The Shade Tree Mechanic

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Oil Consumption

Oil consumption in our vintage vehicles is not a new or unusual issue. Many have engine wear after long years of use and in some cases, they were built before technology that helps to reduce oil consumption became available. Finally, owner expectations were not as high in years past as they are today so manufacturers didn't make as great an effort to eliminate oil consumption.

Owners would have been happy with no oil consumption but were used to their vehicle using some oil. Most of us can remember full-service gas stations and the directions given to the attendant, "Fill 'er up and check the oil." And, if oil consumption were severe enough it might have been "Fill up the oil and check the gas." More than one owner of an "oil burner" collected and used waste oil as it was consumed so quickly that using new oil didn't make financial sense.

There can be several causes of oil consumption but the one that is most likely to come to mind is oil getting past the piston rings and into the combustion chamber. This can be due to worn cylinder bores or piston rings that are worn, stuck or even broken. Any of these is the usual cause of the vehicle that burns oil and belches blue smoke at most times while driving.

On newer vehicles equipped with a PCV system, oil consumption can occur when oil is pulled through the PCV system. The PCV valve is usually connected to a valve cover and if oil can't drain out of the valve cover quickly enough or PCV vacuum is too great, oil can be pulled through the PCV and into the intake where it enters the cylinders and is burned. This is not a typical cause of oil consumption but when it occurs it's typically caused by a stuck or incorrect PCV valve.

Extreme oil coking on the back side of an intake valve. This is caused by oil being pulled past the valve guide and baking to the valve.

Similar to PCV pullover, a leaking intake manifold gasket can also cause oil consumption. If the underside of the intake manifold is in contact with oil and the manifold gasket doesn't effectively seal the manifold to the head, oil can be pulled through this gap and burned.

One other common cause of oil consumption is oil being pulled past the intake valve guides. This is usually the cause when the vehicle smokes after a long decel or after driving down a long hill. When the carburetor throttle plates are closed intake manifold is high. This high vacuum level surrounds the intake valve head and stem and can pull oil past the valve guide. After the long decel, when the throttle is opened, oil that slipped past the intake valve guide is pulled into the combustion chamber and burned. This is what makes the puff or worst case cloud of

Flathead two-piece valve guide design. Oil can be pulled through the split line between the guide halves, around the O.D. of the guide and between the valve stem and guide.

One-piece valve guide design introduced in about 1949.

blue smoke.

Oil pulled past the intake valve stem is usually caused by wear in the valve guides. This wear creates a little extra clearance between the valve stem and the guide allowing the oil to more easily pass through. This oil will then collect on the backside of the intake valves and bake to the valve, this is known as coking. If the baked-on oil is thick enough it can also cause cold hard starting and cold stalling. This occurs because the baked-on oil acts like a sponge absorbing the fuel passing by the intake valve on its way to the combustion chamber. Once this carbon "sponge" is saturated with fuel, the engine will start easier and run much

The large O-ring shown was also added to the one-piece guide to prevent oil from being pulled around the O.D. of the guide. A valve stem seal is shown to the left.

better.

Older engines may also experience oil pulling past the intake valve guide due to design, for example the Ford flathead engines. The guides in these engines are a slip fit into a bore in the block and before about 1949 were a two-piece, split design with no outside diameter (O.D.) seal. This design provided the oil with three paths to enter the engine, through the small clearance around the O.D. of the guide, through the split line between the guide halves and past the valve stem through the small clearance to the guide.

Starting in about 1949 the guides became a solid design eliminating the split line and an O-ring seal was added to the O.D. of the guide to better seal the guide to the block. This new design helped to reduce or eliminate two of the three paths of oil entry found in the

One-piece guide shown with the valve stem seal installed to the left and the O-ring seal installed around the guide O.D.

previous design.

The final oil entry path has been reduced or eliminated in most newer engines through the addition of a valve stem oil seal. This seal acts like an umbrella to effectively seal the valve stem to the guide and stop oil from passing between the valve stem and the guide. Valve stem seals of this type were never added to the Ford flathead in production but I did come across one shop that is offering these for a flathead.

I had been running a one-piece valve guide and when the engine was recently disassembled, I was surprised to find some oil coking on the backside of the intake valves. Based on monitoring the dipstick this engine did not consume oil in its normal 2,000-mile oil change period but the coking showed that it used a small amount.

In order to use this valve stem seal, the O.D. of the smaller end of the valve guide must be reduced in diameter. The seal then pushes over the guide and the valve stem passes through the seal. This final piece of updated technology should help to bring this old-tech engine closer to the modern age, at least from an oil consumption perspective. We'll see you down the hopefully slightly less smoky road.

A small amount of oil coking on the backside of an intake valve.