Volume 2013

TURBO DIESEL Buyer's Guide

What you should know about the
2013 Ram Turbo Diesel truck.

A Publication of the ***Turbo Diesel Register***

Turbo Diesel Buyer's Guide

A WORD ABOUT THIS BUYER'S GUIDE

Recently my wife and I spent much time looking for a "new" used car. I fired up my computer, studied comments and users' experiences in forum-based websites, and downloaded archived articles from Car and Driver and Edmunds.com. There was a lot of miscellaneous and helpful information, free and for the taking. I figure this sort of web search is pretty typical for prospective vehicle purchasers today. As it turned out, we didn't make a purchase, but my experience in searching for a suitable used car made me more aware of issues of value and economy in owning a Turbo Diesel today.

As a writer it is tempting to tell the long story of "information being worth the price that you paid for it." I will refrain. Many thought-provoking articles on the state of the publishing business versus the free-for-all of the interweb (pun intended) have been written and my opinion is not likely to change anyone's point of view.

Back to the subject at hand—you are a prospective or new owner. You want more information. You want it now. You want it at no charge.

Since the late 90s we have compiled information on the Dodge/Cummins Turbo Diesel truck. Each year we update the book. We call the data the Turbo Diesel Buyers Guide, which you have successfully downloaded.

The price of this book has been discussed many times over. It is offered to you at no charge. Our hope is that its value will lead you to purchase a subscription to the Turbo Diesel Register magazine. Thanks for your consideration.

Robert Patton
TDR Editor

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A WORD ABOUT THE TURBO DIESEL REGISTER

How did the Turbo Diesel Register get its start? First off, I'm an automotive enthusiast. An automotive enthusiast that was in search of a tow vehicle for my admittedly small collection of automobiles. As you can imagine, the search for the right tow vehicle took me in the direction of the Ram Turbo Diesel. My search was aided by the fact that my previous job was in the diesel engine profession as a Cummins distributor product support representative. Do I have a good knowledge of the Turbo Diesel engine? Well, maybe. I'll let you be the judge.

Back to the "story." As an automotive enthusiast, I am a member of a handful of car club/register type publications. In addition, I subscribe to just about every car and truck monthly publication in hopes that I can learn something more about my vehicles. The only vehicle I owned that didn't have its own club was the Turbo Diesel. The light goes on. Why not start a Turbo Diesel club? The light flickers. I know the immediate answer: not enough time, no money, and who would write the articles? Needless to say, the idea got put on the back burner. Another great idea, but…

Looking back, that was many long years ago. Prior to our first magazine (Fall '93) I took time to talk to other Turbo Diesel owners who wanted to know more about their truck and specifically the Cummins engine. At the time I knew the Turbo Diesel Register would work. I also knew it would be a lot of hard work with an up-front monetary investment and the commitment to publish the magazine.

Positive discussions with other club/register publishers and an unofficial "good luck" or two from the manufacturers, and well, I was still hesitant. Back to the all-important concerns: time, money and writing skills. Time? In the initial two-career-days it was nothing to stay up until 2:00 a.m. Money? What the heck, we took out a second mortgage. And writing skills? You've heard the saying, "if it is to be, it is up to me." Thus, we started the TDR way back in the summer of 1993.

Robert Patton
TDR Editor

PS. We hope you'll learn something from the following collection of tips and Ram technical data. Please realize this booklet is just the "tip of the iceberg." The TDR and its members provide a wealth of information. How to join? Please fill-out and mail the order form or register on-line at www.turbodieselregister.com.

Join Us Today!

An annual subscription to the Turbo DIesel Register is $35.00 U.S. and $45 Canadian/International.

Please complete this subscription form and enclose it in an envelope along with your check or money order payable to:

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1150 Samples Industrial Drive
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WHY A DIESEL?

by Robert Patton

As the editor of a club news magazine (the *Turbo Diesel Register* for Dodge/Cummins owners), I am frequently asked, "Why is a diesel engine more fuel efficient than a gasoline engine of comparable displacement and horsepower?"

Let's see if I can provide a simple, no-nonsense answer. At the close of this article we'll do a quick diesel-payback example. Armed with a better understanding of why diesel provides a better payback on fuel consumption, you will be equipped to wring the most mileage from your tankful of diesel fuel.

How would you respond to, "Why is a diesel more fuel efficient?"

You may respond with one of the common clichés, such as, "It's the design of the diesel, it's built to be more efficient." How about, "The compression ratio is higher, there is more power?" Or, maybe a little more helpful, "The Btu content of diesel fuel is greater;" or perhaps, "It's in the injection system."

All of the above are correct, but the answers are pretty intuitively obvious.

When working with diesel powered generators, I encountered similar queries and responded with the same partial answers. I've seen the same "you didn't answer my question" body language from interested parties. It took being embarrassed in front of a large crowd before I vowed to get the complete answer.

Let's see if I can tie it all together and give you an answer you'll be able to use with your acquaintances. We will examine the diesel's design, compression ratios, fuel Btu's, and the fuel injection system to lead us to a concise answer, one that's easy to recall.

The Diesel's Design

"It's the design of the diesel; it's built to be more efficient."

The diesel engine was designed and patented in 1892 in Europe by Rudolf Diesel.[1] In the early part of the last century, Mr. Clessie Cummins, founder of Cummins Engine Company, refined the diesel design and developed engines to be used on-highway in the USA. Clessie's son, Clessie Lyle Cummins Jr., is a diesel historian. A passage from his book Diesel's Engine provides an historical perspective on Rudolf Diesel's early struggle to perfect his revolutionary engine and bring it to market.[2]

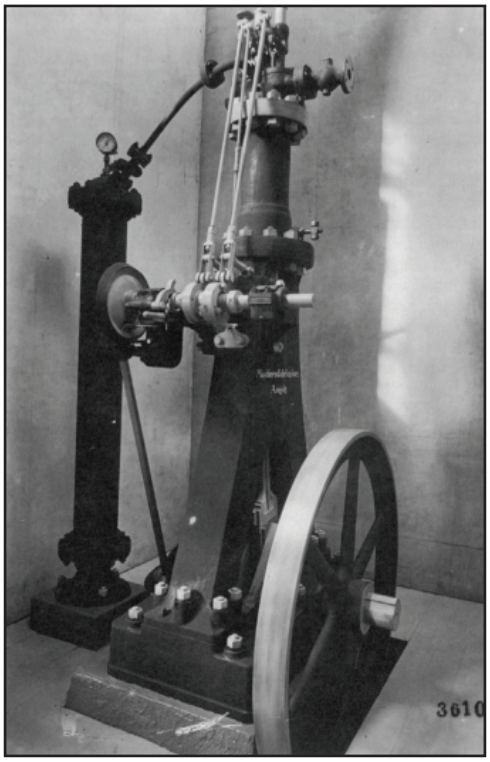
> After a ten-year search Rudolf Diesel was convinced he had found the way to design an engine with the highest thermal efficiency. He believed the most difficult days were over and transforming ideas into reality should prove a simpler task: License a qualified manufacturer to develop and build the engine under his guidance and then await the forthcoming royalty check. One company finally agreed to evaluate a test engine built to his design, but gave him no financial support. Because of this limited commitment he continued to promote his theories through the book based on his studies. Gift copies went to influential professors and companies deemed possible licensees. A few favorable academic endorsements resulted, but no new firms showed any interest. Meanwhile, when Diesel came to realize that his patented combustion process was unsuitable for a real engine he quietly substituted another. The path of his endeavors still failed to follow his optimistic, short range plan.

Diesel continued to seek the "highest thermal efficiency," or what he called a "heat engine," until his suicide in 1913. But the design principle is remarkably simple. From Mr. Clessie Cummins' book My Days With the Diesel,[3] I'll let the senior Mr. Cummins explain.

> As the term "heat engine" implies, the diesel differs in principle from the gasoline engine, in that [diesel] combustion is obtained by the heat created by compression of air in the cylinder. The diesel needs no electrical (spark) ignition system. Furthermore, it burns low-grade oil rather than the highly refined, more expensive fuels required by the gasoline engine.
>
> Adjudged practical only for heavy-duty, stationary, or marine power applications, diesels, when I first encountered them, weighed as much as 400 pounds per horsepower and ran at very slow speeds. Entering the industry some eight years after introduction of the diesel in this country, I undertook a personal campaign, with the crudest of experimental facilities, to reduce this pound-per-horsepower ratio, despite all textbook rules to the contrary. These efforts culminated in the invention of the high-speed, light-weight automotive diesel.
>
> For two decades, while struggling with the engine developments, I battled equally big odds to build a highly specialized business. Cummins Engine Company was incorporated in 1919, but it took the better part of eighteen years for our bookkeeper to need any black ink. Then success arrived with a rush, after the initially skeptical long distance truckers finally accepted our new engine.
>
> Today Cummins Inc., of Columbus, Indiana, is the world's largest independent producer of automotive diesel engines. It provides jobs for ten thousand persons, with sales of more than $250 million annually (the publish date of Clessie Cummins' book was 1967).

Note: 2005 sales were 9.92 billion.

Considering the level of technology in machined parts in the late 19th century, it is no wonder that Rudolf Diesel was unable to build his heat engine and prove its practicality. But in time, technology would catch up with the simplicity of Diesel's informing concept; and so the seemingly offhand answer that the design of the diesel is built to be more efficient is a true statement. Let's look further at the components that make the diesel different.



Diesel's first engine at the start of an 1893 test (photo courtesy of C. Lyle Cummins).

HIGHER COMPRESSION RATIO

"The compression ratio is higher, there is more power."

Technically speaking, the compression ratio of an engine is the comparison of the total volume of the cylinder at the bottom of the piston's stroke divided by the volume of the cylinder remaining at the top of the piston's stroke. Since we are familiar with gasoline engines, let's quickly discuss their compression ratios and a condition that spells disaster in a gasoline engine, detonation, or pinging.

The Gasoline Engine

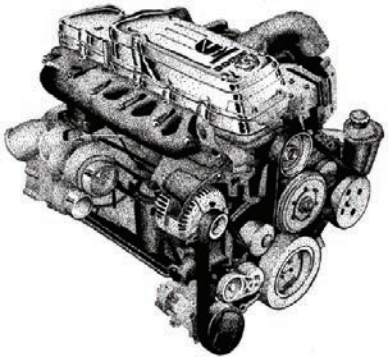
Serious damage to a gasoline engine can result if you attempt to run a high compression ratio with low octane fuel. Detonation or pinging is the ignition of the fuel due to the high temperature caused by a high compression ratio/high pressure developed by a given design. Premature ignition of the fuel, i.e., coming before the spark of the spark plug, results in rapid uncontrolled burning. When timed properly, the approximate maximum compression ratio for a gasoline engine in race trim is 14:1. Most non-racing low octane compression ratios used in automobiles and trucks are less than 9:1.

The Diesel Engine

Remember, the diesel is a "heat engine" using heat energy developed from the compression of air. High compression ratios (ratios range from 14:1 to 20:1) are possible since air only is compressed. The hot compressed air is sufficient to ignite the diesel fuel when it is finally injected near the top of the compression stroke. A high compression ratio equals a greater expansion of the gases following ignition and a higher percent of the fuel's energy is converted into power! The diesel compression ratio is higher, there is more power! However, I've provided yet another incomplete answer that is a true statement, but not the complete story.

Thus far we've covered the principle of diesel operation and the high compression ratios needed to make the heat for diesel engine combustion. The high compression ratio requires the designers to test and manufacture the block, heads, head bolts, crankshaft, connecting rods, rod bolts, pistons, piston pins, etc., with greater structural capacity. Diesel engines are heavy in comparison to their gasoline brothers. Take, for example, the B-Series engine used in the Dodge pickup. It is 970 pounds for the 359 cubic inch Turbo Diesel engine versus 540 pounds for the 360 cubic inch Dodge Magnum V-8 gasoline engine. With the greater structure and a diesel's need for air, the turbocharger (introduced in the 1950s) was a natural fit for diesel engines.

Looking back, the first engine designed by Clessie Cummins in the 1920s was a monster at 400 pounds per horsepower produced. The year model 2005, 325 horsepower Cummins Turbo Diesel pickup truck engine is 3 pounds per unit of horsepower. I'd say diesels have made some progress in 85 years.



The Cummins engine used in today's Dodge pickup.

Fuel BTU's

"The BTU value of diesel is greater."

Quite true, the BTU, or British Thermal Unit, for diesel fuel is 130,000 per gallon, with a weight of 7.0 lbs./gallon. The value for gasoline is 117,000 BTUs at a weight of 6.3 lbs./gallon. If we go back to our basic physics rules for energy, you'll note the fuel in the tank has potential for work if it is injected into the cylinders and, when combined with the compressed heated air, ignited. The piston is forced downward, the crankshaft rotates, and the wheels turn. True as all this is, the BTU value is not the major contributing factor to the diesel's miles-per-gallon superiority. So, what is the key answer?

The Injection System

"It's in the injection system."

Rudolf Diesel designed the heat engine to use the injection of fuel at the last moment to ignite the compressed air. Understanding the heart of the diesel, the fuel pump, is the key to answering the fuel efficiency question.

The Gasoline Engine

A gasoline engine is what engineers call "stochiometric." Stochiometric describes the quantitative relationship between two or more substances, especially in processes involving physical or chemical change. With a gasoline engine there is a stochiometric equation of 14 parts of air to one part of fuel. Remember, always 14:1. Whether at idle or full throttle, the fuel and air are mixed outside the cylinders in a carburetor or injection manifold, and the mixture is introduced to the combustion chamber via the intake valve, 14:1, always.

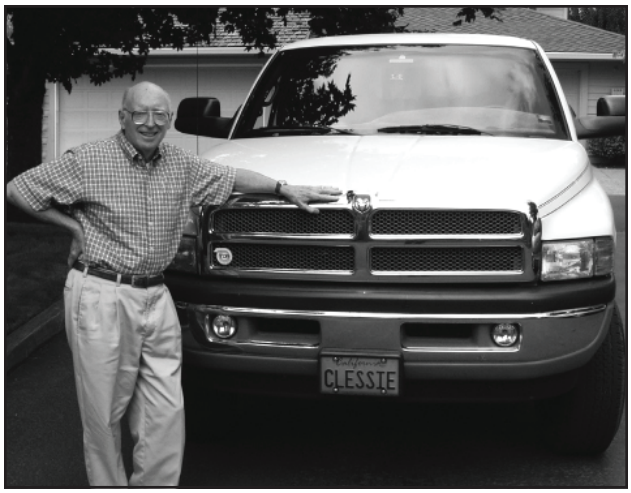
The Diesel Engine

Fuel and air in the diesel design are not premixed outside the cylinder. Air is taken into the cylinder through the intake valve and compressed to make heat. Diesel fuel is injected near the top of the piston's stroke in an amount or ratio corresponding to the load on the engine. At idle the air-to-fuel ratio can be as high as 85:1 or 100:1. At full load the diesel still boasts a miserly 25:1 or 30:1 ratio! It is in the injection system where we find the key to the diesel's fuel mileage superiority.

The Fuel Pump is the Key

The fuel pump used on early '90s vintage diesel pickup trucks typically was a rotary style fuel pump. Think of this pump as a mini automobile-spark-distributor. A rotary head sends fuel pulses through the high-pressure fuel lines to the injectors. The pressure opens the injector valve, and fuel is injected.

As exhaust emissions standards tightened in 1994, there was a need for higher fuel injection pressures and more timely delivery of fuel into the combustion chamber. Pickup truck leader, Ford, used an injection system developed by Caterpillar called HEUI (hydraulically-actuated, electronically controlled, unit injection). The Dodge/Cummins engine used a Bosch P7100 in-line fuel pump. Think of it as a mini in-line six cylinder engine, and it's easy to understand its principle of operation. Six plunger pumps actuated by the pump camshaft send fuel pulses through six high pressure fuel lines to the injectors. The pressure opens the injector valve, allowing fuel to pass into the combustion chamber. With the Bosch P7100 fuel pump the metering of the fuel (at idle, 85:1; or at full load, 25:1) is controlled by a fuel rack and gears that rotate a metering helix to allow fuel into the six plunger pumps.



C. Lyle Cummins Jr. poses in front of a '02 Dodge/Cummins Turbo Diesel pickup.

Future Considerations

Further exhaust emission legislation in 1998 and again in 2002 has forced the diesel engine manufacturers to introduce electronic fuel injection controls. Key legislation dates were 1988, 1994, 1998, and 2002. Thus the progression from simple mechanical (vintage 1988-1993) to more complex mechanical (vintage 1994-1997) followed by simple electronics (vintage 1998-2001) and now advanced electronics (2002 and newer) has been the norm that the diesel industry has followed. Stay tuned as the 2007 emissions legislation has brought another dramatic decrease in exhaust emissions for diesel engines in pickups and big-rigs.

