRAIN KNOB" is located inside the engine nose cap access door and is connected to the strainer quick-drain valve. After the knob has been released, make sure that strainer drain is closed.

ELECTRICAL SYSTEM

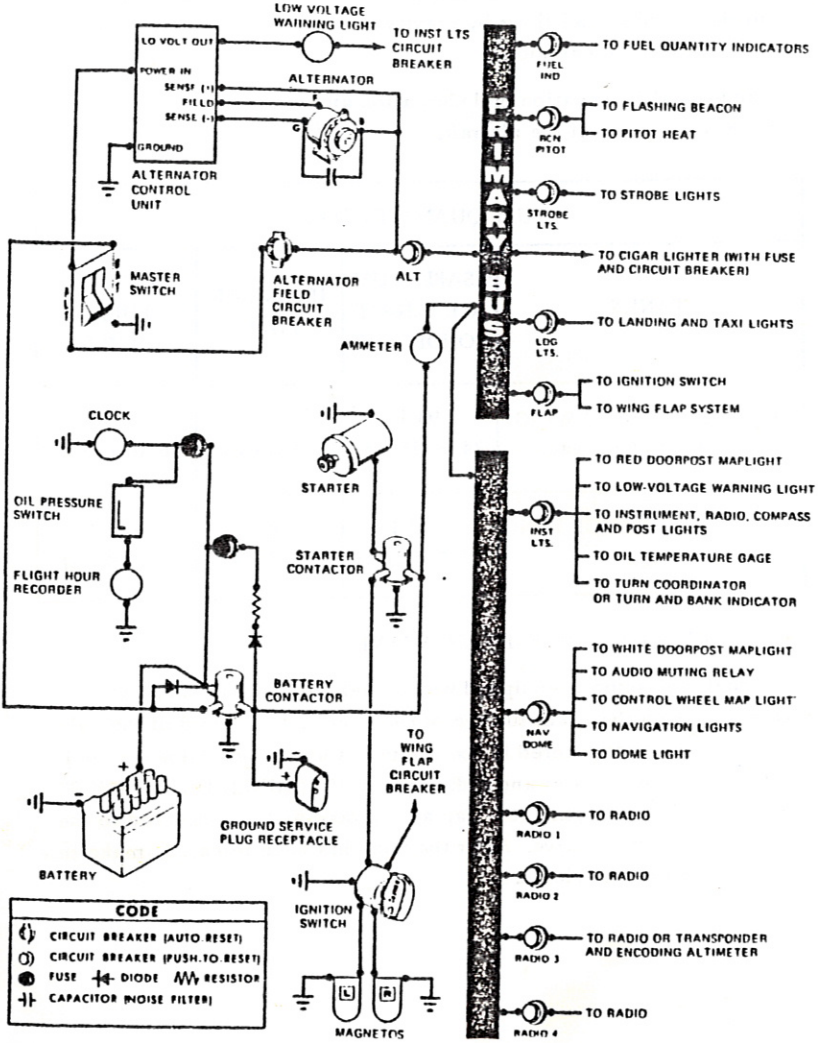


Figure 1-4

ELECTRICAL SYSTEM

Electrical energy is supplied by a 28-volt, direct-current system powered by an engine-driven, 60-amp alternator and a 24-volt, 14-amp hour battery located on the right forward side of the firewall.
A master switch controls power to all circuits, except the engine ignition system, optional clock and optional flight hour recorder (operative only when the engine is operating).

MASTER SWITCH

The master switch is a split-rocker type switch labeled "MASTER", and is "ON" in the up position and "OFF" in the down position. The right half of the switch, labeled "BAT", controls all electrical power to the airplane. The left half, labeled "ALT", controls the alternator.

Normally, both sides of the master switch should be used simultaneously, however, the "BAT" side of the switch could be turned "ON" separately to check equipment while on the ground. The "ALT" side of the switch, when placed in the "OFF" position, removes the alternator from the electrical system. With this switch in the "OFF" position, the entire electrical load is placed on the battery. Continued operation with the alternator switch "OFF" will reduce battery power low enough to open the battery contactor, remove power from the alternator field, and prevent alternator restart.

AMMETER

The ammeter indicates the flow of current, in amperes, from the alternator to the battery or from the battery to the aircraft electrical system. When the engine is operating and the master switch is "ON", the ammeter indicates the charging rate applied to the battery.

ALTERNATOR CONTROL UNIT AND LOW-VOLTAGE WARNING LIGHT

The airplane is equipped with a combination alternator regulator high-low voltage control unit mounted on the engine side of the firewall and a red warning light, labeled "LOW VOLTAGE", under the ammeter on the instrument panel.

In the event an over-voltage condition occurs, the alternator control unit automatically removes alternator field current which shuts down the alternator. The battery will then supply system current as shown by a discharge rate on the ammeter. Under these conditions, depending on electrical system load, the low-voltage warning light will illuminate when system voltage drops below normal. The alternator control unit may be reset by turning the master switch off and back on again. If the warning light does not illuminate, normal alternator charging has resumed ; however, if the light does illuminate again, a malfunction has occured, and the flight should be terminated as soon as practicable.

NOTE

Illumination of the low-voltage light and ammeter discharge indications may occur during low RPM conditions with an electrical load on the system, such as during a low RPM taxi. Under these conditions, the light will go out at higher RPM. The master switch need not be recycled since an over-voltage condition has not occured to de-activate the alternator system.

The warning light may be tested by turning on the landing lights and momentarily turning off the "ALT" portion of the master switch while leaving the "BAT" portion turned on.

CIRCUIT BREAKERS AND FUSES

Most of the electrical circuits in the airplane are protected by "push-to-

reset" circuit breakers mounted under the engine controls on the instrument panel. The cigar lighter is equipped with a manually-reset type circuit breaker located on the back of the lighter and a fuse behind the instrument panel. The control wheel map light (if installed) is protected by the "NAV/DOME" circuit breaker, and a fuse behind the instrument panel. Electrical circuits which are not protected by circuit breakers are the battery contactor closing (external power) circuit, clock circuit, and flight hour recorder circuit. These circuits are protected by fuses mounted adjacent to the battery.

LIGHTING SYSTEMS

EXTERIOR LIGHTING

Conventional navigation lights are located on the wing tips and top of the rudder.
A single landing light or dual landing/taxi lights are installed in the cowl nose cap.

Optional flashing beacon is mounted on top of the vertical fin.

A strobe light is mounted on each wing tip.

All exterior lights, except the courtesy lights, are controlled by rocker type switches on the left switch and control panel.

NOTE

The flashing beacon should not be used when flying through clouds or overcast ; the flashing light reflected from water droplets or particles in the atmosphere, particularly at night, can produce vertigo and loss of orientation.

The two high intensity strobe lights will enhance anti-collision protection. However, the lights should be turned off when taxiing in the vicinity of other aircraft, or during flight through clouds, fog or haze.

INTERIOR LIGHTING

Instrument and control panel lighting is provided by flood lighting, integral lighting, and post lighting (if installed). Two concentric rheostat control knobs on the left switch and control panel, labeled "PANEL LT" and "RADIO LT", control intensity of the instrument and control panel lighting. A slide-type switch (if installed) on the overhead console, labeled "PANEL LIGHTS", is used to select flood lighting in the "FLOOD" position, post lighting in the "POST" position, or a combination of post and flood lighting in the "BOTH" position.

The engine instrument cluster (if lighting is installed), radio equipment, and magnetic compass have integral lighting and operate independently of post or flood lighting. Light intensity of the radio lighting is controlled by the "RADIO LT" rheostat control knob. The integral compass and engine instrument cluster light intensity is controlled by the "PANEL LT" rheostat control knob.

A cabin dome light, in the overhead console, is operated by a switch on the left switch and control panel. To turn the light on, move the switch to the "ON" position.

A control wheel map light is available and is mounted on the bottom of the pilot's control wheel. The light illuminates the lower portion of the cabin just forward of the pilot and is helpful when checking maps and other flight data during night operations. To operate the light, first turn on the "NAV LT" switch ; then adjust the map light's intensity with the rheostat control knob located at the bottom of the control wheel.

A doorpost map light is available, and is located on the left forward doorpost. It contains both red and white bulbs and may be positioned to illuminate any area desired by the pilot. The light is controlled by a switch, above the light, which is labeled "RED" "OFF", and "WHITE". Placing the switch in the top position will provide a red light. In the bottom position, standard white lighting is provided. In the center position, the map light is tumed off. Light intensity of the red light is controlled by the "PANEL LT" rheostat control knob.

WING FLAP SYSTEM

The wing flaps are of the single-slot type and are extended or retracted by positioning the wing flap switch lever on the instrument panel to the desired flap deflection position. The switch lever is moved up or down in a slot in the instrument panel that provides mechanical stops at the 10° and 20° positions. For flap settings greater than 10°, move the switch lever to the right to clear the stop and position it as desired. A scale and pointer on the left side of the switch lever indicates flap travel in degrees. The wing flap system circuit is protected by a 15-ampere circuit breaker, labeled FLAP, on the right side of the instrument panel.

CABIN HEATING AND VENTILATING SYSTEM

The temperature and volume of airflow into the cabin can be regulated to any degree desired by manipulation of the push-pull "CABIN HT" and "CABIN AIR" knobs. Heated fresh air and outside air are blended in a cabin manifold ; this air is then vented into the cabin from outlets in the cabin manifold near the pilot's and passenger's feet. A separate adjustable ventilator near each upper corner of the windshield supplies additional outside air to the pilot and passenger.

PARKING BRAKE SYSTEM

To set parking brake, pull out on the parking brake knob, apply and release toe pressure to the pedals, and then release the parking brake knob. To release the parking brake, apply and release toe pressure on the pedals while checking to see that the parking brake knob is full in.

STALL WARNING HORN

The stall warning horn produces a steady signal 9 to 18 km/h - 5 to 10 kts - 6 to 12 MPH before actual stall is reached and remains on up to the stall.

SECTION 2

LIMITATIONS

CERTIFICATION BASIS

The REIMS/CESSNA F152 is certified in the Utility Category under AIR 2052 regulations, with amendments dated 5 November 1965, with the limits indicated in this section.

INDICATED AIRSPEED LIMITATIONS

	km/h	kts	mph
V_{NE} (Never Exceed Speed)	276	149	171
V_{NO} (Maximum Structural Cruising Speed)	206	111	128
V_A (Maneuvering Speed)	193	104	120
V_{FE} (Maximum Speed, Flaps Extended)	158	85	98

INDICATED AIRSPEED INDICATOR MARKINGS

Red Line	276	149	171
Yellow Arc (Caution Range)	206-276	111-149	128-171
Green Arc (Normal Operating Range)	74-206	40-111	46-128
White Arc (Flap Operating Range)	65-158	35-85	40-98

FLIGHT MANEUVERING LOAD FACTORS AT GROSS WEIGHT

Flaps Up	+ 4.4	- 1.76
Flaps Down	+ 3.5	- 0

MAXIMUM GROSS WEIGHT FOR TAKE-OFF AND LANDING : 758 kg

CENTER OF GRAVITY LOCATION

- Leveling Means : Screws on outer left side aft of cabin.
- Center of Gravity Reference : Forward face of firewall.
- Center of Gravity Limits :

Aft at 758 kg or less	:	+ 0,93 m
Forward at 612 kg or less	:	+ 0,79 m
Forward at 758 kg	:	+ 0,83 m

Straight line variation between 612 kg and 758 kg

LOADING LIMITS

Number of Occupants : 2

Minimum Crew : 1 pilot

Maximum Baggage in Baggage Compartment : 54 kg

Occupied Optional Child's Seat Approved if Fitted With a Safety Belt

NIGHT VFR AND IFR APPROVAL

For night VFR and IFR approval, the aircraft must carry the additional equipment specified by current operating regulations dated 8 July 1976 applicable on 15 June 1974. This additional equipment is to be described in section 6 of this manual.

FLIGHT IN ICING CONDITIONS

Flight in icing conditions is strictly prohibited.

MANEUVERS - UTILITY CATEGORY

This airplane is not designed for aerobatic maneuvers. However, certain maneuvers that are required in the acquisition of various certificates may be performed provided the limitations in the following table are not exceeded.

No aerobatic maneuvers are approved except those listed below :

MANEUVER	RECOMMENDED ENTRY INDICATED SPEED
Chandelles	175 km/h - 95 kts - 109 MPH
Lazy Eights	175 km/h - 95 kts - 109 MPH
Steep Turns	175 km/h - 95 kts - 109 MPH
Spins	Use Slow Deceleration
Stalls (Except Whip Stalls)	Use Slow Deceleration

The baggage compartment and/or child's seat must not be occupied during aerobatics.

During prolonged spins the engine may stop ; however, spin recovery is not adversely affected by engine stoppage.

Intentional spins with flaps extended are not approved. Inverted flight maneuvers are not recommended.

The important thing to bear in mind in flight maneuvers is that the airplane is clean in aerodynamic design and will build up speed quickly with the nose down. Proper speed control is an essential requirement for execution of any maneuver, and care should be exercised to avoid excessive speed which in turn can impose excessive loads. In the execution of all maneuvers, avoid abrupt use of controls.

ENGINE OPERATION LIMITATIONS

Power and Speed ..... 110 BHP - 82 kW at 2550 RPM

ENGINE INSTRUMENT MARKINGS

OIL TEMPERATURE GAGE

Normal Operating Range ..... Green Arc
Maximum Allowable (red line)... 118°C - 245°F

OIL PRESSURE GAGE

Minimum Idling (red line).....	1.72 bar - 25 PSI
Normal Operating (green arc).....	4.14-6 21 bar - 60-90 PSI
Maximum (red line).....	6.89 bar - 100 PSI

FUEL QUANTITY INDICATORS

Red Line Indicating Unusable Fuel

TACHOMETER

Normal Operating Range (green arc)	1900 - 2550 RPM
Maximum Allowable (red line)....	2550 RPM

SUCTION GAGE

Normal Operating Range (green arc)	4.6-5.4 in.Hg

PLACARDS

The following information is displayed in the form of individual placards.

1. In full view of the pilot :
   a. Day VFR operation

This airplane is approved in the utility category and must be operated in compliance with the operating limitations as stated in the form of placards, markings, and manuals

NO AEROBATIC MANEUVERS APPROVED
EXCEPT THOSE LISTED BELOW

Maneuver	Recm. Entry Indicated Speed
Chandelles	175 km/h - 95 kts - 109 MPH
Lazy Eights	175 km/h - 95 kts - 109 MPH
Steep Turns	175 km/h - 95 kts - 109 MPH
Spins	Slow Deceleration
Stalls (except Whip Stalls)	Slow Deceleration

Intentional spins prohibited with flaps extended.
Flight into known icing conditions prohibited.

This airplane is certified for the following flight operations as of date of original airworthiness certificate :

DAY - VFR

   b. If the aircraft is equipped with equipment shown on page 6-6. 1

This airplane is approved in the utility category and must be operated in compliance with the operating limitations as stated in the form of placards, markings, and manuals

NO AEROBATIC MANEUVERS APPRC VED
EXCEPT THCSE LISTED BELOW

Maneuver	Recm. Entry Indicated Speed
Chandelles	175 km/h - 95 kts - 109 MPH

Lazy Eights	175 km/h - 95 kts - 109 MPH
Steep Turns	175 km/h - 95 kts - 109 MPH
Spins	Slow Deceleration
Stalls (except Whip Stalls)	Slow Deceleration

Intentional spins prohibited with flaps extended.
Flight into known icing conditions prohibited.

