

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

E-252
Revision 34

CONTINENTAL
C90-8F, -8FJ
C90-12F, -12FH, -12FJ, -12FP
C90-14F, -14FH, -14FJ, -16F
O-200-A, O-200-B, O-200-C,
O-200-D, O-200-X

June 27, 2013

TYPE CERTIFICATE DATA SHEET NO. E-252

Engine of models described herein conforming with this data sheet (which is a part of type certificate No. 252) and other approved data on file with the Federal Aviation Administration, meet the minimum standards for use in certificated aircraft in accordance with pertinent aircraft data sheets and applicable portions of the Civil Air Regulations and Federal Aviation Regulations provided they are installed, operated and maintained as prescribed by the approved manufacturer's manuals and other acceptable instructions.

Type Certificate Holder Continental Motors, Inc.
2039 Broad Street
Mobile, Alabama 36601

Type Certificate Holder Record Teledyne Continental Motors
Ownership & name change as of April 19, 2011 (Continental Motors, Inc.)

Model	C90-8F	C90-12F, -14F, -16F	O-200-A, -B, -C
Type	4HOA	---	---
Rating, standard atmosphere			
Max. continuous hp., r.p.m., at sea level pressure altitude	90-2475	---	100-2750
Takeoff hp., 5 min., r.p.m., full throttle, at sea level pressure alt	95-2625	---	100-2750
Fuel (min. grade aviation gasoline)	80/87	---	---
Lubricating oil, ambient air temp.	Oil Grade		
Below 40° F.	SAE 20	---	---
Above 40° F.	SAE 40	---	---
Bore and stroke, in.	4.062 x 3.875	---	---
Displacement, cu. in.	201	---	---
Compression ratio	7:1	---	---
Weight (dry), lb.	184	188	190
C.G. location (with accessories)			
Fwd. of rear face of mounting lugs, in.	6.2	4.6	---
Below crankshaft center line, in.	1.5	1.3	1.2
Propeller shaft, SAE No.	1 Flange	---	---
Carburetion (see NOTE 4 for injectors)	Marvel-Schebler MA-3SPA (CMI/TCM P/N 627367, 629175, 637101 or 637835)	---	Marvel-Schebler MA-3SPA
	Bendix-Stromberg NA-S3A1 (CMI/TCM P/N 530625, 530726, 531126, 530846, 531157)	---	(CMI/TCM P/N 627143, 640416 or 633028)

Page No.	1	2	3	4
Rev. No.	34	33	33	34

Model	C90-8F	C90-12F, -14F, -16F	O-200-A, -B, -C
Timing, °BTC	26 Top, 28 Bottom	---	24 Top, 24 Bottom
Spark plugs	See NOTE 6	---	---
Oil sump capacity, qt.	5 or 6	---	---
NOTES	1 through 7	1, 2, 3, 4, 6, 7	1, 2, 3, 4, 6, 7

"- - -" indicates "same as preceding model"

Model	O-200-D	O-200-X
Type	4HOA	4HOA
Rating, standard atmosphere		
Max. continuous hp., r.p.m., at sea level pressure altitude	100-2750	100-2750
Takeoff hp., 5 min., r.p.m., full throttle, at sea level pressure alt	100-2750	100-2750
Fuel (min. grade aviation gasoline)	100/100LL, RH100/130	100/100LL, RH100/130
Lubricating oil, ambient air temp.	Oil Grade	Oil Grade
Below 40° F.	SAE 30	SAE 30
Above 40° F.	SAE 50	SAE 50
Bore and stroke, in.	4.062 x 3.875	4.062 x 3.875
Displacement, cu. in.	201	201
Compression ratio	8.5:1	8.5:1
Weight (dry), lb.	176.5	176.5
C.G. location (with accessories)		
Fwd. of rear face of rear acc. case	6.2	6.2
Below crankshaft center line, in.	0.96	0.96
Beside crankshaft centerline toward 1-3 side	0.06	0.06
Propeller shaft, SAE No.	CMI/Cessna	CMI/Cessna
Carburetion (see NOTE 4 for injectors)	---	---
Ignition	Slick Electro 4301 (both sides) or 1 ea. CMI/TCM S4LSC-200 and S4LSC204 or 1 ea. CMI/TCM S4LSC-200 and S4LSC204T or CMI/TCM S4LSC-21 (both sides)	---
Timing, °BTC	24° ± 1°	24° ± 1°
Spark plugs	See NOTE 6	See NOTE 6
Oil sump capacity, qt.	5	5
NOTES	1, 2, 3, 4, 6, 7	1, 2, 3, 4, 6, 7