1. We capitalize "Wankel" when referring to a rotary engine. When did we stop capitalizing the "D" in diesel?

2. I found Lyle Cummins' *Diesel's Engine* to be a complete history of Rudolf Diesel's engineering efforts. For information on how to order this book, please see this story's source table. I'll bet that if you request it, Mr. Cummins will autograph your copy! A must for your automotive library.

3. The senior Cummins' book, *My Days with the Diesel* is no longer in print (publication date, 1967). Lyle Cummins remembers his father in his recent book, *The Diesel Odyssey of Clessie Cummins.* Copies of the latter book are available. Again, please see the source table for complete information.

Sources:
Diesel's Engine (760 pages, $55) and *The Diesel Odyssey of Clessie Cummins* (400 pages, $37) are books written by diesel historian Clessie Lyle Cummins Jr. Published by Carnot Press. The books can be ordered at (503) 694-5353.

DIESEL VERSUS GASOLINE
DO THE MATH

My own experience has been with a 2002 Dodge 1500 with its 360 cubic inch (5.9 liter) gasoline engine and a 2003 Dodge 2500 with the 359 cubic inch (5.9 liter) Cummins diesel engine. Overall numbers in around-town driving equated to 13.5 mpg gasoline, 18.5 diesel.

In our example, let's figure that I travel 20,000 miles per year.

Gasoline usage: $\frac{20{,}000}{13.5} = 1{,}481$ gallons used

Diesel usage: $\frac{20{,}000}{18.5} = 1{,}081$ gallons used

It used to be that the price of diesel fuel was less than that of regular gasoline. Lately in my area that has not been the case. However, for comparison sake, let's assume the numbers are equal at $3 a gallon.

Gasoline expense: $3 × 1,481 = $4,443

Diesel expense: $3 × 1,081 = $3,243

Diesel net yearly fuel savings = $1200

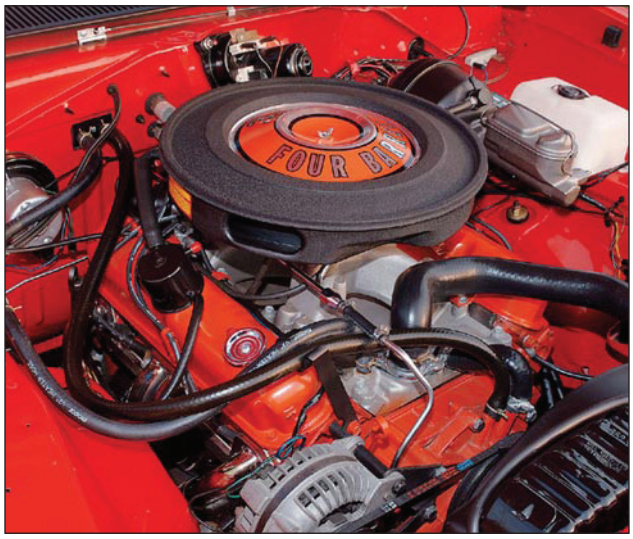
Estimated sticker price for the optional diesel engine – $7,000

Years (assuming 20K per year) and miles to payback – 5.8 years or 116,000 miles

If you subscribe to the adage, "Figures don't lie, but liars figure," you can easily make the previous example work for a shorter or longer payback period. In this short, down-n-dirty comparison we're not going to consider maintenance or resale values. And don't lose track of the obvious: as the diesel engine option in pickup trucks continues to price-creep upward, the payback is longer; however, as fuel prices rise, the payback is quicker.

To close the do-the-math example, remember that "your mileage may vary based on driving conditions." Don't ya love the clichés of automotive doubletalk?

Robert Patton
TDR Staff



The Chrysler 360 gasoline engine delivers around-town fuel mileage of 13.5 mpg.

The Cummins Turbo Diesel engine delivers around-town fuel mileage of 18.5 mpg.

CUMMINS 6.7-LITER FOURTH GENERATION POWER RATINGS

MODEL YEAR	HP@RPM	TORQUE @RPM	TRANSMISSION	COMMENTS
2010 6.7 Pickup	350@3000	610@1600	6 Manual	All States DOC/NAC/DPF
		650@1600	68RFE Automatic	
2010 3500 Cab/Chassis	305@2900	610@1600	6 Manual	All States
			Aisin Automatic	
2010 4500/5500 Cab/Chassis	305@2900	610@1600	6 Manual	All States
			Aisin Automatic	
2011 6.7 Pickup	350@3000	610@1400	Manual	All States DOC/NAC/DPF
		650@1600	68RFE Automatic	
2011.5 6.7 Pickup (HO)	350@3000	800@1600	68RFE Automatic	All States DOC/NAC/DPF
2011 Cab/Chassis	305@2900	610@1600	Manual	All States SCR System
			Aisin Automatic	
2012 6.7 Pickup	350@3000	610@1400	Manual	All States DOC/NAC/DPF
		800@1600	68RFE Automatic	
	385@2800 HO	850@1700	Aisin Automatic	
2012 Cab/Chassis	305@2900	610@1600	Manual	All States SCR System
			Aisin Automatic	
2013 6.7 Pickup	350@2800	660@1400	Manual	All States SCR System
	370@2800	800@1600	68RFE Automatic	
	385@2800 HO	850@1700	Aisin Automatic	
2013 Cab/Chassis	320@2800	650@1600	Manual	All States SCR System
	325@2400	750@1600	Aisin Automatic	

HOLSET HE351 VARIABLE GEOMETRY TURBINE

ISSUE 70 – TECHNICAL TOPICS

by Jacques Gordon

Why are there wires connected to my turbocharger?

by Jacques Gordon

Engines generate power by making gases expand in a confined space and then converting gas pressure into mechanical motion. In a given space, more gas expansion makes more power, and one way to increase gas expansion is to increase the amount of gas in the combustion chamber. This is done by forcing more air into the chamber than the engine can normally inhale at atmospheric pressure. Known as "supercharging" because the air charge is above (super) atmospheric pressure, the technique was initially used in the late 1800s on large stationary engines. Those superchargers were so big and heavy that they had to be driven by their own smaller engine. In November of 1905, Swiss engineer Alfred Büchi patented the exhaust gas turbine-driven supercharger, a forced-induction device that could theoretically be made small enough for mobile engines. Thus, the turbocharger was officially born: See TDR Issue 50, page 58, for a history lesson on turbochargers, as we acknowledged the 100 year anniversary of Büchi's patent in that magazine.

Like so many other ideas that were first described in the earliest days of automotive technology, it took a while to develop the materials needed to turn theory into fact. For detailed information about the development of those metals and of the turbocharger itself, take a look at Kevin Cameron's articles in TDR Issues 42, 47 and 50 that can be found at the TDR's website listed as the "Cameron Collection". Here we'll just say that by the 1920s, nickel alloys became available that could withstand repeated heat cycles without becoming distorted. Engineers began designing precision turbines, and some of the first "production" turbochargers were built for large ship engines.

The first widespread use of turbochargers was on aircraft engines in the 1930s. Turbochargers are ideally suited for flight because they enable the engine to produce sea level power at higher altitudes where the air is thin. Near the end of piston aircraft engine development in the 1950s, even the biggest engines with huge mechanically-driven superchargers were fitted with two or even three exhaust-driven turbochargers for high-altitude flight. They are still used on small aircraft engines today.

Turbochargers are also well suited to Diesel engines. Unlike gasoline engines, Diesels make their power with low-rev torque rather than high-rpm horsepower. In a slow-turning engine, power output depends more on displacement, but as noted earlier, a turbocharger increases the engine's specific power output, the amount of power it can make for a given displacement. A turbocharger also recovers heat energy from the exhaust that would otherwise be wasted. Both of these qualities make a turbocharged Diesel engine more economical to operate, and Diesel engines are all about economy.

How They Work

Although there is a wide variety of types and sizes, turbochargers all have the same basic design and operating principles. A turbine wheel and a compressor wheel are attached to opposite ends of the same shaft. Engine exhaust flows through the turbine, spinning the shaft and turning the compressor. The compressor draws air in through the center, stuffs it into a carefully-shaped housing at the outer circumference of the wheel, and sends it to the intake manifold under pressure. In less technical terms, imagine a double-sided pinwheel. Air blowing through the wheel on one side causes the other wheel to turn too. Air moving one wheel causes the other wheel to move air. The flow volume and pressure generated by the compressor wheel are determined primarily by its rotational speed, but also by its size and the design of the compressor and the housings.

Turbochargers for modern Diesel engines are typically designed to flow 2.5 times the engine's displacement at maximum turbine rpm. Turbine speeds have been climbing over the past several years, and today 140,000 rpm is not uncommon, reflecting the industry trend towards smaller turbochargers. Peak boost pressure depends on the application; 90 psi or more is possible, but for the average road-going engine, boost is usually limited to less than 20 psi.

Big industrial engines are operated in a very narrow speed/load range, so they have big turbos that move lots of air at relatively low turbine speeds. Road-going engines operate at varying speeds and loads, so they need a turbo that responds quickly to changes in load but can also spin fast enough to provide full boost at rated rpm. One way to accomplish this is with two different turbochargers operating in sequence, a smaller one for low-speed operation and a larger one for higher engine speeds. TDR performance enthusiast/writer Doug Leno has been experimenting with exactly that by adding a second turbocharger to his early-2004 5.9-liter engine. Technically called compound turbocharging (but often called 'twins'), Leno learned that it's an effective way to generate high boost pressures at every engine speed, providing the instantaneous throttle response we all love.

Another less complex solution is to use one fast-acting turbocharger and control its speed over a wide range to control boost pressure. But as we'll soon see, this is easier said than done.

Turbine Speed

The way to control turbine speed is to control the exhaust gas flowing through it. For most applications, this can be easily accomplished with a "wastegate," a valve on the turbine housing that allows some of the exhaust gas to bypass the turbine, "wasting" the exhaust gas energy. On the aircraft turbochargers mentioned earlier, the wastegate is operated by electronic engine controls using an actuator and a sensor that converts air pressure to a control signal. To avoid over-boosting at low altitudes, the wastegate is wide open and turbine speed is almost zero. As altitude increases and atmospheric pressure decreases, the wastegate gradually closes to send more exhaust energy to the turbine, spinning it faster to make more boost pressure.

On road engines that operate at varying speeds, the wastegate is used in a different manner, primarily to limit boost pressure according to engine speed and load. Boost is needed throughout the engine's speed range, but most especially just above idle. As engine speed and intake manifold pressure increase, the pressure acts against a spring-loaded diaphragm. At a pre-set pressure, the diaphragm pushes a rod that opens the wastegate. It's simple, reliable and easily applied to different engine/turbocharger combinations. Using electronic controls with sensors and actuators, the wastegate can also be operated by the Powertrain Control Module (PCM) to manage the boost over a wider speed range. But there are limits.

Even with electronic controls, a wastegate limits boost by controlling the volume of exhaust gas flowing through the turbine. This is okay for shaping the engine's power curve, but today's engines must also meet strict new emissions regulations. A different kind of boost control is needed. Could a variable-geometry turbocharger be the answer to the engineers' desire to meet the new emissions regulations?

Up on a pedestal (and rightfully so), this Holset HE351 VGT is the key to managing intake air pressure for economy, power and emissions.

Emission Control

Diesel engines are now equipped with Exhaust Gas Recirculation (EGR), which is used to control Nitrogen Oxide (NOx) emissions. In sunlight, NOx becomes ground-level ozone, aka smog. NOx is formed when nitrogen and oxygen combine chemically. Even though air is made up of 78 percent nitrogen and 21 percent oxygen, it's a simple mixture of gasses, not a chemical compound. The molecules can only combine chemically when combustion (oxidation) takes place under pressure, such as in an engine.

NOx can be reduced by controlling peak temperature in the combustion chamber. It can also be reduced by making sure there's no extra oxygen in the chamber after combustion. Since a Diesel combustion chamber contains a lot of excess oxygen (and we're stuffing in even more with a turbocharger; see the sidebar to understand why), EGR flow in a Diesel must be much higher than in a gasoline engine to be effective at controlling NOx. TDR has covered the emissions story since our first issue back in 1993. The most recent coverage of emissions regulations is in Issue 49.

The exhaust gas for EGR is taken from the exhaust manifold before it reaches the turbocharger. To make sure the exhaust flows towards the intake manifold, pressure in the exhaust manifold must always be higher. This requires extremely precise control, because if too much exhaust gas is recirculated, there won't be enough oxygen in the combustion chamber to burn all the fuel, and particulate emissions (soot) increase. It's a fine balance.

To manage both manifold pressure and exhaust backpressure across the engine's entire operating range, the Holset turbocharger on the Cummins 6.7-liter engine has a Variable Geometry Turbine (VGT). Instead of controlling exhaust gas *flow volume*, the VGT controls exhaust gas *pressure* in the turbine housing. At low engine speeds when exhaust flow is low, the flow from the turbine housing to the blades on the turbine wheel is restricted. This increases backpressure in the exhaust manifold, which increases the pressure of the exhaust gas striking the turbine blades. This makes the turbine spin faster at low exhaust flow. It's the same principle as putting your thumb over a garden hose; flow may decrease a little but pressure increases a lot.

As engine speed increases, so does exhaust flow, so the restriction is opened to reduce backpressure in the exhaust manifold. By reading a turbine speed sensor and pressure sensors in both manifolds, the PCM can adjust the restriction quickly to control backpressure and boost at any speed or load. Some versions of the Holset VGT turbocharger also have a wastegate to limit maximum boost pressure.

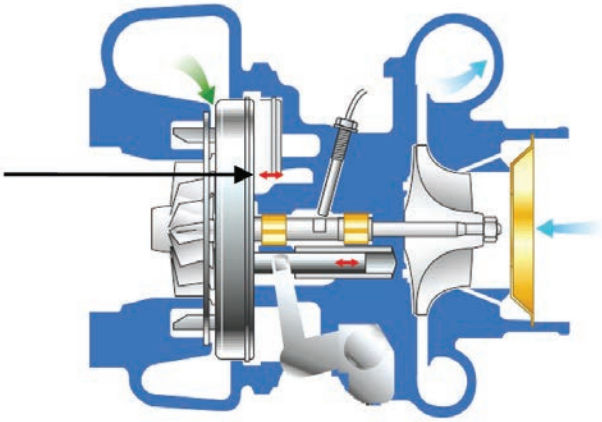
Simple and Direct

Compared to a wastegate, or even an electronically controlled wastegate, the VGT is a complex piece of machinery. The restriction device is in the collector ring of the exhaust turbine housing. That means there are moving parts in the hottest, dirtiest part of the turbocharger. Early models suffered soot-related seizure, proving that keeping things moving properly requires advanced materials, extremely precise engineering and sophisticated controls.

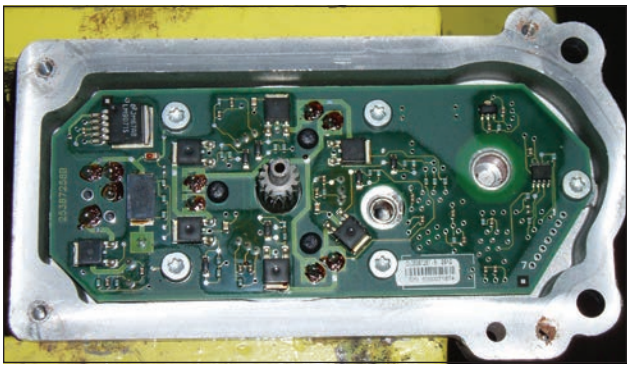
Precision is easier when the machine is simple: to that end the Holset VGT has only one moving part in the turbine's hot section. It is a high-temperature alloy sleeve with vanes at one end, and it moves axially, parallel to the turbine shaft. When the sleeve is fully retracted, exhaust gas flows freely from the exhaust collector through the turbine wheel. When fully extended, the vanes block off the exhaust flow. This creates exhaust back pressure (the exhaust cannot escape) and the turbo acts like and exhaust brake.

