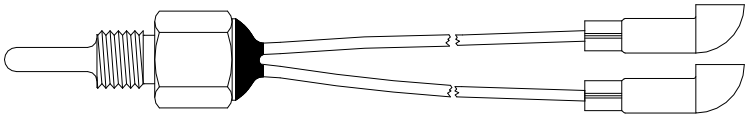
INSTALLATION MANUAL AND OPERATING INSTRUCTIONS

B-5
Carburetor Air Temperature Probe



Mid-Continent Instruments and Avionics
9400 E. 34th Street N, Wichita, KS 67226 USA
Phone 316-630-0101 • Fax 316-630-0723

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ECO	Rev.	Detail	Date	Approved
	A	Initial Release.		
	B	Combine Richter Installation Bulletins 3 and 4 into one standard format install manual.	2/28/07	ScH/CHS
4983	C	Add MD11-3, -4 gauge connections to Figure 3.3.3.	2/15/08	MKN/ScH
5184	D	Remove “STC Assignment” page 20. Replace with new page 20 “Permission to use”.	3/26/09	CHS/ScH
5648	E	Edited troubleshooting instructions in paragraph 2 of section 3.4: Ground Test and Troubleshooting.	10/17/11	CJM/MKN
	F	Changed the STC permission letter to include regulatory references. Changed signature	5/10/12	CHS/MWS

TABLE OF CONTENTS

SECTION 1 GENERAL DESCRIPTION

1.1 INTRODUCTION

The B-5 Carburetor Temperature Probe is a carburetor mounted sensor to aid in detecting temperature conditions favorable to carburetor icing. It is used in combination with a panel mounted Carburetor Temperature Indicator to convey the information to the pilot. The most suitable gauge to use with the B-5 Probe is a Mid-Continent Instruments and Avionics Model MD11-6 Carburetor Temperature Indicator, available as a complete kit supplied by Mid-Continent Instruments and Avionics. This gauge has an appropriately colored arc to aid in instant reading. The warning placard required by STC-SE1-201 is furnished attached to the gauge.

Note: The contents of this manual contain the text of Richter Installation Bulletins 3 and 4 as referenced in STC SE1-201.

The materials used in the construction of the B-5 Probe are the best obtainable and will successfully resist the effects of oil, water, gasoline, as well as heat and cold. The sensing coil is encapsulated in epoxy resin within a protective metal shell, thick enough to withstand repeated backfires, but thin enough to give nearly instant sensitivity to temperature change.

1.2 TECHNICAL SPECIFICATIONS

1.2.1 PHYSICAL CHARACTERISTICS

Mounting:	¼-28 tapped hole
Width:	3/8 Inches (across flats)
Length:	0.65 Inches (to sensor tip from mounting shoulder)
Height:	0.35 Inches (top of shell from mounting shoulder)
Weight:	0.02 lbs. (not including panel mounted indicator)

1.2.2 ENVIRONMENTAL CHARACTERISTICS

Temperature Range:	-104°C to +200°C
Humidity:	95% Non-Condensing
Altitude Range:	-1,300 to 55,000 ft.

1.2.3 ELECTRICAL SPECIFICATIONS

Sensing coil resistance (0°C)	89.68 to 91.08 ohms

1.3 EQUIPMENT LIMITATIONS

1.3.1 ELECTRICAL

The resistance characteristics of the sensing coil inside the tip of the unit have been made to correspond as nearly as possible to the AN scale. The special small wire that makes possible the miniature size of the B-5 Probe has a resistance curve which matches the AN specifications exactly at 0° C, and is accurate to within 1° C in the range from –15° C to +15° C (-5° to +59° F). Above and below these figures the resistance curve of the B-5 deviates gradually from the AN curve, giving an error of –3° C at 38° C; that is, for an actual temperature of 38° C an AN indicator used with the B-5 Probe will indicate 35° C. For the purpose for which the B-5 Probe is intended, the measurement of carburetor air temperature, this error is of no real consequence. The important point is that the B-5 Probe will sense the freezing point and its vicinity with greater accuracy than most available meters will indicate.

1.3.2 MECHANICAL

Although the B-5 Probe is designed to be durable, it is not indestructible. Pliers should not be used on the delicate probe end, but the rest of the unit can stand any normal handling. Tests at our facilities indicate that the tightening torque should be within the range of 3 to 4 foot-pounds to prevent damage to the threads in the carburetor or the probe. These torque values were determined in laboratory testing and are in no way based on field experience.

Tensile tests have shown that the lead-in wires take at least 90 pounds to pull them out of the shell. Since the combined tensile strength of the two lead-in wires is about 100 pounds, the only possibility of strain trouble here is if insufficient slack is allowed between the probe and the first support of the wires.

