BASIC AUTO INFO

Called a Mechanic…

SMARTER EVERYDAY!

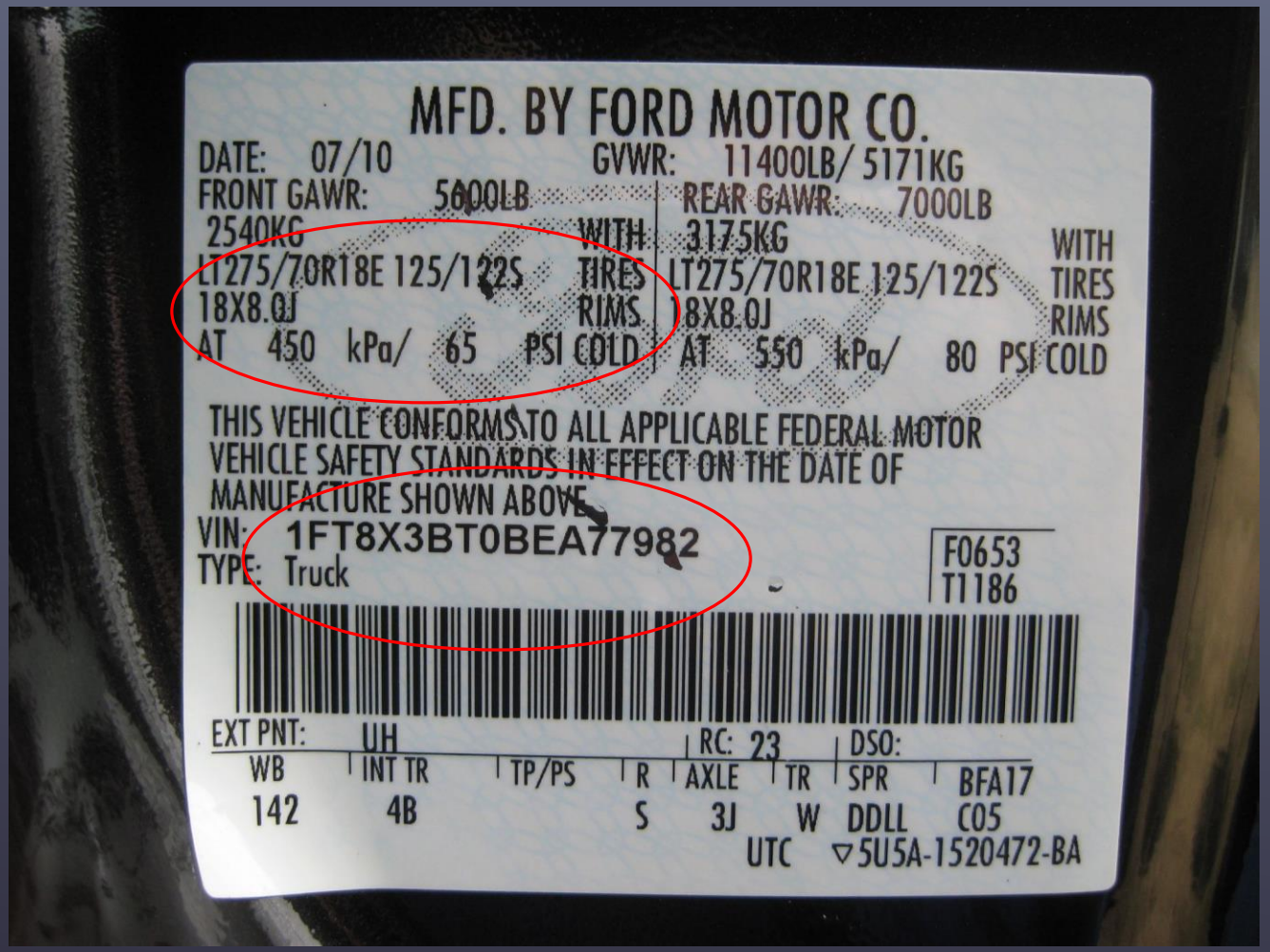
BETTER TO KNOW A LITTLE IN A BAD SITUATION THAN NOTHING AND BE AT THE MERCY OF OTHERS

WHAT SHOULD I KNOW ABOUT OWNING A CAR

- **Vehicle Identification Number (VIN) –** Why and what does it mean
- **Electrical**: Fuses, battery, starter, alternator, spark plugs, OBD codes / Idiot lights
- **Troubleshooting** - https://repairpal.com/symptoms
- https://repairpal.com/warning-lights-chart
- **Tires** – what do the numbers mean, PSI, wear signals, how to change
- **Brakes/shocks/struts** – sounds and what looks good
- **Fuel system** – Octane, filter, cap, pump
- **Fluids -** (oil, trans, brake, antifreeze (orange/green), steering) how to change oil and filter
- **Exhaust / Emission test –** O2 sensors/mufflers/pipe color of smoke
- **Buying checklist** - What to consider when buying a used car

- Where is VIN and why important - decoder
http://researchmaniacs.com/VIN/VIN-Decoder.html

Located: Door jam (sticker also shows paint and tire pressure), driver's window, and registration