The sleeve is operated by an electronically-controlled brushless motor, so the sleeve position is infinitely variable. This provides the critical feature of the VGT turbocharger: infinite and continuous control at any engine speed/load. The motor and electronic controls are in a housing mounted on the center section of the turbocharger housing. To help deal with the heat, coolant is circulated through part of the motor/control housing, but truly advanced electronics are required to withstand that kind of heat and vibration. The following pictorial will, literally, show you how the HE351 VGT operates.

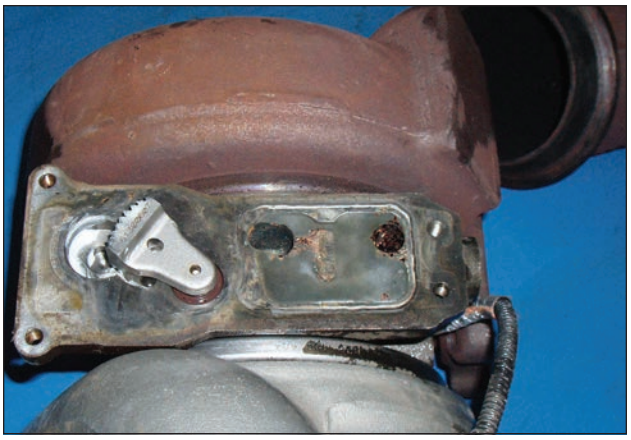
The Holset Variable Geometry Turbocharger



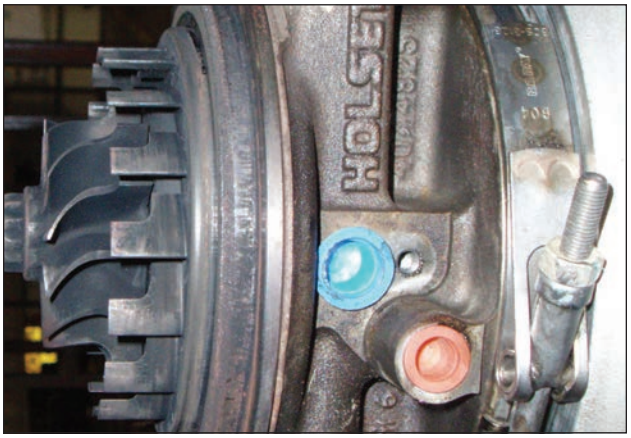
In this picture the vane is closed. Exhaust gas flow is restricted and, thus, the turbocharger is acting like an exhaust brake. Allow the vane to move to the right and the exhaust gas flow is "full-on" allowing the turbine (exhaust) blades of the turbocharger to spin faster and ceate more boost.



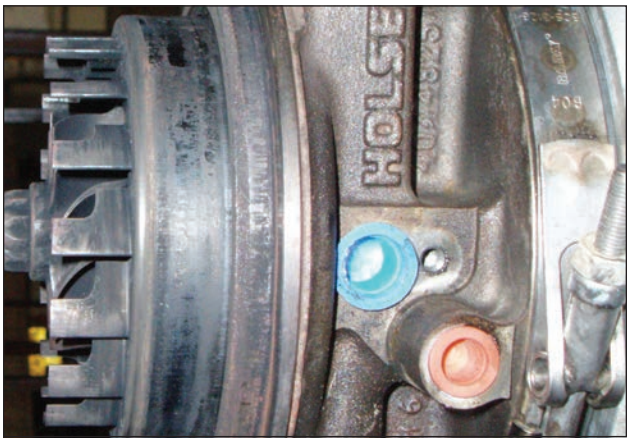
The motor is below this circuit board inside the motor housing. The visible gear engages a position sensor that sends information to the engine control computer. The electronics remain accurate over a 300-degree temperature range, but additional cooling is needed for this application.



The gear rack on the left connects to the linkage that moves the vane sleeve. The two holes to the right of the gear are coolant passages.



With the sleeve totally fully retracted, the vanes are open to exhaust flow. Exhaust flows freely and the prssure on the turbine blades builds intake air boost/pressure.

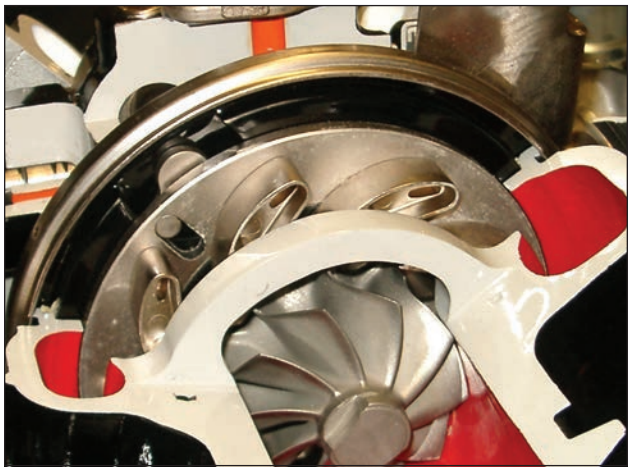


With the sleeve fully extended, the vanes are closed to exhaust flow. This creates exhaust gas back pressure (the exhaust cannot escape) and the turbo acts like an exhaust brake.

Other Methods Work Too

The Honeywell/Garrett turbo on the Ford PowerStroke engine is another example of a variable geometry turbocharger. Called the Variable Nozzle Turbine™

(VNT), it was introduced along with cooled EGR to help the 6.0-liter engine meet 2004 NOx emission standards. It operates on the same principal as the Holset VGT, but instead of moving axially, the vanes rotate like slats in a window blind to open and close the flow area. A pin in the center of each vane fits into the turbine housing, and each vane pivots around this pin. Behind the vanes is a plate with slots, and a pin on the end of each vane projects into a slot. When the plate rotates, it causes the vanes to pivot. The plate is rotated by a crank that's operated by a control piston and oil pressure.



On this Ford turbocharger, the vanes are pinned to the (white) turbine housing. When the plate behind the vanes rotates, the vanes pivot around the pins like slats in a window blind. Note the slot for the crank; the plate rotates only a few degrees.

In addition to controlling the exhaust gas energy acting on the turbine wheel, this system also controls backpressure in the exhaust manifold. With the right software, it can also be used as an exhaust brake.

As noted before, road-going engines work best with a small high-speed turbocharger that spools up quickly to generate boost anywhere above idle rpm. But the turbo also has to be big enough to provide boost at full load. The Honeywell Dual Boost turbocharger on Ford's new 6.7-liter Diesel engine has an interesting solution. In addition to the variable nozzle turbine, it also has what they call a single-sequential compressor. Two sets of compressor blades are cast back-to-back on the same shaft, and each set spins in its own inlet housing. The name is somewhat of a misnomer, because the air from both compressors is fed to the same outlet housing, effectively adding their volumes together at the same time rather than in sequence. Maximum boost pressure is about 30 psi at 150,000 rpm, which is not difficult to achieve with a single compressor wheel, but this double-sided compressor wheel has a much smaller diameter. A smaller compressor spins up quickly, so boost builds almost instantly when the driver presses the accelerator pedal.

The Dual Boost turbo has a set of blades on each side of the compressor wheel, each set spinning in its own inlet housing, but feeding air to the same outlet housing.

The upper and lower openings are both compressor inlets, the tube pointing to the right sends the output of both compressor wheels to the intercooler.

General Motors also began fitting the Garrett VNT™ Turbocharger to the 6.6-liter Duramax engine to meet emissions regulations in the 2004 model year. Compared with the Holset VGT, the Garrett VNT™ has more moving parts in the turbo's hot section. However the control system is much simpler; oil pressure moves a piston that operates the crank that rotates the vane positioning plate. Oil pressure on the piston is precisely controlled with a pulse-width-modulated solenoid valve. Although this valve is mounted directly on the housing, it's far more tolerant of extreme temperatures than the Holset's control motor and electronics, so no additional cooling is needed.

Living With a Turbocharged Engine

Proper lubrication is critical to so many parts of the engine, but nothing in the engine must survive as much heat or move as fast as the turbocharger. Anything that impedes the flow of clean, cool and correct oil to that bearing will impact the service life of the turbocharger. Of course cool is a relative term, but if there's an oil temperature gauge in your truck, know that the turbocharger is the first thing to suffer if the temperature stays higher than normal for an extended period.

While oil has changed a lot in recent years, the definition of the correct oil hasn't really changed at all. There are good reasons to think one oil performs better than another, but there's only one oil that's been subjected to lab testing by the manufacturer, and that's the factory-fill, manufacturer-recommended oil. According to Cummins, the 6.7-liter Turbo Diesel engine requires low-ash oil because it is equipped with exhaust after-treatment equipment. The oil must meet CES 20081 standards and have a maximum of one percent by mass of sulfated ash. While this oil is specifically engineered to prevent damage to the catalytic converters, as we'll see in a moment, that's just as important to turbocharger life.

At high loads the turbocharger can get hot. Excess heat cooks the oil in the bearing housing to a hard carbon deposit that restricts oil passages. Holset recommends idling the engine for two or three minutes before shutdown to circulate coolant and oil through the bearing housing. Some owners idle longer because turbine housing temperature actually increases immediately after shutdown.

Holset also recommends allowing the engine to idle for one minute after a cold start, just to make sure of proper lubrication before asking the turbo to go to work.

Excess idling causes different problems. Holset says idling more than about 20 minutes can cause oil mist to leak past the shaft seals into the turbine and compressor housings. Although no real harm is done to the turbocharger, as load and temperatures increase, the oil will start to cook and cause blue smoke. On engines with EGR and a Diesel Particulate Filter (DPF), burning oil can clog the DPF, generating higher exhaust backpressure and therefore, higher EGR flow. This will send soot into the whole air intake system, resulting in a clogged turbocharger. Repairs can be expensive, and Chrysler has issued several service bulletins (11-001-09, 11-001-08, 11-002-08) that describe "desoot" procedures. On some models, the procedure can be done with the vehicle not moving, but others require driving the truck, and all require a scan tool to command the desoot process.

Fuel quality also has an influence on soot formation. While the problem should be all but eliminated since ultra low-sulfur fuel was mandated back in January 2007, some fleets that use off-road fuel (intended for construction equipment, etc) in their on-road trucks have traced failed turbochargers and clogged DPFs to misfueling.

The Future is Variable

Variable Geometry Turbochargers were originally developed for gasoline engines in the late 1980s. Again, the moving parts are in the hottest part of the turbocharger, so the advanced materials and precision engineering needed to keep things moving smoothly make VGTs expensive. But the ability to control boost and exhaust backpressure separately from engine speed and load is the only way to meet today's Diesel emissions standards, so it looks like their time has come. We can expect to see VGT turbochargers on a wider range of engines over the next decade, especially on small engines from Europe. There's even talk of using them on small gasoline engines too, but that market would (at least initially) be limited to high-priced models.

The Variable Geometry Turbine is the most significant advance in turbocharger technology in the past 100 years. It has added a whole new dimension to engine management strategy, and although it's been around for 20 years, for engineers and tuners who understand the possibilities, the fun is just getting started.

Jacques Gordon
TDR Writer

SIDEBAR

Fuel must be mixed with air to burn. If there is not enough air to burn all the fuel, that's called a rich mixture. In a lean mixture, there will be air left over after all the fuel burns. The perfect mixture, the one that produces the most power and the least amount of pollution, will have just enough air to burn all the fuel.

When fuel is injected into a Diesel combustion chamber, each droplet of fuel burns the moment it comes into physical contact with oxygen in the air. However, most of the air in that chamber is far away from the fuel injector, and each successive droplet of fuel will travel farther into the chamber before it finds oxygen. This creates local areas of rich air/fuel mixture, while the mixture in most of the combustion chamber is lean.

The chamber's shape, injector spray pattern, injection pressure and a few other factors all have an influence on air/fuel mixing, but a perfectly even mixture throughout the chamber has only been achieved in laboratory engines. To avoid making smoke instead of power, Diesel engines run lean.

While the air/fuel mixture in the chamber is uneven, the density of the air is the same everywhere in the chamber. If we increase that density by stuffing in more air with a turbocharger, there is more oxygen close to the injector, so we can burn more fuel and make more power.

Jacques Gordon
TDR Writer

CUMMINS ENGINE LUBE OIL QUESTIONS

ISSUE 84 – IDLE CLATTER

by Robert Patton

As we have mentioned, the 2013 and newer Heavy Duty 2500-5500 Cummins-powered trucks come from the factory with a fill of 5W-40 synthetic diesel rated engine oil (API CJ-4 specification). Oil additions and changes should be made using this lubricant or 15W-40 petroleum based oils. Your Owner's Manual clearly spells this out.

So, here is the obvious question: (Actually, it is close to a $2 million, or more, dollar question. The math: 150,000 engines per year; three gallons of lube oil at a cost estimate of $4/gallon premium for a synthetic oil: 150,000 × 3 × $4 = $1,800,000.) Why is the factory fill a 5W-40 synthetic?

Answer, Chrysler's cold start testing criteria dictates that 5W-40 be used. I wish I could tell you how Chrysler's test relates to the requirement at Ford, Chevy, Mercedes-Benz, BMW, Audi, etc., but I do not know. Let's simply enjoy the fact that your 2013-newer truck has the synthetic 5W-40 lube oil.

The next obvious question: do I have to continue with 5W-40 synthetic. The short answer, no. Documentation for this response is, again, found in your Owner's Manual. Quoting from the 2014 book:

> "In ambient temperatures *above* 0°F, we recommend you use 15W-40 engine oil such as Mopar, Shell Rotella and Shell Rimula that meets Chrysler Materials Standard MS-10902 and the API CJ-4 engine oil category is required. Products meeting Cummins CES 20081 may also be used. The identification of these engine oils is typically located on the back of the oil container.
>
> "In ambient temperatures *below* 0°F, we recommend you use 5W-40 *synthetic* engine oil such as Mopar, Shell Rotella and Shell Rimula that meets Chrysler Materials Standard MS-10902 and the API CJ-4 engine oil category is required."

For what it is worth, the 2012 and 2013 books had this extra little diddy: "Failure to use SAE 5W-40 synthetic engine oil in ambient temperatures below 0°F could result in severe engine damage."

This leads to question number three: What do I recommend on lube oils? For the answer to this I'm going to leave it to the experts and to you to do some research. TDR writer and oil guru John Martin did an article on the new CJ-4 lube oils in TDR Issue 77. One takeaway from Martin's article (and the editor's response, too) is to find a mineral-based 15W-40 that meets the CJ specification and then purchase and use the least expensive oil that you can find. Cheapskates! Change the oil based on your Owner's Manual/EVIC recommendation. For me, I'll stick with the 5W-40 synthetic, CJ specification oil.

Some owners have called wishing to know if the initial fill of engine oil should be run for a full oil change interval, or should it be changed early? Answer: Cummins recommends using the oil for a full oil change interval. The computer EVIC display will tell you when it is time for an oil change based on driving conditions.

Along with engine oil, use of the proper oil filter is essential. Your writer personally recommends the Fleetguard Stratapore oil filters for all model years of Cummins diesel engines. The complete story on lube filters is found in TDR Issue 71, pages 60-67. Fleetguard's Stratapore filter (LF16035) uses a synthetic filter media that is typically $4-5 higher than the Fleetguard LF3972 or Mopar M285 (same filter, different paint on the outer shell) filters that are paper cellulose media. These filters (Stratapore or standard-type) are available in the Geno's Garage catalog at competitive prices, and at any Cummins distributor. They really are superior in quality and filtration against other brands, thus helping to make your engine last longer.

Here is a photo from Issue 71 showing writer Jim Martin's two favorites – the Fleetguard and Wix filters that use StrataPore filter media.

LUBE OIL UPDATE

ISSUE 76 – TECHNICAL TOPICS

by Robert Patton and John Martin

A New Inquiry

Last October I received an e-mail from TDR member Desmond Rees:

I am looking for supplemental information following up John Martin's article from Issue 57 on engine oil. The August 2007 article is somewhat dated. With the switch to the new API requirements for EGR/DPF diesel engines, are there plans to revisit this topic regarding the best engine oils meeting the API CJ-4 requirement? John's article only looked at a handful of the CJ-4 oils and they ranked at the bottom of the pile when compared to the previous generation of oils. Thanks.
Desmond Rees

My response: Prior to Desmond's letter, there were no plans to revisit the topic. However, it has been five years and oils do change. I will purchase and test the CJ oils and John can comment on the data. We will see if John's previous conclusion holds: "If it meets a spec, it becomes a commodity. Low price can be the purchase criteria. Change the oil based on the Owner's Manual recommendations."

Thanks to Desmond for the letter.

Background Information

It seems like just yesterday that I met lube oil expert John Martin and we collaborated on a series of articles about lube oils.

