IO-360-A, AB
C, CB
D, DB, ES
G, GB
H, HB
J, JB
K & KB

CONTINENTAL® AIRCRAFT ENGINE

MAINTENANCE AND OPERATOR'S MANUAL

TECHNICAL CONTENT ACCEPTED BY THE FAA

Publication X30617

AUG 2011

Supersedure Notice

This manual revision replaces the front cover and list of effective pages for Publication Part No. X30617, dated January 1994. Previous editions are obsolete upon release of this manual.

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0 .... January 1994			
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NOTICE

Continental Motors engine operating instructions are generated prior to and independently of the aircraft operating instructions established by the airframe manufacturer. Continental Motors operating instructions are developed using factory controlled parameters that are not necessarily the same as those specifications required to satisfy a specific aircraft I engine installation. Because of this difference the aircraft operator should use the airframe manufacturers operating instructions found in the Pilots Operating Handbook (POH) while operating the aircraft unless otherwise specified by the original airframe manufacturer.

The operator must comply with all the instructions contained in this manual and related publications in order to assure safe and reliable engine performance. Failure to comply will be deemed misuse, thereby relieving the engine manufacturer of responsibility under its warranty.

This manual contains no warranties, either expressed or implied. The information and procedures contained herein provide the operator with technical information and instructions applicable to safe operation.

CHAPTER INDEX

FIGURE INDEX

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CHAPTER 1
INTRODUCTION

Section Index

1-1 SCOPE

Requirements, cautions and warnings regarding operation of this engine are not intended to impose undue restrictions, but are inserted to enable the pilot to obtain maximum performance from the engine commensurate with safety and efficiency. Abuse, misuse, or neglect of any piece of equipment can cause eventual failure. In the case of an aircraft engine it should be obvious that a failure may have disastrous consequences. Failure to observe the instructions contained in this manual constitutes unauthorized operation in areas unexplored during development of the engine, or in areas which experience has proved to be undesirable or detrimental.

Notes, *Cautions* and **Warnings** are included throughout this manual. Application is as follows:

NOTE...Special interest information which may facilitate the operation of equipment.

CAUTION...Information issued to emphasize certain instructions or to prevent possible damage to engine or accessories.

WARNING...Information which, if disregarded, may result in severe damage to or destruction of the engine or endangerment to personnel.

1-2 RELATED PUBLICATIONS

1. Overhaul Manual for IO-360 Series Aircraft Engine. Form X30594A.
2. Illustrated Parts Catalog for IO-360 Series Aircraft Engine. Form X30595A.
3. Teledyne Continental Motors Aircraft Engine Service Bulletins.
4. Fuel Injection Manual. Form X30593A.

The above publications can be ordered through your Teledyne Continental Motors Distributor or ordered directly, from:

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Accessory Manuals:

1.	Magnetos	Service Manual Form X40000
2.	Alternator	Alternator Service Instructions Form X30531-3
3.	Starter	Starter Service Instructions Form X30592

Bulletins:

Bulletins that are issued to Distributors and subscribers from Teledyne Contiental Motors are divided into three separate groups: (1) Customer Information Bulletins; (2) Service Bulletin and (3) Mandatory Service Bulletins.

(1) Customer Information Bulletins are published to help provide the latest information on TCM marketing procedures, polices and product information.

(2) Service Bulletins provide current information related to service, maintenance and technical support of the product.

(3) Mandatory Service Bulletins are issued with required compliance information that may affect safety of flight.

These bulletins are also available to owners, operations or maintenance personnel on an annual subscription basis.

NOTE...Teledyne Continental Bulletins are easily distinguished by their title color:

(1) Customer Informaiton Bulletins — Blue.
(2) Service Bulletins — Black.
(3) Mandatory Service Bulletins — Red.

1-3 ABBREVIATIONS AND GLOSSARY OF TERMS

Abbreviation	Terms
A.B.C.	After Bottom Center
ADMP	Absolute Dry Manifold Pressure
Approx.	Approximately
A.T.C.	After Top Center
Bar.	Barometric
B.B.C.	Before Bottom Center
B.H.P.	Brake Horsepower
BSFC	Brake Specific Fuel Consumption
BSOC	Brake Specific Oil Consumption
B.T.C.	Before Top Center
C.A.R.	Civil Air Regulations
C.G.	Center of Gravity
c.f.m.	Cubic Feet Per Minute
C.H.T.	Cylinder Head Temperature
CW	Clockwise Rotation
CCW	Counterclockwise Rotation
°C	Degrees Celsius
°F	Degrees Fahrenheit
°	Degrees of Angle
Dia.	Diameter
EGT	Exhaust Gas Temperature
FAA	Federal Aviation Administration
Fig.	Figure (Illustration)
Front	Propeller End of Engine
Ft.	Foot or Feet
F.T.	Full Throttle
FT-LBS	Foot Pounds Torque
G.P.M.	Gallons Per Minute
gms	Grams
Hex	Hexagon
H2O	Water
Hg.	Mercury
hr.	Hour
I.D.	Inside Diameter
IN-LBS	Inch Pounds Torque
in. (")	Inches
Left Side	Side on which No's 2, 4 and 6 cylinders are located.
Lbs.	Pounds
Lockwire	Soft steel wire used to safety connections, etc.
Man.	Manifold or Manometer
MAP	Manifold Pressure
Max.	Maximum
Min.	Minimum

