REVISION

MODEL 172S
NAV III AVIONICS OPTION - GFC 700 AUTOPILOT

SERIALS
172S10468, 172S10507,172S10640
AND
172S10656 AND ON

PILOT'S OPERATING HANDBOOK
AND
FAA APPROVED AIRPLANE FLIGHT MANUAL

REVISION 1
12 JANUARY 2009

PART NUMBER:
172SPHBUSR01

INSERT THE FOLLOWING PAGES INTO
THE PILOT'S OPERATING HANDBOOK

Cessna
A Textron Company

Pilot's Operating Handbook And FAA Approved Airplane Flight Manual

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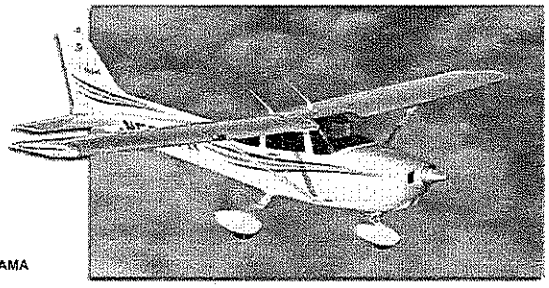

Member of GAMA

Model 172S
NAV III Avionics - GFC 700 AFCS
Serials
172S10468, 172S10507, 172S10640
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Cessna Aircraft Company

PILOT'S OPERATING HANDBOOK
AND
FAA APPROVED AIRPLANE FLIGHT MANUAL

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LOG OF EFFECTIVE PAGES

Use this page to determine the currency and applicability of your POH.

Pages affected by the current revision are indicated by an asterisk (*) preceding the pages listed under the Page Number column.

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AIRSPEED INDICATOR MARKINGS

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

AIRSPEED INDICATOR MARKINGS

MARKING	KIAS VALUE OR RANGE	SIGNIFICANCE
Red Arc*	20 - 40	Low airspeed warning.
White Arc	40 - 85	Full Flap Operating Range. Lower limit is maximum weight V_{SO} 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.

*G1000 airspeed indicator only.

Figure 2-2

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
Oil Pressure, Maximum: . . . . . .115 PSI

CAUTION

ENGINE OPERATION WITH INDICATED OIL PRESSURE BELOW THE GREEN BAND RANGE WHILE IN CRUISE OR CLIMB CONFIGURATION IS CONSIDERED ABNORMAL. REFER TO SECTION 3, AMPLIFIED EMERGENCY PROCEDURES, "LOW OIL PRESSURE".

Fuel Grade: Refer to 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, **must be used.**

Propeller Manufacturer: McCauley Propeller Systems
Propeller Model Number: 1A170E/JHA7660
Propeller Diameter:
Maximum . . . . . .76 INCHES
Minimum . . . . . .75 INCHES

G1000 LIMITATIONS (Continued)

The COM 1/2 (split COM) function of the Audio Panel is not approved for use. During COM 1/2 operation, transmission by one crew member inhibits reception by the other crew member.

The fuel quantity, fuel used and fuel remaining functions of the G1000 are supplemental information only and must be verified by the pilot.

GARMIN GFC 700 AFCS (if installed)

1. The GFC 700 AFCS preflight test must be successfully completed prior to use of the autopilot, flight director or manual electric trim.
2. A pilot, with the seat belt fastened, must occupy the left pilot's seat during all autopilot operations.
3. The autopilot must be off during all takeoff and landings.
4. Autopilot maximum engagement speed - 150 KIAS.
   Autopilot minimum engagement speed - 70 KIAS.
   Electric Trim maximum operating speed - 163 KIAS.
5. Maximum fuel imbalance with autopilot engaged - 90 pounds.
6. The autopilot must be disengaged below 200 feet AGL during approach operations and below 800 feet AGL during all other operations.
7. ILS approaches using the autopilot/flight director are limited to Category I approaches only.
8. Use of the autopilot is prohibited when the audio panel is inoperative (since the aural alert will not be provided when autopilot is disengaged).
9. Use of the autopilot is prohibited when conducting missed approach procedures until an established rate of climb that ensures all altitude requirements of the procedure will be met.

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G1000 LIMITATIONS (Continued)

TERRAIN AWARENESS AND WARNING SYSTEM (TAWS-B)

Use of the Terrain Awareness and Warning System (TAWS-B) to navigate to avoid terrain or obstacles is prohibited. TAWS-B is only approved as an aid to help the pilot to see-and-avoid terrain or obstacles.

TAWS-B must be inhibited when landing at a location not included in the airport database.

Use of TAWS-B is prohibited when operating using the QFE altimeter setting (altimeter indicates 0 feet altitude when the airplane is on the runway).

The pilot is authorized to deviate from the current ATC clearance only to the extent necessary to comply with TAWS-B warnings.

The geographic area of the TAWS-B database must match the geographic area in which the airplane is being operated.

Serials 172S10468 and 172S10507 thru 172S10775 not incorporating SB08-34-03

Flight operations are prohibited over large bodies of sea level water if that flight is conducted under operating regulations that require a functioning TAWS.

CAUTION

TAWS-B FORWARD LOOKING TERRAIN AVOIDANCE (FLTA) IS NOT AVAILABLE WHEN FLYING OVER THE OPEN OCEAN/SEA (SPECIFICALLY ANY BODY OF WATER AT SEA LEVEL, MORE THAN 6NM FROM ANY TERRAIN FEATURES) UNTIL TERRAIN DATABASE 08T2 OR LATER IS INSTALLED. DO NOT USE TAWS-B INFORMATION FOR PRIMARY TERRAIN AVOIDANCE. TAWS-B IS INTENDED ONLY TO ENHANCE SITUATIONAL AWARENESS.

EMERGENCY PROCEDURES

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VACUUM SYSTEM FAILURE

LOW VACUUM ANNUNCIATOR COMES ON

1. **Vacuum Indicator (VAC) - CHECK EIS ENGINE PAGE (make sure vacuum pointer is in green band limits)**

CAUTION

IF VACUUM POINTER IS OUT OF THE GREEN BAND DURING FLIGHT OR THE GYRO FLAG IS SHOWN ON THE STANDBY ATTITUDE INDICATOR, THE STANDBY ATTITUDE INDICATOR MUST NOT BE USED FOR ATTITUDE INFORMATION.

HIGH CARBON MONOXIDE (CO) LEVEL ADVISORY

CO LVL HIGH ANNUNCIATOR COMES ON

1. **CABIN HT Control Knob - OFF (push full in)**
2. **CABIN AIR Control Knob - ON (pull full out)**
3. **Cabin Vents - OPEN**
4. Cabin Windows - OPEN (163 KIAS maximum windows open speed)

CO LVL HIGH ANNUNCIATOR REMAINS ON

5. Land as soon as practical.

NORMAL PROCEDURES

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TABLE OF CONTENTS (Continued)

BEFORE STARTING ENGINE

1. Preflight Inspection - COMPLETE
2. Passenger Briefing - COMPLETE
3. Seats and Seat Belts - ADJUST and LOCK (verify inertia reel locking)
4. Brakes - TEST and SET
5. Circuit Breakers - CHECK IN
6. Electrical Equipment - OFF
7. AVIONICS Switch (BUS 1 and BUS 2) - OFF

CAUTION

THE AVIONICS SWITCH (BUS 1 AND BUS 2) MUST BE OFF DURING ENGINE START TO PREVENT POSSIBLE DAMAGE TO AVIONICS.