Ouch! As Desmond reminded me, "yesterday" was Issue 54 of the TDR, which was published in December of 2006. The four-part series that we wrote took a year to complete.

The reason behind the year-long series of articles was the forthcoming change from lube oil category CI+4 (an industry specification that was implemented in 2002) to the new category CJ. The CJ formula of oil was developed for the lower diesel exhaust emissions engines that were being implemented starting 1/1/2007.

I wondered how the lube oil would change. John Martin was the guy to tell me. (More about John in just a minute.)

In a lengthy telephone conversation he shared his opinion about the forthcomming CJ lube oil specification. Bottom line: John felt that the CI+4 oils were some of the best to come out of the respective refineries. In his discussions with those in the oil business, he had formed the opinion that the new CJ oils would not necessarily be new-and-improved.

As I noted, the CJ formula was developed for the new lower emissions diesel engines. From John I understood that the CJ oil would not necessarily be new-and-improved. Without analysis of the lube oils, I asked John what were the proposed changes from the highly acclaimed CI+4 to the new CJ oils. His response: "Robert, this is a lengthy topic, but it is very important for the audience to understand what is happening in the oil business." So, I looked back to Issue 54 and made a couple of tweaks to its contents. The following is the updated text that gives you the insight that you need to understand the CI+4 to CJ change.

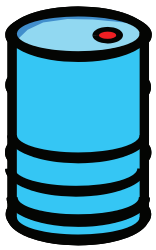
A Little Lube Oil History

Before we talk about what the additive industry and the oil companies have done to meet the EPA's latest directive, we need a brief lube oil history lesson. Years ago diesels were operated on refined crude oils containing virtually no additive chemistry. As power density increased oil companies found they needed to add specific chemical compounds to the oil to provide performance attributes that crude oils couldn't deliver. The additive industry was born.

Traditionally, each new diesel engine oil specification was issued because available oils couldn't provide the lube oil performance needed. For example, API CE was issued to create oils which solved an oil consumption problem in Cummins NTC-400 engines. For fifty years each new diesel engine oil specification meant a better performing diesel engine oil was available—all the way from API CD to API CI+4.

Today diesel engine oils look like the example shown in figure 1. From 20 to 30% of modern diesel engine oil is additives designed to improve performance in key areas. These additives are carefully engineered mixtures of compounds formulated to pass the various diesel engine tests which define a new lube oil specification like the CI+4 or the new CJ.

Typical Diesel Oil Composition



Base Oils:	69-80%
Performance Package	15-20%
Viscosity Modifier:	5-10%
Pour Point Depressant	0-1%

Pour point depressants are used to keep the oil fluid at very low temperatures. (They inhibit wax crystal formation.) Viscosity modifiers are used to make the oil thin out less as it is heated. This makes an oil which we call "Multigrade" and it simply means the multigrade oil acts like a thinner oil at low temperatures and a thicker oil at high temperatures. Multigrade diesel engine oils were a key part of the solution to the excessive oil consumption problem addressed by API formulation CE.

The performance additive package (see figure 2) is a mixture of 8-12 specialty chemicals, each of which is intended to impart specific properties to the oil's performance. The important thing to remember here is that most additive chemicals (particularly detergents) deplete or wear out in service. This is one of the reasons why the oil must be changed. Life *was* good.

Typical Diesel Oil Performance Package

- **Detergents**
  Neutralize Combustion Acids
  Minimize Wear
  Inhibit Rust Formation
  Oxidation Inhibitor
- **Dispersants**
  Prevent Agglomeration of Soot Particles
  Suspend Contaminants in Oil
- **Oxidation Inhibitors**
  Retard Oil Decomposition
  Slow Deposit Formation
- **Anti-Wear Agents**
  Create Sacrificial Film Between Metal Parts
  Minimize Valve Train Wear
- **Foam Inhibitors**
  Prevent Oil Foaming

What Did the EPA Do To Us/Why Do We Need CJ-4 Oils?

First, let's discuss why this new oil was developed. The EPA tightened their exhaust emissions thumbscrew on diesel engines starting January 1, 2007, to reduce particulate matter (PM) and oxides of Nitrogen (NO_x) emissions even further. To meet those requirements most diesel engine manufacturers resorted to the use of diesel particulate filters (DPFs). A DPF differs from the catalytic converters we have used for years on gasoline engines in that a DPF actually filters the *entire* diesel exhaust stream.

On the surface you wouldn't think this would be a big deal—Europeans have been using DPFs for years. The difference is that Europeans don't accumulate mileage like Americans and they will tolerate much more frequent service intervals. Our EPA has decreed that the new DPFs must go 150,000 miles before needing removal for cleaning. This means the soot collected in the DPF must be burned off in the exhaust system frequently if trap life is to exceed 150,000 miles without removal and cleaning.

Now, don't take me wrong—I'm for a cleaner environment like everyone else is. The problem with the EPA is that they just decree which emissions will be reduced without once considering the cost, the technology needed or its effect on your operation. They refer to that as "Technology Forcing Legislation." In the case of diesel engine oils, the EPA forced the adoption of a low-sulfate ash, phosphorus, and sulfur (low SAPS) oil whose technology hasn't yet been proven extensively in the field.

I don't have to tell you that diesel exhaust is relatively dirty. It consists of lots of soot (That's what turns your oil black!) and unburned residues from both the fuel and the oil. Sulfur in the fuel can significantly hamper DPF performance. That's why the ultra low sulfur diesel (ULSD) fuel was implemented 1/1/2007. Phosphorus and sulfur in the lube oil can shorten DPF cleaning intervals considerably. Phosphorus (P) can "glaze over" and plug the tiny holes in the DPF, making the openings effectively smaller and quicker to plug. Sulfur (S) can "mask" the DPF, making it temporarily less effective. Sulfated Ash (SA) in the lube is thought to build up deposits on the DPF over time. These deposits that originate from diesel fuel and lube oil then make the DPF effectively smaller and quicker to plug.

What does this mean to you?

Low P means the Feds placed a limit on the amount of Zincdithiophosphate (ZDP) additive which can be utilized. ZDP is the most effective oxidation inhibitor and anti-wear agent currently available. Additive manufacturers are now forced to use more expensive and less effective ashless oxidation inhibitors and anti-wear agents.

Low S means the new oils can't rely on some of the least expensive Sulfur-based oxidation inhibitors used in the past. And, once again, many of the new ashless oxidation inhibitors haven't been thoroughly field proven in heavily loaded trucks. Low S also means more highly refined base oils, which is a positive thing. Average base oil quality is now significantly improved.

Low SA (less than 1 percent weight) effectively places a limit on the amount of detergent which can be used in these oils. But diesels love detergents. In over 25 years of inspecting various diesel engines in the field, I've yet to see one which didn't perform better on oils with higher levels of detergency.

So, What Oil Should I use?

If you have a diesel engine equipped with a DPF, you should probably use API CJ-4 oils. You really don't have a choice unless you want to clean your particulate trap more frequently. Pay particular attention to oil change intervals.

I know that the major oil marketers are telling their customers that CJ-4 oils are backward compatible (you can use them in pre-2007 engines), and that is somewhat true. But if you use less detergent in an oil, your oil change interval should be shortened accordingly. Oil marketers don't care if you have to change your oil more frequently—in fact, they love it! Remember oil companies are really in the business of moving as much base oil as possible. They love short oil change intervals.

In closing, remember to change your oil as frequently as possible, so we all can generate some more profits for those poor oil companies.

John R. Martin
TDR Writer

More About the Previous Series of Articles

Way back in Issue 54 I asked John how we might test the CI+4 oils and the new CJs. His response: "That's easy: You spend the $25 for a complete oil sample evaluation. Be sure the test includes total base number (TBN) and viscosity—and send me the results. Don't tell me what is what. Let's see if there is an obvious difference and let's see who makes the best lube oil(s). Who knows what we will find. Will purchasing a lube oil be as easy as purchasing a commodity? You know, as long as it meets a specification then it is 'good,' therefore you can shop for your lube oil based on price."

Answers to these questions gave me the basis for an excellent article. So, the oil analysis kits were purchased, $25 x 22 kits ($550) and I went on a shopping spree for oil, $15 x 22 oils ($330). A cool $880, just so John and Robert would know about lube oils.

Earlier I stated that John was the oil expert. Prior to retirement he was an engineer at Lubrizol, one of the companies that makes and sells the additive packages to the oil manufacturers. And, at John's stage in life, he was/is not beholden to anyone in the industry.

So, what conclusions could one draw from the year-long Martin and Patton examination of 22 different diesel lube oils? I've talked to many TDR members about the series of articles and each one has shared with me their own unique conclusion. Didn't we all read the same article?

I have often stated that, "changing a person's opinion about lube oils is like trying to change their opinion about religion. It is not going to happen." My take-away from the year long, $880 expenditure (oops… perhaps John Martin has brainwashed me) is as follows:

Back in 1999, it took a series of oil analyses samples before I was comfortable changing my 3,000 mile change-the-lube-oil/guy-on-TV mentality. Then again, it took a series of 22 oil samples to change my mentality concerning lube oil by brand name versus lube oil as a commodity.

I'm on the same page as John Martin; if it meets the specification you can purchase oil like a commodity. Change the oil based on the Owner's Manual recommendations.

LUBE OILS – VERSION 2012

Questions for 2012

So, the long answer to Desmond Rees has thus far taken 2.5 pages! However, I felt the background data was necessary before we just jumped into "Lube Oils—Version 2012." The following are the questions I wanted John to help me answer:

Q1 Could I find the good stuff, an old CI-4 specification oil?

Q3 Who has the best "John Martin" oil for 2012?

Q2 How would the CJ-4 oils blended today compare with the same oil that we sampled back in the summer of 2007?

Q4 What has changed in the world of John Martin in these past five years?

The Oil Analysis for 2012

As mentioned, back in 2007 we tested 22 different brands of lube oils: everything from Amsoil to Walmart; Caterpillar to John Deere; Red Line to Liqui Moly. The prices ranged from low of Walmart's Super Tech at $7.68 per gallon to the high of Red Line Diesel Synthetic at $35 per gallon. If you want the complete list of CI-4 plus and CJ-4 oils that were tested you'll want to look back at Issue 58, pages 52 and 53.

Why 22 oils back then and only 10 oils for 2012? Remember my comment about lube oils, religion and the change of opinion? Well, my opinion has been changed! How so? A look back at Issue 56 gives you some insight into my mindset prior to the testing of the 22 lube oils. Here is the recap:

"When new lube oil is analyzed you can get a good idea of the quality of the additive package that, as learned from Martin's experience, makes up 20–25% of the lube oil blend. Maintaining viscosity at higher temperatures, maintaining high alkalinity (total base number); and protecting against wear with the right blend of molybdenum, zinc, phosphorus and boron are important lube oil attributes. Readings for calcium are a way to measure dispersion detergency.

"In the blind-sampling-from-the-bottle done by Trailer Life magazine in January 2005, I was greatly disappointed to see that Walmart Super Tech 15W40 diesel oil stood toe-to-toe with other very respected brand names.

"Why disappointment? First, consider what John Martin said, 'Consequently there is less and less difference between engine oil that barely passes the API certification test and one that is designed to pass by a significant margin. Therefore, oils meeting a given performance spec are approaching commodity status.'

"Second, I am not a big fan of Walmart. I could go into a long tirade, but I will refrain.

"Third, for all of my vehicle ownership years (let's see, that is about 37 years) had I been duped? Had I fallen for the marketing hype? I did not want to believe that lube oil is just a commodity. Yet the Trailer Life grid did not lie."

What story did the forthcoming TDR grid tell?

Had I fallen for the marketing hype? I did not want to believe that lube oil is just a commodity

The previous 22 brand oil test did give me an education. For 2012 I did not feel the need to test every lube oil in the marketplace. As a matter of fact, I only went to two places for the various oils, Autozone (where each oil was priced at $17.99) and Walmart. The following is the blind sampling data:

Sample Description	Viscosity @ 100°	TBN	Calcium	Magnesium	Phosphorus	Zinc	Boron	Molybdenum
1	14.1	8.84	1050	777	975	1110	82	0
2	15.5	8.17	2183	9	1053	1152	3	1
3	15.1	8.69	1135	783	1020	1172	0	40
4	14.7	9.27	1299	837	941	1069	64	48
5	16.5	8.19	1412	395	1084	1250	503	89
6	15.5	9.15	1171	970	1088	1202	0	43
7	15.0	9.03	2209	10	1039	1156	35	0
8	15.1	9.09	2305	10	1077	1169	58	0
9	15.5	8.7	1134	787	1017	1169	0	40
10	14.3	9.22	770	1119	994	1171	60	58

Product Identification Chart

Item	Product	Viscosity	Price
1	Mobil 1 (Syn)	5W40	$26.33
2	Motorcraft	15W40	20.99
3	Walmart	15W40	10.97
4	Mobil Delvac	15W40	17.99
5	Chevron Delo	15W40	17.99
6	Valvoline	15W40	17.99
7	Shell Rotella	15W40	17.99
8	Castrol Tection	15W40	17.99
9	Warren	15W40	14.99
10	Shell Rotella (Syn)	5W40	27.99

And now, the answers for Lube Oils – Version 2012:

A1) I could not find any CI-4 lube oil.

A2) I'll turn this answer over to John Martin. John's response:

Robert and TDR audience, remember my often-used statement, "Diesels Love Detergents"? It appears from the oil analysis data that Samples 4, 5, 6, 7, 8, and 10 all have total base numbers (TBN) in excess of 9, which suggests to me that these oil marketers are trying to provide as much TBN as possible given the 1.0% weight sulfated ash limitation imposed by the API CJ-4 specification. They are doing this to satisfy those fleets whose oil change intervals are based on TBN depletion.

Samples 2 and 5 have the least amount of detergency of the oils tested. Sample 5 uses either a borated detergent or a boron-containing oxidation inhibitor. Borated detergents are thought by some to be more effective than traditional detergents. It is also possible that data in the last two columns for sample 5 has been transposed. *(Editor's note: the 503 and 89 numbers are as printed by the lab.)*

My field test experience has taught me that calcium (Ca) detergents are more effective than magnesium (Mg) detergents, so, to answer question 2, "Who has the best oil for 2012?" I think oils 7 and 8 would be the best of the oils you surveyed. Oils 4, 6, and 10 also have high TBN values for CJ-4 oils, but they depend heavily on magnesium detergents, so I don't think they would yield diesel performance as good as oils 7 and 8.

Oils 1, 4, 5, 7, 8, and 10 all contain boron, but I'm certain that the additive chemistry in sample 5 is different than the others (or the last two columns of data for sample 5 have been transposed). Boron oxidation inhibitors are evidently being utilized to improve the high temperature performance of these CJ-4 oils.

Now, if you allow me to look at the number-to-product identification report I can tell you that oil 5 has been completely reformulated, and I know why. Chevron Delo 400 is the most widely used oil in big trucking fleets. When CJ-4 came about, fleet operators told Chevron they preferred the old CI-4 oil, particularly when they found out that Chevron was going to ask more money for their CJ-4 oil. Neither Chevron nor the fleets would budge off their positions, and big marketers like Chevron only want one oil in their distribution systems. Chevron went back to the drawing board, reformulated, and retested until they could pass the API CI-4 tests with a CJ-4 oil. Then they dropped both earlier oils out of their systems and offered only the new, improved CJ-4 oil. I wonder if the big fleets paid them more money for the new oil?

Mobil and Shell also supply a lot of oil to truckers. If you compare sample 1 (a consumer oil, Mobil 1 synthetic) with sample 4 ((Mobil Delvac) you can see that Mobil added more detergency to oil 4 (Ca and Mg) to give their big fleets increased TBN and keep them happy. Fleets wouldn't use the Mobil oil in Sample 1. The Shell samples (7 and 10) are also very interesting. Shell is using different additive chemistry in their 15W40 (Rotella mineral, sample 7) than in their 5W40 (Rotella synthetic, sample 10). I'm guessing that the big fleets are mostly purchasing oil 7. I do not know why the chemistry is so different in oil 10, other than perhaps another additive supplier was able to pass the tests, allowing Shell to get the credentials they desired.

So, once again, my picks are oils 7 and 8. If you religiously adhere to your manufacturer's recommended oil change intervals, oil 3 would be the best performer on a cost per mile basis. Oils 1, 2, and 10 offer the highest cost per mile, so I would avoid them altogether.

A3) Now, let's compare the 2007 oils to the 2012 oils. I asked Robert to save you from going back to Issue 58 and present a comparison chart for you.

