

**PILOT'S OPERATING HANDBOOK  
AND FAA APPROVED  
AIRPLANE FLIGHT MANUAL  
for the  
CIRRUS DESIGN SR22T**

**Aircraft Serials SR22T-0001 & Subsequent with  
Teledyne Continental Motors Turbocharged Engine**



FAA Approved in Normal Category based on FAR 23. This document must be carried in the airplane at all times and be kept within the reach of the pilot during all flight operations.

THIS HANDBOOK INCLUDES THE MATERIAL REQUIRED TO BE FURNISHED TO THE PILOT BY FAR PART 23 AND ADDITIONAL INFORMATION PROVIDED BY CIRRUS DESIGN AND CONSTITUTES THE FAA APPROVED AIRPLANE FLIGHT MANUAL.

Model - Serial Num.: \_\_\_\_\_ Registration Num.: \_\_\_\_\_

FAA Approved

[Redacted Signature]

Jan 14, 2013  
Date

for Charles Smalley, Manager  
Chicago Aircraft Certification Office, ACE-115C  
Federal Aviation Administration

P/N 13772-003  
Reissue A: 01-14-2013

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## Engine Instrument Markings & Annunciations

The following describes the engine instrument markings. Associated Warning and Caution Annunciations are shown in capitalized text.

### PowerPlant

| Instrument<br>(Range & Units)                          | Red<br>Arc/Bar            | Yellow<br>Arc/Bar           | Green<br>Arc/Bar | Yellow<br>Arc/Bar           | Red<br>Arc/Bar            |
|--------------------------------------------------------|---------------------------|-----------------------------|------------------|-----------------------------|---------------------------|
|                                                        | Lower<br>Warning<br>Range | Minimum<br>Caution<br>Range | Normal<br>Range  | Maximum<br>Caution<br>Range | Upper<br>Warning<br>Range |
| Cylinder Head<br>Temperature<br>(100°F – 500°F)        | —                         | —                           | 240 – 420        | 420 – 460<br>CHT            | > 460<br>CHT              |
| Engine Speed<br>(0 – 3000 RPM)                         | —                         | —                           | 500 – 2550       | —                           | > 2550<br>RPM             |
| Exhaust Gas<br>Temperature<br>(500°F – 1800°F)         | —                         | —                           | 1000–1800        | —                           | —                         |
| Manifold Pressure<br>(10 – 40 in.Hg)                   | —                         | —                           | 15.0 - 36.5      | 36.5 - 37.5                 | 37.5 - 40.0               |
| Oil Pressure<br>(0 – 100 PSI)                          | 0 – 10                    | 10 – 30<br>OIL<br>PRESS     | 30 – 60          | 60 – 100                    | > 100<br>OIL<br>PRESS     |
| Oil Temperature<br>(75°F – 250°F)                      | —                         | —                           | 100 – 240        | —                           | > 240<br>OIL TEMP         |
| Percent Power<br>(0 – 100%)                            | —                         | —                           | 0 – 100          | —                           | —                         |
| Turbocharger Inlet<br>Temperature<br>(1000°F - 1800°F) | —                         | —                           | 1000 –<br>1750   | —                           | 1750 -1800<br>TIT         |

## Fuel

| Instrument<br>(Range & Units)                 | Red<br>Arc/Bar    | Yellow Arc/<br>Bar          | Green Arc/<br>Bar | Yellow Arc/<br>Bar          | Red<br>Arc/Bar |
|-----------------------------------------------|-------------------|-----------------------------|-------------------|-----------------------------|----------------|
|                                               | Minimum           | Minimum<br>Caution<br>Range | Normal<br>Range   | Maximum<br>Caution<br>Range | Maximum        |
| Fuel Flow*<br>(0 – 45 U.S. Gal./Hr.)          | —                 | —                           | 10 - 45           | —                           | —              |
| Fuel Totalizer<br>(U.S. Gallon)               | N < 9<br>FUEL QTY | 9 – 18                      | > 18              | —                           | —              |
| Fuel Quantity Gage**<br>(0 – 46 U.S. Gallon)  | 0                 | 10 – 14                     | —                 | —                           | —              |
| Fuel Quantity Gage***<br>(0 – 46 U.S. Gallon) | 0                 | 10 – 14                     | 14 – 46           | —                           | —              |

\* Dynamically changes based on engine parameters.

