

In nearly everyone's life, one of the most dangerous things you do is drive a car. While getting in a crash can be deadly, having your car suddenly stall or skid can also leave you in harms way. The steering wheel can suddenly lose its connection to the wheel, leaving you helpless to steer; the wiring can short out and turn the dashboard into an inferno belching toxic smoke; the heater core can burst open cascading your legs with scalding coolant; or a fuel leak can cause the car to explode!

While these things are unlikely to happen, we believe there needs to be a complete listing of the trouble danger signs. They may come in many forms; sounds, smells, leaks, puddles, and dash warning lights. Just like a doctor recognizes the danger symptoms of heart failure you as a driver should learn to recognize and diagnose these warning signs. Pay attention to what your vehicle is telling you so that you avoid winding up in a potentially perilous predicament.

The following tell-tale signs of impending mechanical failure should not be ignored. It is the job of the motor vehicle operator to know the danger signs, the sounds, the smells, and visual clues. If you experience one of the symptoms we've described, it's your duty to do something about it for the continued safe operation of your vehicle.

If you're aware of any of the danger symptoms below, find someone who can repair the vehicle as soon as possible. One of these danger signs may already be happening to your vehicle, only you haven't recognized it. If you experience any of the danger symptoms repair the vehicle as soon as possible. The tell-tale signs should NOT be ignored. To be forewarned is to be forearmed!

The Motorwatch Technical Committee has compiled a complete list of the various vehicular impending trouble danger signs. We would like to educate all vehicle drivers to help recognize and diagnose these warning signs so that you can avoid a potentially perilous predicament.

*Important: When you see the warning word **Caution!** it means the driver should beware of an impending failure that is too hazardous to ignore. If a fire hazard exists and you must drive, be sure to carry a fire extinguisher. If an electrical short hazard exists, carry a fire extinguisher rated for A,B,C fires, as well as having the tools and ability to disconnect the battery. For brevity we'll use the term "car," however the term applies to all motor vehicles.*

#### DETECTING LEAKS

The puddle under your car can mean a lot of trouble if the puddle isn't water. You can tell a great deal by checking out the color of the puddle. While plain water puddles can be ignored, oily puddles are a major concern and a cause for immediate action.

The puddle location tells a lot about the source. Wet carpets in the front foot well area indicate a leaking heater. Puddles in the grille area are usually related to a leaking radiator, hoses, or couplings. Oily puddles further back are almost always caused by the drivetrain. Oily puddles in the back of a RWD car are likely to come from a leaking rear axle.

#### DETECTING LEAKS

If you suspect your car is leaking fluid on the ground, but can't tell what it is because you park over dirt or gravel use a piece of cardboard to help pinpoint the source. Cut a large cardboard box and slide it under the car over night and check it the next morning. **Caution!** Cardboard touching hot exhaust parts can catch fire.

**Clear or light red**→usually indicates a power steering (P/S) fluid leak. It's important to try and pinpoint the exact nature and location of the puddle in order to determine the cause. Lack of P/S fluid can lead to loss of steering assist, making turning the steering wheel extremely difficult. Leaking brake fluid can lead to a loss of brakes. Rub some of the liquid between your fingers to see if it is oily, brake fluid, or just plain water. Water is a normal outflow from the car's air conditioner and comes out of the evaporator located in the middle of the dashboard area. **Caution!** These leaks can cause a fire.

**Dirty, dark, or black**→usually indicates a motor oil leak. Keep track of oil consumption—more than a quart every 1,000 miles is a concern. If the engine runs low on oil, it can suddenly seize up and cause expensive engine damage. A tip off of an oil leak is when the engine smokes after you shut it off. A dirty brown puddle could be leaking dirty coolant, but will not be oily. **Caution!** These leaks can cause a fire.

**Green, yellow, or orange**→puddles may be a coolant leak, an indication the engine could soon run hot. Overheating can cause expensive engine damage. Fluids used in late model engines and transmissions could have yellow, red, or black tint and could be synthetic. If the leak is from the front engine area, the water pump or its hoses are suspect. Cars with red-colored coolant can be confused with transmission or power steering fluid. Coolant is water soluble, transmission or power steering fluid isn't. Rub some of the liquid between your fingers and add water to see if it dissolves. **Caution!** Leaking coolant smells good to pets that might drink it and be poisoned.