8. FUEL SELECTOR Valve - BOTH
9. FUEL SHUTOFF Valve - ON (push full in)

STARTING ENGINE (With Battery)

1. Throttle Control - OPEN 1/4 INCH
2. Mixture Control - IDLE CUTOFF (pull full out)
3. STBY BATT Switch:
   a. TEST - (hold for 10 seconds, verify that green TEST lamp does not go off)
   b. ARM - (verify that PFD comes on)
4. Engine Indicating System - CHECK PARAMETERS (verify no red X's through ENGINE page indicators)
5. BUS E Volts - CHECK (verify 24 VOLTS minimum shown)
6. M BUS Volts - CHECK (verify 1.5 VOLTS or less shown)
7. BATT S Amps - CHECK (verify discharge shown (negative))
8. STBY BATT Annunciator - CHECK (verify annunciator is shown)
9. Propeller Area - CLEAR (verify that all people and equipment are at a safe distance from the propeller)
10. MASTER Switch (ALT and BAT) - ON
11. BEACON Light Switch - ON

NOTE

If engine is warm, omit priming procedure steps 12 thru 14 below.

12. FUEL PUMP Switch - ON
13. Mixture Control - SET to FULL RICH (full forward) until stable fuel flow is indicated (approximately 3 to 5 seconds), then set to IDLE CUTOFF (full aft) position.
14. FUEL PUMP Switch - OFF
15. MAGNETOS Switch - START (release when engine starts)
16. Mixture Control - ADVANCE SMOOTHLY TO RICH (when engine starts)

NOTE

If the engine is primed too much (flooded), place the mixture control in the IDLE CUTOFF position, open the throttle control 1/2 to full, and engage the starter motor (START). When the engine starts, advance the mixture control to the FULL RICH position and retard the throttle control promptly.

(Continued Next Page)

STARTING ENGINE (With Battery) (Continued)

17. Oil Pressure - CHECK (verify that oil pressure increases into the GREEN BAND range in 30 to 60 seconds)
18. AMPS (M BATT and BATT S) - CHECK (verify charge shown (positive))
19. LOW VOLTS Annunciator - CHECK (verify annunciator is not shown)
20. NAV Light Switch - ON as required
21. AVIONICS Switch (BUS 1 and BUS 2) - ON

STARTING ENGINE (With External Power)

1. Throttle Control - OPEN 1/4 INCH
2. Mixture Control - IDLE CUTOFF (pull full out)
3. STBY BATT Switch:
   a. TEST - (hold for 10 seconds, verify green TEST lamp does not go off)
   b. ARM - (verify that PFD comes on)
4. Engine Indication System - CHECK PARAMETERS (verify no red X's through ENGINE page indicators)
5. BUS E Volts - CHECK (verify 24 VOLTS minimum shown)
6. M BUS Volts - CHECK (verify 1.5 VOLTS or less shown)
7. BATT S Amps - CHECK (verify discharge shown (negative))
8. STBY BATT Annunciator - CHECK (verify annunciator is shown)
9. AVIONICS Switch (BUS 1 and BUS 2) - OFF
10. MASTER Switch (ALT and BAT) - OFF
11. Propeller Area - CLEAR (verify that all people and equipment are at a safe distance from the propeller)
12. External Power - CONNECT (to ground power receptacle)
13. MASTER Switch (ALT and BAT) - ON
14. BEACON Light Switch - ON
15. M BUS VOLTS - CHECK (verify that approximately 28 VOLTS is shown)

NOTE

If engine is warm, omit priming procedure steps 16 thru 18 below.

16. FUEL PUMP Switch - ON

(Continued Next Page)

STARTING ENGINE (With External Power) (Continued)

17. Mixture Control - SET to FULL RICH (full forward) until stable fuel flow is indicated (approximately 3 to 5 seconds), then set to IDLE CUTOFF (full aft) position.
18. FUEL PUMP Switch - OFF
19. MAGNETOS Switch - START (release when engine starts)
20. Mixture Control - ADVANCE SMOOTHLY TO RICH (when engine starts)

NOTE

If the engine is primed too much (flooded), place the mixture control in the IDLE CUTOFF position, open the throttle control 1/2 to full, and engage the starter motor (START). When the engine starts, advance the mixture control to the FULL RICH position and retard the throttle control promptly.

21. Oil Pressure - CHECK (verify oil pressure increases into the GREEN BAND range in 30 to 60 seconds)
22. Power - REDUCE TO IDLE
23. External Power - DISCONNECT FROM GROUND POWER (latch external power receptacle door)
24. Power - INCREASE (to approximately 1500 RPM for several minutes to charge battery)
25. AMPS (M BATT and BATT S) - CHECK (verify charge shown (positive))
26. LOW VOLTS Annunciator - CHECK (verify annunciator is not shown)
27. Internal Power - CHECK
    a. MASTER Switch (ALT) - OFF
    b. TAXI and LAND Light Switches - ON
    c. Throttle Control - REDUCE TO IDLE
    d. MASTER Switch (ALT and BAT) - ON
    e. Throttle Control - INCREASE (to approximately 1500 RPM)
    f. M BATT Ammeter - CHECK (verify battery charging, amps positive)
    g. LOW VOLTS Annunciator - CHECK (verify annunciator is not shown)

(Continued Next Page)

FUEL VAPOR PROCEDURES

The engine fuel system can cause fuel vapor formation on the ground during warm weather. This will generally occur when the outside ambient air temperature is above 80°F. Vapor formation may increase when the engine fuel flows are lower at idle and taxi engine speeds. The following procedures are recommended when engine idle speed and fuel flow fluctuations show that fuel vapor may be present:

1. With the mixture full rich, set the throttle at 1800 RPM to 2000 RPM. Maintain this power setting for 1 to 2 minutes or until smooth engine operation returns.
2. Retard the throttle to the idle stop to verify normal engine operation.
3. Advance the throttle to 1200 RPM and lean the mixture as described under FUEL SAVINGS PROCEDURES FOR FLIGHT TRAINING OPERATIONS.
4. In addition to the above procedures, the auxiliary fuel pump may be turned ON with the mixture adjusted as required to aid vapor suppression during ground operations. The auxiliary fuel pump should be turned OFF prior to takeoff.
5. Just prior to TAKEOFF, apply full throttle for approximately 10 seconds to verify smooth engine operation for takeoff.

NOTE

When the engine is operated above 1800 RPM, the resulting increased fuel flow results in lower fuel temperatures throughout the engine fuel system. This increased flow purges the fuel vapor and the cooler fuel minimizes vapor formation.

In addition to the previous procedures, the sections below should be reviewed, and where applicable, adhered to:

Section 3 -Take note of the excessive fuel vapor procedures in both the checklist and the amplified procedures sections.

Section 4 -Take note of the hot weather operational notes and procedures in both the checklist and the amplified procedures sections.

TAXIING

When taxiing, it is important that speed and use of brakes be held to a minimum and that all controls be utilized (refer to Figure 4-2, Taxiing Diagram) to maintain directional control and balance.

