

**FAA APPROVED  
FLIGHT MANUAL SUPPLEMENT**

For

Normal, Utility and Acrobatic Airplanes and Helicopters Equipped

With

Continental, Franklin and Lycoming Type Engines and Precision Air-Motive  
(Facet or Marvel-Schebler) MA-2, MA-3, MA-3A, MA-3SPA, MA-4, MA-4-5,  
MA-4SPA, MA-5, MA-6, MA-6AA and HA-6 Series Carburetors

With

ARP Carburetor Ice Detector System

Registration No.: \_\_\_\_\_

Serial No.: \_\_\_\_\_

This supplement must be attached to the FAA approved Aircraft or Rotorcraft Flight Manual when the Aircraft & Rotorcraft Products (ARP) Incorporated Carburetor Ice Detector System Model 107AP is installed in accordance with FAA Supplemental Type Certificate (STC) Number SA489EA, Dated April 28, 1967, Amended December 5, 2002

The information contained herein supplements or supersedes the basic Flight Manual only in those areas listed herein. For limitations, procedures and performance information not contained in this document consult the appropriate Aircraft or Rotorcraft Flight Manual.

FAA APPROVED: *Michelle Maurer*  
for Vito Pulera, Manager,  
New York Aircraft Certification Office

REVISED DATE: DEC 5 2002



## LOG OF REVISIONS

Revision Letter	Pages Affected	Change Description	FAA	
			Approved	Date
A	All	Complete Rewrite	P. Cuneo	11/21/97
B	Page 4	Added Part No's 107AP-U-12 and 107AP-U-24 to Section I (1); revised Section I (2), (4) & (5).	M. Maurer	12/5/02
	Page 5	Revised Section IV (complete rewrite).		

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## SECTION I, DESCRIPTION

**Warning— This instrument is approved as ‘optional’ equipment only and flight operation predicated on its use is prohibited. Instructions provided herein on the use of carburetor heat are intended to supplement existing procedures.**

1. ARP's Carburetor Ice Detector System is designed to alert the pilot as to impending engine power loss or stoppage due to ice / frost accumulation inside the carburetor so that carburetor heat can be applied, and applies to the following ARP Part Numbers—

### “Panel Mount” Configuration

<u>Part Numbers</u>	<u>Descriptions</u>
107AP-12	Carburetor Ice Detector, Panel Mount, 12 Volts
107AP-24	Carburetor Ice Detector, Panel Mount, 24 Volts

### “Remote Mount” Configuration

<u>Part Numbers</u>	<u>Descriptions</u>
107AP-R-12	Carburetor Ice Detector, Remote Mount, 12 Volts
107AP-R-24	Carburetor Ice Detector, Remote Mount, 24 Volts

### “Universal Mount” Configuration

<u>Part Numbers</u>	<u>Descriptions</u>
107AP-U-12	Carburetor Ice Detector, Universal Mount, 12 Volts
107AP-U-24	Carburetor Ice Detector, Universal Mount, 24 Volts

2. Unlike temperature sensing devices, this carburetor ice detector system utilizes an electronic light source and feedback sensor. A red warning light inside the cockpit is activated when the probe's radiated light beam and photo-detector sensor, located in the carburetor throat, is blocked due to ice / frost formation. In the absence of carburetor ice / frost the red warning light automatically deactivates.
3. This carburetor ice detector system provides real-time detection of ice / frost formation within the carburetor and alerts the pilot accordingly. It is completely independent of temperature or pressure changes which do not affect the system operation except to melt away ice / frost accumulation.
4. The rotary sensitivity adjustment control knob is provided to adjust the system sensitivity level for ice / frost detection. This setting should be just above the threshold where the red warning light deactivates and should be set after engine start.

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5. With increasing time of operation on the engine (or twin engines) a slight film of fuel residue may form on the probe, which may result in a slight reduction of sensitivity as compared to the original setting when the ice detector is first installed. This will be observed when it is required to turn the sensitivity adjustment knob to an ever increasing clockwise or higher setting as time goes on. However, the basic ice detection sensitivity is not reduced when adjusted as prescribed herein. In the event the sensitivity adjustment control must be turned to the full clockwise position and the red warning light does not deactivate, then the probe must be removed and cleaned with a soft cloth and white gasoline. Refer to ARP's Installation Manual for instructions.