The CJ-4 Lube Oils Tested in Issue 58 were:

Shell Rotella T	15W40
Castrol Tection	15W40
Chevron Delo 400 LE	15W40
Cummins/Valvoline Premium Blue	15W40

The following chart gives you the "Then and Now" candidates:

Price	Description	Viscosity @ 100°	TBN	Calcium	Magnesium	Phosphorus	Zinc	Boron	Molybdenum
$10.96	**Shell Rotella T**	15.7	8.77	2488	8	1108	1147	37	2
17.99	**Same 2012**	15.0	9.03	2209	10	1039	1156	35	0
10.80	**Castrol Tection**	14.7	7.74	2011	6	876	1035	0	0
17.99	**Same 2012**	15.1	9.09	2305	10	1077	1169	58	0
12.99	**Chevron Delo 400 LE**	15.7	7.82	1593	416	1156	1268	83	570
17.99	**Same 2012**	16.5	8.19	1412	395	1084	1250	503	89
9.98	**Cummins/Valvoline**	15.6	8.42	1109	827	994	1041	0	41
17.99	**Same 2012**	15.5	9.15	1171	970	1088	1202	0	43

Now, to compare the 2012 results to the 2007 table, it appears that Shell has dropped their ZDP content by 10% in oil 7. Before interpreting data from this type of analysis remember that repeatability of these numbers is no better than 10%. Looking at the data in that light, two things could have happened in the last five years. Either the ZDP level could have been dropped 10% to enable Shell's additive supplier to put more detergent in the oil to increase TBN levels, or the data is on the outer edge of the repeatability limits. When comparing today's Shell oils, it looks to me like Shell may be using a different ZDP than they did in 2007.

But, audience, did you notice from your 2007 to 2012 comparative data that all of the oils cost more in 2012? Whether or not the oil marketer changed his initial CJ-4 formulation, he has managed to use the new credentials as a vehicle to raise the selling price of their oils significantly. As I said before, I don't know if oil marketers are getting more for their CJ-4 oils at major fleets, but they are certainly getting more from retail consumers. ***(Editor's note: I looked back to November 2007 and a barrel of crude oil was $88, today it is $106.)*** You and I get to pay for everything!

A4) What has changed in John Martin's world in the last five years?

For one thing, I spend much more time researching alternate fuels than diesel lube oils these days. Everyone wants to just jump into the future, be green and reduce our dependence on foreign sources of crude oil without even considering what these moves will do to the poor people who design the vehicles and systems that will have to make that happen.

For example, the public is finally beginning to discover that corn-based ethanol containing fuels (one of the worst jokes of the modern era) are actually worse than gasoline regarding greenhouse gas (GHG) emissions. It has taken the do-gooders billions of our tax dollars to discover what they've been told long ago by fuels researchers. The California Air Resources Board (CARB), a bastion of the most radical environmentalists in the world, has actually had their low carbon fuel standard (LCFS) overturned by a Federal judge.

Secondly, remember how the do-gooders tell us we should all be driving the Toyota Prius (Pious)? The latest GHG emissions research has shown that power plants are responsible for more GHG emissions than transportation vehicles. Where did the do-gooders think that electricity was coming from? Was it magic? Left-wing environmentalists never let facts get in the way of a good story. These are the same radicals who are currently stalling the Keystone pipeline project which could bring much needed crude oil from the North to refineries on the Gulf Coast. After the OPEC countries, China, and Hugo Chavez purchase all that valuable Canadian crude, we will decide to build the pipeline. Our environmentalists are getting to the point where they are very destructive. (My political rant is over. Don't send the editor hate mail.)

Our next new diesel lube oil spec (currently called PC-11) will occur sometime around 2015. The Federal government recently decreed that diesel trucks must provide significantly better fuel economy by 2016. The Engine Manufacturers Association (EMA) has already asked the lube oil industry for some improved fuel economy (FE) oils by 2015 so they can be field tested prior to production. Since the major fuel economy differences are observed by lowering oil viscosity, expect to see some very thin (5W30, 5W20) diesel oils in 2015. Very thin oils probably won't work well in current engines. (More about that in future TDR magazines?) This, too, won't be as easy as the EPA activists think it will be, but, as long as your tax money will hold out, they will be asking you to finance this research.

John Martin
TDR Writer

ADD OIL HERE/PC-11 AND CK-4 UPDATE

ISSUE 83 – TDREVIEW

ADD OIL HERE

by Robert Patton

Every now and then you'll stumble across an automotive writer that clicks with you. (See Motojournalism Connection, pages 4-7.)You find that their stories convey what you would say if you had their literary talent. Some of my favorite writers: the TDR's very own Greg Whale (all things automotive, Whale's "been there, done that"); Kevin Cameron (Kevin can make a nut and bolt into a fascinating story) and Mark Barnes (Mark's writings have reinforced that I'm not the only one that enjoys the solitude of a workshop); Peter Egan from Road & Track and Cycle World (Egan's writings can make a trip to the 7-11 store into an adventure); and Peter DeLorenzo from Autoextremist.com (his automotive rants/insights challenge the norm).

A quick story about Greg, Kevin, and Mark.

Back in the early days of the TDR (think 1994 for Greg Whale, 1996 for Kevin Cameron, 1998 for Mark Barnes) I was on the lookout for writers that could bring their insight to our new member/club organization. To reach these writers, I sent a request to their respective editors asking if I could contact them. As I have come to learn, automotive and freelance writing is not the glamor job you might envision, and the editors were willing to grant me access to these talented writers. After all, the TDR did not compete with the titles that Greg, Kevin or Mark were writing for. So, now you know the TDR writer story.

Oops, I'm a little off track.

I have here before me a story from Cycle World written by Egan that reminded me of the oil change woes that many of us have encountered with the 2013-and newer Turbo Diesel trucks. However, unlike the TDR's Donnelly, Roberts, Redmond or Langan that give you the steps to perform the task, Egan tells the oil change story of the average Joe, complete with a handful of mistakes.

Here are just a few excerpts from the story that will help me transition into a humorous story that was told to me by our very own Greg Whale.

Egan's original article in Cycle World was titled "Zen and the Art of the Oil Change." He starts the story with a long introduction and then a question from a CW reader:

"These days, a lot of younger, less experienced riders come up to me and say, 'Mr. Egan, you have an almost legendary reputation for being able to change the oil and filter on your motorcycles without spilling more than about 30 percent of the oil onto the garage floor or your own clothing. How the heck do you do it?'"

Next Egan gives the audience the step-by-step process that he used to tell this tale:

"Step 1: Place a 'suitable container' under the sump or oil reservoir—which, in the Buell's case, is in the hollow swingarm above the end of the muffler—and remove the plug. A stream of scalding hot oil will run down over the rear of the muffler and cascade into the pan, like Niagara Falls in a nightmare. Some will run down to the far end of the muffler and onto the floor. Or trickle warmly down your forearm and into your sleeve.

"Step 2: While oil is dripping from the drain hole and muffler, remove the small chin fairing and place another pan under the oil filter. Remove the filter with a web-type tool and stand back as oil from the engine and filter run over the front of the muffler and into the pan. Much of the oil will follow the bottom of the muffler and run onto the floor. Expect some to drip off the filter wrench onto your blue jeans. Accidentally drop the slippery, hot filter into the pan for a nice splash effect.

"Step 3: Carefully fill the new filter with oil, spilling hardly any at all, then screw it into the engine and put the drain plug back in. Here's where you give the drain pan an accidental kick so that a small tidal wave of oil flops onto the floor. Then refill the reservoir using a funnel with too small an opening so that it overflows immediately and burps oil onto the swingarm. Before putting the chin spoiler back on, use massive amounts of contact cleaner/degreaser to clean up the muffler and floor, along with ecologically friendly piles of oil-soaked paper towels.

"Step 4: Carry the main oil drain pan across the workshop and dump it down a large funnel into a disgustingly filthy, oil-streaked, red-plastic five-gallon gas can with the words 'DRAIN OIL' scrawled across it so people don't accidentally drink from it.

"Step 5: Check to make sure this can isn't already almost full. Otherwise, about two quarts of dirty drain oil will well up around the sides of the funnel and run onto the floor, as mine did. Expect some oil to run down the back side of the pouring spout on the drain pan and drip onto your running shoes.

"Step 6: Mop up the oil spill with more paper towels and wring them out over your drain pan. Clean the whole area with half a spray can of contact cleaner, but don't breathe any of the fumes. When everything is cleaned up, start the bike and check it for oil leaks. Mine was fine; not a sign of a drip.

"Step 7: Wipe your tools carefully, put them away and then go into the house. Throw all your clothes—including the running shoes—into the washer and then take a shower. Put on clean clothes and return to the workshop to have a beer and ponder the evening's work. Now, you're done.

Peter Egan
Cycle World

A "Zen" moment as the editor-dude changes the oil in his EcoDiesel. (Like it's big brother, it holds almost three gallons.) The unattended drain bucket almost overflowed.

As mentioned, I wish I could tell a story like that. The best I can do is to add a footnote to his yarn. From TDR's Greg Whale: "Dear Mr. Egan, please add steps 3a and 3b.

"3a: As you are pouring fresh oil into the engine make a note that the fresh oil ($8/quart) is leaking from the location of the oil drain plug. Oops, it's not leaking, it is pouring. STOP ADDING FRESH OIL!

"3b: Rush to install the oil drain plug."

Now, in fairness to the folks at Cycle World and to Peter Egan, I have to give credit where the credit is due. You can find all of Egan's books from his Cycle World days and from his Road & Track editorials by doing a quick search at Google for your favorite place to shop for books or go directly to Amazon.com.

The "Zen" quotes came from Egan's book "Leanings 3: On the Road and in the Garage with Cycle World's Peter Egan.

While you have your computer fired-up, take a few minutes to log onto www.cycleworld.com and start a new subscription! You'll not be disappointed.

Enjoy Mr. Egan's writing. Buy one (or all) of his books. Subscribe to Cycle World. I'm hopeful my endorsements prompt you to make a purchase. Again, some great reading material, you won't be disappointed!

Robert Patton
TDR Staff

While we're on the subject of lube oil...

The Motojournalism thing, combined with excerpts from Mr. Egan and Greg Whale tie-in give you a humorous look at the mundane oil change(s) that we all have to endure. I can only imagine those of you guilty of Steps 3a and 3b, myself included.

Now, let's move on to the serious look at oil in the news, the new lube oil specifications that will be introduced in December. In the update that follows, our oil-guru, John Martin, tells us about the new CK-4 and FA-4 oils.

Robert Patton
TDR Staff

PC-11 UPDATE
or
You're Getting Something Besides Red Socks for Christmas
by John Martin

If you readers will recall, I thoroughly discussed the upcoming new engine lube oil performance category, PC-11, in October of last year, TDR Issue 89. I mentioned that the API (American Petroleum Institute), the ASTM (American Society for Testing of Materials) and the SAE (Society of Automotive Engineers) were feverishly working to develop two new diesel engine oil performance categories as requested by the EMA (Engine Manufacturers Association) to improve diesel engine fuel economy. This is part of our nation's greenhouse gas (GHG) reduction effort.

Well, folks, on December 1, 2016, it's finally going to become a reality. This will be a major change for the diesel engine oil market for several reasons.

First, there will be two new performance categories, API CK-4 (PC-11A) for existing diesel engines and API FA-4 (PC-11B) for new/post 2017 engine designs which will tolerate lower viscosity oils. (Viscosity is still the most important parameter influencing both fuel economy and horsepower.)

API CK-4 is no big deal, other than the cost and time it takes to develop a new diesel engine oil. Current estimates are that it costs over one million dollars to develop a new oil even if it passes all the required laboratory tests the first time out. And that doesn't count the time and money it takes to field test the new product in a variety of engines in different types of service. In this day and age, you need at least two to three years of field testing to feel comfortable about the performance of any new diesel engine oil.

Now, the new FA-4 oil is creating quite a stir for several reasons. Oil marketers get very nervous when someone suggests putting an FA-4 oil in an older engine design with looser engine clearances, yet having to spend millions of dollars to develop a product to be used on only 2017 and later engine designs doesn't fully justify the tremendous expenditures involved.

So both end users and oil marketers will want to see how many other engines the FA-4 oils can safely be used in to maximize their investment. In the end it will probably be up to each engine manufacturer to determine which of their engines can tolerate FA-4 oils without sacrificing engine service life. Big Oil will want you to put this oil in everything to simplify logistics, but most end users will want to make sure FA-4 oils don't void their warranties. It's a shame oil marketers didn't better educate the end users ahead of time so they could make more intelligent selections.

Due to the extremely high costs associated with developing and marketing two completely new oils, many oil marketers are taking a closer look at product line simplification. ConocoPhillips, for example, currently markets four diesel engine oils under its brand umbrella, Conoco, Kendall, Phillips, and 76 Lubricants. To minimize developmental and marketing costs, they have decided to drop the Conoco and 76 Lubricants brands from their diesel engine oil lineup.

I'm sure other oil marketers are either reducing product lines or having a brand represent only one of the new oils. For example, Shell, which has both their Rimula and Rotella brands, also owns Pennzoil and Quaker State. Will they eliminate some oils from this complicated lineup? I predict that both Rimula and Quaker State won't offer the full range of FA-4 products to minimize expenditures.

It's going to be fun with a lot of to-ing and fro-ing. Take the time to carefully read the API label on the container (see examples). Note that the FA-4 label will be shaded to make it stand out a little. API CJ-4 oils will continue to be produced and marketed for at least a year before that performance category is obsoleted. The CK-4 oils shouldn't pose any problems for you.

Who knows, once there is product available (both CK-4 and FA-4), I might have the TDR guy go on a spending spree so we can check the composition of all these new-fangled oils and see what is really best for your truck.

John Martin
TDR Writer

WHAT IS NEW FOR 2013: EMPHASIS ON THE CUMMINS ENGINE

ISSUE 80 – TDREVIEW

by Robert Patton

	MANUAL		AUTOMATIC	
	Old	New	Old	New
2500 pickup	350/610	350/660	350/800	370/800 (68RFE)
3500 pickup (SRW or DRW)	350/610	350/660	350/800	370/800 (68RFE) 385/850 (Aisin)
3500/4500/5500 Cab and Chassis	305/610	320/650	305/610	325/750

From the article you noted the obvious: the horsepower and torque ratings for the new 2013 trucks vary based on model (2500 versus 3500 consumer pickup) and type of chassis. Within those categories the rating then varies based on the type of transmission that is offered. The 2500 is only offered with automatic 68RFE. The 3500 (SRW or DRW) automatic can be either the 68RFE or the Aisin AS69RC. The cab and chassis automatic is also the Aisin AS69RC. The manual transmission for all trucks is the existing G56.

Also, from the article I noted that fuel mileage should improve by as much as 10%. As you might expect, we were inundated with questions about the cost and the amount of DEF that would enter into the 10% miles per gallon improvement.

To answer the question for TDR members, I did some research back to Issue 75, page 68.

In that article, there was the comparison of the Ford, GMC and Ram by an unbiased magazine group led by Pickuptruck.com. We lost miserably by 1mpg towing with a load. Ford showed 9.5mpg versus the Ram at 8.5. For their 2000 mile trip, the fuel for the Ram was $99 more than the Ford. However, the Ford used an estimated 6 gallons of DEF ($6 \times \$3 = \$18$). If we assume, as mentioned in the Ram literature, that the Ram will get 10% better mileage… well, let's go ahead and figure that the Ram can equal the Ford at 9.5mpg.

I think you see where this is going: For a 2000 mile trip the new 2013 will save you ($\$99 - \$18 = \$81$) $81 over the 2012 engine in my fictitious example.

So, in really round numbers, the advantage to using the DEF is about 8%.

What Does This Mean to You?
Changes to Exhaust Emissions

While we clearly understand the race between the manufacturers for higher power levels and improved fuel economy, my story did not do a good job of explaining the emissions reason(s) that the engine was changed.

In Issue 74 I wrote a lengthy article that talked about the emissions puzzle and the forthcoming government regulations that are being phased in for over-the-road tractors. No longer do the regulations apply to the emissions of particulate matter (PM) or oxides of nitrogen (NO_X) which were "big two" of diesel exhaust. These two emissions are at such low levels that they are difficult to measure. Now the standard to be met is a carbon dioxide (CO_2) standard. (Essentially fuel economy—the less CO_2 the better the fuel economy.) This standard is set by the EPA or by NHTSA.