N.P.T.	National Pipe Thread (Tapered)
N.R.P.	Normal Rated Power
N.C.	National Course (Thread)
N.F.	National Fine (Thread)
O.A.T.	Outside Air Temperature
O.D.	Outside Diameter
oz.	Ounce
PPH	Pounds Per Hour
Press.	Pressure
p.s.i.	Pounds Per Square Inch
PSIA	Power Per Square Inch Absolute
PSIG	Power Per Square Inch Gauge
Rear	Accessory End of Engine
Right Side	Side on which No's 1, 3 and 5 cylinders are located.
R.P.M.	Revolutions Per Minute
Std.	Standard
TBO	Time Between Overhaul
T.C.D.P.	Turbocharger Deck Pressure
T.D.C.	Top Dead Center
Temp.	Temperature
T.I.T.	Turbine Inlet Temperature
Torque	Force x lever arm (125 ft.-lbs. torque = 125 lbs. Force applied one ft. from bolt center or 62-1/2 lbs. 2 ft. from center)
100LL	100 Octane Low Lead Fuel
1-3-5	Cylinder numbering right side of engine (rear to front)
2-4-6	Cylinder numbering left side of engine (rear to front)
30'	Thirty minutes of angle (60' equal one degree)

Glossary

ADMP — Absolute dry manifold pressure, is used in establishing a baseline standard of engine performance. Manifold pressure is the absolute pressure in the intake manifold; measured in inches of mercury.

Ambient — A term used to denote a condition of surrounding atmosphere at a particular time. For example; Ambient Temperature or Ambient Pressure.

BHP — Brake Horsepower. The power actually delivered to the engine propeller shaft. It is so called because it was formerly measured by applying a brake to the power shaft of an engine. The required effort to brake the engine could be converted to horsepower - hence: "brake horsepower".

BSFC — Brake Specific Fuel Consumption. Fuel consumption stated in pounds per hour per brake horsepower. For example, an engine developing 300 horsepower while burning 150 pounds of fuel per hour, has a BSFC of .5.

$$\frac{\text{Fuel Consumption in PPH}}{\text{Brake Horsepower}} = .5$$

Cavitation — Formation of partial vacuums in a flowing liquid as a result of the separation of its part.

Cold Soaking	Prolonged exposure of an object to cold temperatures so that its temperature throughout approaches that of ambient.
Corrosion	Deterioration of a metal surface usually caused by oxidation of the metal.
Critical Altitude	"Critical Altitude" means the maximum altitude at which, in standard atmosphere, it is possible to maintain, at a specified rotational speed, a specified power or a specified manifold pressure. Unless otherwise stated.
Density Altitude	Altitude as determined by pressure altitude and existing ambient temperature. In Standard Atmosphere (IAS) density and pressure altitudes are equal. For a given pressure altitude, the higher the temperature, the higher the density altitude.
Dynamic Condition	A term referring to properties of a body in motion.
E.G.T.	Exhaust Gas Temperature. Measurement of this gas temperature is sometimes used as an aid to fuel management.
Exhaust Back Pressure	Opposition to the flow of exhaust gas, primarily caused by the size and shape of the exhaust system. Atmospheric pressure also affects back pressure.
Four Cycle	Short for "Four Stroke Cycle." It refers to the four strokes of the piston in completing a cycle of engine operation (Intake, Compression, Power and Exhaust).
Fuel Injection	A process of metering fuel into an engine by means other than a carburetor.
Gallery	A passageway in the engine or subcomponent. Generally one through which oil is flowed.
Galling or Scuffing	Excessive friction between two metal surfaces resulting in particles of the softer metal being torn away and literally welded to the harder metal.
Hg"	Inches of Mercury. A standard for measuring pressure, especially atmospheric pressure or manifold pressure.
Heat Soaked	Prolonged exposure of an object to hot temperature so that its temperature throughout approaches that of ambient.
Humidity	Moisture in the atmosphere. Relative humidity, expressed in percent, is the amount of moisture (water vapor) in the air compared with the maximum amount of moisture the air could contain at a given temperature.
Impulse Coupling	A mechanical device used in some magnetos to retard the ignition timing and provide higher voltage at cranking speeds for staring.
Lean Limit Mixture	The leanest mixture approved for any given power condition. It is not necessarily the leanest mixture at which the engine will continue to operate.
Manifold Pressure	Pressure as measured in the intake manifold down-stream of the air throttle. Usually measured in inches of mercury.
Mixture	Mixture ratio. The proportion of fuel to air used for combustion.

