



Big Block Chevy Spotter's Guide

Copyright 2021, Kwik Performance, Inc.

www.kwikperf.com 417-955-1467 V.1.1

Are you one of those hard-core Big Block Chevy fans who believes there is no replacement for displacement?

Are you also a BBC fan who is trying to put together a modern serpentine-style front accessory drive system without spending a fortune?

If so, you've come to the right place.

Enter Kwik Performance. Our company got its start when three guys got our heads together to solve the front drive system problem on our own 396 and 454 projects and discovered other people liked what we came up with.

We had to learn some things about all the variations in BBC engines and we're happy to share what we've learned in this little guide. Some of this information will be important in choosing which of our front drive systems will work best for you.

Engine families by "Generation"

Mark IV

We're going to skip over the "W-series 348 and 409 engines which some people consider "big blocks". Our focus is on the so-called Mark IV that was introduced in 1966 with 396 cu. in. and all the later variations on that design.

Mark IV 396 was used in Corvette, Camaro, Chevelle, Nova, Monte Carlo, full size Chevys and Chevy pickups. In 1970 Chevy bored the cylinders 30 thousandths over to produce 402 cu. in. even though most badges still said "396".

Also introduced in 1966 was the potent 427. And the 454 version came along in 1970.

Mark IV Truck Engines

Special versions of the Mark IV were used in medium-duty (Class 6 and 7) GM trucks. They came in two sizes, 366 and 427 and featured taller deck heights so the pistons could have an extra ring for better oil control under heavy, continuous loads.

Generation V

GM finally decided to update the BBC in 1991 by switching to a one-piece rear crankshaft seal. These 454 engines all had 4-bolt main caps and were visually different because of the cast aluminum valve covers. Most of these used throttle-body style fuel injection.

Generation VI

More upgrades followed in 1996. These 454 engines (now called Vortec 7400) used in 2500 and 3500 trucks got roller camshafts and multi-port fuel injection.

A 502 crate engine was also introduced and followed by the monstrous 572. This big boy also had the tall deck block to accommodate the longer 4.375" stroke. Today's crate engines combine some Mark IV features like a mechanical fuel pump boss along with some Gen V and VI features like the one-piece rear seal.

And here's a BBC you've probably never heard of: The 8.0 liter Vortec. No, not the 8.1 liter (see below). This 488 cu. in. tall deck was available as a crate engine in the 2015-17 Chevy Performance catalogs but disappeared in the 2018 version. We think it's a Gen VI but it came with a cast iron serpentine crank pulley typical of medium duty trucks and buses. One of our customers swapped the balancer for a regular Mark IV and was able to use our SBC conversion adapter plates.

Generation VII

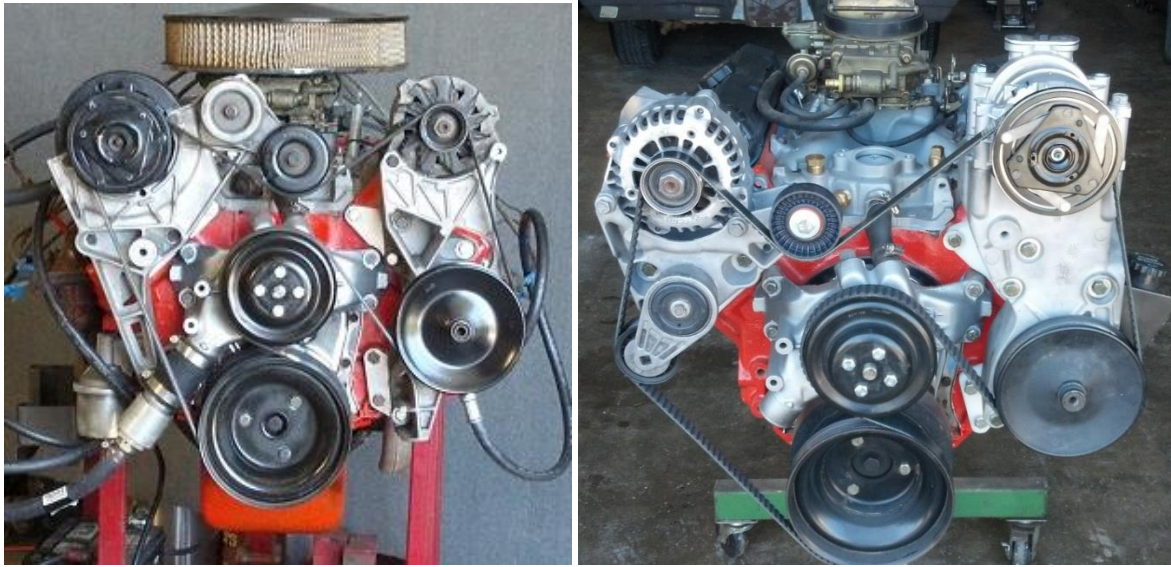
Yep, this is the 8.1 liter or Vortec 8100. And nope, we don't have any brackets or systems for this engine. It's a completely different design.