"- - -" indicates "same as preceding model"

Certification Basis	Part 13 of the Civil Air Regulations. Type Certificate No. 252 (All models except O-200-D, -X)
	Part 33 of the Federal Air Regulations through Amendment 24 effective November 5, 2007 Type Certificate No. 252, Model O-200-D added October 10, 2008 Model O-200-X added March 19, 2010
Production Basis	Production Certificate No. 7 Production Certificate No. 508 (All models except C90-16F)

NOTE 1.	Maximum permissible temperatures:		
	<u>C90 Series</u>	<u>O-200-A, -B, -C</u>	<u>O-200-D, -X</u>
Cylinder head	525° F.	525° F.	480° F.
Cylinder barrel	275° F.	290° F.	N/A
Oil inlet	225° F.	225° F. (Straight mineral)	240° F.

7.8 INSTALL CONTACT POINTS

7.8.1 PRIMARY CONTACT POINTS—ALL MAGNETOS

- A. Attach contact point assembly on the bearing cap using appropriate screw.

NOTE: ON RETARD BREAKER MAGNETOS, THE PRIMARY POINTS ARE SECURED WITH A *BLACK ANODIZED* SCREW.

CAUTION: RETARD BREAKER MAGNETOS USE DIFFERENT LENGTH SCREWS TO SECURE THE CONTACT BREAKER ASSEMBLIES. USE OF INCORRECT MOUNTING SCREWS WILL DAMAGE UPPER MAGNETO BEARING AND CAUSE POSSIBLE MAGNETO FAILURE.

7.8.2 RETARD BREAKER CONTACT POINTS—RETARD BREAKER MAGNETOS ONLY

NOTE: INSTALL PRIMARY POINT ASSEMBLY BEFORE INSTALLING RETARD POINT ASSEMBLY.

- A. Place spacer on bearing cap and attach retard contact points assembly using silver screw and plain washer.
B. Do not tighten screws until magneto is timed.

7.8.3 TACHOMETER DRIVE CONTACT POINTS—TACHOMETER DRIVE MAGNETOS ONLY

NOTE: INSTALL PRIMARY POINT ASSEMBLY BEFORE INSTALLING TACHOMETER POINT ASSEMBLY.

- A. Place tachometer contact points on bearing cap and secure using two screws and plain washers.
B. Do not tighten screws until magneto is timed.

7.9 INSTALL ROTOR CAM

- A. Install cam using a light hammer and T-151 cam and rotor set.
B. Drive the cam until it bottoms in the rotor cam slot. (See Figure 7.9).

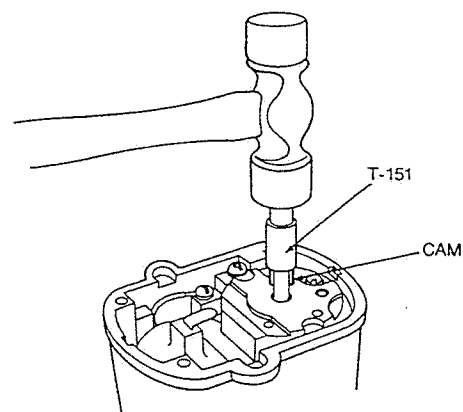


Figure 7.9

7.10 TIME THE MAGNETO

NOTE: FOR RETARD BREAKER MAGNETOS, THE PRIMARY POINTS MUST BE SET FIRST. THE RETARD (SECONDARY) POINTS ARE SET IN REFERENCE TO THE PRIMARY POINTS AND THE PRIMARY POINTS MUST BE SET CORRECTLY TO ENSURE ACCURACY OF RETARD CONTACT SETTINGS.

7.10.1 SET PRIMARY POINTS—ALL MAGNETOS

- A. Place the magneto on the T-125 base, flange down.

6300 Series Magnetos—Remove T-509 timing base adapter.

Retard Breaker Magnetos—Install the T-123 timing plug on the rotor shaft before placing the magneto on the T-125 rotor base.

Impulse Coupled Magnetos—Do not use T-123 timing plug.

Direct-Drive Magnetos—Install the T-123 timing plug on the rotor shaft before placing the magneto on the T-125 base.

- B. Looking directly down on the magneto, align the magneto so that the coil is oriented in the 12 o'clock position.
C. Insert T-150 "E" Gap Gauge (Figure 7.10.1) between the pole laminations in the rotor shaft and the pole laminations in the frame.