Taxiing over loose gravel or cinders should be done at low engine speed to avoid abrasion and stone damage to the propeller tips.

NOTE

The LOW VOLTS annunciator may come on when the engine is operated at low RPM with a high load on the electrical system. If this is the case, the LOW VOLTS annunciator will go off when the engine is run at higher RPM to provide greater alternator system output. Verify that the M BATT AMPS indication shows positive (charging) current at the higher RPM.

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TAXIING (Continued)

TAXIING DIAGRAM

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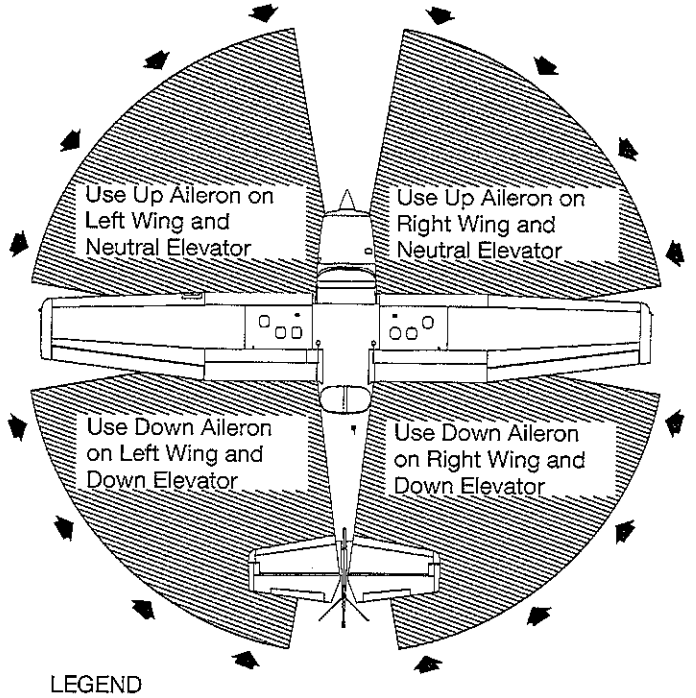

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NOTE

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 nosewheel and rudder to maintain direction.

Figure 4-2

BEFORE TAKEOFF

WARM UP

If the engine idles, with the throttle against the idle stop, (approximately 600 RPM) and accelerates smoothly, the engine is warm enough for takeoff. Since the engine is closely cowled for efficient in-flight engine cooling, the airplane should be pointed into the wind to avoid overheating during prolonged engine operation on the ground. Long periods of idling may cause fouled spark plugs.

MAGNETO CHECK

The magneto check must be made at 1800 RPM. Turn the MAGNETOS switch from the BOTH position to the R position. Note the new RPM, then turn the MAGNETOS switch back to the BOTH position to clear the spark plugs. Turn the MAGNETOS switch to the L position, note the new RPM, then turn the switch back to the BOTH position. RPM decrease should not be more than 150 RPM on either magneto or be greater than 50 RPM differential between magnetos. If there is a doubt concerning operation of the ignition system, RPM checks at higher engine speeds will usually confirm whether a deficiency exists.

No RPM drop may indicate a faulty ground to one magneto or magneto timing set in advance of the angle specified.

ALTERNATOR CHECK

Make sure that both the alternator and alternator control unit are operating properly before night or instrument flight, or flights where electrical power is essential. Check the electrical system during the MAGNETO check (1800 RPM) by setting all electrical equipment required for the flight to the ON position. When the alternator and alternator control unit are both operating properly, the ammeters will show zero or positive current (amps), the voltmeters should show between 27 to 29 volts, and no electrical system annunciations will appear. Reduce the electrical load before reducing engine speed so the battery will not discharge while the engine is at idle.

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BEFORE TAKEOFF (Continued)

ELEVATOR TRIM

The elevator trim tab is in the takeoff position when the trim pointer is aligned with the index mark on the pedestal cover. Adjust the trim wheel during flight as necessary to make control wheel forces more neutral.

LANDING LIGHTS

It is recommended that only the taxi light be used to enhance the visibility of the airplane in the traffic pattern or enroute. This will extend the service life of the landing light.

TAKEOFF

POWER CHECK

It is important to check full throttle engine operation early in the takeoff roll. Any sign of rough engine operation or sluggish engine acceleration is good cause for discontinuing the takeoff. If this occurs, you are justified in making a thorough full throttle static run-up before another takeoff is attempted. The engine should run smoothly and turn approximately 2300 - 2400 RPM with the mixture leaned to provide maximum RPM.

Full throttle run-ups over loose gravel are especially harmful to propeller tips. When takeoffs must be made over a gravel surface, advance the throttle slowly. This allows the airplane to start rolling before high RPM is developed, and the gravel will be blown behind the propeller rather than pulled into it.

Prior to takeoff from fields above 3000 feet pressure altitude, the mixture should be leaned to give maximum RPM at full throttle, with the airplane not moving.

After full throttle is applied, adjust the throttle friction lock clockwise to prevent the throttle from moving back from a maximum power position. Similar friction lock adjustments should be made as required in other flight conditions to hold the throttle setting.

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TAKEOFF (Continued)

WING FLAP SETTINGS

Normal takeoffs use wing flaps UP - 10°. Using 10° wing flaps reduces the ground roll and total distance over an obstacle by approximately 10 percent. **Flap deflections greater than 10° are not approved for takeoff.** If 10° wing flaps are used for takeoff, the flaps should stay at 10° until all obstacles are cleared and a safe flap retraction speed of 60 KIAS is reached. For a short field, 10° wing flaps and an obstacle clearance speed of 56 KIAS should be used.

Soft or rough field takeoffs are performed with 10° 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. When departing a soft field with an aft C.G. loading, the elevator trim control should be adjusted towards the nose down direction to give comfortable control wheel forces during the initial climb.

CROSSWIND TAKEOFF

Takeoffs under strong crosswind conditions 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 higher than normal, then the elevator control is used to quickly, but carefully, lift the airplane off the ground and 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.

ENROUTE CLIMB

Normal enroute climbs are performed with flaps up, at full throttle and 75 to 85 KIAS for the best combination of performance, visibility and engine cooling. The mixture should be full rich during climb at altitudes up to 3000 feet pressure altitude. Above 3000 feet pressure altitude, the mixture can be leaned as needed for increased power or to provide smoother engine operation.

If it is necessary to climb more rapidly to clear mountains or reach favorable winds at higher altitudes, the best rate of climb speed should be used with Maximum Continuous Power (MCP). This speed is 74 KIAS at sea level, decreasing to 72 KIAS at 10,000 feet.

If an obstruction dictates the use of a steep climb angle, the best angle of climb speed should be used with flaps UP and MCP. This speed is 62 KIAS at sea level, increasing to 67 KIAS at 10,000 feet. This type of climb should be of the minimum duration and engine temperatures should be carefully monitored due to the low climb speed.

CRUISE

Normal cruise is performed between 45% and 75% power. The engine RPM and corresponding fuel consumption for various altitudes can be determined by using the data in Section 5.

NOTE

Cruise flight should use 75% power as much as possible until the engine has operated for a total of 50 hours or oil consumption has stabilized. Operation at this higher power will ensure proper seating of the piston rings and is applicable to new engines, and engines in service following cylinder replacement or top overhaul of one or more cylinders.