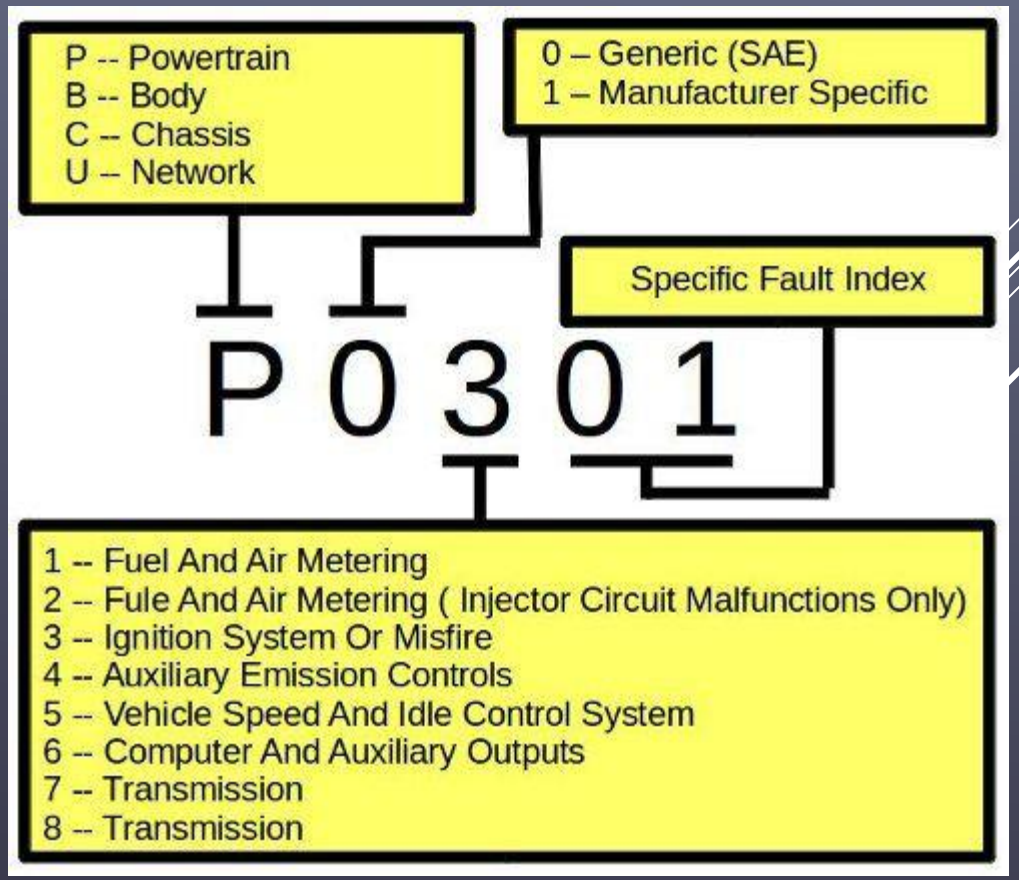


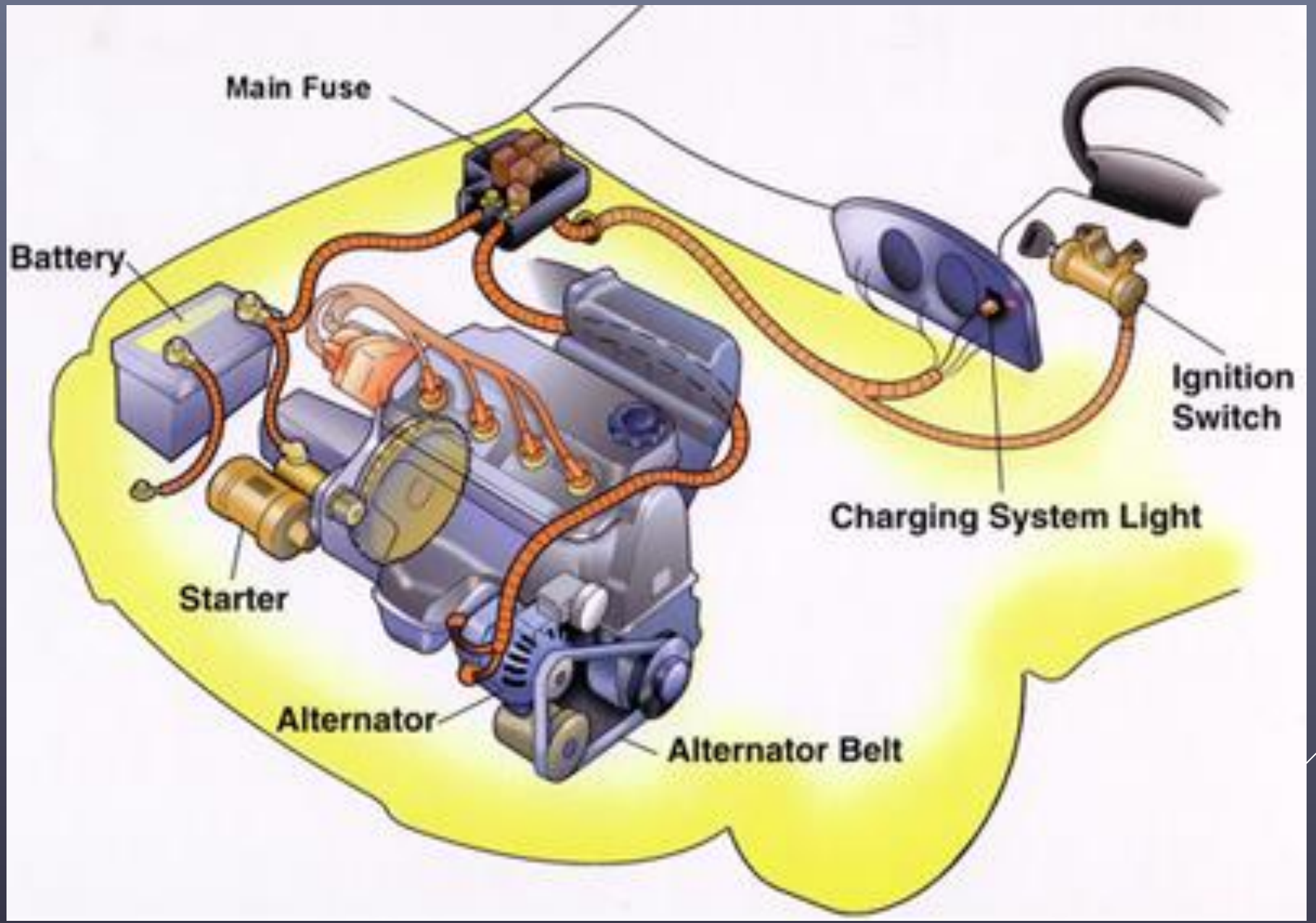
O'Reilly PROFESSIONAL PARTS PEOPLE

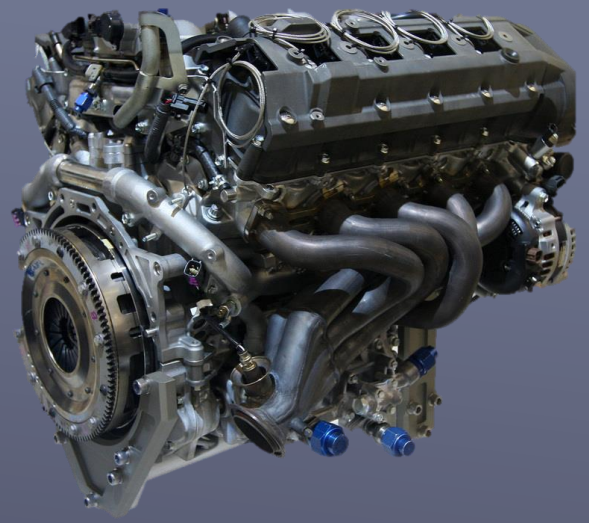
Part stores will check for free

https://www.obd-codes.com/trouble_codes/

P0457 Evaporative Emission System Leak Detected




Main Fuse
Battery
Ignition Switch
Charging System Light
Starter
Alternator
Alternator Belt