\*\* Serials 0001 thru 0310, 0315, 0318

\*\*\* Serials 0311-0314, 0316-0317, 0319 and Subs

## Electrical

| Instrument<br>(Range & Units)          | Red<br>Arc/Bar      | Yellow<br>Arc/Bar           | Green Arc/<br>Bar | Yellow<br>Arc/Bar           | Red<br>Arc/Bar  |
|----------------------------------------|---------------------|-----------------------------|-------------------|-----------------------------|-----------------|
|                                        | Minimum             | Minimum<br>Caution<br>Range | Normal<br>Range   | Maximum<br>Caution<br>Range | Maximum         |
| Essential Bus Volts<br>(0 – 36 Volts)  | 0 – 24.4<br>ESS BUS | —                           | 24.5 – 32         | —                           | > 32<br>ESS BUS |
| Main Bus 1 Voltage<br>(0 – 36 Volts)   | —                   | 0 – 24.4<br>M BUS 1         | 24.5 – 32         | —                           | > 32<br>M BUS 1 |
| Main Bus 2 Voltage<br>(0 – 36 Volts)   | —                   | 0 – 24.4<br>M BUS 2         | 24.5 – 32         | —                           | > 32<br>M BUS 2 |
| Alternator 1 Current<br>(0 – 100 Amps) | —                   | —                           | 2 – 100           | 0 – 1<br>ALT 1              | —               |
| Alternator 2 Current<br>(0 – 100 Amps) | —                   | —                           | 2 – 100           | 0 – 1<br>ALT 2              | —               |
| Battery 1 Current<br>(-59 to 59 Amps)  | —                   | —                           | -4 – 59           | -59 to -5<br>BATT 1         | —               |

## Engine Failures

### Engine Failure On Takeoff (Low Altitude)

1. Best Glide or Landing Speed (as appropriate) ..... ESTABLISH
2. Mixture ..... CUTOFF
3. Fuel Selector ..... OFF
4. Ignition Switch ..... OFF
5. Flaps ..... AS REQUIRED

*If time permits:*

6. Power Lever ..... IDLE
7. Fuel Pump ..... OFF
8. Bat-Alt Master Switches ..... OFF
9. Seat Belts ..... ENSURE SECURED

#### **Amplification**

#### **• WARNING •**

If engine failure is accompanied by fuel fumes in the cockpit, or if internal engine damage is suspected, move Mixture Control to CUTOFF and do not attempt a restart.

If a turn back to the runway is elected, be very careful not to stall the airplane.

If the engine fails immediately after becoming airborne, abort on the runway if possible. If altitude precludes a runway stop but is not sufficient to restart the engine, lower the nose to maintain airspeed and establish a glide attitude. In most cases, the landing should be made straight ahead, turning only to avoid obstructions. After establishing a glide for landing, perform as many of the checklist items as time permits.

## CAPS Deployment

1. Airspeed..... MINIMUM POSSIBLE  
The maximum demonstrated deployment speed is 133 KIAS.
2. Mixture (If time and altitude permit) .....CUTOFF
3. Activation Handle Cover.....REMOVE
4. Activation Handle (Both Hands).....PULL STRAIGHT DOWN

### *After Deployment:*

5. Mixture ..... CHECK, CUTOFF
6. Fuel Selector..... OFF
7. Bat-Alt Master Switches..... OFF
8. Ignition Switch..... OFF
9. Fuel Pump ..... OFF
10. ELT ..... ON
11. Seat Belts and Harnesses ..... TIGHTEN
12. Loose Items ..... SECURE
13. Assume emergency landing body position.
14. After the airplane comes to a complete stop, evacuate quickly and move upwind.