1.4 MAJOR COMPONENTS

The system is comprised of two major components, the B-5 Carb. Temp Probe and a MD11-( ) Carb. Temp Indicator or other compatible indicator.

SECTION 2 INSTALLATION CONSIDERATIONS

2.1 COOLING

No direct cooling is required.

2.2 EQUIPMENT LOCATION

The B-5 Carb. Temp Probe must be mounted in the carburetor wall as shown in the diagrams. The best location will vary slightly with each type of carburetor. Refer to the installation procedures below for more information.

2.3 ROUTING OF CABLES

Avoid sharp bends in wires and routing near aircraft control cables.

SECTION 3 INSTALLATION PROCEDURES

3.1 GENERAL INFORMATION

This section contains connection diagrams, mounting instructions and other information pertaining to the installation of the B-5 Carb. Temp Probe.

Utilization with AN series instruments: The resistance characteristics of the B-5 Probe duplicate those of the AN5525-1 and AN5525-2 probes, having a resistance of 90.38 ohms at 0° C or 32° F. The B-5 Probe can therefore be used for carburetor air temperature indication with any of the AN gauges designed to operate with the AN5525-1 or AN5525-2 probes. It is mandatory according to STC SE1-201 that any gauge used must be placarded: "Maintain at least 5°C or 9°F above freezing during possible carburetor icing conditions."

3.2 UNPACKING AND INSPECTING EQUIPMENT

When unpacking equipment, make a visual inspection for evidence of damage incurred during shipment. The following parts should be included:

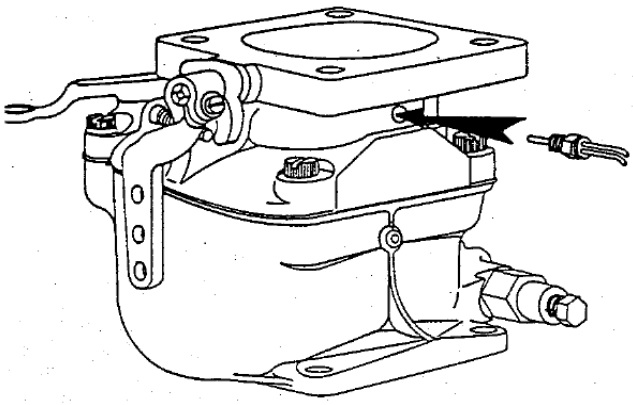
P/N	Qty	Description
B-5	1	Carburetor Temperature Probe
7015258	1	Installation Manual (this document)
8013203	1	Probe warranty card
1519939	4	Lock washer 0.020
1519962	1	Spacer 0.020
1519954	1	Spacer 0.040
1519947	1	Spacer 0.060
1519996	2	Knife connector 16-15
7014822	2	Heat shrink 3/16 dia x 2.5" length

3.3 INSTALLING THE B-5 PROBE

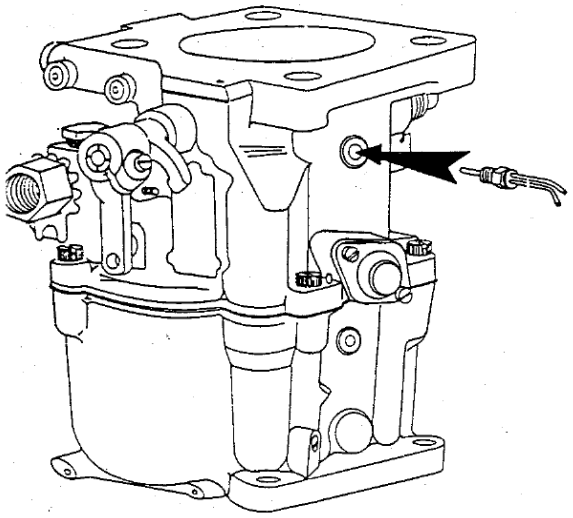
3.3.1 MECHANICAL INSTALLATION

Figure 3.3.1 Installation of B-5 Probe in Marvel-Schebler Carburetors

Marvel-Schebler Models MA-2, MA-3, MA-4



Marvel-Schebler Model MA-4-5

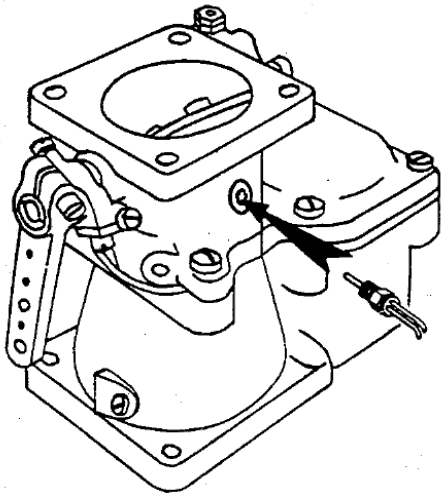


Approval for this installation is covered by STC SE1-201.

