

TELEDYNE CONTINENTAL[®] AIRCRAFT ENGINE SERVICE INFORMATION LETTER

CATEGORY 5

SIL99-1

Technical Portions FAA
Approved
Supercedes M91-5

CONTAINS USEFUL INFORMATION PERTAINING TO THE
CONTINENTAL AIRCRAFT ENGINE

SUBJECT: ENGINE PRESERVATION FOR ACTIVE AND STORED
AIRCRAFT

PURPOSE: Provide current engine preservation information

COMPLIANCE: During periods as specified by this document

**MODELS
AFFECTED:** All Continental Engine Models

GENERAL

There is no practical procedure that will insure corrosion prevention on installed aircraft engines. Susceptibility to corrosion is influenced by geographical location, season and usage. The owner/operator is responsible to recognize the conditions that are conducive to corrosion and take appropriate precautions.

ENGINE PRESERVATION

Corrosive attack can occur in engines that are flown only occasionally regardless of geographical location. In coastal areas and areas of high humidity, corrosive attack can occur in as little as two days. The best method of reducing the likelihood of corrosive attack is to fly the aircraft at least once every week for a minimum of one hour.

NOTE...

Corrosive attack may reduce engine service life. Of primary concern are cylinders, piston rings, valves, valve guides, camshaft and lifters.

TEMPORARY STORAGE (Aircraft that are not flown for 30 to 90 days)

Preparation for storage.


1. Remove oil sump drain plug and drain oil. Replace drain plug, torque and safety. Remove oil filter. Install new oil filter, torque and safety. Service engine to proper sump capacity with oil conforming to MIL-C-6529 Type II.

2. Perform a ground run-up. Perform a pre-flight inspection and correct any discrepancies. Fly the aircraft for one hour at normal operation temperatures.

WARNING

To prevent possibility of serious bodily injury or death, before moving the propeller accomplish the following:

- a. Disconnect all spark plug leads.
- b. Verify magneto switches are connected to magnetos, that they are in the "OFF" Position and "P" leads are grounded.
- c. Throttle position "CLOSED."
- d. Mixture control "IDLE-CUT-OFF."
- e. Set brakes and block aircraft wheels. Insure that aircraft tie-downs are installed and verify that the cabin door latch is open.
- f. Do not stand within the arc of the propeller blades while turning the propeller.

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Airworthiness Directive Compliance Record

AIRCRAFT RECORDS - DO NOT DESTROY

airframe

Company
Manufacturer CESSNA AIRCRAFT CORP.
Model 182L
Tail # N42279
Serial # 18258940
Current Time 3425
Total Time 5521
A/C Cert. Date 3-20-68

***71-22-02** 11/09/71 [R1] NOSE GEAR FORK/
Method of Compliance N/A By Part Number
SB #
Signature Date Next Due N/A
Cert. #

***72-03-03 R3** 10/15/84 WING FLAP ACTUATOR JACK SCREW/
Method of Compliance Snubber Kit Installed, Terminating Action
SB #
Signature Date 12/27/00 2484.9 Tach Next Due N/A
Cert. # See Logbook

***72-07-09** 10/17/74 [R1] VERTICAL STABILIZER ATTACHMENT/
Method of Compliance
SB #
Signature Date 4/13/07 3139.2 Tach Next Due 4139.2 Tach
Cert. # See Logbook

***75-05-02** 02/21/75 AIR OIL SEPARATOR FILTRATOR ASSEMBLY/
Method of Compliance N/A by STC
SB #
Signature Date Next Due N/A
Cert. #

***83-13-01** 08/01/83 PLACARD-IMPROPER FUEL CAP SEALING/
Method of Compliance Inspected Fuel Caps For Proper Sealing
SB #
Signature Date 4/5/10 3425 Tach Next Due 4/30/11
Cert. # 2703762 A&P

***84-10-01 R1** 07/05/88 BLADDER FUEL CELLS AND QUICK DRAINS/
Method of Compliance Verified Filler Neck And Quick Drain Kit Installed
SB #
Signature Date 3/19/85 738.9 Tach Next Due N/A
Cert. # See Logbook

***87-20-03 R2** 09/24/90 SEAT TRACKS AND SEAT PIN ENGAGEMENT/
Method of Compliance Inspected Seat Tracks, Rollers, and Stop Pins
SB #
Signature Date 4/5/10 3425 Tach Next Due 4/30/11
Cert. # 2703762 A&P

AIRCRAFT RECORDS - DO NOT DESTROY

engine

Company
Manufacturer TELEDYNE CONTINENTAL MOTORS
Model O-470R42B
Location Front
Serial # 815953-R
Prepared by S. TUCKER

Date 4-5-10

TELEDYNE CONTINENTAL[®] AIRCRAFT ENGINE

service bulletin

M89-7 Rev. 1
Supersedes M89-7

Technical Portions Are
FAA Approved

4 August 1989

SUBJECT: ENGINE OPERATION AFTER CYLINDER REPLACEMENT AND/OR MAJOR OVERHAUL

MODELS
AFFECTED: All Models (Steel, Nitrided or Chrome Cylinders)

Proper operation of the engine following cylinder replacement or major overhaul is extremely important. The following procedures should be followed to insure that adequate lubrication is being provided to newly installed components and that the piston ring seating will occur as soon as possible.

I. Operation After Major Overhaul Utilizing an Engine Test Cell

A. Servicing and Pre-starting Procedures

1. Service the lubricating system with mineral oil of the appropriate grade depending on ambient temperature.

NOTE...Corrosion preventive mineral oil MIL-C-6529 Type II can be used but must not be used after the first 25 hours, or six months, whichever occurs first as this oil can cause coking with extended use.

2. Rotate the propeller by hand through several cycles with the spark plugs removed.
3. Pre-oil the lubrication system using an external pre-oiling pressure system.
4. Install the spark plugs and ignition harness.

B. Test Cell Operational Procedures

1. Consult the applicable TCM Overhaul Manual and follow the recommended test cell operational procedures listed.

II. Operation After Major Overhaul Utilizing The Aircraft in Lieu of an Engine Test Cell

A. The Aircraft can be considered a suitable test stand for running-in overhauled engines contingent on the following conditions:

1. Install engine cowling.

(continued)

2. Each cylinder should be equipped with a temperature sensing device to monitor the head temperature. If the aircraft cylinder head temperature gauge monitors one cylinder the following precaution must be adhered to:

During ground runs **do not** permit monitored head temperatures to exceed 400°F or oil temperature to exceed 200°F.

3. The flight propeller may be used contingent on careful observation of cylinder temperatures. Head the aircraft into the wind for this test.
4. Calibration of the aircraft engine instruments must be performed.

B. Prepare and test the engine per the procedures outlined in Paragraph I above.

III. Engine Operation After Cylinder(s) Overhaul or Installation of New Cylinders(s)

A. Engine Starting and Ground Operation

1. Service the engine with mineral oil of the appropriate grade depending on ambient temperature.

NOTE...Corrosion preventive mineral oil MIL-C-6529 can be used but must not be used after the first 25 hours, or six months, whichever occurs first as this oil can cause coking with extended use.

2. Assure that all engine and cylinder baffling is properly installed and in good condition.
3. Cowl the engine. Start the engine and assure that oil pressure rises to within the specified limits within 30 seconds.
4. Operate the engine at 750 RPM for one minute, gradually increasing toward 1000 RPM in three minutes. Check the magneto circuit for grounding prior to a normal shut-down. Allow the engine to cool adequately and then make a visual inspection for any irregularities.

(continued)

5. Start the engine again and operate it at 750 RPM gradually increasing to 1500 RPM over a period of four minutes. If the engine is equipped with a controllable pitch propeller, cycle the propeller allowing only a 100 RPM drop. Return to the idle range and make adjustments to the idle mixture and RPM as required on carburetor engines and to the low unmetered fuel pressure, idle RPM and mixture on fuel injected engines. Position the throttle to 1200 RPM to smooth the engine. Then do an idle mixture check. Refer to the appropriate service information for these fuel system adjustments. Run engine up to full power for a period not to exceed 10 seconds. Visually inspect and correct any discrepancies. Check the oil quantity. Re-cowl the engine in preparation for test flight.

B. Test Flight

1. Ambient air and engine operation temperatures are of major concern during this test flight. Do a normal pre-flight run-up in accordance with the aircraft flight manual. Conduct a normal take-off with full power and monitor the fuel flow, RPM, oil pressure, cylinder head temperatures and oil temperatures. Reduce to climb power in accordance with the flight manual and maintain a shallow climb attitude to gain optimum airspeed and cooling. Rich mixture for all operations except lean for field elevation where applicable and lean to maintain smoothness during climb in accordance with airframe manufacturer's operating instructions.
2. Level flight cruise should be at 75% power with best power or richer mixture for the first hour of operation. The second hour power settings should alternate between 65% and 75% power with the appropriate best power mixture settings. Engine controls or aircraft attitude should be adjusted as required to maintain engine instrumentation within specifications.
3. The descent should be made at low cruise power settings, with careful monitoring of engine pressures and temperatures. Avoid long descents with cruise RPM and manifold pressure below 18" hg.; if necessary decrease the RPM sufficiently to maintain manifold pressure.
4. Any discrepancies detected during test flight or any final adjustments necessary should now be made. The engine can be operated in normal service in accordance with the aircraft flight manual.

TELEDYNE CONTINENTAL[®] AIRCRAFT ENGINE SERVICE INFORMATION DIRECTIVE

Compliance Will Enhance Safety, Maintenance or Economy
Of Operation

CATEGORY 4

SID97-2
FAA APPROVED

SUBJECT: THIS SERVICE INFORMATION DIRECTIVE (SID) SUMMARIZES INFORMATION PERTINENT TO THE DESIGN, OPERATION, MAINTENANCE AND WARRANTY FOR TCM CYLINDERS.

- PURPOSE:**
1. To provide information to assist in obtaining maximum cylinder assembly service life.
 2. To assist in inspecting for and identifying certain cylinder problems.
 3. To provide information related to product improvement in TCM cylinders.
 4. To introduce TCM's TopCare[™] Program and TopCare Cylinder Warranty.

COMPLIANCE: TCM recommends that the TopCare Health Check[™] Inspection be performed at time of engine or cylinder installation and annually thereafter in conjunction with a regularly scheduled inspection.


MODELS AFFECTED: All TCM engine models. The information is especially critical to the higher output and larger displacement engines such as the IO-520, TSIO-520, GTSIO-520, IO-550, TSIO-550 and TSIOL-550 series.

INTRODUCTION:

This SID summarizes the activities and planned product improvements resulting from field service reports of low differential compression checks, cylinder barrel wear and rust formation on 520 and 550 engines reported during service inspections and maintenance actions. A review of these reports indicates that the percentage of reported incidents on these three issues has not changed significantly from historical levels. The actual number of incidents has increased proportionally with the increased use of factory new cylinders at overhaul and/or cylinder replacement.