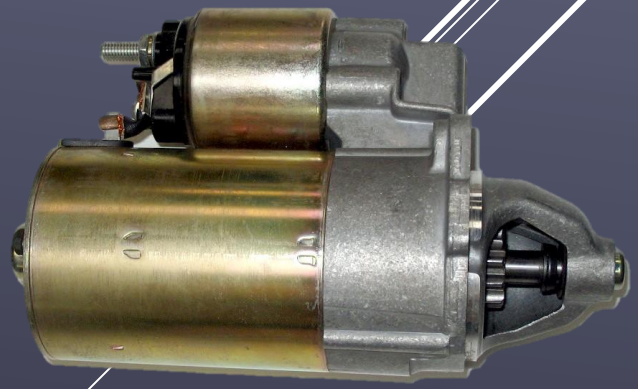
Hide a key on vehicle

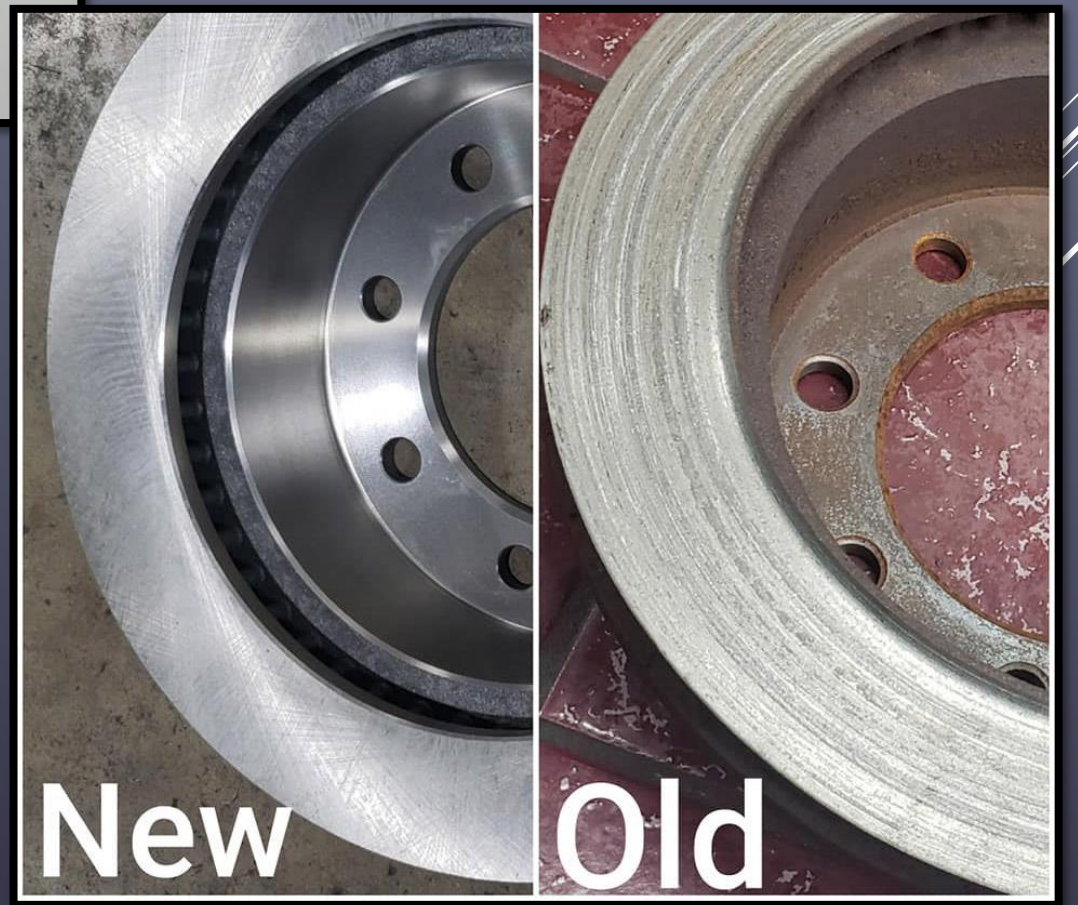
Battery: water/acid levels, swelling, how to jump start, loose connections

Fuses, starter, spark plugs, wires, coil packs, OBD, idiot lights

- What to do if car won't start…electrical: noises means starter, battery, or alternator

