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 first step in this scenario is 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

**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.
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.
Tools & Equipment

Line Painter 1200 and Xtreme Paint
For straight lines or perfect circles and arcs, no machine makes it easier than the Toro Line Painter 1200. An ergonomic gearshift and handle offers more control than any competitor designs, while the front pivoting caster wheel moves effortlessly in any direction then self locks in place. Clean up is easier. The Express Clean System has an on board water tank to clean lines and nozzles with the flip of a switch. Toro Xtreme Paint is the ultimate field marking paint for all natural turf sports fields, lines and logo.

www.Toro.com

Conco acrylic field marking paint
Conco’s quick-drying formula is available in bright white, with optical brighteners that maximize line visibility, as well as your team’s colors. This cost-effective, concentrated formula can be reduced up to 200% with water. So whether your fields are natural grass or artificial turf, you can count on Conco Paints to score points with athletes, officials and fans alike. Conco paints are available exclusively at Menards, your one-stop shop for all your turf maintenance needs and more.

www.concopaints.com

Streamliner dryline marker
The Streamliner is simply the best dryline marker in the business. With its variable flow control, Field Testing has proven the Streamliner is the best for the quality of the chalk line, all the while using less chalk than its competition. A heavy-duty steel frame, pneumatic tires, rugged molded plastic hopper, flexible brush agitator, accurate string-line guides, and a one-button retractable handle for easy storage set the Streamliner apart. Available in 2-, 3-, and 4-wheel models with optional Double-Play aerosol paint attachment. Streamliner models now available at a reduced “rollback price”!

www.beaconathletics.com

World Class stencils, paints
World Class Field Stencils are designed to provide high quality field graphics at an economical price. With just one phone call you will find your custom graphics package with custom matched paints to your exact specifications. Our stencils are perfect for lettering, team logos and corporate sponsor logos to take your event to the next level. Call now for your free Virtual Field Look.

Do wish that you could paint your fields less often? Is your current field paint causing harm to your grass? Are you looking for a way to save your field painting budget while maintaining high quality and value? World Class Premium Paint is the answer. Call now and let us help you find the solutions to your field painting challenges. (800) 748 9649

www.worldclasspaints.com

Ingredients matter
The finest fields, turf or grass, are the product of great ingredients. Choosing the right products and equipment that make the work smooth and effective makes all the difference. At Pioneer we know how much ingredients matter. We see to it that each and every stencil, striper, paint, groomer, tool and accessory we offer delivers the performance you need to be on top of your game. Every drop of paint, every stripping tip, every engineering and formulation choice are all focused on providing you with key ingredients for a field of excellence.

www.pioneerathletics.com

Newstripe’s athletic field marking machine
Newstripe has introduced the NewRider 3000 with upgrades to all the great features of the NewRider series to line your fields even easier and faster. The NewRider 3000 features a 55-gallon tank, foot pedal and hand lever for forward/reverse, continuous paint re-circulation, a 13 hp Honda engine, hydrostatic transmission, seat-based operator controls, front dual spray head, hand wand and water bottle holder. Options include side spray head and removable sun shade.

www.newstripe.com

Turf paint, accessories
GameTime Athletics is your premier resource for turf paint! From aerosol to bulk paint, we have your turf covered. Our Aerosol Paint comes in white or 10 other colors, and our Bulk Field Marketing Paint is great for creating a professional look on all types of fields. We offer all the equipment and accessories you need to create a perfect field for football, baseball, soccer, lacrosse, and field hockey. Save money by ordering online.

www.GTathletics.net
**Tools & Equipment**

**Painting fields made easy**

The Line-Up Hash-Mark Painting System: helps ground crews paint football field hash marks accurately and efficiently. Line-Up's individual hash mark and inbound line pans minimize paint overspray. Its built-in centering and offsets ensure the system produces consistent hash marks. Inbound lines and hash marks for an entire field are often painted in less than 90 minutes. Line-Up folds in half easily and weighs 48 pounds. Alumanumber: provides 4' by 6' Pro or Stadium style font, 1/8-inch thick aluminum number templates. Alumanumber's useful handholds and built-in offsets ensure quick alignments. [www.dssworks.com](http://www.dssworks.com)