Although the information presented is pertinent to obtaining maximum service life for all cylinder assemblies, the larger and higher output 520 and 550 series engine cylinders are more susceptible to premature service life issues identified in this SID. These TCM engine series have been used in a large number of engine installations that have been in service for many years. They are also frequently employed as power upgrades to older aircraft. These installations require careful control of cooling as margins can be quickly eroded by deviations from nominal baffling performance, improper fuel system setup and inadequate maintenance.

Improperly maintained and low-usage aircraft are the most susceptible to premature cylinder service issues. Many of the factors which lead to these problems are within the control of operator and maintenance personnel and are detectable during routine inspections, if the proper preventive checks are performed. Even with cylinder design and manufacturing process improvements, decreased cylinder life can occur if proper attention is not given to the various factors identified in this SID.

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TCM TopCare Health Check Inspection - Two of the purposes of this SID are to assist in identifying problems with cylinders in service and to provide a preventive maintenance checklist to utilize in identifying and correcting factors which, if left unaddressed, can lead to reduced cylinder service life. The TCM TopCare Health Check Inspection is intended to supplement the checks normally prescribed by TCM and the airframe manufacturer relating to factors affecting cylinder life and should be conducted at least once per year in conjunction with a regularly scheduled inspection.


TCM TopCare Cylinder Warranties - Aircraft owners who participate in the TopCare Program can be eligible for special warranty coverage, provided certain eligibility requirements are met. The TopCare Cylinder Warranty applies to cylinder assemblies manufactured or supplied by TCM which incorporate the applicable TopCare cylinder improvement package. Additionally, any engine presently covered by the Gold Medallion Standard Aircraft Engine Warranty or the Gold Medallion Plus II Aircraft Engine Warranty but without the TopCare cylinder improvement package may qualify for additional warranty coverage. A summary of TCM TopCare Warranties is presented on page 22 of this SID. Any engine that does not qualify for coverage under the TopCare warranties will continue to be covered under the terms of the Gold Medallion Standard Aircraft Engine Warranty, the Gold Medallion Plus II Aircraft Engine Warranty or the Aircraft Engine Part, Component & Accessory Warranty, as applicable. It should be noted, however, that the issues addressed in this SID relate to the proper installation, operation and maintenance of TCM engines. The discrepancies discussed in this SID may adversely affect the engine and any resulting damage will not be eligible for coverage under any TCM warranty.

TCM TopCare Health Check Inspection

TCM recommends that each operator of a TCM powered aircraft have the TopCare Health Check Inspection performed annually in conjunction with a regularly scheduled inspection to identify cylinder condition and installation items which can result in reduced cylinder life.

The points of the TopCare Health Check are:

- Cylinder Differential Compression Check And Trend Monitoring
- Cylinder Borescope Inspection, As Required
- Oil Consumption Trend Monitoring
- Oil Analysis Trend Monitoring
- Baffle Condition Inspection
- Induction System Examination
- Cowling Inspection And Cowl Flap Operational Check
- Ignition System Inspection
- Fuel System Setup
- Verification Of Accuracy Of Engine Gages
- Flight Test

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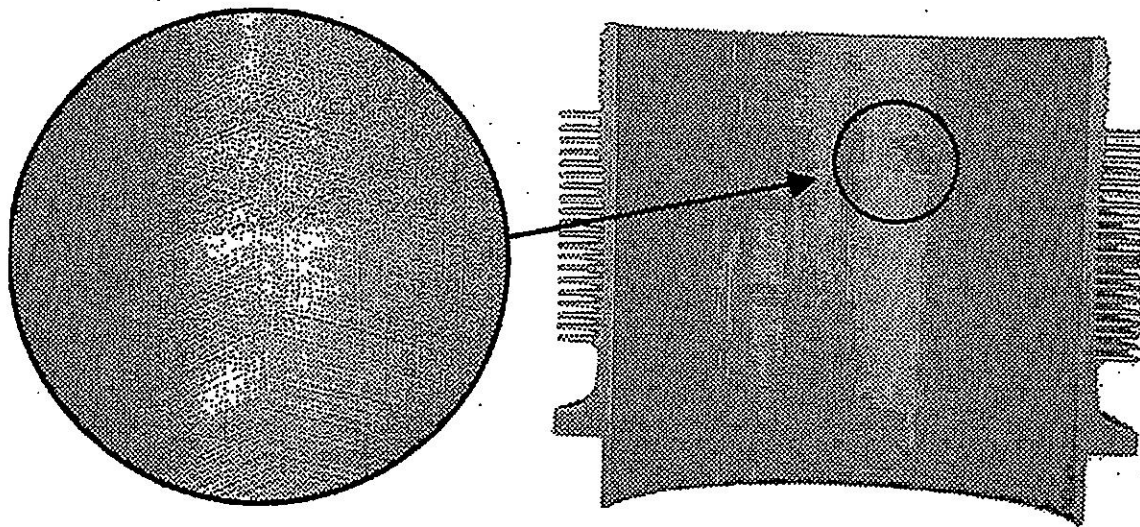
A. RUST EXAMINATION:

To achieve long cylinder life, TCM cylinder barrels are constructed of through-hardened steel with a nitrided surface. Regular use of the aircraft in normal operation is usually sufficient to provide an oil coating which prevents excessive rust formation in the cylinders. However, new cylinders are particularly sensitive to rust formation if not used frequently or preserved during periods of inactivity.

To provide improved rust formation protection in new cylinders, TCM cylinders produced beginning in February and March 1997 (depending on the model) have a manganese phosphate coating. Cylinders produced after these dates also have an advanced multi-step hone pattern to aid in oil retention. Note that the phosphated cylinder bore will have a dark gray to brownish color that will wear away as hours in service are accumulated.

Infrequent or irregular use of the aircraft can easily lead to rust formation which may result in reduced cylinder life if the engine is not properly preserved in accordance with the latest version of the TCM Service Bulletin M91-5 concerning engine preservation.


Caution: *The practice of ground running as a substitute for regular use of the aircraft is unacceptable. Ground running does not provide adequate cooling for the cylinders. In addition, ground running introduces water and acids into the lubrication system which can cause substantial damage over time to cylinders and other engine components such as camshafts. Turning the propeller by hand is not recommended as this wipes off the residual oil.*

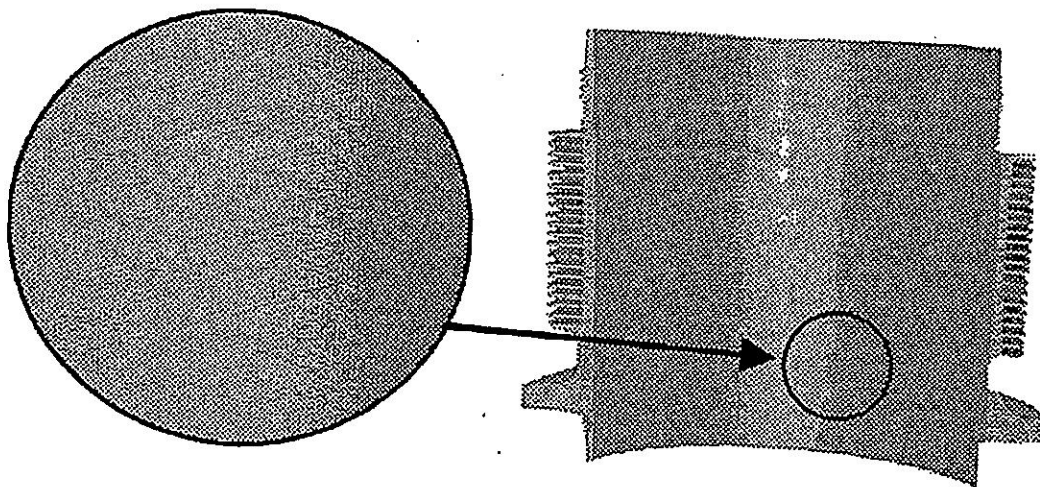


Light Rust Formation, Hone Not Affected.

FIGURE 1

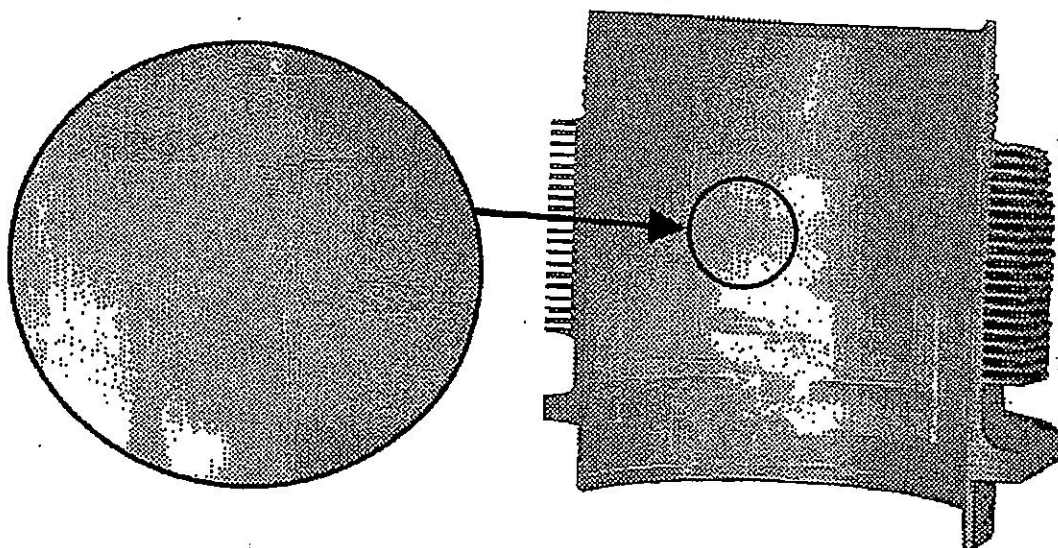
Light rust signatures which have not pitted the cylinder wall, or rust indications above the top ring travel area, are not usually cause for concern. See Figure 1. Severe rust will pit the barrel wall and can damage rings. See Figure 2. Such damage will usually be evident by low differential compression checks and high oil consumption. TCM'S WARRANTY DOES NOT COVER DAMAGE FROM RUST. Rust damage must be prevented by the operator and/or maintenance facility.

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New Steel Cylinder Bore


FIGURE 3



Typical Cylinder Bore At TBO

FIGURE 4

Scratches or grooves that extend in the direction of piston travel can result from contamination and may lead to low differential compression checks and high oil consumption. Heavy bore wear with a complete loss of visible hone pattern over the full ring travel can result from over-temperature operation or abrasive wear. See Figure 5. These signatures, in conjunction with low differential compression checks or high oil consumption, generally indicate cylinder repair or replacement or, at minimum, call for more frequent condition inspections.

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TCM cylinder assemblies produced after February 1997, for 520 and 550 engines have revised oil ring tensions to produce improved cylinder bore lubrication characteristics.