This airplane is certified for the following flight operations as of date of original airworthiness certificate :

DAY - NIGHT - VFR

c. If the aircraft is equipped with equipment shown on page 6-7.1

This airplane is approved in the utility category and must be operated in compliance with the operating limitations as stated in the form of placards, markings, and manuals

NO AEROBATIC MANEUVERS APPROVED
EXCEPT THOSE LISTED BELOW

Maneuver	Recm. Entry Indicated Speed
Chandelles	175 km/h - 95 kts - 109 MPH
Lazy Eights	175 km/h - 95 kts - 109 MPH
Steep Turns	175 km/h - 95 kts - 109 MPH
Spins	Slow Deceleration
Stalls (except Whip Stalls)	Slow Deceleration

Intentional spins prohibited with flaps extended.
Flight into known icing conditions prohibited.

This airplane is certified for the following flight operations as of date of original airworthiness certificate :

DAY - NIGHT - VFR - IFR

2. In the baggage compartment :

120 lbs - 54 kg maximum baggage and/or auxiliary seat passenger. For additional loading instructions see Weight and Balance Data.

3. Near fuel shutoff valve
Standard tanks

FUEL - 24.5 US Gal - 93 l - "ON-OFF"

Long range tanks

FUEL - 37.5 US Gal - 142 l - "ON-OFF"

4. Near fuel tank filler cap
Standard tanks

FUEL 100LL/100 MIN. GRADE AVIATION GASOLINE CAP. 13 US Gal - 49 l

Long range tanks

FUEL 100LL/100 MIN. GRADE AVIATION GASOLINE CAP. 19.5 US Gal - 74 l CAP 13.0 US Gal - 49 l TO BOTTOM OF FILLER COLLAR

5. On the instrument panel near the altimeter :

SPIN RECOVERY 1. VERIFY AILERONS NEUTRAL AND THROTTLE CLOSED 2. APPLY FULL OPPOSITE RUDDER 3. MOVE CONTROL WHEEL BRISKLY FORWARD TO BREAK STALL 4. NEUTRALIZE RUDDER AND RECOVER FROM DIVE

6. Near airspeed indicator :

MANEUVER INDICATED AIRSPEED - 193 km/h - 104 kts - 120 MPH

SECTION 3

EMERGENCY PROCEDURES

ENGINE FAILURE

DURING TAKE-OFF (WITH SUFFICIENT RUNWAY AHEAD)

1. Throttle - IDLE .
2. Brakes - APPLY.
3. Flaps - RETRACT (if extended) during ground roll to provide effective braking.
4. Mixture - IDLE CUT-OFF (pulled full out).
5. Ignition and Master Switches - "OFF".

AFTER TAKE-OFF

1. Glide Speed - 111 km/h - 60 kts - 69 MPH (IAS).
2. Mixture - IDLE CUT-OFF .
3. Fuel Shutoff Valve - OFF .
4. Ignition Switch - "OFF".
5. Wing Flaps - AS REQUIRED.
6. Master Switch - "OFF".

CAUTION

Perform the landing straight ahead, making only small changes in heading to avoid obstructions. Altitude and airspeed are seldom sufficient to execute a 180° gliding turn necessary to return to the runway.

DURING FLIGHT

1. Glide Speed - 111 km/h - 60 kts - 69 MPH IAS.
2. Carburetor Heat - "ON".
3. Primer - IN and LOCKED.
4. Fuel Shutoff Valve - "ON".
5. Mixture - RICH .
6. Ignition Switch - "BOTH" (or "START" if propeller is stopped).

FIRES

ENGINE FIRE DURING START ON GROUND

1. Continue cranking is an attempt to get a start which would suck the flames and accumulated fuel through the carburetor and into the engine.

If the start is successful :

2. Run the engine at 1700 RPM for a few minutes.
3. Engine - SHUT DOWN and inspect the fire damage.

If engine start is unsuccessful :

4. Throttle - FULL OPEN.
5. Mixture - IDLE CUT-OFF .
6. Engine - CONTINUE cranking for two or three minutes.
7. Use fire extinguisher (if available).
8. Engine - SHUT DOWN
   a. Master Switch - "OFF"
   b. Ignition Switch - "OFF"
   c. Fuel Shutoff Valve - "OFF".
9. Flames - SMOTHER with fire extinguisher, wool blanket, or loose dirt
10. MAKE a thorough inspection of fire damage, and repair or replace damaged components before conducting another flight.

ENGINE FIRE IN FLIGHT

1. Mixture - IDLE CUT-OFF .
2. Fuel Shutoff Valve - "OFF".
3. Master Switch - "OFF".
4. Cabin Heat and Air - "OFF" (except overhead vents).
5. Indicated Airspeed - 158 km/h - 85 kts - 98 MPH. If fire is not extinguished, increase glide speed to find an airspeed which will provide an incombustible mixture.
6. Forced Landing - EXECUTE (as described in "Emergency Landing Without Engine Power").

CABIN FIRE

1. Master Switch - "OFF".
2. Vents/Cabin Air/Heat - CLOSED (to avoid drafts).
3. Fire Extinguisher - ACTIVATE if available and ventilate the cabin.
4. Land the airplane as soon as possible to inspect for damage.

WING FIRE

1. Navigation Light Switch - "OFF".
2. Strobe Light Switch (If installed) - "OFF".
3. Pitot Heat Switch (if installed) - "OFF".

NOTE

Perform a side slip to keep the flames away from the fuel tank and cabin, and land as soon as possible, with flaps retracted.

ELECTRICAL FIRE IN FLIGHT

1. Master Switch - "OFF".
2. All Other Switches (except ignition switch) - "OFF".
3. Vents/Cabin Air/Heat - CLOSED .
4. Fire Extinguisher - ACTIVATE (if available) and ventilate the cabin.

If fire appears out and electrical power is necessary for continuance of flight :

5. Master Switch - "ON".
6. Circuit Breakers - CHECK for faulty circuit, do not reset.
7. Radio/Electrical Switches - ON one at a time, with delay after each until short circuit is localized.
8. Vents/Cabin Air/Heat - OPEN when it is ascertained that fire is completely extinguished.

ELECTRICAL POWER SUPPLY SYSTEM MALFUNCTIONS

AMMETER SHOWS EXCESSIVE RATE OF CHARGE
(Full Scale Deflection)

1. Alternator - "OFF".
2. Nonessential Electrical Equipment - "OFF".
3. Flight - TERMINATE as soon as practical.

LOW-VOLTAGE LIGHT ILLUMINATES DURING FLIGHT
(Ammeter Indicates Discharge)

1. Radios - "OFF".
2. Master Switch - "OFF" (both sides).
3. Master Switch - "ON".
4. Low-Voltage Light - CHECK OFF.
5. Radios - "ON".

If low-voltage light illuminates again :

6. Alternator - "OFF".

7. Nonessential Radio and Electrical Equipment - "OFF".
8. Flight - TERMINATE as soon as practical.

FLIGHT IN ICING CONDITIONS

Although flying in known icing conditions is prohibited, an unexpected icing encounter should be handled as follows :

1. Turn pitot heat switch ON (if installed).
2. Turn back or change altitude to obtain an outside air temperature that is less conducive to icing.
3. Pull cabin heat control full out to obtain windshield defroster airflow. Adjust cabin air control to get maximum defroster heat and airflow.
4. Open the throttle to increase engine speed and minimize ice build-up on propeller blades.
5. Watch for signs of carburetor air filter ice and apply carburetor heat as required. An unexplained loss in engine speed could be caused by carburetor ice or air intake filter ice. Lean the mixture for maximum RPM if carburetor heat is used continuously.
6. Plan a landing at the nearest airport. With an extremely rapid ice build-up, select a suitable "off airport" landing site.
7. With an ice accumulation of 1/4 inch or more on the wing leading edges, be prepared for significantly higher stall speed.
8. Leave wing flaps retracted. With a severe ice build-up on the horizontal tail, the change in wing wake airflow direction caused by wing flap extension could result in a loss of elevator effectiveness.
9. Open left window and, if practical, scrape ice from a portion of the windshield for visibility in the landing approach.
10. Perform a landing approach using a forward slip, if necessary, for improved visibility.
11. Approach at 65 to 75 KIAS, depending upon the amount of ice accumulation.
12. Perform a landing in level attitude.

RECOVERY FROM A SPIRAL DIVE

1. Close the throttle.
2. Stop the turn by using coordinated aileron and rudder control to align the symbolic aircraft in the turn coordinator with the horizon reference line.
3. Cautiously apply elevator back pressure to slowly reduce the indicated airspeed to 130 km/h - 70 kts - 81 MPH.
4. Adjust the elevator trim control to maintain an 130 km/h - 70 kts - 81 MPH (IAS) glide.
5. Keep hands off the control wheel, using rudder control to hold a straight heading.
6. Apply carburetor heat.
7. Clear engine occasionally, but avoid using enough power to disturb the trimmed glide.
8. Upon breaking out of clouds, apply normal cruising power and resume flight.

LANDING

LANDING WITH ONE FLAT TIRE

1. Expect the airplane to swing off on the flat tire side.
2. Lower the flaps normally and land the airplane with nose up and wing banked to hold the flat tire off the ground as long as possible. At touch-down, directional control can be maintained with rudder and the brake on the good wheel.

LANDING WITHOUT PITCH CONTROL

Trim for horizontal flight (with an airspeed of approximately 102 km/h - 55 kts - 63 MPH and flaps lowered to 20°) by using throttle and trim tab controls. Then, do not change the elevator trim control setting ; control the glide angle by adjusting power exclusively.

At flareout, the nose-down moment resulting from power reduction is an adverse factor and the aircraft may hit on the nose wheel. Consequently, at flareout, the control should be set at the full nose-up position and the power adjusted so that the aircraft will rotate to the horizontal attitude for touchdown. Close the throttle at touchdown.

FORCED LANDINGS

PRECAUTIONARY LANDING WITH ENGINE POWER

Before attempting an "off airport" landing, one should drag the landing area at a safe but low altitude to inspect the terrain for obstructions and surface conditions, proceeding as follows :

1. Drag over selected field with flaps 20° and 111 km/h - 60 kts - 69 MPH indicated airspeed, noting the preferred area for touchdown for the next landing approach. Then retract flaps upon reaching a safe altitude and airspeed.
2. Radio, Electrical Switches - "OFF".
3. Wing Flaps - 30°.
4. Airspeed - 102 km/h - 55 kts - 63 MPH.
5. Master Switch - "OFF".
6. Doors - UNLATCH PRIOR TO TOUCHDOWN.
7. Touchdown - SLIGHTLY TAIL LOW.
8. Ignition Switch - "OFF".
9. Brakes - APPLY HEAVILY.

EMERGENCY LANDING WITHOUT ENGINE POWER

1. Indicated Airspeed - 120 km/h - 65 kts - 75 MPH (flaps UP)
   111 km/h - 60 kts - 69 MPH (flaps DOWN).
2. Mixture - "IDLE CUT-OFF".
3. Fuel Shutoff Valve - "OFF".
4. Ignition Switch - "OFF".
5. Wing Flaps - AS REQUIRED (30° recommended).
6. Master Switch - "OFF".
7. Doors - UNLATCH PRIOR TO TOUCHDOWN.
8. Touchdown - SLIGHTLY TAIL LOW.
9. Brakes - APPLY HEAVILY.

DITCHING

Prepare for ditching by securing or jettisoning heavy objects located in the baggage area, and collect folded coats for protection of occupant's face at touchdown. Transmit "Mayday" message on 121.5 MHz. giving location and intentions.

1. Plan approach into wind if winds are high and seas are heavy. With heavy swells and light wind, land parallel to swells.
2. Approach with flaps 30° and sufficient power for a 300 ft/min. rate of descent at 102 km/h - 55 kts.
3. Unlatch the cabin doors.
4. Maintain a continuous descent until touchdown in level attitude. Avoid a landing flare because of difficulty in judging airplane height over a water surface.
5. Place folded coat in front of face at time of touchdown.
6. Evacuate airplane through cabin doors. If necessary, open window to flood cabin compartment for equalizing pressure so that door can be opened.
7. Inflate life vests and raft (if available) after evacuation of cabin. The aircraft cannot be depended on for flotation for more than a few minutes.

SECTION 4

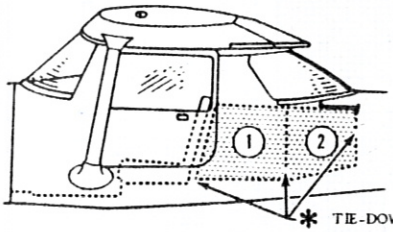
NORMAL PROCEDURES

SAMPLE LOADING PROBLEM

DESIGNATION	SAMPLE AIRPLANE		YOUR AIRPLANE	
	Weight kg	Moment m. kg	Weight kg	Moment m. kg
Basic Empty Weight (Includes unusable fuel and full oil)	515	394		
Usable Fuel D = 0. 72 Standard Tanks (24. 5 US Gal - 93 l Maxi) Long Range Tanks (37. 5 US Gal - 142 l Maxi)	67	72		
Pilot and Passenger (station 0. 89 to 1. 41 m)	154	145		
Baggage - Area 1 (Or passenger on child's seat) (Station 1. 27 to 1. 93 m, 54 kg Maxi)	22	36		
Baggage - Area 2 (Station 1. 93 to 2. 39, 18 kg Maxi)				
TOTAL WEIGHT AND MOMENT	758	647		
Locate this point (758 and 647) on the CENTER OF GRAVITY MOMENT ENVELOPE, and since this point falls within the envelope, the loading is acceptable.				

Figure 4-1

BAGGAGE LOADING AND TIE-DOWN



BAGGAGE AREA
MAXIMUM ALLOWABLE LOADS

AREA (1) = 54 KG
AREA (2) = 18 KG
AREAS (1) + (2) = 54 KG

* TIE-DOWN NET ATTACH POINTS

*A cargo tie-down net is provided to secure baggage in the baggage area. The net attaches to six tie-down rings. Two rings are located on the floor just aft of the seat backs and one ring is located two inches above the floor on each cabin wall at the aft end of area (1). Two additional rings are located at the top, aft end of area (2). At least four rings should be used to restrain the maximum baggage load of 54 kg. If the airplane is equipped with an optional utility shelf, it should be removed prior to loading and tying down large baggage items. After baggage is loaded and secured, either stow the shelf or, if space permits, install it for storing small articles.

Figure 4-2

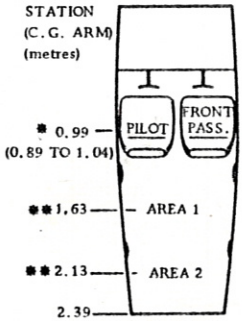
LOADING ARRANGEMENTS

* Pilot or passenger center of gravity on adjustable seats positioned for average occupant. Numbers in parentheses indicate forward and aft limits of occupant center of gravity range.