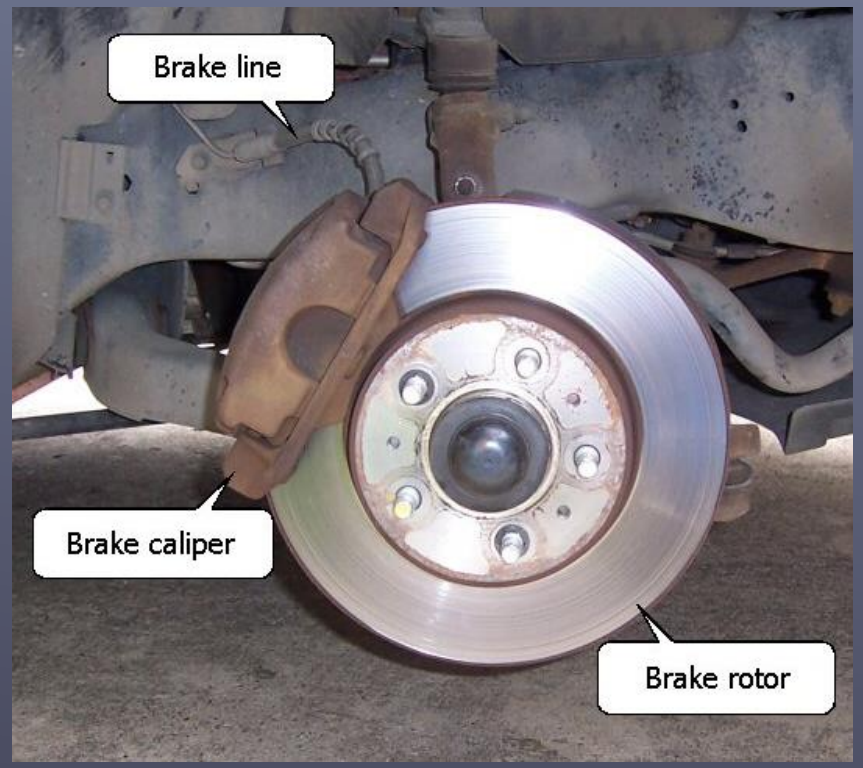
ELECTRICAL

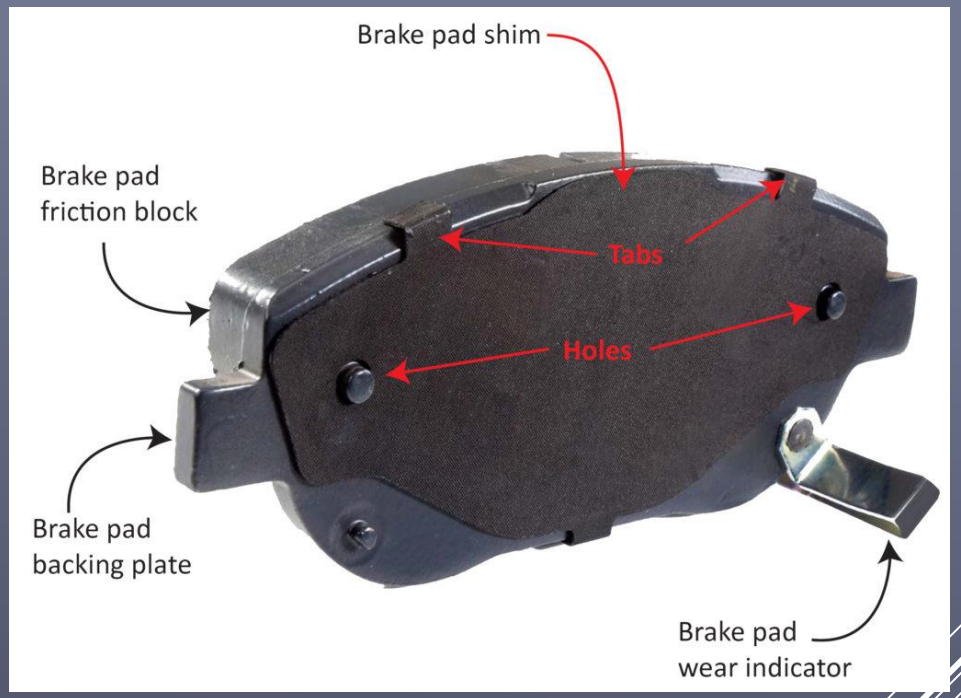


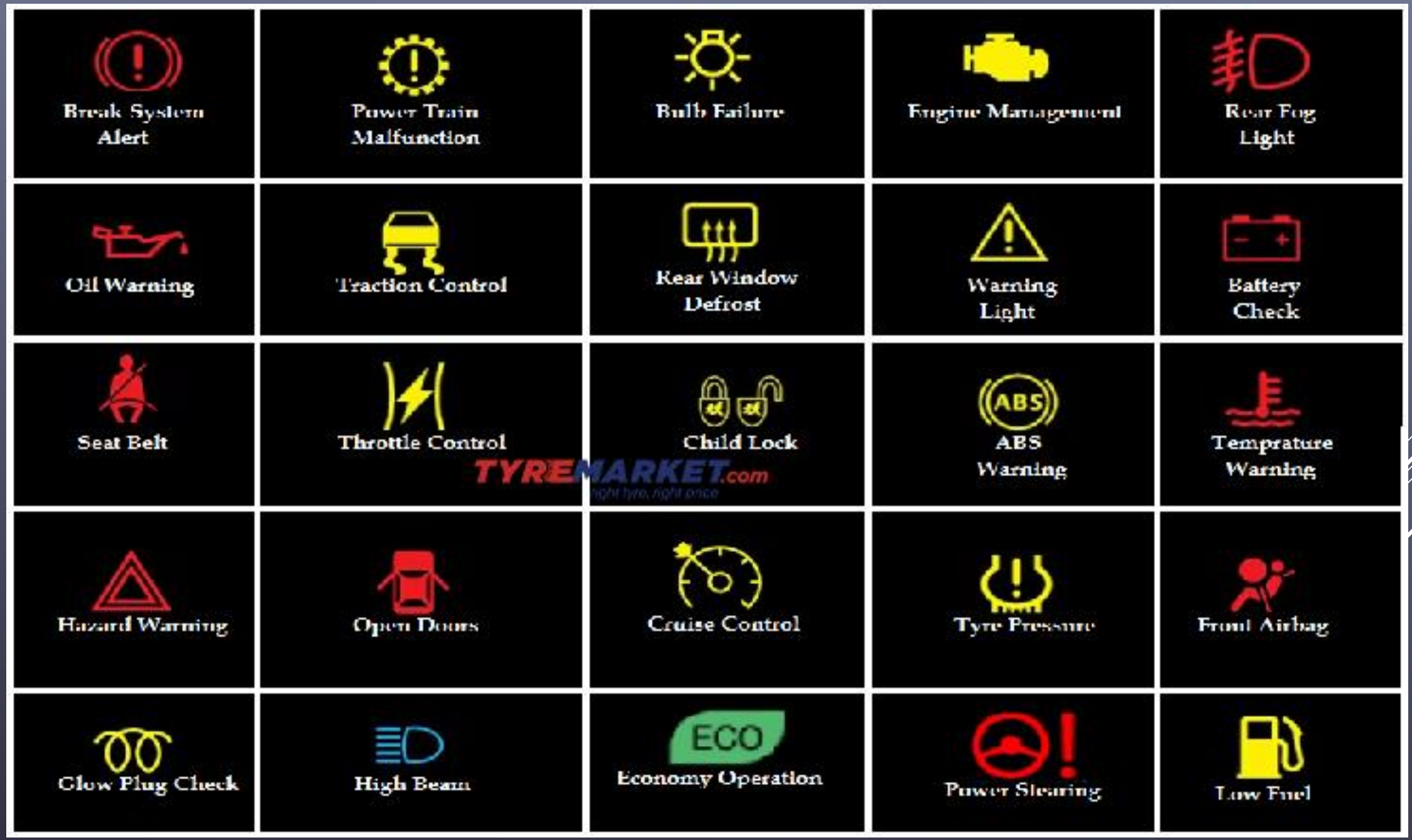


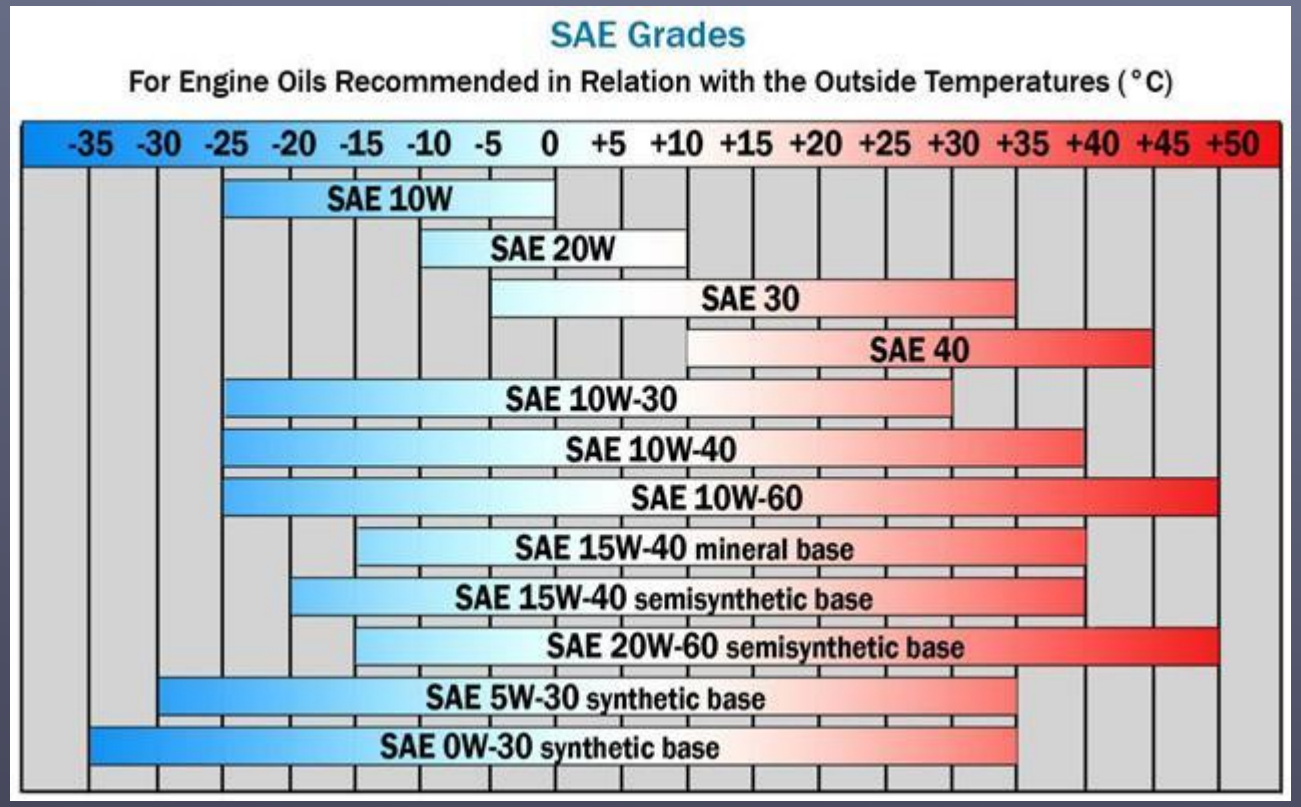
BRAKE SQUEALER

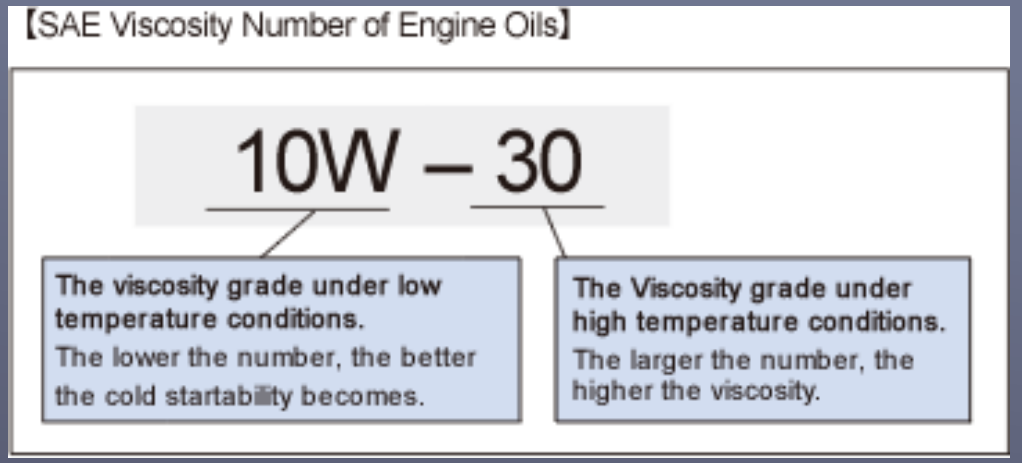
Also known as a brake wear indicator, this metal tab squeaks against your rotors when your brake pads have become worn—indicating that you're due for a replacement.