The TopCare Health Checklist Form at the end of this SID contains a means to record oil consumption that should be completed and maintained with the engine logbook. OIL CONSUMPTION TRENDS ARE EXCELLENT INDICATORS OF CYLINDER BORE AND RING CONDITION.

4. OIL ANALYSIS TREND MONITORING

Oil analysis is a tool to monitor wear material and contaminants in the engine. To be effective, a baseline of at least three analyses must be established from a single source to provide trend characteristics. For those engines with an established oil analysis profile, changes in iron, copper and other tracked elements can indicate unusual wear. In such cases, other diagnostic tools such as differential compression checks, borescope inspections, oil filter/screen examination and oil consumption trends can be useful in identifying the problem. Oil analysis can also detect air filtration or induction system leaks indicated by high silicon content. Note that oil analysis does not provide any indication of cracks, leaks or similar situations that could result in engine problems.

NOTE: To establish a meaningful data base for comparison, the oil samples must be taken on a regular schedule using the same sampling technique and laboratory. The engine must have operated long enough to obtain normal operational temperatures and the oil sample taken within 30 minutes after engine shut down. The tube or funnels used to drain the oil from the oil sump must be clean and free of any foreign material or residue. If the oil sample is taken from the oil as it drains from the sump, allow approximately 1/3 of the oil to drain prior to taking the sample. If the sample is taken via the oil filler or other location using a sampling tube it is critical that the sample not be taken from the bottom of the sump, but at a location 2 to 3 inches above the bottom of the sump. Under no circumstances should an oil sample be taken from the oil filter canister.

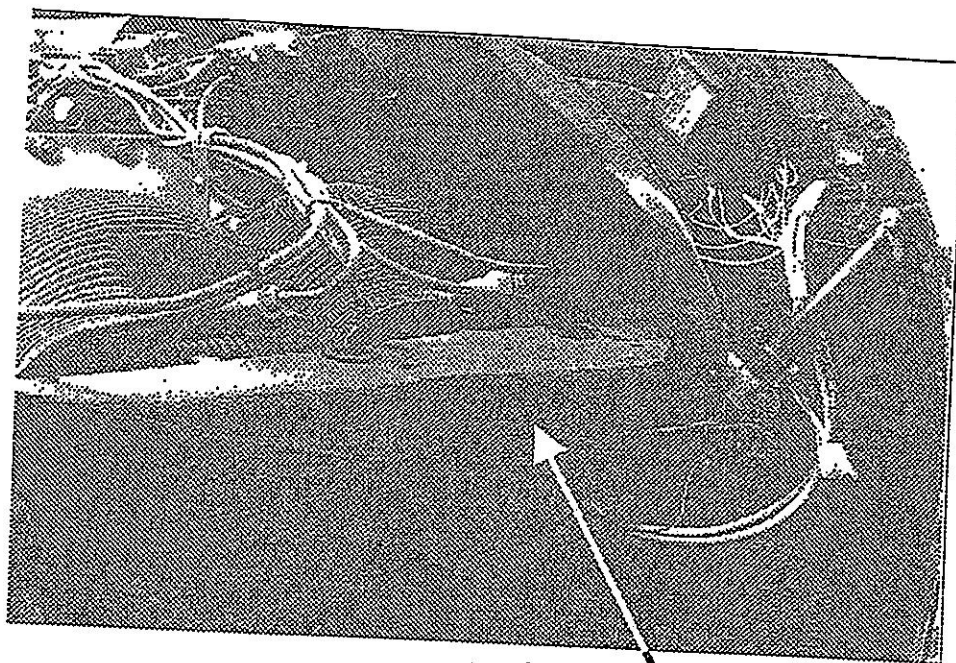
The TCM LINK Aviator Services program provides a mechanism for recording and tracking oil analysis through the software supplied to Aviator Services members. For additional information on Aviator Services, contact TCM LINK Aviator Services Desk at 1-888-826-5465.

5. BAFFLE CONDITION INSPECTION

Investigations into cylinder service life issues found that maintenance of cylinder and oil cooling systems (incorrect and improperly fitting baffles) were factors in premature cylinder removals. To understand the importance of this cooling control, note that approximately one third of the energy of the fuel used is transferred as heat to the structure (cylinder head, barrel, crankcase, etc.) and oil. THE AMOUNT OF HEAT ENERGY THAT MUST BE REMOVED BY THE COOLING AIR IS APPROXIMATELY EQUAL TO THE HORSEPOWER THAT IS DRIVING THE PROPELLER. This is why failure of the cooling baffles to perform efficiently can lead to rapid and significant deterioration of the cylinders and other engine components.


To remove this heat, cooling airflow is directed by a series of baffles and ducts so that the airflow passes over cooling fins or directly to components requiring cooling. IT IS IMPORTANT TO UNDERSTAND THAT THE PRESSURE DIFFERENTIAL IN THE COWLING IS SMALL AND SLIGHT IRREGULARITIES IN THE BAFFLES CAN EASILY HAVE AN ADVERSE AFFECT ON ENGINE COOLING.

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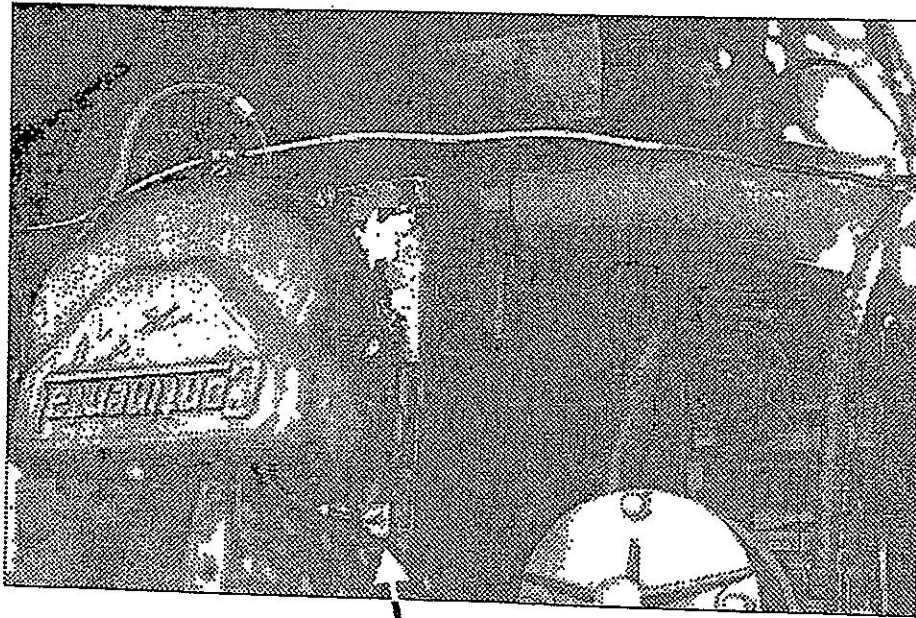


Peripheral Baffle Seals Improperly Positioned



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Air and Side Batties with
Air Gaps



6. INDUCTION SYSTEM EXAMINATION

Improper or inadequate maintenance of the air induction components of the aircraft engine installation can and often does result in the engine breathing unfiltered air. Unfiltered air contains particulates which are abrasive to the engine, especially to the cylinder walls and ring faces. Induction system maintenance that emphasizes properly sealed filters, alternate air doors, and air ducts can prevent much of that damage. Induction system deficiencies can often be detected through oil analysis which identifies the contamination.

In addition to using the engine manuals, also consult the aircraft maintenance manual for information. The TopCare Health Check Inspection contains the basic elements that should be considered as a minimum to inspect induction system integrity.

7. COWLING INSPECTION AND COWL FLAP OPERATIONAL CHECK

In addition to baffle conditions, other components that affect airflow through the cowl must be reviewed. Supplemental equipment or modifications must not restrict cowl openings and exit areas. Abnormal temperatures can result from airflow blockage or restrictions which can lead to cylinder damage. Cowl flap operation is also an integral part of engine cooling control. The TopCare Health Check Inspection recommends verification of the correct opening, rigging, and operation of the cowl flaps.

8. IGNITION SYSTEM INSPECTION

Advanced magneto to engine timing can cause elevated cylinder head temperatures. Maintain and adjust magnetos in accordance with the engine or magneto service instructions. Inspect the magneto harness and spark plugs and replace if needed.


9. FUEL SYSTEM SET-UP

Improper maintenance and adjustment of the fuel system can be a significant factor in premature cylinder removal. Engine operation and cooling are directly related to the correct set-up of the fuel system. In addition, improper fuel system settings can affect engine performance in terms of both power and response to throttle movement. For most installations, the available airflow is insufficient to cool the engine during high-power operation and additional fuel is required to provide supplemental cooling. Mixture control can also be used in cruise to maintain correct cylinder head temperatures. Full rich fuel flows must be set properly in order to provide designed cooling margins.

Refer to the latest version of TCM Service Bulletin SID97-3 concerning fuel system set-up instructions. Use the aircraft manuals and, if the installation is an STC, use the instructions provided with the STC.

Caution: When performing fuel system set-up or adjustment, it is essential that the applicable manufacturer's and/or STC holder's published instructions be followed. It is also essential that proper tools, equipment and calibrated test gages be utilized. Do not rely on aircraft fuel flow pressure gages for fuel system set-up or adjustment. Aircraft tachometer and manifold pressure gages must be verified for accuracy.

To assist in this critical system adjustment, TCM will produce a video about the setup and maintenance of TCM fuel injection systems as a supplement to existing information. The video will be available on the FBO SERVICES software for TCM LINK FBO Services members or may be ordered by contacting the TCM Customer Service Department.

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The highest combustion temperatures occur near the ideal fuel/air ratio of about one pound of fuel for 15 pounds of air. Combustion temperatures drop on both the lean side and rich side of this point. However, on the lean side of peak, the reduction in power with leaning is rapid and lean misfire occurs on many engines about 100 degrees F lean of peak. On the rich side, power is very stable with changes in fuel flow. This characteristic allows the engine to obtain rated power with rich mixtures where the combustion temperatures are substantially reduced. This additional fuel at takeoff is required to maintain control of cylinder structure and oil cooling.

In cruise, operating rich reduces combustion temperatures and should be used to control engine temperatures. For maximum range, operation on the lean side of peak or at peak is permitted at low cruise power on some engine models. For normal operation, it is good practice that mixtures be controlled so that the hot cylinder is 50 to 100 degrees F rich of peak at cruise settings.

In addition, rapid temperature changes should be avoided. Warm-up and cool down periods at the start and end of flights are also recommended. Leaning recommendations and fuel flow limits are found in the Airplane Flight Manual, or supplemental Airplane Flight Manual if you have an STC installation. These recommendations should be followed with pilot control of fuel flows and cowl flaps used to maintain temperature control.