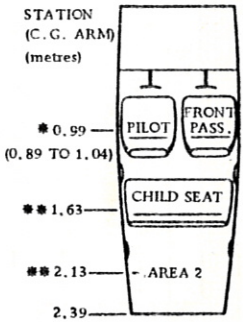
** Arms measured to the center of the areas shown.

NOTE

The aft baggage wall (approximate station 94) can be used as a convenient interior reference point for determining the location of baggage area fuselage stations.



STANDARD SEATING



OPTIONAL SEATING

Figure 4-3

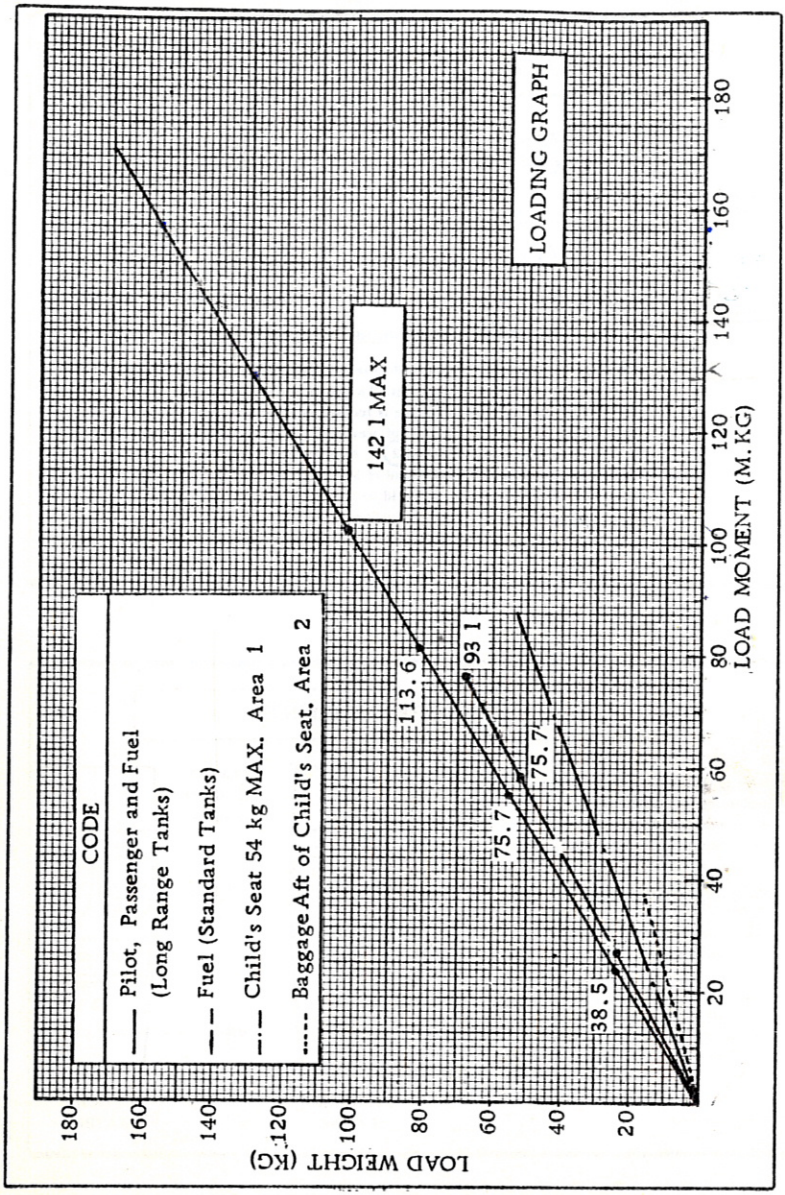

LOADING GRAPH
LOAD WEIGHT (KG)
LOAD MOMENT (M.KG)
142 1 MAX
113.6
93 1
75.7
75.7
38.5
CODE
Pilot, Passenger and Fuel
(Long Range Tanks)
Fuel (Standard Tanks)
Child's Seat 54 kg MAX. Area 1
Baggage Aft of Child's Seat, Area 2
180
160
140
120
100
80
60
40
20
20
40
60
80
100
120
140
160
180

Figure 4-4

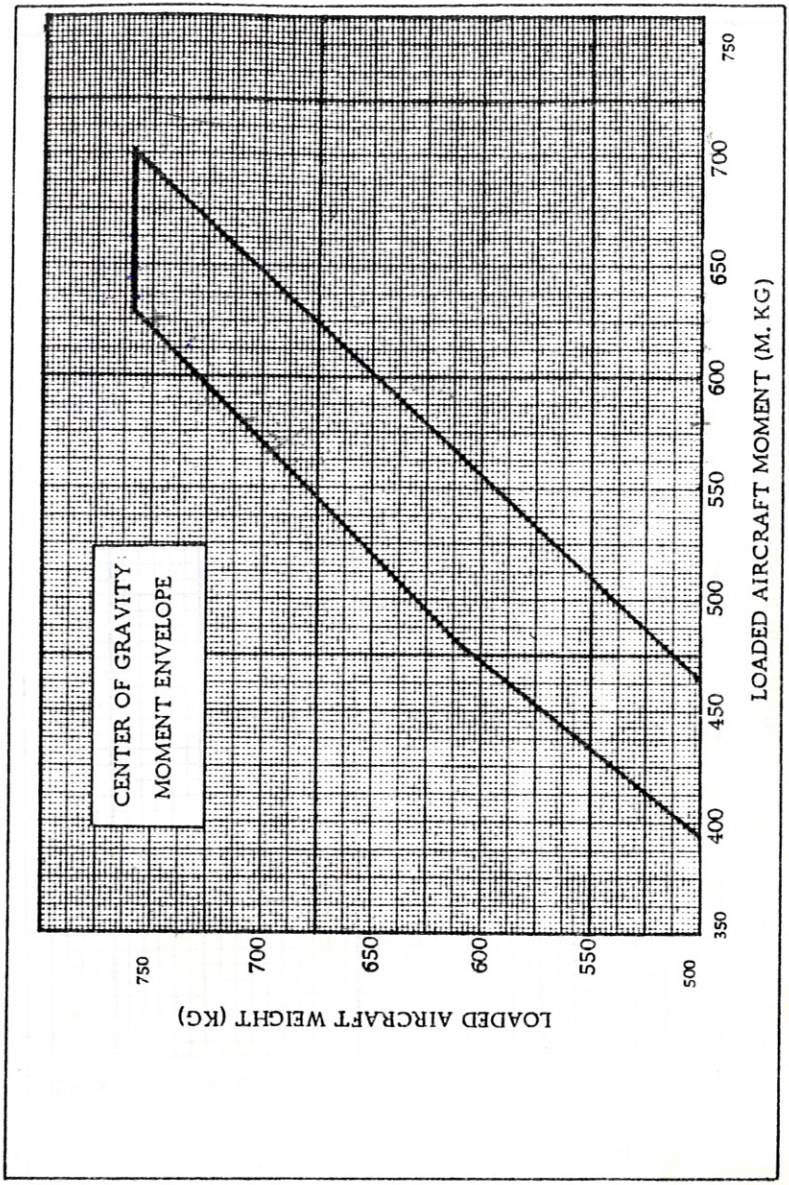

CENTER OF GRAVITY
MOMENT ENVELOPE
LOADED AIRCRAFT WEIGHT (KG)
750
700
650
600
550
500
LOADED AIRCRAFT MOMENT (M. KG)
350
400
450
500
550
600
650
700
750

Figure 4-5

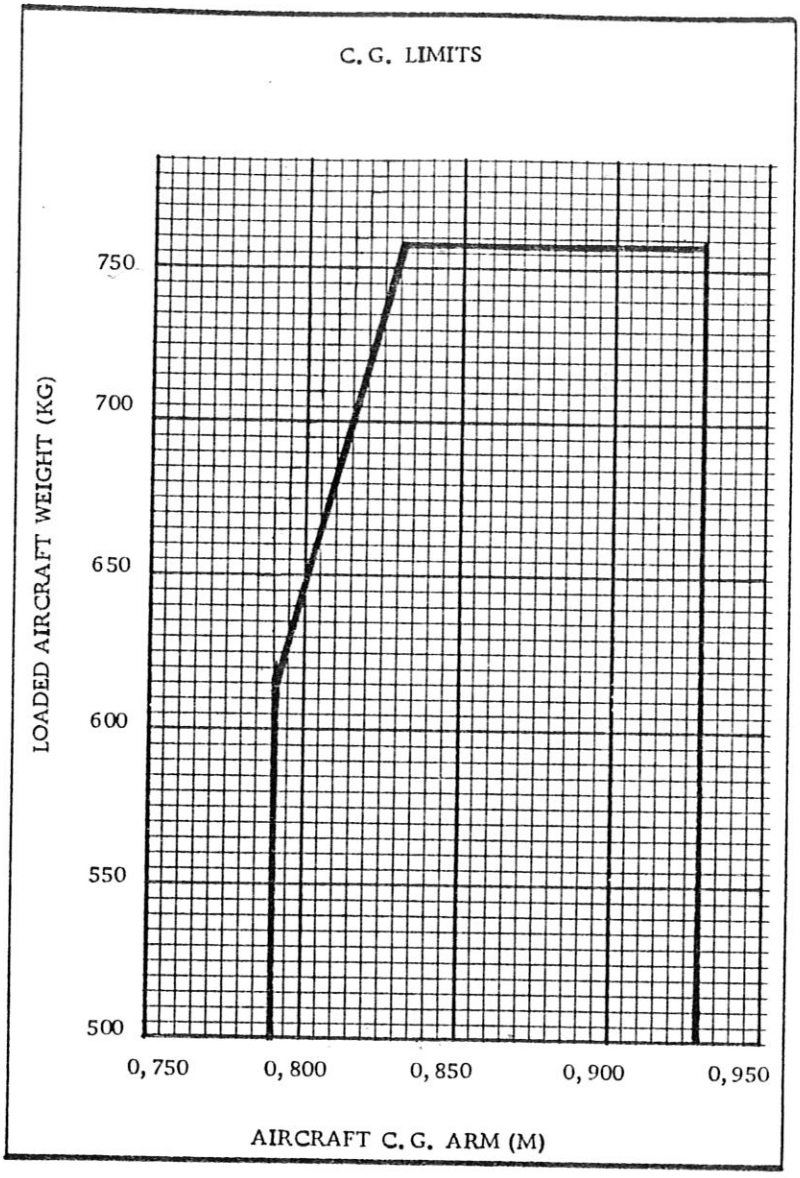
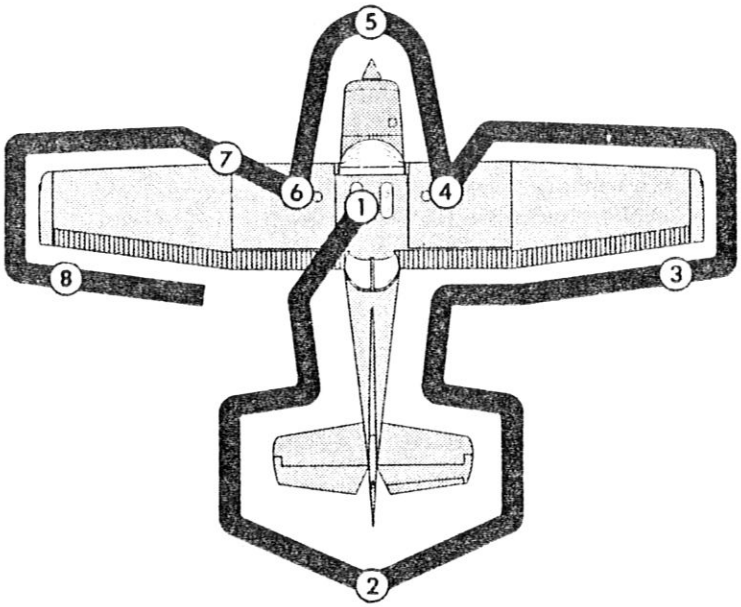

C. G. LIMITS
LOADED AIRCRAFT WEIGHT (KG)
750
700
650
600
550
500
0, 750
0, 800
0, 850
0, 900
0, 950
AIRCRAFT C. G. ARM (M)

Figure 4-6

Refer to Section 6 of this manual for quantities, materials, and specifications of frequently used service items.



NOTE

Visually check aircraft for general condition during walk-around inspection. In cold weather, remove even small accumulations of frost, ice or snow from wing, tail and control surfaces. Also, make sure that control surfaces contain no internal accumulations of ice or debris. Prior to flight, check that pitot heater (if installed) is warm to touch within 30 seconds with battery and pitot heat switches on. If a night flight is planned, check operation of all lights, and make sure a flashlight is available.

Figure 4-7

(1) a. Check for Flight Manual in the airplane.
b. Remove control wheel lock.
c. Check ignition switch "OFF".

WARNING

When turning on the master switch, using an external power source, or pulling the propeller through by hand, treat the propeller as if the ignition switch were on. Do not stand, nor allow anyone else to stand, within the arc of the propeller, since a loose or broken wire, or a component malfunction, could cause the propeller to rotate.

d. Turn on master switch and check fuel quantity indicators ; then turn master switch "OFF".
e. Check fuel shutoff valve handle "ON".

(2) a. Remove rudder gust lock, if installed.
b. Disconnect tail tie-down.
c. Check control surfaces for freedom of movement and security.

(3) a. Check aileron for freedom of movement and security.

(4) a. Disconnect wing tie-down.
b. Check main wheel tire for proper inflation.
c. Before first flight of day and after each refueling, use sampler cup and drain small quantity of fuel from fuel tank sump quick-drain valve to check for water, sediment, and proper fuel grade.
d. Visually check fuel quantity ; then check fuel filler cap secure.

(5) a. Check oil level. Do not operate with less than four quarts. Fill to six quarts for extended flight.

b. Before first flight of the day and after each refueling, pull out strainer drain knob for about four seconds to clear fuel strainer of possible water and sediment. Check strainer drain closed. If water is observed, the fuel system may contain additional water, and further draining of the system at the strainer, fuel tank sumps, and fuel line drain plug will be necessary.

c. Check propeller and spinner for nicks and security.

d. Check carburetor air filter for restrictions by dust or other foreign matter.

e. Check landing light for condition and cleanliness.

f. Check nose wheel strut and tire for proper inflation.

g. Disconnect nose tie-down.

h. Inspect flight instrument static source opening on left side of fuselage for stoppage.

(6) Same as (4).

(7) a. Remove pitot tube cover, if installed, and check pitot tube opening for stoppage.

b. Check stall warning vent opening for stoppage.

c. Check fuel tank vent opening for stoppage.

d. Disconnect wing tie-down.

(8) Same as (3).

NORMAL PROCEDURES

BEFORE ENTERING THE AIRPLANE

1. Make an exterior inspection in accordance with figure 4-7.
2. Ensure that the C. G. of your airplane falls within the enveloppe of page 4-5.

BEFORE STARTING ENGINE

1. Seats, Belts, Shoulder Harnesses - ADJUST and LOCK.
2. Fuel Shutoff Valve - "ON".
3. Radios, Electrical Equipment - "OFF".
4. Brakes - TEST and SET.
5. Circuit Breakers - CHECK IN.