OK, now let's talk about serpentine systems for the Mark IV, Gen 5 and Gen 6 engines.

Budget Friendly Conversion System

Our very first product is still one of our most popular. It's a set of adapter plates that bolt on the front of a BBC and lets you bolt on a factory small block Chevy serpentine system. Salvage yards and swap meets are full of these SBC brackets. They're cheap, more compact than a factory 454 serpentine system, lighter because they are cast aluminum, not cast iron, and they use accessories found in every auto parts store in the country.

There are two families of SBC brackets you can use and here's what they look like:



The first thing you probably notice is how GM switched the alternator and AC compressor locations. The brackets on the left come from full size pickups from 1990-95 and S10 trucks from 1988-95. The brackets on the right were introduced in 1996, the first Vortec series.

OK, let's get a little more specific. We'll refer to these SBC brackets as "early" and "late".

Early

S10 pickups and S10 Blazers with 4.3L V6 engines—1988-95

Full size pickups with 4.3L V6, 5.0L and 5.7L V8 engines with throttle body fuel injection—1990-95. You might find some 1988-89 full size trucks with stamped steel serpentine brackets. There is a way to use these but it involves cutting and welding. The cast aluminum brackets are the best choice for a truly bolt-on system.

Late

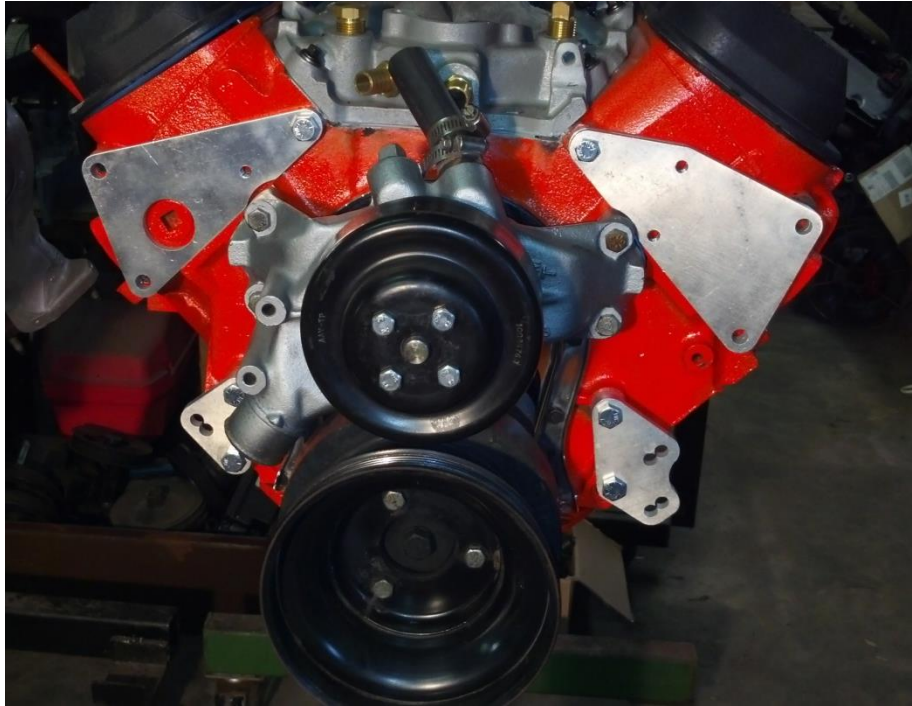
S10 pickups and S10 Blazers with 4.3L V6 engines—1996-2004

Full size pickups with 4.3L V6 engines—1996-2013

Full size pickups with 5.0L and 5.7L engines with multi-port fuel injection—1996-98

The Adapter Plates

Here's a look at the "early" adapter plates to give you a better idea about how this works.