COMMENT ON ENGINE TOP OVERHAUL PROCEDURES

If the results of the TopCare Health Check Inspection indicate that one or more cylinders should be removed from the engine, it is extremely important the cylinder removal, repair or replacement, and installation be conducted according to the instructions contained in the appropriate aircraft manufacturer's instructions, TCM Overhaul Manual and other related TCM service documents for the aircraft and engine under service.


Evaluations of engine service issues and incidents in the field indicate that a number of engines that experience reduced service life can be attributed to improper field top overhaul procedures. Improper torque sequencing or procedures employed during reassembly can result in loss of engine crankcase through-bolt torque.

WARNING

THE USE OF IMPROPER PROCEDURES FOR CYLINDER REMOVAL AND REPLACEMENT CAN LEAD TO LOSS OF MAIN BEARING CRUSH AND ENGINE FAILURE.

To assist with the understanding of the proper procedures for engine top overhaul, TCM is producing a video which highlights the critical elements of a field top overhaul. The top overhaul video will be available to TCM LINK FBO Services members through their TCM LINK software package.

Non-members can contact TCM Customer Service and order the video for a nominal charge. Availability of videos will be announced with a Service Information Directive.

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- d. Inspect each cylinder for signatures of heavy wear. See Figure 5. Heavy bore wear is identified as a complete loss of visible hone pattern over the full ring travel and will normally have associated low cylinder differential compression and/or high oil consumption. This generally will indicate a need for cylinder repair or replacement or, at minimum, call for more frequent condition inspections.
- e. Inspect each cylinder for signatures of scoring. A predominant amount of cylinder bore scratches or grooves that extend in the direction of piston travel will normally lead to low differential compression checks and high oil consumption. This may also be identified by burnt or blistered paint on the exterior of the cylinder barrel. This will indicate a need for cylinder repair or replacement.

3. OIL CONSUMPTION TREND MONITORING

- a. A formal oil consumption record should be generated for the engine installation. If oil consumption is more than one quart every three hours of operation or if the oil consumption trend has changed substantially, conduct the differential compression and borescope examinations defined by sections 1 and 2 of the TopCare Health Checklist. If the oil consumption trend is stable and the oil consumption is less than one quart every three hours, continue with the TopCare Health Checklist.
- b. Record type of oil used.
- c. Record the number of quarts of oil added.
- d. Record oil change interval.
- e. At every oil change, strain the oil and examine for debris. Also, cut open the oil filter and examine it for unusual material content. Record examination results of the strained oil, oil filter or screen. The presence of a heavy amount of material will require investigation to determine the source prior to further engine operation.

4. OIL ANALYSIS TREND MONITORING

- a. If an oil analysis profile has been established, review the results for indications of wear or contamination.
- b. Based on the latest oil analysis, record the results of the profile trend. If the trend indicates an abnormal increase in material amounts, reference the recommended actions provided by the oil analysis laboratory.
- c. If no prior oil analysis exists, initiate sampling according to the instructions you receive with the oil analysis kit.

5. BAFFLE CONDITION INSPECTION

- a. Check baffles for condition, correct position, and proper contact with cowl.
- b. Repair or replace worn or distorted baffles.
- c. Check and adjust inter-cylinder baffles to ensure a tight fit.

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10. AIRCRAFT ENGINE GAGE VERIFICATION

- a. In addition to the verification of accuracy of the tachometer and manifold pressure gage required for fuel system setup, verify that the fuel flow, cylinder head temperature (CHT) and exhaust gas temperature (EGT) gages are providing accurate indications.

11. FLIGHT TEST

- a. Refer to TCM Service Bulletin M89-7R1 for guidelines for initial operation and flight test after maintenance.
- b. Conduct flight test as called for in TCM Service Bulletin M89-7R1.
- c. Make adjustments as indicated by the flight test.
- d. Follow the limitations and operating instructions provided in the Airplane Flight Manual or supplemental Airplane Flight Manual.
- e. Under standard atmospheric conditions, typical full rich climb cylinder head temperatures should be 380 to 420 degrees F and oil temperatures should be 180 to 220 degrees F.
- f. Under standard atmospheric conditions, typical lean cruise cylinder head temperatures should be 340 to 380 degrees F and oil temperatures should be 170 to 190 degrees F.

PILOT OPERATIONAL AWARENESS

In addition to the items contained in the TopCare Health Checklist, the maintenance facility should also provide the owner information concerning the following:

- a. Rust - Refer to TCM Service M91-5 for engine preservation instructions. Frequent use for periods that ensure at least 30 minutes of flight operation after oil temperatures have stabilized is the best routine. DO NOT SUBSTITUTE GROUND RUNNING FOR FLIGHT OPERATION.
- b. Lubrication - Use only oils approved for aircraft engines. Refer to the latest TCM Service M87-12 Rev. 1 concerning recommended fuel and oil grades. Oil changes at intervals not to exceed 50 hours of operation (25 hours for engines with oil screens) or 6 months, whichever occurs first, is considered good practice.
- c. Cooling Control - Follow the leaning recommendations and fuel flow limits in the Airplane Flight Manual or supplemental Airplane Flight Manual if an STC installation. Pilot control of fuel flow and cowl flap position to maintain temperature within the guidelines is recommended practice.

TCM LINK Aviator Services - This owner service provides direct exchange of information with TCM and provides reference information such as TCM service bulletins and FAA Airworthiness Directives related to specific TCM engines and ignition systems. For enrollment information contact the TCM LINK Aviator Services Desk at 1-888-TCM-LINK (826-5465).

ISSUED			REVISED			 TELEDYNE CONTINENTAL MOTORS <small>An Allegheny Teledyne Company</small> P.O. Box 90, Mobile, AL 36601 (334) 438-3411	PAGE NO	REVISION
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2. ADDITIONAL WARRANTY COVERAGE

Any engine presently covered by the Gold Medallion Standard Aircraft Engine Warranty or Gold Medallion Plus II Aircraft Engine Warranty but without the cylinder improvement package required for coverage under the TopCare Cylinder Warranty may qualify for the additional warranty coverage described below under the TopCare Program. To qualify, the customer must have the TopCare Health Check Inspection performed and all discrepancies must be corrected. To maintain the coverage, the TopCare Health Check Inspection must be performed annually and any discrepancies must be corrected at that time.

Participation in the TopCare Program will not extend the term of coverage for either warranty, i.e. for the Gold Medallion Standard Aircraft Engine Warranty, the term of the warranty is to TBO based on actual hours or 40 hours per month, whichever occurs first and for the Gold Medallion Plus II Aircraft Engine Warranty, the term of the warranty is to TBO based on actual hours or 30 hours per month, whichever occurs first. However, if under the terms of the applicable warranty, the customer is entitled to a prorata adjustment relating to a cylinder repair or replacement, the adjustment will be calculated on the basis of actual hours or 25 hours per month, whichever is greater, rather than the 40 hours per month ordinarily utilized under the Gold Medallion Standard Aircraft Engine Warranty or 30 hours per month ordinarily utilized under the Gold Medallion Plus II Aircraft Engine Warranty. The additional warranty coverage applies only to the following parts: cylinder, intake and exhaust valves, valve guides, valve springs, valve retainers, valve seat inserts, pistons, piston rings and related O-rings and gaskets.

3. ENROLLMENT INTO THE TOPCARE WARRANTY PROGRAM

Each new aircraft powered by an engine which incorporates the TopCare cylinder improvement package is covered and no enrollment is required. For other than new aircraft, enrollment into the TopCare Warranty Program must be accomplished by performing the initial TopCare Health Check at time of engine (or cylinder) installation and correcting any discrepancies. The initial TopCare Health Check Form must be completed, signed by the inspecting mechanic and returned along with the attached TCM TopCare Warranty Enrollment Form to:

Teledyne Continental Motors
Attn. Warranty Services
P.O. Box 90
Mobile, AL 36601
Fax Number 334-432-7352.

To maintain coverage, the TopCare Health Check Inspection must be performed annually and any discrepancies corrected at that time. The TopCare Health Check Form must be completed for each inspection, signed by the inspecting mechanic and retained by the owner for submittal to TCM with any warranty claim under the TopCare warranty.

Any FBO facility having all of the minimum tools required for performing the TopCare Health Check Inspection as identified on page 4 of this SID and the capability to properly perform the TopCare Health Check Inspection may contact TCM Service Department at 1-888-200-7565 and request that they be included on a list to be maintained by TCM to assist customers in identifying facilities capable of properly performing the TopCare Health Check Inspection. TCM reserves the right to audit both the equipment and capability of any FBO facility requesting to be included on the list and may require demonstration of capability and/or training for continuation on the list.

ISSUED			REVISED			 TELEDYNE CONTINENTAL MOTORS <small>An Allegheny Teledyne Company</small> P.O. Box 90, Mobile, AL 36601 (334) 438-3411	PAGE NO	REVISION
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TCM Field Service Representative Directory

NAME	TELEPHONE & FAX NUMBER	TERRITORY
John Black	972-219-5414 972-219-5415	Alabama, Georgia, Louisiana, Mississippi, New Mexico, Oklahoma, and Texas, Mexico.
Othell "Virg" Virgin	360-892-3821 360-892-4828	Alaska, Idaho, Montana, Oregon, Washington and Wyoming.
Loren Lemen	702-884-1524 702-884-1247	Arizona, California, Hawaii, Nevada and Utah. Australia and New Zealand.
Bob Moseley	816-489-8282 816-489-8283	Arkansas, Colorado, Iowa, Kansas, Missouri, Nebraska, South Dakota and North Dakota.
Dave Blanchard	207-883-3150 207-883-2640	Connecticut, District of Columbia, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Pennsylvania, Rhode Island, South Carolina, Virginia and Vermont.
Mike DeHate	561-388-4757 561-388-4758	Florida.
Al Lewis	973-890-9916 973-890-9608	Illinois, Indiana, Kentucky, Michigan, Ohio, Tennessee, West Virginia and Wisconsin.
Tony Evanson	44-1270-76-7339 44-1270-76-1999	Europe, Africa and Asia.
Edgardo Martedi	55-11-959-3166 55-11-959-3201	Central and South America.
TCM Factory	1-888-200-7565 334-432-7352	

ISSUED		REVISED		MO		DAY		YEAR		02		17		97	
MO		DAY		YEAR		MO		DAY		YEAR					
TELEDYNE CONTINENTAL MOTORS An Allegheny Teledyne Company P.O. Box 90, Mobile, AL 36601 (334) 438-3411															
PAGE NO		REVISION		25 OF 28		SID97-2									

TCM TopCare™ Health Checklist Form

Inspecting Agency: _____
 Inspecting Mechanic: _____
 Aircraft Owner: _____
 Aircraft Make/Model: _____
 Aircraft Year: _____
 Engine Model: _____
 Engine Hours: Time since major O/H _____

Date: _____

Aviator Services Member #: _____
 (As Applicable)

Aircraft Serial #: _____

Registration #: _____

Engine Serial #: _____

Time Since Top O/H: _____

1. Differential Compression Check Record Readings

1a. Master Orifice Reading _____
 1b. Record Differential Compression Values for Each Cylinder _____

	#1	
	#2	
	#3	
	#4	
	#5	
	#6	

2. Cylinder Bore Inspection Check ☒ Inspection Results for Each Cylinder

	2a - Normal Wear	2b - Light Rust	2c - Heavy Rust	2d - Heavy Wear	2e - Scoring
Cylinder #1 _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cylinder #2 _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cylinder #3 _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cylinder #4 _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cylinder #5 _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cylinder #6 _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Oil Consumption Trend Monitoring Record Information

3a. Record Oil Consumption - One (1) Quart Every _____ Hours
 3b. Type of Oil Used _____
 3c. Record the Number of Quarts Added _____
 3d. Record Oil Change Interval _____ Hours
 3e. Sump Oil Strained and Filter Contents Examined and Found to be: _____

☐ Clean
☐ Light Material
☐ Heavy Material

4. Oil Analysis Trend Monitoring Check ☒ as Applicable

4a. Oil Analysis Profile Established _____ ☐ Yes ☐ No
 4b. Latest Oil Analysis Indicates _____ ☐ Normal Trend ☐ Abnormal Trend
 4c. Oil Analysis Sampling Initiated _____ ☐ Yes ☐ No
 Oil Analysis Lab Used _____

ISSUED			REVISED		
MO	DAY	YEAR	MO	DAY	YEAR
02	17	97			

TELEDYNE
CONTINENTAL MOTORS
 An Allegheny Teledyne Company
 P.O. Box 90, Mobile, AL 36601 (334) 438-3411

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1. Approving National Aviation
Authority/Country:

UNITED STATES

2.

