Manifold Cleaning

Intake and Exhaust Manifolds are critical components of automobile engines responsible for supplying the fuel/air mixture to the engine (intake) and collecting the gases for expulsion (exhaust). They need to be clean and functioning in order for a car to operate at peak efficiency. Problems with the manifolds can result in costly repair and poor performance. Therefore, cleaning these parts before they are added to the engine is a high priority for auto manufacturers and suppliers.

Intake Manifolds

The intake manifold has a high specification of cleanliness. Since the manifold supplies the engine, it must be clean. Debris and contamination in the manifold can be hazardous to the engine, clogging the engine and damaging the car. Metal chips left over from the production process need to be eliminated in order for the manifold to pass inspection by the manufacturer.

Intake manifolds are often made of soft metals, such as aluminum or magnesium. As such, they require specific cleaning chemistry. When selecting a chemistry to use for cleaning the intake manifold, it is important that the chemistry can effectively clean the manifold without damaging the soft metal construction. Further, the chemistry must not create hydrogen during the cleaning process, because that can result in an explosion.

A common specification for contamination in intake manifolds is in the 1.5mg range. A filter weight test is used to measure the level of contamination. Depending on the design of the manifold, both immersion and spray systems can be effective in reaching this specification. These methods can both produce manifolds with contamination weights less than 1.5mg, usually clearing the standard quite comfortably.

Exhaust Manifolds

The exhaust manifold also needs to be cleaned, but often the specifications are not as stringent as for intake manifolds. This is because the exhaust manifold is located downstream from the engine, meaning it does not provide any material for the engine. Rather, it collects gas from the engine and expels it. There are exceptions to this general rule. If a turbocharger is present, it will be located downstream from the exhaust manifold. In this case, the exhaust manifold must reach cleanliness levels comparable to the intake manifold, or the turbocharger will be contaminated. These manifolds are usually constructed from cast iron, and sometimes cast stainless steel. Exhaust manifolds must pass a smoke test before the manufacturer accepts them. A smoke free performance in the test is required by ISO 14001 standards that auto manufacturers adhere to. Rust inhibitors are also necessary to prevent excessive rust. Rust inhibition applies to the cast iron models; a stainless steel manifold, obviously, does not have the same rust concerns. Many manifolds are imported from foreign manufacturers, and therefore American based auto manufacturers require them to be thoroughly inspected and tested to ensure that the foreign production has met the domestic standards in place.

Washer Solutions

For intake manifolds, there is often a specific area of chips and coolant that needs to be removed. These contaminated areas can be cleaned easily and quickly with a custom washer. By using a custom-rotating fixture, along with spray headers targeted specifically for the part, the manifold can meet cleanliness specifications. The fixture will rotate to the locations of the contamination to target individual orifices and enhance cleaning. By rotating in a full circle, optimal drainage and drying can be achieved.

Exhaust manifolds do not require the same level of specificity. For these manifolds, a washer needs to be able to remove chips form the manifold along with applying a rust inhibitor and drying the parts to virtually “bone dry”. One way of achieving this goal is a fixtured indexing washer. The system removes contaminant first. After that, a rust inhibitor is applied to protect the manifold. Then a blow dry process leaves the parts dry enough for specifications. By including multiple filtration features, the part can be cleaned effective. This process includes a special chip basket filter in the fluid that removes the chips via a flush and then returns the part to the process.

These solutions will not work for every situation. However, by working with a qualified and experienced washer manufacturer, a company in need of manifold cleaning will certainly be able to custom design a machine that works to the specifications they require. Producing clean, quality manifolds is important and necessary. Finding a custom washer to assist in the process will go a long way in maintaining the high level of quality required to produce for American auto manufacturers.

For more information on cleaning exhaust as well as intake manifolds go to www.midbrook.com