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FORD 351C, 351M, AND 400 - TECH HIGHLIGHTS

Federal-Mogul Document #1011

The 351 Cleveland series of engines first appeared in 1970. While it has the same displacement as the 351 "Windsor" motor, they share very few parts. The Cleveland engine came in two basic styles, with the four barrel versions having much larger ports and valves than the two barrel variations. The four barrel heads are often considered too large for street applications, while the two barrel versions have moderate performance potential. (The two barrel versions are used with the Windsor block in a combination referred to as a "Clevor," only possible with special hypereutectic pistons Federal Mogul makes for this application.) The 351C was original equipment in several factory muscle cars, most notably the 1971 Boss 351. Many parts developed for this package are still available, and form the basis for high performance upgrades to this engine family

In a situation similar to that of the big block Chevy, the Cleveland can be found with either "open" or "closed" chamber cylinder heads. The piston dedicated to the open chamber version is P/N L2408F Do not use this piston in closed chamber applications due to potential cylinder head interference. Our other pistons can be used with either type head.

The 351M and 400 are "tall deck" variations of the Cleveland engine, introduced in response to changes in emission regulation and intended engine use. While neither one appeared in a high performance version, many of their components are similar to those of the 351C. These engines share much of the Cleveland's upgrade potential. Pistons are not interchangeable between engines though, due to the different compression heights required.

The area of greatest potential trouble in the assembly of these engines lies in the variety of valvetrain parts used in the cylinder heads. Depending upon the origins of your heads, you may find either an adjustable or a nonadjustable valvetrain, along with any combination of single and multi-groove valve stem locks. If not originally equipped, the adjustability feature can be added to your heads by machining the rocker pedestal pads and installing studs and guide plates. The single and multi-groove stem valves are interchangeable, as long as you use the matching locks and retainers. Normally you would use the VSR7O15R retainer with multi-groove locks, and the VSR7O17R retainer with the single groove type.

When building a high performance Cleveland engine the cylinder head design dictates the rest of the package. The four barrel heads work best at a high RPM level. The rest of the parts should be chosen to match this characteristic, with emphasis placed upon improving the somewhat restrictive exhaust side flow. If using the two barrel heads, you should concentrate on low and midrange enhancement, with smaller headers and carb than would be required for the four barrel headed variation.

Four barrel intake manifolds are readily available for the "two barrel" head engines, so don't be misled by the description. This may be the better combination for regular street use.