AUTHORIZED RELEASE CERTIFICATE

FAA Form 8130-3, AIRWORTHINESS APPROVAL TAG

3. Form Tracking Number:

26003

4. Organization Name and Address:

AERO ACCESSORIES 16152 VALERIO ST. VAN NUYS CALIF. 91406

5. Work Order/Contract/Invoice
Number:

26003

6. Item:	7. Description:	8. Part Number:	9. Eligibility:*	10. Quantity:	11. Serial/Batch Number:	12. Status/Work:
1	MAGNETO	6310	N/A	1	99091408	REPAIRED

13. Remarks:

REPAIRED, INSPECTED, AND TESTED IN ACCORDANCE WITH SLICK SERVICE MANUAL AS PER SLICK 500HR. INSPECTION

14. Certifies the items identified above were manufactured in conformity to:

- ☐ Approved design data and are in condition for safe operation.
☐ Non-approved design data specified in Block 13.

19. ☒ 14 CFR 43.9 Return to Service ☐ Other regulation specified in Block 13

Certifies that unless otherwise specified in block 13, the work identified in Block 12 and described in Block 13 was accomplished in accordance with Title 14, Code of Federal Regulations, part 43 and in respect to that work, the items are approved for return to service.

15. Authorized Signature:

16. Approval/Authorization No.:
XXXXXXXXXXXXXXXXXX

20. Authorized Signature:

21. Approval/Certificate No.:
XB2R286L

17. Name (Typed or Printed):

XXXXXXXXXXXXXXXXXXXXXXXXXXXX

18. Date:

XXXXXXXXXXXXXXXXXXXX

22. Name (Typed or Printed):

ROBERT J. RUMM

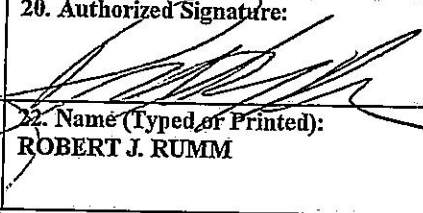
23. Date (m/d/y):
1/11/06

User/Installer Responsibilities

It is important to understand that the existence of this document alone does not automatically constitute authority to install the part/component/assembly.

Where the user/installer performs work in accordance with the national regulations of an airworthiness authority different than the airworthiness authority of the country specified in Block 1, it is essential that the user/installer ensures that his/her airworthiness accepts parts/components/assemblies from the airworthiness authority of the country specified in Block 1.

Statements in Blocks 14 and 19 do not constitute installation certification. In all cases, aircraft maintenance records must contain an installation certification issued in accordance with the national regulations by the user/installer before the aircraft may be flown.

1. Approving National Aviation Authority/Country: UNITED STATES		2. AUTHORIZED RELEASE CERTIFICATE FAA Form 8130-3, AIRWORTHINESS APPROVAL TAG					3. Form Tracking Number: 26004	
4. Organization Name and Address: AERO ACCESSORIES 16152 VALERIO ST. VAN NUYS CALIF. 91406							5. Work Order/Contract/Invoice Number: 26004	
6. Item:	7. Description:	8. Part Number:	9. Eligibility:*	10. Quantity:	11. Serial/Batch Number:	12. Status/Work:		
1	MAGNETO	6310	N/A	1	99091407	REPAIRED		
13. Remarks: REPAIRED, INSPECTED, AND TESTED IN ACCORDANCE WITH SLICK SERVICE MANUAL AS PER SLICK 500HR. INSPECTION								
14. Certifies the items identified above were manufactured in conformity to: <input type="checkbox"/> Approved design data and are in condition for safe operation. <input type="checkbox"/> Non-approved design data specified in Block 13.				19. <input checked="" type="checkbox"/> 14 CFR 43.9 Return to Service <input type="checkbox"/> Other regulation specified in Block 13 Certifies that unless otherwise specified in block 13, the work identified in Block 12 and described in Block 13 was accomplished in accordance with Title 14, Code of Federal Regulations, part 43 and in respect to that work, the items are approved for return to service.				
15. Authorized Signature:		16. Approval/Authorization No.: XXXXXXXXXXXXXXXXXX		20. Authorized Signature: 		21. Approval/Certificate No.: XB2R286L		
17. Name (Typed or Printed): XXXXXXXXXXXXXXXXXXXXXXXXXXXX		18. Date: XXXXXXXXXXXXXXXXXXXX		22. Name (Typed or Printed): ROBERT J. RUMM		23. Date (m/d/y): 1/11/06		
User/Installer Responsibilities								
<p>It is important to understand that the existence of this document alone does not automatically constitute authority to install the part/component/assembly.</p> <p>Where the user/installer performs work in accordance with the national regulations of an airworthiness authority different than the airworthiness authority of the country specified in Block 1, it is essential that the user/installer ensures that his/her airworthiness accepts parts/components/assemblies from the airworthiness authority of the country specified in Block 1.</p> <p>Statements in Blocks 14 and 19 do not constitute installation certification. In all cases, aircraft maintenance records must contain an installation certification issued in accordance with the national regulations by the user/installer before the aircraft may be flown.</p>								



CESSNA AIRCRAFT CO

EQUIPMENT LIST

MODEL 182L

WICHITA, KANSAS

AIRCRAFT SERIAL NO 18258940

FAA REGISTRATION NO. N42279

DATE 3-20-68

NOTES

1. Suffix letters to item numbers:
- R required items of equipment for FAA certification
 - S standard equipment items
 - O optional equipment items replacing required or standard items
 - A optional equipment items which are in addition to required or standard items
2. Status of equipment
- installed in the aircraft at the factory
 - loose item of equipment which is stowed in the aircraft when it left the factory but which is not included in the Optional Equipment Weight and Moment (Installed ARM is listed.)
3. Unless otherwise indicated, true values (not net change values) for weight and arm are shown. Positive arms are distances aft of datum; negative arms are distances forward of datum (see weight and balance data sheet for datum location).
4. A separate FAA approval must be obtained if the following items are not installed per applicable Cessna drawings or accessory kit instructions.

ITEM NO	DESCRIPTION	REF DRAWING	WT LBS	ARM INS
001-R	Engine, Continental (180-70-P)			
002-R	Propeller (McCauley 2A15C66/90AT-8)	C161002-0201	430.0	-17.5
003-R	Spinner, Propeller	0752637	52.0	-40.0
004-R	Governor, Propeller (Garwin)	34-828-01 or	4.0	-40.0
	(McCauley)	C290-D2/T1	4.0	-32.5
005-R	Alternator, 60 Amp. 14-Volt (Cessna)	1250212	11.5	- 5.5
006-R	Regulator, Alternator, 60 Amp. 14-Volt (Cessna)	C611001-0101	1.0	- 1.0
007-R	Battery, 12-Volt, 33 Amp. Hr.	0712605	28.0	116.0
008-R	Filter, Carburetor Air	0750038	1.0	-33.0
009-R	Heating System, Cabin and Carburetor Air		18.0	-16.0
010-R	Oil Cooler, Engine (Continental)	625093	5.5	-31.5
010-O	Oil Cooler, Engine Non-congealing (Continental)	630050	7.0	-31.5

APPROVED

Cessna Aircraft Co. Commercial Dept.
Wichita, Kansas 67209

ISSUED: 9-20-67

REVISED:

APPROVED: *Bill* Division Engineer

FORM NO. 80-187

SHT 1 OF 5

Cessna

CESSNA AIRCRAFT CO

EQUIPMENT LIST (CONT'D)

MODEL 182L

WICHITA, KANSAS

ITEM NO		DESCRIPTION	REF DRAWING	WT LBS	ARM INS
011-R	✓	Wheel, Tire and Tube and Brake Assembly (two) 6:00 x 6, 6-ply (main)	1241156	30.0	59.0
011-L		Wheel, Tire and Tube and Brake Assembly (two) 8:00 x 6, 6-ply (main)	1241156	36.0	59.0
011-S	✓	Wheel and Tire Assembly (one) 5:00 x 5, 6-ply (nose)	1241156	8.0	-6.5
012-L		Wheel and Tire Assembly (one) 6:00 x 6, 6-ply (nose)-Requires Item 136-A	1241156	12.0	-6.5
014-R	✓	Indicator, Stall Warning Audible	S-1407-6	1.0	17.5
014-R		Altimeter	S-1314N1	1.0	16.0
014-L	✓	Altimeter (sensitive)	C661011-0105	1.5	15.5
014-U-1		Altimeter, Sensitive (feet & millibars)	C661011-0106	1.5	15.0
015-R		Seat Adjustable, Pilot	0700678	14.0	40.0
015-L	✓	Seat Adjustable, Vertically, Fore and Aft and with Reclining Back, Pilot	0700630	18.0	40.0
016-S		Seat Adjustable, Copilot	0700678	14.0	40.0
016-L	✓	Seat Adjustable, Vertically, Fore and Aft and with Reclining Back, Copilot	0700630	18.0	40.0
017-S	✓	Seat, Rear	0700678	25.5	80.5
018-R	✓	Belt, Safety, Pilot	S-1746-2	1.0	36.0
019-S	✓	Belt, Safety, Copilot	S-1746-2	1.0	36.0
020-L	✓	Belt, Safety, Rear Seat (two)	S-1746-1	2.0	71.0
021-S		Paint Scheme, Standard Stripes	0704002	3.5	100.0
021-L	✓	Paint Scheme, All-over	0704002 or 0704003	18.5	95.5
022-R	✓	Gage, Cylinder Head Temperature	1213505	1.0	11.5
023-R	✓	Gage, Manifold Pressure	S-1301N1	1.0	15.0
024-R	✓	Tachometer, Recording	S-1305N8	1.5	14.0
025-R		Indicator, Air Speed	S-1470N4	1.0	16.0
025-L	✓	Indicator, True Airspeed	0713843	1.0	16.5
026-S	✓	Lights, Landing	0523118	2.5	31.0
100-A		Axle, Heavy Duty (net change)	1441003	2.0	59.0
101-A		Cables, Stainless Steel Control (net change)		Negl.	--
102-A	✓	Clock, Electric	S-1317N2	0.5	16.5
103-A	✓	Controls, Dual (wheel, pedals, and toe brakes)	0760650	8.0	15.0
104-A		Corrosion Proofing, Internal	0760101		
105-A	✓	Curtain, Rear Window	0700707	7.0	70.0
106-A	✓	Detectors, Nav. Light	0523702	1.5	112.0
107-A		Discharger, Static	0770726	Negl.	--
108-A	✓	Fairing, Standard Nose Wheel	0743625	4.5	-5.0
109-A		Fairing, Oversize Nose Wheel	0743618	4.5	-5.5
110-A	✓	Fairings, Standard Main Wheel (set of two)	0741046	13.0	61.5
111-A	✓	Fairings, Oversize Main Wheel (set of two)	0741615	15.5	61.0