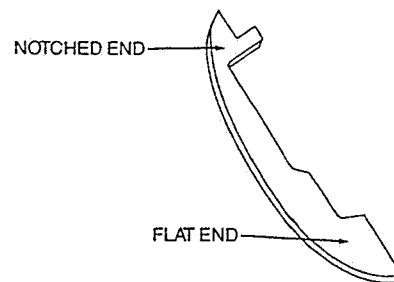


Figure 7.10.1

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PAGE NO.

REVISION

7-3

Insert flat end of T-150 when using old style rotor (no slots on the magnet head). See Figure 7.10.2. Reference the magneto data plate for magneto rotation. Insert the "E" Gap Gauge against the right lamination for right-hand rotation magnetos and against the left laminations for left-hand rotation magneto.

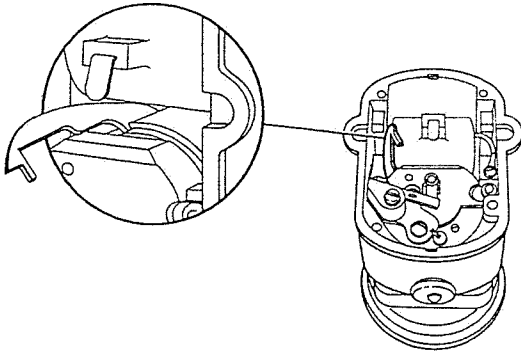


Figure 7.10.2

Insert notched end of T-150 when using new style rotors (with slots on magnet head). See Figure 7.10.3. Locate the appropriate "L" or "R" timing slot on the rotor magnet head and insert the notched end of the "E" gap gauge. Use the "L" slot for left-hand rotation magnetos and the "R" slot for right-hand rotation magnetos.

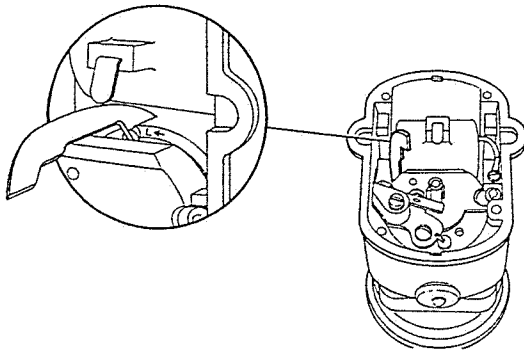


Figure 7.10.3

- D. Rotate the magneto frame on the T-100 base until the T-150 "E" gap gauge rests against the pole lamination in the magneto frame. Rotate the magneto frame **clockwise for left-hand rotation magnetos and counterclockwise for right-hand rotation magnetos**. The magneto rotor shaft is now in "E" gap position.
- E. Using a timing light, adjust the contact points to be just opening when the frame is against the T-150 gauge. This will provide a point gap opening of .008-.012 inches.

- F. **Impulse Coupled and Direct Drive Magnetos:** Secure the points in this position by tightening the screws. Torque adjusting screw to 18-20 in-lbs. Torque the pivot screw to 15-18 in-lbs.

Retard Breaker Magnetos: Secure primary points by tightening the adjusting screw. Torque to 15-18 in-lbs. Proceed to 7.10.2.

Tachometer Drive Magnetos: Secure primary points by tightening the adjusting screw. Torque to 15-18 in-lbs. Proceed to 7.10.3.

- G. Apply cam grease sparingly to each lobe of the cam. (See Figure 7.10.4).

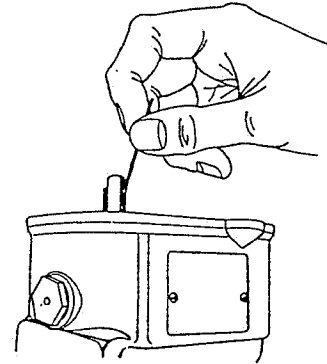


Figure 7.10.4

- H. Attach coil lead wire to the vertical bronze male terminal of the primary point assembly.

7.10.2 SET SECONDARY POINTS—RETARD BREAKER MAGNETOS ONLY

NOTE: FOR RETARD BREAKER MAGNETOS, THE PRIMARY POINTS MUST BE SET FIRST. THE RETARD (SECONDARY) POINTS ARE SET IN REFERENCE TO THE PRIMARY POINTS, AND THE PRIMARY POINTS MUST BE SET CORRECTLY TO ENSURE ACCURACY OF RETARD CONTACT SETTINGS.

- A. Set primary points according to instructions in Section 7.10.1 above. Do not remove T-150 "E" gap gauge, and do not remove magneto frame from T-125 base.