Naturally Aspirated	A term used to describe an engine which obtains induction (Engine)air by drawing it directly from the atmosphere into the cylinder. A non-supercharged engine.
NRP	Normal Rated Power.
O.A.T	Outside Air Temperature.
Octane Number	A rating which describes relative anti-knock (detonation) characteristics of fuel. Fuels with greater detonation resistance than 100 octane are given performance number ratings.
Oil Temperature Control Valve	A thermostatic unit to divert oil through or around the oil cooler, as necessary, to maintain oil temperature within desired limits.
Overboost Valves	A pressure relief valve, set slightly in excess of maximum deck pressure, to prevent damaging overboost in the event of a system malfunction.
Overhead Valves	An engine configuration in which the valves are located in the cylinder head itself.
Overspeed	When an engine has exceeded its rated revolutions per minute.
Performance Number	A rating system used to described the anti-knock (detonation) characteristic as compared with 100 octane fuel. For example, an engine with high compression needs a higher Performance Number fuel than a low compression engine.
Pressure Altitude	Altitude, usually expressed in feet, (using absolute static pressure as a reference) equivalent to altitude above the standard sea level reference plane (29.92" Hg).
Propeller Load Curve	A plot of horsepower, fuel flow, or manifold pressure versus engine speed through the full power range of one engine using a fixed pitch propeller or a constant speed propeller running on the low pitch stops. This curve is established or determined during design and development of the engine.
Propeller Pitch	The angle between the mean chord of the propeller and the plane of rotation.
Ram	Increased air pressure due to forward speed.
Rated Power	The maximum horsepower at which an engine is approved for operation. Rated power may be expressed in horsepower or percent.
Retard Breaker	A device used in magnetos to delay ignition during cranking. It is used to facilitate starting.
Rich Limit	The richest fuel/air ratio permitted for any given power condition. It is not necessarily the richest condition at which the engine will run.
Rocker Arm	A mechanical device used to transfer motion from the pushrod to the valve.

Run Out	Eccentricity or wobble of a rotating part.
Scavenge Pump	A pump (especially an oil pump) to prevent accumulation of liquid in some particular area.
Sonic Venturi	A restriction, especially in cabin pressurization systems, to limit the flow of air through a duct.
Standard Day	By general acceptance, temperature -59°F/15°C, pressure -29.92 In. Hg.
Static Condition	A term referring to properties of a body at rest.
Sump	The lowest part of a system. The main oil sump on a wet sump engine contains the oil supply.
TBO	Time Between Overhauls. Usually expressed in operating hours.
T.D.C.	Top Dead Center. The position in which the piston has reached the top of its travel. A line drawn between crankshaft rotation axis, through the connection rod and axis and the piston pin center would be straight line. Ignition and valve timing are stated in terms of degrees before or after TDC.
Thermal Efficiency	Regarding engines, the percent of total heat generated which is converted into useful power.
T.I.T.	Turbine Inlet Temperature. The measurement of E.G.T. at the turbocharger turbine inlet.
Torque	Twisting moment or leverage, stated in pounds-foot (or pounds-inch).
Turbocharger	A device used to supply increased amounts of air to engine induction system. In operation, a turbine is driven by engine exhaust gas. In turn, the turbine directly drives a compressor which pumps air into the engine intake.
Vapor Lock	A condition in which the proper flow of a liquid through a system is disturbed by the formation of vapor. Any liquid will turn to vapor if heated sufficiently. The amount of heat required for vaporization will depend on the pressure exerted on the liquid.
Variable Absolute Pressure Controller	A device used to control the speed, and thus the output of the turbocharger. It does so by operating the wastegate which diverts, more or less, exhaust gas over the turbine.
Vernatherm Valve	A thermostatic valve used to divert oil through or around the oil cooler, as necessary, to maintain oil temperature within desired limits.
Viscosity	The characteristic of a liquid to resist flowing. Regarding oil, high viscosity refers to thicker or "heavier" oil while low viscosity oil is thinner. Relative viscosity is indicated by the specific "weight" of the oil such as 30 "weight" or 50 "weight". Some oils are specified as multiple-viscosity such as 10W30. In such cases, this oil is more stable and resists the tendency to thin when heated or thicken when it becomes cold.
Volatility	The tendency of a liquid to vaporize.

Volumetric Efficiency	The ability of an engine to fill its cylinders with air compared to their capacity for air under static conditions. A "naturally aspirated" engine will always have a volumetric efficiency of slightly less than 100%, whereas superchargers permit volumetric efficiencies in excess of 100%.
Wastegate Valve	A unit, used on turbocharged engines, to divert exhaust gas through or around the turbine, as necessary to maintain turbine speed. As more air is demanded by the engine, due to throttle operation, the compressor must work harder. In order to maintain compressor and turbine speeds, more exhaust must be flowed through the turbine. The wastegate valve closes and causes gas, which would go directly overboard, to pass through the turbine. The wastegate is usually operated by an actuator which gets signals from the turbocharger controller.
Wastegate Valve (Fixed Orifice)	A ground adjustable by pass located in the turbine exhaust bypass duct. The position of the fixed orifice wastegate valve remains constant throughout all modes of engine operation.