**Bulk liquid paint and aerosol chalk**

Temporary field marking solutions without special cleaning agents for removal are available. A time and labor saving solution for short duration events. Tru Mark Athletic Field Marker introduced Bulk Liquid Chalk in 5-gallon pails for application on both synthetic turf and natural grass applications. Also offered is aerosol chalk in 20-ounce cans with 18 ounces of material. Using foot or brush abrasion along with water removes all effects of field marking chalk. [www.AthleticFieldMarker.com](http://www.AthleticFieldMarker.com)

**Krylon striping paints**

Krylon Products Group offers a complete “line-up” of striping paints. Line-Up Striping Paints are water-based, fast drying formulas specifically designed for striping athletic fields. With excellent coverage for bright, vivid lines and a safe alternative to lime, this VOC nationally compliant program is available in many popular team colors. Our aerosol products are greenhouse gas free; which does not contribute to global warming and our bulk products are available as concentrates or ready-to-use and can be custom tinted. [www.KPG-Industrial.com](http://www.KPG-Industrial.com)

**Temporary paint remover machine**

This machine is excellent for removal of Whitlam’s Temp-Stripe Athletic Field paint from new synthetic turf surfaces. Operator friendly, saves time, money and labor costs. Used at both indoor and outdoor venues. It cleans virtually any surface. It is a quick, efficient, multipurpose machine with two 12-inch counter rotating cylindrical brushes that allows the portable scrubber to clean both sides of the synthetic grass fiber and glide back and forth in forward or reverse with little effort. Also works great for cleaning those old dingy, dirty white lines or letters on your field. [www.whitlampaint.com](http://www.whitlampaint.com)

**Trac-Cut rolling spray shield**

Athletic Field Design offers Trac-Cut rolling spray shield that features razor-sharp cut lines. The disc shield makes contact with work surfaces and cuts as it rolls and the reusable discs last long. Attaches to most airless spray tips without tools. See informational pdf file at [www.athleticfield.com](http://www.athleticfield.com).
**Turfmarkers manufactured by Jaydee**

Jaydee pioneered water mix, latex-based, line painting for turf in 1961. Since 2001, we have focused more than ever on the idea of “user friendly.” Easy to set up, quick to use and clean up, combined with sturdy construction and long life means we can help stretch field maintenance budgets as far as possible. We have always prided ourselves on fast parts service after point of sale. Since introducing our new Turfmarker Models 15 and 30, we have noticed a drastic reduction in parts calls. Our products are designed with the operator in mind.

[www.turfmarker.com](http://www.turfmarker.com)

---

**Speeflo PowrLiner**

Professional and non-professional athletic field, turf, and pavement users prefer to use line stripers that can be used to stripe turf, grass, and pavement as well as within the budget of municipalities, townships, recreational commissions, athletics organizations, schools, cities, and line striping companies. These machines can withstand rigorous regular use on turf, grass, and pavement and are light enough for easy transportation; easy to operate and maneuver; easy to clean and maintain. Speeflo PowrLiners are built for precise and consistent line striping without the fuzzy and uneven lines that result from conventional air spray systems.

[www.paintsprayersLV.com](http://www.paintsprayersLV.com)

---

**Kromer’s painting system**

Kromer offers the best, simplest, and quickest way to mark your fields with a complete line of riding units that are available with our exclusive Ultra Pressure 300 psi painting system. A high pressure painting system providing crisp, precise lines with no over spray and uses 50% less paint! Our riding units are fully self-propelled can apply dry lines, wet lines, grooms, paints, conditions, sprays and will cut and paint a line at the same time. Available in natural turf or synthetic turf models and can be configured to meet your needs.

[www.kromerco.com](http://www.kromerco.com)

---

**Sports turf paint from sports turf manager**

The sports turf paint developed by a pro sports turf specialist now available for groundskeepers everywhere. Spin Martin, formerly head man for the Indianapolis Colts, used this paint he helped develop for 17 years before “going public.” Spin feared that the formula would be modified in order to cut costs. He declined the major paint company’s proposal and has recently decided to devote himself to the cause of making this turf paint available to groundskeepers.