The Cruise Performance charts in Section 5 provide the pilot with flight planning information for the Model 172S in still air with speed fairings installed. Power, altitude, and winds determine the time and fuel needed to complete any flight.

The Cruise Performance Table, Figure 4-3, shows the true airspeed and nautical miles per gallon during cruise for various altitudes and percent powers, and is based on standard conditions and zero wind. This table should be used as a guide, along with the available winds aloft information, to determine the most favorable altitude and power setting for a given trip. The selection of cruise altitude on the basis of the most favorable wind conditions and the use of low power settings are significant factors that should be considered on every trip to reduce fuel consumption.

In addition to power settings, proper leaning techniques also contribute to greater range and are figured into cruise performance tables. To achieve the recommended lean mixture fuel consumption figures shown in Section 5, the mixture should be leaned using the Exhaust Gas Temperature (EGT) indicator as noted.

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CRUISE (Continued)

CRUISE PERFORMANCE TABLE

CONDITIONS:
Standard Conditions Zero Wind

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

Figure 4-3

The Cruise Performance charts in Section 5 provide the pilot with cruise performance at maximum gross weight. When normal cruise is performed at reduced weights there is an increase in true airspeed. During normal cruise at power settings between 55% and 75%, the true airspeed will increase approximately 1 knot for every 150 pounds below maximum gross weight. During normal cruise at power settings below 65%, the true airspeed will increase approximately 1 knot for every 125 pounds below maximum gross weight.

The fuel injection system employed on this engine is considered to be non-icing. In the event that unusual conditions cause the intake air filter to become clogged or iced over, an alternate intake air door opens automatically for the most efficient use of either normal or alternate air, depending on the amount of filter blockage. Due to the lower intake pressure available through the alternate air door or a partially blocked filter, engine RPM can decrease from a cruise power setting. This RPM loss should be recovered by increasing the throttle setting to maintain desired power.

(Continued Next Page)

CRUISE (Continued)

LEANING USING EXHAUST GAS TEMPERATURE (EGT)

The cruise performance data in this POH is based on the recommended lean mixture setting determined from the maximum or peak EGT at power settings of 75% MCP and lower. The 172S Nav III provides EGT indications for all (4) engine cylinders. The ability to monitor all cylinders is an aid in early identification and correction of fuel injection problems.

NOTE

All engine cylinders do not receive identical fuel/air mixtures (due to unequal intake pipe lengths, uneven intake air temperatures, fuel injection nozzle tolerances etc.). However, all cylinder EGTs should be within approximately 100°F of each other during normal operations. An EGT difference greater than 100°F between cylinders indicates that fuel injection system maintenance is necessary.

EGT is displayed on the EIS ENGINE and LEAN pages. The ENGINE page has a horizontal scale with a temperature indicator (inverted triangle) with a number representing the cylinder with the highest EGT.

The EIS LEAN page provides vertical bar graph displays showing EGT for all cylinders. The cylinder with the highest EGT is shown in cyan (light blue). The numerical value for the highest EGT is located below the bar. The EGT and Cylinder Head Temperature (CHT) value for any cylinder may be shown by using the CYL SLCT softkey to select the desired cylinder. After a short period without CYL SLCT softkey activity, automatic indication of the highest EGT and CHT will start again.

(Continued Next Page)

CRUISE (Continued)

LEANING USING EXHAUST GAS TEMPERATURE (EGT) (Continued)

To aid in leaning the mixture, push the ENGINE, LEAN and ASSIST softkeys, ΔPEAK °F will display below the EGT °F numerical value. Lean the mixture by slowly turning the mixture control knob in the counterclockwise direction while monitoring EGTs. As EGTs increase, continue to lean the mixture until the hottest (cyan) cylinder reaches peak EGT. This is identified by the EGT bar graph for that cylinder changing to cyan with a hollow bar at the top. Note the ΔPEAK °F and FFLOW GPH values for the first peaked cylinder. Peak EGT is represented by ΔPEAK 0°F, if ΔPEAK °F value is negative (-) the mixture can be on the lean side of peak. Enrichen the mixture by slowly turning the mixture control clockwise and monitor both fuel flow and EGTs until the leanest cylinder returns to peak EGT (ΔPEAK 0°F) or desired setting based on the Exhaust Gas Temperature (EGT) Table, Figure 4-4.

ΔPEAK °F values rich of peak will also be a negative (-) value (-50°F). The lean assist system calculation is defined such that the peak EGT is the highest value and any lesser value is represented with a negative (-) value, whether on the lean or rich side of the peak.

NOTE

The 172S engine manufacturer, Textron Lycoming, has not approved operation of the engine at fuel flow rates (mixture settings) less than necessary to reach peak EGT in the leanest cylinder (the first cylinder to reach peak EGT). Use FULL RICH mixture when operating the engine above 75% power.

(Continued Next Page)

CRUISE (Continued)

LEANING USING EXHAUST GAS TEMPERATURE (EGT) (Continued)

EXHAUST GAS TEMPERATURE (EGT)

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

Figure 4-4

Operation at peak EGT provides the best fuel economy. This results in approximately 4% greater range than shown in this POH accompanied by approximately a 3 knot decrease in speed.

Under some conditions, engine roughness may occur while operating at peak EGT. In this case, operate at the recommended lean mixture.

NOTE

- Any change in altitude or power setting will require a change in the recommended lean mixture setting and a recheck of the EGT setting.
- The EGT indicators take several seconds, after a mixture adjustment, to start to show EGT changes. Finding peak EGT and adjusting the mixture to the applicable setting should take approximately one minute when the adjustments are made carefully and accurately. Adjusting the mixture quickly is not recommended.

(Continued Next Page)

CRUISE (Continued)

FUEL SAVINGS PROCEDURES FOR FLIGHT TRAINING OPERATIONS

For best fuel economy during flight training operations, the following procedures are recommended.

1. After engine start and for all ground operations, set the throttle to 1200 RPM and lean the mixture for maximum RPM. After leaning, set the throttle to the appropriate RPM for ground operations. Leave the mixture at this setting until beginning the BEFORE TAKEOFF checklist. After the BEFORE TAKEOFF checklist is complete, lean the mixture again as described above until ready to perform the TAKEOFF checklist.
2. Lean the mixture for maximum RPM during full throttle climbs above 3000 feet. The mixture may remain leaned (maximum RPM at full throttle) for practicing maneuvers such as stalls and slow flight.
3. Lean the mixture for maximum RPM during all operations at any altitude, including those below 3000 feet, when using 75% or less power.

NOTE

- When cruising or maneuvering at 75% power or less, the mixture may be further leaned until the EGT indicator peaks and is then enrichened 50°F. This is especially applicable to cross-country training flights, but should be practiced during transition flight to and from the practice area as well.
- Using the above recommended procedures can provide fuel savings in excess of 5% when compared to typical training operations at full rich mixture. In addition, the above procedures will minimize spark plug fouling since the reduction in fuel consumption results in a proportional reduction in tetraethyl lead passing through the engine.

(Continued Next Page)

STALLS

The stall characteristics are conventional and aural warning is provided by a stall warning horn which sounds between 5 and 10 knots above the stall in all configurations.