Brake line
Brake caliper
Brake rotor


Brake pad shim
Brake pad friction block
Tabs
Holes
Brake pad backing plate
Brake pad wear indicator


Break System Alert
Power Train Malfunction
Bulb Failure
Engine Management
Rear Fog Light
Oil Warning
Traction Control
Rear Window Defrost
Warning Light
Battery Check
Seat Belt
Throttle Control
Child Lock
ABS
ABS Warning
Temprature Warning
TYREMARKET.com
Hazard Warning
Open Doors
Cruise Control
Tyre Pressure
Front Airbag
Glow Plug Check
High Beam
ECO
Economy Operation
Power Steering
Low Fuel





Standard oil vs. Synthetic oils

Best engine oil overall

Mobil 1 Extended Performance motor oil

Best engine oil overall runner-up

Castrol GTX Magnatec motor oil

Best synthetic engine oil

Pennzoil Ultra Platinum full synthetic motor oil

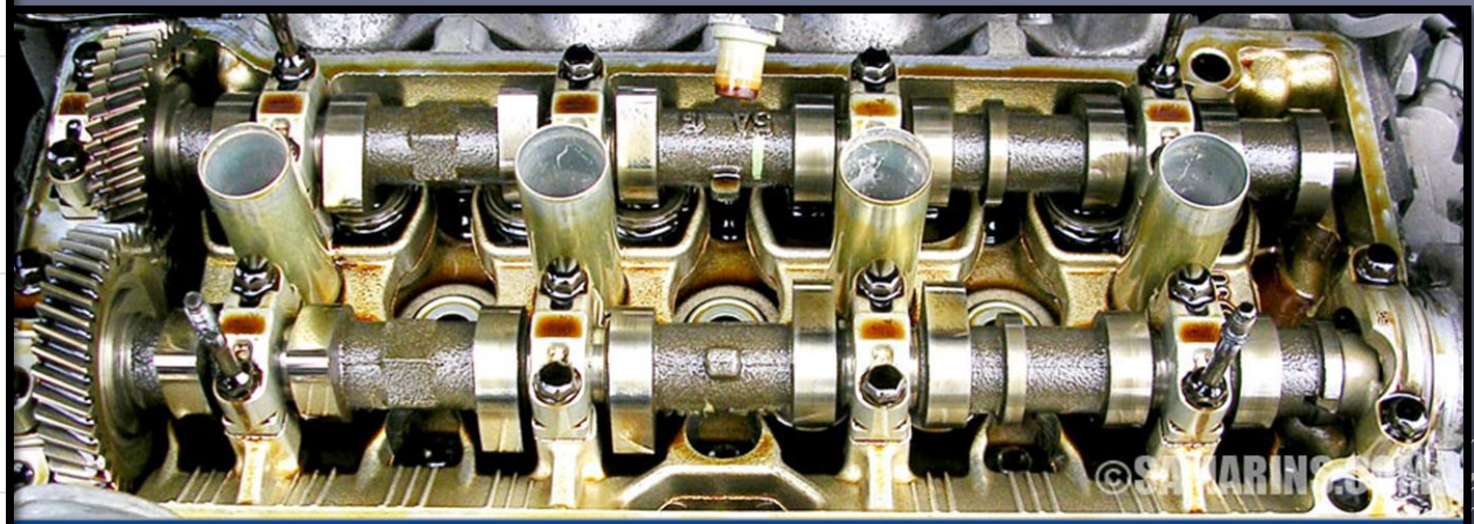
Best synthetic engine oil runner-up

Amsoil Signature Series synthetic motor oil

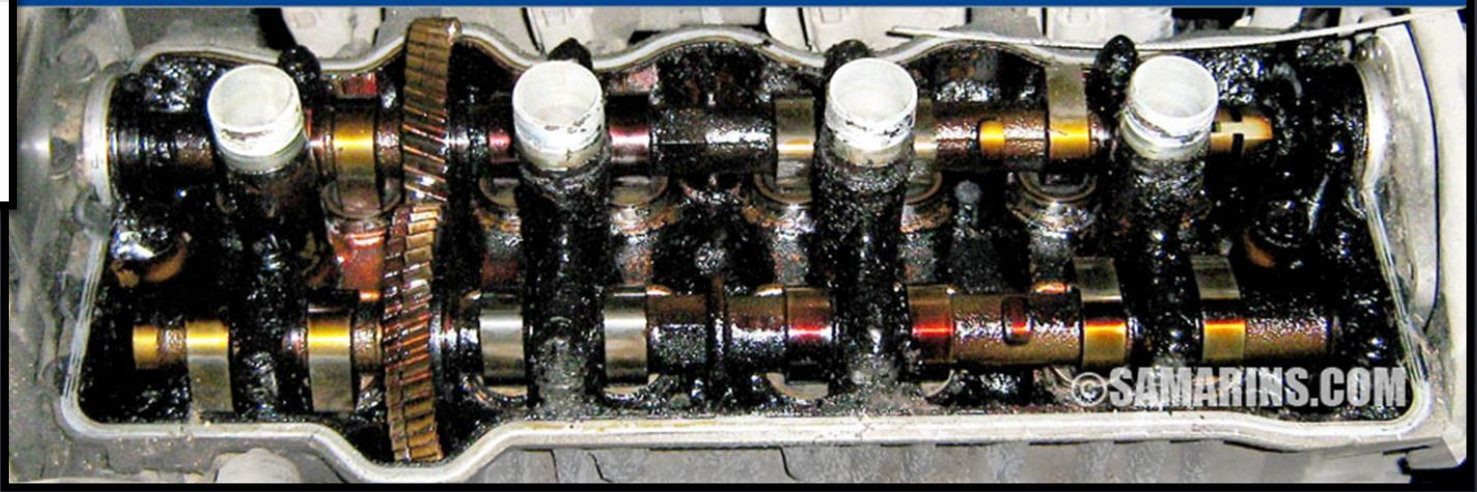
Best cheap synthetic engine oil

Valvoline Advanced full synthetic motor oil

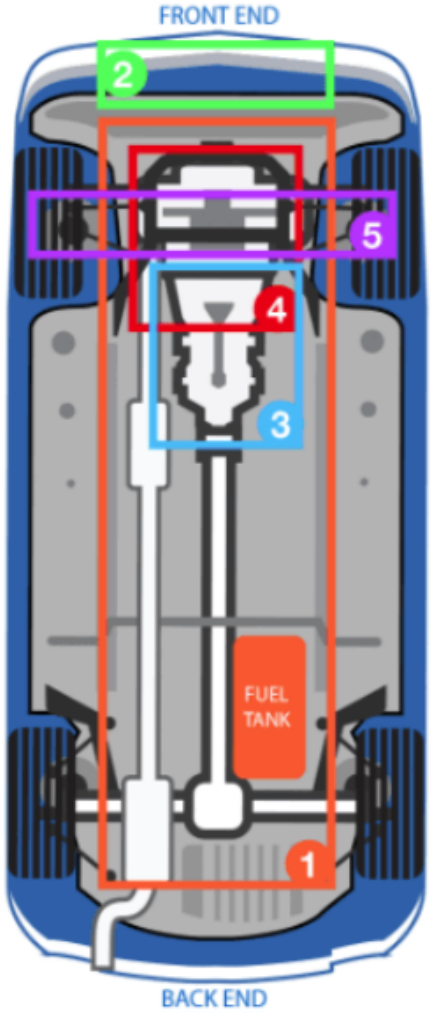
Dollar General



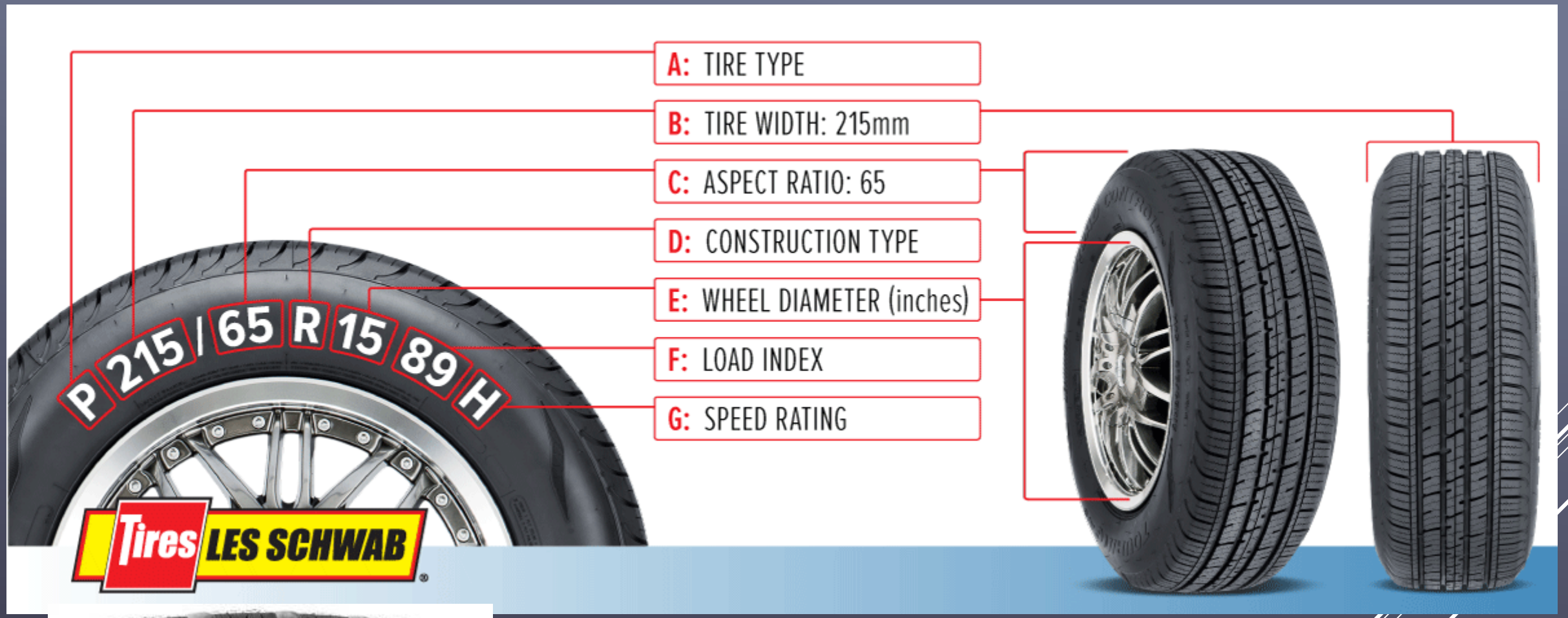
Can you spot a well-maintained engine?



IDENTIFY THE LEAK



FLUID	Fuel	Brake Fluid	Coolant	Transmission	Engine Oil	Power Steering	Windshield Wiper
LOCATION	1 Most likely under the fuel tank	1	2	3	4	5	4