**Oily**→clear, thick spots on the usually indicates the manual transmission or differential is leaking gear lube. It has a strong oil refinery odor. **Caution!** These gear oil leaks can cause a fire.

**Oily**→spots seen around wheel openings or wheel wells inside of tires could indicate failing axle seals, leaking CV boots, leaking brake calipers, or wheel cylinders.

**Oily shiny** coating, seen on the inside of the tire, could be gear lube leaking on the tire. This might cause the car to spin out of control in the rain. **Caution!** These leaks may cause the car to lose traction and spin out of control in the rain, or unwanted ABS application.

**Oily streaks** seen on a wheel, or inside or outside of a tire indicate an overheated wheel bearing. **Caution!** The bearing could fail at anytime, and possibly cause the axle to break.

**Red puddles** are likely to be automatic transmission or power steering fluid which could cause a transmission or steering system breakdown. See if the leak is in the area of the transmission or from the grille area, especially the hoses from the transmission to the radiator. Fix the leak before it ruins the transmission and suddenly leaves you stranded.

**Caution!** These leaks can cause a fire.

**Wet carpet** especially on the passenger side floor well when it's not been raining could indicate a leaking heater core which would be accompanied by a loss of coolant which will cause engine overheating.

**Wet wheel**→seen as puddles next to or under one of the tires is caused by dogs urinating on the wheel. Urine can cause damage to alloy wheels or the car's paint. (See "Urine" smell p.9)

## DETECTING SMELLS

Pay attention to the air you're breathing and let your nose serve as a detective to alert you of the odors coming from your car. Make a note of where its coming from and when you smell it. Does it smell when you first start up, after driving a while, at night, or when it's raining or damp out?

*Here are some trouble smells to be on the watch for:*

**Acrid sweet chemical**→after the car is operated for a while indicates coolant leaking out of the engine and onto hot engine or exhaust parts. If the coolant is being consumed by the engine, the smell may come out the tailpipe. (See "white smoke" p.9)

**Burned bakelite**→coming from *inside* the car may be caused by the HVAC blower motor resistor assembly overheating and its failure may stop the blower. Try operating the blower on high in order to bypass the resistor and stop the smell.

**Burned bakelite**→coming from *outside* the car (like a singed handle on a cook pot, also described as a hot dry/dusty smell) could indicate binding or frozen brake component causing dragging brakes. Burned odor from the rear wheels usually means the parking brake isn't releasing properly. On a manual transmission, this smell could indicate a slipping clutch.

**Burning leaves** smell may come from leaves in the HVAC blower motor. **Caution!** This can cause a fire.

**Burning plastic**→coming *from the door* could be a stuck electric window switch causing the electric window motor to heat up. Tap on the switch to try and free it up or remove the fuse. **Caution!** This can cause an electrical fire.

**Burning rubber or plastic**→coming from *outside* the car especially after driving awhile, is likely an electrical overload or short circuit. The smell is coming from the rubber wire insulation burning caused by an electrical overload, short circuit, or chafed wire. For likely sources of the smell the under dash or under hood electric panels look for 1) a hose touching a hot engine part 2) a seized pulley is making a fan belt burn 3) an over-heated tire is causing a dragging brake 4) a flat tire. Use your nose to help pinpoint. **Caution!** This can lead to a rubber or an electrical fire.

**Burning rubber or plastic**→noticed especially after driving awhile and coming from *inside* the car, especially from the dash area, is likely an electrical overload or a short circuit burning the rubber wire insulation. The fuse box and attendant wiring is a likely source of the smell, so examine all of the fuses and look for signs of overheating. **Caution!** This can lead to an electrical fire

**Exhaust**→smell inside means exhaust is leaking into the passenger compartment, possibly from a leaking trunk or tailgate seal. Exhaust gases contain dangerous carbon monoxide. **Caution!** Do not drive with the windows closed, carbon monoxide kills without warning!

**Gasoline**→from outside the car but only on warm days is usually caused by a faulty evaporative emission carbon canister. Failure of the evaporative emission system causes air pollution. Gas smell from the rear of the car is likely to come from a cracked filler neck hose, leaking gas cap, or leaking gas tank. Gas smell from the underhood area is likely to be caused by a leaking fuel hose. **Caution!** Gas odors could cause a fire.

