

# The Road to Hell is Paved With Good Intentions

*Dynamic emissions testing on chassis dynamometers can be disastrous for all-wheel-drive transfer cases*

**By Mike Weinberg**

In my distant youth, my mother often said to me, "The road to Hell is paved with good intentions." During those years it never dawned on me how true those words were, but as I aged it became clear how smart my mother really was.

Nowhere is this more self-evident than in the machinations of our various federal, state and local governments. There is no one in government who actually starts out to do evil; rather, some politician or bureaucrat seeks to legislate an answer to a social problem. The idea, on the face of it, will always be well intentioned and have some logic to it, but after it passes through a number of studies, is modified to

make the most political capital and then is influenced by the many special-interest groups, the end result is unrecognizable by the author, and largely more trouble than it is worth.

Plus, each good intention falls into the hell of creating new industries just to service the regulations that we were better off without. As you know, a camel is a horse that was designed by a committee. When you get a number of people working on an answer to a problem that they have no real-world experience with, you wind up with cures that are worse than the disease. This is why you have a federal Tax Code that is now about 28,000 pages long and that even the people who wrote it cannot fully explain.

*continues next page*





## Up To Standards

You may be wondering where this is going, and all will be clear soon. There is a serious regulatory problem that has been increasing until it threatens your wallet and reputation and is the point of this article. For many years various states have had vehicle safety-inspection programs, which have done a great deal to improve the road-worthiness of the vehicles on the highway.

The federal government has expanded those programs to include emissions inspection to help cut vehicle pollution, another worthy goal. As the demands for clean air increased, many states went to emissions testing in real time rather than just sniffing the tailpipe with a four-gas analyzer. In order to do this, they mandated the use of chassis dynamometers in order to test the cars through all types of throttle openings and load conditions.

Once dynamometers became necessary equipment in many states, problems started to arise. The growth continues in SUV and pickup trucks and many "crossover vehicles" that are really all-wheel-drive cars. The increased sophistication of the all-wheel- and four-wheel-drive systems in late-model vehicles is on a direct collision course with dynamometer emissions testing. Most four-wheel-drive vehicles that use the newer "active" transfer cases and all of the all-wheel-drive systems cannot be tested on a dyno without severe damage to the transfer case. Most of the states have recognized this and published cautionary instructions, but we are seeing dozens of transfer cases that have been killed on a dyno.

Figure 3



**NP242 differential with pinion gears removed. The overspeed condition of the short pinion gear has resulted in damage to the case pin and enlargement of the bore of the short pinion gear. The bores of the long and short pinion gears should be the same diameter.**

As a rule of thumb, any transfer case with a viscous coupling, a clutch pack or a planetary type of differential should not be driven at the rear wheels with the front wheels stationary. Now, this is a double-edged sword, with one side bringing increased business to you through these testing errors, but on the flip side you need to understand the technology involved and modify your warranty to make sure that units you have under warranty do not come back after dyno tests with the vehicle owner expecting free repairs.

Looking at the technology involved, we will use a New Process 242 transfer case as an example. The 242 is used in Dodge trucks, Jeeps and Hummers. It is equipped with a planetary type of differential and can operate as a full-time or part-time transfer case. This means that in the full-time mode it can be driven at highway speeds with most of the torque going to the rear axle until conditions arise that create a slip at the rear wheels. The transfer-case differential then sends torque to the front axle until the shaft speeds equalize.

The pictures here illustrate the planetary-type differential with two sets of pinions. If you have the

**ROCKLAND STANDARD GEAR**

**Be A Winner. Shift To**

**Rockland Standard Gear Inc.**

**5 & 6-Speed Specialists!**

Corvettes • F-Bodies • Mustangs • Dodge Vipers  
Drag • Road Race • Street

**Tremec T56, T500 & T600 Master Distributor**  
New & remanufactured units in stock – huge parts inventory!

**Race-Prepped T56s**

- Rated to 750hp
- Carbon Fiber Synchros
- Steel 3-4 Shift Forks
- 30-Spline Output Shafts
- Blueprinted Clearances

Race-Ready C5 Rear Ends 3.42, 3.73, 3.90 & 4.10

**Available NOW:**  
EXEDY Performance Hyper Clutch for LS1 & LS6 motors

CALL **1-800-227-1523**  
FAX **1-877-774-3294** (TOLL FREE)  
ONLINE AT [WWW.RSGEAR.COM](http://www.rsgear.com)



## Up To Standards

rear wheels turning at high speeds and the front wheels at a standstill, the shorter set of differential pinions will exceed 10,000 rpm. This immediately outstrips the lube capacity, and the differential goes into meltdown. Looking at the "before and after" pictures, you can see the disaster that awaits your unit under warranty if it undergoes a dynamic emissions test.