1-4 MANUAL REVISIONS

This manual and Teledyne Continental Motors related manuals are current and correct to the best of Teledyne Continental Motors' knowledge at the time of publication. Any errors, recommended changes, or questions should be submitted in writing to:

Technical Publications Department
Teledyne Continental Motors
P.O. Box 90
Mobile, Alabama 36601

Manuals will be revised and updated as necessary.

Consult Teledyne Continental Motors' Service Bulletin publications for latest technical information available.

CHAPTER 2
DETAILED ENGINE DESCRIPTION

Section Index

2-1 DESCRIPTION OF ENGINE MODEL CODE

DETAILED ENGINE DESCRIPTION

Prefix

I - Fuel Injected

O - Horizontally Opposed
Cylinder Configuration

Example:

IO 360 AB (1) B

Displacement
360 Cubic Inch Cylinder
Volume Displacement

Suffix

The Model of Engine

Wooden Container (Section 4-8)

Specification Number
Refer To Current Specification
Listings or Parts Catalog
Form X30595A for information

2-2 BASIC DESIGN FEATURES

The IO-360 Series engines are air cooled, having six horizontally opposed, inclined overhead valve cylinders. The cylinder displacement of 360 cubic inches is achieved with a 4.44 inch bore and a 3.88 inch stroke. The IO-360 Series engines have an 8.5 to 1 compression ratio. The IO-360 Series engines are fuel injected and naturally aspirated. The crankshaft is equipped with pendulum type vibration absorber that suppress torsional vibrations.

The IO-360 engines have a doweled six bolt hole configuration propeller flange. A mounting pad is provided for a governor which provides control for a hydraulically operated constant speed propeller.

2-3 LUBRICATION SYSTEM

The oil supply is contained in a (Figure 2-1) wet sump attached to the bottom of the crankcase. A conventional dipstick is provided for determining the oil quantity.

When the crankshaft is turning, oil is drawn through a screen and pick up tube which extends from the sump to a port in the crankcase. (Due to the modification to the oil sump and accessory case of some engine model-spec. applications, oil may be picked up from two separate locations depending on engine position and flight attitude. A baffle and flapper valve assembly located in the oil sump retains oil around the pick-up tube during variable attitude flight operations to prevent oil starvation.) Oil then passes to the inlet of the gear-type, engine-driven oil pump and is forced under pressure through the pump outlet. A pressure relief valve prevents excessive oil pressure by allowing excess oil to be returned to the sump. After exiting the pump, the oil (now under pressure), enters a full-flow filter and is passed on to the oil cooler. If the filter element becomes blocked, a bypass relief valve will open to permit unfiltered oil to flow to the engine. As the oil enters the oil cooler, it will flow in one of two directions: (a) When the oil is cold, an oil temperature control unit will open and most of the oil will bypass the cooler. Some oil always flows through the cooler to help prevent congealing in cold weather. (b) As the oil warms, the oil temperature control unit actuates to close off the cooler bypass forcing the oil flow through the cooler core. In operation, the oil temperature control unit modulates to maintain oil temperature in the normal range of approximately 170°F.

After leaving the cooler, the oil enters the crankcase where the various channels and passageways direct it to the bearing surfaces and other areas requiring lubrication and cooling. The propeller governor boosts engine oil pressure for operation of the propeller. It controls oil pressure going to the propeller hub to maintain or change propeller blade angles. This oil flows through the propeller shaft to reach the hub.

Other areas within the engine receiving oil include the valve lifters, inner domes and lower cylinder walls. Oil within the engine drains, by gravity, back into the sump.