STARTING ENGINE. (Temperatures Above Freezing)

1. Mixture - RICH.
2. Carburetor Heat - COLD
3. Prime - AS REQUIRED (up to 3 strokes).
4. Throttle - OPEN 1/2 INCH.
5. Propeller Area - CLEAR.
6. Master Switch - "ON".
7. Ignition Switch - START (release when engine starts).
8. Throttle - ADJUST for 1000 RPM or less.
9. Oil Pressure - CHECK.

BEFORE TAKEOFF

1. Parking Brake - SET.
2. Cabin Doors - CLOSED and LATCHED.
3. Flight Controls - FREE and CORRECT.
4. Flight Instruments - SET.
5. Fuel Shutoff Valve - "ON".
6. Mixture - RICH (below 3000 ft - 915 m)
7. Elevator Trim - "TAKEOFF".

8. Throttle - 1700 RPM.
   a. Magnetos - CHECK (RPM drop should not exceed 125 RPM on either magneto or 50 RPM differential between magnetos).
   b. Carburetor Heat - CHECK (for RPM drop).
   c. Engine Instruments and Ammeter - CHECK.
   d. Suction Gage - CHECK.
9. Radios - SET.
10. Flashing Beacon, Navigation Lights and/or Strobe Lights - "ON" as required.
11. Throttle Friction Lock - ADJUST.
12. Brakes - RELEASE.

TAKEOFF

NORMAL TAKEOFF

1. Wing Flaps - 0° - 10° (refer to p. 4-17, "Flap Settings").
2. Carburetor Heat - COLD .
3. Throttle - FULL OPEN.
4. Elevator Control - LIFT NOSE WHEEL at 93 km/h - 50 kts - 58 MPH IAS.
5. Climb Speed - 120 to 139 km/h - 65 to 75 kts - 75 to 86 MPH IAS.

SHORT FIELD TAKEOFF

1. Wing Flaps - 10° (refer to p. 4-17, "Flap Settings").
2. Carburetor Heat - COLD .
3. Brakes - APPLY.
4. Throttle - FULL OPEN.
5. Mixture - RICH (above 3000 ft - 915 m, LEAN to obtain maximum RPM).
6. Brakes - RELEASE.
7. Elevator Control - SLIGHTLY TAIL LOW.
8. Climb Speed - 100 km/h - 54 kts - 62 MPH IAS (until all obstacles are cleared).
9. Wing Flaps - RETRACT slowly after reaching 111 km/h - 60 kts - 69 MPH.

ENROUTE CLIMB

1. Airspeed - 130 to 148 km/h - 70 to 80 kts - 81 to 92 MPH IAS. Refer to Section 5 for the maximum performance climb.
2. Throttle - FULL OPEN
3. Mixture - RICH below 3000 ft - 915 m, LEAN for maximum RPM above 3000 ft - 915 m.

CRUISE

1. Power - 1900 to 2550 RPM (no more than 75 %).
2. Elevator Trim - ADJUST.
3. Mixture - LEAN.

NOTE

If a loss of RPM is noted, use the carburetor heater (refer to "CARBURETOR ICING" on page 4-24)

BEFORE LANDING

1. Seats, Belts, Harnesses - ADJUST and LOCK.
2. Mixture - RICH.
3. Carburetor Heat - "ON" (apply full heat before closing throttle).

LANDING

NORMAL LANDING

1. Airspeed - 111 to 130 km/h - 60 to 70 kts - 69 to 81 MPH (flaps UP).
2. Wing Flaps - AS DESIRED (below 158 km/h - 85 kts - 98 MPH IAS).

3. Indicated Airspeed - 102 to 120 km/h - 55 to 65 kts - 63 to 75 MPH (flaps DOWN).
4. Touchdown - MAIN WHEELS FIRST.
5. Landing Roll - LOWER NOSE WHEEL GENTLY.
6. Braking - MINIMUM REQUIRED.

SHORT FIELD LANDING

1. Indicated Airspeed - 111 to 130 km/h - 60 to 70 kts - 69 to 81 MPH (flaps UP).
2. Wing Flaps - 30° (below 158 km/h - 85 kts - 98 MPH IAS).
3. Indicated Airspeed - MAINTAIN 100 km/h - 54 kts - 62 MPH.
4. Power - REDUCE to idle as obstacle is cleared.
5. Touchdown - MAIN WHEELS FIRST.
6. Brakes - APPLY HEAVILY.
7. Wing Flaps - RETRACT.

BALKED LANDING

1. Throttle - FULL OPEN.
2. Carburetor Heat - COLD .
3. Wing Flaps - RETRACT to 20°.
4. Indicated Airspeed - 102 km/h - 55 kts - 63 MPH.
5. Wing Flaps - RETRACT (slowly).

AFTER LANDING

1. Wing Flaps - UP.
2. Carburetor Heat - COLD .

SECURING AIRPLANE

1. Parking Brake - SET.
2. Radios, Electrical Equipment - "OFF".
3. Mixture - IDLE CUT-OFF (pull full out).
4. Ignition Switch - "OFF".
5. Master Switch - "OFF".
6. Control Lock - INSTALL.

OPERATING DETAILS

STARTING ENGINE (Temperatures Above Freezing)

During engine starting, open the throttle approximately 1/2 inch. In warm weather, one stroke of the primer should be sufficient. In temperatures near freezing, up to 3 strokes of the primer may be necessary. As the engine starts, slowly adjust the throttle as required for 1000 RPM or less.

NOTE

The carburetor used on this airplane does not have an accelerator pump ; therefore, pumping of the throttle must be avoided during starting because doing so will only cause excessive leaning.

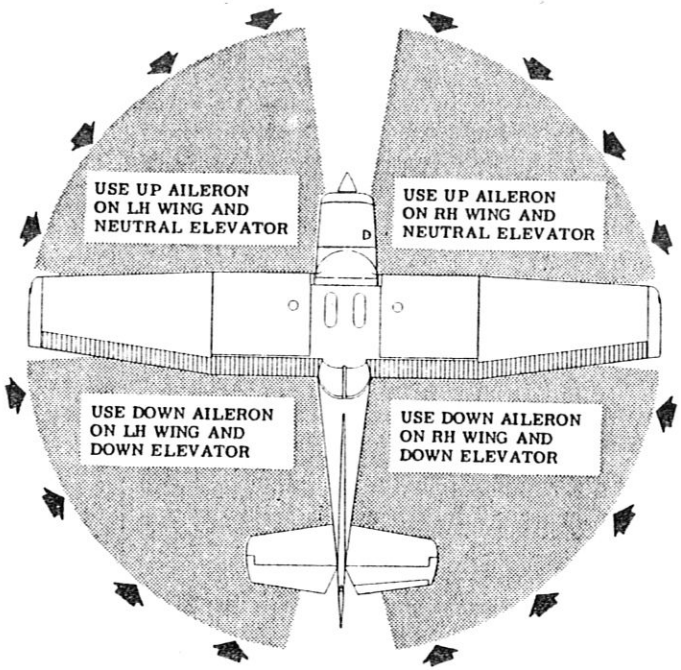
Weak intermittent firing followed by puffs of black smoke from the exhaust stack indicates overpriming or flooding. Excess fuel can be cleared from the combustion chambers by the following procedure : Set mixture control in the idle cut-off position, throttle full open, and crank the engine through several revolutions with the starter. Repeat the starting procedure without any additional priming.

If the engine is underprimed (most likely in cold weather with a cold engine) it will not fire at all, and additional priming will be necessary.

After starting, if the oil gage does not begin to show pressure within 30 seconds in the summertime and about twice that long in very cold weather, stop engine and investigate. Lack of oil pressure can cause serious engine damage. After starting, avoid the use of carburetor heat unless icing conditions prevail.

NOTE

Details concerning cold weather starting and operation at temperatures below freezing may be found under Cold Weather Operation paragraphs in this section.



CODE

WIND DIRECTION

NOTE

Strong quartering tail winds require caution. Avoid sudden bursts of the throttle and sharp braking when the airplane is in this attitude. Use the steerable nose wheel and rudder to maintain direction.

Figure 4-8

TAXIING

When taxiing, it is important that speed and use of brakes be held to a minimum and that all controls be utilized (see taxiing diagram, fig. 4-8) to maintain directional control and balance. Taxiing over loose gravel or cinders should be done at low engine speed.

The nose wheel is designed to automatically center straight ahead when the nose strut is fully extended. In the event the nose strut is over-inflated and the airplane is loaded to a rearward center of gravity position, it may be necessary to partially compress the strut to permit steering. This can be accomplished prior to taxiing by depressing the airplane nose or during taxi by sharply applying brakes.

BEFORE TAKE-OFF

WARM-UP

Most of the warm-up will have been conducted during taxi, and additional warm-up before take-off should be restricted to the checks outlined in this Section. Since the engine is closely cowled for efficient inflight cooling, precautions should be taken to avoid overheating on the ground.

MAGNETO CHECK

The magneto check should be made at 1700 RPM as follows :

Move the ignition switch first to "R" position and note RPM, then move switch back to "BOTH" position. Then move switch to "L" position, note RPM and return to "BOTH". RPM drop should not exceed 125 RPM on either magneto or show greater than 50 RPM differential between magnetos. If there is a doubt concerning the operation of the ignition system, RPM checks at higher engine speeds will usually confirm whether a deficiency exists. An absence of RPM drop may be an indication of faulty grounding of one side of the ignition system or should be cause for suspicion that the magneto timing is set in advance of the setting specified.

ALTERNATOR CHECK

Prior to flights where verification of proper alternator and alternator control unit operation is essential (such as night or instrument flights), a positive verification can be made by loading the electrical system momentarily (3 to 5 seconds) with the optional landing light, (if so equipped), or by operating the wing flaps during the engine runup.

The ammeter will remain at zero if the alternator and alternator control unit are operating properly.

TAKE-OFF

POWER CHECKS

It is important to check full-throttle engine operation early in the take-off run. Any signs of rough engine operation or sluggish engine acceleration is good cause for discontinuing the take-off. If this occurs, you are justified in making a thorough full-throttle, static runup before another take-off is attempted. The engine should run smoothly and turn approximately 2280 to 2380 RPM with carburetor heat off and mixture leaned to maximum RPM.

Full throttle runups over loose gravel are especially harmful to propeller tips. When take-offs must be made over a gravel surface, it is very important that the throttle be advanced slowly.

Prior to take-off from fields above 3000 ft - 915 m elevation, the mixture should be leaned to give maximum RPM in a full-throttle, static runup.

FLAP SETTINGS

Normal takeoffs are accomplished with wing flaps 0° - 10°. Using 10° wing flaps reduces the total distance over an obstacle by approximately 10 %. Flap deflections greater than 10° are not approved for takeoff. If 10° wing flaps are used for takeoff, they should be left down until all obstacles are cleared and a safe flap retraction indicated airspeed of 111 km/h - 60 kts - 69 MPH is reached.

On a short field, 10° wing flaps and an obstacle clearance indicated airspeed of 100 km/h - 54 kts - 62 MPH should be used. This speed provides the best overall climb speed to clear obstacles when taking into account turbulence often found near ground level.

Soft or rough field takeoffs are performed with 10° wing flaps by lifting the airplane off the ground as soon as practical in a slightly tail-low attitude. If no obstacles are ahead, the airplane should be leveled off immediately to accelerate to a higher climb speed.

PERFORMANCE CHARTS

Consult the Take-Off Distance chart in Section 5 for take-off distances at gross weight under various altitude and headwind conditions.

CROSSWIND TAKE-OFFS

Takeoffs into strong crosswinds normally are performed with the minimum flap setting necessary for the field length, to minimize the drift angle immediately after takeoff. With the ailerons partially deflected into the wind, the airplane is accelerated to a speed slightly higter than normal, and then pulled off abruptly to prevent possible settling back to the runway while drifting. When clear of the ground, make a coordinated turn into the wind to correct for drift.

CLIMB

For detailed data see Maximum Rate-Of-Climb Data chart in Section 5.

CLIMB SPEEDS

Normal climbs are performed with flaps up and full throttle and at indicated airspeeds 9 to 18 km/h - 5 to 10 kts - 6 to 12 MPH higher than best rate-of-climb speeds for the best combination of performance, visibility and engine cooling. The mixture should be full rich below 3000 ft - 915 m and may be leaned above 3000 ft - 915 m for smoother operation or to obtain maximum RPM. For maximum rate of climb, use the best rate-of-climb indicated airspeeds shown in the Rate Of Climb chart in Section 5. If an obstruction dictates the use of a steep climb angle, the best angle-of-climb indicated airspeed should be used with flaps up and maximum power. Climbs at speeds lower than the best rate-of-climb indicated airspeed should be of short duration to improve engine cooling.

CRUISE

Normal cruising is performed between 55 % and 75 % power. The engine RPM and corresponding fuel consumption for various altitudes can be determined by using your airplane Power Computer or the data in Section 5.

NOTE

Cruising should be done at 65 % to 75 % power until a total of 50 hours has accumulated for new engines or oil consumption has stabilized for overhauled engines in service.

This is illustrated in the following table which shows the true airspeed and nautical miles per US gallon during cruise for various altitudes and percent powers.

CRUISE PERFORMANCE

	75 % POWER		65 % POWER		55 % POWER	
ALTITUDE	TRUE AIRSPEED	DISTANCE per US Gal (3, 8 l)	TRUE AIRSPEED	DISTANCE per US Gal (3, 8 l)	TRUE AIRSPEED	DISTANCE per US Gal (3, 8 l)
SEA LEVEL	185 km/h 100 kt 115 MPH	30 km 16, 4 NM	174 km/h 94 kt 108 MPH	33 km 17, 8 NM	161 km/h 87 kt 100 MPH	36 km 19, 3 NM
1220 m 4000 ft	191 km/h 103 kt 119 MPH	31 km 17, 0 NM	180 km/h 97 kt 112 MPH	34 km 18, 4 NM	165 km/h 89 kt 102 MPH	37 km 19, 8 NM
2440 m 8000 ft	198 km/h 107 kt 123 MPH	33 km 17, 6 NM	185 km/h 100 kt 115 MPH	35 km 18, 9 NM	169 km/h 99 kt 114 MPH	38 km 20, 4 NM

Standard Conditions — Zero Wind

To achieve the recommended lean mixture fuel consumption figures shown in section 5, the mixture should be leaned until engine RPM peaks and drops 25-50 RPM. At lower powers it may be necessary to enrichen the mixture slightly to obtain smooth operation.

The use of full carburetor heat is recommended during flight in heavy rain to avoid the possibility of engine stoppage due to excessive water ingestion or to carburetor icing. The mixture setting should be readjusted for smoothest operation. Power changes should be made cautiously followed by prompt adjustment of the mixture for smoothest operation.

At temperatures lower than 0°C, partial carburetor heat should be avoided since the temperature rise obtained (0° to 21°C) may cause carburetor icing in certain atmospheric conditions.

STALLS

The stall characteristics are conventional for the flaps up and flaps down condition.

Figure 5-2 of Section 5 shows the stall indicated speeds with respect to the flaps position and angle of bank of the aircraft for maximum gross weight.

