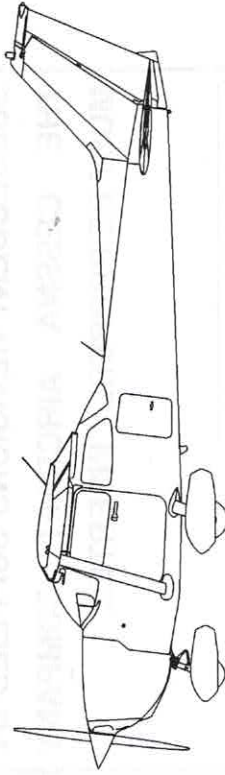


Pilot's Operating Handbook and

FAA Approved Airplane Flight Manual



THIS PUBLICATION MUST BE
CARRIED IN THE AIRPLANE
AT ALL TIMES.

The Cessna Aircraft
Company

Model 172S

Serial No. 172S8671

Registration No. N740SP

This publication includes the material required to be furnished to the pilot by FAR Part 23 and constitutes the FAA Approved Airplane Flight Manual.

FAA APPROVAL

FAA APPROVED UNDER FAR 21 SUBPART J
The Cessna Aircraft Co
Delegation Option Manufacturer CE-1

Richard W. Hickey Executive Engineer

Date: July 10, 1998

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The Cessna Aircraft Company
Wichita, Kansas USA

COVERAGE

The Pilot's Operating Handbook in the airplane at the time of delivery from The Cessna Aircraft Company contains information applicable to the Model 172S airplane by serial number and registration number shown on the Title Page. This handbook is applicable to airplane serial number 172S8001 and On. All information is based on data available at the time of publication.

This handbook consists of nine sections that cover all operational aspects of a standard-equipped airplane. Following Section 8 are the Supplements, Section 9, which provide expanded operational procedures for the avionics equipment (both standard and optional), and provides information on special operations.

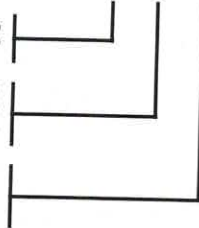
Supplements are individual documents, and may be issued or revised without regard to revision dates which apply to the POH itself. These supplements contain a Log of Effective Pages, which should be used to determine the status of each supplement.

ORIGINAL ISSUE AND REVISIONS

This Pilot's Operating Handbook and FAA Approved Airplane Flight Manual is comprised of the original issue and any subsequent revisions. To ensure that information in this manual is current, the revisions must be incorporated as they are issued. This manual was originally issued on July 8, 1998. As revisions are issued, they will be noted in the Log of Effective Pages table.

The part number of this manual has also been designed to further aid the owner/operator in determining the revision level of any POH. Refer to the example below for a breakdown:

172S PHUS 00



Revision Level (Revision 0, Original Issue)
Manual (Pilot's Operating Handbook, U.S.)
Airplane Model (172S)

CONGRATULATIONS

Congratulations on your purchase and welcome to Cessna ownership! Your Cessna has been designed and constructed to give you the most in performance, value and comfort.

This Pilot's Operating Handbook has been prepared as a guide to help you get the most utility from your airplane. It contains information about your airplane's equipment, operating procedures, performance and suggested service and care. Please study it carefully and use it as a reference.

The worldwide Cessna Organization and Cessna Customer Service are prepared to serve you. The following services are offered by each Cessna Service Station:

- THE CESSNA AIRPLANE WARRANTIES, which provide coverage for parts and labor, are upheld through Cessna Service Stations worldwide. Warranty provisions and other important information are contained in the Customer Care Program Handbook supplied with your airplane. The Customer Care Card assigned to you at delivery will establish your eligibility under warranty and should be presented to your local Cessna Service Station at the time of warranty service.
- FACTORY TRAINED PERSONNEL to provide you with courteous, expert service.
- FACTORY APPROVED SERVICE EQUIPMENT to provide you efficient and accurate workmanship.
- A STOCK OF GENUINE CESSNA SERVICE PARTS are available when you need them.
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A current Cessna Service Station Directory accompanies your new airplane. The Directory is revised annually, and a current copy can be obtained from your nearest Cessna Service Station.

We urge all Cessna owners/operators to utilize the benefits available within the Cessna Organization.

PERFORMANCE-SPECIFICATIONS

(Continued)

WING LOADING: Lbs/Sq Ft	14.7
POWER LOADING Lbs/HP	14.2
FUEL CAPACITY	56 GAL
OIL CAPACITY	8 QTS
ENGINE: Textron Lycoming	IO-360-L2A
180 BHP at 2700 RPM	
PROPELLER: Fixed Pitch, Diameter	76 IN.

*** NOTE**

Speed performance is shown for an airplane equipped with speed fairings which increase the speeds by approximately 2 knots. There is a corresponding difference in range, while all other performance figures are unchanged when speed fairings are installed.

The above performance figures are based on airplane weights at 2550 pounds, standard atmospheric conditions, level, hard-surfaced dry runways and no wind. They are calculated values derived from flight tests conducted by The Cessna Aircraft Company under carefully documented conditions and will vary with individual airplanes and numerous factors affecting flight performance.

PERFORMANCE - SPECIFICATIONS***SPEED:**

Maximum at Sea Level	126 KNOTS
Cruise, 75% Power at 8500 FT	124 KNOTS

CRUISE: Recommended lean mixture with fuel allowance for engine start, taxi, takeoff, climb and 45 minutes reserve.

75% Power at 8500 FT	Range	518 NM
53 Gallons Usable Fuel	Time	4.26 HRS
Range at 10,000 FT, 45% power	Range	638 NM
53 Gallons Usable Fuel	Time	6.72 HRS

RATE OF CLIMB AT SEA LEVEL 730 FPM

SERVICE CEILING 14,000 FT

TAKEOFF PERFORMANCE:

Ground Roll	960 FT
Total Distance Over 50 FT Obstacle	1630 FT

LANDING PERFORMANCE:

Ground Roll	575 FT
Total Distance Over 50 FT Obstacle	1335 FT

STALL SPEED:

Flaps Up, Power Off	53 KCAS
Flaps Down, Power Off	48 KCAS

MAXIMUM WEIGHT:

Ramp	2558 LBS
Takeoff	2550 LBS
Landing	2550 LBS

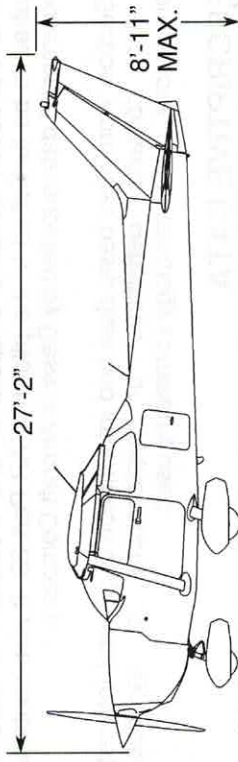
STANDARD EMPTY WEIGHT 1663 LBS

MAXIMUM USEFUL LOAD 895 LBS

BAGGAGE ALLOWANCE 120 LBS

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HANDLING, SERVICE & MAINTENANCE	8
SUPPLEMENTS	9



NOTE 1: WING SPAN SHOWN WITH STROBE LIGHTS
INSTALLED.

NOTE 2: WHEEL BASE LENGTH IS 65".

NOTE 3: PROPELLER GROUND CLEARANCE IS 11 1/4".

NOTE 4: WING AREA IS 174 SQUARE FEET.

NOTE 5: MINIMUM TURNING RADIUS (* PIVOT POINT TO
OUTBOARD WING TIP) IS 27'-5 1/2".

NOTE 6: NORMAL GROUND ATTITUDE IS SHOWN WITH
NOSE STRUT SHOWING APPROXIMATELY 2" OF
STRUT, AND WINGS LEVEL.

0510T1005

 Figure 1-1. Three View - Normal Ground
Attitude (Sheet 2)

INTRODUCTION

■ This handbook contains 9 sections, and includes the material required to be furnished to the pilot by FAR Part 23. It also contains supplemental data supplied by Cessna Aircraft Company.

Section 1 provides basic data and information of general interest. It also contains definitions or explanations of symbols, abbreviations, and terminology commonly used.

DESCRIPTIVE DATA

ENGINE

Number of Engines: 1.

Engine Manufacturer: Textron Lycoming.

Engine Model Number: IO-360-L2A.

Engine Type: Normally aspirated, direct drive, air-cooled, horizontally opposed, fuel injected, four cylinder engine with 360 cu. in. displacement.

Horsepower Rating and Engine Speed: 180 rated BHP at 2700 RPM.

PROPELLER

Propeller Manufacturer: McCauley Propeller Systems.

Propeller Model Number: 1A170E/JHA7660.

Number of Blades: 2.

Propeller Diameter: 76 inches.

Propeller Type: Fixed pitch.

FUEL



WARNING

USE OF UNAPPROVED FUELS MAY RESULT IN DAMAGE TO THE ENGINE AND FUEL SYSTEM COMPONENTS, RESULTING IN POSSIBLE ENGINE FAILURE.

Approved Fuel Grades (and Colors):
100LL Grade Aviation Fuel (Blue).
100 Grade Aviation Fuel (Green).

SYMBOLS, ABBREVIATIONS AND TERMINOLOGY

GENERAL AIRSPEED TERMINOLOGY AND SYMBOLS

KCAS

Knots Calibrated Airspeed is indicated airspeed corrected for position and instrument error and expressed in knots. Knots calibrated airspeed is equal to KTAS in standard atmosphere at sea level.

KIAS

Knots Indicated Airspeed is the speed shown on the airspeed indicator and expressed in knots.

KTAS

Knots True Airspeed is the airspeed expressed in knots relative to undisturbed air which is KCAS corrected for altitude and temperature.

V_A

Maneuvering Speed is the maximum speed at which full or abrupt control movements may be used without overstressing the airframe.

V_{FE}

Maximum Flap Extended Speed is the highest speed permissible with wing flaps in a prescribed extended position.

V_{NO}

Maximum Structural Cruising Speed is the speed that should not be exceeded except in smooth air, then only with caution.

V_{NE}

Never Exceed Speed is the speed limit that may not be exceeded at any time.

V_S

Stalling Speed or the minimum steady flight speed is the minimum speed at which the airplane is controllable.

V_{SO}

Stalling Speed or the minimum steady flight speed is the minimum speed at which the airplane is controllable in the landing configuration at the most forward center of gravity.

V_X

Best Angle-of-Climb Speed is the speed which results in the greatest gain of altitude in a given horizontal distance.

V_Y

Best Rate-of-Climb Speed is the speed which results in the greatest gain in altitude in a given time.

NOTE

Isopropyl alcohol or diethylene glycol monomethyl ether (DiEGME) may be added to the fuel supply. Additive concentrations shall not exceed 1% for isopropyl alcohol or 0.10% to 0.15% for DiEGME. Refer to Section 8 for additional information.

Fuel Capacity:

Total Capacity: 56.0 U.S. gallons.
Total Usable: 53.0 U.S. gallons.

Total Capacity Each Tank: 28.0 U.S. gallons.
Total Usable Each Tank: 26.5 U.S. gallons.

NOTE

To ensure maximum fuel capacity and minimize cross-feeding when refueling, always park the airplane in a wings-level, normal ground attitude and place the fuel selector in the Left or Right position. Refer to Figure 1-1 for normal ground attitude dimensions.

OIL

Oil Specification:

MIL-L-6082 or SAE J1966 Aviation Grade Straight Mineral Oil: Used when the airplane was delivered from the factory and should be used to replenish the supply during the first 25 hours. This oil should be drained and the filter changed after the first 25 hours of operation. Refill the engine with MIL-L-6082 or SAE J1966 Aviation Grade Straight Mineral Oil and continue to use until a total of 50 hours has accumulated or oil consumption has stabilized.

MIL-L-22851 or SAE J1899 Aviation Grade Ashless Dispersant Oil: Oil conforming to the latest revision and/or supplements to Textron Lycoming Service Instruction No. 1014, **must be used** after first 50 hours or once oil consumption has stabilized.

(Centimeters x .394 = Inches) (Inches x 2.54 = Centimeters)

**CENTIMETERS INTO INCHES
CENTIMETRES EN POUCES**

cm	0	1	2	3	4	5	6	7	8	9
in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
0	---	0.394	0.787	1.181	1.575	1.969	2.362	2.756	3.150	3.543
10	3.937	4.331	4.724	5.118	5.512	5.906	6.299	6.693	7.087	7.480
20	7.874	8.268	8.661	9.055	9.449	9.843	10.236	10.630	11.024	11.417
30	11.811	12.205	12.598	12.992	13.386	13.780	14.173	14.567	14.961	15.354
40	15.748	16.142	16.535	16.929	17.323	17.717	18.110	18.504	18.898	19.291
50	19.685	20.079	20.472	20.866	21.260	21.654	22.047	22.441	22.835	23.228
60	23.622	24.016	24.409	24.803	25.197	25.591	25.984	26.378	26.772	27.164
70	27.559	27.953	28.346	28.740	29.134	29.528	29.921	30.315	30.709	31.102
80	31.496	31.890	32.283	32.677	33.071	33.465	33.858	34.252	34.646	35.039
90	35.433	35.827	36.220	36.614	37.008	37.402	37.795	38.189	38.583	38.976
100	39.370	39.764	40.157	40.551	40.945	41.339	41.732	42.126	42.520	42.913

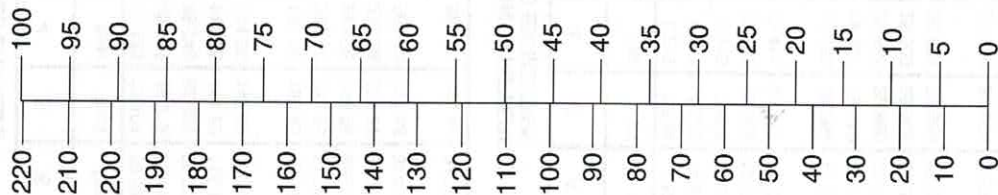
**INCHES INTO CENTIMETERS
POUCES EN CENTIMETRES**

in.	0	1	2	3	4	5	6	7	8	9
cm	cm	cm	cm	cm	cm	cm	cm	cm	cm	cm
0	---	2.54	5.08	7.62	10.16	12.70	15.24	17.78	20.32	22.86
10	25.40	27.94	30.48	33.02	35.56	38.10	40.64	43.18	45.72	48.26
20	50.80	53.34	55.88	58.42	60.96	63.50	66.04	68.58	71.12	73.66
30	76.20	78.74	81.28	83.82	86.36	88.90	91.44	93.98	96.52	99.06
40	101.60	104.14	106.68	109.22	111.76	114.30	116.84	119.38	121.92	124.46
50	127.00	129.54	132.08	134.62	137.16	139.70	142.24	144.78	147.32	149.86
60	152.40	154.94	157.48	160.02	162.56	165.10	167.64	170.18	172.72	175.26
70	177.80	180.34	182.88	185.42	187.96	190.50	193.04	195.58	198.12	200.66
80	203.20	205.74	208.28	210.82	213.36	215.90	218.44	220.98	223.52	226.06
90	228.60	231.14	233.68	236.22	238.76	241.30	243.84	246.38	248.92	251.46
100	254.00	256.54	259.08	261.62	264.16	266.70	269.24	271.78	274.32	276.86

Figure 1-4. Length Conversions (Sheet 1 of 2)

(Kilograms x 2.205 = Pounds) (Pounds x .454 = Kilograms)

POUNDS KILOGRAMS



Units x 10, 100, etc.

