

Zenith Model A Ford Carburetor Restoration Worksheets

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These worksheets are evolving as a sequential guide to help Model A Ford owners restore their Zenith carburetors. These sequential steps are intended to keep the restorer on track but, not necessarily provide the details on how to do each step. Some good sources, which provide information on theory of operation, specifications, and how to do restoration details, are identified at the end of these worksheets as "References and Acknowledgements".

What is known about the specific carburetor being restored:

Vehicle _____
Owner _____

Owners experience driving with this carburetor - Why do they think this Carburetor may have a problem?

Starting: _____
Gas mileage: _____
Idle / slow speed: _____
High speed: _____
Leaks: _____
Not recently used: _____
Other: _____

Remind owner that no carburetor can perform well on an engine without good ignition system, that is timed correctly. If possible, verify that carburetor is likely a problem by running a known good carburetor on the vehicle.

Carburetor Description

Lower Casting Markings: _____

Upper Casting Markings: _____

Do castings match year of vehicle manufacturer? _____

Paint & Rust Conditions: _____

Do external parts appear to be compatible with casting Manufacturer and timing? _____

Attached Tags or Labels: _____

Testing Gas Adjusting Valve seat

1. Assemble "Test hardware" in Lower casting
 - A. Cap jet, with o-ring and vinyl tubing _____
 - B. Main jet with o-ring _____
 - C. Compensating jet (Solder closed old jet) with o-ring _____
 - D. 3/8-24 Bolt, with o-ring, to seal secondary well hole _____
 - E. Drain plug w/ o-Ring _____
 - F. GAV Seat (if needed), Needle, Housing, and Choke Driver, that will be used in carburetor _____
2. Fill bowl about half full with water. _____
3. Blow air into cap jet vinyl tubing while adjusting GAV. _____
 When GAV is open air should bubble out thru the water in bowl. _____
 With the GAV closed no air should bubble out. _____
4. If air bubbles out when the GAV is closed , the seat needs to be honed smooth for a tight seal. _____
5. Remove Water or Gasoline from Float well, Secondary well, etc. _____
6. Remove all Test Hardware and parts _____
7. If water was used, Dry water out of Casting immediately with a torch, to minimize rusting. _____

Testing Upper Castings internal passages

1. Blow air thru Fuel input, Strainer, and Float Valve holes. (Make sure old strainer tip isn't left inside) _____
2. Install an Idling Jet and Air Adjust Screw Assembly _____
3. Blow through Idling jet to verify passage is open between idling jet and idling port. _____
4. Verify that Air Adjusting screw assembly can actually shut off all air flow _____
 Block idling port in throat, and blow in Idling Jet. _____
 When Air adjusting screw is all the way in, No air should flow out air input passage. _____

Painting of Castings

Mask all openings to internal carburetor areas. _____

Paint with: Orr-Lac, Gloss Black #903; Duracryl, Acrylic Lacquer Low Gloss DIA 9468; or
 "Plasti-kote", Flat Black # 344 for compatability with high temperature and gasoline to some degree. _____

Suggest that paint be baked at 250 degrees F for a couple hours. _____

Press in brass plugs _____

Paint two stop pins with Aluminum paint _____

Throttle Assembly (Inspect, clean with solvent, repair and assemble)

Plate: 20 degree to June 1928, after 18 1/2 degree; Check for fit and motion _____ **A9585**

Lever / Shaft: Check for rotational motion and slop in bearing areas _____ **A9581**

Lever forged steel, nickle finish to mid 28, forged brass, nickle or plain finish to early 30, then Stamped steel , cadmium or plain finish
 It may be disirable to salvage original shafts, versus replace, by building them up with solder and then file / emroy cloth them down to size.
 When shaft holes get worn, they leak vacuum, and may need to be drilled out for bushings.