With aircraft weights lower than the full gross weight, stall speeds are reduced. The stall warning horn produces a steady signal 9 to 18 km/h - 5 to 10 kts - 6 to 12 MPH before the actual stall is reached and remains on until the normal flight attitude is resumed.

In case of roll, use ailerons to return wings level, then neutralize aileron control.

LANDING

Normal landing approaches can be made with power-on or power-off at indicated airspeeds of 111 to 129 km/h - 60 to 70 kts - 69 to 80 MPH with flaps up, and 55 to 65 kts - 63 to 75 MPH with flaps down. Surface winds and air turbulence are usually the primary factors in determining the most comfortable approach speeds.

SHORT FIELD LANDINGS

For a short field landing in smooth air conditions, make an approach at 100 km/h - 54 kts - 62 MPH IAS with 30° flaps using enough power to control the glide path.

After all approach obstacles are cleared, progressively reduce power and maintain 100 km/h - 54 kts - 62 MPH IAS by lowering the nose of the airplane. Touchdown should be made with power-off and on the main wheels first. Immediately after touchdown, lower the nose wheel and apply heavy braking as required. For maximum brake effectiveness, retract the flaps, hold full nose-up elevator, and apply maximum brake pressure without sliding the tires.

Slightly higher approach speeds should be used under turbulent air conditions.

CROSSWIND LANDINGS

When landing in a strong crosswind, use the minimum flap setting required for the field length. Use a wing low, crab, or a combination method of drift correction and land in a nearly level attitude.

BALKED LANDING

In a balked landing (go-around) climb, the wing flap setting should be reduced to 20° immediately after full power is applied. Upon reaching a safe airspeed, the flaps should be slowly retracted to the full up position.

COLD WEATHER OPERATION

Prior to starting on cold mornings, it is advisable to pull the propeller through several times by hand to "break loose" or "limber" the oil, thus conserving battery energy. Do not stand, nor anyone else to stand, within the arc the propeller.

Preheat is generally required with outside air temperatures below - 18° C and is recommended when temperatures are below - 7° C.

Cold weather starting procedures are as follows :

With Preheat :

1. Ignition Switch - "OFF".
2. Throttle - CLOSED.

3. Mixture - IDLE CUT-OFF.
4. Parking Brake - SET.
5. Propeller - PULL through by hand several revolutions.

NOTE

Caution should be used to ensure the brakes are set or a qualified person is at the controls.

6. Mixture - RICH.
7. Throttle - OPEN 1/2 to 3/4 INCH.
8. Prime - 2 to 4 STROKES depending on temperature.
9. Primer - RECHARGE for priming after engine start.
10. Propeller Area - CLEAR.
11. Master Switch - "ON".
12. Ignition Switch - "START" (release when engine starts).
13. Prime - AS REQUIRED until the engine runs smoothly.
14. Throttle - ADJUST for 1200 to 1500 RPM for approximately one minute after which the RPM can be lowered to 1000 or less.
15. Oil Pressure - CHECK.
16. Primer - LOCK.

Without Preheat :

The procedure for starting without preheat is the same as with preheat except the engine should be primed an additional three strokes just prior to pulling the propeller through by hand. Carburetor heat should be applied after the engine starts. Leave the carburetor heat on until the engine runs smoothly.

NOTE

If the engine fires but does not start or continue running, repeat the above starting procedure beginning with step 6. If the engine does not start during the first few attempts, or if engine firing diminishes in strength, it is possible that the spark plugs have been frosted over, in which case preheat must be used before another start is attempted.

During cold weather operations, no indication will be apparent on the oil temperature gage prior to take-off outside air temperatures are very cold. After a suitable warm-up period (2 to 5 minutes at 1000 RPM),

accelerate the engine several times to higher engine RPM. If the engine accelerates smoothly and the oil pressure remains normal and steady, the airplane is ready for take-off.

When operating in temperatures below - 18°C, avoid using partial carburetor heat. Partial heat may increase the carburetor air temperature to the 0° to 21°C range, where icing is critical under certain atmospheric conditions.

Refer to Section 6 for cold weather equipment.

ROUGH ENGINE OPERATION OR LOSS OF POWER

CARBURETOR ICING

A gradual loss of RPM and eventual engine roughness may result from the formation of carburetor ice. To clear the ice, apply full throttle and pull the carburetor heat knob full out until the engine runs smoothly ; then remove carburetor heat and readjust the throttle.

If conditions require the continued use of carburetor heat in cruise flight, use the minimum amount of heat necessary to prevent ice from forming and lean the mixture slightly for smoothest engine operation.

SPARK PLUG FOULING

A slight engine roughness in flight may be caused by one or more spark plugs becoming fouled by carbon or lead deposits. This may be verified by turning the ignition switch momentarily from "BOTH" to either "L" or "R" position. An obvious power loss in single ignition operation is evidence of spark plug or magneto trouble. Assuming that spark plugs are the more likely cause, lean the mixture to the normal lean setting for cruising flight. If the problem does not clear up in several minutes, determine if a richer mixture setting will produce smoother operation.

If not, proceed to the nearest airport for repairs using the "BOTH" position of the ignition switch unless extreme roughness dictates the use of a single ignition position.

MAGNETO MALFUNCTION

A sudden engine roughness or misfiring is usually evidence of magneto problems. Switching from "BOTH" to either "L" or "R" ignition switch position will identify which magneto is malfunctioning. Select different power settings and enrichen the mixture to determine if continued operation on "BOTH" magnetos is practicable. If not, switch to the good magneto and proceed to the nearest airport for repairs.

LOW OIL PRESSURE

If low oil pressure is accompanied by normal oil temperature, there is a possibility the oil pressure gage or relief valve is malfunctioning. A leak in the line to the gage is not necessarily cause for an immediate precautionary landing because an orifice in this line will prevent a sudden loss of oil from the engine sump. However, a landing at the nearest airport would be advisable to inspect the source of trouble.

If a total loss of oil pressure is accompanied by a rise in oil temperature, there is good reason to suspect an engine failure is imminent. Reduce engine power immediately and select a suitable forced landing field. Leave the engine running at low power during the approach, using only the minimum power required to reach the desired touchdown spot.

SPECIFIC OPERATION

SPINS

Intentional spins are approved in this airplane. No spins should be attempted without first having received dual instruction in both spin entries and spin recoveries from a qualified instructor who is familiar with the spin characteristics of the F152 airplane.

The cabin should be clean and all loose equipment (including the microphone) should be stowed. For a solo flight in which spins will be conducted, the copilot's seat belt and shoulder harness should be secured. Spins with baggage loadings or occupied child's seat are not approved.

The seat belts and shoulder harnesses should be adjusted to provide proper restraint during all anticipated flight conditions. However, care should be taken to ensure that the pilot can easily reach the flight controls and produce maximum control travels.

It is recommended that, where feasible, entries be accomplished at high enough altitude that recoveries are completed 4000 feet or more above ground level. At least 1000 feet of altitude loss should be allowed for a 1-turn spin and recovery, while a 6-turn spin and recovery may require somewhat more than twice that amount. For example, the recommended entry altitude for a 6-turn spin would be 6000 feet above ground level. In any case, entries should be planned so that recoveries are completed well above the minimum 1500 feet above ground level. Another reason for using high altitudes for practicing spins is that a greater field of view is provided which will assist in maintaining pilot orientation.

SPECIFIC OPERATION

SPIN

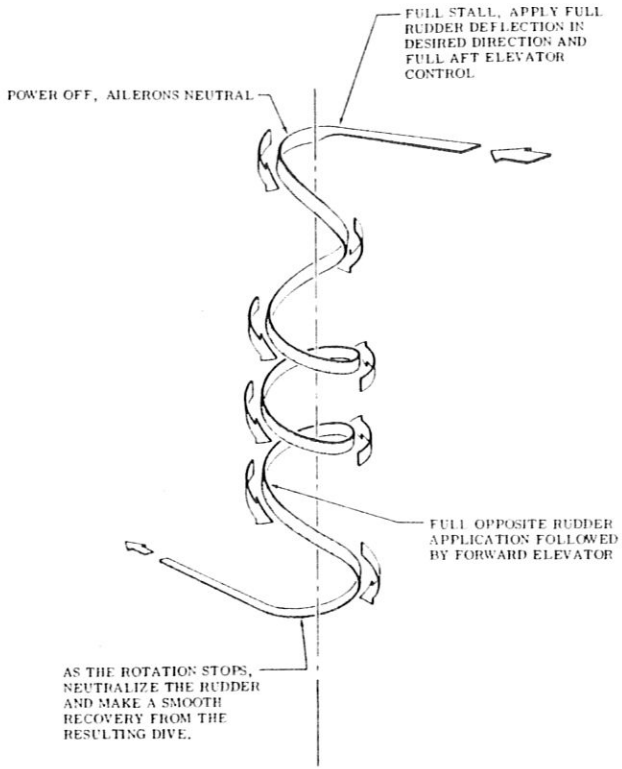


Figure 4-9

Regardless of how many turns the spin is held or how it is entered, the following recovery technique should be used :

1) VERIFY THAT THROTTLE IS IN IDLE POSITION AND AILERONS ARE NEUTRAL.

2) APPLY AND HOLD FULL RUDDER OPPOSITE TO THE DIRECTION OF ROTATION.

3) JUST AFTER THE RUDDER REACHES THE STOP, MOVE THE CONTROL WHEEL BRISKLY FORWARD FAR ENOUGH TO BREAK THE STALL. FULL DOWN ELEVATOR MAY BE REQUIRED AT AFT CENTER OF GRAVITY LOADINGS TO ASSURE OPTIMUM RECOVERIES.

4) HOLD THESE CONTROL INPUTS UNTIL ROTATION STOPS. PREMATURE RELAXATION OF THE RECOVERY CONTROL INPUTS MAY RESULT IN EXTENDED RECOVERIES.

5) AS ROTATION STOPS, NEUTRALIZE RUDDER, AND MAKE A SMOOTH RECOVERY FROM THE RESULTING DIVE.

NOTE

If disorientation precludes a visual determination of the direction of rotation, the symbolic airplane in the turn coordinator or the needle of the turn and bank indicator may be referred to for this information.

Variation in basic airplane rigging or in weight and balance due to installed equipment or cockpit occupancy can cause differences in behavior, particulary in extended spins. These differences are normal and will result in variations in the spin characteristics. However, the above recovery procedure should always be used and will result in the most expeditious spin recovery.

Intentional spins with flaps extended are prohibited, since the high speeds which may occur during recovery are potentially damaging to the flap/wing structure.

SECTION 5

PERFORMANCE

NOTIFICATION

The tables appearing on the following pages result from actual tests with an airplane in good flying condition. They will be useful in flight planning ; nevertheless, it will be advisable to plan on an ample safety margin concerning the fuel reserve at arrival, since the data given does not take into account the effects of wind, navigational errors, pilot technique, run-up, climb, etc. All these factors should be considered when estimating the reserve required by regulations. Don't forget that maximum range increases by using a lower power setting. To solve these problems, consult the Cruise Performance table.

Remember that the charts contained herein are based on standard day conditions.

MAXIMUM DEMONSTRATED CROSSWINDS

The maximum demonstrated crosswind component for take-off and landing is 22 km/h - 12 kts - 14 MPH.

AIRSPEED CALIBRATION												
FLAPS UP												
IAS	km/h	74	93	111	130	148	167	185	204	222	241	259
CAS	km/h	85	98	111	128	145	163	180	198	217	235	252
IAS	kts	40	50	60	70	80	90	100	110	120	130	140
CAS	kts	46	53	60	69	78	88	97	107	117	127	136
IAS	MPH	46	58	69	81	92	104	115	127	138	150	161
CAS	MPH	53	61	69	79	90	101	112	123	135	146	157
FLAPS 10°												
IAS	km/h	74	93	111	130	148	158					
CAS	km/h	82	96	113	130	148	156					
IAS	kts	40	50	60	70	80	90					
CAS	kts	44	52	61	70	80	84					
IAS	MPH	46	58	69	81	92	98					
CAS	MPH	51	60	70	81	92	97					
FLAPS 30°												
IAS	km/h	74	93	111	130	148	158					
CAS	km/h	80	95	113	132	152	161					
IAS	kts	40	50	60	70	80	85					
CAS	kts	43	51	61	71	82	87					
IAS	MPH	46	58	69	81	92	98					
CAS	MPH	49	59	70	82	94	100					

Figure 5-1

INDICATED STALL SPEEDS - POWER OFF				
GROSS WEIGHT 758 kg FLAPS	ANGLE OF BANK 0°	30°	45°	60°
0°	74 km/h 40 kts 46 MPH	80 km/h 43 kts 49 MPH	89 km/h 48 kts 55 MPH	106 km/h 57 kts 66 MPH
10°	74 km/h 40 kts 46 MPH	80 km/h 43 kts 49 MPH	89 km/h 48 kts 55 MPH	106 km/h 57 kts 66 MPH
30°	65 km/h 35 kts 40 MPH	70 km/h 38 kts 44 MPH	78 km/h 42 kts 48 MPH	91 km/h 49 kts 56 MPH

NOTE : Altitude loss during a stall recovery may be as much as 160 ft - 49 m

Figure 5-2

PERFORMANCE	SPECIFICATIONS
MAXIMUM GROSS WEIGHT	758 kg
SPEED :	
Maximum at Sea Level	204 km/h - 110 kts - 127 MPH
Cruise, 75 % power at 8000 feet	198 km/h - 107 kts - 123 MPH
CRUISE :	
Recommended lean mixture with fuel allowance for engine start, taxi, takeoff, climb and 45 minutes reserve at 45 % power	
75 % power at 8000 feet and 93 l (24, 5 US Gal) usuable fuel	Range 648 km - 350 NM Time 3. 4 hrs
75 % power at 8000 feet and 142 l (37. 5 US Gal) usuable fuel	Range 1074 km - 580 NM Time 5. 5 hrs
At 10000 feet and 93 l (24, 5 US Gal) usuable fuel	Range 769 km - 415 NM Time 5. 2 hrs
At 10000 feet and 142 l (7, 5 US Gal) usuable fuel	Range 1278 km - 690 NM Time 8. 7 hrs
RATE OF CLIMB AT SEA LEVEL	3. 63 m/s - 715 fpm
SERVICE CEILING	4481 m - 14, 700 ft

TAKE-OFF :	
Ground Run	221 m
Total Distance Over 50-Ft Obstacle	408 m
LANDING :	
Ground Roll	145 m
Total Distance Over 50-Ft Obstacle	366 m
EMPTY WEIGHT	
With "Standard" Tanks	490 kg
With "Long Range" Tanks	492 kg
BAGGAGE	54 kg
WING LOADING	51.0 kg/m2
POWER LOADING	9.24 kg/kW
TOTAL FUEL CAPACITY	
Standard Tanks - Total	26 US Gal. - 98 litres
Long Range Tanks - Total	39 US Gal. - 148 litres
OIL TANK CAPACITY	6 qts - 6 litres
PROPELLER : Fixed Pitch (Diameter)	1.75 m

ENGINE : AVCO LYCOMING 0-235-L2C, 110 BHP-82 kW at 2550 RPM

Figure 5-1

TAKEOFF DISTANCE — SHORT FIELD

CONDITIONS : Flaps 10° - Full Throttle Prior to Brake Release - Paved, Level, Dry Runway - Zero Wind

Gross Weight kg	Takeoff Speed		Pressure Altitude		0° C		10° C		20° C		30° C		40° C	
	Lift Off	At 15 m	ft	m	Ground Roll m	Total to Clear 15 m m	Ground Roll m	Total to Clear 15 m m	Ground Roll m	Total to Clear 15 m m	Ground Roll m	Total to Clear 15 m m	Ground Roll m	Total to Clear 15 m m
758	93	100	Sea Level		195	363	212	393	230	424	247	456	267	489
	km/h	km/h	1000	305	215	399	233	433	251	466	271	501	293	539
			2000	610	236	440	256	477	277	515	299	555	322	597
	50	54	3000	914	261	488	282	527	305	570	329	616	355	666
	kts	kts	4000	1219	287	541	311	585	335	634	363	686	392	744
			5000	1524	317	600	343	652	370	707	401	770	433	838
	58	62	6000	1829	349	671	379	730	410	796	443	870	479	952
	MPH	MPH	7000	2134	387	753	419	824	454	902	492	992	532	1094
			8000	2438	428	853	465	939	504	1035	547	1148	591	1279

NOTES :
1. Short field technique as specified in Section 4.
2. Prior to takeoff from fields above 3000 ft - 914 m elevation, the mixture should be leaned to give maximum RPM in a full throttle, static runup.
3. Decrease distances 10 % for each 16, 5 km/h - 9 kts - 10, 5 MPH headwind. For operation with tailwinds up to 10 knots, increase distances by 10 % for each 3, 5 km/h - 2 kts - 2, 5 MPH.
4. For operation on a dry, grass runway, increase distances by 15 % of the "ground roll" figure.