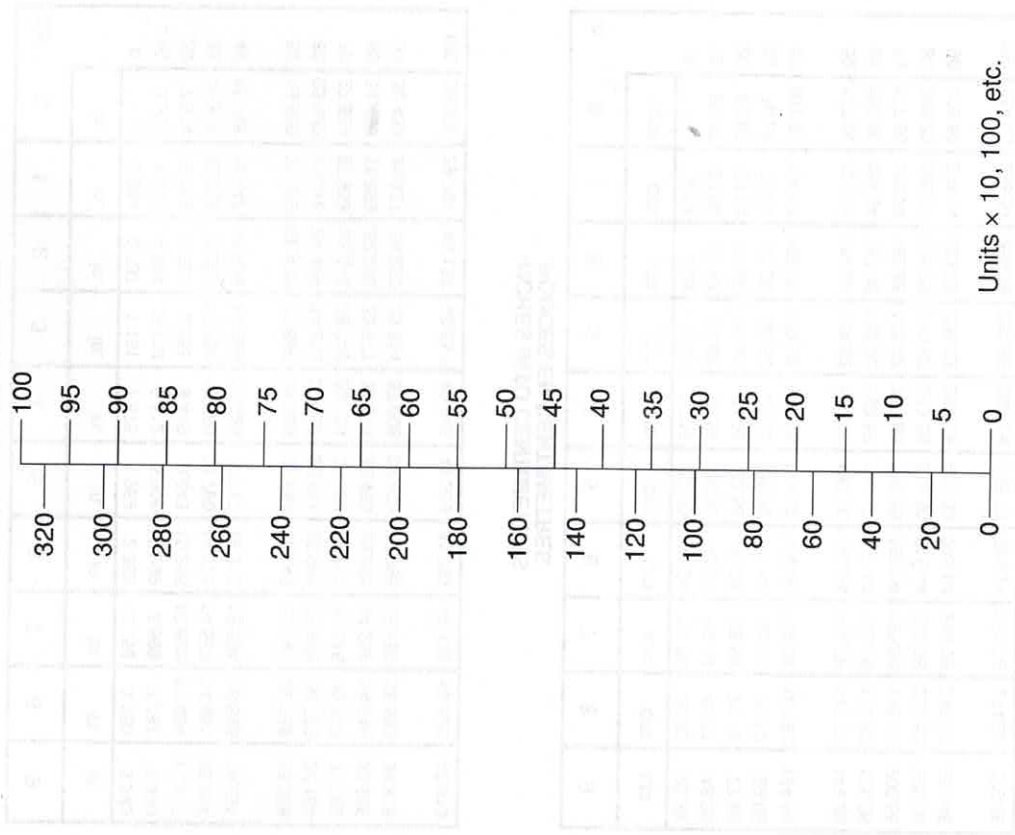
Figure 1-2. Weight Conversions (Sheet 2)

(Meters x 3.281 = Feet)

(Feet x .305 = Meters)

(Meters x 3.281 = Feet) (Feet x .305 = Meters)

FEET METERS

METERS INTO FEET
METRES EN PIEDS

m	0	1	2	3	4	5	6	7	8	9
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet
0	---	3.281	6.562	9.842	13.123	16.404	19.685	22.956	26.247	29.528
10	32.808	36.089	39.370	42.651	45.932	49.212	52.493	55.774	59.055	62.336
20	65.617	68.897	72.178	75.459	78.740	82.021	85.302	88.582	91.863	95.144
30	98.425	101.71	104.99	108.27	111.55	114.83	118.11	121.39	124.67	127.95
40	131.23	134.51	137.79	141.08	144.36	147.64	150.92	154.20	157.48	160.76
50	164.04	167.32	170.60	173.88	177.16	180.45	183.73	187.01	190.29	193.57
60	195.85	200.13	203.41	206.69	209.97	213.25	216.53	219.82	223.10	226.38
70	229.66	232.94	236.22	239.50	242.78	246.06	249.34	252.62	255.90	259.19
80	262.47	265.75	269.03	272.31	275.59	278.87	282.15	285.43	288.71	291.58
90	295.27	298.56	301.84	305.12	308.40	311.68	314.96	318.24	321.52	324.80
100	328.08	331.36	334.64	337.93	341.21	344.49	347.77	351.05	354.33	357.61

FEET INTO METERS
PIEDS EN METRES

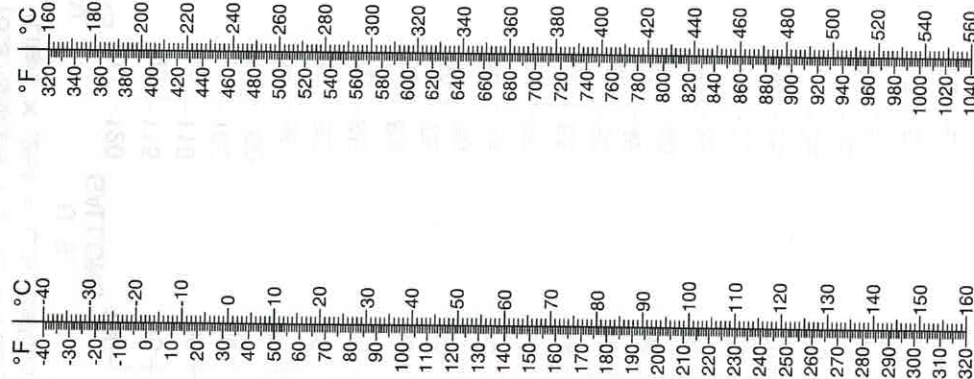
ft	0	1	2	3	4	5	6	7	8	9
	m	m	m	m	m	m	m	m	m	m
0	---	0.305	0.610	0.914	1.219	1.524	1.829	2.134	2.438	2.743
10	3.048	3.353	3.658	3.962	4.267	4.572	4.877	5.182	5.486	5.791
20	6.096	6.401	6.706	7.010	7.315	7.620	7.925	8.230	8.534	8.839
30	9.144	9.449	9.754	10.058	10.363	10.668	10.973	11.278	11.582	11.887
40	12.192	12.497	12.802	13.106	13.411	13.716	14.021	14.326	14.630	14.935
50	15.240	15.545	15.850	16.154	16.459	16.754	17.069	17.374	17.678	17.983
60	18.288	18.593	18.898	19.202	19.507	19.812	20.117	20.422	20.726	21.031
70	21.336	21.641	21.946	22.250	22.555	22.860	23.165	23.470	23.774	24.079
80	24.384	24.689	24.994	25.298	25.603	25.908	26.213	26.518	26.822	27.127
90	27.432	27.737	28.042	28.346	28.651	28.956	29.261	29.566	29.870	30.175
100	30.480	30.785	31.090	31.394	31.699	32.004	32.309	32.614	32.918	33.223

Figure 1-3 . Length Conversions (Sheet 2)

Figure 1-3. Length Conversions (Sheet 1 of 2)

TEMPERATURE CONVERSIONS

$$(^{\circ}\text{F} - 32) \times 5/9 = ^{\circ}\text{C} \quad ^{\circ}\text{C} \times 9/5 + 32 = ^{\circ}\text{F}$$



0585T1034

Figure 1-7. Temperature Conversions

(Imperial Gallons $\times$ 4.546 = Liters) (Liters $\times$.22 = Imperial Gallons)

LITERS INTO IMPERIAL GALLONS LITRES EN GALLONS IMPERIAL

Lt	0	1	2	3	4	5	6	7	8	9
	IG	IG	IG	IG	IG	IG	IG	IG	IG	IG
0	---	0.220	0.440	0.660	0.880	1.100	1.320	1.540	1.760	1.980
10	2.200	2.420	2.640	2.860	3.080	3.300	3.520	3.740	3.960	4.180
20	4.400	4.620	4.840	5.059	5.279	5.499	5.719	5.939	6.159	6.379
30	6.599	6.819	7.039	7.259	7.479	7.699	7.919	8.139	8.359	8.579
40	8.799	9.019	9.239	9.459	9.679	9.899	10.119	10.339	10.559	10.779
50	10.999	11.219	11.439	11.659	11.879	12.099	12.319	12.539	12.759	12.979
60	13.199	13.419	13.639	13.859	14.078	14.298	14.518	14.738	14.958	15.178
70	15.398	15.618	15.838	16.058	16.278	16.498	16.718	16.938	17.158	17.378
80	17.598	17.818	18.038	18.258	18.478	18.698	18.918	19.138	19.358	19.578
90	19.798	20.018	20.238	20.458	20.678	20.898	21.118	21.338	21.558	21.778
100	21.998	22.218	22.438	22.658	22.878	23.098	23.318	23.537	23.757	23.977

IMPERIAL GALLONS INTO LITERS GALLONS IMPERIAL EN LITRES

IG	0	1	2	3	4	5	6	7	8	9
	Lt	Lt	Lt	Lt	Lt	Lt	Lt	Lt	Lt	Lt
0	---	4.546	9.092	13.638	18.184	22.730	27.276	31.822	36.368	40.914
10	45.460	50.006	54.552	59.097	63.643	68.189	72.735	77.281	81.827	86.373
20	90.919	95.465	100.011	104.556	109.102	113.648	118.194	122.740	127.286	131.832
30	136.38	140.93	145.47	150.02	154.56	159.11	163.66	168.20	172.75	177.29
40	181.84	186.38	190.93	195.48	200.02	204.57	209.11	213.66	218.21	222.75
50	227.30	231.84	236.39	240.94	245.48	250.03	254.57	259.12	263.67	268.21
60	272.76	277.30	281.85	286.40	290.94	295.49	300.03	304.58	309.13	313.67
70	318.22	322.76	327.31	331.86	336.40	340.95	345.49	350.04	354.59	359.13
80	363.68	368.22	372.77	377.32	381.86	386.41	390.95	395.50	400.04	404.59
90	409.14	413.68	418.23	422.77	427.32	431.87	436.41	440.96	445.50	450.05
100	454.60	459.14	463.69	468.23	472.78	477.33	481.87	486.42	490.96	495.51

Figure 1-6. Volume Conversions (Sheet 1 of 3)

AIRSPEED LIMITATIONS

Airspeed limitations and their operational significance are shown in Figure 2-1. Maneuvering speeds shown apply to normal category operations. The utility category maneuvering speed is 98 KIAS at 2200 pounds.

SYMBOL	SPEED	KCAS	KIAS	REMARKS
VNE	Never Exceed Speed	160	163	Do not exceed this speed in any operation.
VNO	Maximum Structural Cruising Speed	126	129	Do not exceed this speed except in smooth air, and then only with caution.
VA	Maneuvering Speed: 2550 Pounds 2200 Pounds 1900 Pounds	102 95 88	105 98 90	Do not make full or abrupt control movements above this speed.
VFE	Maximum Flap Extended Speed: 10° Flaps 10° to 30° Flaps	107 85	110 85	Do not exceed this speed with flaps down.
-----	Maximum Window Open Speed	160	163	Do not exceed this speed with windows open.

Figure 2-1. Airspeed Limitations

AIRSPEED INDICATOR MARKINGS

Airspeed indicator markings and their color code significance are shown in Figure 2-2.

MARKING	KIAS VALUE OR RANGE	SIGNIFICANCE
White Arc	40 - 85	Full Flap Operating Range. Lower limit is maximum weight V_{S0} in landing configuration. Upper limit is maximum speed permissible with flaps extended.
Green Arc	48 - 129	Normal Operating Range. Lower limit is maximum weight V_{S1} at most forward C.G. with flaps retracted. Upper limit is maximum structural cruising speed.
Yellow Arc	129-163	Operations must be conducted with caution and only in smooth air.
Red Line	163	Maximum speed for all operations.

POWERPLANT LIMITATIONS

Engine Manufacturer: Textron Lycoming.
Engine Model Number: IO-360-L2A.
Maximum Power: 180 BHP rating.
Engine Operating Limits for Takeoff and Continuous Operations:
Maximum Engine Speed: 2700 RPM.

NOTE

The static RPM range at full throttle is 2300 - 2400 RPM.

Maximum Oil Temperature: 245°F (118°C).
Oil Pressure, Minimum: 20 PSI.
Maximum: 115 PSI.

INTRODUCTION

Section 2 includes operating limitations, instrument markings, and basic placards necessary for the safe operation of the airplane, its engine, standard systems and standard equipment. The limitations included in this section and in Section 9 have been approved by the Federal Aviation Administration. Observance of these operating limitations is required by Federal Aviation Regulations.

NOTE

Refer to the Supplements, Section 9, of this Pilot's Operating Handbook for amended operating limitations, operating procedures, performance data and other necessary information for airplanes equipped with specific options.

NOTE

The airspeeds listed in the Airspeed Limitations chart (Figure 2-1) and the Airspeed Indicator Markings chart (Figure 2-2) are based on Airspeed Calibration data shown in Section 5 with the normal static source. If the alternate static source is being used, ample margins should be observed to allow for the airspeed calibration variations between the normal and alternate static sources as shown in Section 5.

The Cessna Model 172S is certificated under FAA Type Certificate No. 3A12.

SECTION 2 LIMITATIONS

CESSNA
MODEL 172S

Fuel Grade: See Fuel Limitations.
Oil Grade (Specification):

MIL-L-6082 or SAE J1966 Aviation Grade Straight Mineral Oil or MIL-L-22851 or SAE J1899 Ashless Dispersant Oil. Oil must comply with the latest revision and/or supplement for Textron Lycoming Service Instruction No. 1014.

Propeller Manufacturer: McCauley Propeller Systems.

Propeller Model Number: 1A170E/JHA7660.

Propeller Diameter : Maximum 76 inches.

Minimum: 75 inch minimum.

POWERPLANT INSTRUMENT MARKINGS

Powerplant instrument markings and their color code significance are shown in Figure 2-3.

INSTRUMENT	RED LINE (MINIMUM)	GREEN ARC (NORMAL OPERATING)	RED LINE (MAX)
Tachometer: Sea Level 5000 Feet 10,000 Feet	----	2100 to 2500 RPM 2100 to 2600 RPM 2100 to 2700 RPM	2700
Oil Temperature	----	100 to 245°F	245°F
Oil Pressure	20 PSI	50 to 90 PSI	115 PSI
Fuel Quantity	0 (1.5 Gal. Unusable Each Tank)		
Fuel Flow	----	0 to 12 GPH	----
Vacuum Gage	----	4.5 - 5.5 in.Hg	----

Figure 2-3. Powerplant Instrument Markings

FLIGHT LOAD FACTOR LIMITS

NORMAL CATEGORY

Flight Load Factors (Maximum Takeoff Weight - 2550 lbs.):
*Flaps Up +3.8g, -1.52g
*Flaps Down +3.0g

*The design load factors are 150% of the above, and in all cases, the structure meets or exceeds design loads.

UTILITY CATEGORY

Flight Load Factors (Maximum Takeoff Weight - 2200 lbs.):
*Flaps Up +4.4g, -1.76g
*Flaps Down +3.0g

*The design load factors are 150% of the above, and in all cases, the structure meets or exceeds design loads.

KINDS OF OPERATION LIMITS

The airplane as delivered is equipped for day VFR and may be equipped for night VFR and/or IFR operations. FAR Part 91 establishes the minimum required instrumentation and equipment for these operations. The reference to types of flight operations on the operating limitations placard reflects equipment installed at the time of Airworthiness Certificate issuance.

Flight into known icing conditions is prohibited.

WEIGHT LIMITS

NORMAL CATEGORY

Maximum Ramp Weight: 2558 lbs.
Maximum Takeoff Weight: 2550 lbs.
Maximum Landing Weight: 2550 lbs.
Maximum Weight in Baggage Compartment:
Baggage Area 1 - Station 82 to 108: 120 lbs.
Baggage Area 2 - Station 108 to 142: 50 lbs.

NOTE

The maximum combined weight capacity for baggage areas 1 and 2 is 120 lbs.

UTILITY CATEGORY

Maximum Ramp Weight: 2208 lbs.
Maximum Takeoff Weight: 2200 lbs.
Maximum Landing Weight: 2200 lbs.
Maximum Weight in Baggage Compartment: In the utility category, the baggage compartment must be empty and rear seat must not be occupied.

CENTER OF GRAVITY LIMITS

NORMAL CATEGORY

Center of Gravity Range:

Forward: 35.0 inches aft of datum at 1950 lbs. or less, with straight line variation to 41.0 inches aft of datum at 2550 lbs.

