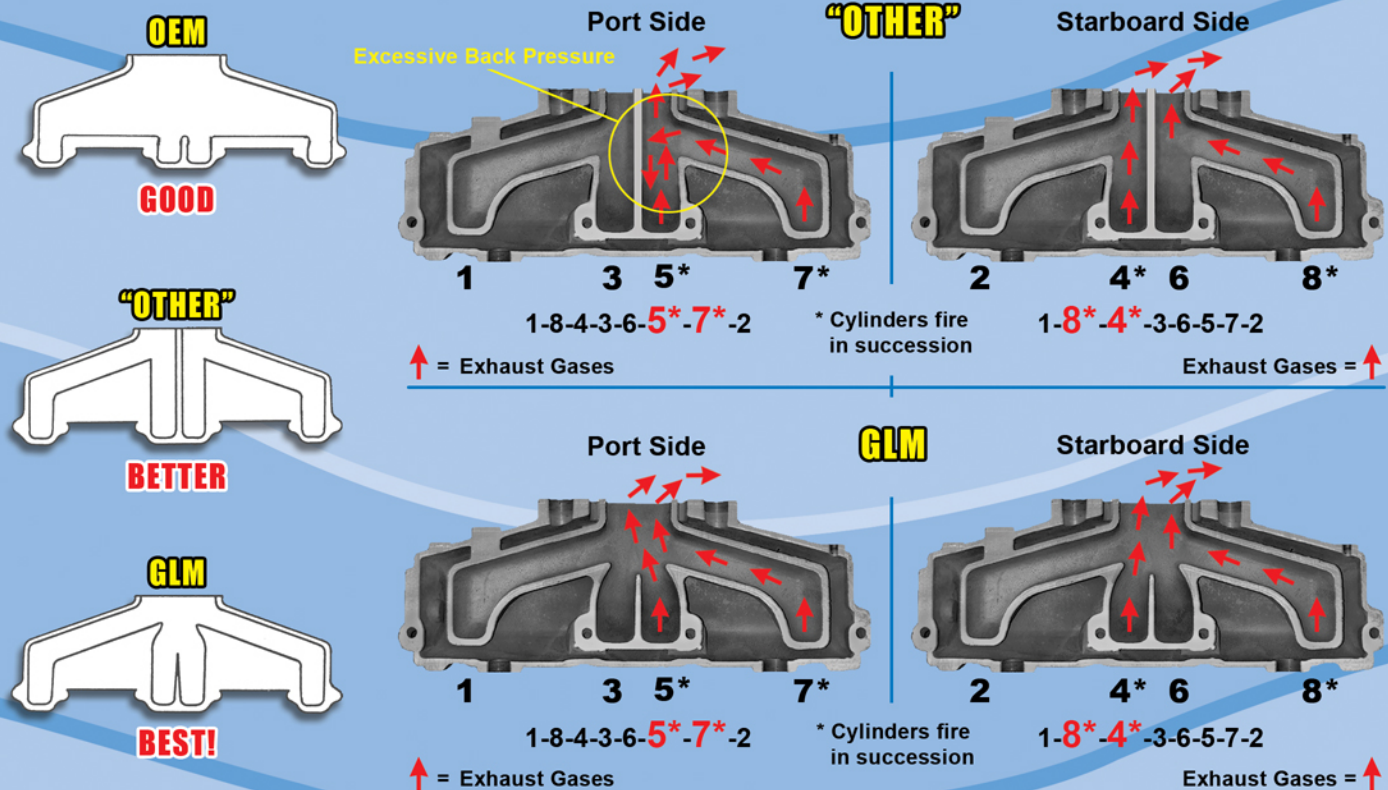


## EXHAUST SYSTEM EVALUATION

**A high performance aftermarket exhaust manifold can deliver a performance increase over a stock OEM exhaust manifold**



**If properly designed, it can achieve this by two ways:  
Separating Exhaust Gas Pulses and Lowering Back Pressure.**

### Separating Exhaust Gas Pulses

All V8 engines have a firing order that fires two cylinders within 90 degrees of each other on the same bank of cylinders. With a firing order of 1-8-4-3-6-5-7-2 we have #8 and #4 firing on the starboard side of the engine within 90 degrees of crankshaft rotation of each other. Of course, this also means that the exhaust gases for these cylinders immediately discharges into the exhaust manifold one after the other. It is at this point, when the two cylinders fill the manifold in immediate succession, that the exhaust manifold becomes overwhelmed with exhaust gases, creating excessive back pressure. In fact, these two cylinders on each bank firing in succession, not only create excessive back pressure in the manifold, but all the way down the exhaust pipe. Excessive back pressure from an overwhelmed exhaust system will not only keep spent gases from leaving the cylinder head exhaust port, but in certain ports, exhaust gases from adjacent cylinders may find their way back in.

The solution is to isolate each exhaust gas pulse as much as possible for as long as possible in the exhaust manifold. There are aftermarket manifold manufacturers that go to great lengths to isolate each exhaust pulse the full length of the manifold and there are some that barely address the problem at all.

Because the starboard side of the engine fires cylinders 4 & 8 in succession, there is a cylinder (#6) separating the two. Dividing this manifold into two different sections by grouping cylinder #2 and #4 in the front half of the manifold, and #6 and #8 into the back half of the manifold with a divider, works relatively well in isolating cylinders #4 and #8. On the port side of the engine, we have a problem. The cylinders that fire in succession, 5&7, are next to each other. Dividing the port manifold into a front half and back half groups cylinder 1&3 together (which is okay) but also groups cylinder 5&7 together (definitely not okay). This is exactly what we are trying to prevent. The correct way to build the port side manifold is to isolate the exhaust gases from cylinders 5&7 all the way to the manifold exit. This can not be done with a simple divider in the middle of the manifold.

### Lowering Back Pressure

Lowering back pressure in the exhaust manifold is a combination of isolating the exhaust pulses as discussed in the previous paragraph and simply making the exhaust system larger. Large passages in the exhaust manifolds, a large exit hole out of the manifold, a large exhaust pipe and large radius curves in the pipe wherever the exhaust gases have to change direction are the secrets to lowering backpressure."