Figure 3.3.2 Installation of B-5 Probe in Bendix NA-S3B and AN-S3A1 Carburetors

The instructions for installation, testing and use of the B-5 Probe in Marvel-Schebler MA series carburetors outlined in Section 3 are also applicable to the Bendix NA-S3B and AN-S3A1 Carburetors.

The B-5 Probe should be installed as indicated in the sketch into the hole, which may or may not have to be modified using the instructions of Section 3.3.1(B).



Approval for this installation is covered by an amendment to STC SE1-201 dated August 11, 1961.This approval covers installation of the B-5 Probe in Bendix NA-S3B and AN-S3A1 carburetors on the following engines:

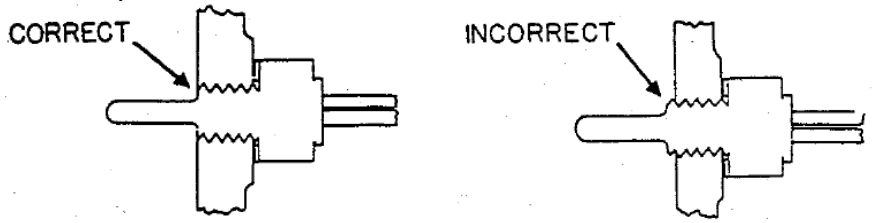
Continental Motors Corp. Model A 65-8, -12 Series
Continental Motors Corp. Model C 75-8, -12 Series
Continental Motors Corp. Model C 85-8, -12 Series
Continental Motors Corp. Model C 90-8F, -12F, -14F Series

A. Carburetors provided with factory-tapped hole to accept B-5 Probe:
Marvel-Schebler now furnishes some carburetors provided with a threaded brass plug in a ¼”-28 tapped hole instead of filling this drill-access hole with a lead plug.

1. Unscrew threaded plug at position indicated by arrow in Fig. 3.3.1.

2. Using only one 0.018” star lock washer, screw probe into hole and note whether a portion of the threaded length protrudes into the inner barrel of the carburetor.

Probe depth into carburetor:



3. Remove the B-5 Probe, and select from the special star lock washer and flat spacing washers furnished, a combination which will make the small diameter end of the probe start flush with the wall of the inner barrel of the carburetor. See sketch. The lock washers furnished should not be used stacked, that is two at a time in this installation. Only one spacing washer can be used, and should contact the carburetor casting, with the lock washer in contact with the shoulder on the B-5 Probe. If necessary, lock washers can be used on both sides of the flat washer. If the probe does not reach all the way into the carburetor barrel, the counterbore can be used again to reduce the thickness of the casting slightly at the outside of the hole. Recommended torque is 3 to 4 foot-pounds to prevent damage to the threads in the carburetor or the probe. See section 1.3.2 for more information.

4. Proceed to Electrical Wiring.

B. Carburetors not provided with factory-tapped hole:
Adjacent to the butterfly valve in all Marvel-Schebler MA2, MA3, MA4 and MA4-5 series carburetors is a lead plug filling the access hole through which the idler jets were drilled on the far side of the carburetor barrel. This lead plug fills a stepped hole in the aluminum casting. The wall of the carburetor is approximately ¼ inches thick at the boss in which this lead plug is inserted. These instructions describe a procedure by which this plug is removed, the hole enlarged and threaded so that the B-5 Probe can be securely mounted at a point adjacent to the butterfly valve where it will accurately measure the temperature of the fuel-air mixture and thus warn of impending danger due to throttle valve icing.

1. Remove the carburetor assembly from engine.

2. The installation tools needed include a 7/16” aircraft counterbore with a 7/32” pilot, a 7/32” drill, and a ¼-28 tap. Support the carburetor firmly on a drill press, and drill out the lead plug with the 7/32” drill. Drill slowly and/or limit the drill travel so the drill does not break through and plunge into the valve. It has been found helpful to put a small amount of putty over the inner end of the lead plug to keep metal chips out of the carburetor. If the drill does not go through the putty the problem of removing chips is simplified.

3. The counterbore pilot is inserted into the new hole, and the counterbore is then used lightly to create a flat surface (spot-face) at the outside of the hole. The function of the flat, which should be square with the hole, is to provide a locking surface for the lock-washer between the carburetor and the probe.

