

THE BOSS CARBURETOR STORY

ALONG WITH AUTOLITE HIPO CARBURETORS, COBRA JET CARBS (BOTH THE 428 & 429), SOME OF THE HIGHEST INTEREST PERFORMANCE CARBURETORS ARE THE BOSS CARBS.

TYPES OF CARBURETORS

In 1969 and 1970, all Boss 302 and 429 engines had special Holley carbs. According to all Holley and Ford literature, the cubic feet per minute (CFM) of the Boss 302 was 780 and the Boss "9" was 735. Interesting isn't it?

In 1971, Ford was going to make a Boss 302, but the vehicle got cancelled. Ford had already bought a bunch of Holley carburetors (D1ZF-VA) and subsequently sold these pieces over the Ford parts counter (a carburetor without a car). In 1971, Ford also introduced the Boss 351. The vehicle was carbureted by the Autolite 4300D spreadbore, rated at 715 CFM. Spreadbore means that the secondary bores were much larger than the primaries.

THE SIZING SITUATION

The marketing of carburetors at Holley has always been centered around CFM. Cubic feet per minute of air flow in a carburetor is determined by the size of the bores (the four holes in the bottom) and the venturi (the hour glass shape in the middle of the carburetor) size. The larger the bore and venturi, the more CFM a carburetor will flow (as long as the engine can use it). The reality is that Holley carburetors manufactured for Ford and most other manufactures rated at 715, 725, 735, 750 and 780 CFM are all the same size carburetor, meaning that the venturis and bores are identical (bore size = 1 11/16-inches in diameter). Depending on what day of the week it is, what CFM would you like your carburetor to be? One important note is that the 750 and 780 CFM rated carbs did use a thinner secondary throttle shaft.

CFM CALCULATION

In order to calculate the CFM of air/fuel mixture that an engine can use, we use the following formula:

Engine Displacement		Maximum RPM		THEORETICAL
2	X	1728	=	Max CFM
Then:				
Theoretical Maximum	X	Volumetric Efficiency	=	Real CFM

We can use 90% volumetric efficiency in calculations which equals a full blown race engine. Here are some "real world" numbers:

Engine/Vehicle	Carb Size	6000 RPMs	7000 RPMs	8000 RPMs	9000 RPMs	10000 RPMs
Boss 302	780	472	557	629*	708*	786*
Boss 429	735	670	782	*	*	*
Boss 351	715	548	640	731*	*	*

* Engine will not tolerate this RPM, at least not for very long!

BOSS CARBURETOR SPECIFICS

Year	Vehicle	Ford Engineering # *	Holley List #	Primary Metering Block #	Secondary Metering Block #	Value**
1969	Boss 302	C9ZF-J	4511	6211	6213	1600
1969	Boss 429	C9AF-S	4456	6044	6045	3500
1970	Boss 302	D0ZF-Z	4653	6396	9213	1200
1970	Boss 429	D00F-S	4647	6044	6045	3000
1971	Boss 302 (no car)	D1ZF-VA	6129	6678	6213	200
1971	Boss 351	D1ZF-ZA		3500		
1971	Boss 351 (CA Emissions)	D1ZF-FA				400

* The full Ford engineering number stamped in the air horn includes 9510. This is Ford's group number for a carburetor assembly and is not constantly repeated.

** These values are approximate and are for totally complete cores with every factory part, except the solenoid.

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GOOD CARBS

The Autolite 4300D on the Boss 351 has a much smaller primary bore (1 9/16-inches) than the Holley. The secondary bore is 1.96-inches. The spreadbore is much more forgiving about oversizing than the squarebore carburetors. In addition, the 4300 with air valve secondaries will only open as far as they need too in order to supply the engine.

ENGINEERING ISSUES - HOLLEY

The obvious engineering issue is that the Boss 302 carb is WAY oversized. It should be noted that Chevrolet did the exact same thing to the Z-28 Camaro. When a carburetor is grossly oversized—off idle—the driver will experience hesitations, surging and flat spots. Due to other engineering issues besides oversizing, the secondaries on the Boss 302 carb would barely work. The Holley carbs also had the usual hard hot starting issues. At Pony Carburetors, during our restoration process, we do subtle engineering changes (not jets) to eliminate the aforementioned problems. We cure the Boss 302 stumbles and hesitations and make the secondaries work properly for the first time ever.

ENGINEERING ISSUES - AUTOLITE 4300D

Where shall we start? Hesitations, flat spots, surging, hard hot starting, and a big bog on hard acceleration were all present. It's no wonder people took these carburetors off, changed intakes and went to a squarebore Holley. That is exactly why they are so rare today. Too many ended up in the junkyard or recycled. Again, at Pony Carburetors we correct every one of these issues. With a Pony restored carburetor, the Boss 351, out of the box, bone stock will turn in the upper 13-second range in the quarter mile.

HOW TO SPOT A REAL BOSS 351 CARB

The value of the carburetor is in the lid (air horn). There are three unique features:

1. The fuel inlet is very small (1/8-inch NPT). Your little finger will not go into the threads.
2. The word "Motorcraft" is NOT cast into the lid.
3. There is no curved air deflection bar in front of the secondary air valve plate. This bar is approximately 1/4-inch wide and attached with two small Phillips head screws.

The D1ZF-FA for California Emissions does not have "Motorcraft" on the lid, but does have the large fuel inlet (7/8 - 20). Your thumb will get lost inside this size opening.

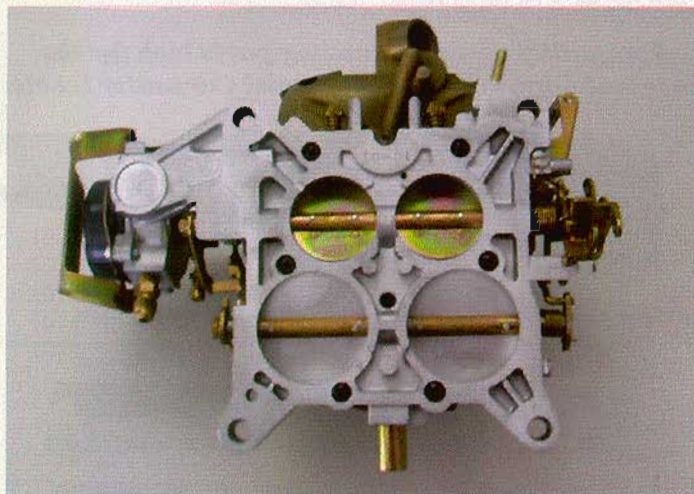
THE BOSS CONVERSION

There are not nearly enough Boss 351 carbs to go around. At Pony Carburetors, we make a Boss "Clone" that has been calibrated to run identically to the real deal. We remove the "Motorcraft" from the lid and restamp the correct engineering number in the toe. The restored cost difference of this clone compared to the original is \$750 vs. \$4,000.

BOSS SOLENOIDS

All solenoids on Bosses are for anti-dieseling. They are interlocked with the ignition switch. When the ignition switch is turned off, the plunger depresses thereby closing the primary throttle plates a little further, preventing dieseling. The proper adjustment of the solenoid is to set the curb idle speed with the plunger extended. Then, back off the regular curb idle speed screw on the carburetor one turn. In reality, the solenoids do very little, but there has been a large demand for them. Pony Carburetors has had them reproduced and we also have a few NOS solenoids.

As always, I invite your comments about any of the "Good Carbs" columns. You may reach me at Pony Carburetors by phone or email.



Happy Driving

A handwritten signature in black ink that reads "Jon M. Enyeart". The signature is written in a cursive style and is positioned above a small black and white portrait of the same man.

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