Bushings: _____ **A9581-S**

Plate Screws: _____ **A20042-S7 (Oval 5-40 UNF (SAE) Thread x 19/64)**
 5-40 UNC (SAE) Threads (2 Places) _____

Fillister Screw: 1/2" long until early 30, then 5/8" _____ **A20108-S7 (8-36 UNF (SAE) Thread x 5/8)**

Check for head and slot damage _____

Adjustment: Off engine, initial screw setting should slightly open throttle plate _____

Air Adjusting Screw Assembly (Inspect, clean with solvent and assemble)

Function is to introduce air into fuel stream, metered by the idling Jet.

Needle: _____ **A9577**

Shaft Length: (minus head = 1 & 3/16 or 1.1875"; Including head = 1 & 11/32" or 1.344" _____

Head Diameter: 1927-30 = 3/8" or .375"; 1930 - End = 5/16" or .3125" _____

Cap: _____ **A9579** Spring: _____ **A9578**
 (Off Engine initial setting should be 1 & 1/2 turns from full clockwise)

Strainer (Inspect, clean with solvent and assemble)

Strainer: _____ **A9559** Gasket: _____ **A22333 (1/2")**

Float and Valve Assembly (Inspect, clean with solvent, repair and assemble)

Controls the level of fuel allowed into the bowl

Valve: _____ A9564A

Valves can be intermittent: Leak when they should be closed or stick partly open when they should be open. Push in hard and twist valve stem a few times to seat it.

Consider replacing with gas resistant rubber tip or "Gross Jet" designs. _____ A9564-Z

Float: Test for Leaks _____ A9550

Float Hinge Pin: _____ A9558

Hinge: Check for damage and security _____
If hinge rivets are a problem: Either replace rivets or tap and insert 6/32 Screws

Washer _____ A9502Z

Inspect Float for a small dimple worn into the top of the float by the valve needle. The effect of this dimple is a lateral bind on the valve needle that prevents it from closing completely and sealing.

To get float solder seam to be parallel with upper casting surface, gasket thickness may need to be varied.

Float Tab may need to be bent so that float does not drop too far down.

Idling Jet (Inspect, clean with solvent, adjust, test, and assemble)

Delivers fuel (from the Secondary Well) to the engine at idle (effect only at low speed).

This jets orifice is very small and is easily clogged by dirt or sediment. If jet is too large, the adjustment screw will need to be turned out very far (>4 turns). If jet is too small, it will be impossible to obtain a satisfactory mixture except by turning idling adjustment screw in all the way.

Inspect for fractures / breaks along the shaft and stems that turn in its base.

_____ A9542

Orifice Size recommendations:

Altitude	Drill	Diameter in inches
For Zero to 3000 Foot	#75	.021
For 3000 to 5000 Foot	#75	.021
For 5000 Plus Foot	#76	.020

Recommended Flow (measured at desired altitude) 44 to 48 milliliters per minute
(Some Carburetor to Engine combinations require +/- 5 milliliter from this.)

Orifice Size Measured: _____ Adjusted to: _____

Flow Measure at Altitude: _____ Adjusted to: _____

No washer is used with this jet because it is a taper fit.

Main Jet (Inspect, clean with solvent, adjust, test, and assemble)

Delivers the major portion of the fuel to the engine at over 30 miles per hour.

Usually is the cause of high speed carburetor problems. If the jet is too large, it will make the mixture rich, give low mileage, sooty plugs, smell of gas, and irregular running. If the jet is too small, it will make the mixture lean, the car won't go very fast, and might even backfire at high speed.

Should have indented tip to prevent capillary action leaks when engine is off.

_____ A9534B

Critical Length should be: 1 and 15/32" or 1.46875" Measured Length: _____

Orifice Size recommendations:

Altitude	Drill	Diameter in inches
For Zero to 3000 Foot	#63	.037
For 3000 to 5000 Foot	#64	.036
For 5000 Plus Foot	#65	.035

Recommended Flow (measured at desired altitude) 150 to 160 milliliters per minute

Orifice Size Measured: _____ Adjusted to: _____

Flow Measure at Altitude: _____ Adjusted to: _____

Gasket / Washer (One Only!): _____ A22086

Verify that Main Jet is 3/8" from the top of the Lower Casting & in line with the narrowest point of ventrui.