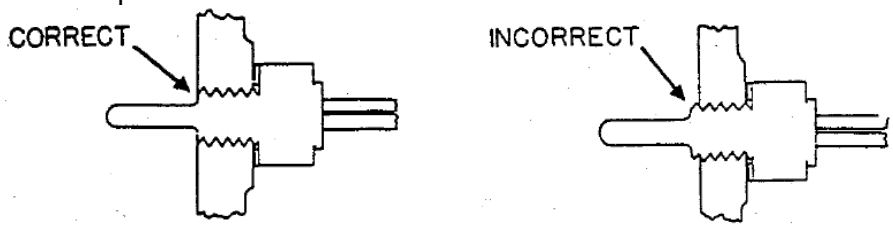
4. Lubricate the ¼-28 tap and tap the hole through.

5. Carefully remove all chips and metal shavings from the inside of the carburetor.

6. Apply thread lubricant to the threaded portion of B-5 Probe.

7. Screw the B-5 Probe into the hole and note whether a portion of the threaded length protrudes into the inner barrel of the carburetor. Refer to sketches below.

Probe depth into carburetor:



8. Remove the B-5 Probe, and select from the special star lock washer and flat spacing washers furnished, a combination which will make the small diameter end of the probe start flush with the wall of the inner barrel of the carburetor. See sketch. The lock washers furnished should not be used stacked (that is two at a time) in this installation. Only one spacing washer can be used, and should contact the carburetor casting, with the lock washer in contact with the shoulder on the B-5 Probe. If necessary, lock washers can be used on both sides of the flat washer. If the probe does not reach all the way into the carburetor barrel, the counterbore can be used again to reduce the thickness of the casting slightly at the outside of the hole. When the correct probe depth has been set, recommended torque is 3 to 4 foot-pounds to prevent damage to the threads in the carburetor or the probe. See section 1.3.2 for more information.

9. Proceed to Electrical Wiring.

3.3.2 ELECTRICAL WIRING

1. Make a cable to connect the probe to the gauge in the instrument panel. Aircraft quality wire with a minimum gauge of 18 AWG (0.04”), well insulated, should be used. For installations requiring runs of more than ten feet, a minimum of 16 AWG (0.051”) should be used. The cable consists of two conductors, which terminate at the gauge end in the appropriate AN or lug connector on the indicator unit selected. At the end next to the probe, each wire is terminated with the Amp 35613 Clasps furnished. These are installed with the appropriate crimping tool, care being taken to make the indentation on the opposite side of the connector from the seam. The insulation grip is then clamped down. The cable should be long enough to reach from the carburetor through a grommeted opening in the firewall to the connector on the panel indicator. Some installers prefer to rig the engine side first, leaving excess wire at the panel that can be cut to length after the gauge is installed.

2. Connect cable to the B-5 Probe knife connectors and slide the Heat Shrink insulating tubing over connections. Apply heat until the Heat Shrink has completely sealed around the connections.

3. The cable should be routed to avoid hot areas and should be supported so there is no excessive whip or vibration from the engine. Allow generous slack from the probe to the first support so that engine motion will not draw the wires tight. The wires leading into the probe are flexible to allow for limited vibration.

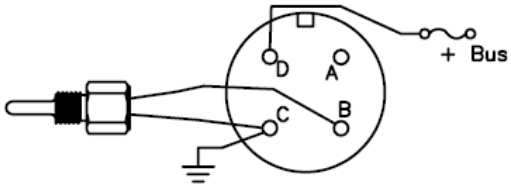
4. Draw free ends of cable through grommet in firewall. This can usually be an existing hole through which other wires are already routed. If a new hole is required, it should be a minimum possible diameter and should be provided with a fireproof grommet to prevent chafing and cutting the insulation on the wires. Route the cable, with appropriate supports, to the panel space provided for the gauge. Be sure that the cable does not and cannot affect the freedom of travel of controls behind the instrument panel.

5. Attach free ends of cable to connector appropriate to instrument being used. Refer to Figure 3.3.3 wiring diagrams for connections, which will depend on the voltage, model of instrument, and number of engines. Connection to the aircraft electrical system should be made through a 2 to 5 ampere fuse or 5 ampere trip free circuit breaker.

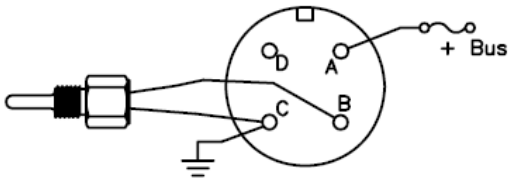
6. Install gauge in panel cutout, attach connector to gauge, and test. Note: if the B-5 Probe is being installed to replace another type of probe such as the AN5525, and the gauge already installed has colored limit markings, these markings should be changed to suit the more accurate readings made possible by the B-5 Probe. The range between –4° F (-20° C) and 40° F (+5° C) can be marked with an orange arc.