Aft: 47.3 inches aft of datum at all weights.

Reference Datum: Lower portion of front face of firewall.

UTILITY CATEGORY

This airplane is not designed for purely aerobatic flight. However, in the acquisition of various certificates such as commercial pilot and flight instructor, certain maneuvers are required by the FAA. All of these maneuvers are permitted in this airplane when operated in the utility category.

In the utility category, the rear seat must not be occupied and the baggage compartment must be empty.

UTILITY CATEGORY MANEUVERS AND RECOMMENDED ENTRY SPEED*

Chandelles	105 Knots
Lazy Eights	105 Knots
Steep Turns	95 Knots
Spins	Slow Deceleration
Stalls (Except Whip Stalls)	Slow Deceleration

* **Abrupt use of the controls is prohibited above 98 knots.**

Aerobatics that may impose high loads should not be attempted. 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 always be exercised to avoid excessive speed which in turn can impose excessive loads. In the execution of all maneuvers, avoid abrupt use of controls.

**SECTION 2
LIMITATIONS****UTILITY CATEGORY**

Center of Gravity Range:

Forward: 35.0 inches aft of datum at 1950 lbs. or less, with straight line variation to 37.5 inches aft of datum at 2200 lbs.

Aft: 40.5 inches aft of datum at all weights.

Reference Datum: Lower portion of front face of firewall.

MANEUVER LIMITS**NORMAL CATEGORY**

This airplane is certificated in both the normal and utility category. The normal category is applicable to aircraft intended for non aerobatic operations. These include any maneuvers incidental to normal flying, stalls (except whip stalls), lazy eights, chandelles, and turns in which the angle of bank is not more than 60°.

NORMAL CATEGORY MANEUVERS AND RECOMMENDED ENTRY SPEED*

Chandelles	105 Knots
Lazy Eights	105 Knots
Steep Turns	95 Knots
Stalls (Except Whip Stalls)	Slow Deceleration

* **Abrupt use of the controls is prohibited above 105 KIAS.**

5. In baggage compartment:

120 POUNDS MAXIMUM BAGGAGE
FORWARD OF BAGGAGE DOOR LATCH

50 POUNDS MAXIMUM
BAGGAGE AFT OF BAGGAGE DOOR LATCH

MAXIMUM 120 POUNDS COMBINED

FOR ADDITIONAL LOADING INSTRUCTIONS
SEE WEIGHT AND BALANCE DATA

6. A calibration card must be provided to indicate the accuracy of the magnetic compass in 30° increments.

7. On the oil filler cap:

OIL
8 QTS

8. On control lock:

CAUTION!
CONTROL LOCK
REMOVE BEFORE STARTING ENGINE

9. Near airspeed indicator:

MANEUVERING SPEED - 105 KIAS

FUEL LIMITATIONS

Total Fuel: 56 U.S. gallons (2 tanks at 28.0 gallons each).

Usable Fuel (all flight conditions): 53.0 U.S. gallons.

Unusable Fuel: 3.0 U.S. gallons (1.5 gallons each tank).

NOTE

To ensure maximum fuel capacity and minimize cross-feeding when refueling, always park the airplane in a wings-level, normal ground attitude and place the fuel selector in the Left or Right position. Refer to Figure 1-1 for normal ground attitude definition.

ADDITIONAL FUEL LIMITATIONS

Takeoff and land with the fuel selector valve handle in the BOTH position.

Maximum slip or skid duration with one tank dry: 30 seconds.

Operation on either LEFT or RIGHT tank limited to level flight only.

With 1/4 tank or less, prolonged uncoordinated flight is prohibited when operating on either left or right tank.

Fuel remaining in the tank after the fuel quantity indicator reads 0 (red line) cannot be safely used in flight.

Approved Fuel Grades (and Colors):

100LL Grade Aviation Fuel (Blue).
100 Grade Aviation Fuel (Green).

OTHER LIMITATIONS

FLAP LIMITATIONS

Approved Takeoff Range:

0° to 10°

Approved Landing Range:

0° to 30°

2. On the fuel selector valve:

TAKEOFF LANDING	BOTH 53.0 GAL.	ALL FLIGHT ATTITUDES
FUEL SELECTOR		
LEFT 26.5 GAL. LEVEL FLIGHT ONLY		RIGHT 26.5 GAL. LEVEL FLIGHT ONLY

3. Near fuel tank filler cap:

FUEL
100LL/100 MIN. GRADE AVIATION GASOLINE
CAP. 26.5 U.S. GAL. USABLE
CAP 17.5 U.S. GAL. USABLE TO BOTTOM OF FILLER INDICATOR TAB

4. On flap control indicator:

0° to 10°	110 KIAS	(Partial flap range with blue color code; also, mechanical detent at 10°.)
10° to 30°	85 KIAS	(White color code; also, mechanical detent at 20°.)

SECTION 2
LIMITATIONSCESSNA
MODEL 172S

PLACARDS

The following information must be displayed in the form of composite or individual placards.

1. In full view of the pilot: (The "DAY-NIGHT-VFR-IFR" entry, shown on the example below, will vary as the airplane is equipped).

The markings and placards installed in this airplane contain operating limitations which must be complied with when operating this airplane in the Normal Category. Other operating limitations which must be complied with when operating this airplane in this category or in the Utility Category are contained in the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

Normal Category

No acrobatic maneuvers, including spins, approved.

Utility Category

No acrobatic maneuvers approved, except those listed in the Pilot's Operating Handbook.

Baggage compartment and rear seat must not be occupied.

Spin Recovery

Opposite rudder - forward elevator - neutralize controls.

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

10. On the Upper Right Side of the Aft Cabin Partition:

EMERGENCY LOCATOR TRANSMITTER
INSTALLED AFT OF THIS PARTITION
MUST BE SERVICED IN ACCORDANCE
WITH FAR PART 91.207

11. On forward face of firewall adjacent to the battery:

CAUTION 24 VOLTS D.C.
THIS AIRCRAFT IS EQUIPPED WITH ALTERNATOR
AND A NEGATIVE GROUND SYSTEM.
OBSERVE PROPER POLARITY.
REVERSE POLARITY WILL DAMAGE ELECTRICAL
COMPONENTS.

12. On the upper right instrument panel:

SMOKING PROHIBITED

INTRODUCTION

Section 3 provides checklist and amplified procedures for coping with emergencies that may occur. Emergencies caused by airplane or engine malfunctions are extremely rare if proper preflight inspections and maintenance are practiced. Enroute weather emergencies can be minimized or eliminated by careful flight planning and good judgment when unexpected weather is encountered. However, should an emergency arise, the basic guidelines described in this section should be considered and applied as necessary to correct the problem. Emergency procedures associated with standard avionics, the ELT, or any optional systems can be found in the Supplements, Section 9.

AIRSPEEDS

AIRSPEEDS FOR EMERGENCY OPERATION

Engine Failure After Takeoff:	70 KIAS
Wing Flaps Up	65 KIAS
Wing Flaps Down	
Maneuvering Speed:	
2550 Lbs	105 KIAS
2200 Lbs	98 KIAS
1900 Lbs	90 KIAS
Maximum Glide	68 KIAS
Precautionary Landing With Engine Power	65 KIAS
Landing Without Engine Power:	
Wing Flaps Up	70 KIAS
Wing Flaps Down	65 KIAS

PRECAUTIONARY LANDING WITH ENGINE POWER

1. Passenger Seat Backs -- MOST UPRIGHT POSITION.
2. Seats and Seat Belts -- SECURE.
3. Airspeed -- 65 KIAS.
4. Wing Flaps -- 20°.
5. Selected Field -- FLY OVER, noting terrain and obstructions, then retract flaps upon reaching a safe altitude and airspeed.
6. Avionics Master Switch and Electrical Switches -- OFF.
7. Wing Flaps -- 30° (on final approach).
8. Airspeed -- 65 KIAS.
9. Master Switch -- OFF.
10. Doors -- UNLATCH PRIOR TO TOUCHDOWN.
11. Touchdown -- SLIGHTLY TAIL LOW.
12. Ignition Switch -- OFF.
13. Brakes -- APPLY HEAVILY.

DITCHING

1. Radio -- TRANSMIT MAYDAY on 121.5 MHz, giving location and intentions and SQUAWK 7700.
2. Heavy Objects (in baggage area) -- SECURE OR JETTISON (if possible).
3. Passenger Seat Backs -- MOST UPRIGHT POSITION.
4. Seats and Seat Belts -- SECURE.
5. Wing Flaps -- 20° to 30°.
6. Power -- ESTABLISH 300 FT/MIN DESCENT AT 55 KIAS.

NOTE

If no power is available, approach at 70 KIAS with flaps up or at 65 KIAS with 10° flaps.

7. Approach -- High Winds, Heavy Seas -- INTO THE WIND.
Light Winds, Heavy Swells -- PARALLEL TO SWELLS.
8. Cabin Doors -- UNLATCH.
9. Touchdown -- LEVEL ATTITUDE AT ESTABLISHED RATE OF DESCENT.
10. Face -- CUSHION at touchdown with folded coat.
11. ELT -- Activate.
12. Airplane -- EVACUATE through cabin doors. If necessary, open window and flood cabin to equalize pressure so doors can be opened.
13. Life Vests and Raft -- INFLATE WHEN CLEAR OF AIRPLANE.

EMERGENCY PROCEDURES CHECKLIST

Procedures in the Emergency Procedures Checklist portion of this section shown in **bold faced** type are immediate action items which should be committed to memory.

ENGINE FAILURES

ENGINE FAILURE DURING TAKEOFF ROLL

1. **Throttle -- IDLE.**
2. **Brakes-- APPLY.**
3. Wing Flaps -- **RETRACT.**
4. Mixture -- **IDLE CUT OFF.**
5. Ignition Switch -- **OFF.**
6. Master Switch -- **OFF.**

ENGINE FAILURE IMMEDIATELY AFTER TAKEOFF

1. **Airspeed -- 70 KIAS (flaps UP).**
65 KIAS (flaps DOWN).
2. Mixture -- **IDLE CUT OFF.**
3. Fuel Shutoff Valve -- **OFF (Pull Full Out).**
4. Ignition Switch -- **OFF.**
5. Wing Flaps -- **AS REQUIRED.**
6. Master Switch -- **OFF.**
7. Cabin Door -- **UNLATCH.**
8. Land -- **STRAIGHT AHEAD.**

ENGINE FAILURE DURING FLIGHT (Restart Procedures)

1. **Airspeed -- 68 KIAS.**
2. **Fuel Shutoff Valve -- ON (push full in).**
3. **Fuel Selector Valve -- BOTH.**
4. **Auxiliary Fuel Pump Switch -- ON.**
5. **Mixture -- RICH (if restart has not occurred).**
6. Ignition Switch -- **BOTH (or START if propeller is stopped).**

NOTE

If the propeller is windmilling, the engine will restart automatically within a few seconds. If the propeller has stopped (possible at low speeds), turn the ignition switch to **START**, advance the throttle slowly from idle and lean the mixture from full rich as required for smooth operation.

7. Auxiliary Fuel Pump Switch -- **OFF.**

NOTE

If the fuel flow indicator immediately drops to zero (indicating an engine-driven fuel pump failure), return the Auxiliary Fuel Pump Switch to the **ON** position.

FORCED LANDINGS

EMERGENCY LANDING WITHOUT ENGINE POWER

1. Passenger Seat Belts -- **MOST UPRIGHT POSITION.**
2. Seats and Seat Belts -- **SECURE.**
3. **Airspeed -- 70 KIAS (flaps UP).**
65 KIAS (flaps DOWN).
4. Mixture -- **IDLE CUT OFF.**
5. Fuel Shutoff Valve -- **OFF (Pull Full Out).**
6. Ignition Switch -- **OFF.**
7. Wing Flaps -- **AS REQUIRED (30° recommended).**
8. Master Switch -- **OFF (when landing is assured).**
9. Doors -- **UNLATCH PRIOR TO TOUCHDOWN.**
10. Touchdown -- **SLIGHTLY TAIL LOW.**
11. Brakes -- **APPLY HEAVILY.**

WING FIRE

1. Landing/Taxi Light Switches -- OFF.
2. Navigation Light Switch -- OFF.
3. Strobe Light Switch -- OFF.
4. Pitot Heat Switch -- OFF.

NOTE

Perform a sideslip to keep the flames away from the fuel tank and cabin. Land as soon as possible using flaps only as required for final approach and touchdown.

ICING

INADVERTENT ICING ENCOUNTER

1. Turn pitot heat switch ON.
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 and open defroster outlets to obtain maximum windshield defroster airflow. Adjust cabin air control to get maximum defroster heat and airflow.
4. Watch for signs of engine-related icing conditions. An unexplained loss in engine speed could be caused by ice blocking the air intake filter, or, in extremely rare instances, ice completely blocking the fuel injection air reference tubes. Change the throttle position to obtain maximum RPM. This may require either advancing or retarding the throttle, dependent on where ice has accumulated in the system. Adjust mixture, as required, for maximum RPM.
5. Plan a landing at the nearest airport. With an extremely rapid ice build up, select a suitable "off airport" landing site.
6. With an ice accumulation of 1/4 inch or more on the wing leading edges, be prepared for significantly higher stall speed and a longer landing roll.
7. 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.
8. Open left window and, if practical, scrape ice from a portion of the windshield for visibility in the landing approach.
9. Perform a landing approach using a forward slip, if necessary, for improved visibility.

FIRES

DURING START ON GROUND

1. Ignition Switch -- START, Continue Cranking to get a start which would suck the flames and accumulated fuel into the engine.

If engine starts:

2. Power -- 1800 RPM for a few minutes.
3. Engine -- SHUTDOWN and inspect for damage.

If engine fails to start:

4. Throttle -- FULL OPEN.
5. Mixture -- IDLE CUT OFF.
6. Cranking -- CONTINUE.
7. Fuel Shutoff Valve -- OFF (Pull Full Out).
8. Auxiliary Fuel Pump Switch -- OFF.
9. Fire Extinguisher -- ACTIVATE.
10. Engine -- SECURE.
 - a. Master Switch -- OFF.
 - b. Ignition Switch -- OFF.
11. Parking Brake -- RELEASE.
12. Airplane -- EVACUATE.
13. Fire -- EXTINGUISH using fire extinguisher, wool blanket, or dirt.
14. Fire Damage -- INSPECT, repair damage or replace damaged components or wiring before conducting another flight.

ENGINE FIRE IN FLIGHT

1. Mixture -- IDLE CUT OFF.
2. Fuel Shutoff Valve -- Pull Out (OFF).
3. Auxiliary Fuel Pump Switch -- OFF.
4. Master Switch -- OFF.
5. Cabin Heat and Air -- OFF (except overhead vents).
6. Airspeed -- 100 KIAS (If fire is not extinguished, increase glide speed to find an airspeed - within airspeed limitations - which will provide an incombustible mixture).
7. Forced Landing -- EXECUTE (as described in Emergency Landing Without Engine Power).

10. Approach at 65 to 75 KIAS depending upon the amount of the accumulation.
11. Perform a landing in level attitude.

STATIC SOURCE BLOCKAGE (Erroneous Instrument Reading Suspected)

1. **Static Pressure Alternate Source Valve -- PULL ON.**
2. Airspeed -- Consult appropriate calibration tables in Section 5.

LANDING WITH A FLAT MAIN TIRE

1. Approach -- NORMAL.
2. Wing Flaps -- 30°.
3. Touchdown -- GOOD MAIN TIRE FIRST, hold airplane off flat tire as long as possible with aileron control.
4. Directional Control -- MAINTAIN using brake on good wheel as required.

LANDING WITH A FLAT NOSE TIRE

1. Approach -- NORMAL.
2. Flaps -- AS REQUIRED.
3. Touchdown -- ON MAINS, hold nose wheel off the ground as long as possible.
4. When nose wheel touches down, maintain full up elevator as airplane slows to stop.