The following is a list of transfer cases that have no business being dyno tested with the front wheels static. Make a note of these units, and we will solve this problem in the next paragraph.

Ford

BorgWarner 4404, 4405, 4406, Dana RA28 (Aerostar)

GM

New Venture 136 (Astro van); BW4472 Bravada, Astro van, Typhoon; NV 149, Cadillac Escalade

Jeep

NP119, NP219, BW Quadratrac, NP242, NP247, NP249

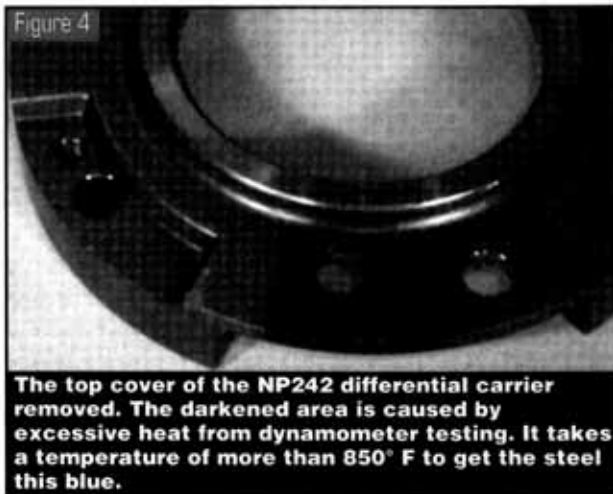
Dodge

NP242, NV244

AMG

NP242 Hummer.

This list includes only American models, but disaster awaits the many import models out there with all-wheel-drive transfer cases, including BMW, Audi, Jaguar, Mitsubishi, Land Rover Discovery, Subaru and Volvo Cross Country. The solution is fairly simple and in several steps. The first step is to add to your warranty applying to transfer cases a paragraph that disclaims any responsibility for warranty on units that are put on an emissions dyno. Step 2 is to educate your customer both on the



The top cover of the NP242 differential carrier removed. The darkened area is caused by excessive heat from dynamometer testing. It takes a temperature of more than 850° F to get the steel this blue.

proper operation of the transfer case you have just repaired and on the need for them to make sure that they never permit the vehicle to be dynamically tested. If you educate your customer and amend the warranty to cover this scenario, you will protect your customer and yourself.

State inspections and emissions testing are good things. They improve the safety and quality of our lives and create repair work for our industry. With the huge number of car models on the road, it is inevitable that mistakes will be made in testing and cars will be damaged. By being aware of the downside, you can protect your wallet and reputation, and give your customer value-added good advice.

TD

### THE BOTTOM LINE:

Tell us your opinion of this article:

Circle the corresponding number on the free information card.

- 87 Useful information.
- 88 Not useful information.
- 89 We need more information.



### The Ultimate 6-Speed Manual Gearbox!

- 1,200hp & 1,000ft/lb capacity
- 22-degree helix 9310 alloy gears/shafts
- Vette-style triple cone synchros
- Carbon fiber synchro rings
- Steel 3-4 shift forks
- Blueprinted & race-ready

#### 4 Ratios Available:

1st	2nd	3rd	4th	5th	6th
2.98	1.99	1.35	1-1	.86	.73
2.71	1.79	1.30	1-1	.89	.75
2.62	1.73	1.35	1-1	.86	.73
2.29	1.60	1.21	1-1	.85	.76*

\*(Close Ratio)

### "Son of Tranzilla™" New Tremec T-56s Modified To Accept 800 ft. lbs. of Torque

- Tough 30-spline Viper output shafts
- Steel 3-4 shift forks
- Carbon fiber synchro rings
- Solid synchro keys
- All components match-fitted, blueprinted & precision shimmed with new OEM bearings
- Various ratios and shifter locations available

Applications for: GM F-Bodies

- Pontiac GTO • Corvette C5 • Cadillac CTSV
- Mustang • Viper • Dodge Sidedwinder and more!

Call for New Hemi Applications!

Become an Exclusive RSG Dealer Call 800-227-1523



CALL 1-800-227-1523

FAX 1-877-774-3294 (TOLL FREE)

www.rsgear.com

Circle No. 22 on Reader Card