



SMALL BLOCK FORD TUTORIAL

[Small Block Ford](#) is one of the most difficult engines for customers to understand when it comes to accessory drives. Vast amounts of time have gone into dissecting the various combinations of SBF. Collecting samples of water pumps, balancers, timing covers and blocks, measuring, re-measuring and test fitting to find the most comprehensive array of solutions on the market for our customers. We won't get into all the details of the motor as it pertains to the 221 or 260, just what pertains to the accessory drives and the 289/302/351W and try to keep it as simple as possible.

STANDARD ROTATION VS REVERSE ROTATION

Ford ran standard rotation water pumps in the SBF from the inception on up until around the mid-1980's. There are a couple different ways to identify STD vs REV or CW vs CCW. Standard rotation water pumps should have a 1.75" bolt circle, reverse rotation water pumps should have a 2.06" bolt circle. This difference was to help technicians identify them easily but some of the aftermarket manufacturers didn't adhere to it and/or decided to put both bolt patterns on their flanges.

Another way to try and identify the rotation of the water pump would be to look at the belt(s). A v-belt water pump pulley should be a standard rotation pump. A serpentine belt water pump pulley with ribs should be a standard rotation pump. A serpentine belt water pump pulley that is smooth or without grooves should be a reverse rotation pump.

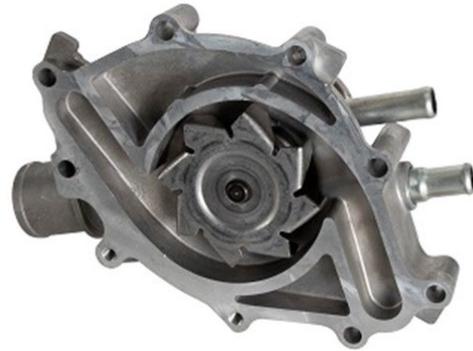
If you're still unsure you can remove the pump and examine the impeller and timing cover. With the lower hose pointing down look at the back of the pump and position one of the blades at 12 o'clock. The flat part of the impeller blade will be facing left on a standard rotation pump and right on a reverse rotation pump.

You can also identify the timing cover by looking at the direction of the coolant passages. Which brings us to the timing covers.

SMALL BLOCK FORD TUTORIAL



STANDARD ROTATION



REVERSE ROTATION

TIMING COVERS

For all intents and purposes there are essentially 3 SBF timing covers:

- Standard Rotation (Clockwise, CW)
- Early Reverse Rotation (Counter Clockwise, CCW)
- Late Reverse Rotation (94 Cover)

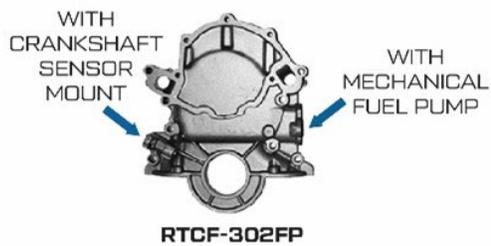
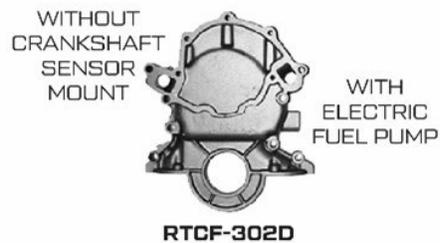
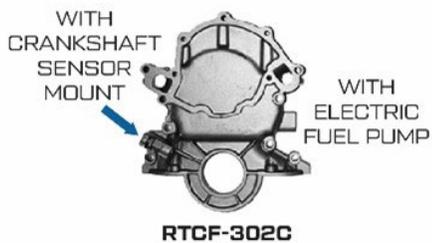
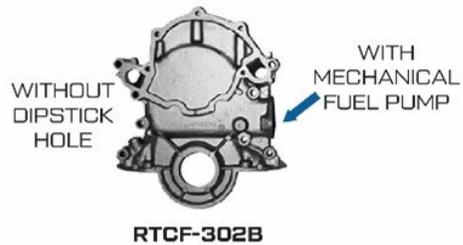
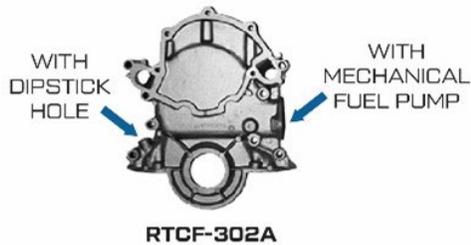
There are many variations of the Standard Rotation cover with different provisions for dipstick, crankshaft sensor, fuel pump, etc. But they are all the same dimension, bolt pattern, and cooling passages.

The Early Reverse Rotation timing cover shares the same dimension and bolt pattern as the Standard, but the cooling passages are angled differently.

