

## Big Block Chevrolet Head Gaskets and Coolant Flow.

Chevy Big Blocks have two different "routings" for the coolant flow. Most but not all Mark IV big blocks use series flow. The coolant from the radiator enters the water pump and is forced into the front of the block. It travels to the rear of the block to a pair of passages in the block deck, head gasket, and cylinder head. Once in the head, the coolant travels forward until at the front of the head, it enters the intake manifold and then out the thermostat housing. The coolant is constantly picking up heat from the engine, so the warmest coolant (in the front of the head, about to transfer to the manifold and then to the radiator) is directly above the coolest coolant—the fresh stuff coming from the radiator and out of the water pump. This can and does work out OK, but it's not the best way to do it.

Some Mark IV, and all Gen V and VI Big Block Chevys use parallel-flow routing of coolant. The cool water enters the front of the block just as in the series-flow system above. The coolant is directed to the rear of the block, but there are three intermediate holes in the block deck and head gasket between the cylinders, and a certain portion of the total coolant "geysers" up and enters the head between each cylinder pair. The remainder of the coolant enters the head through one of the same passages in the rear of the block and head as the series flow system, but usually the larger rear passage is blocked by the gasket, so only the smaller passage is open.

As far as I know, all Big Block cylinder heads have all needed passages to operate with either type of coolant flow system. The ONLY differences are in the block deck and the head gaskets. Series flow blocks (which are all Mark IV) can be converted to parallel flow by drilling the three additional holes in each deck, and installing a parallel flow gasket. Some blocks may have one hole already, but it needs to be oblonged to match the hole in the head gasket. Use the gasket as a template for location and size of the "new" holes. You must, of course, use a gasket that has the additional holes. You can put a series-flow gasket on a Mark IV (but NOT a Gen V) parallel flow block, and that's all you need to convert to series flow—but why would you want to? Parallel flow is better at keeping block and head temperatures more even.

If you put a Mark IV series flow head gasket on a Gen V block, the coolant will "short circuit" directly to the head and thermostat without going through the rest of the engine first. A recipe for disaster.

The dangerous combination is to install a parallel-flow gasket on a series-flow block. The block deck won't have the three additional holes (unless you drill them), and the gasket will have the large rear coolant passage blocked off. The result is an engine that will overheat no matter how many times you change the thermostat, or flush the coolant, or pour "miracle coolant" additives into the radiator. The engine will be fine at low speed/light load, but will overheat when run hard because the coolant passages between the block and head are too small to flow enough coolant, and there's NOTHING you can do about it but pull the heads and fix the restriction.

The top photo is a parallel flow gasket. Note the single small coolant hole at each end (only the one at the rear is used) and the three small round holes between the cylinders that look like oversized head bolt holes. Those holes are on the lower edge of the deck, which is the upper part of the gasket in the photo.

The lower photo is a series flow gasket. Note the double coolant passages, one large and one small, at each end of the gasket. (Only the rear holes are used) and the lack of coolant holes between the cylinders.