At the conclusion of the article, I was mistaken when I commented, "Regardless, our truck will move to fuel economy standards for vehicles over 8500 GVWR that will be administered by EPA or NHTSA. The trucks no longer fall under the car and light truck standards as administered by CAFE guidelines."

The consumer 2500/3500 pickup trucks stay under the CAFE guidelines and are still in "Tier 2, Bin 5." To try and explain what Tier 2, Bin 5 means is futile. At Ram and Cummins there is an engineer guy in the corner that has charts and graphs to deal with the complexity of Tier 2, Bin 5.

However, do realize that that engineer is charged with trying to give you an engine with less CO_2 emissions. Remember, less CO_2 = better fuel economy.

The same engineer guy has the same assignment for the cab and chassis trucks to meet the fuel consumption standards for the "big rig" type vehicles.

Now, what does all this gobbledy gook mean to you and why was the engine changed for 2013? Turn to the next page to find out!

TIER 2, BIN 5

THE ENGINEER IN THE CORNER WITH CHARTS AND GRAPHS

I mentioned that it is futile to try and understand the meaning of "Tier 2, Bin5," and introduced the fictional "engineer in the corner with charts and graphs." A quote from an article about the EPA's quirky emissions and fuel economy rules from the periodical Automotive News will give you an idea of what I am talking about.

From 10/15/2012 Automotive News, "CAFE Guide: A Map Through the MPG Maze:

"The federal government has a screaming deal for automakers that have struggled to find a market for electric vehicles: Two for the price of one.

"In the 2017 through 2019 model years, regulators will count each EV produced as two when calculating whether automakers are meeting new fuel-economy standards for light vehicles.

"The standards have a simple-sounding goal: Cut fuel consumption and emissions. But the rules—at 1994 pages and more than half a million words are anything but straightforward filled with little-known peculiarities and fine print added to help get automakers on board.

"Each automaker's vehicle fleet ultimately will have to average at least 54.5mpg. However, the 54.5mpg figure is based on strict federal testing criteria, with real-world fuel economy expected to be around 40mpg.

"Automakers have a myriad of ways to earn credits, such as using certain air-conditioning technologies to reduce emissions and building large numbers of hybrid trucks. Credits accumulated for overachieving can be shuffled, traded or sold.

"One key provision: A company that falls short one year can make up the difference with credits obtained as many as five years earlier.

"Among other loopholes that automakers might use to their benefit:

- Automakers that sell fewer than 50,000 vehicles annually in the United States are granted two additional years to begin meeting the standards.
- Some versions of a particular nameplate will be held to a higher standard than others. The two-wheel-drive Escape, for example, qualifies as a passenger car. But the four-wheel-drive Escape is considered a light truck and therefore has a lower emissions and fuel-economy target.
- So-called off-cycle credits account for benefits that may not be fully measured in testing. Credit can be earned for features such as active grille shutters, engine stop-start and solar panels.
- As mentioned, EVs count double from the 2017 through 2019 model years, after which the multiplier declines annually. Plug-in hybrids, such as the Chevrolet Volt, count as 1.6 vehicles each at first.

THE CHART AND GRAPH ENGINEER – PART 2

In my research to write the "10 Back" column (page 8) I ran across a previous article that attempts to explain the "Tier 2, Bin5" rules. If you'll suffer through this brief explanation, I think you'll see why we should leave this task to the Chart and Graph engineer. In the TDR Issue 38 article, I spoke of research at www.dieselnet.com to try and make automotive and light-duty emissions comparisons. The results were confusing and led me to a defeatist comment, "Forget the numbers (Tier 2 regulations), they will make you crazy." I resigned to leave it to a professional.

From January 2003, Automotive News' Harry Stoffer succinctly describes the Tier 2 rules. "Automakers, demonstrating their commitment to the environment, generally supported Tier 2 rules when they were adopted by the Clinton administration in late 1999. The rules combine cars and light trucks, as well as gasoline, diesel and other fuels, into the same regulatory framework. A series of compliance categories, called bins, were created.

"Automakers will be free to certify some dirtier vehicles to higher bins as long as they also certify cleaner vehicles to lower bins and reach the overall standard for average fleet emissions."

Got it? Tier 2, Bin 5 – whatever that means.

What Does This Mean to You?
Changes to Exhaust Emissions (Continued)

What do the exhaust emissions mean to you? Three things come to mind:

First, the obvious: the engineers will continue to refine the engine to give you better fuel economy (oops, lower CO_2 emissions).

Second: the engine(s) will continue to be refined as there are on-board-diagnostics requirements for advanced monitoring of the emissions controls.

Third: the up-the-ante, neverending race for horsepower and torque bragging rights between Ram, Ford and General Motors will continue. Can you believe some of the numbers and tow ratings that are available?

Let's Do a Recap

As a recap, here is a list of the big changes to the engine that we have seen in the past:

1/1/91 – The engine gets a charge air aftercooler added to the intake air system.

1/1/94 – The '94 engine uses a mechanical Bosch P7100 fuel pump rather than the mechanical Bosch VE fuel pump. A catalytic converter is added to address particulate matter.

1/1/98 – The engine uses the electronic Bosch VP44 fuel pump and the cylinder head is now a 24-valve design.

2003 model year – The high pressure, common rail (HPCR) fuel system is introduced one year early in the new-for-2003 Third Generation truck

1/1/04 – A catalytic converter is added to the exhaust to meet the 2004 standards.

1/1/07 – The 6.7-liter engine is introduced to the marketplace and meets the 1/1/07 emissions as well as the forthcoming 2010 emissions guidelines. Exhaust aftertreatment now includes exhaust gas recirculation, a NO_x catalyst, a diesel oxidation catalyst and a diesel particulate filter. The cab and chassis trucks are not required to have the NO_x catalyst.

1/1/10 – The cab and chassis trucks add selective catalyst reduction (SCR), which is a fancy term for urea injection, to control NO_x.

Now, unlike those big hardware changes that we've seen in the past, I'm thinking that future changes to the engine will be more like refinements. If I am wrong in this assessment, in several years you'll see me "eat crow" in our "Backfire" section of the magazine.

Death of the Manual Transmission?

No doubt that subtitle caught your attention. And, since I've introduced the subject, I'd like to stop and ask, "Why do you think that competitors Ford and General Motors no longer offer a manual gearbox option?"

Well? The answer may not be what you think.

The obvious: People are lazy and don't like to shift. Besides, dear TDR members, we all know you can't shift and text at the same time.

The obvious: Bigger power numbers mean bigger clutches and bigger gearboxes—perhaps bigger warranty expenses too, as clutch abuse is not a warranty item but often is taken care of *once* for customer goodwill.

The not so obvious: To certify a power rating takes lots of engineering time and lots of testing expense. More ratings, more expenses.

The really not so obvious: The certification process and the ratings numbers are different for the consumer 2500/3500 pickup trucks than they are for the cab and chassis 3500/4500/5500. And, although this is buried in the "really not so obvious" paragraph, this may be the real reason for the death of the manual transmission.

How so?

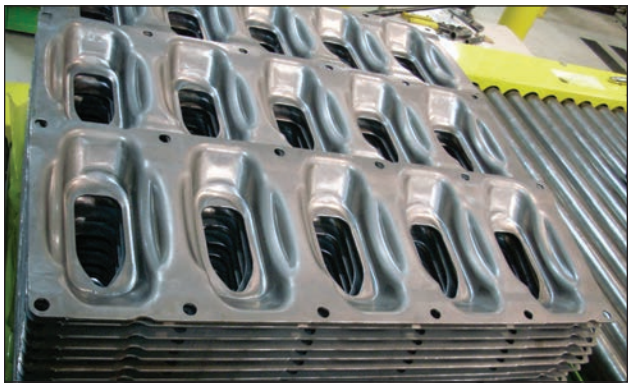
To see the correlation you have to understand how the government does the emissions (or miles per gallon) testing on your Turbo Diesel truck and/or automobile. The consumer pickups are strapped to a chassis dynamometer and run through their paces. Imagine that there is an emissions "window of variance" that follows the engine's power curve. Likewise, the engine has a torque range that is best suited for a good fuel economy number. To keep the engine at its best performance, you want the predictability of an automatic gearbox with as many speeds as possible to keep the engine within the emissions/mileage variance.

And, although the testing of the cab and chassis trucks is done on an engine dynamometer, a similar window of variance for emissions and fuel economy exist.

Now, if we leave the testing up to "Marvin the manual shifter dude," well, I think you see the problem. Marvin doesn't have access to the same load, speed and shift algorithms that the software engineer of the engine/automatic transmission combination has at his computer. Yes, the engine/powertrain's electronic control unit (ECU) is more predictable and smarter than Marvin the manual shifter dude. Also, consider that the ECU can be programmed for all kinds of power-to-load scenarios and gearbox choices that give you six to eight forward speeds and I think you see why manual gearboxes are becoming less common in *any* type of vehicle.

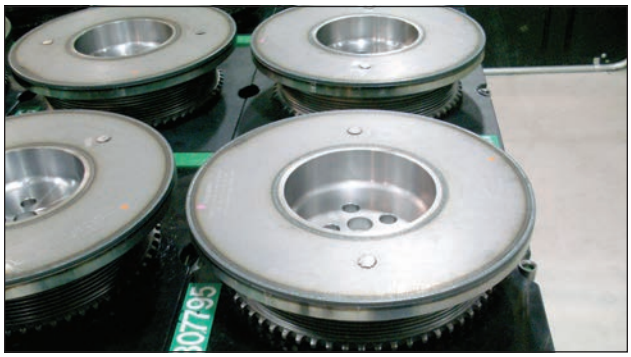
Back to the Story – What is New for 2013?

For the 2013 consumer pickups and 2013 cab and chassis engines there are lots of parts that are new. The folks at Cummins' Columbus MidRange Engine Plant (CMEP) allowed me to photograph the new hardware and took the time to explain "What this means to you" on each part that we examined. The following items were changed on the 2013 engine:

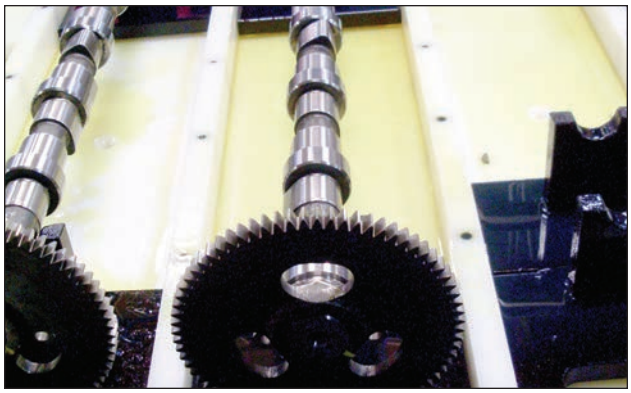


In 2012 a bedplate was added to the engine to increase block strength and reduce noise. This is a picture of the redesigned part used in the 2013 engine.

The new payload and towing ratings for the 2013 Ram necessitated changes to the truck's frame. Redesign of the engine oil pan was required to clear the suspension and frame. The oil pick up tube was also redesigned.



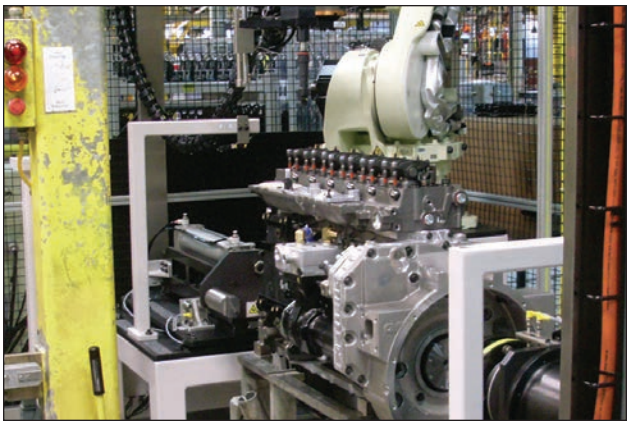
With new horsepower ratings come new torsional vibrations that have to be absorbed. This is the new vibration damper.



With the cab and chassis engine there was a change the camshaft's intake duration and lift. Power ratings and fuel economy necessitated the changes. The cam for the consumer pickup trucks remains the same. On the assembly line they do a photo scan to ensure the correct cam is used in an engine. This is the end of the cam showing the drive gear already installed.

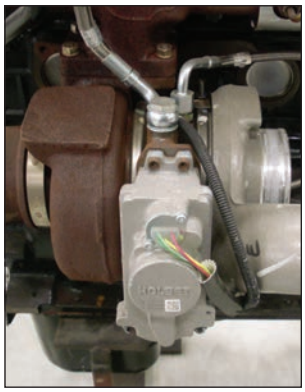
For the first time in Ram truck applications the pistons are coated in the skirt area to eliminate the chances of high/over temperature scuffing. The coating also eliminates cold start-up piston slap noise. Finally the piston bowl was redesigned for emissions concerns.

Higher horsepower and more heat call for better piston cooling. This is a picture of the piston cooling nozzle that sprays engine oil onto the underside of the piston to keep piston temperatures in check.

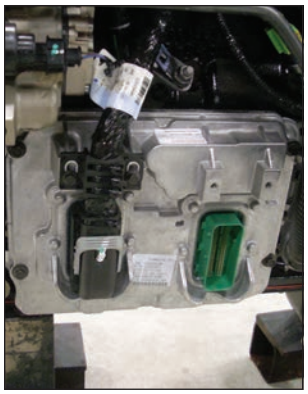


For the 2013 consumer pickup trucks, the cylinder head was revised. Here is a picture of a machine that automatically sets the valve lash of the intake and exhaust valves.

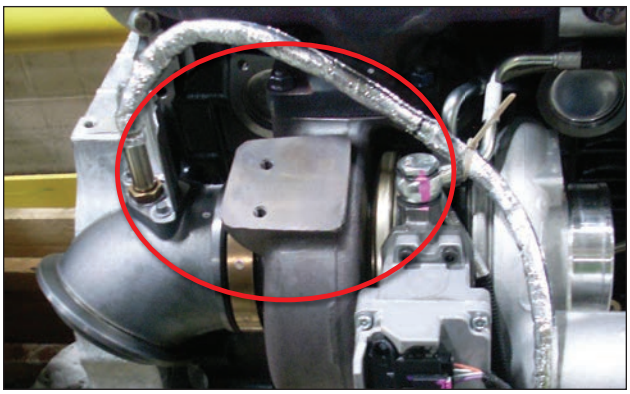
Higher horsepower, more heat, more cooling is necessary. The old engine is on the left, new on the right. Study the photographs carefully and you should see that the water pump and fan drive pulleys are slightly smaller so that they spin faster to provide better cooling.



The old turbocharger is on the left, the new is on the right. The new turbocharger is enhanced with the addition of a feature that controls the exhaust braking to maintain a set vehicle speed when descending a grade.



Old ECU on the left, new ECU on the right. New software, new coding and two 96 wire (versus the previous two 76 wire) connector affirms that there is more data to process and control the engine.



With the advent of SCR technology there is no longer a NO_X catalyst in the exhaust aftertreatment. Therefore, the NO_X sensor has been moved to the turbocharger downpipe.

In the previous engine there were individual noise isolators attached to the fuel injection lines (left picture). Now there is a rubber isolation boot that covers the injection lines (right).

As is the case with many model year or generational changes, there are lots of other knick-knack parts and sensors that are changed. For example, when you open the hood on the 2013 you'll notice that the plastic "bat wing" that surrounded the top valve cover portion of the engine has been replaced with a rubber noise isolation cover. (Oops...late breaking news: I think I'm correct, the rubber cover has been changed back to the batwing.) There are sensors that have been moved, coolant tubes rerouted, brackets changed, etc. However, for the most part, the folks at CMEP tell me that I have covered the highlights.

Finally, saving the best for last, there is word from Cummins' subsidiary company Fleetguard that the fuel filter has changed for 2013. If you will recall from the Issue 78 magazine, the folks at Ram added a "first line of defense" see-through fuel filter to the trucks frame rail.

Now the news from Fleeetguard: they have changed the filter element inside the primary fuel filter that is located on the engine. The new part number is: Fleetguard FS53000, Mopar 68157291AA. The trade name for the new fuel filter media is Fleetguard "NanoNet." This filter will fit '10-'13 pickups and '11-'13 chassis cab.

The new NanoNet fuel filter is a direct replacement for the existing Fleetguard FS43255 and Mopar 68065608AA. It has yet to be determined whether these old numbers will be superseded. Again, the new part numbers should be FS53000/68157291AA. I cannot imagine that customers would choose the old/less efficient filter…a supercession sounds logical to me.