Figure 5-4

RATE OF CLIMB — MAXIMUM

CONDITIONS : Flaps Up - Full Throttle - Mixture leaned above 3000 ft - 914 m for maximum RPM.

WEIGHT	PRESSURE ALTITUDE		CLIMB INDICATED AIRSPEED			RATE OF CLIMB							
						- 20° C		0° C		20° C		40° C	
kg	ft	m	km/h	kts	MPH	ft/mn	m/s	ft/mn	m/s	ft/mn	m/s	ft/mn	m/s
758	SEA LEVEL		124	67	77	835	4,24	765	3,88	700	3,55	630	3,20
	2000	610	122	66	76	735	3,73	670	3,40	600	3,04	535	2,71
	4000	1219	120	65	75	635	3,22	570	2,89	505	2,56	445	2,26
	6000	1829	117	63	73	535	2,71	475	2,41	415	2,10	355	1,80
	8000	2438	115	62	71	440	2,23	380	1,93	320	1,62	265	1,34
	10000	3048	113	61	70	340	1,72	285	1,44	230	1,16	175	0,88
	12000	3658	111	60	69	245	1,24	190	0,96	135	0,68	85	0,43

Figure 5-5

TIME, FUEL, AND DISTANCE TO CLIMB

MAXIMUM RATE OF CLIMB

CONDITIONS : Flaps UP - Full Throttle - Standard Temperature - Zero Wind

WEIGHT kg	PRESSURE ALTITUDE		TEMPE-RATURE	CLIMB INDICATED AIRSPEED		RATE OF CLIMB		FROM SEA LEVEL				
								TIME	FUEL USED		DISTANCE	
	ft	m	°C	km/h	kts	ft/mn	m/s	mn	US.Gal	l.	NM	km
758	SEA LEVEL		15	124	67	715	3,63	0	0	0	0	0
	1000	305	13	122	66	675	3,42	1	0,2	0,8	2	4
	2000	610	11	122	66	630	3,20	3	0,4	1,5	3	6
	3000	914	9	120	65	590	2,99	5	0,7	2,6	5	9
	4000	1219	7	120	65	550	2,79	6	0,9	3,4	7	13
	5000	1524	5	119	64	505	2,56	8	1,2	4,5	9	17
	6000	1829	3	117	63	465	2,36	10	1,4	5,3	12	22
	7000	2134	1	117	63	425	2,15	13	1,7	6,4	14	26
	8000	2438	- 1	115	62	380	1,93	15	2,0	7,6	17	31
	9000	2743	- 3	115	62	340	1,72	18	2,3	8,7	21	39
	10000	3048	- 5	113	61	300	1,52	21	2,6	9,8	25	46
	11000	3353	- 7	113	61	255	1,29	25	3,0	11,4	29	54
	12000	3658	- 9	111	60	215	1,09	29	3,4	12,9	34	63

NOTES : 1. Add 0. 8 US Gal - 3, 0 l of fuel for engine start, taxi and takeoff allowance.
2. Mixture leaned above 3000 ft - 914 m for maximum RPM.
3. Increase time, fuel and distance by 10 % for each 10°C above standard temperature.

Figure 5-6

CIVIL AVIATION AUTHORITY
ADDITIONAL LIMITATIONS AND INFORMATION FOR UNITED KINGDOM CERTIFICATION

CAA Change Sheet 101 Issue 2 to the Cessna 152 and Reims/Cessna 152 Series Pilots Operating Handbooks/Flight Manuals listed below.

CESSNA	Constructor's	Registration
152	Serial No. 1663	Mark G-HFCL

The limitations and information contained herein either supplement or, in the case of conflict, override those in the Pilot's Operating Handbook/Flight Manual.

PERFORMANCE

To allow for the performance determined for this series of aeroplanes, the following adjustments must be made to the performance scheduled in the Pilots Operating Handbook/Flight Manual.

1. Increase the take-off distance by 5%
2. Decrease the scheduled rate of climb by 60 ft/min. Note that this will affect the time, fuel and distance to climb (to altitude) data.

This adjustment becomes effective from the date of approval of this Change Sheet and is to be applied in addition to any other adjustment of performance specified in the Pilots Operating Handbook/Flight Manual.

APPLICABILITY

This Change Sheet is applicable to the following Pilots Operating Handbooks/Flight Manuals:

Aircraft Type	Reference	Aircraft Type	Reference
Model 152	D1107 *	Aerobat A152	D1108 *
Model 152	D1136 *	Aerobat A152	D1137 *
Model 152	D1170 *	Aerobat A152	D1171 *
Model 152	D1190 *	Aerobat A152	D1191 *
Model 152	D1210 **	Aerobat A152	D1211 **
Model 152	D1229 **	Aerobat A152	D1230 **
Model 152	D1249 **	Aerobat A152	D1271 **
Model 152	D1270 **		
Reims Cessna F152	D1107 ***	Reims Cessna FA152	D1108 ***
Reims Cessna F152	D1136 ***	Reims Cessna FA152	D1137 ***
Reims Cessna F152	D1170 ***	Reims Cessna FA152	D1171 ***
Reims Cessna F152	D1190 ***	Reims Cessna FA152	D1191 ***

To be inserted in Section 5 of the Pilots Operating Handbook/Flight Manual facing the pages detailing the Rate of Climb and Take-Off Distances as follows:

*Manuals marked * — Pages 5-4, 5-11, 5-12 and 5-13*
*Manuals marked ** — Pages 5-4, 5-12, 5-13 and 5-14*
*Manuals marked *** — Pages 5-4, 5-5, 5-6, 5-7 and 5-8*

The CAA revisions record sheet is to be amended accordingly.

CAA Change Sheet 101
Issue 2

CIVIL AVIATION AUTHORITY

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6 March 1995

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CRUISE PERFORMANCE

CONDITIONS : Gross Weight 758 kg - Recommended Lean Mixture

Cruise speeds are shown for an airplane equipped with speed fairings which increase the speeds by approximately 3, 5 km/h - 2 kts - 2, 5 MPH.

PRESSURE ALTITUDE		RPM	20°C BELOW STANDARD TEMPERATURE						STANDARD TEMPFRATURE						20°C ABOVE STANDARD TEMPERATURE					
			% BHP	TRUE AIRSPEED			FUEL USED		% BHP	TRUE AIRSPEED			FUEL USED		% BHP	TRUE AIRSPEED			FUEL USED	
ft	m			km/h	kts	MPH	US Gal/h	l/h		km/h	kts	MPH	US Gal/h	l/h		km/h	kts	MPH	US Gal/h	l/h
2000	610	2400	-	-	-	-	-	-	75	187	101	116	6.1	23.0	70	187	101	116	5.7	21.6
		2300	71	180	97	112	5.7	21.6	66	178	96	110	5.4	20.4	63	176	95	109	5.1	19.3
		2200	62	170	92	106	5.1	19.3	59	169	91	105	4.8	18.2	56	167	90	104	4.6	17.4
		2100	55	161	87	100	4.5	17.0	53	159	86	99	4.3	16.3	51	158	85	98	4.2	15.9
		2000	49	150	81	93	4.1	15.5	47	148	80	92	3.9	14.8	46	146	79	91	3.8	14.4
4000	1219	2450	-	-	-	-	-	-	75	191	103	119	6.1	23.0	70	189	102	117	5.7	21.6
		2400	76	189	102	117	6.1	23.0	71	187	101	116	5.7	21.6	67	185	100	115	5.4	20.4
		2300	67	178	96	110	5.4	20.4	63	176	95	109	5.1	19.3	60	176	95	109	4.9	18.5
		2200	60	169	91	105	4.8	18.2	56	167	90	104	4.6	17.4	54	165	89	102	4.4	16.7
		2100	53	159	86	99	4.4	16.7	51	158	85	98	4.2	15.9	49	156	84	97	4.0	15.1
		2000	48	150	81	93	3.9	14.8	46	148	80	92	3.8	14.4	45	145	78	90	3.7	14.0

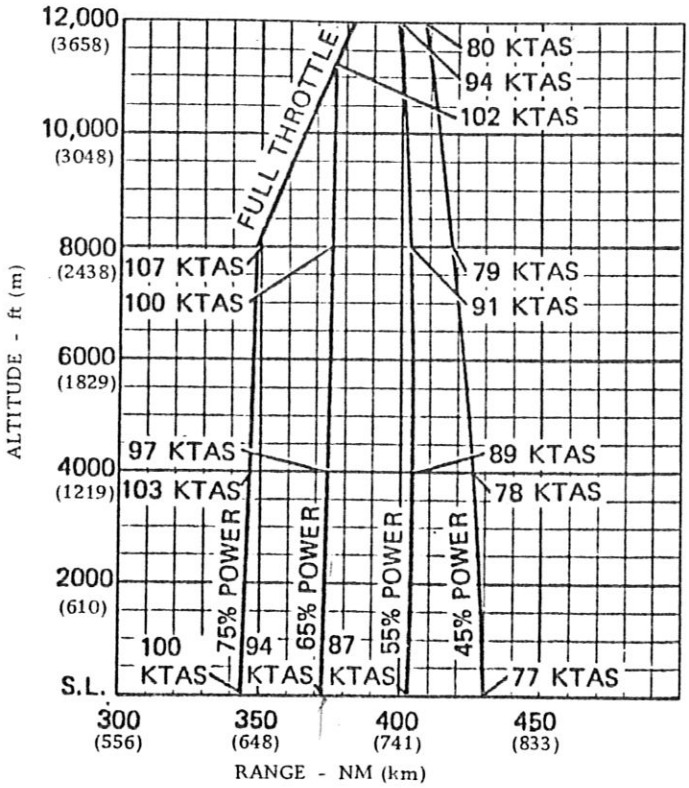
6000 1829	2500	-	-	-	-	-	-	75	195	105	121	6.1	23.0	71	193	104	120	5.7	21.6
	2400	72	187	101	116	5.8	22.0	67	185	100	115	5.4	20.4	64	183	99	114	5.2	19.7
	2300	64	178	96	110	5.2	19.7	60	176	95	109	4.9	18.5	57	174	94	108	4.7	17.8
	2200	57	167	90	104	4.6	17.4	54	165	89	102	4.4	16.7	52	163	88	101	4.3	16.3
	2100	51	158	85	98	4.2	15.9	49	156	84	97	4.0	15.1	48	154	83	96	3.9	14.8
	2000	46	148	80	92	3.8	14.4	45	146	79	91	3.7	14.0	44	143	77	89	3.6	13.6
8000 2438	2550	-	-	-	-	-	-	75	198	107	123	6.1	23.0	71	196	106	122	5.7	21.6
	2500	76	195	105	121	6.2	23.5	71	193	104	120	5.8	22.0	67	191	103	119	5.4	20.4
	2400	68	185	100	115	5.5	20.8	64	183	99	114	5.2	19.7	61	181	98	113	4.9	18.5
	2300	61	176	95	109	5.0	18.9	58	174	94	108	4.7	17.8	55	172	93	107	4.5	17.0
	2200	55	167	90	104	4.5	17.0	52	165	89	102	4.3	16.3	51	161	87	100	4.2	15.9
	2100	49	156	84	97	4.1	15.5	48	154	83	96	3.9	14.8	46	152	82	94	3.8	14.4
10000 3048	2500	72	195	105	121	5.8	22.0	68	191	103	119	5.5	20.8	64	191	103	119	5.2	19.7
	2400	65	183	99	114	5.3	20.0	61	182	98	113	5.0	18.9	58	180	97	112	4.8	18.2
	2300	58	174	94	108	4.7	17.8	56	172	93	107	4.5	17.0	53	170	92	106	4.4	16.7
	2200	53	165	89	102	4.3	16.3	51	163	88	101	4.2	15.9	49	159	86	99	4.0	15.1
	2100	48	154	83	96	4.0	15.1	46	152	82	94	3.9	14.8	45	150	81	93	3.8	14.4
12000 3658	2450	65	187	101	116	5.3	20.0	62	185	100	115	5.0	18.9	59	183	99	114	4.8	18.2
	2400	62	183	99	114	5.0	18.9	59	180	97	112	4.8	18.2	56	178	96	110	4.6	17.4
	2300	56	172	93	107	4.6	17.4	54	170	92	106	4.4	16.7	52	169	91	105	4.3	16.3
	2200	51	163	88	101	4.2	15.9	49	161	87	100	4.1	15.5	48	158	85	98	4.0	15.1
	2100	47	152	82	94	3.9	14.8	45	150	81	93	3.8	14.4	44	146	79	91	3.7	14.0

Figure 5-7

RANGE PROFILE

45 MINUTES RESERVE - 24, 5 US Gal - 93 l USABLE FUEL

CONDITIONS : 758 kg - Recommended Lean Mixture for Cruise - Standard Temperature - Zero Wind



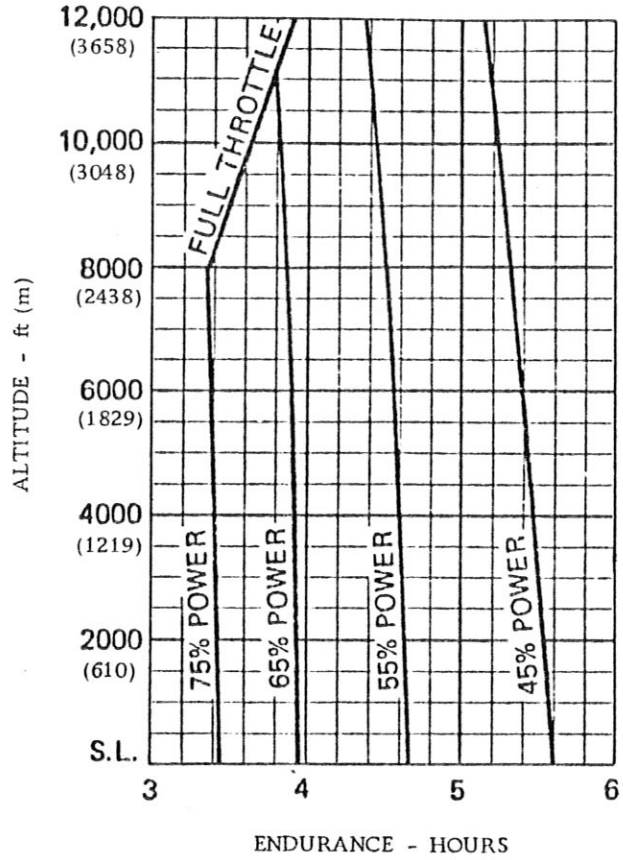
NOTES :
1. This chart allows for the fuel used for engine start, taxi, takeoff and climb, and the distance during climb as shown in figure 5-6.
2. Reserve fuel is based on 45 minutes at 45 % BHP and is 2. 8 US Gal - 10. 6 l.
3. Performance is shown for an airplane equipped with speed fairings which increase the cruise speeds by approximately 3, 5 km/h - 2 kts - 2, 5 MPH.