Attach free ends of cable to connector appropriate to instrument being used. The B-5 Probe is a resistive element; therefore connections to it are not polarized. Refer to wiring diagrams for connections, which are different on the various indicators.

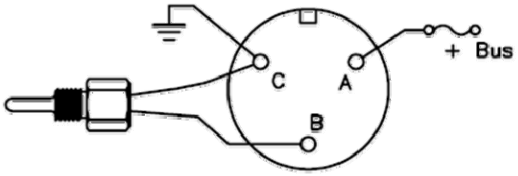
Mid–Continent MD11–6 gauge used in 14 volt system. Uses AN3106–14S–2S connector.



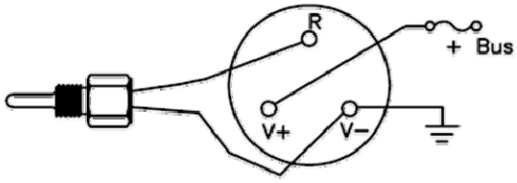
Mid–Continent MD11–6 gauge used in 28 volt system. Uses AN3106–14S–2S connector.



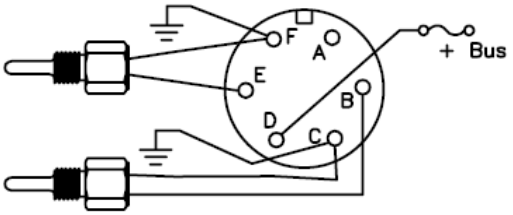
Mid–Continent MD11–3 gauge used in 12 volt system. Mid–Continent MD11–4 gauge used in 24 volt system. C–11, C–12, F–8, or F–9 gauge. 12 or 24 volts as indicated on dial. Uses AN3106–14S–7S connector.



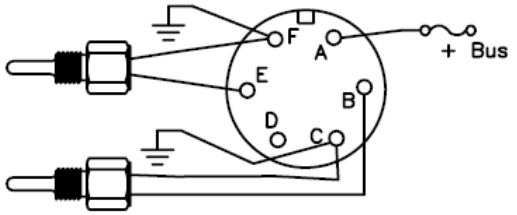
Weston 602 and 606 series. Lug connections.



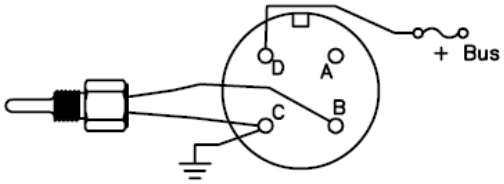
Lewis dual gauge used in 12 volt system.



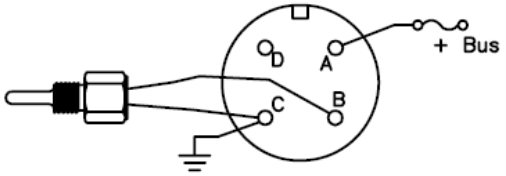
Lewis dual gauge used in 24 volt system.



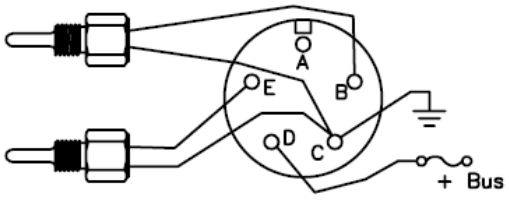
AN5790–6 or C10 gauge used in 12 volt system. Uses AN3106–14S–2S connector.



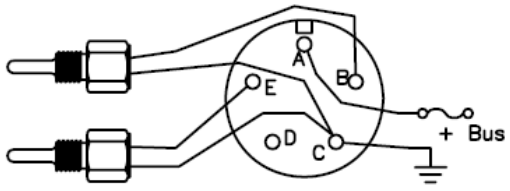
AN5790–6 or C10 gauge used in 24 volt system. Uses AN3106–14S–2S connector.



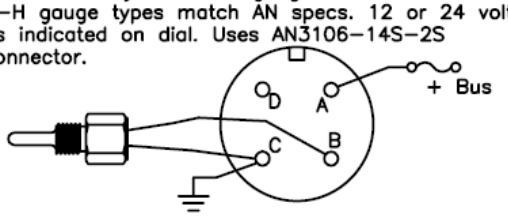
AN5795–6 Dual Gauge used in 12 volt system. Uses AN3106–14S–5S connector.



AN5795–6 Dual Gauge used in 24 volt system. Uses AN3106–14S–5S connector.