Given that the NanoNet is a two-stage filter designed to trap smaller particles than the existing filters, there will likely be a price premium for this new media. I do not yet have the details. Also, yet to be determined, are the price and availability of the NanoNet for the '07.5-'09 pickup trucks ('07-'10 for chassis cab).

At this time the part numbers that have been pre-assigned for the older trucks:

Fleetguard	**Mopar**	
FS53001	68157287AA	(filter and shell)
FS53002	68157288AA	(filter only)

A final note about the NanoNet filter as a "better mousetrap." I took some time to read the Fleetguard literature on the filter (bulletin LT36228NA). The Fleetguard folks use a different testing process and they shy away from the "micron rating" terminology that is frequently used in the business. Regardless, word on the street has it that the old filter was a "5 micron" unit and this is a "5 micron outer with a 3 micron inner" two stage design. I understand how confusing all the marketing hype can be and I'll trust the factory-guys on this one.

Okay folks, is that enough detail for you? Again, my thanks to the folks at CMEP for helping me with the photographs and I look forward to hearing stories from our audience about the new 2013 truck and engine.

Robert Patton
TDR Staff

RAM WINS

ISSUE 83 – TDREVIEW

by Robert Patton

With the kickoff of the 2014 model year last fall, the Ram folks were in the news in magazines, performance comparisons, shows and exhibits. There were several feature articles that caught my attention. The biggest news for the Ram/Cummins Turbo Diesel faithful was the www.pickuptrucks.com (PUTC) "King of Beast" comparison. Good news for the Ram faithful, Ram wins!

Next up, a comparison by Canadian automotive journalist for the crown of "Truck King." Ram trucks win three-of-three categories.

Finally, at the Texas State Fair the Texas Auto Truck Writers name the Ram 1500 EcoDiesel the "2013 Truck of Texas."

Summaries of these press events start with PUTC's "King of Beast."

KING OF BEAST

In my recent travels, I had the good fortune to meet Automotive journalist Mark Williams of pickuptrucks.com, and Kent Sundling of mrtruck.com. More from Williams and Sundling in a minute.

These two names may sound familiar to you. They were part of the team that did a 2500 truck comparison in the Fall of 2010, "Diesel Shootout" (covered in Issue 71, page 56); and a 3500 truck comparison back in September of 2011, "Hurt Locker" (covered in our Issue 75, pages 66-68).

So what is new from writer Williams and tester Sundling? While Ram did not fare so well in the two previous www.pickuptrucks.com tests, I have good news for you. Back in early October, Mark Williams told me to be on the lookout for their "King of Beasts" shootout. It was released to the public on October 21, 2013.

Unlike the "Diesel Shootout" and "Hurt Locker" tests, this time around there were only two contenders: The Ram 3500, 2013 model, with its newly released 30,000-pound tow rating; and the closest competitor, a Ford F-450 Super Duty, 2013 model, with a maximum tow rating of 24,700 pounds.

Using the same methodical procedure used in the other www.pickuptrucks.com (PUTC) evaluations, the staff chose the Davis Dam/SAE testing route and scored the "King of Beast" trucks in acceleration, braking, fuel economy and comfort.

Behind the Scenes

Just before the test was published at PUTC I had the chance to talk with Kent Sundling at a press event. I told Kent that I wanted to do a summary of "King of Beast" for the TDR audience and asked if he could provide us with some behind-the-scenes commentary. Kent's response, "You bet! I think your readers would enjoy a look at how we went about our testing of the two vehicles."

I gave Kent our magazine deadline and went ahead writing my summary of the PUTC article. You'll find Kent's comments interspersed in the summary and italicized for clarity.

The following are Kent's thoughts prior to the test:

I was skeptical when Ram announced the 2013 3500 dually could tow 30,000 pounds, a GCWR almost ½ of a Class 8 Peterbilt. However, after the "King of Beasts" shootout, I'm a believer. As you know, we closely matched the 2013 Ford F-450 Power Stroke diesel to the 2013 Ram. Both have a gross vehicle weight rating of 14,000 pounds. For weight rating they both are Class 3 trucks, but Ford likes to call the F-450 a class 4. Since all the truck manufacturers, except Toyota, have ignored the SAE Standard J-2807 for pickup truck weight carrying and towing, the only way to know what a new truck is capable of is a road test towing top capacity trailers through mountain grades. And that's what we did. These trucks towing heavily loaded trailers felt surprisingly similar. They took turns winning the test we threw at them. But, in the end, one was a clear winner slowing down and safely handling 14 tons in the rearview mirror.

The stats: The 2013 Ford F-450 was a crew cab, long bed, 4x4 with a 4.30 rear axle ratio. It had a maximum towing capacity of 24,700 pounds. The 2013 Ram 3500 was a crew cab, long bed 4x4 with a 4.10, rear axle ratio. It had a maximum towing capacity of 28,800 pounds. To be fair we loaded both Load Trail 32' flatbed trailers with pallets of rock to Ford's maximum 24,700 pounds.

Acceleration Test

The following quote from PUTC's writer Mark Williams sets the stage for the evaluations.

"We wanted to find out: How well can these big trucks pull the heavy loads their manufacturers say they can pull, and how comfortable do they feel doing it? We started the acceleration portion of our test with level-ground runs to give us a baseline. Of course, what we really wanted to find out was how well these two pickups could pull driving up the two toughest, most punishing grades in the country—Davis Dam and the Eisenhower Pass."

The following are Kent's comments as they saddled-up to start the evaluation:

I ordered the trailers from Load-Trail to safely haul 30,000 pounds. These heavy duty goosenecks were painted in Kubota orange, which made them easy to see on the road in front or back. We picked electric-over-hydraulic disc trailer brakes on the dual tandem axles. This is as powerful as it gets in a gooseneck without air brakes. Stopping power is as important as torque and horsepower when were towing over 12 tons. Interstate-70 through Colorado has many run away ramps, but we never want to test drive one.

Our test started in my back yard where we loaded a 14,350 pound 1942 WWII Army Half-Track M2-A1 on one of the trailers. We used the restored half-track as ballast for 0-40 mph acceleration and 40 to 0 brake tests before we climbed the mountains. The total weight of the trailer: 22,620 pounds.

The 10-foot dovetail was hydraulic, making it easy to load the vintage half-track. We opted for complete trailer air suspension and I was glad we picked the air suspension axles as Highway 191 crossing Arizona to Utah had the trucks almost airborne. The trucks bounced dramatically more than the trailers.

The new 30,000 pound trailer capacity of the Ram 3500 has ignited another race—trailer manufacturers have to catch up with bigger trailers. A few companies were making large gooseneck trailers for the "Hot Shot" haulers. However, one of the reasons it's hard to find gooseneck trailers with a GVWR over 26,000 pounds is the federal excise tax for trailers 26001 pounds and over. This IRS road tax is 12%. Ouch!

How did the Ram 3500 truck perform? Let's start with a recap of the level ground test.

No load, 0-40mph test
- Ford: 5.91 seconds
- Ram: 7.0 seconds

No load, 1/4 mile test
- Ford: 18.4 seconds at 78.3mph
- Ram: 19.1 seconds at 77.6 mph

Gooseneck trailer (22,620 pounds), 0-40mph
- Ford: 18.6 seconds
- Ram: 18.9 seconds

Now the towing test, a run up the Davis Dam highway. A little background from PUTC's Mark Williams: "We like to use the section of Arizona Highway 68—which heads East from Bullhead City, Arizona—because it provides us with a long stretch of two-lane highway that climbs more than 3,000 feet in elevation over a relatively short 10-mile stretch. At certain points, the grade is at least 6 percent."

Ford – 12:28 and 12:17 minutes; maximum speed 56.3mph, slowest speed 45.5mph
Ram – 12:20 and 12:24 minutes; maximum speed 57.8mph, slowest speed 43.5mph

Another towing test was the Eisenhower Pass Run. The test route is Interstate 70, eastbound starting at Dillon, Colorado, and travelling for 7.2 miles from 9,000 to 11,000 feet at an average grade of 6%.

Ford – 11.44 minutes; maximum speed 53mph, slowest speed 31mph
Ram – 10:31 minutes; maximum speed 57mph, slowest speed 37mph

Conclusion: The PUTC writers did not do a summary after the acceleration tests. My summary: this is a darned close horse race. I've already mentioned that Ram was chosen as the winner. Read on to see how evenly matched these trucks are.

Braking Test

Let's start with the unloaded 40mph-0 test.

Ford: 117 feet
Ram: 104.5 feet

Loaded vehicle (without the use of trailer brakes) 40mph-0 test

Ford: 165.5 feet
Ram: 148 feet

As a subset to the braking test, the PUTC writers tested the effectiveness of each truck's exhaust brake by setting the cruise control to 50mph on the 10-mile downhill descent to Davis Dam. How many times would the driver have to touch the brakes to keep the speed in the 50mph window?

Ford: 20 times and 18 times
Ram: 7 times and 12 times*

*The Ram did not downshift to third in the 12-times scenario.

Same test down the shorter (7.2 miles) Eisenhower Pass.

Ford: 18 times
Ram: 11 times

In the for-what-it-is-worth department the PUTC testers took an infrared thermometer and recorded the temperatures of the front rotors at the bottom of Davis Dam and Eisenhower Pass.

The readings:

Ford: 375° (Davis); 1105° (Eisenhower)
Ram: 262° (Davis); 740° (Eisenhower)

The PUTC braking test data and my brief summary do not begin to tell the story. Comments from Kent give you the details and it is this kind of detail that made Ram/Cummins the winner. Kent writes:

I've been complaining about Ford's diesel exhaust brake since it was introduced in 2011. There is no button to turn it on like Ram and GM have. Ford says it comes on automatically in Tow Mode. I can't tell when it comes on. Going down a steep grade, you can only grade shift so many times, then if there isn't enough RPM band left to downshift before hitting the rev limiter, it will upshift and make you go faster, leaving you only the brakes. I'll stop complaining. Bottom line: the Ford takes more braking going downhill, the brakes get hotter and you don't feel safe downhill in the mountains with a big trailer. I've seen the new 2015 Ford Super Duty at the Texas State Fair. It has a larger turbo and an exhaust brake button. Future tests might be interesting.

Exhaust brakes for diesel trucks towing trailers in the mountains are very important. Combine them with grade shifting from the transmission and the Rockies are less scary. I was very impressed with Ram's new Smart Brake exhaust brake. The Ram 3500's new Smart Brake offers two levels of exhaust brake aggressiveness: "Auto" is meant for all-around usage, while "On" provides maximum exhaust back pressure braking. We ran all of our exhaust brake testing runs in the "On" position.

As you saw in the data, during the first run, the Ram's Aisin transmission was quick to downshift all the way to 3rd gear, revving the engine on one particularly steep stretch to 3,500 rpm until the halfway point, then upshifting to 4th gear for the remainder of the run. Any time our speed exceeded 56 mph, we brought the speed back down to 45 mph by braking and then we let the truck go again. For that full 10-mile run we needed to touch the brakes on the Ram just seven times. On the next run, where the transmission never did kick down to 3rd gear, but instead only got down to 4th gear, we needed to touch the brakes 12 times.

The Ford F-450 was a different story. Without a dedicated separate exhaust brake activation button all you can do is turn on tow/haul. Unfortunately, it doesn't do as good a job of slowing the vehicle as the Ram's bigger, more aggressive exhaust brake. Down the Davis Dam section, we had to brake 20 times on the first run and 18 times on the second F-450 run.

And then there was the Ram 3500 "alone test" and the big trailer (28,800 pounds) facing Eisenhower-Dillon run. Ram 3500 only braked 10 times down the hill. I'll say it again "only braked 10 times." It was very controllable, towing almost 29k, the trailer brakes all worked. Grade shifting was perfect and the exhaust brake was the best in the business. Going down the 7 % grade, it felt comfortable and controlled. Braking 3 times coming out of the tunnel, then into the groove with the exhaust brake and grade shift controlling my speed. I was not thinking about runaway ramps, only getting to the next destination.

Oddly enough, the Ram 3500 with the larger load caused the front rotors to be 820° at the stop sign at the bottom on the Dillon off ramp.

Fuel Economy

When you keep fuel filling records over a 1500 mile test, your data is not suspect like it would be with a one tank fill-it-up. The towing results:

Ford: 7.95mpg
Ram: 8.08mpg

They tested the truck's on-board computer for accuracy by averaging the numbers seen between fill-ups. The Ford showed 8.5mpg, the Ram showed 8.2mpg. Give the closest-to-the-pin award to Ram.

Once again, it is nice to have some comments from our behind-the-scenes correspondent. Kent writes:

On our full-length trip, the Ram recorded the best tank average at 10.3 mpg (its worst was 7.5 mpg); the Ford's best was 9.6 mpg (its worst was 7.0 mpg).

Comfort

The reviewers praised Ram's ride quality and noted that the seats (Laramie trim) were more comfortable after a long day's ride.

Ram Laramie trim package.

Kent gives us some insight into the subjective category of "comfort":

My only complaint with the Ram has to do with the thickness of the steering wheel. Does it have to be as thick as a baseball bat? We found that holding onto the wheel for extended periods was tiring and at times, a little clumsy. The Cummins diesel is louder in the cab of the Ram, or at least a more noticeable frequency than the F450.

I wish the Ford had the DEF gauge in the dash like Ram. Ford has an "OK' light, for what it's worth. When towing, you use more DEF, and knowing how much is left before the next "100 miles to the next town" would be good. Glad to see both trucks had the DEF fill cap behind the fuel door. The Ram fuel tank could be larger; 32 gallons is not enough for the big trailer hauler.

And The Winner Is…

The PUTC writers did not use an elaborate system of points for this and/or points for that. Looking back, the Ford won many of the performance tests. In the end it was a subjective evaluation. The staff at PUTC decided that, "the Ram also had higher top speeds up the steepest grades, handled the heavy loads with more control, and kept the drivers more comfortable and less stressed. With all that said, we finally say congratulations to the 2013 Ram 3500 HD, our winner and last beast standing in this bloody two-truck battle."

Should you want to read the full story go to www.pickuptrucks.com and click on the category "Special Reports."

For now, my thanks to PUTC for allowing us to use summary bits and pieces from their test.

Robert Patton and Kent Sundling
TDR Staff TDR Writer

FINAL COMMENTS/MAXIMUM LOAD

A final comment from Kent about the PUTC "King of Beast" test: After the side-by-side comparisons were completed, writers Williams and Sundling did some additional testing on the Ram. Kent gives us the story:

Extra loading for author Sundling's adventure.

The last day of our adventure, the Ram HD was alone. We loaded up another 3,804 pounds onto the trailer to the maximum trailer weight, over 28,800 pounds. Although we did not get an exact time, our unofficial time keeper had the finishing time for the Eisenhower Pass run was in the high 13-minute range. Top speed at its top maximum GCWR number was 48mph. It held 30mph for most of the uphill run; right near the top, the speed dropped to 28mph. It seldom hit 3000rpm, and would shift down at 2800rpm. Impressive run, I passed many semi-trucks. I had all day, so I checked temps relative to towing; Coolant temp peaked at 222°; transmission peaked at 188°; and engine oil peaked at 228°.

With this bigger load, the Ram bounced more going up the mountain pass.

I was skeptical about Ram's 30,000 pound trailer claim, but now I'm comfortable that the truck is competent. I'm impressed; we passed semi-trucks on the way up and on the way down mountain passes. I now believe Ram's towing ratings are realistic, with good trailer brakes this is the new towing standard to beat.

Robert Patton and Kent Sundling
TDR Staff TDR Writer

CANADIAN TRUCK KING

I'm going to tip my hat to writer Mark Williams of PUTC fame. He did a succinct summary of the Canadian Truck King comparison. Mark's evaluation: "The Truck King Challenge fielded 16 competitors for the event: Eight trucks in the over $45,000 category; five pickups in the under $45,000; and three pickups in the heavy-duty category.

"The multi-test event took place in Kawartha Lakes (light-duty trucks) and London, Ontario (heavy-duty trucks), with an expert panel of five judges making real-world truck evaluations that focused on work capability, fuel consumption and features. The testing included towing an 8,000-pound trailer, carrying 1,800 pounds of payload and subjecting the vehicles to some light off-roading. This was the seventh year of the competition.