### ***Amplification***

#### **• WARNING •**

CAPS deployment is expected to result in loss of the airframe and, depending upon adverse external factors such as high deployment speed, low altitude, rough terrain or high wind conditions, may result in severe injury or death to the occupants. Because of this, CAPS should only be activated when any other means of handling the emergency would not protect the occupants from serious injury.

Jerking or rapidly pulling the activation T-handle will greatly increase the pull forces required to activate the rocket. Use a firm and steady pulling motion – a “chin-up” type pull enhances successful activation.

The Cirrus Airframe Parachute System (CAPS) should be activated in the event of a life-threatening emergency where CAPS deployment is determined to be safer than continued flight and landing.

Expected impact in a fully stabilized deployment is equivalent to a drop from approximately 13 feet.

Several possible scenarios in which the activation of the CAPS would be appropriate are discussed in [Section 10: Safety Information](#) of this Handbook. These include:

- Mid-air collision
- Structural failure
- Loss of control
- Landing in inhospitable terrain
- Pilot incapacitation

All pilots should carefully review the information on CAPS activation and deployment in Section 10 before operating the airplane.

#### CAPS Deployment at High Altitudes

For any indicated airspeed, as altitudes increase the true air speed of the deployment increases. Higher true air speeds increase the parachute inflation loads. Therefore, it is important for the operator takes all reasonable efforts to slow to the minimum possible airspeed prior to deploying the CAPS.

indicate faulty grounding of one side of the ignition system or magneto timing set in advance of the specified setting.

### **Maximum Power Fuel Flow**

For maximum power operations (Power Lever full forward - 2500 RPM, 36.0 in.Hg manifold pressure) fuel flow should be in the green arc.

For any power setting greater than 30.5 in.Hg (cruise power) fuel flow is indicated by a dynamically calculated green arc displayed on the fuel gage. Fuel flow should be maintained within this arc by use of the mixture lever.

### ***Amplification***

The fuel pump should be in the BOOST position during takeoff and for climb as required for vapor suppression with hot or warm fuel

### **Takeoff Power Check**

Check full-throttle engine operation early in takeoff run. The engine should run smoothly and turn approximately 2500 RPM. All engine parameters are not in caution or warning ranges. Discontinue takeoff at any sign of rough operation or sluggish acceleration. Make a thorough full-throttle static run-up before attempting another takeoff.

Manifold pressure may temporarily increase to 36.0 - 37.0 in.Hg on first flight of the day due to cooler oil temperatures and associated higher oil pressures. This is acceptable under these conditions but normal full throttle manifold pressure should be 36.0 in.Hg. The fuel flow will normally also increase in proportion to the increase in manifold pressure. If manifold pressure exceeds 37.0 in.Hg on takeoff or during full power climbs, reduce power to maintain no more than 37.0 in.Hg.

For takeoff over a gravel surface, advance Power Lever slowly. This allows the airplane to start rolling before high RPM is developed, and gravel will be blown behind the propeller rather than pulled into it.

### **Takeoff Flap Settings**

Normal and short field takeoffs are accomplished with flaps set at 50%. Takeoffs using 0% are permissible, however, no performance data is available for takeoffs in the flaps up configuration. Takeoffs with 100% flaps are not approved.

Soft or rough field takeoffs are performed with 50% flaps by lifting the airplane off the ground as soon as practical in a tail-low attitude. If no obstacles are ahead, the airplane should be leveled off immediately to accelerate to a higher climb speed.

Takeoffs into strong crosswinds are normally performed with the flaps set at 50% to minimize the drift angle immediately after takeoff. With the ailerons fully deflected into the wind, accelerate the airplane to a speed slightly higher than normal while decreasing the aileron deflection as speed increases then - with authority - rotate to prevent possibly settling back to the runway while drifting. When clear of the ground, make a coordinated turn into the wind to correct for drift.