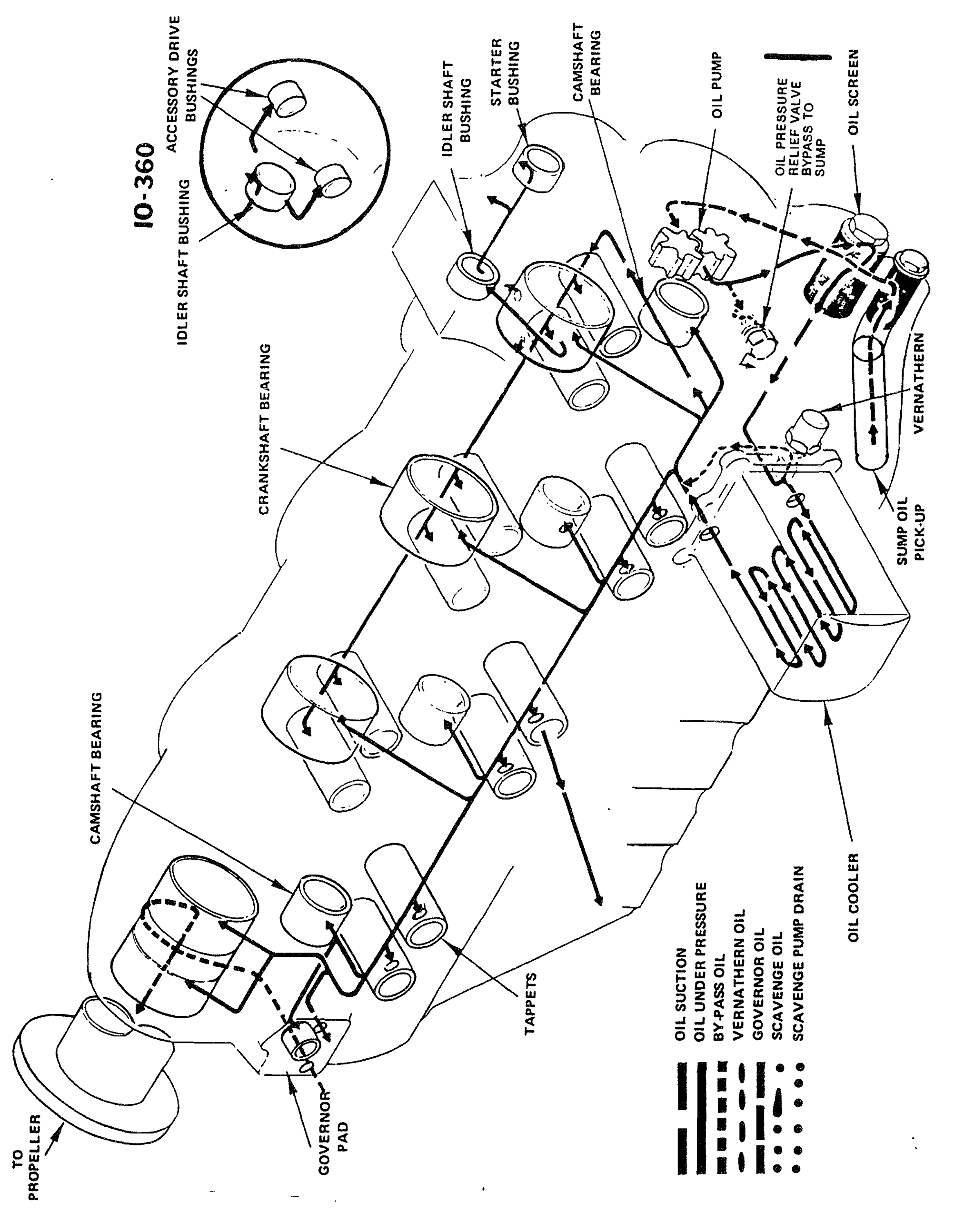

FIGURE 2-1. LUBRICATION DIAGRAM

2-4 INDUCTION SYSTEM

The induction system components include the aircraft filter/alternate air door, throttle, manifold and cylinder intake ports. Air flows through these components in the order they are listed.

Refer to Aircraft Operating Handbook for alternate air door operation.

The intake manifold system is a six-tube, air distribution system mounted atop the engine. It serves to carry induction air to the individual cylinder intake ports.

The cylinder intake ports are cast into the cylinder head assembly. Air from the manifold is carried into the intake ports, mixed with fuel from the injector nozzles, and then enters the cylinder as a combustible mixture when the intake valve opens.

2-5 IGNITION SYSTEM

Engine firing order is 1-6-3-2-5-4. As viewed from the distributor end, the magneto rotor turns counterclockwise, passing in succession the terminals of spark plug cables in engine firing order. Cables are connected to the magnetos so that the right magneto fires the 1-3-5 upper plugs on the right side and 2-4-6 lower plugs on the left. The left magneto fires the 2-4-6 upper plugs on the left and the 1-3-5 lower plugs on the right. The magneto cases, spark plugs, cables and connections are shielded to prevent radio interference.

Torque from the engine crankshaft is transmitted through the camshaft gear to the magneto drive gear. The magneto drive gear incorporates rubber bushings that engage the magneto impulse coupling. As the rubber bushings in the drive gear turns the coupling drive lugs, counterweighted latch pawls, inside the coupling cover, engage a pin on the magneto case and hold back the latch plate until it is forced inward by the coupling cover. When the latch plate is released, the coupling spring spins the magneto shaft through its neutral position and the breaker opens to produce a high voltage surge in the secondary coil. The spring action permits the latch plate, magneto and breaker to be delayed through a lag angle of 30 degrees of drive gear rotation during the engine cranking period. Two stop pins in the case and two lobes on the breaker cam produce two sparks per revolution of the drive shaft. After the engine is started, counterweights hold the latch paws clear of the stop pins and the magnet shaft is driven at full advance.