### SECTION II, LIMITATIONS

1. This carburetor ice detector system is approved for use on Normal, Utility and Acrobatic category airplanes (single and twin engine) and helicopters powered by Continental, Franklin and Lycoming type engines equipped with Precision Air-Motive (Facet or Marvel-Schebler) MA-2, MA-3, MA-3A, MA-3SPA, MA-4, MA-4-5, MA-4SPA, MA-5, MA-6, MA-6AA and HA-6 series carburetors.
2. Flight operation shall not be predicated on the use of the carburetor ice detector system.
3. The carburetor ice detector system serves only as a pilot advisory, and does not replace any existing airplane or helicopter carburetor ice detection or deicing operations or procedures.

### SECTION III, EMERGENCY PROCEDURES

NONE

Note: The ARP Carburetor Ice Detector System operates only as a pilot advisory and the failure on the system will not have an adverse affect on the safe operation of the airplane or helicopter.

### SECTION IV, NORMAL OPERATING PROCEDURES

1. After turning the aircraft master switch to the ON position and starting the aircraft engine, set the carburetor ice detector power switch to ON, and rotate the sensitivity adjustment control knob to zero or full counter-clockwise position. The red warning light will turn ON. Slowly rotate the sensitivity control knob up or clockwise until the red warning light turns OFF. This is the threshold setting for ice / frost detection.

#### Notes:

- a) After engine start, increase power to run-up setting, and apply carburetor heat for at least 30 seconds prior to adjusting the sensitivity adjustment control knob. This will ensure that no ice / frost is present when adjustment is made.
- b) Every time a readjustment of the sensitivity adjustment control is required, carburetor heat must be applied for at least 30 seconds, prior to such adjustment.
- c) If the sensitivity threshold setting is set too low and the red warning light comes on prematurely, increase or rotate clockwise the sensitivity adjustment control knob slightly more above the threshold level to correct it.

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2. After the sensitivity threshold setting has been established, be sure the carburetor ice detector switch is ON and remains ON at all times during flight.
3. To test the carburetor ice detector system, turn the instrument's power switch OFF then ON during normal operation. The red warning light will go ON then OFF indicating that all components are operating properly. (Cycling the power switch OFF and ON simulates ice / frost on the probe.)
4. If the red warning light turns ON, indicating initial ice / frost formation on the probe within the carburetor throat, immediately apply carburetor heat (to both engines if a twin engine aircraft) until the red warning light turns OFF automatically. This indicates the ice / frost has been cleared within the carburetor.
5. If the red warning light does not turn OFF after approximately two minutes of heat application, the cause may either be an improper sensitivity setting or carburetor icing conditions. Continue flight operation using Flight Manual Procedures and check the carburetor ice detector sensitivity setting after landing.

### SECTION V, PERFORMANCE

NO CHANGE

Note: The performance of this airplane or helicopter equipped with the carburetor ice detector system is equal to or better than the performance as listed in the basic Flight Manual.

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### SECTION VI, UNAPPROVED DATA

**Note:** The information provided herein Section VI and Figure 1 are not FAA approved and shall be used as reference information only.

Carburetor Icing Probability— The NTSB, FAA, Military, Foreign Aviation Agencies, and various pilot organizations have extensive reports and publications dealing with carburetor icing accidents / incidents. As a result, icing probability curves have been published for pilot education in order to preclude a potentially dangerous situation (refer to Figure 1, Carburetor Icing Probability Chart). The curves provided on this chart encompass situations known to be favorable for carburetor icing. The severity of this problem varies depending on the surrounding atmospheric conditions and mode of flight operation. Therefore, the chart provided herein is to be used as reference information only for typical light aircraft.

As indicated in FAA AC 20-113, carburetor-icing problems are preventable when following the prescribed precautions and preventative procedures and properly applying airplane or helicopter carburetor heat when needed. To further reduce the likelihood of accidents / incidents due to carburetor ice, continue using ARP's Carburetor Ice Detector System as a means of providing advance warning of ice / frost formation. In addition, with a little experimentation with the amount of carburetor heat applied, it can be determined just how little heat is required to keep the red warning light off. This will result in more efficient engine operation under the existing atmospheric conditions.

Caution: Light icing over a prolonged period may become serious. When you receive a weather bulletin or briefing, note the temperature and dew point and refer to Figure 1, Carburetor Icing Probability Chart.