ELECTRICAL FIRE IN FLIGHT

1. **Master Switch -- OFF.**
2. **Vents, Cabin Air, Heat -- CLOSED.**
3. **Fire Extinguisher -- ACTIVATE.**
4. Avionics Master Switch -- OFF.
5. All Other Switches (except ignition switch) -- OFF.



WARNING

AFTER DISCHARGING FIRE EXTINGUISHER AND ASCERTAINING THAT FIRE HAS BEEN EXTINGUISHED, VENTILATE THE CABIN.

6. Vents/Cabin Air/Heat -- OPEN when it is ascertained that fire is completely extinguished.

If fire has been extinguished and electrical power is necessary for continuance of flight to nearest suitable airport or landing area:

7. Master Switch -- ON.
8. Circuit Breakers -- CHECK for faulty circuit, do not reset.
9. Radio Switches -- OFF.
10. Avionics Master Switch -- ON.
11. Radio/Electrical Switches -- ON one at a time, with delay after each until short circuit is localized.

CABIN FIRE

1. **Master Switch -- OFF.**
2. **Vents/Cabin Air/Heat -- CLOSED (to avoid drafts).**
3. **Fire Extinguisher -- ACTIVATE.**



WARNING

AFTER DISCHARGING FIRE EXTINGUISHER AND ASCERTAINING THAT FIRE HAS BEEN EXTINGUISHED, VENTILATE THE CABIN.

4. Vents/Cabin Air/Heat -- Open when it is ascertained that fire is completely extinguished.
5. Land the airplane as soon as possible to inspect for damage.

INTRODUCTION

Section 4 provides checklist and amplified procedures for the conduct of normal operation. Normal procedures associated with optional systems can be found in the Supplements, Section 9.

AIRSPEEDS

AIRSPEEDS FOR NORMAL OPERATION

Unless otherwise noted, the following speeds are based on a maximum weight of 2550 pounds and may be used for any lesser weight.

Takeoff:		
Normal Climb Out	.....	75-85 KIAS
Short Field Takeoff, Flaps 10°, Speed at 50 Feet	.....	56 KIAS
Enroute Climb, Flaps Up:		
Normal, Sea Level	.....	75-85 KIAS
Normal, 10,000 Feet	.....	70-80 KIAS
Best Rate-of-Climb, Sea Level	.....	74 KIAS
Best Rate-of-Climb, 10,000 Feet	.....	72 KIAS
Best Angle-of-Climb, Sea Level	.....	62 KIAS
Best Angle-of-Climb, 10,000 Feet	.....	67 KIAS
Landing Approach:		
Normal Approach, Flaps Up	.....	65-75 KIAS
Normal Approach, Flaps 30°	.....	60-70 KIAS
Short Field Approach, Flaps 30°	.....	61 KIAS
Balked Landing:		
Maximum Power, Flaps 20°	.....	60 KIAS
Maximum Recommended Turbulent Air Penetration Speed:		
2550 Lbs	.....	105 KIAS
2200 Lbs	.....	98 KIAS
1900 Lbs	.....	90 KIAS
Maximum Demonstrated Crosswind Velocity:		
Takeoff or Landing	.....	15 KNOTS

ALTITUDE	75% POWER		65% POWER		55% POWER	
	KTAS	NMPG	KTAS	NMPG	KTAS	NMPG
Sea Level	114	11.2	108	12.0	101	12.8
4000 feet	119	11.7	112	12.4	104	13.2
8000 feet	124	12.2	117	12.9	107	13.6

Figure 4-3. Cruise Performance Table

LEANING WITH AN EGT INDICATOR

At or below 75% power in level cruise flight, the exhaust gas temperature (EGT) indicator is used to lean the fuel-air mixture for best performance or economy. The Cruise Performance charts in Section 5 are based on the EGT to adjust the mixture to Recommended Lean per Figure 4-4.

MIXTURE DESCRIPTION	EXHAUST GAS TEMPERATURE
RECOMMENDED LEAN (Pilot's Operating Handbook)	50° Rich of Peak EGT
BEST ECONOMY	Peak EGT

Figure 4-4. EGT Table

Use the mixture control vernier adjustment (rotate the knob CCW to lean the mixture) to **slowly** lean, from full rich or maximum RPM mixture, while monitoring the EGT indicator. As the EGT indication begins to increase, continue to **slowly** lean the mixture until an EGT indication decrease is just detectable. Reverse the adjustment **slowly** in the rich direction until an EGT indication decrease is again just detectable, then set the EGT index pointer to match the peak indication. The mixture may be leaned slightly to return to peak EGT or may be further richened to Recommended Lean mixture as desired. **Continuous operation at mixture settings lean of peak EGT is prohibited.** Any change in altitude or throttle position will require that peak EGT be redetermined and the desired mixture be reset. Under some conditions, engine roughness may occur at peak EGT. In this case, operate at Recommended Lean mixture.

As noted in Figure 4-4, operation at peak EGT provides the best fuel economy. Operation at peak EGT results in approximately 4% greater range and approximately a 3 knot decrease in airspeed from the figures shown in the Performance section of this handbook. Recommended Lean mixture provides best level cruise performance (generally close to "best power" or maximum RPM).

AIRSPEED CALIBRATION

NORMAL STATIC SOURCE

CONDITION:

Power required for level flight or maximum power descent.

FLAPS UP	50	60	70	80	90	100	110	120	130	140	150	160
KIAS	56	62	70	78	87	97	107	117	127	137	147	157
KCAS												
FLAPS 10°	40	50	60	70	80	90	100	110	---	---	---	---
KIAS	51	57	63	71	80	89	99	109	---	---	---	---
KCAS												
FLAPS 30°	40	50	60	70	80	85	---	---	---	---	---	---
KIAS	50	56	63	72	81	86	---	---	---	---	---	---
KCAS												

Figure 5-1. Airspeed Calibration (Sheet 1 of 2)

TEMPERATURE CONVERSION CHART

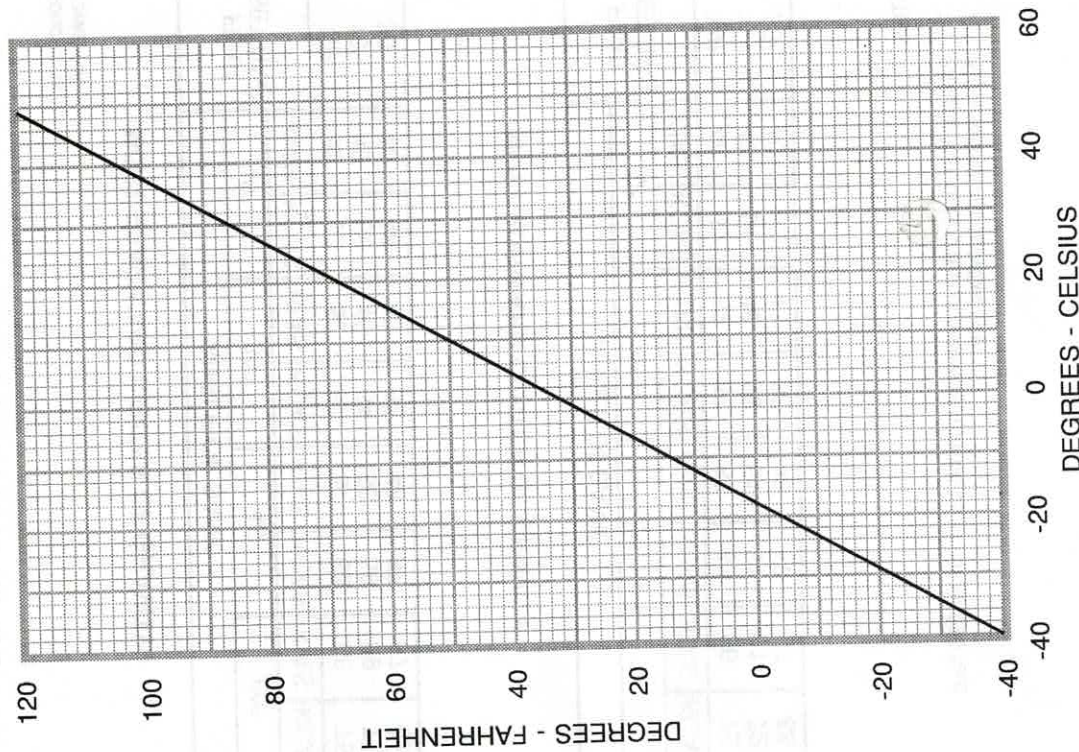


Figure 5-2. Temperature Conversion Chart

STALL SPEEDS AT 2550 POUNDSConditions:
Power Off**MOST REARWARD CENTER OF GRAVITY**

FLAP SETTING	ANGLE OF BANK									
	0°		30°		45°		60°			
	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
UP	48	53	52	57	57	63	68	75		
10°	42	50	45	54	50	59	59	71		
30°	40	48	43	52	48	57	57	68		

MOST FORWARD CENTER OF GRAVITY

FLAP SETTING	ANGLE OF BANK									
	0°		30°		45°		60°			
	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
UP	48	53	52	57	57	63	68	75		
10°	43	51	46	55	51	61	61	72		
30°	40	48	43	52	48	57	57	68		

NOTES:

- Altitude loss during a stall recovery may be as much as 230 feet.
- KIAS values are approximate.

Figure 5-3. Stall Speeds

AIRSPEED CALIBRATION**ALTERNATE STATIC SOURCE**

CONDITION:

Power required for level flight or maximum power descent.

FLAPS UP	50	60	70	80	90	100	110	120	130	140	150	160
KIAS												
KCAS	56	62	68	76	85	95	105	115	125	134	144	154
FLAPS 10°	40	50	60	70	80	90	100	110	---	---	---	---
KIAS												
KCAS	51	55	60	68	77	86	96	105	---	---	---	---
FLAPS 30°	40	50	60	70	80	85	---	---	---	---	---	---
KIAS												
KCAS	49	54	61	69	78	83	---	---	---	---	---	---

NOTE:

Windows closed, ventilators closed, cabin heater, cabin air, and defroster on maximum.

Figure 5-1. Airspeed Calibration (Sheet 2 of 2)

SHORT FIELD TAKEOFF DISTANCE AT 2400 POUNDS

CONDITIONS:

Flaps 10°
Full Throttle Prior to Brake Release
Paved, level, dry runway
Zero Wind
Lift Off: 48 KIAS
Speed at 50 Ft: 54 KIAS

	0°C		10°C		20°C		30°C		40°C	
	Press Alt In Feet	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft
S. L.	745	1275	800	1370	860	1470	925	1570	995	1685
1000	810	1390	875	1495	940	1605	1010	1720	1085	1845
2000	885	1520	955	1635	1030	1760	1110	1890	1190	2030
3000	970	1665	1050	1795	1130	1930	1215	2080	1305	2230
4000	1065	1830	1150	1975	1240	2130	1335	2295	1430	2455
5000	1170	2015	1265	2180	1360	2355	1465	2530	1570	2715
6000	1285	2230	1390	2410	1500	2610	1610	2805	1725	3015
7000	1415	2470	1530	2685	1650	2900	1770	3125	1900	3370
8000	1560	2755	1690	3000	1815	3240	1950	3500	2095	3790

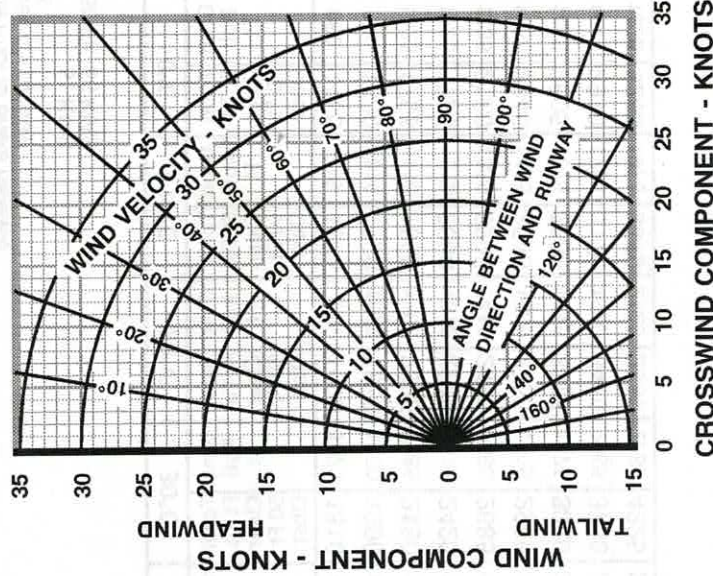
NOTES:

- Short field technique as specified in Section 4.
- Prior to takeoff from fields above 3000 feet elevation, the mixture should be leaned to give maximum RPM in a full throttle, static runup.
- Decrease distances 10% for each 9 knots headwind. For operation with tail winds up to 10 knots, increase distances by 10% for each 2 knots.
- For operation on dry, grass runway, increase distances by 15% of the "ground roll" figure.

Figure 5-5. Short Field Takeoff Distance (Sheet 2 of 3)

WIND COMPONENTS

NOTE:
Maximum demonstrated crosswind velocity is 15 knots (not a limitation).



NOTE

Maximum demonstrated crosswind component is 15 knots (not a limitation).

Figure 5-4. Crosswind Components

SHORT FIELD TAKEOFF DISTANCE AT 2200 POUNDS

CONDITIONS:

Flaps 10°
Full Throttle Prior to Brake Release
Paved, level, dry runway
Zero Wind
Lift Off: 44 KIAS
Speed at 50 Ft: 50 KIAS

Press Alt In Feet	0°C			10°C			20°C			30°C			40°C		
	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft
S. L.	610	1055	655	1130	705	1205	760	1290	815	1380					
1000	665	1145	720	1230	770	1315	830	1410	890	1505					
2000	725	1250	785	1340	845	1435	905	1540	975	1650					
3000	795	1365	860	1465	925	1570	995	1685	1065	1805					
4000	870	1490	940	1605	1010	1725	1090	1855	1165	1975					
5000	955	1635	1030	1765	1110	1900	1195	2035	1275	2175					
6000	1050	1800	1130	1940	1220	2090	1310	2240	1400	2395					
7000	1150	1985	1245	2145	1340	2305	1435	2475	1540	2650					
8000	1270	2195	1370	2375	1475	2555	1580	2745	1695	2950					

NOTES:

- Short field technique as specified in Section 4.
- Prior to takeoff from fields above 3000 feet elevation, the mixture should be leaned to give maximum RPM in a full throttle, static runup.
- Decrease distances 10% for each 9 knots headwind. For operation with tail winds up to 10 knots, increase distances by 10% for each 2 knots.
- For operation on dry, grass runway, increase distances by 15% of the "ground roll" figure.

Figure 5-5. Short Field Takeoff Distance (Sheet 3 of 3)

SHORT FIELD TAKEOFF DISTANCE AT 2550 POUNDS

CONDITIONS:

Flaps 10°
Full Throttle Prior to Brake Release
Paved, level, dry runway
Zero Wind
Lift Off: 51 KIAS
Speed at 50 Ft: 56 KIAS

Press Alt In Feet	0°C			10°C			20°C			30°C			40°C		
	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft
S. L.	860	1465	925	1575	995	1690	1070	1810	1150	1945					
1000	940	1600	1010	1720	1090	1850	1170	1990	1260	2135					
2000	1025	1755	1110	1890	1195	2035	1285	2190	1380	2355					
3000	1125	1925	1215	2080	1310	2240	1410	2420	1515	2605					
4000	1235	2120	1335	2295	1440	2480	1550	2685	1660	2880					
5000	1355	2345	1465	2545	1585	2755	1705	2975	1825	3205					
6000	1495	2605	1615	2830	1745	3075	1875	3320	2010	3585					
7000	1645	2910	1785	3170	1920	3440	2065	3730	2215	4045					
8000	1820	3265	1970	3575	2120	3880	2280	4225	2450	4615					

NOTES:

- Short field technique as specified in Section 4.
- Prior to takeoff from fields above 3000 feet elevation, the mixture should be leaned to give maximum RPM in a full throttle, static runup.
- Decrease distances 10% for each 9 knots headwind. For operation with tail winds up to 10 knots, increase distances by 10% for each 2 knots.
- For operation on dry, grass runway, increase distances by 15% of the "ground roll" figure.