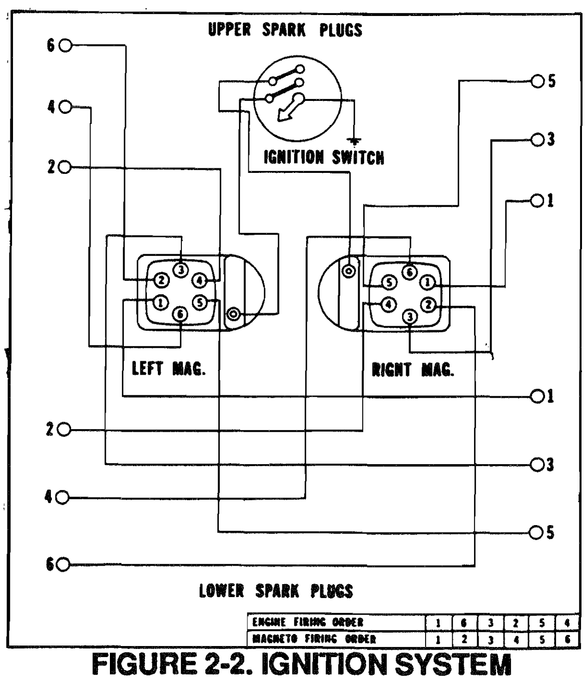

FIGURE 2-2. IGNITION SYSTEM

2-6 FUEL SYSTEM

The fuel injection system is of the multi-nozzle, continuous-flow type which controls fuel flow to match engine air flow. (See Figure 2-3.) Any change in air throttle position, engine speed, or a combination of these cause changes in fuel flow in the correct relation to engine air flow. A manual mixture control is provided for leaning at any combination of altitude and power setting.

The continuous-flow system permits the use of a typical rotary vane pump with integral relief valve.

Fuel is drawn from the supply tanks by the engine driven pump, where and vapor is separated from liquid fuel by swirling action. Vapor is returned to the fuel tank.

An auxiliary pump is supplied by the airframe manufacturer for use in starting or as an emergency pump to supply fuel in flight if the engine-driven pump fails.

When liquid fuel leaves the pump pressure chamber it is directed to the mixture control valve, which is an integral part of the fuel pump assembly. The mixture control valve shaft is linked to the cockpit mixture control.

From the mixture control valve fuel is directed to the fuel metering valve, which is mounted on the side of the air throttle body. (See Figure 2-4.) The shaft that positions the air throttle body butterfly valve also positions the metering valve. The air throttle body throttle and metering shaft is linked to the cockpit throttle control.

The fuel manifold valve contains a diaphragm chamber and necessary outlet ports which connect to the fuel injector lines. The spring-loaded diaphragm works with a ported plunger which allows fuel, through fuel injector lines, to the fuel injector nozzles, (See Figure 2-5), in the cylinders.

