Article No.: TC Tip_07-07
Author: Ed Lee
Total Pages: 2

Myth Busters

Part 3 in a four-part series on torque converter modifications

In parts 1 and 2 we looked at the results of chassis dyno testing conducted on torque converter modifications by Sean Boyle's students in the automatic transmission course at Southern Illinois University. The testing was done on a MD-250 Mustang chassis dyno, and the test vehicle was a stock 2000 Dodge Durango RT equipped with a 5.9L gas engine and a 46RE transmission.

Converter "A" had a stator modification that lowered the stall of the converter. The vehicle responded favorably to this modification and consistently outperformed the stock 144K factor converter that was used for the base line of the evaluations. There were also no negative trade-offs with the modifications done to converter "A." Converter "B" also had a stator modification, which raised the stall. The stock power plant of the test vehicle did not respond in a positive manner to this stator modification. The OEM converter consistently outperformed converter "B" throughout the dyno run and converter "B" had a negative trade-off with increased temperature.

The next converter to be evaluated was converter "C." Converter "C" retained the stock 144K factor stator. The only modification to converter "C" was to the internal clearance. The .080" OEM clearance between the impeller and turbine was increased to .160".

This modification is popular on performance converters to increase the stall. Since the wide-open throttle horsepower test was the only one used for evaluating purposes, no measurable increase in stall could be seen with this modification. If you look at the overlay graph of the original converter vs. converter "C" in Figure 1 and the line-by-line comparison in Figure 2, you will notice some distinct differences. The torque and horsepower values started higher with the OEM converter and continued to climb to 4400 RPM. Both converters had their peak performance at the 3800 RPM break, but the greatest difference in performance occurred at 3000 RPM.

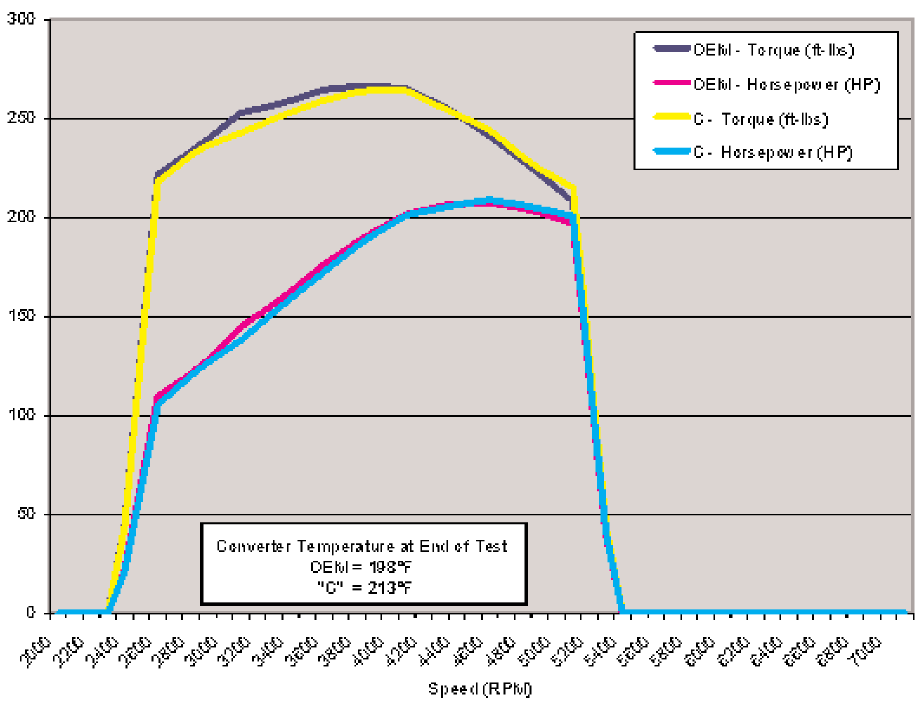

Figure 1

Automatic Drive • P. O. Box 440
Bellows Falls, VT 05101-0440 USA
800-843-2600 • 802-463-9722 • fax: 802-463-4059
email: info@sonnax.com • www.sonnax.com

continued on page 2

At 3000 RPM the OEM converter outperformed the modified converter by 6 HP and 10 ft/lbs of torque. The major difference in performance with converter "C" when compared to converters "A" and "B" is that its performance levels did not continue to parallel that of the OEM for the entire run. Converter "A" had performance levels that were consistently higher than the OEM converter, and converter "B" had performance levels that were consistently lower than the OEM converter throughout the dyno runs.

