Patent wars: Ford 11-speed automatic transmission

In the ever-intensifying race for fuel efficiency, Ford has patented an 11-speed automatic transmission. Whoa.

Not too long ago, anything more than a 4-speed automatic was considered a luxury item. General Motors dominated the automatic transmission market, having first introduced them in Oldsmobile models in 1939. The venerable HydraMatic, and Turbo HydraMatic transmissions that followed were considered the gold standard. So much so, in fact, that Jaguar used a Turbo 400 3-speed automatic behind its mighty V12 in the Jaguar XJS, and Bentley, even as recently as the 2000s, was using a 4L80E electronically controlled 4-speed General Motors automatic transmission in its Arnage models behind the twin-turbo 6.75 liter V8.

These days, 4-speed autos are considered outdated, and virtually gone from the marketplace as fuel efficiency becomes a bigger concern thanks to government regulation. Continuously variable transmissions (CVT) have become common, and 6 speed automatics are are the new 4-speeds. Some manufacturers have 8 (Lexus, Chrysler), and even 9 (Chrysler) gears to choose from. Ford and GM are even co-developing a 10-speed automatic unit which is supposed to see use in the 2017 Ford F-150 Raptor, and who knows what else. Of course, having more gears allows the transmission to keep the engine in its "sweet spot" for efficiency more easily in a number of different driving scenarios, thus improving overall fuel efficiency.

Now Ford has apparently patented an 11-speed automatic transmission, according to our friends at AutoGuide.com.

The patent was first applied for on October 4, 2013, and was published in April 10, 2015. The abstract reads as follows:

> A transmission gearing arrangement produces eleven forward speed ratios and one reverse speed ratio by selective engagement of three shift elements in various combinations. One embodiment includes four simple planetary gear seats, four clutches, and two brakes. Another embodiment includes two axis transfer gear pairs, three simple planetary gear sets, four clutches, and two brakes. Each of these embodiments may include a one way brake such that the first shift is non-synchronous. A third embodiment includes four simple planetary gear sets, four brakes, and two clutches.

According to the patent, which you can read in PDF form by scrolling to the bottom of this post, the new 11-speed automatic transmission from Ford will have an input, output, and first-through-fifth shaft. This snippet from the PDF shows the gear ratios for each gear and roughly how it would work by putting an X over the clutch elements (numbered across the top) that would be applied to engage each gear.

[caption id="attachment_3186" align="aligncenter" width="444"]

TABLE 2

	60	62	64	66	68	70/72	74	Ratio	Step
Rev	X			X		X		−6.19	86%
1^{st}	X		X			X		7.20	
2^{nd}	X		X		X			4.25	1.69
3^{rd}	X		X				X	2.88	1.48
4^{th}	X				X		X	1.97	1.47
5^{th}	X	X					(X)	1.63	1.21
6^{th}		X			X		X	1.30	1.25
7^{th}		X	X				X	1.00	1.30
8^{th}		X	X		X			0.86	1.16
9^{th}		X	X			X		0.77	1.12
10^{th}		X			X	X		0.67	1.15
11^{th}		X		X		X		0.58	1.16

This is unprecedented.[/caption]

According to the chart, 7th gear would be direct drive, while gears 8, 9, 10, and 11 would each be overdrive gears, resulting in lower output shaft speeds and lower engine RPM to maintain a given speed.

What do you think of Ford's new 11-speed automatic transmission? It's definitely going to help increase fuel efficiency, but our questions are as follows:

How much will it weigh?

How difficult is it going to be to service?

Time will tell, but for now, we can tell you that the 11-speed automatic transmission is coming soon. Which vehicles do you think it will be used in first?

Read and download the official patent PDF by clicking the link below:

Ford-11-speed-transmission-patent