Sutton–Horsley Canadian gauge. Caution!! Not all S–H gauge types match AN specs. 12 or 24 volts as indicated on dial. Uses AN3106–14S–2S connector.



Sutton–Horsley Canadian gauge. Caution!! Not all S–H gauge types match AN specs. 12 or 24 volts as indicated on dial. Uses AN3106–14S–2S connector.

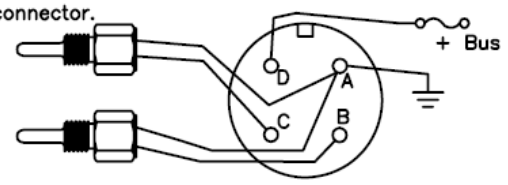


Figure 3.3.3 Gauge Connections

3.4 GROUND TEST & TROUBLESHOOTING

The B-5 Probe, properly installed, should permit temperature readings accurate within 1°C.

1. After installation of the complete system, with engine still cold, the master switch should be turned on. The gauge should register a temperature near the prevailing outside temperature. This will vary if the carburetor is for any reason measurably warmer or colder than the surrounding air. If the gauge registers much higher than the surrounding air, either there is a defective connection or wire introducing added resistance, or the gauge or probe is defective. If the gauge registers much lower than the surrounding air there is a short circuit either in the probe, the cable, or the gauge, or power is not reaching the system.

2. The normal application of the B-5 Probe is not in an outside air temperature system. It is designed to maintain its greatest accuracy at 0° C, not at higher and lower temperatures usually seen on the OAT system. However, if the gauge readings vary substantially from outside air temperature, the gauge unit can be checked with another probe if available or with a 91-ohm precision resistor in place of the probe resistance. With the 91-ohm resistor the gauge should read approximately 1.4°C or 34°F. The probe may be checked on a Wheatstone bridge or precision ohm-meter. It should have a resistance of 90.38 ohms at 0° C or 32° F.

3. The engine should be started and the gauge observed during idling. There should be only a small change (usually a drop) in indicated temperature during idling. If the fuel supply is colder or warmer than the surrounding air temperature this will be reflected in the reading.

4. The engine should be run up to cruise RPM, at which time the gauge should indicate a temperature drop in the carburetor of approximately 15° C or 26° F. This may vary with different configurations of intake systems and the amount of manifold pressure that in turn controls the rate of expansion of the gas-air mixture in the carburetor.

3.5 REMOVAL/REPLACEMENT INSTRUCTIONS

1. With master switch OFF, remove heat shrink, unwind tape or safety wires from insulating tubing over knife connectors.

2. Cut or slide tubing away from knife connectors and disconnect.

3. Carefully unscrew the B-5 Probe from carburetor. Carburetor need not be removed from engine

4. Insert new B-5 Probe into existing hole in carburetor using installation procedure.

** If system is temporarily disconnected for replacement of either probe or gauge, disconnect power supply wire from the bus and PLACARD GAUGE: “Not Operating”.

SECTION 4 OPERATION

It is the responsibility of each pilot to determine his own operating procedure and limits on the basis of information contained in the specific Aircraft Operators Manual or obtained with his own plane under known carburetor icing conditions. Airline flight engineer manuals call for the application of a carburetor heat to an indicated level of 20° C above freezing 3 minutes before entering visible moisture. Since most commercial aircraft don’t have sensing probes as critically placed as the B-5 Probe, an approximate assumption of a 15° C (26° F) temperature drop must be made by the flight engineer or pilot of most models of transport aircraft. This means that standard practice actually amounts to carrying approximately 5° C (9° F) of heat above freezing measured at the throttle valve, which is the most critical point. In practice we find it sufficient to carry 5° C of indicated heat above freezing except when the outside air temperature would be subject to suddenly extreme variations, or extreme icing conditions. Even under these circumstances, the pilot must remain alert and be able to add more carburetor heat. Constant monitoring of the gauge is required during possible icing conditions.

Induction system icing can occur at several points. Fuel lines, pump, or screens can become blocked if there is water in the fuel and it freezes. The intake screen can become blocked with frozen moisture such as sleet or heavy snow. Elbows where the air box angles sharply can be rammed full of incident ice. And most commonly, the throttle valve can accumulate a rim of ice, which, if allowed to develop unchecked, will grow to join a deposit that forms on the wall of the carburetor barrel adjacent to the throttle valve. This occurs exactly at the point where the B-5 Probe is located. The alternate air supply via the carburetor heater will enable continued operation of the engine even when the intake screen is blocked, but if the obstruction at the throttle valve grows large enough to cut off the air supply, no alternate source is available, and engine failure will result.