What we've done is overlaid the SBC bolt pattern onto the BBC pattern. Some holes are common. Where they don't match, we drill and tap threads for the SBC bolts. The lower plates have some overlapping holes to work with both standard-deck and tall-deck engines.

What Else You Need—Water pump, crank pulley and harmonic balancer

This whole conversion concept was based on the fact that there was a factory serpentine style water pump readily available. The 454 truck engines all through the 1990s had serpentine systems so they came with a reverse-rotation water pump. (Not reverse flow, the coolant still flows the same as a v-belt pump.)

The other key item when we first introduced this system was a 454 crank pulley that was readily available at your local GM dealer. However, GM stopped producing that 454 crank pulley for a while so we put our thinking caps on and came up with a solution. It's an adapter that lets the SBC crank pulley bolt onto the BBC harmonic balancer. The adapter spaces the SBC pulley out for proper belt alignment and it also centers the pulley.



Above: SBC crank pulley and Kwik adapter. Note machined lip to properly center the pulley.

Then we discovered that late Gen V and most Gen VI BBC harmonic balancers (1994-2000) have a different design than the traditional Mark IV (1966-1993). The Mark IV and early Gen V balancers have a large recessed area around the crankshaft. The late Gen V and Gen VI have a flat face and the hole is only crank diameter. So, we now have two part numbers for the crank adapters.



Above left: Mark IV balancer. Above right: Late Gen V and Gen VI balancer.

Oh, and GM decided to go back into production on the 454 crank pulley but the price went from less than \$40 to almost \$200. That's a really good reason to use the SBC crank pulley from your donor engine.

But that's not all GM has done to keep us off balance. All of the info above about Gen V and Gen VI balancers? Guess what? It doesn't apply to BBC crate engines. They still come with the Mark IV style balancer with the large recess in the center. That's true for the ZZ427, 454HO, ZZ454, HT502, 502HO, ZZ502, and ZZ572. Some of these will come with a race approved balancer, some with just a stock replacement style but they all (to our knowledge) have the Mark IV recess.

Other BBC Serpentine System Options

So, what if you don't like the looks of the factory SBC brackets, or you can't find them, or you don't want to scrounge through the local Pick-A-Part and then spend your spare time cleaning them up?

Have we got a deal for you. We call it our M4 system and it's a serpentine system we designed and make from scratch. It comes ready to bolt on. It has multiple configurations and choices of accessories. And it's still very budget-friendly compared to other systems.

Once again, it's based on the 454 water pump which is considered a "long" pump. Then we add a new SBC crank pulley and our adapter, a new water pump pulley and a spring-loaded belt tensioner.

The system comes standard with a Type 2 power steering pump. Then you can add an optional CS130 style alternator. You can then choose from two AC compressors—the more compact Sanden SD7B10—7176 mini compressor, or, the larger 508/709 style.

The brackets are aircraft-grade 6061 aluminum precision machined on a waterjet and then surfaced to a smooth, satin finish. The end result is an attractive, compact serpentine system with standard accessories that any auto parts store can replace if needed.



Above left: Kwik Performance BBC M4 system shown with Sanden SD7B10—7176 mini AC compressor.

Above right: M4 system with 508/709 AC compressor.

Like many of our serpentine systems, you can supply some of your own accessories or we can supply a complete, turn-key system. You get to choose.

Summary

We admit to being LS engine enthusiasts but they will never have the awesome presence of a nicely detailed big block Chevy. It was our love of the BBC that got our business started and it's still a big part of what we sell.

We hope this document gives you some ideas about how to put a modern serpentine system on your BBC but if you need more help sorting it all out, we're happy to share what we know.

Just call us at 417-955-1467. And check out our web site: www.kwikperf.com

Big Block Chevy ID

Years	Series	Displacement	Bore/Stroke
1966-90	Mark IV	366	3.935/3.76
		396	4.094/3.76
		402	4.125/3.76
		427	4.25/3.76
		454	4.25/4.0
1991-95	Gen V	454	4.25/4.0
1996-2000	Gen VI	454	4.25/4.0

GM Crate Engines (2020)

Model	Displacement	HP/Torque	Bore/Stroke
ZZ427/480	427	480/490	4.25/3.76
454HO	454	438/500	4.25/4.0
ZZ454/440	454	469/519	4.25/4.0
HT502	502	406/541	4.47/4.0
502HO	502	461/558	4.47/4.0
ZZ502	502	508/580	4.47/4.0
ZZ572/620	572	621/645	4.56/4.375
ZZ572/720	572	727/680	4.56/4.375