COLOR	Clear (Additives can change the color)	Clear or Yellow to Brown	Green or Yellow (Some less common ones are pink & orange)	Pink or Red to Brown	Brown to Black	Pink or Red to Brown	Blue or Green (Some less common ones are pink & orange)
FEEL	Thin & watery	Oily (Slicker than engine oil)	Slimy	Oily (Thinner than engine oil)	Oily (Thick & slippery)	Oily (Thinner than engine oil)	Thin & watery
SMELL	Gasoline	Fish Oil	Sweet	Petroleum	Cooking Oil	Burnt Marshmallow	Glass Cleaner


A: TIRE TYPE
B: TIRE WIDTH: 215mm
C: ASPECT RATIO: 65
D: CONSTRUCTION TYPE
E: WHEEL DIAMETER (inches)
F: LOAD INDEX
G: SPEED RATING
P 215 / 65 R 15 89 H
Tires LES SCHWAB

Continental
225/50 R 17 98 H

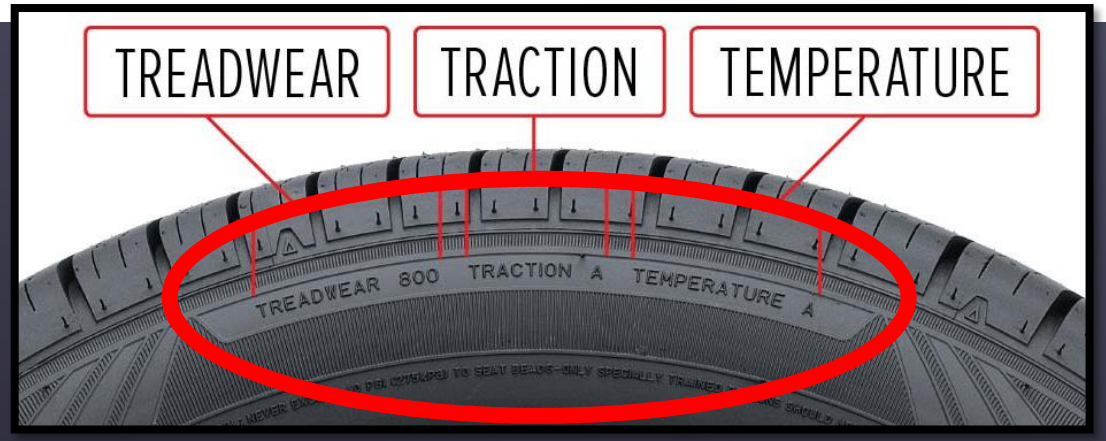
	MAXIMUM SPEED		TYPE / VEHICLE TYPE
L	75 mph	120 km/h	Off-Road & Light Truck Tires
M	81 mph	130 km/h	Temporary Spare Tire
N	87 mph	140km/h	Temporary Spare Tires
Q	99 mph	160 km/h	Winter 4x4
R	106 mph	170 km/h	Heavy Duty Light Truck
S	112 mph	180 km/h	Family Sedans & Vans
T	118 mph	190 km/h	Family Sedans & Vans
U	124 mph	200 km/h	Sedans & Coupes
H	130 mph	210 km/h	Sport Sedans & Coupes
V	149 mph	240 km/h	Sports Cars
Z	149+ mph	240+ km/h	Sports Cars
W	168 mph	270 km/h	Exotic Sports Cars
Y	186 mph	300 km/h	Exotic Sports Cars
(Y)	186+ mph	300+ km/h	Exotic Sports Cars

