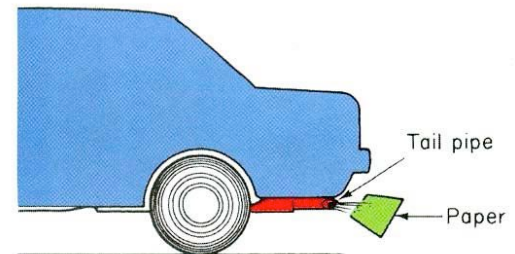


Paper Test

Meets NATEF Task: (A8-A-3) Diagnose engine mechanical concerns; determine necessary action. (P-1)

Name _____ Date _____ Time on Task _____
 Make/Model/Year _____ VIN _____ Evaluation: 4 3 2 1

- _____ 1. The engine should be at normal operating temperature (the upper radiator hose hot and pressurized).
- _____ 2. Start the engine and allow it to idle. A sound running engine should produce even and steady exhaust at the tailpipe.
- _____ 3. Hold a piece of paper (even a dollar bill works) or a 3" x 5" card within 1 inch (25 mm) of the tailpipe with the engine running at idle. The paper should blow out evenly without "puffing".



- a. If the paper is drawn toward the tailpipe at times, the valves in one or more cylinders could be burned. Other possible problems if the paper is sucked toward the tailpipe include:
 - 1. The engine could be misfiring due to a lean condition that could occur normally when the engine is cold.
 - 2. Pulsing of the paper toward the tailpipe could also be caused by a hole in the exhaust system. If exhaust escapes through a hole in the exhaust system, air could be drawn from the tailpipe to the hole in the exhaust between the exhaust "puffs," causing the paper to be drawn toward the tailpipe.
- b. If the paper is unevenly pulsing outward, an engine misfire is a possibility. The usual cause of this is an ignition or an engine mechanical problem such as a worn camshaft or broken rocker arm.

_____ 4. Based on the test results, what is the necessary action? _____