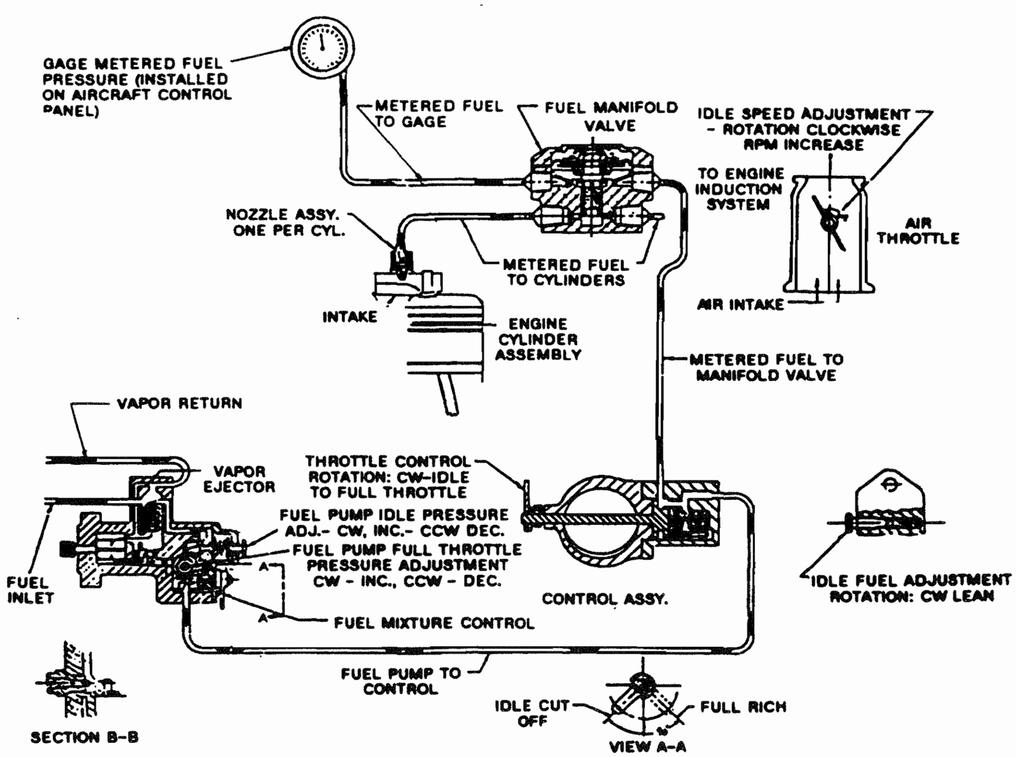

FIGURE 2-3. FUEL SYSTEM SCHEMATIC

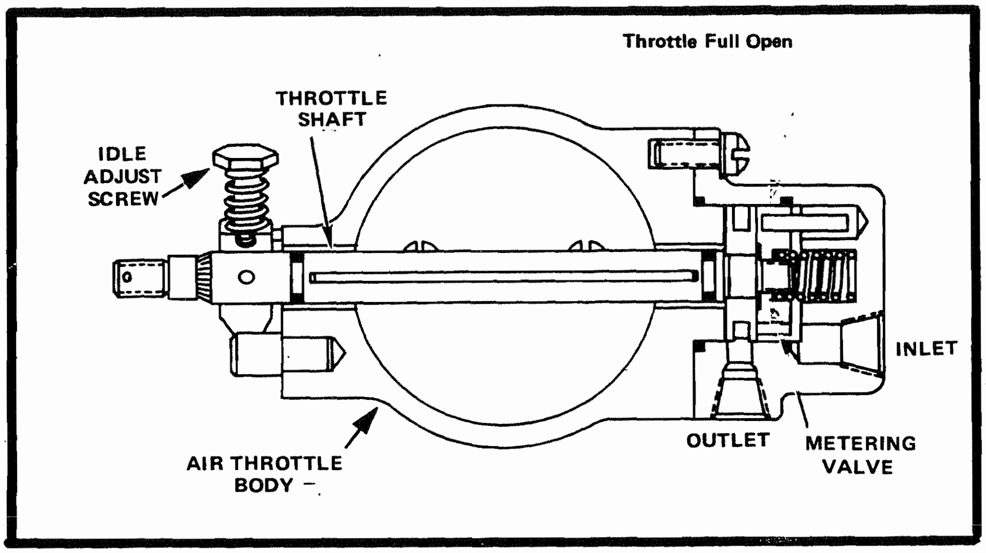

FIGURE 2-4. AIR THROTTLE & METERING UNIT

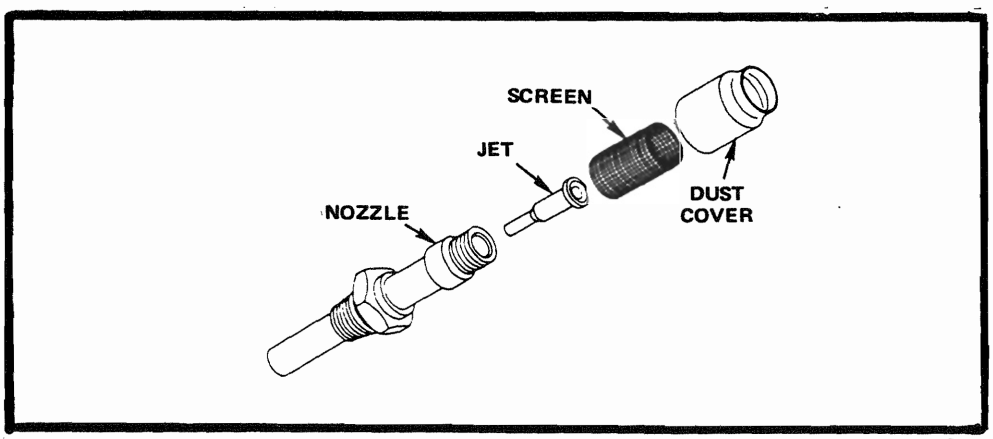

FIGURE 2-5. FUEL INJECTION NOZZLE.

2-7 CYLINDERS

The externally finned aluminum cylinder heads are heated and threaded on to the steel alloy barrels. The valve guides and seats are pressed into the hot cylinder head. When the entire unit has cooled, a permanent cylinder assembly results. Replaceable helical coil inserts are installed in the spark plug ports.

2-8 VALVE TRAIN

Exhaust valves are faced with a special heat and corrosion-resistant material and the valve stems are chromed for wear resistance. Oil fed to the hydraulic valve lifters, under pressure from galleries, lubricates the lifter guide surfaces and fills the reservoirs inside the lifers. Oil from the lifters flows through the pushrods to the rocker arms. Each rocker arm directs a portion of its oil through a drilled orifice toward the respective valve stem. Oil is returned to the crankcase through the pushrod housings, which are sealed to the cylinder head and crankcase with rubber seals. Drain holes in the lifter bores return oil to the sump.

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CHAPTER 3
ENGINE SPECIFICATIONS AND OPERATING LIMITS

Section Index

3-1 GENERAL

The operating limits and specifications listed in this section are applicable to the IO-360 Series aircraft engine. Consult Sections 6 and 7 for additional operating procedures.

3-2 ENGINE SPECIFICATIONS

Manufacturer . . . . Teledyne Continental Motors
Model . . . . IO-360 Series
FAA Type Certificate Number E1CE

Cylinders

Arrangement . . . . Individual cylinders in a horizontally opposed position
Compression Ratio 8.5:1
Firing Order 1-6-3-2-5-4
*Cylinder Head Temperature Maximum Allowable . . . . 460°F
Number of cylinders 6

* Indicates temperature measured by Bayonet Thermocouple, (Aeronautical standard AS234 Element or equivalent), installed in boss in bottom of cylinder head.