Figure 5-8

ENDURANCE PROFILE

45 MINUTES RESERVE - 24, 5 US Gal - 93 l USABLE FUEL

CONDITIONS : 758 kg - Recommended Lean Mixture for Cruise - Standard Temperature - Zero Wind



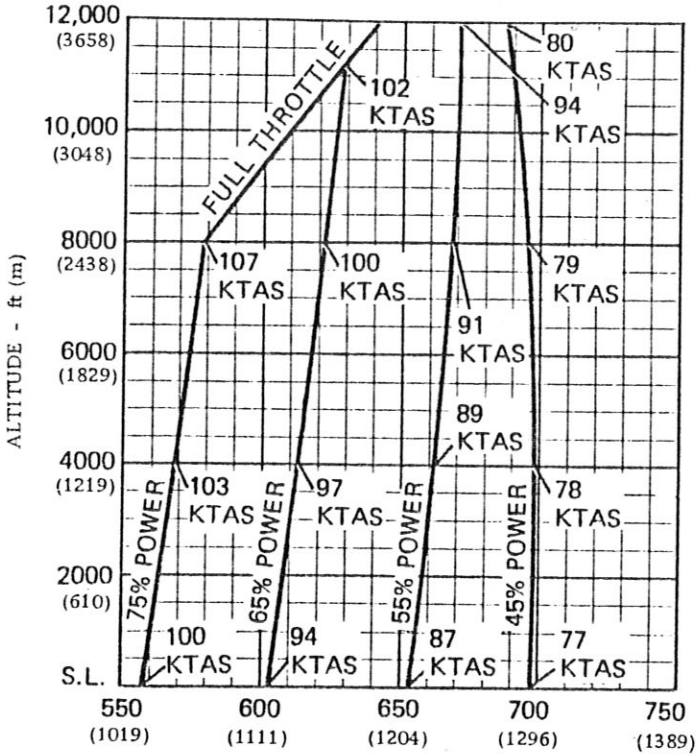
NOTES :
1. This chart allows for the fuel used for engine start, taxi, takeoff and climb, and the time during climb as shown in figure 5-6.
2. Reserve fuel is based on 45 minutes at 45 % BHP and is 2. 8 US Gal. - 10, 5 l.

Figure 5-9

RANGE PROFILE

45 MINUTES RESERVE - 37, 5 US Gal - 142 l USABLE FUEL

CONDITIONS : 758 kg - Recommended Lean Mixture for Cruise - Standard Temperature - Zero Wind



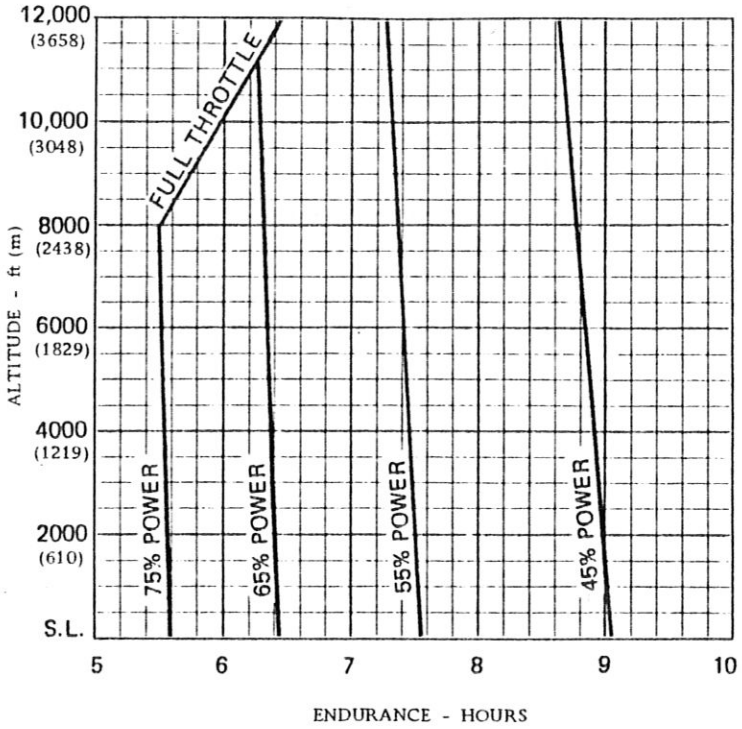
NOTES :
1. This chart allows for the fuel used for engine start, taxi, takeoff and climb, and the distance during climb as shown in figure 5-6.
2. Reserve fuel is based on 45 minutes at 45 % BHP and is 2. 8 US Gal. - 10. 6 l
3. Performance is shown for an airplane equipped with speed fairings which increase the cruise speeds by approximately 3, 5 km/h - 2 kts - 2, 5 MPH.

Figure 5-10

ENDURANCE PROFILE

45 MINUTES RESERVE - 37, 5 US Gal - 142 l USABLE FUEL

CONDITIONS : 758 kg - Recommended Lean Mixture for Cruise - Standard Temperature - Zero Wind



NOTES : 1. This chart allows for the fuel used for engine start, taxi, takeoff and climb, and the time during climb as shown in figure 5-6.

2. Reserve fuel is based on 45 minutes at 45 % BHP and is 2. 8 US Gal - 10, 6 l.

Figure 5-11

LANDING DISTANCE SHORT FIELD

CONDITIONS : Flaps 30° - Power Off - Maximum Braking - Paved, Level, Dry Runway - Zero Wind

Weight lbs (kg)	Indicated Airspeed At 15 m	Pressure Altitude m	Pressure Altitude ft	0° C Ground Roll	0° C Total to Clear 15 m Obs	10° C Ground Roll	10° C Total to Clear 15 m Obs	20° C Ground Roll	20° C Total to Clear 15 m Obs	30° C Ground Roll	30° C Total to Clear 15 m Obs	40° C Ground Roll	40° C Total to Clear 15 m Obs	
1670	100 km/h	Sea Level		137	354	142	361	148	370	152	378	157	386	m
				450	1160	465	1185	485	1215	500	1240	515	1265	ft
(758)	54 kts	305	1000	142	361	148	370	152	378	158	387	163	395	m
				465	1185	485	1215	500	1240	520	1270	535	1295	ft
	62 MPH	610	2000	148	370	152	378	158	387	163	396	169	405	m
				485	1215	500	1240	520	1270	535	1300	555	1330	ft
		914	3000	152	378	158	388	165	398	171	407	175	415	m
				500	1240	520	1275	540	1305	560	1335	575	1360	ft

		1219	4000	158	388	165	398	171	407	177	418	183	427	m
				520	1275	540	1305	560	1335	580	1370	600	1400	ft
		1524	5000	165	398	171	407	177	418	183	427	189	437	m
				540	1305	560	1335	580	1370	600	1400	620	1435	ft
		1829	6000	171	408	177	418	184	430	190	439	197	450	m
				560	1340	580	1370	605	1410	625	1440	645	1475	ft
		2134	7000	178	419	184	430	190	439	198	451	204	462	m
				585	1375	605	1410	625	1440	650	1480	670	1515	ft
		2438	8000	184	430	192	442	198	451	206	463	212	474	m
				605	1410	630	1450	650	1480	675	1520	695	1555	ft

NOTES :
1. Short field technique as specified in Section 4.
2. Decrease distances 10 % for each 9 knots headwind. For operation with tailwinds up to 10 knots, increase distances by 10 % for each 3.5 km/h - 2 kts - 2.5 MPH.
3. For operation on a dry, grass runway, increase distances by 45 % of the "ground roll" figure.

Figure 5-12

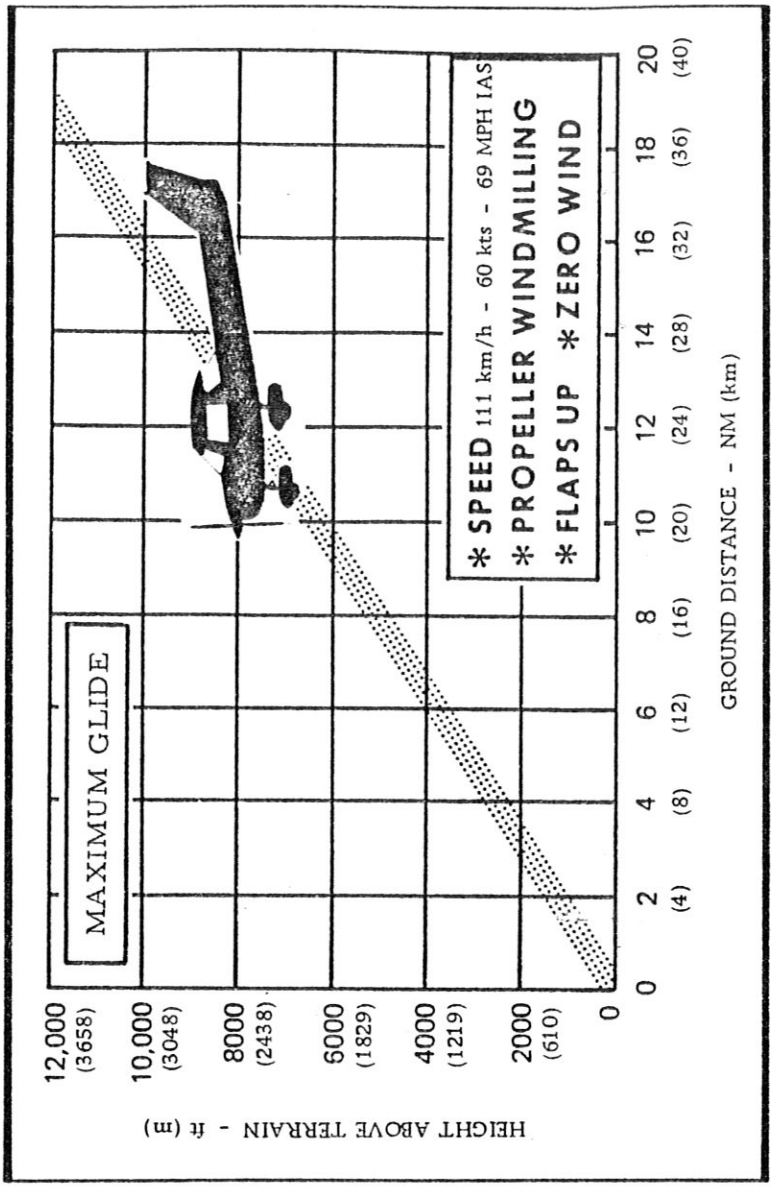

MAXIMUM GLIDE
* SPEED 111 km/h - 60 kts - 69 MPH IAS
* PROPELLER WINDMILLING
* FLAPS UP * ZERO WIND
HEIGHT ABOVE TERRAIN - ft (m)
12,000 (3658)
10,000 (3048)
8000 (2438)
6000 (1829)
4000 (1219)
2000 (610)
0
0 2 (4) 4 (8) 6 (12) 8 (16) 10 (20) 12 (24) 14 (28) 16 (32) 18 (36) 20 (40)
GROUND DISTANCE - NM (km)

Figure 5-13

SERVICING

For quick and ready reference, quantities, materials, and specifications for frequently used service items (such as fuel, oil, etc.) are shown under Servicing Requirements on the following pages.

In addition to the EXTERIOR INSPECTION covered in Section 4, COMPLETE servicing, inspection, and test requirements for your aircraft are detailed in the aircraft Service Manual. The Service Manual outlines all items which require attention at 50, 100, and 200 hour intervals plus those items which require servicing, inspection, and/or testing at special intervals.

Since Dealers conduct all service, inspection, and test procedures in accordance with applicable Service Manuals, it is recommended that you contact your Dealer concerning these requirements and begin scheduling your aircraft for service at the recommended intervals.

The manufacturer Progressive Care ensures that these requirements are accomplished at the required intervals to comply with the 100-hour or ANNUAL inspection.

Depending on various flight operations, your local Government Aviation Agency may require additional service, inspections, or tests. For these regulatory requirements, owners should check with local aviation officials where the aircraft is being operated.

ENGINE OIL

GRADE AND VISCOSITY FOR TEMPERATURE RANGE

The airplane was delivered from the factory with a corrosion preventive aircraft engine oil. This oil should be drained after the first 25 hours of operation, and the following oils used as specified for the average ambient air temperature in the operating area.

MIL-L-6082 Aviation Grade Straight Mineral Oil : Use to replenish supply during the first 25 hours and at the first 25-hour oil change. Continue to use until a total of 50 hours has accumulated or oil consumption has stabilized.

SAE 50 above 16°C
SAE 40 between -1°C and 32°C
SAE 30 between -18°C and 21°C
SAE 20 below -12°C.

MIL-L-22851 Ashless Dispersant Oil : This oil must be used after the first 50 hours or oil consumption has stabilized.

SAE 40 or SAE 50 above 16°C
SAE 40 between - 1°C and 32°C.
SAE 30 or SAE 40 between -18°C and 21°C.
SAE 30 below - 12°C.

CAPACITY OF ENGINE SUMP - 6 Quarts - 5.7 l

Do not operate on less than 4 quarts (3. 8 l). To minimize loss of oil through breather, fill to 5 quart (4. 8 l) level for normal flights of less than 3 hours. For extended flight, fill to 6 quarts (5. 7 l). These quantities refer to oil dipstick level readings. During oil and oil filter changes, one additional quart (0. 9 l) is required when the filter is changed.