ISSUED: 9-20-67

REVISED:

SHT 2 OF 5

FORM NO 80-191



CESSNA AIRCRAFT CO

EQUIPMENT LIST (CONT D)

MODEL 182L

WICHITA, KANSAS

AIRCRAFT SERIAL NO 18258940

FAA REGISTRATION NO. N42279

DATE 3-20-68

ITEM NO	DESCRIPTION	REF DRAWING	WT LBS	ARM INS
112-A	Filter, Full Flow Oil			
114-A	Fire Extinguisher, Hand Type (one with std. pilot's seat)	0750606 1400054	4.5 5.5	- 4.5 35.0
115-A	Fire Extinguisher, Hand Type (one with manual vertical fastening pilot's seat)	0500120	3.5	29.0
116-A	Gage, Carburetor Air Temperature	0750610	1.0	5.5
116-A	Gage, Oil In Air Temperature	S-1322-1	Negl.	28.5
117-A	Door Service Plug Receptacle	0700754	2.5	- 2.0
118-A	Gyr, New Horizon and Directional- to Fire Item 147-A	0706006	6.5	13.5
119-A	Gyr, New Horizon and New A.R.C. Directional-Requires Item 147-A	0701051	6.0	13.0
120-A	Gyr, New A.R.C. Horizon and Directional- to Fire Item 147-A	0701000	6.5	13.0
121-A	Seat, Front, Two (installed)	1714040	2.0	47.0
122-A	Seat, Rear, Two (installed)	1714040	2.0	87.0
123-A	Seat, New - Stall Sensor and Pitot to Fire Item 147-A	0770724	0.5	26.5
124-A	Indicator, Fuel	0712643	0.5	231.0
125-A	Indicator, Fuel	1200744	1.0	11.5
126-A	Indicator, Fuel Mixture	0750609	1.0	6.0
127-A	Indicator, Rate of Climb	S-1392N1	1.0	15.5
128-A	Indicator, Turn and Bank	S-1302N1	2.0	15.0
129-A	Indicator, Turn Coordinator	C661003-0201	2.5	15.0
130-A	Light, Map (control wheel mounted)	1570149	0.5	22.5
131-A	Light, Map (doorpost mounted)	0770725	0.5	30.0
132-A	Light, Flashing Beacon	0700169	1.0	253.0
133-A	Light, Courtesy (set of two)	0700615	0.5	61.5
134-A	Light, Instrument Panel	1213087	0.5	17.5
135-A	Mirror, Rear View	0700156	0.5	16.0
136-A	Net - Gear Fork - Net Change (one with item 012-0)		1.5	- 5.0
137-A	Oil Dilution System	0750604	2.0	- 0.5
138-A	Oxygen System, 4-Port	0700728	50.0	107.0
139-A	Priming System, Six-Cylinder	0750125	1.0	-15.0
140-A	Seat Installation - Auxiliary (includes seat belt)	0711663	10.0	102.0
141-A	Shelf, Utility - Removable	0711682	1.0	105.5
142-A	Stabilizer Abrasion Boots	0500041	1.5	206.0
143-A	Static Source, Alternate	1200678	Negl.	--
144-A	Stretcher Installation, Custom Air	0700164	Use Actual Wt. & Arm Change	
145-A	Sun Visors (two)	0700122	1.0	33.0
146-A	Tow Bar, Aircraft (stowed)	0700315	2.0	97.0
147-A	Vacuum System, Engine Driven	0750224	7.0	- 0.5

ISSUED: 7-20-67

REVISED:

FORM NO 80-103

SHT 3 OF 5

Cessna.

CESSNA AIRCRAFT CO

EQUIPMENT LIST (CONT D) MODEL 182L

WICHITA, KANSAS

ITEM NO	DESCRIPTION	REF DRAWING	WT LBS	ARM INS
148-A	Ventilation System, Rear Seat			
149-A	Windshield, Tinted (not change)	1200636	2.0	50.5
150-A	Wings, Extended Range (not change)		Negl.	--
151-A	Wing Leveler, Brittan (includes turn coordinator)-Required Item 157-A	0720600	7.0	46.5
152-A	Winterization Kit, Engine	0701008	7.5	31.0
		0700734	1.0	- 34.5
500-A	Cessna Nav-O-Matic 300 (includes new A.R.C. gyro, turn coordinator and vacuum system)	0770646	25.0	22.5
501-A	Cessna Nav-O-Matic 300 (includes new A.R.C. directional gyro, new horizon gyro, turn coordinator and vacuum system)	0770646	24.5	22.5
502-A	Cessna Nav-O-Matic 300 (includes new A.R.C. gyros & vacuum system)	0770700	36.0	61.5
503-A	Electronic Installation-Partial-Option A	0770750	7.5	61.0
504-A	Electronic Installation-Partial-Option B		1.0	53.5
505-A	Electronic Installation-Partial-Option C		2.0	15.5
506-A	Electronic Installation-Partial-Option D		0.5	67.0
507-A	Antenna and Cable - Communication (VHF)		1.0	53.5
508-A	Antenna and Cable - Dual Communication (VHF)		2.0	53.5
509-A	Antenna and Cable - Navigation (VHF)		1.5	172.0
510-A	Antenna and Cable - Marker Beacon		1.0	57.5
511-A	Headset and Microphone		1.0	18.0
512-A	Microphone, Boom		1.0	32.0
513-A	Filter, Radio (flap motor)		0.5	60.5
514-A	Cabin Speakers (two)		3.0	40.0
515-A	Radio Selector Switches		0.5	17.0
516-A	Audio Amplifier (KA-25C)	0770750	1.5	11.5
517-A	Radio Cooling System	0770711	1.5	10.0
518-A	Radio Cooling System (multiple TSO instl.)	0770711	0.5	10.0
519-A	Cessna ADF 300 (521B) (includes forward loop and antenna)	0770750	9.5	20.5
520-A	Cessna ADF 300 (521B) (includes aft loop and antenna)		10.5	40.0
521-A	Cessna Transceiver 300 (524A)		8.0	11.5
522-A	Cessna Nav-Com 300 (517R)		11.0	11.5
523-A	Cessna Nav-Com 300 (540A) with IN-514R		11.5	11.5
524-A	Cessna Nav-Com 300 (540A) with IN-525A		12.0	11.5
525-A	Cessna Marker Beacon 300 (502B) (includes antenna & cable)		2.5	20.0
526-A	Cessna DME 300 (KN-60)		9.5	20.5
527-A	Cessna Glideslope (543A) (includes antenna & cable)		6.0	81.5
528-A	Cessna Transceiver 500 (302G) TSO	0770750	14.0	54.0

ISSUED: 9-20-67

REVISED:

FORM NO 80-792

SHT 4 OF 5



CESSNA AIRCRAFT CO

EQUIPMENT LIST (CONT D)
MODEL 182L

WICHITA, KANSAS

AIRCRAFT SERIAL NO 18258940

FAA REGISTRATION NO. N42279

DATE 3-20-68

ITEM NO	DESCRIPTION	REF DRAWING	WT LBS	ARM INS
529-A	Cessna 500 Nav-Com (522A) (with D-522A) TSO	0770750	13.5	34.0
530-A	Cessna 500 Nav-Com (522A) (with D-522A) TSO		13.5	34.0
531-A	Cessna 500 Transceiver (532A) TSO		8.5	47.0
532-A	Cessna 500 Glideslope (543B) TSO		6.0	81.5
533-A	Cessna 500 Transponder (506A) TSO		8.5	88.0
534-A	Cessna 500 ADF (318G-2) TSO (includes forward control loop and antenna)		20.5	38.5
535-A	Cessna 500 ADF (318G-2) TSO (includes aft control loop and antenna)		21.0	48.0
536-A	Ki KX-100		9.5	59.5
537-A	Ki KX-100 with KI-11		14.5	46.0
538-A	Ki IX-100 with KI-11		15.5	44.5
539-A	Narco MK 12A (with V.A-8)		16.5	45.0
540-A	Narco MK 12A (with V.A-9)		16.5	45.0
541-A	Narco MK-2 (includes glideslope antenna)		6.5	82.0
542-A	Pantronics DX-100A V.H.F. Transceiver (with remote loop)		26.0	82.0
543-A	Pantronics DX-100A V.H.F. Transceiver		22.0	77.0
544-A	Pantronics DX-100A V.H.F. Transceiver (includes reel-out antenna)	0770750	31.5	92.0

ISSUED: 9-20-67

REVISED: 1-24-68

FORM NO 80-193

SHT 5 OF 5

DATE _____

MODEL 162L

Weight & Balance Data

Aircraft Serial No. 18258940

F A A. Registration No. **N42279**

Date: **3-20-68**

ITEM	Weight (lbs.)	C.G. Arm (inches)	Moment (lb. ins.)
Standard Assembly (Empty) - (See A-1, Appendix D)	1558.0 Actual 1558.0	34.1	53128
Optimal Equipment	76.5	38.4	2940
Special Installation - DOM Approved	----	----	-----
Pilot XXXXXX Over All	18.5	95.5	1767
Disposable Fuel (50 Gall)	30.0	46.0	1380
Focused Empty Weight Total of Items Above	1683.0	35.2	59215

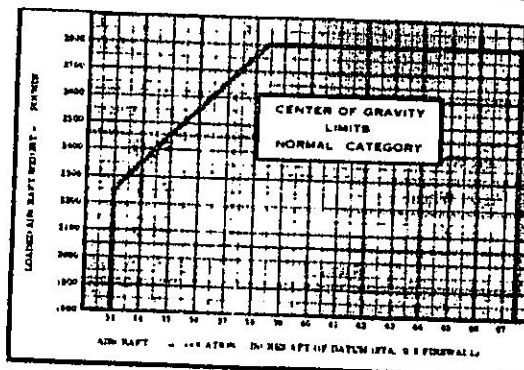
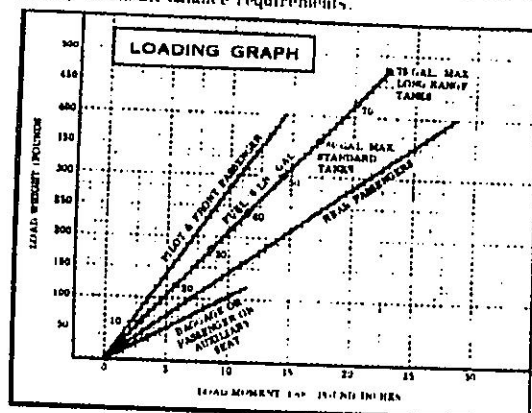
IT IS THE RESPONSIBILITY OF THE PILOT AND AIRPLANE OWNER TO INSURE THAT THE AIRPLANE IS LOADED PROPERLY. THE EMPTY WEIGHT, CG, & USE & LOAD ARE FOR THE AIRPLANE AS DELIVERED FROM THE FACTORY. REFER TO FORM FAA-27 WHEN ALTERATIONS HAVE BEEN MADE.