NOTE: RETARD POINTS ARE SET IN REFERENCE TO PRIMARY POINT SETTINGS. THE LAG ANGLE ON THE MAGNETO DATAPLATE IS THE RETARD BREAKER'S RETARD ANGLE MEASURED IN DEGREES. THE FOLLOWING PROCEDURE WILL SET THE RETARD POINTS THE REQUIRED NUMBER OF DEGREES FROM THE PRIMARY POINTS.

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PAGE NO.	REVISION
7-4	

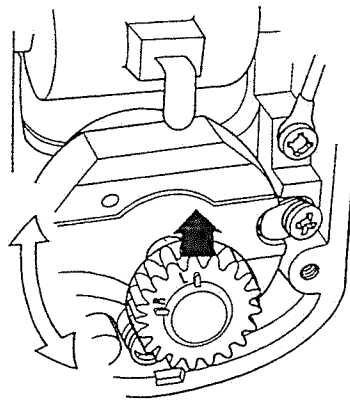


Figure 7.14

7.15 ALIGN DISTRIBUTOR GEAR

- A. Align the "L" or "R" hole in the distributor gear with the "L" or "R" in the distributor block. Use "L" for left-hand rotation and "R" for right-hand rotation magnetos.
- B. Lock the distributor gear in place with the T-118 timing pin through the appropriate hole in the block and gear.
- C. Place distributor block spacers on magneto frame. (See Figure 7.15).

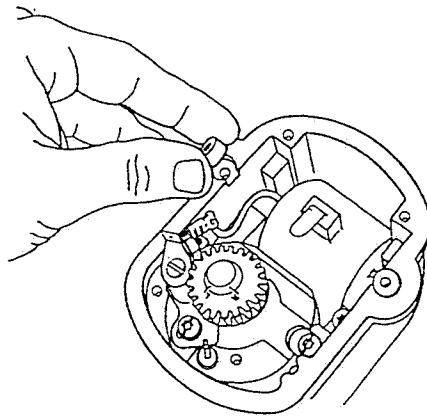


Figure 7.15

- D. Place the distributor block on magneto frame. The distributor gear and rotor gear are properly meshed when the index mark on the rotor gear aligns with the reference mark on the distributor block. (See Figure 7.15.A)

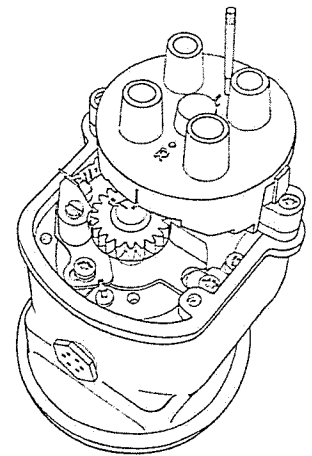


Figure 7.15.A

- E. Secure the distributor block to frame using screws provided.

7.16 CONNECT CONDENSER WIRE

- A. Connect condenser wire to the remaining terminal of the contact assembly.
- B. Attach the terminal with the lead pointing left. (See Figure 7.16).

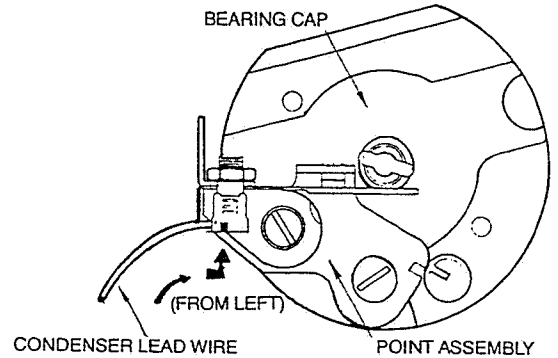


Figure 7.16

7.17 CONNECT RETARD CONTACT WIRE

- A. Connect retard terminal wire to retard contact points. (See Figure 7.17).

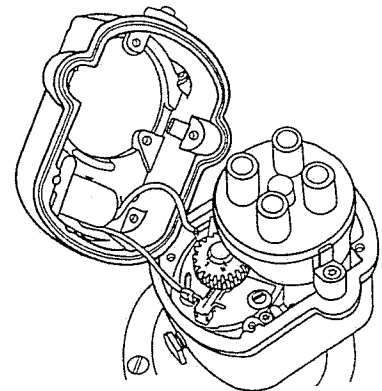


Figure 7.17

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PAGE NO.	REVISION
7-7	

16-12. AIR FILTER

Place the gasket assembled to the air filter against the flange of the air scoop or intake housing, and with the filter locking studs entering the locking plate holes. Press the filter firmly against the scoop and turn the four studs to lock.

