

A Cracked Engine Block

By Tom Endy, Westminster, California



My Victoria in Hawaii sporting one of the three engines in the stable.

One of the three engines I periodically swap out in my Victoria because I have nothing better to do developed a water leak...into the oil pan. The worst part, it is the smoothest running engine in the stable. The leak would cause the oil to look like a vanilla milk shake in short order. After going through the drill of replacing the head gasket and looking for a crack in the block in all the usual places, and changing the oil several times, I pulled the engine from the car and installed a stable mate.

A closer inspection of the engine after it was disassembled revealed a suspect rust spot in the valve port of the exhaust valve of the number two cylinder. There appeared to be a hairline crack in the port just under the valve seat. It was impossible to see it with the valve installed. Not too bad, this could probably be repaired.

However, to be on the safe side, I ordered an engine block testing kit from Snyder's. The kit has a half-inch steel plate that bolts to the top of the head. The plate has a 1/8" rubber gasket glued to the

bottom surface. When bolted to the head with the bolts supplied, it covers up the water jacket ports and leaves the cylinders and valve seat areas exposed. A smaller steel plate also supplied bolts to the water inlet port on the side of the block. It also has a 1/8" rubber gasket glued to it and has an inlet port for shop air. An air pressure regulator is also supplied with the kit.

The scheme is to pressurize the block water passages with 40-50 pounds of shop air and then using a paintbrush and soapy water go looking for bubbles. The first place I soaped was the suspect rust spot and sure enough there was a crack. This would have allowed water to run down the valve guide into the valve chamber and on into the pan. While I was at it, I soaped the whole block. Much to my surprise, I found bubbles coming out of a crack between the cylinder and the valve seat and another in the valve chamber. There were so many cracks around the number two cylinder exhaust valve that I do not think this block is repairable.



The first visible sign of a crack. This is the exhaust valve seat for the number two cylinder. Note the line of rust at the top of the port where the suspect crack is, and the puddle of rust where it is suspected water congregated before it leaked down the valve guide into the valve chamber. Both rust areas were not visible with the valve installed.



The rusted tip of the valve guide from the exhaust port of the number two cylinder.



The Snyder engine block leak testing kit is shown with the rubber gasket side up on both the head plate and the water inlet plate. The kit does not include the air connection fitting. Since there are a variety of fittings, they must be purchased locally to match the shop air system to be used. It is an inexpensive item.



The Snyder kit is shown attached to the engine block under test. There is an excellent YouTube video demonstrating this kit on the Internet. Go to: "John Karal Engine block leak detection".



Shop air is applied and adjusted with the regulator to a nominal 40-50 pounds. The brass fitting screwed into the regulator was purchased to match up with my shop air system.



The first area soaped was at the suspect exhaust port of the number two cylinder. Sure enough, there was a crack leak there. Note bubbles forming just under the valve seat. There were also bubbles coming out of an almost invisible crack between the valve seat and the cylinder.



A bigger surprise were the large bubbles coming out of the valve chamber in the area of the number two cylinder and exhaust valve seat. This pretty well renders this block as scrap, and it was the smoothest running engine in the stable.