Power off stall speeds at maximum weight for both forward and aft C.G. positions are presented in Section 5.

SPINS

Intentional spins are approved when the airplane is operated in the utility category. Spins with baggage loadings or occupied rear seat(s) are not approved.

However, before attempting to perform spins several items should be carefully considered to assure a safe flight. No spins should be attempted without first having received dual instruction both in spin entries and spin recoveries from a qualified instructor who is familiar with the spin characteristics of the Cessna 172S NAV III airplane.

The cabin should be clean and all loose equipment (including the microphone and rear seat belts) should be stowed or secured. For a solo flight in which spins will be conducted, the front passenger's seat belt and shoulder harness should also be secured. Care should be taken to ensure that the pilot can easily reach the flight controls and produce maximum control travels.

(Continued Next Page)

AIRSPEED CALIBRATION

ALTERNATE STATIC SOURCE

CONDITIONS:

Power required for level flight or maximum power descent.

FLAPS UP													
KIAS	—	50	60	70	80	90	100	110	120	130	140	150	160
ALT KIAS	—	50	60	73	82	92	102	112	122	132	143	153	163
FLAPS 10°													
KIAS	40	50	60	70	80	90	100	110	—	—	—	—	—	—
ALT KIAS	40	54	64	73	83	93	103	114	—	—	—	—	—	—
FLAPS FULL													
KIAS	40	50	60	70	80	85	—	—	—	—	—	—	—	—
ALT KIAS	42	53	63	73	83	88	—	—	—	—	—	—	—	—

NOTE

Windows and ventilators closed. Cabin heat, cabin air and defroster on maximum.

Figure 5-1 (Sheet 2)*

TEMPERATURE CONVERSION CHART

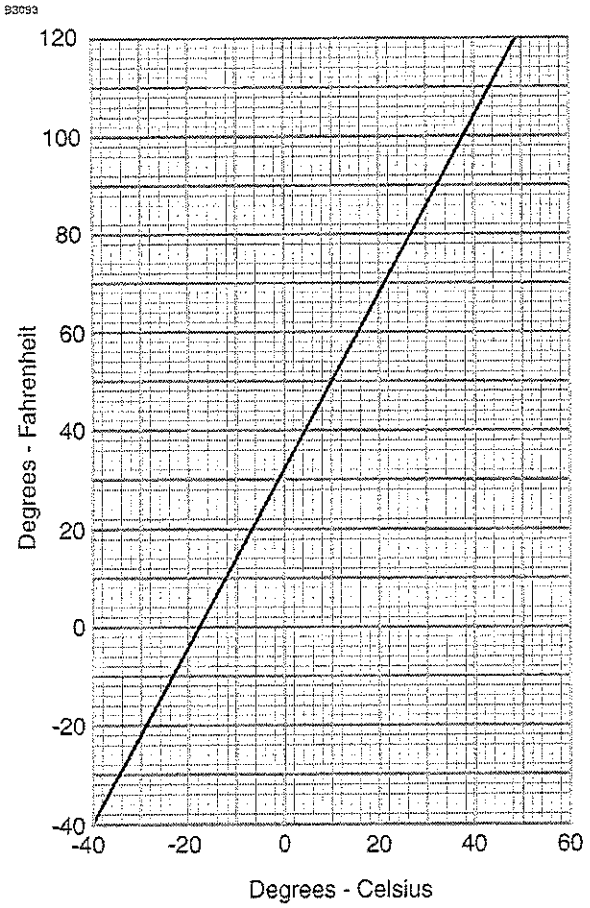


Figure 5-2

STALL SPEED AT 2550 POUNDS

CONDITIONS:

Power IDLE

MOST REARWARD CENTER OF GRAVITY

FLAP SETTINGS	ANGLE OF BANK							
	0°		30°		45°		60°	
	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
UP	48	53	52	57	62	63	76	75
10°	42	50	45	54	54	59	70	71
FULL	40	48	43	52	52	57	65	68

MOST FOREWARD CENTER OF GRAVITY

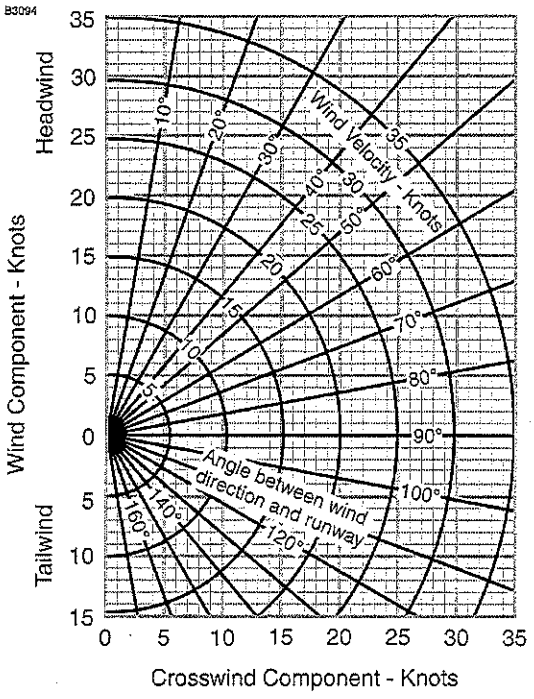
FLAP SETTINGS	ANGLE OF BANK							
	0°		30°		45°		60°	
	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
UP	48	53	52	57	61	63	76	75
10°	43	51	46	55	56	61	71	72
FULL	40	48	43	52	52	57	65	68

NOTE

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

Figure 5-3*

CROSSWIND COMPONENT



NOTE

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

Figure 5-4

ITEM NO	EQUIPMENT LIST DESCRIPTION	REF DRAWING	WT LBS	ARM INS.
	11 - PAINT AND PLACARDS			
11-01-S	PAINT, OVERALL WHITE WITH COLOR STRIPE	0500531	19.2*	95.4*
	- OVERALL WHITE COLOR		18.4	91.5
	- COLOR STRIPING		0.8	135.9
	21 - AIR CONDITIONING			
21-01-S	VENTILATORS, ADJUSTABLE, CABIN AIR	0513575-2	1.7	60.0
21-02-S	CABIN HEATER SYSTEM, SHROUDED MUFFLER TYPE	0550365	2.5	-20.75
21-03-R	FORWARD AVIONICS COOLING FAN - MC24B3	3930379	0.5	12.4
21-04-R	AFT AVIONICS COOLING FAN	3940397	1.1	109.5
	22 - AUTO FLIGHT			
22-01-O	GFC 700 AUTOPILOT		6.9	118.5
	- PITCH SERVO	3940475	2.3	150.6
	- PITCH TRIM SERVO	3940475	2.3	150.6
	- ROLL SERVO	3940474	2.3	54.2
	23 - COMMUNICATIONS			
23-01-S	STATIC DISCHARGE WICKS, (SET OF 10)	0501048-1	0.4	143.2
23-02-R	AUDIO/INTERCOM/MARKER BEACON			
	- GMA 1347 AUDIO PANEL	3930377	1.7	16.3
	- CI-102 MARKER BEACON ANTENNA	3960188	0.5	129.0
23-03-R	NAV/COM/GPS #1 COMPUTER	3921165		
	- GIA 63W INTEGRATED AVIONICS UNIT	3940397	5.2	113.3
	- CI 2580-200 VHF COMM/GPS ANTENNA	3960220	0.5	61.2
23-04-S	NAV/COM/GPS #2 COMPUTER	3921165		
	- GIA 63W INTEGRATED AVIONICS UNIT	3940397	5.2	113.3
	- CI 2580-200 VHF COMM/GPS ANTENNA	3960220	0.5	61.2
	- CI 420-10 XM ANTENNA	3960233	0.5	43.5
	24 - ELECTRICAL POWER			
24-01-R	ALTERNATOR, 28 VOLT, 60 AMP, -9910591-11	0550365	10.0	-29.0
24-02-R	BATTERY, 24 VOLT, 8.0 AMP HOUR	0518034	23.2	-5.0
24-03-R	POWER DISTRIBUTION MODULE - S3100-366	0518034	6.4*	-2.5*
	- ALTERNATOR CONTROL UNIT - AC2101	0518034	0.2	-2.5
	- MASTER CONTACTOR - X61-0007	0518034	0.7	-2.5
	- STARTER CONTACTOR - X61-0027	0518034	0.7	-2.5
	- AMMETER TRANSDUCER - CS3200	0518034	0.1	-2.0
24-04-S	BATTERY, STANDBY - AVT 200413	0518025	14.0	11.2