Experiments indicate that humidity is the controlling factor in the rate of icing. Therefore, the more humid the air, the more rapid the icing. Attention is directed to Aviation Safety Release Numbers 163, 261, and 338 concerning idling failure due in part to the formation

of carburetor ice.

Prudent use of the temperature information furnished by the B-5 probe should enable the average pilot to fly with greater security and economy, since full carburetor heat with its associated loss of power and performance will be required far less frequently. It will also furnish an immediate clue to the trouble if carburetor ice is responsible for a faltering engine. Fuel induction system icing is the largest single cause of engine failure in light aircraft. The B-5 Probe, properly used, should help to eliminate an important percentage of trouble from this source.

An important benefit derived from the use of information provided by the B-5 Probe has come to light as a result of complaints about plug fouling in higher compression engines. A major spark plug manufacturer has found that lead deposits on the plugs in engines using higher octane gasoline are usually the result of inadequate volatilization of the antiknock compounds used to raise the octane rating of the fuel. Most fuels contain tetraethyl lead, which if allowed to burn without an inhibitor, would form metallic lead oxide. Therefore another substance, ethylene dibromide, is added to the fuel along with the tetraethyl lead. The combustion product is lead bromide, a fine powder that is readily blown out the exhaust system. But gasoline has a lower vaporization temperature than ethylene dibromide, which in turn vaporizes more readily than tetraethyl lead. So if the mixture is too cold in the carburetor to vaporize all the fuel components properly, the tetraethyl lead may be concentrated in only part of the engine in the form of large, heavy droplets, and possibly separated from its inhibiting ethylene dibromide.

During combustion, therefore, lead oxide may be formed. This lands on the lowest point in the cylinder, the lower plugs, which then foul out. To avoid this, it has been found that warming the fuel-air mixture in the carburetor will aid the volatilization of all the fuel elements together. Experiments have shown that an indicated temperature of about 5° C (9° F) above freezing measured at the throttle valve assures proper volatilization, increasing plug life and engine reliability. Leaning the mixture to compensate for the slight richening due to heated carburetor air should result in fuel economy equal to or even better than that experienced when fuel is mixed with very cold air. This applies to cruise power conditions. For maximum power the most dense or cold air available is required.

The indication does <u>not</u> supply information concerning the presence of sufficient moisture to form ice, this must still be judged by the pilot. Dew point indications given by air weather stations are a fair indicator of moisture in the air. The closer the dew point is to the reported temperature, the higher the humidity. Still it is quite possible to fly ice free with temperatures 30° to 50° below freezing. Ice formation in carburetors seems to give its principal trouble at or near the actual freezing point. Moisture, condensing on cold metal, begins to build up a deposit adjacent to the throttle valve exactly where the B-5 Probe is located.

Laboratory experiments show that under conditions of 100% humidity, ice will accumulate in the carburetor at temperatures from freezing down to 18° F (-8° C), or possibly lower, as measured at the throttle valve. At lower temperatures moisture is precipitated out of the air in the form of harmless crystals by the refrigerating effect of the expansion of the gas-air mixture in the manifold. It is the expansion–refrigeration effect that manufactures carburetor ice from moist air. The pilot must be alert to keep the carburetor heat level

above freezing during conditions of high humidity.

SECTION 5 SERVICE LIFE

The Mid-Continent Instruments and Avionics -B-5 Carburetor Temperature Probe is guaranteed for one year from date of purchase or 500 hours of operation, whichever comes first. See warranty card for more details.

The probe should be replaced if the wire leads fray at the point where they enter the potting compound at the outer end of the brass shell or when damaged mechanically or electrically. Otherwise it should remain serviceable as long as it reads correctly.

United States of America
Department of Transportation -- Federal Aviation Administration

Supplemental Type Certificate

Number SE1-201

This certificate issued to Mid-Continent Instrument Co., Inc.
9400 E. 34th St. North
Wichita, KS 67226

certifies that the change in the type design for the following product with the limitations and conditions thereof as specified hereon meets the airworthiness requirements of Part 3 & 13 *of the* Civil Air Federal Aviation *Regulations.*

Original Product - Type Certificate Number :

Make : See Attached Engine Eligibility List
Model :

Description of Type Design Change: Installation of the Richter Aero Equipment Type B-4 or B-5 Temperature Probe in Marvel Schebler (Precision Airmotive; Facet) Carburetor Models MA-2, MA-3, MA-3A, MA-3-SPA, MA-4, MA-4-5, MA-5, MA-6, MA-6AA, and HA-6 series and in Bendix Carburetor Models NA-S3B and NA-S3A1, in accordance with Richter Installation Bulletin No. 2 dated March 6, 1958, Bulletin No. 3 revised July 26, 1959, and Bulletin No. 4 dated June 28, 1961. (See Continuation Sheet 2 of 4)