**Hot engine**→coming from the engine compartment means that oil is leaking onto the hot engine. Note: This can also be described as an "oil refinery smell," or an "exhaust smell." (see "white smoke")

**Hot metal**→coming from under the car accompanied by hot floorboards could be an overheating catalytic converter. **Caution!** The undercoating or carpets may catch fire. (see "black smoke")

**Hot oil/grease**→when the brakes are being applied means grease or oil is leaking on the brakes. **Caution!** This condition can cause loss of braking ability, unwarranted ABS application, or the car spinning out of control in the rain.

**Locker room**→coming from inside the car is caused by mold spores growing on the HVAC heater or evaporator. The spores may cause allergy reactions and should be killed using a disinfectant designed for this purpose.

**Plastic or sweet chemical**→coming from inside the car—especially after driving for awhile—usually indicates coolant leaking from the heater. This smell might also be described as the smell of an "old refrigerator." This problem is accompanied by oily film deposits on the inside windows, especially the windshield. (See "green puddles")

**Rotten eggs, burning sulfur**→that persists after warm-up could be caused by the engine running rich which could lead to early engine or catalytic converter failure. This smell on startup is normal, and is caused by the catalytic converter being too cold to properly burn off the rich mixture coming out of the engine. If this smell persists after warm-up (or continues to happen at other odd times) the cause must be identified which might be poor quality gasoline, a leaking fuel injector, or failed catalytic converter.

**Sulfuric acid**→especially from the area of the battery indicates an overcharging battery. **Caution!** The battery could explode.

**Urine**→is most likely coming from where cats have sprayed their urine into the ventilation duct in front of the windshield. Coming from the wheels is caused by dog urinate finding its way into the brakes. (See “wet wheel” p.8)

#### DETECTING SMOKE

Smoke almost always means big trouble. Here are trouble smokes to be on watch for:

**Black or gray smoke**→indicates the air/fuel mixture is too rich and will be accompanied by a drop in gas mileage.

Unchecked, this can lead to accelerated engine wear or a melted catalytic converter. At nighttime the converter will glow red hot. (see “hot metal smell”)

**Blue smoke**→means the engine is burning oil. This is usually an indication of a worn out engine, although there are other less expensive mechanical failures which can be the cause (e.g. a leaking seal, gasket, or transmission vacuum modulator).

**White smoke**→Coming out the tailpipe could indicate a leaking engine headgasket and possibly lead to engine failure.

**White smoke**→Coming out from under the hood, it indicates coolant is leaking onto hot exhaust parts and could cause an underhood fire. (See “acidic smell” p.8)

**White smoke**→Coming from the wheel well accompanied by strong brake odor indicates dragging brakes; this could lead to loss of brakes. (See “burned bakelite” p.8)

#### NOISES

Does your car make a clunk when hitting a bump? Do you hear a squeak once a week? Finding the cause of annoying noises can be a real chore. Narrow down your search by familiarizing yourself with some of the common causes. Noises can be classified as 1) engine RPM sensitive 2) vehicle speed sensitive or 3) tire related causes.

**1. Engine speed sensitive noises** that change along with engine RPM. Listen for these trouble sounds in a quiet area, having an assistant rev the engine while you use your ears to track down the source.

**Chirps squeaks, clicks and rattles** — that usually occur when starting up or when an accessory is in use are likely to be caused by loose, glazed, or slipping fan belts. Notice if it happens when turning the wheel, when the A/C is turned on, or when the alternator is called into action after you turn on the lights or other accessories.

**Exhaust noise** — typically more pronounced when cold and quiets down when hot. This is especially common in exhaust manifold leaks. The cast iron manifold 'expands' as it gets hot, partially sealing off the leak. Exhaust noises that comes and goes is likely to be caused when the engine rocks back and forth. The exhaust pipe gasket will leak exhaust when the engine stresses the pipe. (See “exhaust smell”)

**Gurgling** — coming from the front console area signals low coolant levels, and if accompanied by no heat can lead to engine overheating, blown headgasket, or a bursting heater core.

*Caution! A bursting heater core can send scalding hot coolant onto the driver's or passengers legs.*

**Rattles or knocks** — when the engine RPM changes are likely to be caused by a loose serpentine or timing belt.

**Snapping, rapping, knocking** — intermittently coming from under the hood are likely to be caused by misaligned pulleys or broken brackets for the alternator, A/C compressor, or power steering pump.