WHEEL WEIGHT	HOUSED EMPTY WT	USEFUL LOAD
1683.0	1117	

SAMPLE LOADING PROBLEM

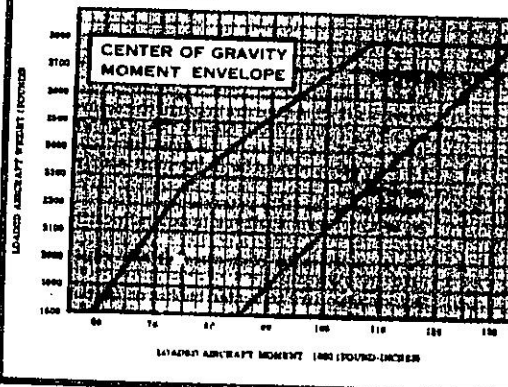
	Weight (lbs)	C.G. Arm (inches)	Moment (lb.-ins 1000)
Unloaded Empty Wt	1683.0		59.2
Oil (12 Qts.)	22	15.0	-0.3
Pilot & Front Passenger	340	36.0	12.2
Fuel	295.0	46.0	14.2
Rear Seat Passengers	340	71.0	24.1
Baggage	120.0	97.0	11.6

Total Loaded Airplane 2800 **121.0** 121.0
Locate this point (2800, **121.0**) on the C.G.
Moment Envelope. Since the point falls within the envelope the
loading meets all balance requirements.



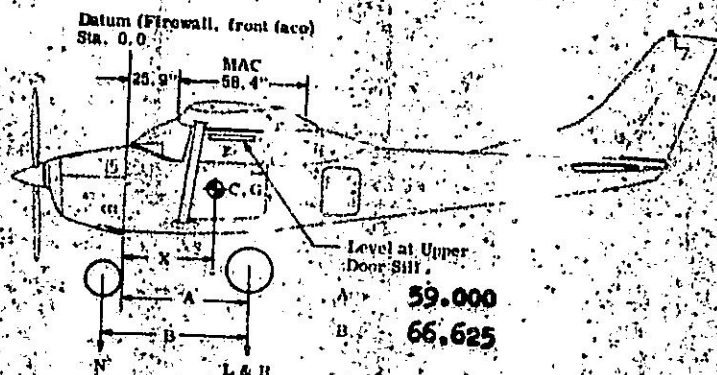
C.G. MONTGOMERY ENVELOPE INSTRUCTIONS

- I To the increased empty weight add weight of all items to be carried.
- II To increased empty weight moment add moment of all items to be carried.
- III Locate point determined by I & II and if it falls within the C.G. moment envelope the loading is satisfactory.



WEIGHT & BALANCE DATA

MODEL 182L



Scale Position	Scale Reading	Tare	Symbol	Net Weight
Left Wheel	729		L	729
Right Wheel	711		R	711
Nose Wheel	679		N	679
Aircraft Empty Weight (As Weighed)				2119
				W

$$X = \text{ARM} = \frac{(A) - (N) \times (B)}{W}$$

$$X = \text{ARM} = \frac{(59.000) - (679) \times (66.625)}{(2119)} = (37.7) \text{ IN.}$$

WEIGHING PROCEDURE

1. Preparation:

- Inflate tires to recommended operating pressures.
- Remove all wing tank drain plugs to remove all fuel.
- Remove oil sump drain plug to drain all oil.
- Move all sliding seats to the most forward position. All seat backs should be in the most nearly vertical position.
- Put flaps in the fully retracted position.
- Place all control surfaces in neutral position.

2. Leveling:

- Place scales under each wheel (1000# minimum capacity for scales).
- Deflate nose tire to center bubble on level (See Diagram).

3. Weighing:

- With the airplane level and brakes released, record the weight shown on each scale. Deduct the tare, if any, from each reading.

4. Measuring:

- Obtain measurement "A" by measuring horizontally (along the airplane center line) from a line stretched between the main wheel centers to a plumb bob dropped from the firewall.
- Obtain measurement "B" by measuring horizontally and parallel to the airplane center line, from center of nose wheel axle, left side, to a plumb bob dropped from the line between the main wheel centers. Repeat on right side and average the measurements.

5. Completing the Form:

- Using weights from (3) and measurements from (4) the airplane weight and C.G. can be determined.
- Obtain licensed empty weight by adding weight and moment of unusable fuel (see other side) to airplane empty weight and moment.

NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

[illegible][illegible][illegible]

SECRET AND 1 ADDITIONAL PAGE ATTACHED

1-800-255-1708

FAA AIRCRAFT REGISTRY
CAMERA NO. 4 DATE: 10-9-84

RECEIVED		DEPT. OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION		OFFICE OF THE DIRECTOR OF REGISTRY	
MAY 25 1977		MAJOR REPAIR AND ALTERATION		OFFICE OF THE DIRECTOR OF REGISTRY	
Sacramento		(Airframe, Powerplant, Propeller, or Appliance)		OFFICE OF THE DIRECTOR OF REGISTRY	
INSTRUCTIONS: Print or type all entries. G-PR-1 (2) PAR. 1, APPENDIX I, FAC-11-1 (Continued on back of form)					
1. AIRCRAFT	MAKE Cessna	MODEL 182	NATIONALITY AND REGISTRATION MARK N18240		
2. OWNER	NAME (As shown on registration certificate) John C. Heston Company	ADDRESS (As shown on registration certificate) 2000 California Street			
UNIT IDENTIFICATION					
UNIT	MAKE	MODEL	TYPE	YEAR	FAA TYPE
AIRFRAME					
POWERPLANT					
PROPELLER					
APPLIANCE					
3. CONFORMITY STATEMENT					
A. AGENCY'S NAME AND ADDRESS		B. TYPE OF AGENCY		C. CERTIFICATE NO.	
Silverado Aviation P.O. Box 758 Mesa, California 94048		M. CERTIFICATE MANUFACTURER L. CERTIFICATE MANUFACTURER N. CERTIFICATE REPAIR STATION O. MANUFACTURER'S REPRESENTATIVE		112-3	
Do I certify that the repair and/or alteration was made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge?					
DATE 5/20/77		SIGNATURE OF AUTHORIZED INDIVIDUAL <i>[Signature]</i> 112-3			
Pursuant to the authority given persons specified below, the undersigned hereby certifies that the work was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations.					
BY	FAA STANDARDS INSPECTOR	FAA REGIONAL INSPECTOR	REPAIR STATION INSPECTOR	CANADIAN DEPARTMENT OF TRANSPORT INSPECTOR	OTHER AUTHORIZED PERSON
DATE OF APPROVAL OR REJECTION 5/20/77		CERTIFICATE OF DESIGNATION NO. 112-3		SIGNATURE OF AUTHORIZED INDIVIDUAL <i>[Signature]</i> 112-3	

FAA AIRCRAFT REGISTRY
CAMERA NO. 4 DATE: 10-9-84

RECEIVED MAJOR REPAIR AND ALTERATION
1111-18-877

INSTRUCTIONS: Print or type all entries. See FAR 43.1, FAR 43.9, Appendix A, and AC 43.16-1 (or subsequent revision thereof) for instructions and disposition of this form.

1. AIRCRAFT	MAKE Cessna	MODEL 172	NATIONALITY AND REGISTRATION MARK N172
2. OWNER	NAME (As shown on registration certificate) John C. Smith	ADDRESS (As shown on registration certificate) 123 Main St Anytown, CA 90001	

3. UNIT IDENTIFICATION				5. TYPE	
UNIT	MODEL	YEAR	SERIAL NO.	REPAIR	ALTERATION
AIRFRAME					
POWERPLANT					
PROPELLER					
APPLIANCE					

A. AGENCY'S NAME AND ADDRESS Sillars Aircraft, Inc. P.O. Box 758 Mesa, California 90001		B. KIND OF AGENCY <input checked="" type="checkbox"/> A. LICENSED MECHANIC <input type="checkbox"/> B. LICENSED MECHANIC <input type="checkbox"/> C. LICENSED MECHANIC <input type="checkbox"/> D. LICENSED MECHANIC	C. CERTIFICATE NO. 412-0
--------------------------------------------------------------------------------------------------	--	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------

D. I certify that the repair and/or alteration was performed in accordance with the instructions in the FAA-approved repair manual, and that the work was done in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations.