## Stall Speeds

**Conditions:**

- Weight ..... 3400 LB
- CG ..... Noted
- Power ..... Idle
- Bank Angle ..... Noted

• Note •

Altitude loss during wings level stall may be 250 feet or more.

KIAS values may not be accurate at stall.

| Weight<br><br>LB              | Bank<br>Angle<br><br>Deg | STALL SPEEDS        |      |           |      |                         |      |
|-------------------------------|--------------------------|---------------------|------|-----------|------|-------------------------|------|
|                               |                          | Flaps 0%<br>Full Up |      | Flaps 50% |      | Flaps 100%<br>Full Down |      |
|                               |                          | KIAS                | KCAS | KIAS      | KCAS | KIAS                    | KCAS |
| 3400<br><br>Most<br>FWD<br>CG | 0                        | 73                  | 70   | 66        | 64   | 62                      | 60   |
|                               | 15                       | 74                  | 71   | 67        | 65   | 64                      | 61   |
|                               | 30                       | 76                  | 75   | 71        | 69   | 66                      | 64   |
|                               | 45                       | 83                  | 83   | 77        | 76   | 72                      | 71   |
|                               | 60                       | 99                  | 99   | 90        | 90   | 84                      | 84   |
| 3400<br><br>Most<br>AFT<br>CG | 0                        | 72                  | 69   | 65        | 63   | 60                      | 58   |
|                               | 15                       | 73                  | 70   | 66        | 64   | 61                      | 59   |
|                               | 30                       | 76                  | 74   | 69        | 67   | 63                      | 62   |
|                               | 45                       | 82                  | 82   | 76        | 75   | 69                      | 69   |
|                               | 60                       | 98                  | 98   | 89        | 89   | 82                      | 82   |

The airplane may be serviced to a reduced capacity to permit heavier cabin loadings. This is accomplished by filling each tank to a tab visible below the fuel filler, giving a reduced fuel load of 30.0 gallons usable in each tank (60 gallons total usable in all flight conditions).

Drain valves at the system low points allow draining the system for maintenance and for examination of fuel in the system for contamination and grade. The fuel must be sampled prior to each flight. A sampler cup is provided to drain a small amount of fuel from the wing tank drains, the collector tank drains, and the gascolator drain. If takeoff weight limitations for the next flight permit, the fuel tanks should be filled after each flight to prevent condensation.

### Fuel Selector Valve

A fuel selector valve, located at the rear of the center console, provides the following functions:

- LEFT Allows fuel to flow from the left tank
- RIGHT Allows fuel to flow from the right tank
- OFF Cuts off fuel flow from both tanks

The valve is arranged so that to feed off a particular tank the valve should be pointed to the fuel indicator for that tank. To select RIGHT or LEFT, rotate the selector to the desired position. To select Off, first raise the fuel selector knob release and then rotate the knob to OFF.