Figure 5-5. Short Field Takeoff Distance (Sheet 1 of 3)

CRUISE PERFORMANCE**CONDITIONS:**

2550 Pounds
Recommended Lean Mixture At All Altitudes (Refer to Section 4,
Cruise)

PRESS ALT FT	RPM	20°C BELOW STANDARD TEMP			STANDARD TEMPERATURE			20°C ABOVE STANDARD TEMP		
		% BHP	KTAS	GPH	% BHP	KTAS	GPH	% BHP	KTAS	GPH
2000	2550	83	117	11.1	77	118	10.5	72	117	9.9
	2500	78	115	10.6	73	115	9.9	68	115	9.4
	2400	69	111	9.6	64	110	9.0	60	109	8.5
	2300	61	105	8.6	57	104	8.1	53	102	7.7
	2200	53	99	7.7	50	97	7.3	47	95	6.9
	2100	47	92	6.9	44	90	6.6	42	89	6.3
4000	2600	83	120	11.1	77	120	10.4	72	119	9.8
	2550	79	118	10.6	73	117	9.9	68	117	9.4
	2500	74	115	10.1	69	115	9.5	64	114	8.9
	2400	65	110	9.1	61	109	8.5	57	107	8.1
	2300	58	104	8.2	54	102	7.7	51	101	7.3
	2200	51	98	7.4	48	96	7.0	45	94	6.7
	2100	45	91	6.6	42	89	6.4	40	87	6.1
6000										
	2650	83	122	11.1	77	122	10.4	72	121	9.8
	2600	78	120	10.6	73	119	9.9	68	118	9.4
	2500	70	115	9.6	65	114	9.0	60	112	8.5
	2400	62	109	8.6	57	108	8.2	54	106	7.7
	2300	54	103	7.8	51	101	7.4	48	99	7.0
	2200	48	96	7.1	45	94	6.7	43	92	6.4

Figure 5-8. Cruise Performance (Sheet 1 of 2)

MAXIMUM RATE-OF-CLIMB AT 2550 POUNDS**CONDITIONS:**

Flaps Up
Full Throttle

PRESS ALT FT	CLIMB SPEED KIAS	RATE OF CLIMB - FPM			
		-20°C	0°C	20°C	40°C
S.L.	74	855	785	710	645
2000	73	760	695	625	560
4000	73	685	620	555	495
6000	73	575	515	450	390
8000	72	465	405	345	285
10,000	72	360	300	240	180
12,000	72	255	195	135	---

NOTE:

1. Mixture leaned above 3,000 feet for maximum RPM.

Figure 5-6. Maximum Rate of Climb

TIME, FUEL AND DISTANCE TO CLIMB AT 2550 POUNDS

CONDITIONS:

Flaps Up
Full Throttle
Standard Temperature

PRESS ALT FT	CLIMB SPEED KIAS	RATE OF CLIMB FPM	FROM SEA LEVEL		
			TIME IN MIN	FUEL USED GAL	DIST NM
S.L.	74	730	0	0.0	0
1000	73	695	1	0.4	2
2000	73	655	3	0.8	4
3000	73	620	4	1.2	6
4000	73	600	6	1.5	8
5000	73	550	8	1.9	10
6000	73	505	10	2.2	13
7000	73	455	12	2.6	16
8000	72	410	14	3.0	19
9000	72	360	17	3.4	22
10,000	72	315	20	3.9	27
11,000	72	265	24	4.4	32
12,000	72	220	28	5.0	38

NOTES:

1. Add 1.4 gallons of fuel for engine start, taxi and takeoff allowance.
2. Mixture leaned above 3,000 feet for maximum RPM.
3. Increase time, fuel and distance by 10% for each 10°C above standard temperature.
4. Distances shown are based on zero wind.

Figure 5-7. Time, Fuel and Distance to Climb

CRUISE PERFORMANCE

CONDITIONS:

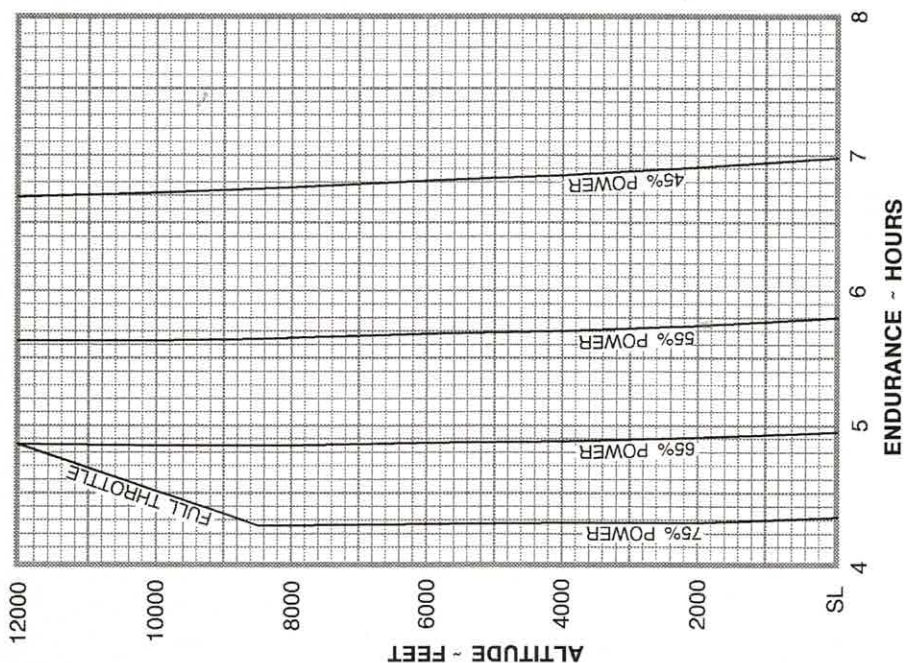
2550 Pounds
Recommended
Cruise)
Lean Mixture At All Altitudes (Refer to Section 4,

PRESS ALT FT	RPM	20°C BELOW STANDARD TEMP			STANDARD TEMPERATURE			20°C ABOVE STANDARD TEMP		
		% BHP	KTAS	GPH	% BHP	KTAS	GPH	% BHP	KTAS	GPH
8000	2700	83	125	11.1	77	124	10.4	71	123	9.7
	2650	78	122	10.5	72	122	9.9	67	120	9.3
	2600	74	120	10.0	68	119	9.4	64	117	8.9
	2500	65	114	9.1	61	112	8.6	57	111	8.1
	2400	58	108	8.2	54	106	7.8	51	104	7.4
	2300	52	101	7.5	48	99	7.1	46	97	6.8
	2200	46	94	6.8	43	92	6.5	41	90	6.2
10,000	2700	78	124	10.5	72	123	9.8	67	122	9.3
	2650	73	122	10.0	68	120	9.4	63	119	8.9
	2600	69	119	9.5	64	117	9.0	60	115	8.5
	2500	62	113	8.7	57	111	8.2	54	109	7.8
	2400	55	106	7.9	51	104	7.5	49	102	7.1
	2300	49	100	7.2	46	97	6.8	44	95	6.5
12,000	2650	69	121	9.5	64	119	8.9	60	117	8.5
	2600	65	118	9.1	61	116	8.5	57	114	8.1
	2500	58	111	8.3	54	109	7.8	51	107	7.4
	2400	52	105	7.5	49	102	7.1	46	100	6.8
	2300	47	98	6.9	44	95	6.6	41	92	6.3

Figure 5-8. Cruise Performance (Sheet 2 of 2)

ENDURANCE PROFILE
45 MINUTES RESERVE
53 GALLONS USABLE FUEL

CONDITIONS:
2550 Pounds
Recommended Lean Mixture for Cruise At All Altitudes
Standard Temperature

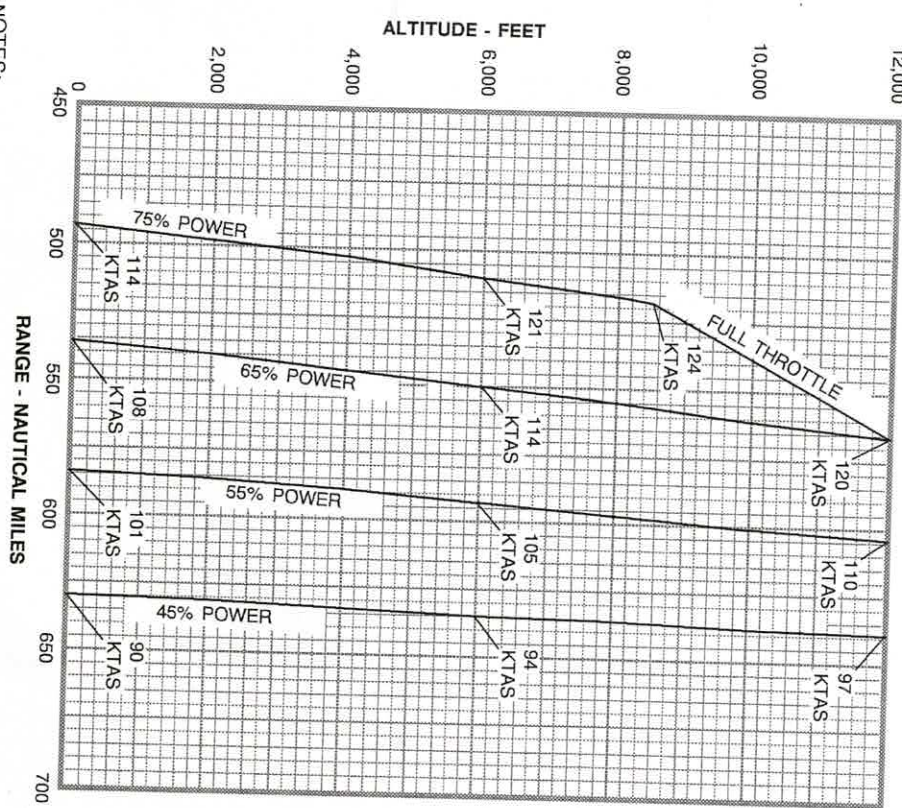


NOTE:
1. This chart allows for the fuel used for engine start, taxi, takeoff and climb, and the time during climb.

Figure 5-10. Endurance Profile

RANGE PROFILE
45 MINUTES RESERVE
53 GALLONS USABLE FUEL

CONDITIONS:
2550 Pounds
Recommended Lean Mixture for Cruise At All Altitudes
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.

Figure 5-9. Range Profile

SHORT FIELD LANDING DISTANCE
AT 2550 POUNDS

CONDITIONS:

Flaps 30°
Power Off
Maximum Braking
Paved, level, dry runway
Zero Wind
Speed at 50 Ft: 61 KIAS

Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst
S. L.	545	1290	565	1320	585	1350	605	1380	625	1415
1000	565	1320	585	1350	605	1385	625	1420	650	1450
2000	585	1355	610	1385	630	1420	650	1455	670	1490
3000	610	1385	630	1425	655	1460	675	1495	695	1530
4000	630	1425	655	1460	675	1495	700	1535	725	1570
5000	655	1460	680	1500	705	1535	725	1575	750	1615
6000	680	1500	705	1540	730	1580	755	1620	780	1660
7000	705	1545	730	1585	760	1625	785	1665	810	1705
8000	735	1585	760	1630	790	1670	815	1715	840	1755

NOTES:

1. Short field technique as specified in Section 4.
2. Decrease distances 10% for each 9 knots headwind. For operation with tail winds up to 10 knots, increase distances by 10% for each 2 knots.
3. For operation on dry, grass runway, increase distances by 45% of the "ground roll" figure.
4. If landing with flaps up, increase the approach speed by 9 KIAS and allow for 35% longer distances.

Figure 5-11. Short Field Landing Distance

SHORT FIELD LANDING DISTANCE
AT 2550 POUNDS

CONDITIONS:

Flaps 30°
Power Off
Maximum Braking
Paved, level, dry runway
Zero Wind
Speed at 50 Ft: 61 KIAS

Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst
S. L.	545	1290	565	1320	585	1350	605	1380	625	1415
1000	565	1320	585	1350	605	1385	625	1420	650	1450
2000	585	1355	610	1385	630	1420	650	1455	670	1490
3000	610	1385	630	1425	655	1460	675	1495	695	1530
4000	630	1425	655	1460	675	1495	700	1535	725	1570
5000	655	1460	680	1500	705	1535	725	1575	750	1615
6000	680	1500	705	1540	730	1580	755	1620	780	1660
7000	705	1545	730	1585	760	1625	785	1665	810	1705
8000	735	1585	760	1630	790	1670	815	1715	840	1755

NOTES:

1. Short field technique as specified in Section 4.
2. Decrease distances 10% for each 9 knots headwind. For operation with tail winds up to 10 knots, increase distances by 10% for each 2 knots.
3. For operation on dry, grass runway, increase distances by 45% of the "ground roll" figure.
4. If landing with flaps up, increase the approach speed by 9 KIAS and allow for 35% longer distances.

Figure 5-11. Short Field Landing Distance

TEMPORARY REVISION FOR CESSNA PILOT'S OPERATING HANDBOOK AND FAA APPROVED AIRPLANE FLIGHT MANUAL

CENTER OF GRAVITY LIMITS

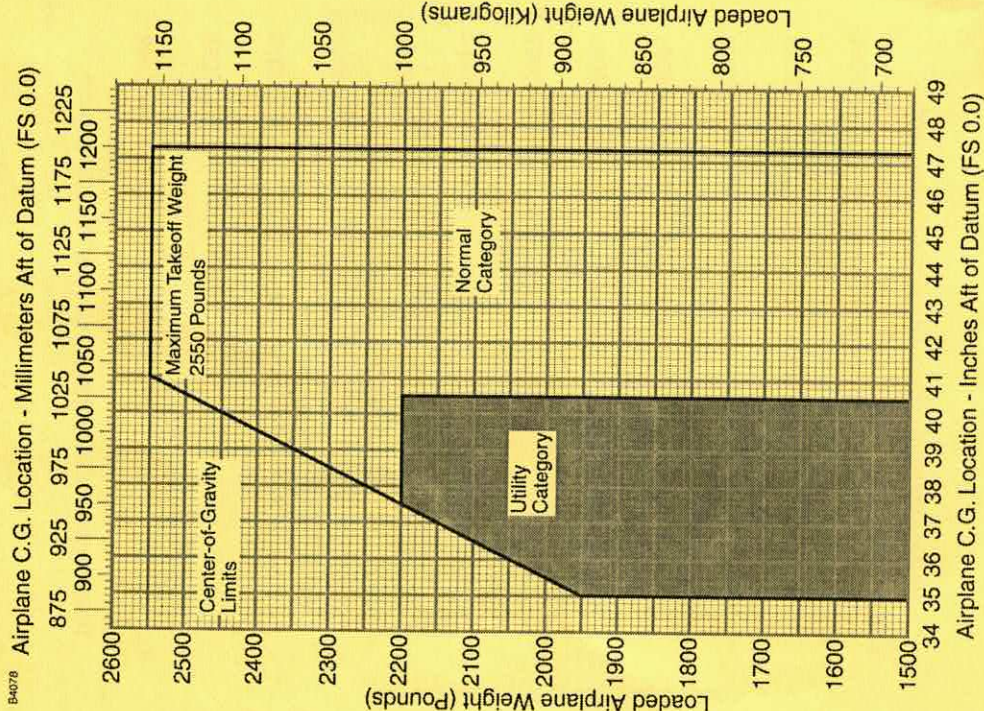


Figure 6-8

172SPHUS-05 TR03

LOCATING CG WITH AIRPLANE ON LANDING GEAR

FORMULA for Longitudinal CG:

$$(X) = (A) - \frac{(\text{NOSE GEAR NET WEIGHT}) () \times (B)}{\text{NOSE AND MAIN LANDING GEAR WEIGHT TOTAL} ()} = () \text{ INCHES AFT OF DATUM}$$

MEASURING A AND B

MEASURE A AND B PER PILOT'S OPERATING HANDBOOK INSTRUCTIONS TO ASSIST IN LOCATING CG WITH AIRPLANE WEIGHED ON LANDING GEAR.