DATE 7/1/77	SIGNATURE OF AUTHORIZED INDIVIDUAL <i>[Signature]</i>
----------------	----------------------------------------------------------

Pursuant to the authority given persons listed in Part 43.1, the Administrator of the Federal Aviation Administration has approved this repair and alteration in the manner prescribed by the Administrator of the Federal Aviation Administration.			
BY 7/1/77	FAA REGIONAL OFFICE SAN FRANCISCO	CERTIFICATE OF APPROVAL 7/1/77	SIGNATURE OF AUTHORIZED INDIVIDUAL <i>[Signature]</i>

FAA AIRCRAFT REGISTRY
CAMERA NO. 4 DATE: 10-9-84

10/9/84

DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION		RECEIVED JUL 29 1977		Approved FAA Form No. 337-108011	
MAJOR REPAIR AND ALTERATION (Airframe, Powerplant, Propeller, or Appliance)				FOR FAA USE ONLY	
INSTRUCTIONS: Print or type all entries. See FAR 43.9 and FAR 43.11 for instructions and disposition of this form. (or subsequent revision thereof)				OFFICE IDENTIFICATION	
1. AIRCRAFT	MAKE Cessna	MODEL 182 Skylane	NATIONALITY AND REGISTRATION MARK N4279		
	SERIAL NO. 1825040				
2. OWNER	NAME (As shown on registration certificate) Held & Williams Company		ADDRESS (As shown on registration certificate) P.O. Box 2007 Mesa, California 94029		
3. UNIT IDENTIFICATION					
UNIT	TYPE	MODEL	SERIAL NO.	REPAIR	ALTERATION
AIRFRAME					X
POWERPLANT					
PROPELLER					
APPLIANCE	TYPE				
	MANUFACTURER				
4. AGENCY'S NAME AND ADDRESS					
Silverado Aviation, Inc.		KIND OF AGENCY		CERTIFICATE NO.	
P.O. Box 258		1. U.S. CERTIFIED MECHANIC		2. FOREIGN CERTIFIED MECHANIC	
Mesa, California		3. CERTIFIED REPAIR STATION		4. MANUFACTURER'S REPRESENTATIVE	
D. I certify that the repair and/or alteration was performed in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations, and that the information furnished herein is true and correct to the best of my knowledge.					
DATE 25 July 77		SIGNATURE OF AUTHORIZED INDIVIDUAL <i>[Signature]</i> 25-0438			
APPROVAL FOR RETURN TO SERVICE					
Pursuant to the provisions of the Federal Aviation Regulations, this aircraft is hereby approved for return to service in the manner prescribed by the Administrator of the Federal Aviation Administration.					
BY: <input checked="" type="checkbox"/> FAA INSPECTOR		<input type="checkbox"/> FAA INSPECTOR		<input type="checkbox"/> CANADIAN DEPARTMENT OF TRANSPORTATION INSPECTOR	
DATE OF APPROVAL OR REJECTION 25 July 77		CERTIFICATE OF DESIGNATION NO. 25-0438		SIGNATURE OF AUTHORIZED INDIVIDUAL <i>[Signature]</i> 25-0438	

FAA AIRCRAFT REGISTRY

CAMERA NO: 4 DATE: 10-9-84

NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

8. DESCRIPTION OF WORK ACCOMPLISHED: (If more space is required, attach additional sheets, identify with aircraft nationality and registration mark, and list sheet number.)
 Removed Air 31...
 with manufacturer's recommendations...
 completed and entered in aircraft log book.

NO.	DATE	DESCRIPTION OF WORK ACCOMPLISHED
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APPROVED FOR SIGNATURE

NAME: _____

POSITION: _____

DATE: _____

REMARKS: _____

ADDITIONAL SHEETS ATTACHED: ☐

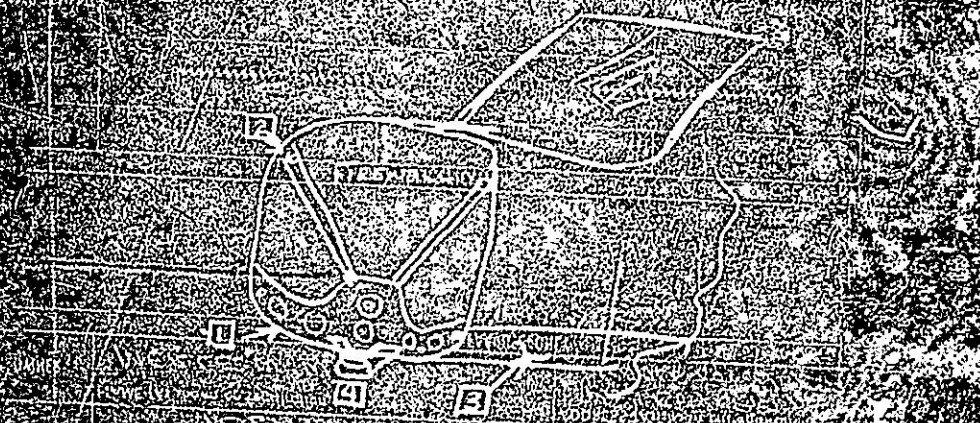
VAA AIRCRAFT REGISTER
CAMERA NO. 10-9-84

NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations and a continued conformity with the applicable airworthiness requirements.

DESCRIPTION OF WORK ACCOMPLISHED (If more space is required, attach additional sheets and identify with aircraft nationality and registration mark and change number.)

- ① Repair line harness with new cables and new cables. Part - 0753602-1/1
- ② Repair line harness with new cables and new cables. Part - 0753602-1/1
- ③ Repair line harness with new cables and new cables. Part - 0753602-1/1
- ④ Repair line harness with new cables and new cables. Part - 0753602-1/1



Repair line harness with new cables and new cables. Part - 0753602-1/1

Work done on 25 Feb 1984
Work done on 25 Feb 1984
Work done on 25 Feb 1984

ADDITIONAL SHEETS ARE ATTACHED

IN OKLAHOMA CITY, OKLAHOMA, THE PRODUCTION DATE
AND CAMERA OPERATOR IDENTIFICATION IS AFFIXED AT THE
TOP OF EACH EXPOSED FRAME.

FAA AIRCRAFT REGISTRY
CAMERA NO. 4 DATE: 10-9-39

FEDERAL AVIATION ADMINISTRATION		RECEIVED		FORM APPROVED BY: [Signature] Under Bureau No. 61-R0601	
MAJOR REPAIR AND ALTERATION (Airframe, Powerplant, Propeller, or Appliance)				FOR RECORDS-PAA USE ONLY	
INSTRUCTIONS: Print or type all entries. Use FAR 43.9, FAR 43.10, FAR 43.11, FAR 43.12, FAR 43.13, FAR 43.14, FAR 43.15, FAR 43.16, FAR 43.17, FAR 43.18, FAR 43.19, FAR 43.20, FAR 43.21, FAR 43.22, FAR 43.23, FAR 43.24, FAR 43.25, FAR 43.26, FAR 43.27, FAR 43.28, FAR 43.29, FAR 43.30, FAR 43.31, FAR 43.32, FAR 43.33, FAR 43.34, FAR 43.35, FAR 43.36, FAR 43.37, FAR 43.38, FAR 43.39, FAR 43.40, FAR 43.41, FAR 43.42, FAR 43.43, FAR 43.44, FAR 43.45, FAR 43.46, FAR 43.47, FAR 43.48, FAR 43.49, FAR 43.50, FAR 43.51, FAR 43.52, FAR 43.53, FAR 43.54, FAR 43.55, FAR 43.56, FAR 43.57, FAR 43.58, FAR 43.59, FAR 43.60, FAR 43.61, FAR 43.62, FAR 43.63, FAR 43.64, FAR 43.65, FAR 43.66, FAR 43.67, FAR 43.68, FAR 43.69, FAR 43.70, FAR 43.71, FAR 43.72, FAR 43.73, FAR 43.74, FAR 43.75, FAR 43.76, FAR 43.77, FAR 43.78, FAR 43.79, FAR 43.80, FAR 43.81, FAR 43.82, FAR 43.83, FAR 43.84, FAR 43.85, FAR 43.86, FAR 43.87, FAR 43.88, FAR 43.89, FAR 43.90, FAR 43.91, FAR 43.92, FAR 43.93, FAR 43.94, FAR 43.95, FAR 43.96, FAR 43.97, FAR 43.98, FAR 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43.182, FAR 43.183, FAR 43.184, FAR 43.185, FAR 43.186, FAR 43.187, FAR 43.188, FAR 43.189, FAR 43.190, FAR 43.191, FAR 43.192, FAR 43.193, FAR 43.194, FAR 43.195, FAR 43.196, FAR 43.197, FAR 43.198, FAR 43.199, FAR 43.200, FAR 43.201, FAR 43.202, FAR 43.203, FAR 43.204, FAR 43.205, FAR 43.206, FAR 43.207, FAR 43.208, FAR 43.209, FAR 43.210, FAR 43.211, FAR 43.212, FAR 43.213, FAR 43.214, FAR 43.215, FAR 43.216, FAR 43.217, FAR 43.218, FAR 43.219, FAR 43.220, FAR 43.221, FAR 43.222, FAR 43.223, FAR 43.224, FAR 43.225, FAR 43.226, FAR 43.227, FAR 43.228, FAR 43.229, FAR 43.230, FAR 43.231, FAR 43.232, FAR 43.233, FAR 43.234, FAR 43.235, FAR 43.236, FAR 43.237, FAR 43.238, FAR 43.239, FAR 43.240, FAR 43.241, FAR 43.242, FAR 43.243, FAR 43.244, FAR 43.245, FAR 43.246, FAR 43.247, FAR 43.248, FAR 43.249, FAR 43.250, FAR 43.251, FAR 43.252, FAR 43.253, FAR 43.254, FAR 43.255, FAR 43.256, FAR 43.257, FAR 43.258, FAR 43.259, FAR 43.260, FAR 43.261, FAR 43.262, FAR 43.263, FAR 43.264, FAR 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1. AIRCRAFT	MAKE: CESSNA	MODEL: 172 L	NATIONALITY AND REGISTRATION MARK: N14229		
	SERIAL NO.: 15255240				
2. OWNER	NAME (As shown on registration certificate): MERLE W. WILLIAMS	ADDRESS (As shown on registration certificate): 265 S. 23rd St. Tulsa, Okla. 74106			
UNITED STATES OF AMERICA					
UNIT	TYPE	CLASS	TYPE		
AIRFRAME					
POWER PLANT					
PROPELLER					
APPLIANCE					
CONFORMITY STATEMENT: I, the undersigned, being duly qualified, have inspected the aircraft and certify that the repair and/or alteration described on the certificate of major repair and alteration and the information furnished hereon are in accordance with the applicable Federal Aviation Regulations.					
1. AGENCY'S NAME AND ADDRESS: PAUL E. LOEWEN, PO Box 815, Lake Park, Ga. 30135		2. KIND OF AGENCY: <input checked="" type="checkbox"/> MANUFACTURER, <input type="checkbox"/> DISTRIBUTOR, <input type="checkbox"/> MAINTENANCE, <input type="checkbox"/> REPAIR STATION, <input type="checkbox"/> MANUFACTURER'S REPRESENTATIVE			
3. DATE OF CERTIFICATE: 10-9-39		4. SIGNATURE OF AUTHORIZED INDIVIDUAL: [Signature]			
5. APPROVAL FOR RETURN TO SERVICE: [Signature]					
Pursuant to the authority given by the Administrator of the Federal Aviation Administration, I hereby approve the repair and/or alteration described on the certificate of major repair and alteration and the information furnished hereon, and I hereby approve the return of the aircraft to service.					
BY: [Signature]	FAA DESIGNATION: [Signature]	FAA DESIGNATION: [Signature]	FAA DESIGNATION: [Signature]		
DATE OF APPROVAL OR REJECTION: 10-10-39	CERTIFICATE OF DESIGNATION NO.: 10-10-39	SIGNATURE OF AUTHORIZED INDIVIDUAL: [Signature]			