2000 Dodge Durango R/T

Modified "C"			OEM		
Speed (RPM)	Torque (Ft-Lbs)	HP (HP)	Speed (RPM)	Torque (Ft-Lbs)	HP (HP)
2000	0.00	0.00	2000	0.00	0.00
2100	85.60	36.62	2100	0.00	0.00
2200	171.19	73.24	2200	0.00	0.00
2300	216.87	95.00	2300	44.36	22.00
2400	222.64	101.89	2400	133.08	66.00
2500	228.40	108.79	2500	221.80	109.99
2600	230.85	114.57	2600	227.57	115.51
2700	233.31	120.35	2700	233.35	121.03
2800	237.03	126.74	2800	239.57	127.98
2900	242.00	133.76	2900	246.25	136.37
3000	**246.98**	**140.78**	**3000**	**252.92**	**144.77**
3100	253.16	149.35	3100	254.83	150.54
3200	259.35	157.93	3200	256.74	156.32
3300	263.21	165.30	3300	259.06	162.64
3400	264.74	171.48	3400	261.77	169.52
3500	266.27	177.66	3500	264.49	176.39
3600	265.77	182.35	3600	265.42	182.01
3700	265.26	187.04	3700	266.35	187.64
3800	264.98	191.87	3800	266.43	192.71
3900	264.95	196.86	3900	265.66	197.23
4000	264.91	201.84	4000	264.89	201.76
4100	260.61	203.35	4100	261.00	203.70
4200	256.30	204.85	4200	257.11	205.65
4300	251.56	205.79	4300	252.35	206.78
4400	246.37	206.18	4400	246.74	207.10
4500	241.19	206.56	4500	241.13	207.42
4600	234.45	205.26	4600	234.83	206.09
4700	227.72	203.96	4700	228.53	204.76
4800	221.77	202.21	4800	221.93	202.65
4900	216.61	200.00	4900	215.02	199.75
5000	211.45	197.79	5000	208.11	196.86
5100	126.87	118.67	5100	124.87	118.12
5200	42.29	39.56	5200	41.62	39.37
5300	0.00	0.00	5300	0.00	0.00

Figure 2

Converter "C" started out with performance levels lower than the OEM converter, but at 4400 RPM the performance levels reversed and converter "C"'s performance levels remained higher for the remainder of the dyno run. You can see that the horsepower and torque lines on the overlay chart cross at 4400 RPM. The line-by-line RPM comparison also backs this up. Raising the performance level to a higher RPM would be beneficial to most engines with enhanced performance.

Temperature	Converter C	OEM
Run 1)	160°	160°
2)	196°	174°
3)	203°	190°
4)	213°	198°
5)	220°	206°

Figure 3

On the negative side, converter "C" had the largest rise in temperature of any converter tested to this time (see Figure 3).

This trade off is significant and would limit this modification to 1/8 and 1/4 mile performance applications. This modification also, usually requires some form of additional cooling.

As you can see with converter "C," some of the trade offs are more significant than others. Consider the intended use of the vehicle and how a trade off may affect or limit its use. You want your customer to be happy.

Next month: Replacing the OEM stator with the 145K factor stator.

Special thanks to Sean Boyle and students Zack Emberto, Ross Rohlman and Luke Davis at Southern Illinois University for their technical assistance with this article.

Ed Lee is a Sonnax Technical Specialist who writes on issues of interest to torque converter rebuilders.

Sonnax supports the Torque Converter Rebuilders Association. Learn more about the group at www.tcraonline.com.