TRACTION RATING CHART

Traction Grades	Asphalt g-Force	Concrete g-Force
AA	Above 0.54	0.38
A	Above 0.47	0.35
B	Above 0.38	0.26
C	Less Than 0.38	0.26

TEMPERATURE RATING CHART

Temperature Grades	Speeds in mph
A	Over 115
B	Between 100 to 115
C	Between 85 to 100



Uniform Tire Quality Grading (UTQG)	Percent of Tire Models Available [a]	Approximated Design Life [b] (miles)
200 or less	15	40,000
201-300	25	50,000
301-400	32	55,000
401-500	20	60,000
501-600	6	70,000
600 or greater	2	80,000
Weighted-average		53,900

[a] from NHTSA data (Safercar.gov, 2006); [b] estimated from warrantees of available tires (Tire Rack, 2006)

Under-inflation

Correct

Over-inflation

Center Wear

Shoulder Wear

Camber Wear

High Speed Feathering

Toe Wear

Cupped Wear

Brake/Skid Flat Sopt Wear

6-Spline
Small
& Large

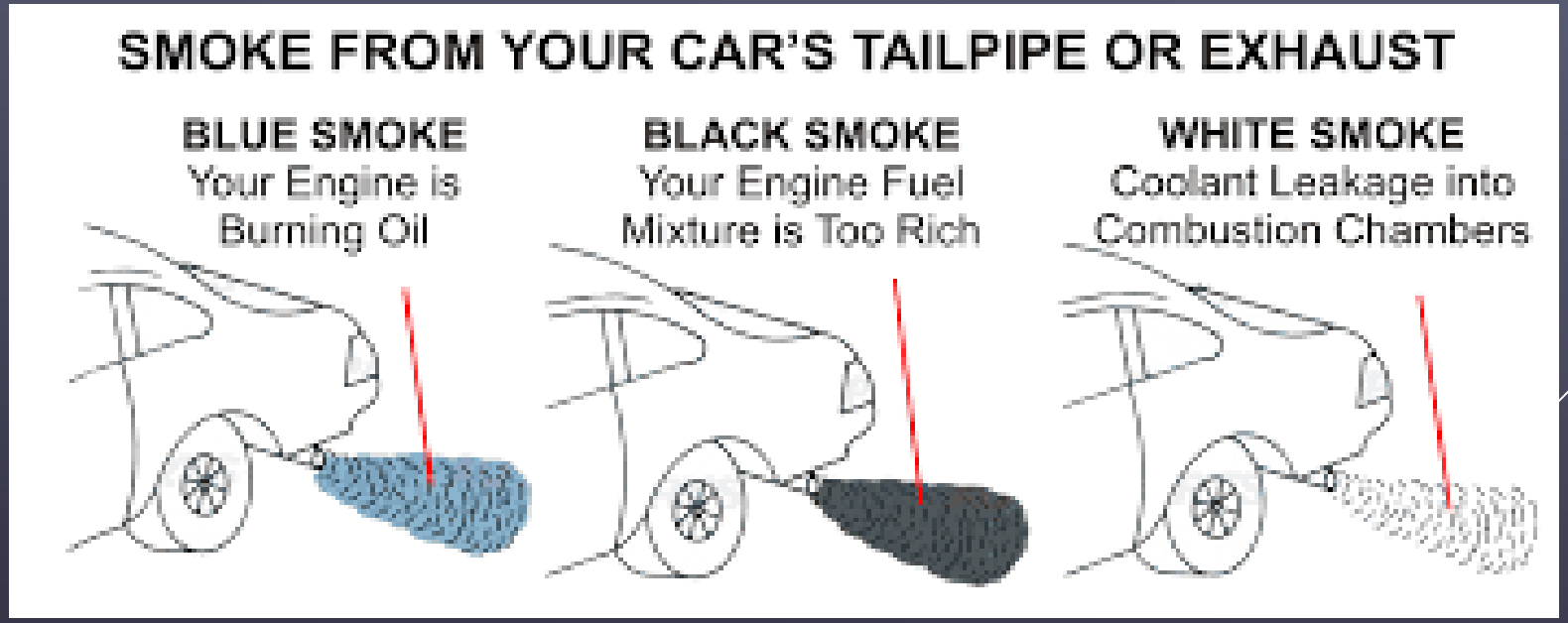
- Instability at highway speeds.
- Vehicle “tips” to one side in turns.
- The front end dives more than expected during hard braking.
- Rear-end squat during acceleration.
- Tires bouncing excessively.
- Unusual tire wear.
- Leaking fluid on the exterior of shocks or struts.

What is octane rating?

- Octane rating is the measure of a fuel's ability to resist "knocking" or "pinging" during combustion, caused by the air/fuel mixture detonating prematurely in the engine.

- In the U.S., unleaded gasoline typically has octane ratings of 87 (regular), 88–90 (midgrade), and 91–94 (premium).

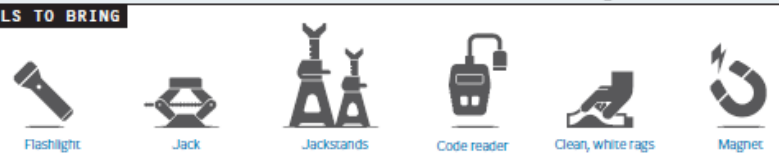
O2 Sensor
P0251-255 code



USED-CAR CHECKLIST

Popular Mechanics

TOOLS TO BRING



Flashlight | Jack | Jackstands | Code reader | Clean, white rags | Magnet

MAKE | **MILEAGE**

MODEL

VIN | **YEAR** | **ASKING PRICE**

SCAN-TOOL CODES (IF ANY)

KEY

Noted, but not serious | Cause for concern | Serious issue

DEAL BREAKER — Flee the premises.

THE BASICS

		Yes	No
1	Is the owner's manual missing?	☐	☐
2	Are there large gaps in the service history or no records at all?	☐	☐
3	Do you suspect the mileage isn't legitimate?	☐	☐
DEAL BREAKER			
4	Does the title include the word "salvage"?	☐	☐

EXTERIOR

5	Is there evidence of curb damage on the wheels?	☐	☐
6	Are the windshield wiper blades damaged?	☐	☐
7	Are any hubcaps missing, damaged or loose?	☐	☐
8	Are all the tire pressures properly set?	☐	☐
9	Is the paint faded or cracked?	☐	☐
10	Are any panels a different shade or color?	☐	☐
11	Are any of the panel gaps markedly different than the others?	☐	☐
12	Are any of the trim pieces loose or missing?	☐	☐
13	Does a magnet fail to adhere to the sheet metal? (Try several spots.)	☐	☐
14	Are any of the tires a different brand or size?	☐	☐
15	Is there evidence of accident damage that has been poorly repaired?	☐	☐
16	Are lug nuts missing?	☐	☐
17	Are there any small dark spots or oily film on the bumper near the exhaust pipe?	☐	☐
18	Are there any small rust spots?	☐	☐
DEAL BREAKER			
19	Is there rust everywhere?	☐	☐

INTERIOR

20	Are there any tears or wear marks in the seats?	☐	☐
21	Are there any cracks, blemishes or broken trim?	☐	☐
22	Are the spare tire, jack and tools damaged or missing?	☐	☐
23	Do any of the windows go down or up slower than the others? Do they make noises?	☐	☐
24	When the climate control is turned on, does the fan squeak or rattle or operate on only one speed setting?	☐	☐
25	Does the air conditioning blow warm air?	☐	☐
26	Turn on all the accessories (windshield wipers, radio, power mirrors, etc). Do any fail to operate properly?	☐	☐
27	Is the brake pedal worn more or less than the mileage on the odometer would suggest?	☐	☐
28	Is there any rust or evidence of water in the spare-tire well?	☐	☐
29	Does the sunroof operate slowly, as if it's struggling to move?	☐	☐
DEAL BREAKER			
30	Is there a stale smell, like mildew or spoiled milk?	☐	☐
31	Is there evidence of water damage in the glovebox or under the rear seat?	☐	☐