Drain Plug (Inspect, clean with solvent and assemble)

Plug: _____ A9590 (3/8 - 24) Gasket: _____ A22256

Plug was brass unfinished to early 1930, then steel, cadmium and plain finish

Cap Jet

Delivers the fuel provided by the Compensator jet and the Gas Adjusting Valve.
 If the jet is too large, gives low mileage, sooty plugs, smell of gas, and irregular running only at low speeds. If the jet is too small, it will give a lean mixture & miss / jerk on hard pulls (at low speeds).
 Should have indented tip to prevent capillary action leaks when engine is off.

A9538B

Critical Length should be: 1 and 3/32" or 1.09375" Measured Length: _____
 Orifice Size recommendations:

Altitude	Drill	Diameter in inches
For Zero to 3000 Foot	#63	.037
For 3000 to 5000 Foot	#64	.036
For 5000 Plus Foot	#65	.035

 Recommended Flow (measured at desired altitude) 150 to 185 milliliters per minute
 Orifice Size Measured: _____ Adjusted to: _____
 Flow Measure at Altitude: _____ Adjusted to: _____
 Gasket / Washer (One Only!): _____ A22086
 Verify that Cap Jet top is 7/16" from the top of Lower Casting.

Compensator Jet

(Inspect, clean with solvent, adjust, test, and assemble)

Compensates for the enriching effect of the Main Jet as airflow increases and it thus provides a more constant air / fuel ratio mixture. If the jet is too large, gives low mileage, sooty plugs, smells of gas, and irregular running only at low speeds. If jet is too small, it will give a lean mixture and miss / jerk on hard pulls (at low speeds). A hard slow pull uses this jet the most and is its best test.

A9575

Orifice Size recommendations:

Altitude	Drill	Diameter in inches
For Zero to 3000 Foot	#65	.035
For 3000 to 5000 Foot	#65	.035
For 5000 Plus Foot	#66	.033

 Recommended Flow (measured at desired altitude) 138 to 142 milliliters per minute
 Orifice Size Measured: _____ Adjusted to: _____
 Flow Measure at Altitude: _____ Adjusted to: _____
 Gasket / Washer (One Only!): _____ A22086

Secondary Well

(Inspect, clean with solvent, dig dirt and rust from holes and assemble)

Integral well until mid 1928, then Secondary Well: _____ A9545

Choke Air Shutter Assembly

(Inspect, clean with solvent, repair and assemble)

The Choke provides vehicle driver a manual control for closing the Air Shuttle plate

Plate: Check for fit and motion _____ A9549
 Shaft: Check for motion and slop in bearing _____ A9547
 Lever: (Lower leg added in early 1928) _____ A9548
 Screws: _____ A20042-S7 (Oval 5-40 UNC (SAE) Thread x 19/64)
 Nut/Washer: _____ 34078-S7 (8-36 UNF (SAE) Thread) and 34902-S (5/32)

Gas Adjusting Valve Assembly

(Inspect, clean with solvent, and assemble)

Provides vehicle driver a manual fuel adjustment to increase the flow of gas thru Cap jet.

Choke Driver: (Check for bends, twist and damage at control end and for in and out choke motion) _____ A9570
 Needle: (Check length, condition of tip and smoothness of thread action in housing) _____ 9525
 Housing: (Check wrench nut condition, and internal and external thread conditions) _____ A9528
 Note: Housing hex nut may be either 7/16 or 13/32. _____
 Seat: (Must provide a smooth, tight fitting seal for Needle - Brass insert used until Jan 1930) _____ A9532

Large Gaskets:

Glue tack manifold Gasket to carburetor _____ A9447-A
Install Large Gasket onto upper Casting _____ A9592-A

Venturi (Inspect, clean with solvent and assemble)

Double Venturi: to mid 1928 _____ A9586-A
Single Venturi: Started in June 1928 _____ A9586-B

Bolt, which holds two casting together (Inspect, clean with solvent and assemble)

Bolt: _____ A209233-S7 (3/8 - 24X3 3/16) Lock Washer: _____ A22257-S2 (3/8")

Install sidebowl filter assembly (Only on models made after early 1931) _____

Bench Reconditioning and Testing completed

Date: _____