Numbering (Accessory end toward propeller):

Right Side cylinders 1-3-5
Left Side cylinders 2-4-6
Bore (Inches) 4.44
Stroke (Inches) 3.88
Piston Displacement (cu. in.) 360

Dimensions (inches)

MODEL	LENGTH	WIDTH	HEIGHT
IO-360A,AB	34.03	31.40	22.43
C,CB	35.34	33.03	22.43
D,DB	34.03	33.04	22.43
ES	36.32	33.05	23.52
G,GB	35.34	33.03	22.43
H,HB	35.34	33.03	22.43
J,JB	35.34	33.03	22.43
K,KB	35.34	33.03	22.43

Complete Engine Includes:
Crankcase assembly, crankshaft assembly, camshaft assembly, valve drive train, cylinder assemblies, piston & connecting rod assemblies, oil sump assembly, (*inter-cylinder baffling), alternator, starter, starter adapter assembly, lubrication system (*includes oil filter), accessory drives, ignition system (includes spark plugs), fuel injection (includes starting primer), induction system, all engine to engine attaching hardware, hoses clamps and fittings.

* On some models; Items are airframe supplied.

TOTAL BASIC ENGINE WEIGHT - DRY (No oil in sump)

(Subject to product variation of ± 2.5%)	IO-360-A,AB,D,BB,H,HB,J,JB,K,KB	327.25
	IO-360-C,CB,G,GB	331.25
	IO-360-ES	350.00

3-3 OPERATING LIMITS

ENGINE MODEL	RATED MAX. CONT. BHP
IO-360-A,AB	195
IO-360-C,CB	210
IO-360-D,DB,ES	210
IO-360-G,GB	210
IO-360-H,HB	210
IO-360-J,JB	195
IO-360-K,KB	195

Crankshaft Speed - RPM

Rated Maximum Continuous . . . . A,AB,C,CB,D,DB,ES,G,GB,H,HB 2800
Rated Maximum Continuous Operation . . . . JB, & KB 2600
Rated Maximum Take-Off . . . . All except K, KB 2800
Rated Maximum Take-Off . . . . K, KB 2600
Recommended Max. for Cruising (75% Power) . . . . All Except A, AB 2600
Recommended Max. for Cruising (75% Power) . . . . A, AB 2500

Intake Manifold Pressure (In. Hg.)

Maximum Take-Off . . . . See Performance Chart (Chapter 12)
Maximum Continuous . . . . See Performance Chart (Charter 12)
Recommended Continuous Max. for Cruising . . . . . . See Performance Chart (Chap. 12)
Fuel Control System . . . . TCM Continuous Flow Fuel Injection
Unmetered Fuel Pressure (P.S.I.G.) . . . . See Performance Chart (Chap. 12)
Fuel (Min. Grade) . . . . Aviation Grade 100 or 100LL

WARNING...The use of lower octane rated fuel can result in destruction of an engine the first time high power is applied. This would most likely occur on takeoff. If the aircraft is inadvertently serviced with the wrong grade of fuel, the fuel tank must be completely drained, properly serviced, and the proper engine inspection completed.

Oil: (First 25 hours of operation) . . . . Mineral (non-detergent) Oil or
. . . . Corrosion Preventive oil Corresponding to MIL-C-6529 Type II
Oil Specification . . . . MHS-24F or MHS-25

Normal Service

All Temperatures . . . . 15W-50 • 20W-50
Below 40°F. Ambient Air (Sea Level) . . . . SAE30 or 10W-30
Above 40° F. Ambient Air (Sea Level) SAE50

Oil Sump Capacity . . . . 10 qts.
Oil Sump Capacity (ES) . . . . 8 qts.
Oil Filter . . . . Full Flow

Max. Oil Consumption lb/hr

ALL MODELS (Except ES)

$$.006 \times \frac{\% \text{ Power}}{100}$$

ES

$$.004 \times \frac{\% \text{ Power}}{100}$$

Oil Pressure

Idle, Minimum, psi 10
Normal Operation, psi . . . . 30 to 60

Oil Temperature Limits

Minimum for Take-Off . . . . 24°C / 75°F
Maximum Allowable (IO-360A,AB) . . . . 107°C / 225°F

Maximum Allowable (All Except A,AB) . . . . 116°C / 240°F
Recommended Cruising . . . . 71° - 82°C / 160°F - 180°F

IGNITION TIMING ° BTC ± 1°	RIGHT	LEFT
All IO360 Models (Except ES)	20°	20°
ES	24°	24°

3-4 ACCESSORIES

The following magnetos equipped with an appropriate harness are eligible on the engines covered by this manual.

Two each TCM S6LN-25 . . . . All Models except ES - No Wt. Change
Two each Slick 6214 . . . . -1.4 lbs. ES

The following spark plugs are approved for use in engines covered in this manual as applicable

ALL IO-360 MODELS

TCM	625350, 365862, 626363, 626364, 636861, 632462, 632463, 635146, 635147, 628325, 646629, 630049, 646630, 642097, 642098, 646091, 646092,
AUBURN	SR83P, SR86, SR93, HSR83P, HSR86, HSR93
AUTOLITE	SH26, SH260, PA26, PH260
CHAMPION	REM38E, REM38S, RHM38E, RHM38S
SMITH	RSE23-3R, RSH23-3R, RSE23-3R1, RSH23-3R1