Tools & Equipment

Let your senses lead you through troubleshooting engine problems

By Dale Gabrielse

Editor's note: This article was supplied by Subaru Robin, a manufacturer of small, industrial engines.

Imagine a lush stretch of turf being mowed on a beautiful summer morning. The sun accents the perfectly straight lines left by the mower, and the clippings yield the distinct, sweet fragrance of freshly cut grass. But gradually, its scent is interrupted by the smell of gasoline coming from the engine. As this intensifies, the mower slows, sounding as if it could stall. Perhaps this will not be such a beautiful day after all.

The first step in this scenario is turning the machine off, but then what? Even if you're not an expert mechanic, just follow your senses and listen to what the engine is saying. It might not be your language, but by deciphering simple clues you can efficiently troubleshoot many problems.

Hearing

Hearing is the first sense that can be used in detecting engine problems. Just as a doctor listens for a steady heartbeat, an operator can use his sense of hearing to detect engine hiccups. When an engine isn't running properly, it may create a popping sound or backfire. These noises shouldn't be ignored and generally indicate that the fuel-air mixture is too lean for the engine, meaning the fuel portion is low.

The fuel-air mixture is managed by either a carburetor or fuel injection system. While modern automobiles use fuel injection, many small engines found in outdoor power equipment still use carburetors. To help a carburetor run efficiently, its inside components can be cleaned with carburetor cleaner, but if this doesn't fix the problem, it may need to be replaced.

On the other hand, fuel injection systems are more reliable and efficient. They use several sensors to determine and deliver the proper fuel-air mixture into the combustion chamber. A clogged fuel pump may cause some problems with fuel injected engines, but in the case of a more complex issue, an authorized engine dealer is probably your best option for providing service.

Next, if the engine produces a knocking noise, it likely contains a worn connecting rod, which connects one of the pistons to the crankshaft. This may be caused by dirty oil in the system, which is one of the many reasons for changing oil regularly, and failure to fix this problem could result in significant damage. Tinny or metallic sounds often indicate a less serious symptom and usually result from loose components, which can be easily fixed by tightening.

On engines with electric starters, a "click" sound when turning the key could indicate a number of problems. The first step in troubleshooting this issue is to trace the battery cables, ensuring that all connections are secure and the terminals are clean. If there is a problem, the terminals can be cleaned with a wire brush, and the cables can be tightened. If all connections are fine, the problem may be in the battery. A voltage tester can be used to check the battery, and if it tests low, it should be hooked up to a charger.

Seeing

If the problem can't be heard, a closer look may be all that's needed to detect a problem. For example, smoke is an obvious sign that something is wrong; however, many don't know that the color of smoke may reveal the issue. Blue smoke, for one, indicates that the engine is burning oil, an occurrence that tends to be more common on cold days. This should dissipate as the piston rings become warmer and expand, but if not, the breather hose or piston rings may need to be repaired or replaced.

Black smoke typically indicates that the air-fuel mixture is too rich, meaning the engine is not receiving enough air to burn the fuel efficiently. Oil residue collecting on the exhaust outlet of the muffler provides another visual hint of a rich mixture. To correct this, the carburetor may need to be cleaned or replaced. A change in elevation also may cause black smoke in carbureted engines, in which case modification is needed. Manufacturers offer elevation kits, which are best installed by an authorized engine dealer.

A loosely hanging recoil rope signals another potential problem. If the rope does not completely return after pulling, the lubricant on the internal drive parts may have washed off. This can be fixed by removing the recoil drive assembly and applying additional lubrication. If the dangling rope goes ignored, it can result in a broken rope or eventual damage to the recoil starter.

Next, the fuel strainer at the top of the tank should be inspected for dirt. Soap and water will easily clean the strainer, but if any dirt enters the fuel tank, it will need to be removed. To do so, one must shut off the fuel line valve, drain the fuel, and use a suction device to remove the sediment. If the contamination is severe, the gas tank can be removed and shaken upside down. The sediment bowl next to the carburetor will be

the end-of-the-line for most dirt, and it can be taken off and wiped with a clean rag to remove sediment. Higher-end engines will have additional filters to prevent dirt from traveling farther through the engine, but they may clog and require changing.

By simply standing back and observing, fluid leaks can also be detected. These are much easier to find if the engine is kept clean and dry. If one is found, the leaking components must be tightened or replaced immediately. Failing to fix the issue is not only wasteful and inefficient, but also potentially dangerous.

Feeling

Unless a person hopes to seriously burn himself, the next sense of touch requires the engine to be cool, and for added safety the spark plugs should be disconnected. Then, the engine can be felt for fluid leaks. This process can pinpoint hidden spots that were missed in the visual inspection. By feeling the engine, loose components can also be detected and subsequently tightened or replaced.

Other problems, such as power loss, can be pinpointed by the feel of a machine during operation. For example, an engine may seem to lug for no apparent reason. This power loss may be the result of a saturated air filter, which should be checked often, or dirty spark plugs, which can be cleaned by a wire brush or spark plug cleaner. In more serious instances, the engine may be experiencing compression loss, which may be caused by poor seals from the piston rings, valves or gaskets.

Smelling

If a person doesn't find any clues with the previous senses, the answer might be right under his nose. For example, if a burning smell is present, the engine oil may be leaking and burning. The scent can be traced to the source of the leak to determine if a part needs to be tightened or replaced. Then, the oil level must be checked and replenished to adequate levels if a significant amount was lost.

While oil has a distinct odor, it shouldn't be noticeable when operating an engine. If it is, the engine is likely burning oil. As mentioned earlier, the culprit for this may be a clogged breather hose or worn piston rings.

Another bad sign is the smell of gasoline coming from the oil reservoir. This often happens when an engine floods, and gasoline dilutes the oil, producing the gassy smell. Before operating again, the gas and oil should be replaced, and the spark plugs should be cleaned. Gasoline should also be drained and refilled if the fuel tank possesses a varnish scent, suggesting that the fuel has turned stale.

Finally, getting a whiff of gasoline while operating a machine may be the smell of trouble, as a strong gas odor coming from the exhaust sometimes indicates an engine problem. If this happens, the operator should ensure the choke is not stuck in the closed position and check the engine exhaust for leaks or loose parts.

Tasting

Fortunately, it's not recommended to use the final sense of taste to diagnose problems. In fact, it's strongly discouraged! Instead, follow your other four senses to determine when the engine on any of your equipment is out of tune. By understanding the issue, you can save quite a bit of time and quickly get back to doing what you know best—maintaining a picturesque sports field. ■

Dale Gabrielse is a Subaru training manager.