16-13. OIL SUMP AND SUCTION TUBE

Make sure that the sump to be installed is the correct type for the engine model and for the aircraft installation; then proceed in the following manner:

- a. Place a new copper-asbestos gasket on the threaded end of the oil pump suction tube. Screw the tube thread into the crankcase cover hole within the sump mount pad circle, and tighten the hex. Install lockwire in the hole across a corner of the hex; twist it, and lead it clockwise to the nearest of two holes provided in the casting. Insert one end of the wire, and twist the two ends to pull the wire tight.
- b. Spread a thin film of non-hardening gasket paste on both surfaces of an oil sump gasket, and place it on the crankcase pad. Ascertain whether the sump filler neck should extend to the left or to the right side to suit the aircraft; then place the sump on the pad, and check the fit of the filler neck bracket on the lower mount arm. If it does not make contact install one or two plain

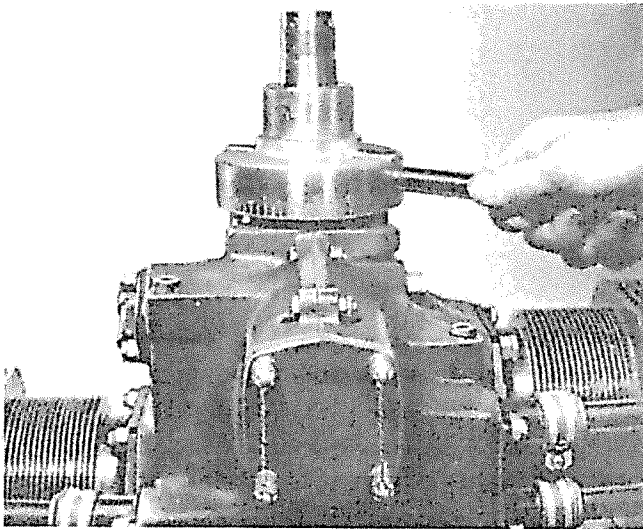


Figure 39. Placing Crankshaft in Firing Positions of No. 1 Piston.

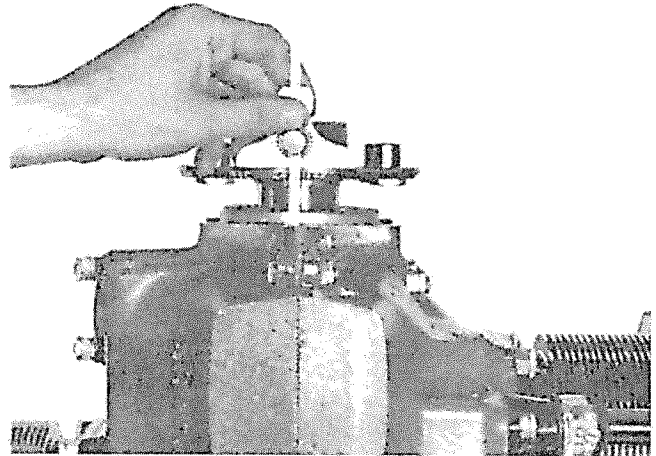


Figure 40. Placing Flange Crankshaft in Firing Position of No.1 Piston.

5/16 inch washers as spacers. Attach the sump and filler neck to crankcase plain studs with elastic stop nuts or to drilled studs with castle nuts and lockwire. Install the oil gauge and cap assembly.

16-14. IGNITION SYSTEM

Install on the two magnetos the proper type or types of gear for the engine model. Tighten the magneto shaft nut, and install a cotter pin to retain each gear. To install the magneto, turn the engine crankshaft in the direction of engine rotation until No.1 cylinder is in its correct firing position on the compression stroke (See Table X). Insert the magneto with the distributor rotor in position to fire No.1 ignition cable (after tripping the impulse mechanism if any). For the Bendix Magneto, timing to the engine is obtained by turning the magneto through the required angle until the breaker points just open. Use a timing light preferably. For the Slick Magneto only the removal of the timing key is required after installing the magneto on the engine.

- a. **SLICK MODEL 4001 MAGNETOS.** Current production Model O-200 engines are equipped with non-adjustable Model 4001 slick Magnetos. Remove the bottom vent plug and "Spark Out" the magneto. This magneto cannot be overhauled and the breaker assembly, coil and capacitor are non-replaceable. Exchange magnetos are available through your Continental Distributor.