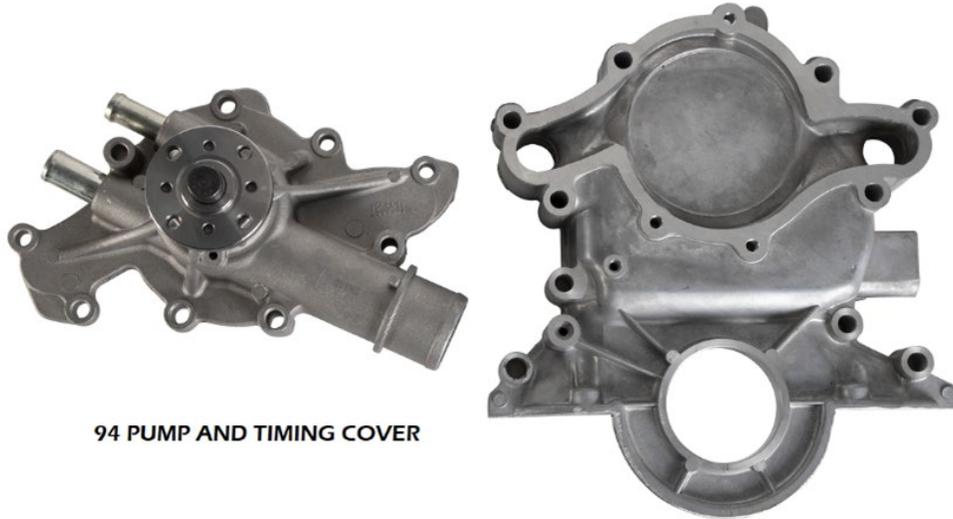
The 94 Cover is a different dimension, bolt pattern and vastly different cooling passage. It was used for such a short time that most manufacturers don't engineer aftermarket components around it.

SMALL BLOCK FORD TUTORIAL

SMALL BLOCK FORD TIMING COVERS



SMALL BLOCK FORD TUTORIAL



WATER PUMPS

For a long time, everything was standard rotation. The early motors came with a water pump that had a passenger side lower radiator hose and a 5.4" hub height.

In the 70's, motors started coming with a driver side lower radiator which had a 5.7" hub height, and this continued until the 80's when reverse rotation started making its appearance.

One curve ball that gets thrown in here is that Ford Racing also offered a "Shorty" pump which had a driver side lower radiator hose and a 4.5" hub height.



As if that isn't confusing enough already, we still have to add balancers and interchange into the equation.

SMALL BLOCK FORD TUTORIAL

BALANCERS

Video: [SMALL BLOCK FORD BALANCER TECH TIPS VIDEO](#)

Early motors with passenger side water pumps came equipped with a 3-bolt balancer. The offset measurement from the balancer face to water pump flange measurement of this factory combination was 3-7/8".

When the water pumps changed to driver side, so did the balancers. They changed to a 4-bolt and not only the obvious change from 3 to 4 bolts but also offset. The 4 bolt balancers were almost 1" taller than the earlier 3 bolt and the balancer face to water pump flange measurement of this combination was 3-1/4". This is also when 351W was introduced, which had a taller deck than the 289/302 but the offset measurement between balancer face and water pump flange was the same.



4-Bolt Factory

Aftermarket with both 3/4 Bolt

3-Bolt Factory

The aftermarket decided to try and help customers out by putting both bolt patterns into their balancers whether they be the early or the late, but the offset problem still persisted. So, when it comes to aftermarket balancers you will generally find that most 3-bolt-only balancers are OEM replacement. Most balancers with both the 3 and 4 bolt patterns will have the same dimensional measurements as the original factory 3 bolt but have the additional 4 bolt pattern so that a crank spacer can be used to aid in pulley alignment. When it comes to aftermarket

SMALL BLOCK FORD TUTORIAL

balancer with only a 4-bolt pattern, it's a coin toss on whether it is OEM spec or has the offset of the original 3-bolt.

$\frac{3}{4}$ -Bolt Aftermarket 3-Bolt Factory $\frac{3}{4}$ -Bolt Aftermarket 4-Bolt Factory



SELECTING THE RIGHT PARTS

With all of these different variations and combinations out there, it gets really confusing on which item to select. At CVF we've tried to make it as painless as possible.

The first and most important thing about Small Block Ford's is to determine whether you're dealing with standard (clockwise) or reverse (counter-clockwise) rotation on the water pump. Reverse rotation systems are our 5.0L / 5.8L Beast systems.

For standard rotation water pumps, there are 3 key pieces of information to get the right parts every time:

- 1) Is your lower radiator hose going to be on the passenger side or driver side? This tells us if your water pump is 5.4" or 5.7" tall.
- 2) Do you have 3 or 4 bolt damper (or both)? This tells us what offset it could be in addition to what the bolt pattern is.
- 3) Is your damper factory or aftermarket? (Aftermarket 4 bolt dampers are shorter and usually require a spacer) This tells us more information about possible offsets of the balancer in addition to how the crank pulley indexes on the balancer.

We have set up the systems on our website with radio buttons to make these selections and ensure that you get the right parts. If you're looking for individual pulleys, we've categorized the website by this information to help guide you in the right directions. If you're still struggling or uncertain our knowledgeable staff is always at your disposal to help you identify or make your selections.