LOCATING PERCENT MAC

FORMULA for Percent MAC:

$$\text{CG Percent MAC} = \frac{(\text{CG Arm of Airplane}) - 25.90}{0.5880}$$

LEVELING PROVISIONS

LONGITUDINAL - LEFT SIDE OF TAILCONE AT FS 108.00 & 142.00

AIRPLANE AS WEIGHED TABLE

POSITION	SCALE READING	SCALE DRIFT	TARE	NET WEIGHT
LEFT SIDE				
RIGHT SIDE				
NOSE				
AIRPLANE TOTAL AS WEIGHED				

BASIC EMPTY WEIGHT AND CENTER-OF-GRAVITY TABLE

ITEM	WEIGHT POUNDS	CG ARM (INCHES)	MOMENT (INCH-POUNDS /1000)
AIRPLANE (CALCULATED OR AS WEIGHED) (INCLUDES ALL UNDRAINABLE FLUIDS AND FULL OIL)			
DRAINABLE UNUSABLE FUEL AT 6.0 POUNDS PER GALLON - (3 GALLONS)	18.0	46.0	0.83
BASIC EMPTY WEIGHT			

Figure 6-1. Airplane Weighing Form (Sheet 2 of 2)

ITEM DESCRIPTION	WEIGHT AND MOMENT TABULATION			
	SAMPLE AIRPLANE		YOUR AIRPLANE	
	Weight (lbs.)	Moment (Lb-ins. /1000)	Weight (lbs.)	Moment (Lb-ins. /1000)
1. Basic Empty Weight (Use the data pertaining to your airplane as it is presently equipped. Includes unusable fuel and full oil)				
2. Usable Fuel (At 6 Lbs./Gal.)	1642	62.6		
53 Gallons Maximum				
30 Gallons (Quantity used for example)	180	8.6		
3. Pilot and Front Passenger (Station 34 to 46)	340	12.6		
4. Rear Passengers	340	24.8		
5. *Baggage Area 1 (Station 82 to 108; 120 Lbs. Max.)				
6. *Baggage Area 2 (Station 108 to 142; 50 Lbs. Max.)	56	4.6		
7. RAMP WEIGHT AND MOMENT (add columns)	2558	113.2		
8. Fuel allowance for engine start, taxi and runup	-8.0	-0.4		
9. TAKEOFF WEIGHT AND MOMENT (Subtract Step 8 from Step 7)	2550	112.8		
10. Locate this point (2550 at 112.8) on the Center of Gravity Moment Envelope, and since this point falls within the envelope, the loading is acceptable. The maximum allowable combined weight capacity for baggage areas 1 and 2 is 120 pounds.				

Figure 6-5. Sample Loading Problem (Sheet 1 of 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.

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

NOTES: 1. The usable fuel C.G. arm for integral tanks is located at station 48.0.

2. The rear cabin wall (approximate station 108) or aft baggage wall (approximate station 142) can be used as convenient interior reference points for determining the location of baggage area fuselage stations.

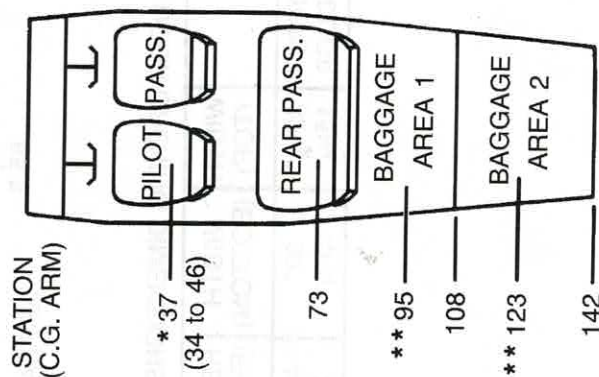
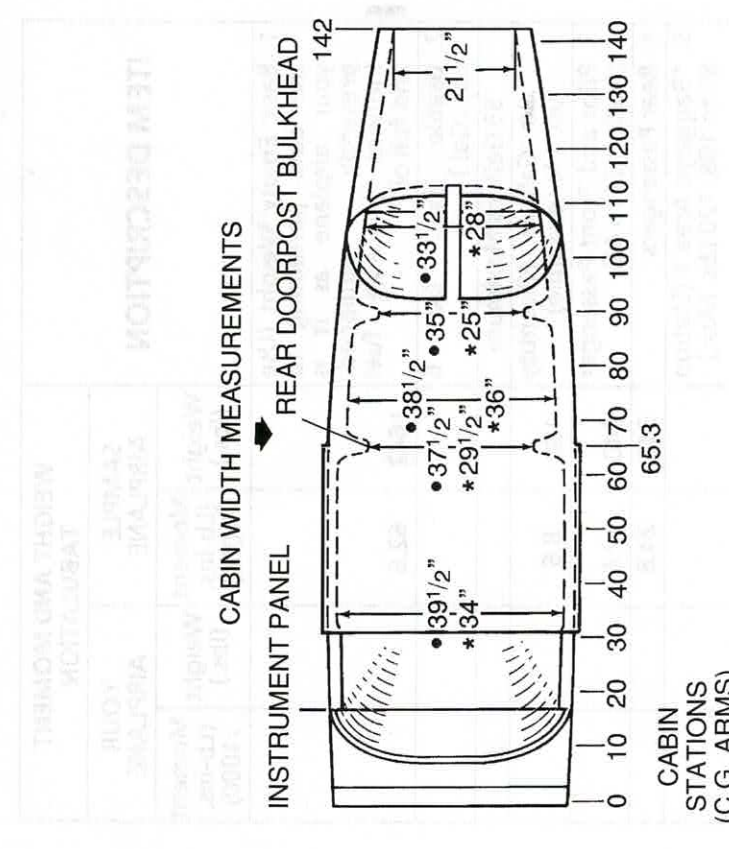
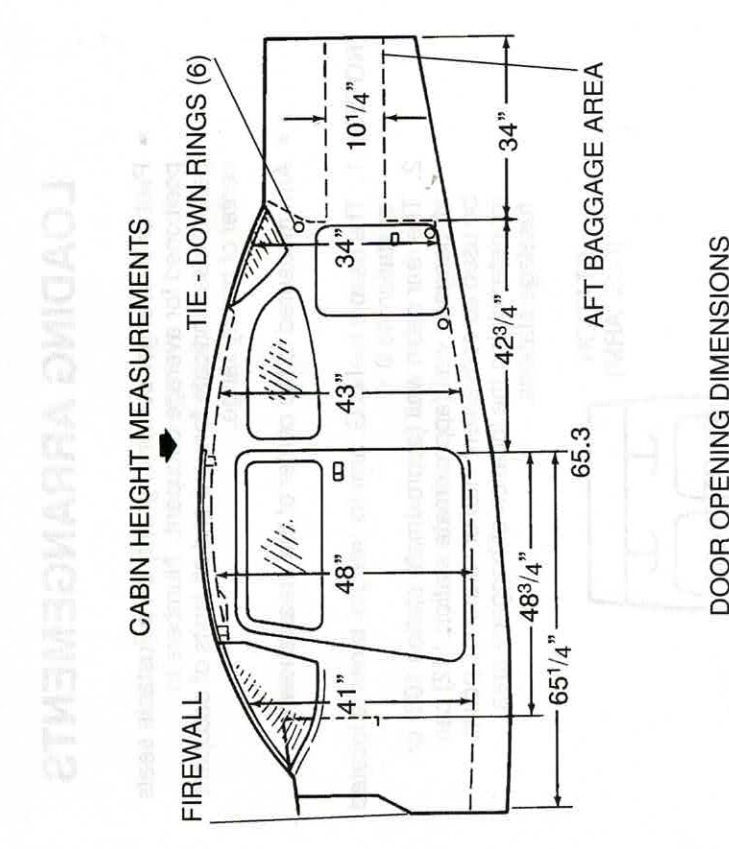


Figure 6-3. Loading Arrangements



- LWR WINDOW LINE
- * CABIN FLOOR



DOOR OPENING DIMENSIONS

	WIDTH (TOP)	WIDTH (BOTTOM)	HEIGHT (FRONT)	HEIGHT (REAR)
CABIN DOORS	32 1/2"	37"	40 1/2"	39"
BAGGAGE DOOR	15 1/4"	15 1/4"	22"	21"

Figure 6-4. Internal Cabin Dimensions (Sheet 1 of 2)

0585X1023

Figure 6-4. Internal Cabin Dimensions (Sheet 2 of 2)

0585X1023

SECTION 6
WEIGHT & BALANCE / EQUIPMENT LIST

CESSNA
MODEL 172S

SECTION 6
WEIGHT & BALANCE / EQUIPMENT LIST

ITEM NO	EQUIPMENT LIST DESCRIPTION	REF DRAWING	WT LBS	ARM INS.
25-15-S	REAR SEAT RESTRAINT SYSTEM, INERTIA REEL	2000031-11,-12	5.2	90.0
25-16-O	REAR SEAT RESTRAINT SYSTEM, MANUAL ADJUST	2000031-11,-12	4.0	90.0
25-17-S	PADDED GLARESHIELD	0514230-1	1.2	21.0
25-18-S	SUN VISORS	0514166-2	1.1	32.8
25-19-S	SUN VISOR INSTL - MILLENNIUM	0519004-1		
25-20-S	BAGGAGE RESTRAINT NET	2015009-7	0.5	95.0
25-21-S	CARGO TIE DOWN RINGS	0515055-6	0.2	95.0
25-22-S	PILOT'S OPERATING CHECKLIST (STOWED IN MAP CASE)	0500835-1	0.3	14.3
25-23-R	PILOT'S OPERATING HANDBOOK AND FAA APPROVED AIRPLANE FLIGHT MANUAL (STOWED IN PILOT'S SEAT BACK CASE)	0500835-1	1.2	50.0
25-24-S	FUEL SAMPLING CUP (STOWED)	S2107-1	0.1	14.3
25-25-S	TOW BAR, NOSE GEAR (STOWED)	0501019-1	1.7	124.0
25-26-R	EMERGENCY LOCATOR TRANSMITTER - ELT TRANSMITTER	3940401-1	3.2*	101.0*
	- ANTENNA AND CABLE ASSY	3000-11	1.8	113.3
		3003-45	0.5	122.0
26-01-S	FIRE EXTINGUISHER INSTALLATION - FIRE EXTINGUISHER	0501011-2	5.3*	43.8*
	- MOUNTING CLAMP	C421001-0201	4.8	44.0
		1290010-1	0.5	42.2
27-01-S	RIGHT SEAT CONTROLS - COPILOT CONTROL WHEEL	0506009-1	6.1*	13.7*
	- COPILOT RUDDER & BRAKE PEDAL INSTL	0513576-4	2.6	26.0
		0510402-16	1.1	6.8
27-02-S	PILOTS CONTROL WHEEL WITH MAP LIGHT, MIC SWITCH AND JACK	0513576-5	0.2	22.0
28-01-R	FUEL QUANTITY INDICATORS			
28-02-R	AUXILIARY FUEL PUMP (UNDER FLOORBOARD)	S3281-2	0.4	16.5
		5100-00-1	1.9	9.5
31-01-S	DIGITAL ELECTRONIC CLOCK/OAT	M803B-2-0/28V-B	0.7	16.5
31-02-S	PILOT'S OPERATING CHECKLIST (STOWED IN MAP CASE)	0500835-1	0.3	14.3
31-03-R	ANNUNCIATOR	C664503-0103	0.5	9.1
31-04-R	PNEUMATIC STALL WARNING SYSTEM	CSEWCA-01	0.5	16.0
		0523112-2	0.4	28.5

Figure 6-9. Equipment List Description (Sheet 3 of 8)

ITEM NO	EQUIPMENT LIST DESCRIPTION	REF DRAWING	WT LBS	ARM INS.
32-01-R	WHEEL BRAKE AND TIRE, 6.00 X 6 MAIN - WHEEL ASSY, CLEVELAND (EACH)	0541200-9,-10	34.4*	57.8*
	- BRAKE ASSY, CLEVELAND (EACH)	C163001-0104	6.2	58.2
	- TIRE, 6-PLY, 6.00 X 6 BLACKWALL	C163003-1111	1.8	54.5
	- TUBE (EACH)	C262003-0204	7.9	58.2
32-02-R	WHEEL AND TIRE, 5.00 X 5 NOSE - WHEEL ASSY, CLEVELAND	0543082-17	9.5*	-6.8*
	- TIRE, 6-PLY, 5.00 X 5 BLACKWALL	1241156-12	3.5	-6.8
	- TUBE	C262003-0202	4.6	-6.8
32-03-A	WHEEL FAIRINGS AND INSTALLATION - NOSE WHEEL FAIRING	C262023-0101	1.4	-6.8
	- MAIN WHEEL FAIRINGS (SET OF 2)	0541225-1	16.5*	46.1*
	- BRAKE FAIRINGS (SET OF 2)	0543079-3	3.5	-3.5
	- MOUNTING PLATE (SET OF 2)	0541223-16,-17	10.1	61.1
32-04-O	PREMIUM TIRES, 6.00 X 6, 160 MPH RATING, EXCHANGE WITH STANDARD TIRES (NET CHANGE)	0541224-1,-2	1.1	55.6
		0541220-1,-2	0.8	59.5
		0501166-1	4.1	47.1
33-01-S	MAP LIGHT IN CONTROL WHEEL (PART OF 27-02-S)	0560059	(0.2)	(21.5)
33-02-S	UNDER WING COURTESY LIGHTS (SET OF 2)	0521101-8	0.5	61.0
33-03-S	NAVIGATION LIGHT DETECTORS	1221201-3,-4	0.0	40.8
33-04-S	FLASHING BEACON	0506003-6	1.4	204.7
33-05-S	WING TIP STROBE LIGHT	0501027-6	3.4	43.3
33-06-S	LANDING AND TAXI LIGHT INSTL IN WING	0523029-7	2.4	28.7
34-01-R	INDICATOR, AIRSPEED	S3225-6	0.6	16.2
34-02-S	ALTERNATE STATIC AIR SOURCE	0501017-2	0.2	15.5
34-03-R	SENSITIVE ALTITUDE	S3288-1	0.9	14.0
34-04-S	BLIND ALTITUDE ENCODER INSTL	3930402-1	0.9	11.0
34-05-R	COMPASS INSTL, MAGNETIC	0513262-3	0.5	14.0
34-06-S	GYRO, INSTALLATION, REQUIRES 37-01-S - DIRECTIONAL GYRO	0501135-1	6.0*	13.0*
	- ATTITUDE GYRO	S3330-1	2.5	14.0
	- HOSES AND MISC HARDWARE	S3326-1	2.1	14.0
34-07-O	GYRO INSTL, REQUIRES 37-01-S & USED WITH 22-02-A OR 22-03-A - ATTITUDE GYRO	0501135-1	1.5	10.0
	- DIRECTIONAL GYRO	3900005	6.5*	13.1*
	- HOSES & MISC HARDWARE	S3326-1	2.3	14.0
		S3330-2	2.8	14.0
		3900005	1.5	10.0

Figure 6-9. Equipment List Description (Sheet 4 of 8)