Figure 6-9 (Sheet 1 of 6)

ITEM NO	EQUIPMENT LIST DESCRIPTION	REF DRAWING	WT LBS	ARM INS.
	25 - EQUIPMENT/FURNISHINGS			
25-01-R	SEAT, PILOT, ADJUSTABLE, LEATHER/VINYL COVER	0719025-4	33.0	41.5
25-02-S	SEAT, FRONT PASSENGER, ADJUSTABLE, LEATHER/VINYL COVER	0719025-4	33.0	41.5
25-03-S	SEAT, REAR PASSENGER, ONE-PIECE BACK, LEATHER/VINYL COVER	0519101-1	38.7	79.5
25-04-O	SEAT, REAR OBSERVER, ADJUSTABLE, LEATHER/VINYL COVER	0519109-2	27.9	72.5
25-07-R	SEAT BELT AND SHOULDER HARNESS, INERTIA REEL, AUTO ADJUST, PILOT AND FRONT PASSENGER	0519031-1	5.2	54.0
25-08-S	SEAT BELT AND SHOULDER HARNESS, INERTIA REEL, AUTO ADJUST, REAR SEAT	0519031-1	5.2	90.0
25-09-S	SUN VISOR (SET OF 2)	0514166-2	1.1	32.8
25-10-S	BAGGAGE RESTRAINT NET	2015009-7	0.5	95.0
25-11-S	CARGO TIEDOWN RINGS (SET OF 6)	0515055-6	0.2	95.0
25-12-S	TOW BAR, NOSE GEAR (STOWED)	0501019-1	1.7	124.0
25-13-R	PILOT'S OPERATING HANDBOOK AND FAA APPROVED AIRPLANE FLIGHT MANUAL (STOWED IN FRONT PASSENGER'S SEAT BACK)	0500832-1	1.2	50.0
25-14-R	GARMIN G1000 COCKPIT REFERENCE GUIDE (STOWED IN COCKPIT SIDE PANEL POCKET)		1.5	15.0
25-15-O	APPROACH PLATE HOLDER	0519107-1	0.1	22.0
25-16-S	FUEL SAMPLING CUP	S2107-1	0.1	14.3
25-17-S	ARTEX ME406 - 2 FREQUENCY ELT	3940458-1	2.6*	134.6*
	- ELT TRANSMITTER	ME406	2.1	135.5
	- ANTENNA AND CABLE ASSY	110-338	0.5	130.0
25-18-O	ARTEX C406-N - 3 FREQUENCY ELT	3940460-1	5.1*	135.0*
	- ELT TRANSMITTER	C406-N	4.6	135.5
	- ANTENNA AND CABLE ASSY	110-338	0.5	130.0

Figure 6-9 (Sheet 2)

ITEM NO	EQUIPMENT LIST DESCRIPTION	REF DRAWING	WT LBS	ARM INS.
	26 - FIRE PROTECTION			
26-01-S	FIRE EXTINGUISHER	0501011-2	5.3*	43.0*
	- FIRE EXTINGUISHER, HAND TYPE	A352GS	4.8	44.0
	- MOUNTING CLAMP AND HARDWARE	1290010-1	0.5	42.2
	27 - FLIGHT CONTROLS			
27-01-S	DUAL CONTROLS, RIGHT SEAT	0506008-1	5.5*	12.4*
	- CONTROL WHEEL, COPILOT	0513576-4	2.6	26.0
	- RUDDER AND BRAKE PEDAL, COPILOT	0510402-16	1.1	6.8
27-02-A	RUDDER PEDAL EXTENSION (SET OF 2) (INSTALLED ARM SHOWN)	0501082-1	2.0	8.0
	28 - FUEL			
28-01-R	AUXILIARY FUEL PUMP - 5100-00-4	0516015	1.9	9.5
28-02-R	FUEL SENDER - 76-207-3	0522644	0.9	47.4
	30 - ICE AND RAIN PROTECTION			
30-01-S	PITOT HEAT	0523080	0.1	28.0
	31 - INDICATING/RECORDING SYSTEM			
31-01-S	RECORDING HOURMETER - C664503-0103	0506009	0.5	16.1
31-02-R	PNEUMATIC STALL WARNING SYSTEM	0523112	0.4	28.5
31-03-R	GEA 71 ENGINE/AIRFRAME UNIT	3930377	2.2	11.4
31-04-R	GTP 59 OUTSIDE AIR TEMPERATURE (OAT) PROBE	0518006	0.1	41.5
	32 - LANDING GEAR			
32-01-R	WHEEL BRAKE AND TIRE, 6.00 X 6 MAIN (2)	0541200-7, -8	34.4*	57.8*
	- WHEEL ASSY (EACH)	C163001-0104	6.2	58.2
	- BRAKE ASSY (EACH)	C163030-0111	1.8	54.5
	- TIRE, 6-PLY, 6.00 X 6, BLACKWALL (EACH)	C262003-0101	7.9	58.2
	- TUBE, (EACH)	C262023-0102	1.3	58.2
32-02-R	WHEEL AND TIRE ASSY, 5.00 X 5 NOSE	0543062-17	9.5*	-6.8*
	- WHEEL ASSY	1241156-12	3.5	-6.8
	- TIRE, 6-PLY, 5.00 X 5, BLACKWALL	C262003-0202	4.6	-6.8
	- TUBE	C262023-0101	1.4	-6.8
32-03-S	WHEEL FAIRING AND INSTALLATION	0541225-1	16.5*	46.1*
	- WHEEL FAIRING, NOSE	0543079-3	3.5	-3.5
	- WHEEL FAIRINGS, MAIN (SET OF 2)	0541223-1, -2	10.1	61.1
	- BRAKE FAIRINGS (SET OF 2)	0541224-1, -2	1.1	55.6
	- MOUNTING PLATE (SET OF 2)	0541220-1, -2	0.8	59.5

Figure 6-9 (Sheet 3)