Limitations and Conditions: 1. Placard required on face of temperature gauge: "Maintain at least 5° C. or 9° F. above freezing during possible carburetor icing conditions." Alternate Placard: "Keep needle out of yellow arc during possible carburetor icing conditions." 2. This approval should not be extended to other specific engines of these models on which other previously approved modifications are incorporated unless it is determined (See Continuation Sheet 2 and 4)

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application : May 6, 1958

Date reissued : June 6, 1991; January 8, 1999

Date of issuance : May 6, 1958

Date amended : 7/7/59; 8/11/61; 3/11/65; 9/20/77; 3/20/92

By direction of the Administrator

Ronald K. Rathgeber
(Signature)
Ronald K. Rathgeber
Associate ACO Manager, Airframe & Services
Wichita Aircraft Certification Office

Supplemental Type Certificate

(Continuation Sheet)

Number SE1-201

Description of Type Design Change, Continued:

This installation includes the WAC Line, Inc. FLDX-N20350 temperature indicator as an alternate instrument in accordance with Richter wiring Bulletin No. 5 dated March 1, 1965.

Limitations and Conditions, Continued:

that the interrelationship between this change and any of those other previously approved modification will introduce no adverse effect upon the airworthiness of that engine.

ENGINE ELIGIBILITY LIST

WSK PZL-RZESZOW Co.
(FRANKLIN)
(AIR-COOLED MOTORS)

FRANKLIN MODEL		T. C. NO.
4AC-150	Series	194
4AC-171	Series	206
6AC-298	Series	225
6ACT-298	Series	225
6AL-315	Series	234
6A4-145	Series	238
6A4-150	Series	238
6A4-165	Series	238
6AG4-185	Series	238
6A4-200	Series	238
6A8-215	Series	242
6V4-178	Series	244
6V4-200	Series	244
6V4-335	Series	244
6VS-335-A	Series	1E2
6VS-335-B	Series	1E2
4A-235-B	Series	E6EA
6V-350-A	Series	E9EA
6V-350-B	Series	E9EA
6V-350-C	Series	E9EA
6A-350-D	Series	E9EA
6AS-350-A	Series	E18EA
2A-120	Series	E24EA

United States of America
Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate

(Continuation Sheet)

Number SE1-201

ENGINE ELIGIBILITY LIST (CONTINUED).

TEXTRON LYCOMING CORPORATION

LYCOMING MODEL		T.C. NO.
0-145	Series	199 and 210
0-235	Series	233
0-350	Series	227
0-435	Series	228
GO-435	Series	228
0-290	Series	229
0-320	Series	274
0-340	Series	277
VO-435	Series	279
0-360	Series (excl A1C, C2B, C2D)	286
HO-360-A1A only		286
VO-360	Series	1E1
TO-360	Series	E26EA
LTO-360	Series	E26EA
0-540	Series	295
VO-540-B&C	Series	304
TVO-540-A1A		1E14

TELEDYNE CONTINENTAL MOTORS CO.

CONTINENTAL MODELS		T.C. NO.
A-50	Series	190
A-65	Series	205
A-75	Series	213
A-80	Series	217
C-75	Series	233
C-85	Series	233
C-115	Series	236
C-125	Series	236
E-165-2 only		246
E-185-2 only		246
C-90	Series	252
0-200	Series	252

United States of America
Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate

(Continuation Sheet)

Number SE1-201

ENGINE ELIGIBILITY LIST (CONTINUED).

CONTINENTAL MODEL		T. C. NO.
C-145	Series	253
0-300	Series	253
0-470-A, E, J, K, L, R, S, T. U, only	Series	273
GO-300	Series	298

RANGER ENGINE CO.

RANGER MODEL	T. C. NO.
6-440-C5	216

ROLLS ROYCE LTD.

MODEL		T. C. NO.
RR C90	Series	E31N
RR 0-300	Series	E41N
RR 0-240-A	Series	E11EU

-END-

9400 E. 34th Street N.
Wichita, Kansas 67226

STC SEI-201 USE PERMISSION LETTER

RE: 14 CFR Part 91.403(d)

We hereby give permission to _____ to install

Mid-Continent Instruments and Avionics B-4 or B-5 Temperature Probe on

Aircraft _____, Serial Number _____, per STC SE1-201.

Sincerely,

Mark Smith
Quality Assurance and Regulatory Manager
Mid-Continent Instruments and Avionics

Please complete the above statement and return a copy to the attention of the above named person.

FAA AC21-40A, paragraph 9-5(c) states that "A copy of each permission statement should be retained by the STC holder, installer, and the owner or operator of the product on which an STC alteration is installed."