[www.HDSportsPaint.com](http://www.HDSportsPaint.com)

---

**Infill removal machine**

Redexim Charterhouse’s The Eliminator removes the infill material from synthetic turf playing surfaces by using a soft rotating brush to lift the material to a conveyor belt system, which must be driven alongside the machine for collection and disposal. The Eliminator is the perfect machine for small repairs, recycling and quick removal of all synthetic turf systems.

[www.redexim.com](http://www.redexim.com)

---

**Take the Challenge**

**Premium Field Marking Paint**

FROM THIS...

...YOU CAN GET THESE.

[www.worldclasspaints.com • 1-800-748-9649](http://www.worldclasspaints.com • 1-800-748-9649)
Polytan CoolPlus System

The latest development from Polytan LigaTurf offers an alternative to reduce the temperatures of synthetic turf systems. Polytan CoolPlus synthetic turf system uses new grass fiber technology and a thermoplastic infill to create a major reduction in temperatures when compared to conventional synthetic turf systems. The system combines the infrared light reflection LigaTurf CoolPlus filament with a Polytan BionPro Infill, which has the same IR reflecting properties and makes the system even more effective. Testing shows that under conditions where the temperature of conventional systems would range between 115-140 degrees F, the Polytan LigaTurf CoolPlus system can achieve a reduction of more than 20%.

The infill BionPro plays an important role in the complete system, as in 3rd generation systems the infill is by far the component with the highest bulk weight and therefore absorbs a considerable amount of heat.

www.polytan-usa.com

Enviroonmentally friendly infill

A soccer field infilled with InfillPro Geo is similar to the highest quality natural grass fields and it guarantees the possibility to use the field intensively, even under bad weather conditions. InfillPro Geo by Limonta Sport, Italy remains the only solution for infilling synthetic turf with materials that are 100% environmentally-friendly and atoxic. InfillPro Geo is produced with carefully selected, specially-treated organic and blended fibers. Advantages include better shock absorption, no unpleasant odors, cleaner appearance, constant degree of humidity, non-toxicity, and a shape that provides better stability vs. sliding spherical granules.

www.geosafeplay.com

New anti-bacterial sprayer

Gravely Turf introduces the new SaniTurf anti-bacterial sprayer. With an 80-gallon, low-profile poly tank, the SaniTurf distributes athletic hygiene products, disinfectants, sanitizers, fungicides, virucides and mildewstats. A boomless nozzle assembly sprays a 30-foot swath at 40 psi, and it avoids potential boom snags with a conventional boom. Powered by a 3.4 hp Briggs & Stratton engine, the SaniTurf also features a six-roller pump which provides a maximum 31.8 gpm and up to 100 psi.

www.ariens.com

Environmentally friendly infill

A soccer field infilled with InfillPro Geo is similar to the highest quality natural grass fields and it guarantees the possibility to use the field intensively, even under bad weather conditions. InfillPro Geo by Limonta Sport, Italy remains the only solution for infilling synthetic turf with materials that are 100% environmentally-friendly and atoxic. InfillPro Geo is produced with carefully selected, specially-treated organic and blended fibers. Advantages include better shock absorption, no unpleasant odors, cleaner appearance, constant degree of humidity, non-toxicity, and a shape that provides better stability vs. sliding spherical granules.

www.geosafeplay.com

New anti-bacterial sprayer

Gravely Turf introduces the new SaniTurf anti-bacterial sprayer. With an 80-gallon, low-profile poly tank, the SaniTurf distributes athletic hygiene products, disinfectants, sanitizers, fungicides, virucides and mildewstats. A boomless nozzle assembly sprays a 30-foot swath at 40 psi, and it avoids potential boom snags with a conventional boom. Powered by a 3.4 hp Briggs & Stratton engine, the SaniTurf also features a six-roller pump which provides a maximum 31.8 gpm and up to 100 psi.

www.ariens.com

Install, repair synthetic turf

The Turf Monster has revolutionized synthetic field installation. Generic cart style machines have been available for years but Turf Sewing Machines has taken the basic cart style machine and added their patented rear puller system, which essentially provides the pulling power of two machines in one. As a result, this translates into less downtime, minimal part replacement, and significantly less labor. Now the operator pulls the trigger and the machine will pull itself. Also available are shears, threads, parts, cutters, and same day repair service.

www.TurfSewingMachines.com

Tools & Equipment