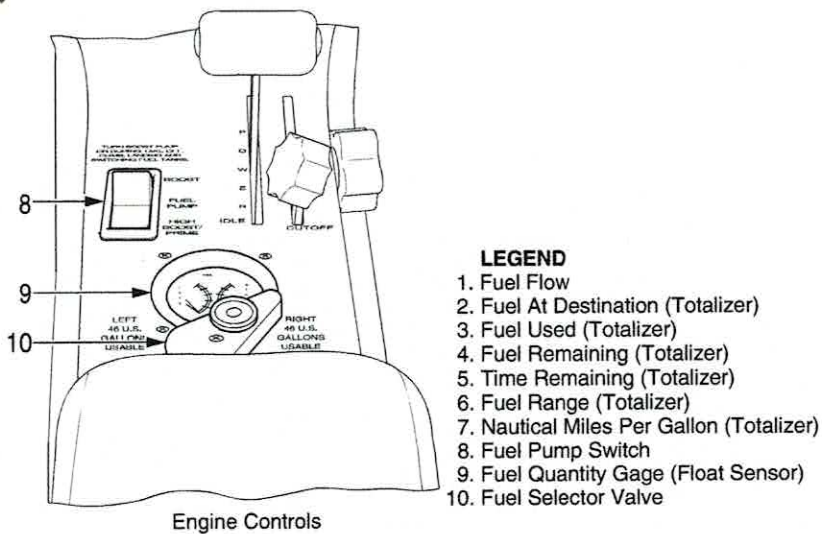
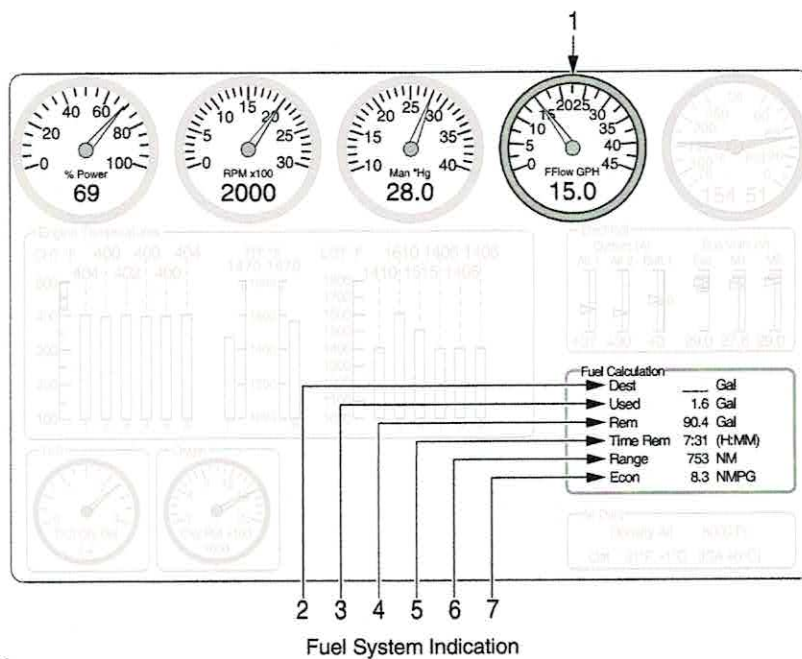
### Fuel Pump Operation

Fuel pump operation and engine prime is controlled through the Fuel Pump rocker switch located adjacent to the fuel selector valve.

To prevent over-priming during low power settings, the system uses a lockout relay that only allows HIGH BOOST/PRIME fuel pump operation when manifold pressure is greater than 24 in.Hg or, - to facilitate engine starting - when engine speed is less than 500 RPM. Whenever the engine parameters fall outside these specifications, pressing HIGH BOOST/PRIME will turn the pump on in low-speed mode.

Selecting BOOST energizes the fuel pump in low-speed mode regardless of engine speed or manifold pressure to deliver a continuous 4-6 psi boost to the fuel flow for vapor suppression in a hot fuel condition.

The fuel pump operates on 28 VDC supplied through the 5-amp FUEL PUMP circuit breaker on MAIN BUS 2.



Serials 0001 thru 0310, 0315, 0318.

SR22\_FM07\_3256A

**Figure 7-9**  
**Fuel System Controls and Indicating - Serials 0001 thru 0318**

## **Cirrus Airframe Parachute System (CAPS)**

The Cirrus Airframe Parachute System (CAPS) is designed to lower the aircraft and its passengers to the ground in the event of a life-threatening emergency. However, because CAPS deployment is expected to result in damage to the airframe and, depending upon adverse external factors such as high deployment speed, low altitude, rough terrain or high wind conditions, may result in severe injury or death to the aircraft occupants, its use should not be taken lightly. Instead, possible CAPS activation scenarios should be well thought out and mentally practiced by every pilot.

The following discussion is meant to guide your thinking about CAPS activation. It is intended to be informative, not directive. It is the responsibility of you, the pilot, to determine when and how the CAPS will be used.

