



The tachometer on a Honda CR-Z shows the redline area. EDINA CARL DA

Redline: Your car's keeping an eye on it

Driving Force. Owners of most modern cars no longer have to worry about the once all-important r.p.m.

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If your car has a tachometer, it may also have a red mark around the higher numbers. It's a warning, appropriately named "redline," but thanks to new auto technologies, it's not as dangerous as it used to be.

"Redline is the maximum rotational speed at which the engine can be operated," says Hayato Mori, manager of production planning for Honda Canada.

"Nothing is indestructible. Everything has its limits." Engines contain pistons that move up and down, powered by the force of gasoline igniting. This movement turns a heavy crankshaft, similar to the way your legs work the pedals on a bicycle. The crankshaft's spinning motion eventually turns the wheels. The crankshaft's motion

Redline facts

- Because cars now have computer-controlled systems to prevent redline damage, some don't have a red warning line on the tachometer anymore.
- Just to be on the safe side, the automakers put the redline a little low, but it's still best to keep your engine speed below it.

is measured in revolutions per minute, or r.p.m. It's also called the "engine speed" and is indicated by the needle on the tachometer. The engine speed will go up or down depending on how fast you're going or what gear you're in. The crankshaft is very strong, but it does have its limits.

"If you spin (a crankshaft) fast enough, it will create a vibration," Mori says.

"If the vibration is too great, it will start to affect the structure and operation of the engine. You have a heavy piston head supported by a rod, and it will get to a point where you will damage the rod."

The damage in that worst-case scenario could possibly

mean complete engine failure. Fortunately, modern cars are equipped to prevent such a problem. If the engine speed goes to redline, the car's control system takes over, cutting back on the throttle and immediately dropping to a safe r.p.m.

That intervention is more likely with a manual transmission, where it's possible for the driver to keep the car in a lower gear while revving the engine, potentially putting it into the danger zone. Cars with automatic transmissions also have the throttle cut-off system, but are less likely to need it, since they will shift to a higher gear once the r.p.m. rises sufficiently.

Redline is more of a problem on older cars, which may not have a fail safe, and drivers have to be careful to keep the engine below the warning area.

Some drivers like to run each gear to the allowable maximum for a racy feel, "but we don't recommend it because in the long range, it won't be good for the engine," Mori says.

"Every machine has its operating parameter, and when we put those red lines on the tachometer, we do it for a reason."

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