ITEM NO	EQUIPMENT LIST DESCRIPTION	REF DRAWING	WT LBS	ARM INS.
	33 - LIGHTS			
33-01-S	MAP LIGHT IN CONTROL WHEEL	0706015	0.2	22.0
33-02-S	COURTESY LIGHTS UNDER WING	0521101-8	0.5	61.0
33-03-S	FLASHING BEACON	0506003-6	1.4	240.7
33-04-R	STROBE LIGHT	0723628	3.4	43.3
33-05-S	LANDING AND TAXI LIGHT	0523029-7	2.8	26.6
	34 - NAVIGATION			
34-01-R	STANDBY AIRSPEED INDICATOR - S3325-6	0506009	0.7	16.2
34-02-R	STANDBY ATTITUDE INDICATOR - S3326-2	0501135	2.2	14.0
34-03-R	STANDBY ALTIMETER, SENSITIVE WITH 20 FOOT MARKINGS, INCHES OF MERCURY AND MILLBARS - S3827-1	0506009	0.9	14.0
34-04-S	ALTERNATE STATIC AIR SOURCE	0501017-1	0.2	15.5
34-05-R	COMPASS, MAGNETIC	0513262-3	0.5	18.0
34-06-R	TRANSPONDER	3940397	3.1*	114.0*
	- GTX-33 TRANSPONDER	3910317	3.6	134.0
	- CI 105-16 TRANSPONDER ANTENNA	3960191	0.4	86.3
34-07-R	PFD DISPLAY	3930377		
	- GDU DISPLAY	3910317	6.4	16.26
34-08-R	MFD DISPLAY	3930377		
	- GDU DISPLAY	3910317	6.4	16.26
34-09-R	ATTITUDE HEADING REFERENCE SENSOR (AHRS)	3940397	2.5*	118.75*
	- GRS 77 AHRS	3910317	2.4	134.0
	- GMU 44 MAGNETOMETER	3940398	0.3	52.7
34-10-R	AIR DATA COMPUTER	3940397	1.7*	118.69*
	- GDC 74A AIR DATA COMPUTER	3910317	1.7	11.4
34-11-S	GDL-69A DATALINK	3940397	4.0	47.0
34-12-O	AUTOMATIC DIRECTION FINDER (ADF)		8.2*	26.9*
	- KR 87 ADF RECEIVER	3930494	3.2	12.1
	- ADF ANTENNA	3960187	4.2	39.3
34-13-O	DISTANCE MEASURING EQUIPMENT (DME)		3.2*	146.9*
	- KN 63 REMOTE DME	3940448	2.8	154.0
	- CI 105-16 DME ANTENNA	3960231	0.4	114.5

Figure 6-9 (Sheet 4)

ITEM NO	EQUIPMENT LIST DESCRIPTION	REF DRAWING	WT LBS	ARM INS.
	37 - VACUUM			
37-01-R	ENGINE DRIVEN VACUUM PUMP			
	- VACUUM PUMP - AA3215CC	0501135	2.1	-5.0
	- COOLING SHROUD	1201998-1	0.2	-5.6
	- FILTER	1201075-2	0.3	2.0
	- VACUUM REGULATOR	AA2H3-2	0.5	2.0
37-02-R	VACUUM TRANSDUCER - P165-5786	0501135	0.3	10.3
	53 - FUSELAGE			
53-01-S	REFUELING STEPS AND HANDLE	0513415-2	1.7	16.3
	56 - WINDOWS			
56-01-S	WINDOW, HINGED RIGHT SIDE (NET CHANGE)	0517001-40	2.3*	48.5
56-02-S	WINDOW, HINGED LEFT SIDE (NET CHANGE)	0517001-39	2.3*	48.5
	61 - PROPELLER			
61-01-R	FIXED PITCH PROPELLER ASSEMBLY	0550320-18	38.8*	-38.2*
	- MCCAULEY 76 INCH PROPELLER	IA170E/JHA7660	35.0	-38.4
	- MCCAULEY 3.5 INCH PROPELLER SPACER	C5464	3.6	-36.0
61-02-R	SPINNER INSTALLATION, PROPELLER	0550320-11	1.8*	-41.0*
	- SPINNER DOME ASSEMBLY	0550236-14	1.0	-42.6
	- FWD SPINNER BULKHEAD	0552231-1	0.3	-40.8
	- AFT SPINNER BULKHEAD	0550321-10	0.4	-37.3
	71 - POWERPLANT			
71-01-R	FILTER, INDUCTION AIR	0550365	0.6	-27.5
71-02-O	WINTERIZATION KIT INSTALLATION (STOWED) (INSTALLED ARM SHOWN)	0501128-3	0.8*	-20.3*
	- BREATHER TUBE INSULATION	0552011	0.4	-13.8
	- COWL INLET COVERS (INSTALLED)	0552229-3, -4	0.3	-32.0
	- COWL INLET COVERS (STOWED)	0552229-3, -4	0.3	95.0
	72 - ENGINES			
72-01-R	ENGINE, LYCOMING IO-360-L2A	0550365	297.8*	-18.6*

Figure 6-9 (Sheet 5)

ITEM NO	EQUIPMENT LIST DESCRIPTION	REF DRAWING	WT LBS	ARM INS.
	73 - ENGINE FUEL AND CONTROL			
73-01-R	FUEL FLOW TRANDUCER - 680501K	0501168	0.8	-22.6
	77 - ENGINE INDICATING			
77-01-R	ENGINE TACHOMETER SENSOR - 1A3C-2	0501168	0.2	-8.0
77-02-S	CYLINDER HEAD THERMOCOUPLES (ALL CYLINDERS) - 32DKWUE006F0126	0501168	0.2	-12.0
77-03-S	EXHAUST THERMOCOUPLES (ALL CYLINDERS) - 86317	0501168	0.3	-12.0
	78 - EXHAUST			
78-01-R	EXHAUST SYSTEM	9954100-1	16.3*	-20.0*
	- MUFFLER AND TAILPIPE WELD ASSEMBLY	9954100-2	4.6	-22.7
	- SHROUD ASSEMBLY, MUFFLER HEATER	9954100-3	0.8	-22.7
	79 - OIL			
79-01-R	OIL COOLER - 10877A	0550365	3.3	-11.0
79-02-R	OIL PRESSURE SENSOR - P165-5281	0550365	0.2	-12.9
79-03-R	OIL TEMPERATURE SENSOR - S2335-1	0550365	0.2	-8.5

Figure 6-9 (Sheet 6)

INTEGRATED SEAT BELT/SHOULDER HARNESS

All seat positions are equipped with integrated seat belts/shoulder harness assemblies, Refer to Figure 7-4. The design incorporates an overhead inertia reel for the shoulder portion, and a retractor assembly for the lap portion of the belt. This design allows for complete freedom of movement of the upper torso area while providing restraint in the lap belt area. In the event of a sudden deceleration, reels lock up to provide positive restraint for the user.