### **Deployment Scenarios**

This section describes possible scenarios in which the activation of the CAPS might be appropriate. This list is not intended to be exclusive, but merely illustrative of the type of circumstances when CAPS deployment could be the only means of saving the occupants of the aircraft.

#### ***Mid-Air Collision***

A mid-air collision may render the airplane un-flyable by damaging the control system or primary structure. If a mid-air collision occurs, immediately determine if the airplane is controllable and structurally capable of continued safe flight and landing. If it is not, CAPS activation should be considered.

#### ***Structural Failure***

Structural failure may result from many situations, such as: encountering severe gusts at speeds above the airplane's structural cruising speed, inadvertent full control movements above the airplane's maneuvering speed, or exceeding the design load factor while maneuvering. If a structural failure occurs, immediately determine if the airplane is controllable and structurally capable of continued safe flight and landing. If it is not, CAPS activation should be considered.

### ***Loss of Control***

Loss of control may result from many situations, such as: a control system failure (disconnected or jammed controls); severe wake turbulence, severe turbulence causing upset, severe airframe icing, or sustained pilot disorientation caused by vertigo or panic; or a spiral/spin. If loss of control occurs, determine if the airplane can be recovered. If control cannot be regained, the CAPS should be activated. This decision should be made prior to your pre-determined decision altitude (2,000' AGL, as discussed below).

### ***Landing Required in Terrain not Permitting a Safe Landing***

If a forced landing is required because of engine failure, fuel exhaustion, excessive structural icing, or any other condition CAPS activation is only warranted if a landing cannot be made that ensures little or no risk to the aircraft occupants. However, if the condition occurs over terrain thought not to permit such a landing, such as: over extremely rough or mountainous terrain, over water out of gliding distance to land, over widespread ground fog or at night, CAPS activation should be considered.

### ***Pilot Incapacitation***

Pilot incapacitation may be the result of anything from a pilot's medical condition to a bird strike that injures the pilot. If this occurs and the passengers cannot reasonably accomplish a safe landing, CAPS activation by the passengers should be considered. This possibility should be explained to the passengers prior to the flight and all appropriate passengers should be briefed on CAPS operation so they could effectively deploy CAPS if required.

## General Deployment Information

### ***Deployment Speed***

The maximum speed at which deployment has been demonstrated is 133 KIAS. Deployment at higher speeds could subject the parachute and aircraft to excessive loads that could result in structural failure. Once a decision has been made to deploy the CAPS, make all reasonable efforts to slow to the minimum possible airspeed. However, if time and altitude are critical, and/or ground impact is imminent, the CAPS should be activated regardless of airspeed.

### ***Deployment Altitude***

No minimum altitude for deployment has been set. This is because the actual altitude loss during a particular deployment depends upon the airplane's airspeed, altitude and attitude at deployment as well as other environmental factors. In all cases, however, the chances of a successful deployment increase with altitude. As a guideline, the demonstrated altitude loss from entry into a one-turn spin until under a stabilized parachute is 920 feet. Altitude loss from level flight deployments has been demonstrated at less than 400 feet. With these numbers in mind it might be useful to keep 2,000 feet AGL in mind as a cut-off decision altitude. Above 2,000 feet, there would normally be time to systematically assess and address the aircraft emergency. Below 2,000 feet, the decision to activate the CAPS has to come almost immediately in order to maximize the possibility of successful deployment. At any altitude, once the CAPS is determined to be the only alternative available for saving the aircraft occupants, deploy the system without delay.

### ***Deployment Attitude***

The CAPS has been tested in all flap configurations at speeds ranging from  $V_{SO}$  to  $V_A$ . Most CAPS testing was accomplished from a level attitude. Deployment from a spin was also tested. From these tests it was found that as long as the parachute was introduced to the free air by the rocket, it would successfully recover the aircraft into its level descent attitude under parachute. However, it can be assumed that to minimize the chances of parachute entanglement and reduce aircraft oscillations under the parachute, the CAPS should be activated from a wings-level, upright attitude if at all possible.