ITEM NO	EQUIPMENT LIST DESCRIPTION	REF DRAWING	WT LBS	ARM INS.
23-03-A	NAV/COM #2 INSTALLATION - WITH G.S. - KX 155A NAV/COM WITH GLIDESLOPE - KI 209A INDICATOR WITH GLIDESLOPE - NAV ANTENNA WITH G.S. COUPLER - CO-AX COM ANTENNA	069-01032-0101 066-03056-0003	6.5*	17.1*
23-04-A	AUDIO/INTERCOM/MARKER BEACON INSTL - KMA-26 AUDIO/RECEIVER PANEL - HARDWARE & CABLE ASSEMBLY	3921101-1 3930407-1 066-01155-0201 3900003-2	0.2 0.2 1.7 0.8	3.5 19.7* 14.8 30.0
23-05-S	BASIC AVIONICS EQUIP/LESS BLACK BOXES - MARKER BEACON ANTENNA INSTL - FUSELAGE AND AUDIO WIRING - MICROPHONE INSTL, HAND HELD - AVN COOLING FAN INSTL - BASIC CIRCUIT BREAKER PANEL - AVN GROUND INSTL - MISCELLANEOUS HARDWARE	3960188-1 3921114-1 3970124-9 3930400-1 3930417-2 3940357-1	11.3* 0.5 7.9 0.2 1.2 0.4 0.2 0.9	27.4* 131.0 26.5 18.0 5.9 16.5 15.0 16.0
24-01-R	24 - ELECTRICAL POWER ALTERNATOR, 28 VOLT 60 AMP	9910591-11	10.0	-29.0
24-02-R	BATTERY, 24 VOLT, 12.75 A.H. MANIFOLD TYPE	C614002-0101	23.2	-5.0
24-03-R	POWER JUNCTION BOX (PRECISION AIRMOTIVE CORP. MC01-2A) INCLUDES: - ALTERNATOR CONTROL UNIT- AC2101 - MASTER CONTACTOR P/N X61-0007 - STARTER CONTACTOR P/N X61-0012 - AMMETER TRANSDUCER P/N CS3100	MC01-2A 1270101-1 1270101-1 3930400-1 3930417-2	6.4* 0.2 0.7 0.7 0.1	2.5* 3.0 2.4 2.4 3.0
25-01-R	25 - EQUIPMENT/FURNISHINGS PILOT SEAT, CLOTH COVER	0514211-1	34.3	41.5
25-02-O	PILOT SEAT, LEATHER COVER	0514211-5	35.0	41.5
25-03-O	PILOT SEAT, LEATHER/VINYL COVER	0514211-8	34.8	41.5
25-04-O	PILOT SEAT, MILLENNIUM COVER	0514211-11	34.3	41.5
25-05-S	COPILOT SEAT, CLOTH COVER	0512211-1	34.3	41.5
25-06-O	COPILOT SEAT, LEATHER COVER	0514211-5	35.0	41.5
25-07-O	COPILOT SEAT, LEATHER/VINYL COVER	0512211-8	34.8	41.5
25-08-O	COPILOT SEAT, MILLENNIUM COVER	0512211-11	43.3	79.5
25-09-S	REAR SEAT, CLOTH COVER	0514219-1	44.7	79.5
25-10-O	REAR SEAT, LEATHER COVER	0514219-2	44.3	79.5
25-11-O	REAR SEAT, LEATHER/VINYL COVER	0514219-3	44.3	79.5
25-12-O	REAR SEAT, MILLENNIUM COVER	0514219-4	52.0	54.0
25-13-R	CREW RESTRAINT SYSTEM, INERTIA REEL	2000031-9,-10	4.0	54.0
25-14-O	CREW RESTRAINT SYSTEM, MANUAL ADJUST	2000031-9,-10	4.0	54.0

Figure 6-9. Equipment List Description (Sheet 2 of 8)

ITEM NO	EQUIPMENT LIST DESCRIPTION	REF DRAWING	WT LBS	ARM INS.
34-08-O	GYRO INSTL, REQUIRES 37-01-S & USED WITH 34-14-O - ATTITUDE GYRO - HOSES & MSIC HARDWARE	3900016 S3326-1 3900016	3.9*	11.8*
34-09-S	TURN COORDINATOR INDICATOR	S3291-1	2.3	14.0
34-10-S	VERTICAL SPEED INDICATOR	S3327-1	1.5	10.0
34-11-A	ADF INSTALLATION - KR 87 ADF RECEIVER - KI 227 ADF INDICATOR - ADF ANTENNA - ADF CABLE ASSEMBLY	3930408-1 066-01072-0014 066-03063-0000 3960187-1 3922102-1	1.0 0.8 10.4* 3.2 2.3	15.8 15.7 26.9* 11.4 29.0
34-12-A	GPS INSTALLATION - KING GPS-VFR, KLN-89 - GPS ANTENNA - GPS CABLE ASSEMBLY	3930408-1 066-01148-1111 3960190-1	4.4* 3.3 0.3	15.3* 12.4 43.5
34-13-S	MODE C TRANSPONDER INSTL - KT 76C TRANSPONDER - TRANS CAL BLIND ENCODER - TRANSPONDER ANTENNA - HARDWARE & CABLE ASSEMBLY	3930404-1 066-01156-0101 3930402-1 3960191-1 3923102-1	4.1* 2.4 0.9 0.2 0.6	18.7* 13.5 10.9 85.3 28.9
34-14-O	HORIZONTAL SITUATION INDICATOR INSTL - NET WT INCREASE, REQUIRES 37-01-S - HSI - GYRO SLAVING METER - FLUX DETECTOR INSTL - REMOTE DIR GYRO-SLAVED - NAV CONVERTER INSTL - WIRING - STD GYRO INSTL - REMOVED - GYRO INSTL FOR HSI INSTALLED - REMOVE #1 NAV INDICATOR	3900016-1 066-03046-0001 071-01242-0006 3940264 3940265 3940266 3900016 0501135 0501171	15.3* 3.4 0.3 0.7 5.1 1.6 8.0 -13.6 -11.0 -1.2	84.1* 13.4 15.8 52.6 112.5 117.0 60.7 3.6 1.6 13.9
37-01-S	37 - VACUUM DUAL PUMP ENGINE DRIVEN VACUUM SYSTEM - AIRBORNE VACUUM PUMP - AIRBORNE VACUUM PUMP - COOLING SHROUD - COOLING SHROUD - FILTER INSTALLATION - COMBINATION VACUUM INDICATOR/AMMETER - VACUUM RELIEF VALVE - MANIFOLD	0501135 E211CC E212CW 1201998-1 1201998-1 1201075-2 S3280-1 2H3-48 1H5-25 S3280-1	5.4* 1.9 1.9 0.1 0.1 0.3 0.3 0.3 0.5 0.3	-1.8* -6.5 -3.9 -6.5 -3.9 5.3 14.3 4.7 -0.2 14.3
37-02-R	COMBINATION VACUUM GAGE/AMMETER	S3280-1	0.3	14.3

Figure 6-9. Equipment List Description (Sheet 5 of 8)

ITEM NO	EQUIPMENT LIST DESCRIPTION	REF DRAWING	WT LBS	ARM INS.
98-02-A	NAV I AVIONICS PKG (NET CHANGE OVER STANDARD AVIONICS PKG) - 34-10-A -GPS INSTALLATION - 23-03-A -NAV/COM INSTL WITH G.S. - 34-09-A -ADF INSTALLATION	3900004-1 3930408-1 3930408-1 3930408-1	21.3* 4.4 6.5 10.4	21.5* 15.3 17.1 26.9
98-03-A	NAV II AVIONICS PKG (NET CHANGE OVER STANDARD AVIONICS PKG) - 98-02-A -NAV I AVN PKG - 22-02-A -SINGLE AXIS AUTOPILOT	3900005-1 3900004-1 3900005-1	28.5* 21.3 7.2	27.1* 21.5 43.6
98-04-A	NAV II WITH HSI AVIONICS PKG (NET CHANGE OVER STANDARD AVIONICS PKG) - 98-02-A -NAV I AVN PKG - 22-02-A -SINGLE AXIS AUTOPILOT - 34-12-O -HSI GYRO INSTL	3900016 3900004-1 3900005-1 3900016-1	43.8* 21.3 7.2 15.3	47.0* 21.5 43.6 84.1
98-05-A	NAV III WITH HSI AVIONICS PKG (NET CHANGE OVER STANDARD AVIONICS PKG) - 98-02-A -NAV I AVN PKG - 22-03-A -2-AXIS AUTOPILOT - 34-12-O -HSI GYRO INSTL	3900018 3900004-1 3900003 3900016-1	56.3* 21.3 19.7 15.3	67.5* 21.5 104.4 84.1
98-06-A	NAV III WITHOUT HSI AVIONICS PKG (NET CHANGE OVER STANDARD AVIONICS PKG) - 98-02-A -NAV I AVN PKG - 22-03-A -2-AXIS AUTOPILOT	3900021 3900004-1 3900003	41.0* 21.3 19.7	61.3* 21.5 104.4

Figure 6-9. Equipment List Description (Sheet 8 of 8)

ITEM NO	EQUIPMENT LIST DESCRIPTION	REF DRAWING	WT LBS	ARM INS.
53-01-S	53 - FUSELAGE REFUELING STEPS AND HANDLE INSTL	0513415-2	1.7	16.3
56-01-S	56 - WINDOWS WINDOW - RIGHT HAND DOOR, OPENABLE	0517001-40	5.8*	48.5*
56-02-S	WINDOW - LEFT HAND DOOR, OPENABLE	0517001-39	5.8*	48.5*
57-01-O	57 - WINGS HEAVY DUTY FLAPS, WT SHOWN NET CHG - TWO (2) FLAPS EXCHANGED - ONE (1) FLAP EXCHANGED	0501165 0523902 0523902	--- 2.2 1.1	--- 83.2 83.2
61-01-R	61 - PROPELLER FIXED PITCH PROPELLER INSTALLATION - MCCAULEY 76 INCH PROPELLER - MCCAULEY 3.5 INCH PROPELLER - SPACER	0550320-11 1A170E/JHA7660 C5464	38.8* 35.0 3.6	-38.2* -38.4 -36.0
61-02-R	SPINNER INSTALLATION, PROPELLER - SPINNER DOME ASSEMBLY - FWD SPINNER BULKHEAD - AFT SPINNER BULKHEAD	0550320-11 0550236-14 0552231-1 0550321-10	1.8* 1.0 0.3 0.4	-41.0* -42.6 -40.8 -37.3
61-03-O	POLISHED SPINNER - MILLENNIUM INSTL (NET CHANGE)	0550371-1	0.0	-41.0*
71-01-R	71 - POWERPLANT AIR INTAKE FILTER, DONALDSON	P198281	0.3	-27.5
71-02-S	WINTERIZATION KIT INSTALLATION (STOWED) (INSTALLED ARM SHOWN) - BREATHER TUBE INSULATION - COWL INLET COVERS (INSTALLED) - COWL INLET COVERS (STOWED)	0501128-3 0552011 0552229-3,-4 0552229-3,-4	0.8* 0.4 0.3 0.3	-20.3* -13.8 -32.0 95.0
71-03-R	ENGINE, LYCOMING IO-360-L2A - FUEL INJECTOR, PAC RSA-SAD1 4371 (SET OF 2) - MAGNETOS & HARNESS, SLICK - OIL FILTER AND ADAPTER (CHAMPION) - SPARK PLUGS (CHAMPION) - STARTER, LAMAR 31B22207	0550365-1 CH48110 0550372-1	297.8* 7.6 9.0 2.5 1.9 11.2 0.0	-18.6* -13.9 -5.0 -18.5 -13.9 -23.0 -18.6

Figure 6-9. Equipment List Description (Sheet 6 of 8)

SECTION 6
WEIGHT & BALANCE / EQUIPMENT LIST

CESSNA
MODEL 172S

ITEM NO	EQUIPMENT LIST DESCRIPTION	REF DRAWING	WT LBS	ARM INS.
73-01-S	73 - ENGINE FUEL & CONTROL EGT/FUEL FLOW INDICATOR	S3277-4	0.6	7.8
77-01-R	77 - ENGINE INDICATING RECORDING TACHOMETER INSTALLATION	S3329-5	1.0	12.1
78-01-R	78 - EXHAUST EXHAUST SYSTEM INSTALLATION - MUFFLER & TAILPIPE WELD ASSY - SHROUD ASSEMBLY, MUFFLER HEATER	9954100-1 9954000-2 9954100-3	16.3* 4.6 0.8	-20.0* -22.7 -22.7
79-01-R	79 - OIL OIL COOLER INSTALLATION	0550365-1	3.3*	-11.0*
79-02-R	- OIL COOLER, STEWART WARNER OIL PRESSURE & TEMPERATURE INDICATOR	10877A S3279-1	2.3 0.4	-11.0 16.5
90-01-A	90 - MISCELLANEOUS MILLENNIUM EQUIPMENT OPTION - 11-04-O MILLENNIUM EXTERIOR STYLING - 25-08-O SUNVISOR INSTALLATION MILLENNIUM - MILLENNIUM UPHOLSTERY OPTION - 25-03-O PILOT'S LEATHER/VINYL SEATS - SIDEWALL INSERT MILLENNIUM UPHOLSTERY - MILLENNIUM FLOOR MATS (SET OF 2) - STORAGE CONSOLE INSTALLATION - 32-04-O PREMIUM TIRE INSTL - 61-03-O POLISHED SPINNER INSTL - 72-02-O ENGINE INSTL - POLISHED FASTENER INSTL - MILLENNIUM CONTROL WHEEL PAD	0501300-1, -2 0504055-1, -2 0519004-1 0519005-1 0519005-1 0519006-1 0519005-1 0519005-1 0519005-2 0501166-1 0550371-1 0550372-1 0552236-1 1219012-1	10.5 0.0 2.1 2.3 4.1 0.0 0.0 0.0	39.1 95.4 15.0 27.0 47.1 -41.0* -18.6
98-01-S	98 - AVIONICS PACKAGES STANDARD AVIONICS PACKAGE - 22-01-S -WING LEVELER PROVISIONS - 23-05-S -BASIC AVIONICS INSTL - 23-04-S -MARKER BEACON/INTERCOM INSTL - 23-02-S -NAV/COM #1 INSTALLATION - 34-11-S -MODE C TRANSPONDER INSTL	3900003-1 3900003 3900003-1 3930407-1 3930407-1 3930407-1	28.0 2.2 11.3 2.5 7.9 4.1	32.2 23.0 27.4 19.7 52.7 18.7

Figure 6-9. Equipment List Description (Sheet 7 of 8)

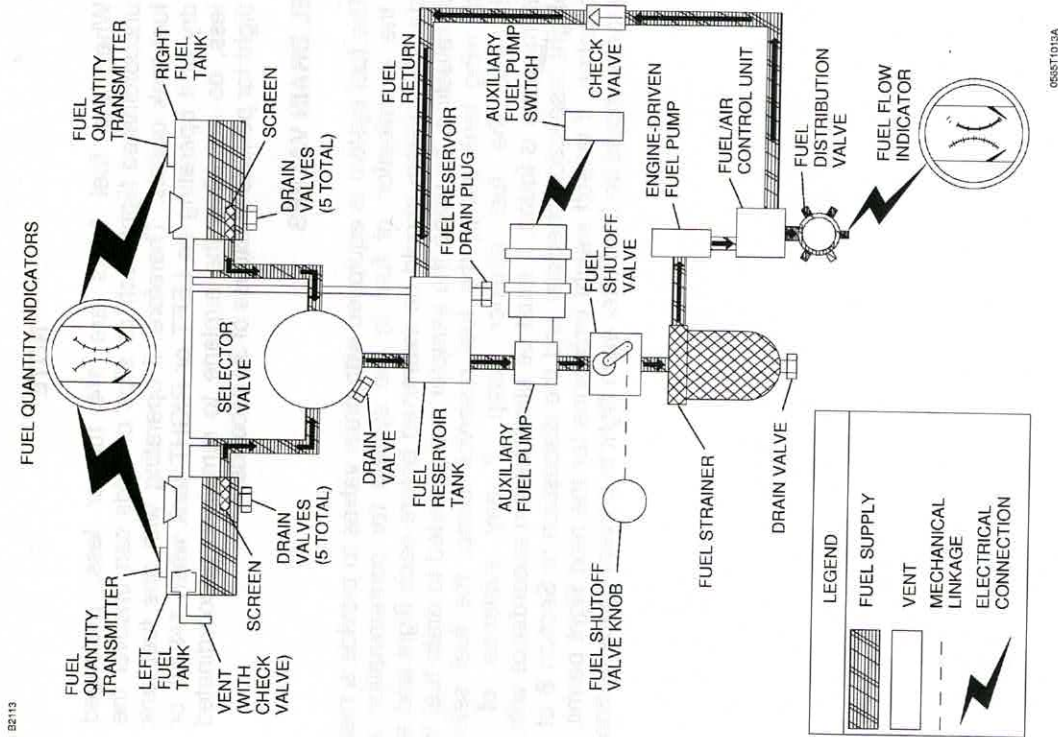


Figure 7-6. Fuel System Schematic
(Sheet 2 of 2)
172S9491 and On
And airplanes incorporating MK172-28-01.