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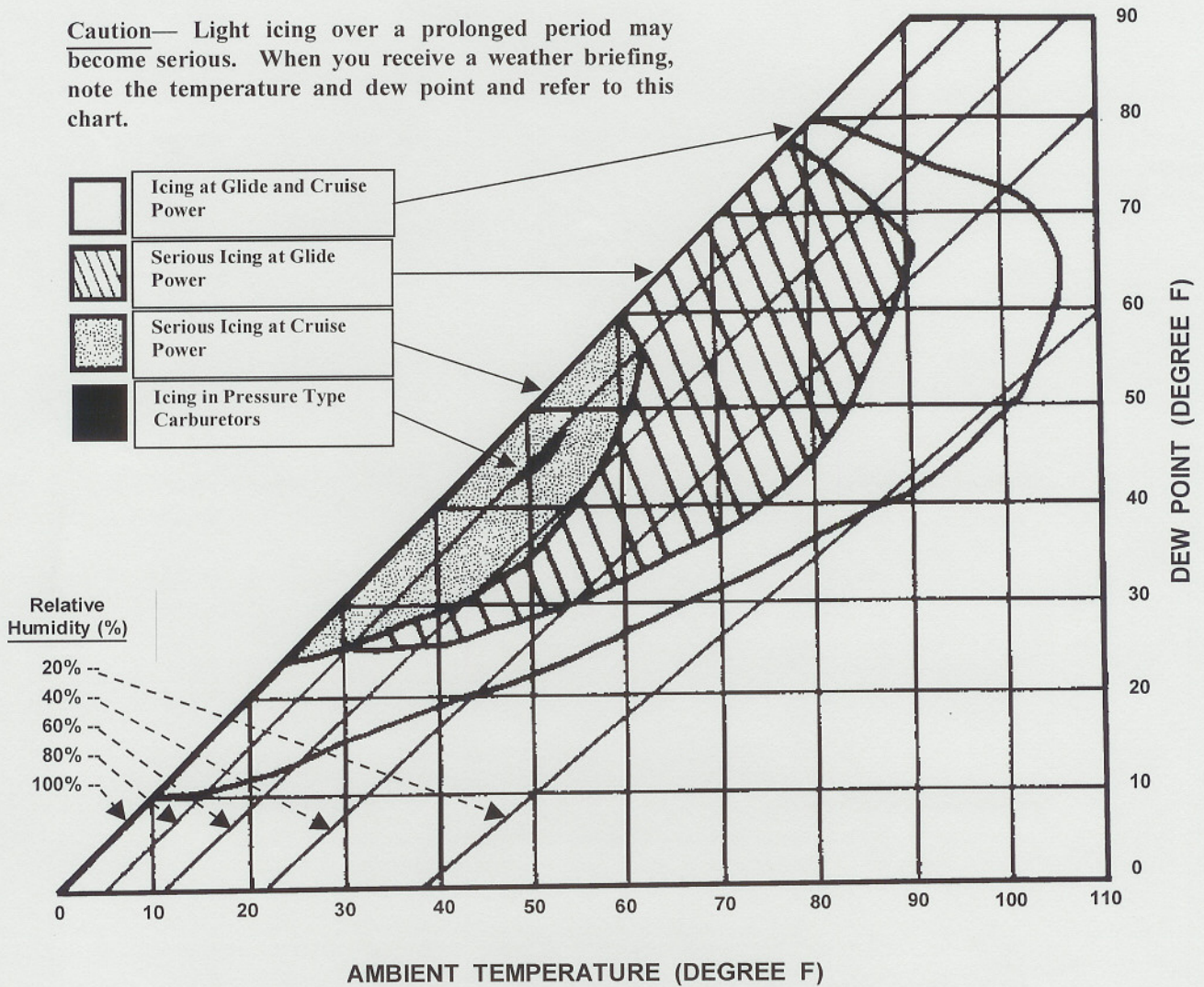
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**Figure 1: Carburetor Icing Probability Chart <sup>(1)</sup>**

**Caution**— Light icing over a prolonged period may become serious. When you receive a weather briefing, note the temperature and dew point and refer to this chart.



(1) Reference: Carburetor Icing Probability Chart from DOT/FAA/CT-82/44

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