OIL AND OIL FILTER CHANGE

After the first 25 hours of operation, drain engine oil sump and oil cooler and clean the oil pressure screen. If an oil filter is installed, change filter at this time. Refill sump with straight mineral oil and use until a total of 50 hours has accumulated or oil consumption has stabilized ; then

change to dispersant oil. On airplanes not equipped with an oil filter, drain the engine oil sump and oil cooler and clean the oil pressure screen each 50 hours thereafter. On airplanes which have an oil filter, the oil change interval may be extended to 100-hour intervals, providing the oil filter is changed at 50-hour intervals. Change engine oil at least every 6 months even though less than the recommended hours have accumulated.
Reduce intervals for prolonged operation in dusty areas, cold climates, or when short flights and long idle periods result in sludging conditions.

FUEL

100LL Grade Aviation Fuel (Blue).

NOTE

100 (Formerly 100/130) Grade Aviation Fuel (Green) with maximum lead content of 4.6 cm3 per gallon is also approved for use.

CAPACITY EACH STANDARD TANK - 49 l - 13 US Gallons

CAPACITY EACH LONG RANGE TANK - 74 l - 19.5 US Gallons.

NOTE

Due to cross-feeding between fuel tanks, the tanks should be re-topped after each refueling to assure maximum capacity.

LANDING GEAR

NOSE WHEEL TIRE PRESSURE : 2.10 bar - 30 psi on 5.00-5, 4-ply rated tire.

MAIN WHEEL TIRE PRESSURE : 1.45 bar - 21 psi on 6.00-6, 4-ply rated tires.

NOSE GEAR SHOCK STRUT -

Keep filled with MIL-H-5606 hydraulic fluid and inflated with air to 1.40 bar - 20 psi. Do not over-inflate.

MAINTENANCE

GROUND HANDLING

The airplane is most easily and safely maneuvered by hand with a tow-bar attached to the nose wheel.

When using the tow-bar, never exceed the turning angle of 30° either side of center, or damage to the gear will result.

MOORING YOUR AIRPLANE

Proper tie-down is the best precaution against damage to your parked airplane by gusty or strong winds. To tie down your airplane securely, proceed as follows :

1. Set parking brake and install control wheel lock.
2. Install a surface control lock between each aileron and flap.
3. Tie sufficiently strong ropes or chains (320 kg tensile strength) to wing and tail tie-down fittings, and secure each rope to ramp tie-down.
4. Install a surface control lock over the fin and rudder.
5. Install a pitot tube cover.
6. Tie a rope to an exposed portion of the engine mount and secure the opposite end to a ramp tie-down.

WINDSHIELD - WINDOWS

The windshield and windows should be kept clean at all times. Wash them carefully with plenty of soap and water, using palm of hand. Chamois or sponge may be used, but only to carry water to the surface. Rinse thoroughly, then dry with a clean, moist chamois.

Rubbing the surface of the plastic with a dry cloth builds up an electrostatic charge which attracts dust particles in the air ; the use of a chamois prevents such a dust attraction.

Remove oil and grease with a cloth moistened with kerosene. Never use gasoline, benzine, alcohol, acetone, carbon tetrachloride, anti-mist fluid, lacquer thinner, etc... These materials will soften the plastic and may cause it to craze.

After removing dirt and grease, the surface may be waxed with a good grade of wax. Apply a thin, even coat of wax and bring it to a high polish by rubbing lightly with a clean, dry, soft flannel cloth. Do not use a power buffer ; the heat generated by the buffing pad may soften the plastic.

PAINTED SURFACES

The painted exterior surfaces of the aircraft require an initial curing period which may be as long as 15 days. During this curing period, some precautions should be taken to avoid damaging the finish. The finish should be cleaned only by washing with clean water and mild soap, followed by a rinse water and drying with chamois. Do not use polish or wax, and avoid flying through rain, hail or sleet during this period. Once the finish has cured completely, wax or polish may be used, particularly on the leading edges, engine nose cap, and propeller spinner to reduce the abrasion encountered in these areas.

PROPELLER CARE

Preflight inspection of propeller blades for nicks, and wiping them occasionally with an oily cloth to clean off grass and bug stains will assure long, trouble-free service. Small nicks on the blades, particularly near the tips and on the leading edges, should be dressed out as soon as possible since these nicks produce stress concentrations, and if ignored, may result in cracks. Never use an alkaline cleaner on the blades ; remove grease and dirt with carbon tetrachloride.

INTERIOR CARE

To remove dust and loose dirt from the upholstery, headliner, and carpet, clean the interior regularly with a vacuum cleaner.

Oily spots may be cleaned with household spot removers, used sparingly. Before using any solvent, test it on an obscure place on the fabric to be cleaned. Never saturate the fabric with a volatile solvent ; it may damage the padding and backing materials.

The "royalite" trim, instrument panel and control knobs need only be wiped off with a damp cloth. Oil and grease on the control wheel and control knobs can be removed with a cloth moistened with kerosene.

Volatile solvents, such as mentioned in paragraphs on care of the windshield, must never be used since they soften and craze the plastic.

NOTE

All servicing procedures are described in detail in the Maintenance Guide available with the aircraft.

OPTIONAL EQUIPMENT LIST

DESCRIPTION	PAGE	APPROVAL
- Winterisation kit	6-1.1	
- Ground Service Plug Receptacle	6-2.1 and 6-2.2	
- Radio Transmitter Selector Switch	6-3.1	
- Boom Microphone	6-3.1	
- True Airspeed Indicator	6-4.1	
- BADIN CROUZET RG10B Automatic Pilot Directional Gyro Coupling Omni Coupling	6-5.1 thru 6-5.3	
- Night VFR Operation	6-6.1	
- Instrument Flying (IFR)	6-7.1	06.09.78

WINTERIZATION KIT

SECTION 1

GENERAL

For continuous operation in temperatures consistently below - 7°C, the winterization kit should be installed to improve engine operation. The kit consists of :

- Two shields to partially cover the cowl nose cap openings.
- An insulation for the engine crankcase breather line.

NOTE

Once installed, the crankcase breather insulation is approved for permanent use in both cold and hot weather.

There is no change to sections 2 thru 5 of the airplane flight manual when this optional equipment is installed.

GROUND SERVICE PLUG RECEPTACLE

SECTION 1

GENERAL

A ground service plug receptacle may be installed to permit the use of an external power source for cold weather starting and during lengthy maintenance work on the electrical and electronic equipment.

SECTION 4

NORMAL PROCEDURES

1. Master Switch - "ON" just before connecting an external power source.

WARNING

When turning on the master switch, using an external power source, or pulling the propeller through by hand, treat the propeller as if the ignition switch were ON. Do not stand, nor allow anyone else to stand, within the arc of the propeller, since a loose or broken wire, or a component malfunction, could cause the propeller to rotate.

NOTE

1. This is especially important since it will enable the battery to absorb transient voltages which otherwise might damage the transistors in the electronic equipment.
2. The battery and external power circuits have been designed to completely eliminate the need to "jumper" across the battery

contactor to close it for charging a completely "dead" battery. A special fused circuit in the external power system supplies the needed "jumper" across the contacts so that with a "dead" battery and an external power source applied, turning the master switch "ON" will close the battery contactor.

Refer to Section 4 of the airplane flight manual for other normal procedures.

There is no change to Sections 2, 3 and 5 of the airplane flight manual when this optional equipment is utilized.

TRUE AIRSPEED INDICATOR

SECTION 1

GENERAL

A true airspeed indicator is available to replace the standard airspeed indicator in your airplane. The true airspeed indicator has a calibrated rotatable ring which works in conjunction with the airspeed indicator dial in a manner similar to the operation of a flight computer.

SECTION 4

NORMAL PROCEDURES

1. To obtain true airspeed, rotate ring until pressure altitude is aligned with outside air temperature in degrees Fahrenheit.
2. Read true airspeed on rotatable ring opposite airspeed needle.

NOTE

Pressure altitude should not be confused with indicated altitude. To obtain pressure altitude, set barometric scale on altimeter to "29.92" (1013 mb) and read pressure altitude on altimeter. Be sure to return altimeter barometric scale to original barometric setting after pressure altitude has been obtained.

Refer to Section 4 of the airplane flight manual for other normal procedures.

There is no change to Sections 2, 3 and 5 of the airplane flight manual when this optional equipment is installed.

OIL QUICK-DRAIN VALVE

SECTION 1

GENERAL

An oil quick-drain valve is optionally offered to replace the drain plug in the oil sump drain port. The valve provides a quicker and cleaner method of draining engine oil.

SECTION 4

NORMAL PROCEDURES

1. Slip a hose over the end of the valve.
2. Route the hose to a suitable container.
3. Push upward on the end of the valve until it snaps into the open position. Spring clips will hold the valve open.
4. After draining, use a screwdriver or suitable tool to snap the valve into the extended (closed) position and remove the drain hose.

There is no change to Sections 2, 3 and 5 of the airplane flight manual when this optional equipment is utilized.

BADIN CROUZET RG10B AUTOMATIC PILOT + DIRECTIONAL GYRO COUPLING + OMNI COUPLING

SECTION 1

GENERAL

BREAKDOWN OF CES. RA. 150. 770 OPTION

A. BADIN CROUZET RG10B Automatic Pilot

This automatic pilot is intended for stabilization or control of the aircraft in roll and yaw through the roll control system.

The major components are as follows :

- A flight controller.
- A roll/yaw sensor.
- An air distributor.
- Two aileron control air-driven actuators.
- A vacuum source.
- Mechanical parts.

B. Directional Gyro Coupling and Omni Coupling

The above automatic pilot may be supplemented with the following equipment :

- A vacuum-driven directional gyro.
- A "HDG-VOR" navigation coupler.

SECTION 2

OPERATION LIMITATIONS

The automatic pilot must not be used for take-off and landing.

Minimum operation altitude : 200 m - 656 ft.

SECTION 3

EMERGENCY PROCEDURES

AUTOMATIC PILOT FAILURE

1. Take over manual control of the aircraft.
2. Set autopilot "ON-OFF" switch to "OFF".
3. Close "VIDE P. A. " ("A. P. VACUUM") valve on the instrument panel.

ELECTRICAL FAILURE

1. Any electrical failure will result in the failure of the automatic pilot and may be cause for residual forces to be overpowered.
2. Apply the above procedure.

SECTION 4

NORMAL PROCEDURES

BEFORE TAKE-OFF

1. Set "TURN" and "TRIM" knobs to neutral.
2. "STAB-HDG" selector switches - "STAB".
3. Autopilot "ON-OFF" switch - "OFF".
4. "VIDE P. A. " ("A. P. VACUUM") valve - "OUVERT" ("OPEN").
5. Suction gage - Check (4. 6 to 5. 4 inches of mercury).

TAKE-OFF

1. Autopilot "ON-OFF" switch - "OFF".

AUTOMATIC PILOT ENGAGEMENT

1. While holding the control wheel, set the following switches as follows :
   - "STAB-HDG" selector switch - "STAB".
   - Autopilot "ON-OFF" switch - "ON".
   - Release the control wheel
2. Adjust "TRIM" knob for zero rate.
3. Maintain a steady climb angle with the manual flight controls without counteracting the transverse movements induced by the automatic pilot.

4. To make turns, rotate "TURN" knob to "L" or "R" according to the desired turn direction.
5. Roll-out : Return "TURN" knob to neutral.
6. "TRIM" knob must be readjusted from time to time to compensate for aerodynamic asymmetry.

NOTE

The automatic pilot is operative as soon as engaged.

DIRECTIONAL GYRO COUPLING

1. Select desired heading on the directional gyro compass card (aligned with magnetic compass heading).
2. Set "HDG-VOR" selector switch to "HDG".
3. Set "STAB-HDG" selector switch to "HDG" - The aircraft turns to the selected heading.
4. "STAB-HDG" selector switch need not be set to "STAB" to change heading or to reset the directional gyro.

OMNI COUPLING FUNCTION

1. Set the selected station frequency at the Omni control unit.
2. Select desired heading on the directional gyro compass card and the Omni indicator.
3. Set "HDG-VOR" selector switch to "VOR".

4. Check "STAB-HDG" selector switch is set to "HDG".
5. The selected heading is automatically maintained or corrected.

NOTE

If the aircraft is subjected to strong crosswind conditions, it is recommended to allow for a certain amount of drift upon heading selection on the directional gyro compass card, not altering the course selected on the Omni indicator.

There is no change to Section 5 of the airplane flight manual when this optional equipment is installed.

OPTIONAL EQUIPMENT

NIGHT VFR OPERATION

SECTION 1

GENERAL

DESCRIPTION

For night VFR operation, F 152 private aircraft must be equipped with the following standard equipment (S) and optional equipment (O).

DESCRIPTION OF EQUIPMENT	S/O
- One Artificial Horizon	O
- One Gyroscopic Turn Indicator (with supply source separate from that of the artificial horizon)	S
- One Gyroscopic Directional Indicator	O
- One Gyroscopic Instrument Power Monitoring System	O
- One Rate of Climb Indicator	S
- One Flashing Beacon	O
- Position Lights	S
- Landing Lights	O
- One Instrument Panel Adjustable Lighting System	O
- One Category 2 VHF Transmitter-Receiver	O
- One Category 2 VOR Receiver or One Category 2 ADF System	O
- One Electric Flashlight	O

There is no change to Sections 2 thru 5 of the airplane flight manual when these optional equipment are installed.

OPTIONAL EQUIPMENT
INSTRUMENT FLYING (IFR)

SECTION 1

GENERAL

DESCRIPTION

For IFR operation, F 152 private aircraft must be equipped with the following standard equipment (S) and optional equipment (O).

DESCRIPTION OF EQUIPMENT	S/O
For Type V Area :	
- One Artificial Horizon	O
- One Gyroscopic Turn Indicator (with supply source separate from that of the artificial horizon)	S
- One Gyroscopic Directional Indicator	O
- One Gyroscopic Instrument Power Monitoring System	O
- A Second Sensitive and Adjustable Altimeter	O
- One Pitot Tube and Stall Warning Heated System	O
- One Alternate Static Pressure Source	O
- One Rate of Climb Indicator	S
- One Outside Air Temperature Gage	O
- One Electric Clock with Second Hand	O
- One Flashing Beacon	O
- Position Lights	S
- Landing and Taxiing Lights	O
- One Instrument Panel Adjustable Lighting System	O
- One Pocket with Two Spare Fuses Each Rating	O
- Two Category 2 VHF Transmitter-Receivers	O
- One Category 2 VOR Receiver	O
- One Category 2 NAV Receiver with Localizer and ILS	O
- One Category 2 Marker Beacon System	O
- One Category 2 ADF System	O
For Type H Area :	
- Same Equipment as Type V Area Equipment	
- One Category 2 HF Transmitter-Receiver	O
NOTE : For night flights, the crew should have an electric flashlight available.	

HOT WEATHER OPERATION

Refer to the general warm temperature starting information under starting engine in Section 4 of this manual. Avoid prolonged engine operation on the ground and the maximum temperature at which cooling is certified is 37. 8°C hot day.

No minimum air temperature has been established.

NIGHT VFR AND IFR APPROVAL

Refer to pages 2-2, 6-6. 1 and 6-7. 1 of this manual.
To be deleted.

ADD the following item 4 in NOTES of page 5-17 of this manual :
4. For flaps-up landing, make an approach at 111 km/h - 60 kts - 69 MPH IAS and increase distances (both "Ground Roll" and "Total to Clear 15 m Obstacle") by 30 %.

CAA APPENDIX