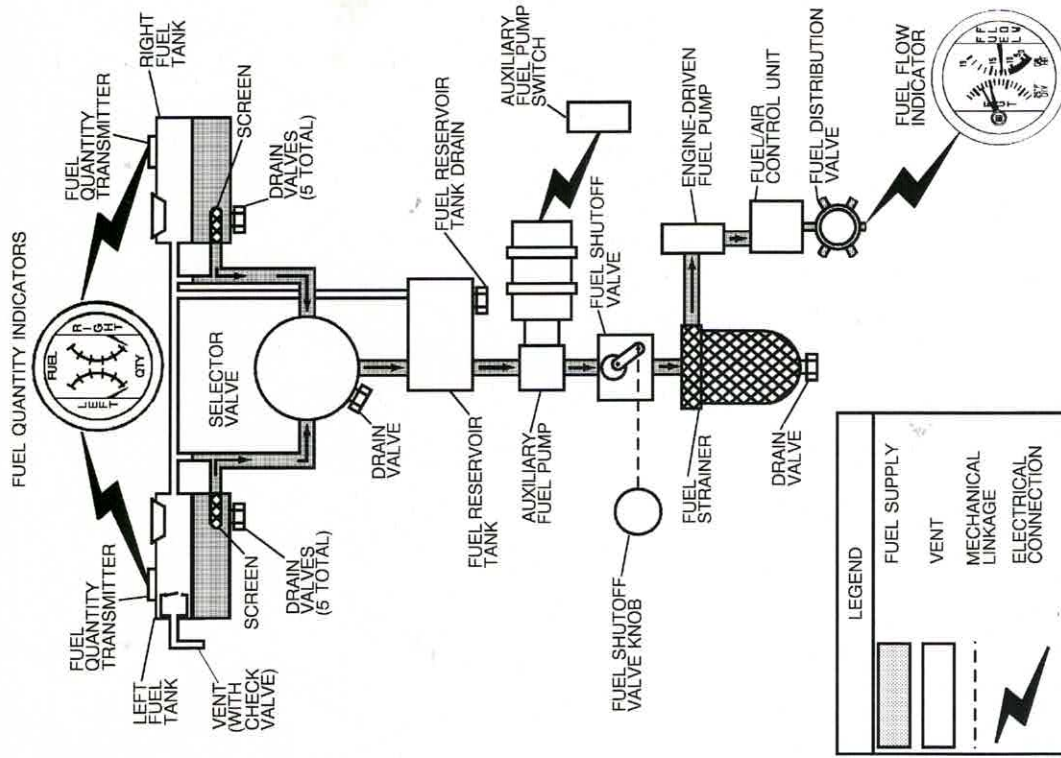


Figure 7-6. Fuel System Schematic
(Sheet 1 of 2)
172S8001 thru 172S9490

BRAKE SYSTEM

The airplane has a single-disc, hydraulically actuated brake on each main landing gear wheel. Each brake is connected, by a hydraulic line, to a master cylinder attached to each of the pilot's rudder pedals. The brakes are operated by applying pressure to the top of either the left (pilot's) or right (copilot's) set of rudder pedals, which are interconnected. When the airplane is parked, both main wheel brakes may be set by utilizing the parking brake which is operated by a handle under the left side of the instrument panel. To apply the parking brake, set the brakes with the rudder pedals, pull the handle aft, and rotate it 90° down.

For maximum brake life, keep the brake system properly maintained, and minimize brake usage during taxi operations and landings.

Some of the symptoms of impending brake failure are: gradual decrease in braking action after brake application, noisy or dragging brakes, soft or spongy pedals, and excessive travel and weak braking action. If any of these symptoms appear, the brake system is in need of immediate attention. If, during taxi or landing roll, braking action decreases, let up on the pedals and then reapply the brakes with heavy pressure. If the brakes become spongy or pedal travel increases, pumping the pedals should build braking pressure. If one brake becomes weak or fails, use the other brake sparingly while using opposite rudder, as required, to offset the good brake.

ELECTRICAL SYSTEM

The airplane is equipped with a 28-volt, direct current electrical system (Refer to Figure 7-7). The system is powered by a belt-driven, 60-amp alternator and a 24-volt battery, located on the left forward side of the firewall. Power is supplied to most general electrical circuits through a split primary bus bar, with an essential bus wired between the two primaries to provide power for the master switch, annunciator circuits and interior lighting.

Each primary bus bar is also connected to an avionics bus bar via a single avionics master switch. The primary buses are on anytime the master switch is turned on, and are not affected by starter or external power usage. The avionics buses are on when the master switch and avionics master switch are in the ON position.

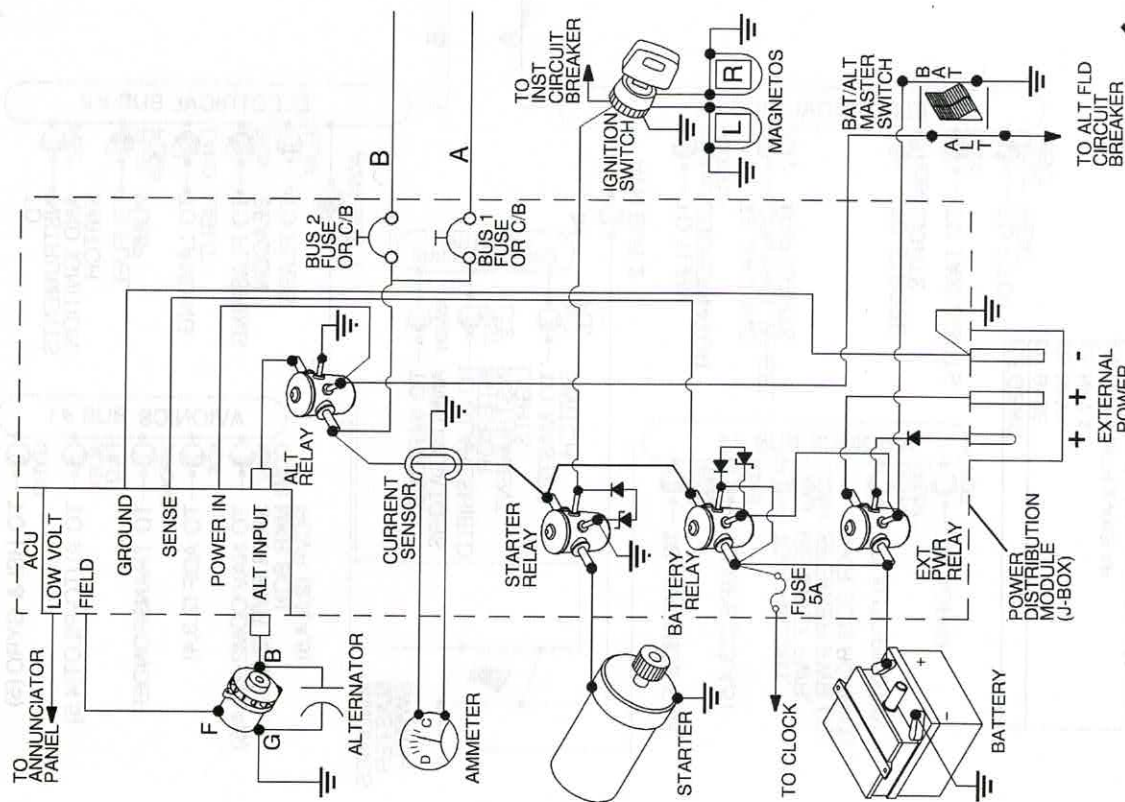
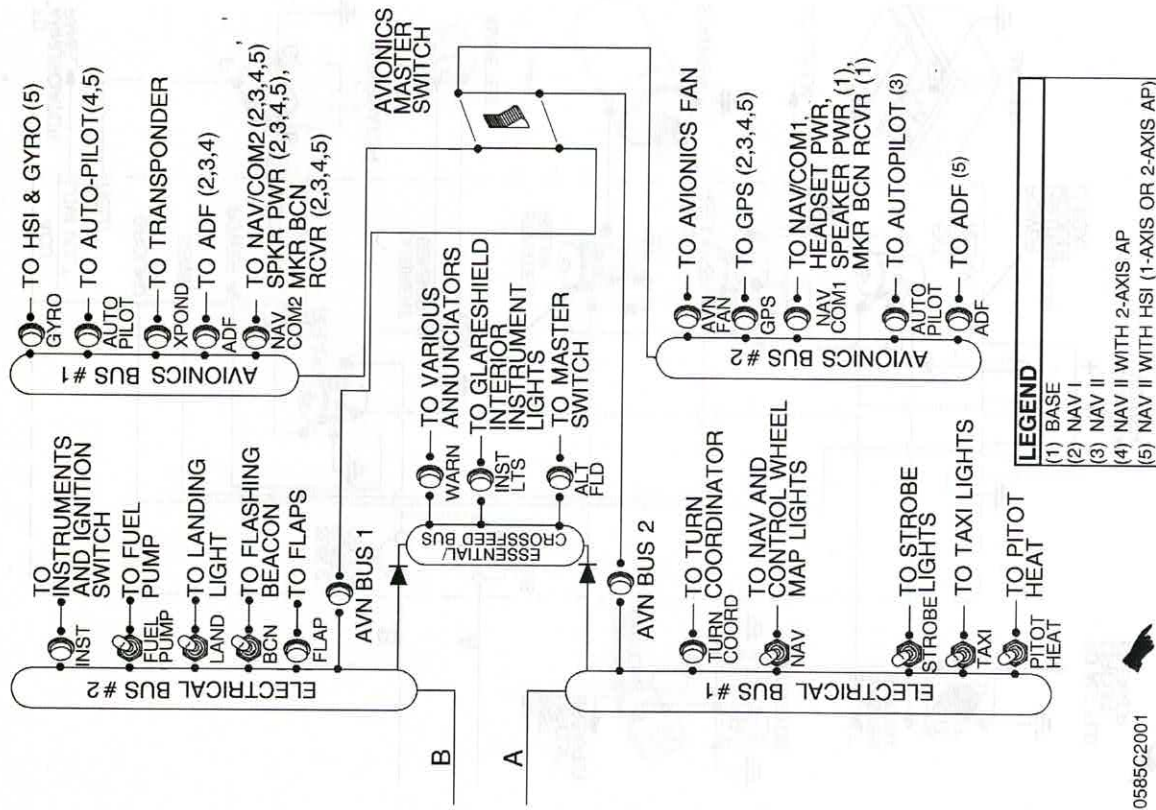
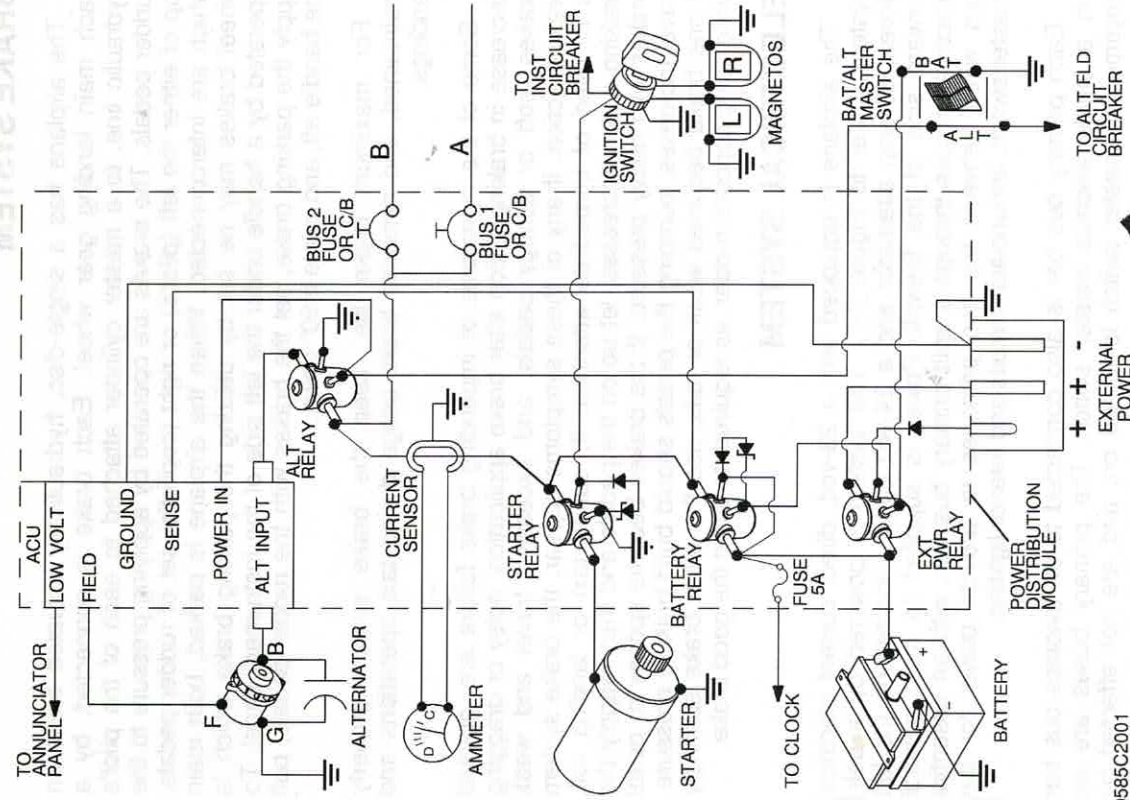


Figure 7-7A. Electrical Schematic (Serials 172S8704 and On)
(Sheet 1 of 2)



0585C2001

Figure 7-7. Electrical Schematic (Serials 172S8001 thru 172S8703) (Sheet 2 of 2)



0585C2001

Figure 7-7. Electrical Schematic (Serials 172S8001 thru 172S8703) (Sheet 1 of 2)

LANDING GEAR

Consult the following table for servicing information on the landing gear.

COMPONENT	SERVICING CRITERIA
Nose Wheel (5.00-5, 6-Ply Rated Tire)	45.0 PSI
Main Wheel (6.00-6, 6-Ply Rated Tire)	38.0 PSI
Brakes	MIL-H-5606
Nose Gear Shock Strut	MIL-H-5606; 45.0 PSI *

* Keep strut filled with MIL-H-5606 hydraulic fluid per filling instructions placard, and with no load on the strut, inflate with air to 45.0 PSI. Do not over inflate.

CLEANING AND CARE

WINDSHIELD AND WINDOWS

The plastic windshield and windows should be cleaned with an aircraft windshield cleaner. Apply the cleaner sparingly with soft cloths, and rub with moderate pressure until all dirt, oil scum and bug stains are removed. Allow the cleaner to dry, then wipe it off with soft flannel cloths.

⚠ CAUTION

NEVER USE GASOLINE, BENZENE, ALCOHOL, ACETONE, FIRE EXTINGUISHER, ANTI-ICE FLUID, LACQUER THINNER OR GLASS CLEANER TO CLEAN THE PLASTIC. THESE MATERIALS WILL ATTACK THE PLASTIC AND MAY CAUSE IT TO CRAZE.

If a windshield cleaner is not available, the plastic can be cleaned with soft cloths moistened with Stoddard solvent to remove oil and grease.