CHASSIS/UNDERBODY

32	Are any of the inner fender shields missing or broken?	☐	☐
33	Put your knee on the bumper, bounce the car three times, then stop. Does the body move up and down more than two times?	☐	☐
34	Is there uneven wear on any of the tires?	☐	☐
35	Does oil coat any of the shock absorbers?	☐	☐
36	Jack up the car and safely support it so the wheels are off the ground. Tug and push on the wheels. Is there any lateral play at the hub?	☐	☐
37	Pull on the tie rods and the suspension mounts. Do you detect any movement?	☐	☐
38	Are the brake pads and rotors worn out?	☐	☐
39	Is there rust on any of the underbody surfaces?	☐	☐
40	Check the engine bottom. Any sign of fluid leaks?	☐	☐
41	What about transmission and differential leaks?	☐	☐
42	Is there any bent or dented metal?	☐	☐
43	Are there shiny marks on the pinch welds?	☐	☐
44	Is there fluid seepage around the brake caliper or from the bottom of the brake drums?	☐	☐
45	Check the ground under the car. Are there any puddles of oil or fluid?	☐	☐
46	Look at the bottom of the radiator. Is it wet from coolant?	☐	☐

WANT A PDF OF POPULAR MECHANICS' USED-CAR CHECKLIST? *Visit popularmechanics.com/usedcarchecklist.*

https://www.dvusd.org/Page/22978

USED-CAR CHECKLIST

Popular Mechanics

ENGINE

		Yes	No
47	With the engine off, squeeze the hoses (be careful, they may be hot). Do they feel stiff or brittle?	☐	☐
48	Are there cracks in the belt(s)?	☐	☐
49	Are there any wires not covered by sheathing?	☐	☐
50	Are there any loose hose clamps?	☐	☐
51	Are there any loose and corroded battery clamps?	☐	☐
52	Is the battery more than 4 years old?	☐	☐
53	Is there any sign of fluid leaks at the accessories (power-steering pump, brake reservoir)?	☐	☐
54	Any evidence of nesting mice or other animals?	☐	☐
55	Is the air filter dirty?	☐	☐
56	Are fluid levels (power steering, brake, coolant, oil and transmission) below the minimum?	☐	☐
57	Check for oil change stickers. Is the car long overdue?	☐	☐
58	Is there seepage at the bottom of the brake reservoir?	☐	☐
59	Is there sludge in the bottom of the coolant reservoir?	☐	☐
60	If the engine has a timing belt, is it older than 4 years? If unknown, answer "yes."	☐	☐
DEAL BREAKER			
61	Put a drop of oil from the dipstick on a clean, dry rag. Does it appear gooey or black?	☐	☐
62	Are there shiny metallic particles in the oil?	☐	☐
63	Does the oil look milky or smell like gasoline?	☐	☐
64	Remove the oil filler cap. Are there thick, black deposits in the cylinder head?	☐	☐
65	Sniff the automatic transmission fluid dipstick. Does it smell burnt?	☐	☐
66	Wipe the dipstick on a clean, white rag. Are there a lot of black particles, or is the fluid dark?	☐	☐

ENGINE, ADVANCED (REQUIRES A MORE RIGOROUS INSPECTION; CLEAR WITH OWNER FIRST)

67	Check the battery for parasitic drains. Is the standby current more than 75 milliamps?	☐	☐
68	Check the voltage between the coolant and battery ground. Is it higher than 250 millivolts?	☐	☐
69	Plug in a scan tool. Are there any pending codes?	☐	☐
70	Pressure-test the cooling system. Does it leak?	☐	☐
DEAL BREAKER			
71	Do a compression test. Are any of the cylinders 25 percent lower or more than the highest?	☐	☐
72	Do a cylinder leak-down test. Do any cylinders leak more than 15 percent?	☐	☐

POWERTRAIN STARTUP

73	Are there any strange noises (belt squeak, exhaust leak)?	☐	☐
74	Turn the key to the "on" position. Do the warning lights fail to illuminate?	☐	☐
75	Start the car. Do the warning lights remain on?	☐	☐
76	Does the airbag light stay on or blink?	☐	☐
77	Does the engine fail to settle into a consistent idle within a couple of minutes?	☐	☐
78	Automatic transmission: Put the car in drive. Does it clunk into gear?	☐	☐
79	Manual transmission: Depress the clutch. Does it feel stiff or jerky?	☐	☐

ON THE ROAD

		Yes	No
80	Drive the car in tight circles in a parking lot. Does anything rub or clunk?	☐	☐
81	Brake firmly. Does the pedal feel soft and mushy?	☐	☐
82	Does the feel of the brake pedal change (e.g., soft one stop, firm the next)?	☐	☐
83	Does the car veer to one side while braking?	☐	☐
84	Drive over some bumps at normal speeds. Does the car bounce up and down after hitting a bump?	☐	☐
85	Do you hear any loud noises from the suspension, such as clunks or creaks?	☐	☐
86	Get up to highway speeds. Is there any vibration?	☐	☐
87	Is the steering wheel off-center when the car is going straight?	☐	☐
88	Do you hear excessive wind noise?	☐	☐
89	Do the interior pieces rattle over bumps?	☐	☐
90	Does the car pull to one side?	☐	☐
91	Accelerate briskly. Does the transmission jerk at the shift points?	☐	☐
92	Does the car accelerate in fits and starts?	☐	☐
93	Manual transmission: Put the car in top gear while driving at 30 mph. Floor the throttle. Do the engine revs climb quickly, as if the clutch is slipping?	☐	☐
DEAL BREAKER			
94	Do you hear any knocking noises from the engine that get faster with higher engine speed?	☐	☐
95	Does the car feel tired, as if it's worn out?	☐	☐

TEST DRIVE (WITH A FRIEND)

96	Have someone watch the headlamps and marker and brake lights as you operate them. Are any burned out?	☐	☐
97	With your friend standing behind the car, start the engine. Is there sustained visible smoke?	☐	☐
98	With your friend following, drive the car. Do the wheels wobble, or does the vehicle have an odd stance (e.g., it rides low in the rear)?	☐	☐
99	Is there smoke coming from the exhaust during acceleration?	☐	☐

POST-TEST-DRIVE INSPECTION

100	Look under the hood. Do you hear a hissing noise?	☐	☐
101	Check under the car again. Any sign of fresh fluid leaks?	☐	☐

WHAT IT MEANS

Number of "yes" answers	Conclusion
Fewer than 5	*Probably a cream puff*
5 to 10	*Relatively easy to fix*
More than 10	*Potentially a time sink, but nothing serious*
Fewer than 5	*Nothing to fret about—it's a used car*
5 to 10	*Enough DIY fix-its to last a year*
More than 10	*Just walk away*
Fewer than 3	*Make a lowball offer*
3 to 6	*Proceed with extreme caution*
More than 6	*Abandon all hope, ye who enter here*

DEAL BREAKER

One or more deal breakers: Dodge this bullet.

SMARTER EVERYDAY!

BETTER TO KNOW A LITTLE IN A BAD SITUATION THAN NOTHING AND BE AT THE MERCY OF OTHERS