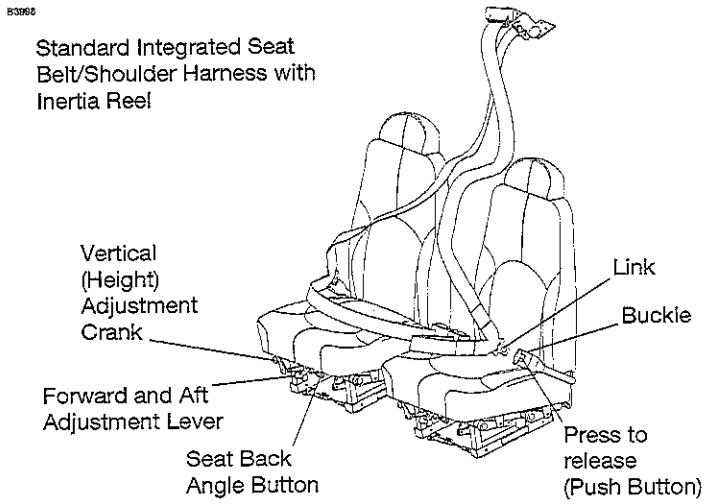
In the front seats, the inertia reels are located on the centerline of the upper cabin area. In the rear seats, the inertia reels are located outboard of each passenger in the upper cabin.

To use the integrated seat belt/shoulder harness, grasp the link with one hand, and, in a single motion, extend the assembly and insert into the buckle. Positive locking has occurred when a distinctive "snap" sound is heard.

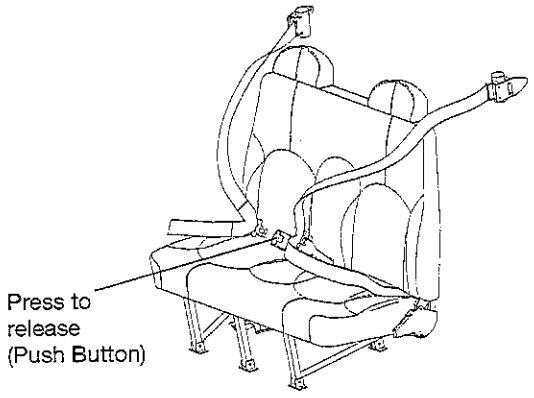
Proper locking of the lap belt can be verified by ensuring that the belts are allowed to retract into the retractors and the lap belt is snug and low on the waist as worn normally during flight. No more than one additional inch of belt should be able to be pulled out of the retractor once the lap belt is in place on the occupant. If more than one additional inch of belt can be pulled out of the retractor, the occupant is too small for the installed restraint system and the seat should not be occupied until the occupant is properly restrained.

Removal is accomplished by pressing the release button on the buckle and pulling out and up on the harness. Spring tension on the inertia reel will automatically stow the harness.

INTEGRATED SEAT BELT/SHOULDER HARNESS



Pilot and Front Passenger Seat



Aft Seat

Figure 7-4*

ELECTRICAL SYSTEM (Continued)

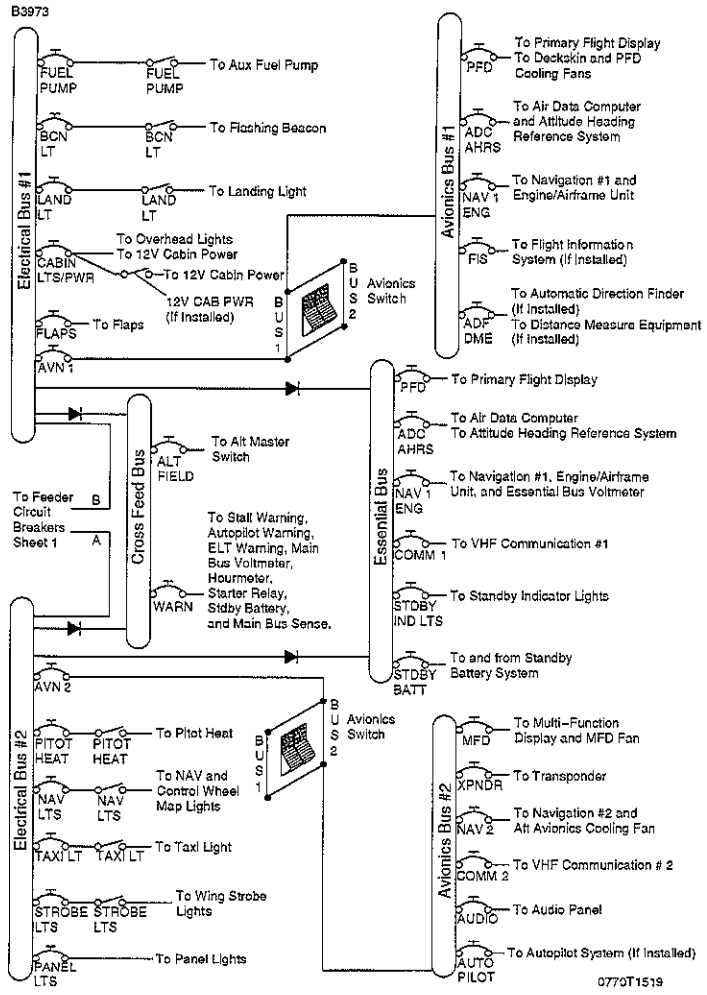


Figure 7-7 (Sheet 2)*

ELECTRICAL SYSTEM (Continued)

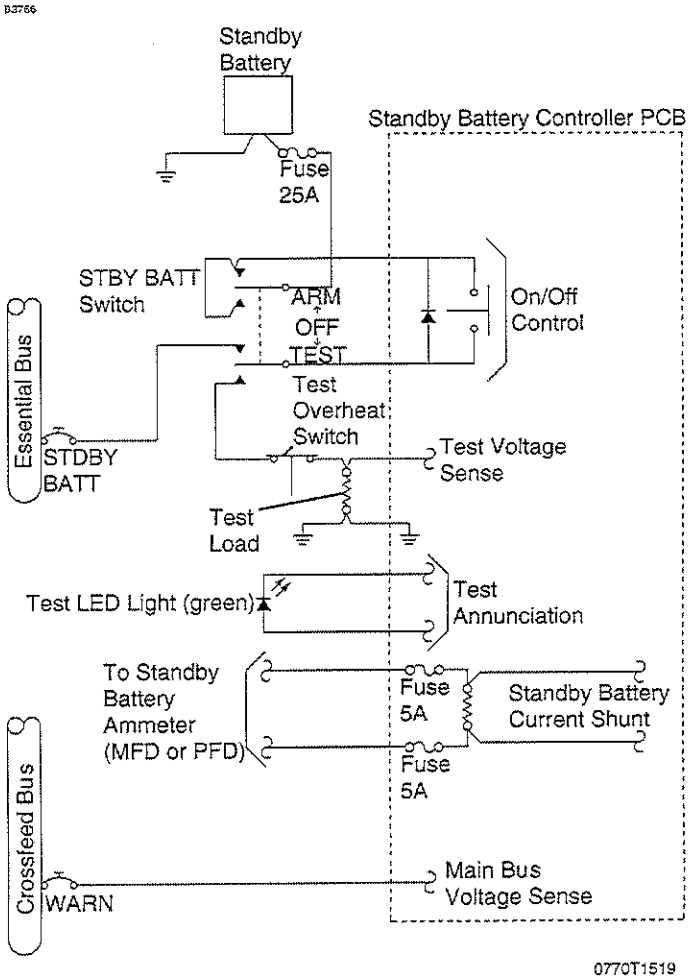


Figure 7-7 (Sheet 3)