

## Guide to The Fundamentals Of A Manual Transmission

Most of us drive vehicles with automatic transmissions. They're more convenient for daily commuting and they're more prevalent; automakers equip the majority of their fleets with them. Having said that, cars with manual transmissions are generally more fun to drive, especially on highways and roads uncongested with traffic. The magic is in the control given to the driver. In effect, the motorist chooses which gears to hit and when to hit them, allowing him or her to maximize engine performance.

Even though manual trannies are becoming rarer each year, they continue to be the main ingredient in performance vehicles. In this article, we'll take a quick tour through manual transmissions. I'll describe the basics regarding how they work, including how moving the shift knob through the gears translates into drive power to the wheels.

### Keeping Below The Redline

Your vehicle's engine has limits; it's generally referred to as the "redline." When you put pressure on the gas pedal, you'll hear the engine grow louder as the RPMs climb. The redline is the point past which your engine becomes in danger of failing - or blowing apart under the stress.

Most engines enjoy their peak performance at approximately 5,500 RPMs. The trick is to come as close as possible to that level without crossing it. That's what a manual transmission does. It lets the driver set the gear ratios that allow the engine to operate within its optimal RPM range without exceeding the redline.

### Clutch And Gears

In a manual 5-speed or 6-speed, the driver controls the gear ratios through the clutch, a component that connects the engine with the transmission. When the clutch pedal is pushed down, the connection is severed. When the clutch pedal is released, the connection is reestablished. When connected, engine powers the revolutions of the output shaft which in turn powers the layshaft. The teeth of the gears interlock so that the spinning of the gears coincide with the spinning of the engine.

### How The Shift Knob Contributes To Gear Selection

From a top-down perspective, the positions of the shift knob look similar to an "H" formation. When you move the knob into a particular position, it powers a gear selector fork. That fork powers a collar within the tranny. The collar is outfitted with dog teeth that fit into the grooves of the 1st through 5th (or 6th) gears. Depending upon the position into which you move the shift knob, the corresponding gear will be engaged.

A car's manual transmission follows a beautifully graceful design. That is not to suggest its design is simplistic. On the contrary, like a Swiss watch, the gears, dog teeth, and other components adhere to a well-honed precision. For car aficionados, that level of precision translates into irreplaceable engine performance.

### About the Author

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