**Squeals or chirps** — occur when starting up the engine or turning the steering wheel are more likely caused by a loose or glazed drive belt.

**Ticking or tapping** — If the sound is loudest right after starting the engine is most likely caused by valve lifters. If this type of noise occurs when coming to a stop after high speed driving, low engine oil pressure could be the cause.

*Caution! This can lead to engine failure.*

**2. Vehicle speed sensitive noises** or those noises that only occur when moving forward or in reverse. Pay attention to what is happening when the noise occurs, e.g. how fast you're going, turning, slowing, etc.

**Chirping or squealing** — repetitive noises that increase with speed are likely to be caused by worn U-Joints (RWD vehicles).

**Clunk** — from the engine compartment when starting or stopping can be caused by a broken engine mount or engine strap, which makes the noise occur only when moving forward or reverse.

**Clunk or bang** — that comes from the rear end and heard when going over bumps is likely to be a broken exhaust hanger.

**Clunk or clang** — one-time noise from under the vehicle when accelerating is likely to be caused by worn U-Joints (rear wheel drive vehicles).

**Clunk, bang, pop** — when turning or going over bumps could be caused by a loose ball joint or worn suspension or steering part. Noise that comes from the front end and is louder on one side of the car is likely to be a worn strut or shock absorber or worn upper strut mount.

*Caution! A loose ball joint can ultimately cause a loss of proper suspension operation or steering.*

**Clunking popping** — during turns or braking could indicate loose or worn suspension components. If the popping or binding is occurring on turns and the vehicle is All Wheel Drive or 4 Wheel Drive, the all wheel drive unit may have failed.

*Caution! Rapid tire wear or a loss of traction may occur of the car is driven.*

**Constant grinding** — which changes intensity during turns or braking usually indicates a failing wheel bearing.

**Knocking, clunking, or clicking** — repetitive noises similar to the sound made by shaking a bag of marbles and which get louder when turning are likely to be caused by worn CV-Joints (FWD vehicles).

**Whine or hum** — changes from low to high pitch in proportion to automatic transmission gear shifts usually means internal transmission problems or low fluid.

**3. Tire noises** usually manifest as thumps or vibration also felt in the steering wheel. It may help to drive alongside a concrete wall to help pinpoint the side of the car with the bad tire.

**Imbalanced tires** — show up at speeds above 50 mph. Check for missing wheel weights.

**Lateral tire runout** — is more noticeable at higher speeds. Check for a bent rim.

**Radial force variation** — causes a thumping noise at all speeds also felt in the steering wheel. A tire probably has slipped

internal belts and is about to fail.

**Radial tire runout** — is most noticeable at low speeds. Check tire for egg-shape.

#### OTHER DANGER SIGNS

There are other conditions which are of important concern but don't fall in any of the above categories:

**Antilock Brake System** operates during normal braking conditions usually means a problem with the ABS wheel sensors or a failing wheel bearing.

**Blinking check engine** light flashing one time per second is warning the driver that immediate attention is required to remedy a potentially catalyst-damaging misfire condition.

**Brake fluid level** in the fluid reservoir drops quickly signaling a soon-to-fail brake system.

**Headlights flicker** or go out for a moment usually means the headlight switch is failing or there's a loose ground.

**Loose/stiff steering wheel** with excessive steering play or hard-to-turn stiffness can indicate a loose or failing steering component (e.g. ball joint, tie rod end, wheel bearing). Stiff steering or hard to turn steering wheel may signal a loss of power steering assist.

*Caution!* A steering wheel that is rapidly becoming loose or stiff could signal imminent loss of steering.

**Mushy/hard to press** brake pedal or a pedal that goes to the floor indicates a failing brake system. Stiff brakes or a hard to press brake pedal usually means failure of power brake assist or the ABS pump (Chrysler).

**Sagging** on one side of the car is usually caused by a broken suspension spring. *Caution!* The broken spring may puncture a tire causing a sudden blowout.

**Steering wheel pull or mushiness** that comes on quickly is likely to be caused by a tire going flat.

**Steering wheel uncentered** or steering wheel that fails to return to the center position usually indicated alignment problems which will cause accelerated tire wear.

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