- **Under $45,000:** Chevy Silverado 1500 (5.3-liter V-8); Ford F-150 (3.7-liter V-6); GMC Sierra 1500 (5.3-liter V-8); Ram 1500 (3.6-liter V-6); Toyota Tacoma (4.0-liter V-6). Winner: Ram
- **Over $45,000:** Chevy Silverado High Country (6.2-liter V-8); Ford F-150 (5.0-liter V-8); Ford F-150 (3.5-liter EcoBoost); GMC Sierra 1500 Denali (6.2-liter V-8); Ram 1500 (3.0-liter V-6 EcoDiesel); Ram 1500 (5.7-liter V-8); Toyota Tundra (5.7-liter V-8). Winner: Ram 1500 EcoDiesel
- **Heavy-Duty:** Ford F-350 (6.7-liter); GMC Sierra 2500 HD (6.6-liter); Ram 2500 (6.7-liter). Winner: Ram 2500"

Wow, some tough competition! With all the vehicles in the mix, I guess I'm surprised to see that a Ram truck won all three categories.

TEXAS AUTO WRITERS

Finally, each year the auto writers of Texas gather at the State Fair and evaluate both automobiles and pickup trucks. Elsewhere in the TDR (BITW, page 38), you can read about how important the Texas marketplace is to the pickup truck manufacturers.

With the state of Texas accounting for one of every six trucks sold in the US, it is a big deal to be named the "Truck of Texas." Again, Ram wins, with the 2014 Ram 1500 EcoDiesel taking the honors.

Robert Patton
TDR Staff

PRINT THE BAD – PRINT THE GOOD

As I mentioned in the opening paragraphs, the TDR gave credit where it was due (hats off to the PUTC staff) and I cited them as the source and presented data from two previous truck comparisons that they had done—the "Diesel Shootout" (Issue 71) and the "Hurt Locker" (Issue 75). In those comparisons we essentially printed the bad, as the Ram Turbo Diesel was not…well, it was not.

With this recent PUTC evaluation there is redemption for the Ram/Cummins rank-and-file and a cause for celebration by the loyal fan base that is the TDR membership. Yes, it is refreshing to print the good.

So, let's not just stop with PUTC's Mark Williams' and Kent Sundling's comments. As they were complimentary, so were the folks at The Truth About Cars (TTAC) web site (www.truthaboutcars.com).

The TTAC review was forwarded to me by a friend. Since I had not yet visited their web site, I took a minute to check it out.

In my search for the Ram 3500 evaluation I was captivated by some of their editorial content. After reading the entire article on Porsche and the Porsche brand, titled "Cayenne won't help ya, Cayenne won't do you no good," dated November 27, by their editor Jack Baruth, I was convinced that these folks had a no-holds-barred attitude in their evaluation of products.

Enough rambling and suspense. What did TTAC have to say about the Ram 3500? The following are some quotes from author Alex Dykes' review:

"Ram was the first to market with an exhaust brake in 3/4 and 1 ton trucks and they continue to lead with one of the best on the market. This system shouldn't be confused with the "Jake Brakes" found in Cummins' big-rig engines: the system Cummins employs here is sometimes called a "potato brake" because it operates by closing the vanes of the variable geometry turbo charger to increase back pressure and thereby increasing engine braking. This type of engine brake is rated in horsepower for some reason, and the 6.7L diesel now brakes to the tune of 225 ponies which has a big impact on brake pad life if you tow in mountainous terrain.

"When it comes to pickup trucks, especially heavy-duty trucks, shoppers are extremely brand conscious and extremely brand loyal. Think about it, how many people do you know that rotate around pickup brands with every purchase? As a result, it would be easy to say the Ram 3500 is a great truck for Ram loyalists and the other trucks are all lovely too. However, the 2014 Ram might be the first truck since 1994 to sway hearts and minds. Not only does the Ram deliver the best interior and infotainment system in the segment, but it also delivers 30,000lbs of bragging rights, a stellar Cummins engine and a rear air suspension that is nothing short of revolutionary for the heavy-duty pickup market. If you're looking at an F-350 or eagerly waiting that new Silverado 3500, swallow your pride and give the Ram a test drive. You'll thank me later."

MORE GOOD NEWS

Motor Trend Names Ram 1500 EcoDiesel as 2014 Truck of the Year

This news comes to us from an early December press release from the folks at Ram. The following are excerpts from their press release:

Motor Trend has selected the Ram 1500 EcoDiesel as its 2014 Truck of the Year.

The announcement was made at the Chrysler's Warren Truck Assembly Plant in Michigan, the birthplace of Ram Trucks.

Nine Truck of the Year contenders were put through an extensive battery of testing designed to evaluate virtually every aspect of each vehicle. In addition to the 2014 Ram 1500 EcoDiesel, the judges examined other all-new or significantly updated trucks the industry produced this year: the Chevrolet Silverado, GMC Sierra, Ram Heavy Duty, and Toyota Tundra pickups; and the Ford Transit Connect, Mercedes-Benz Sprinter, Nissan NV200, and Ram ProMaster vans.

With the votes cast, the Ram 1500 clearly emerged as Motor Trend's 2014 Truck of the year. The judges were particularly impressed with the performance of the Ram 1500's all-new EcoDiesel V-6 engine as well as its eight-speed TorqueFlite transmission, a combination that boasts a towing capacity of up to 9,200 pounds. Further, Motor Trend's Real MPG testing supported what the team learned in Uvalde: None of the gas-powered half-ton trucks in this year's competition—be they V-6 or V-8, 4x2 or 4x4—could match the EcoDiesel's mileage. After delivering observed fuel economy of 15mpg under extreme testing at Continental's proving grounds, the EcoDiesel continued to impress during the Real MPG test loop, returning the following frugal stats: 19/26/21mpg city/highway/combined for the Laramie Longhorn Crew Cab 4x4 with a 3.92 rear axle and an even more notable 18/28/22 for the Lone Star Crew Cab 4x2 with a 3.55 rear axle.

The Ram's optional air suspension system also scored high marks in Engineering Excellence, as it delivered a compliant ride and commendable handling no matter the terrain. In terms of design, the Ram 1500 impressed with its style, packaging, and interior ergonomics: notably, the Laramie Longhorn's luxury aesthetics and real wood trim.

The breadth of the lineup was another compelling factor. Whether outfitted as a basic workhorse or optioned up to a near-luxury hauler, the Ram 1500 provides all of the capability needed in a truck.

"For 2014 we had a large and highly competitive field of contenders for Motor Trend's Truck of the Year," said Edward Loh, Editor-in-Chief of Motor Trend. "At the end of the day, though, the Ram 1500 quickly rose to the top. Not only did it withstand our rigorous testing, it thoroughly impressed our judges with its vast array of standard and optional equipment, and, most notable, its fuel-efficient, segment-exclusive EcoDiesel V-6. With 420ft-lb of torque and up to 28 'Real MPG' highway, the EcoDiesel is a true game-changer. In fact, it helped make Ram 1500 the Motor Trend 2014 Truck of the Year—and the only consecutive winner in the history of the award."

Robert Patton
TDR Staff

RAM WINS, AGAIN

ISSUE 86 – TDREVIEW

by Robert Patton

In the words of 70's country music singer Jerry Reed, "When you're hot, you're hot

(When you're not, you're not)

Members, the folks at Ram and Cummins are sizzling hot!

The balance of this article will give you a summary report of recent testing data and journalistic reviews of model year 2014 Ram, Ford and GM pickup truck (1/2 ton to 5500 series) products. However, the real proof positive of the "sizzling hot" claim lies in the numbers. Here are some sales figures for the first eight months of 2014.

	2013	2014	Change
Ram	234,642	283,256	+20.7%
Ford	499,050	497,174	-1%
GM	450,501	462,503	+2.6%

Careful now, here is some longtime advice I can offer you: Figures don't lie, but liars often figure.

In the case of Ram's sales figures, my cynical play on words is presented only so that we slow down a minute and provide some context for the numbers. These numbers were for *all* pickup trucks. Vehicle sales numbers do not give me diesel-only data. We also have to remember that the Ford F-150 is in its last year before its 2015 redesign. Regardless, a 20.7% increase by the Ram folks is impressive. Take a hike, Mr. Cynic!

Previous Test Data – Ram Wins

All right! Knowing that we have sales data that we can rally around, let's do a quick review of truck testing in the past year that could have influenced buyers' decisions.

It has been only three issues ago (TDR 83, pages 48–53) that we did a five-page *summary* of articles where Ram trucks were the winners of some high-profile testing done by three different media groups. To save you from having to reach for your Issue 83 magazine, here is a quick review:

PickupTrucks.com — "King of Beast": Ram wins in a HD3500 versus a Ford F-450 shootout.

Canadian Truck King Challenge — Ram wins three of three categories: Under $45,000 1500 Series Comparison, a Ram 1500 3.6-liter truck wins; Over $45,000 1500 Series Comparison, a Ram 1500 EcoDiesel wins; and a Heavy Duty Shootout, a Ram 2500 Turbo Diesel wins.

Motor Trend — "2014 Pickup Truck of the Year": the Ram 1500 EcoDiesel wins their annual truck award.

Did the accolades from the media bolster Ram's 2014 sales figures? The numbers certainly do indicate "yes."

I have an admission. The cynical Editor and the pragmatic industry expert Whale have both been put in their place when they would dismiss the test results in assuming that "figures don't lie but liar's figure", the rule I suggested earlier. So, enough of their attempt to ruin the party! The Ram folks are hot! Let's celebrate with Ram and Cummins with some more good news for 2014 and 2015.

New Test Data – Ram Wins (Sort Of), Ram Wins (Without a Doubt)

With all of this rambling on about Ram's good fortune, have you yet bothered to hunt up the TDR Issue 83 to check out the data?

"No, Mister Editor, that is your job: you find #83 and give us the summary."

You got me.

In the previous paragraphs I gave you the big category awards that Ram/Cummins received, as reported in the Issue 85, five-page *summary* article. So, what further data do you need?

Answer: Context, context, context, and a segue for the introduction of guest writer, Mr. Kent Sundling. All right, here goes:

Back in Issue 83 we had a review from the staff at PickupTrucks.com titled, "King of Beast." The "Beast" article was a follow-up to two other diesel truck shootouts that they had done: the fall of 2011's "Hurt Locker" (see Issue 75 for coverage), and fall of 2010's "Diesel Shootout" (see Issue 71 for coverage). One reason for providing this history is that I want to give a tip-of-the-hat to PickupTruck.com's (PUTC) Senior Editor Mark Williams for consistency in testing and reviews. You see, the prior PUTC evaluations have all been done using the SAE standard J2607 testing methods.

Additionally, I want to draw your attention to these oldie-but-goodie TDR magazine issues. You see, not everyone is a new truck buyer; there are lots of folks that will look at, or have already purchased, a used Fourth Generation truck. Check out info in the old issue and compare it to the new. While we may not have always been the winner of the previous comparisons, the earlier Fourth Generation trucks still have a lot to offer the Ram faithful.

Okay, this brings us to PUTC's Fall of 2014 comparisons (and the focus of this summary): "The 2014 Ultimate HD (3500) Challenge" and "The 2014 Ultimate Three-Quarter Ton Challenge."

The 3500 Challenge included comparably equipped 3500 crew cab, diesel-powered, automatic, 4x4, 3.73 ratio, dually trucks. The Three-Quarter Challenge included comparably equipped 2500 crew-cab, gasoline-powered, automatic, 4x4, 4.10 ratio (3.73 for the Ford) trucks.

From the title you already know the outcome: Ram wins (sort of) the Ultimate HD 3500 Challenge, and Ram wins (without a doubt) the Ultimate Three-Quarter Challenge. Now for the fun part, Mr. Editor gets to pick out the highlights.

Before I attempt my highlight/summary notes, one should, again, give credit to the PUTC test staff. Pulling data and reading from the entire 130+ page internet report makes one realize the time and expense that it takes to do this kind of test. Now, consider that they have done four different evaluations (dating back to 2010), and you begin to see the major undertaking the PUTC data represents. Impressive! The full reports are at www.pickuptrucks.com.

The Specifications:

	2015 Ford F-350 4x4	2015 GMC 3500 HD 4x4	2014 Ram 3500 HD 4x4
Cab	Crew Cab	Crew Cab	Crew Cab
Trim	King Ranch	SLT	Laramie Limited
Price	$67,885	$65,520	$69,870
Engine	6.7 PowerStroke V-8	6.6 Duramax V-8	6.7 Cummins I-6
HP @ RPM	440@2,800	397@3,000	385@2,800
Torque @ RPM	860@1,600	765@1,600	850@1,700
Transmission	Ford 6R140 6-speed	Allison 1000 6-speed	Aisin AS69RC 6-speed
Axles	3.73	3.73	3.73
GVWR	14,000	13,025	14,000
Scale Weight	8,700	8,440	8,740
GCWR	31,900	30,500	32,000
Fuel Tank	37.5	36	32

	2015 Chevrolet 2500 HD 4x4	2015 Ford F-250 4x4	2014 Ram 2500 HD 4x4
Cab	Crew Cab	Crew Cab	Crew Cab
Trim	LT, Z71	XLT	SLT Big Horn
Price	$49,545	$47,690	$49,755
Engine	6.0-liter V-8	6.2-liter V-8	6.4-liter V-8
HP @ RPM	360@5,400	385@5,500	410@5,600
Torque @ RPM	380@4,200	405@4,500	429@4,000
Transmission	6L90 six-speed	6R140 six-speed	66RFE six-speed
Axles	4.10:1	3.73:1	4.10:1
GVWR	9,500	10,000	10,000
Scale Weight	6,740	7,120	7,000
GCWR	20,500	19,000	22,500
Fuel Tank	36	35	31

Background Information

PUTC's Mark Williams gives you some background data:

> Based on reader feedback from previous Challenges, we broke this Ultimate HD Challenge into two separate sets of test, each taking a full week to execute. The first focused on closed-course track and fuel economy data, and the second centered on real-world towing up some of the toughest grades in the country. In order to participate in this Challenge, each manufacturer had to agree to provide the exact same trucks for each portion of the test. So the six trucks we tested in Michigan during Week 1 would have to be shipped two weeks later to Las Vegas for the towing portion of the Challenge. All agreed. Week 1 consisted of testing at Milan Dragway, GM's Milford Proving Grounds, and fuel-economy lops near Detroit. Week 2 had us hitting the road for towing tests at Davis Dam in Arizona and the Eisenhower pass in Colorado.

The Specifications:

Ram Turbo Diesel faithful, this is not a category where we find ourselves in the "winner's circle" (literally, the testing was conducted at a 1/4 mile drag strip). For the 2500 test, one would assume the Ram 6.4-liter Hemi with a 4.10 gear would be strong, and it was the winner. The data:

		3500HD	2500HD
Ram	Empty	17.3	16.8
	Loaded	24.3	18.2
Ford	Empty	16.3	17.2
	Loaded	23.5	18.5
GM	Empty	16.2	17.0
	Loaded	24.2	18.8

Fuel Mileage:

For the mpg test all six vehicles travelled the same Ann Arbor, Michigan, test loop of 150 miles. The load on the 3500 trucks was a 16,000 pound trailer with a 64 square-foot windscreen; the 2500 trucks had 2,480 pounds of payload.

		3500HD	2500HD
Ram	Empty	16.31	14.03
	Loaded	7.23	13.65
Ford	Empty	16.12	15.10
	Loaded	6.92	13.70
GM	Empty	16.12	14.81
	Loaded	7.76	14.09

Braking (60-0mph):

The braking test was done at GMs proving grounds. On level pavement the trucks accelerated and braked empty and then did the same exercise with the payload used in the acceleration test: the 3500 trucks were pulling the 16,000 pound trailer; the 2500 trucks had the 2,480 pound payload.

		3500HD	2500HD
Ram	Empty	148.3	155.0
	Trailer Brake 5	249	161.0 (payload)
	Unplugged	312	
Ford	Empty	156.4	147.8
	Trailer Brake 5	285	153.2 (payload)
	Unplugged	335	
GM	Empty	145.9	146.4
	Trailer Brake 5	281	150.1 (payload)
	Unplugged	326	

Performance/Davis Dam Acceleration:

The Davis Dam data for the 3500 truck is based on a test pulling right at 21,000 pounds up the 10.8-mile stretch of Highway 68 from Bullhead City, Arizona, to Union Pass Summit, a 3000 foot elevation change, with a 5% grade. The Davis Dam data for the 2500 truck is based on a test using a 2400 pound payload and accelerating up a 1/2 mile section of the roadway where the average incline is close to 7% grade.

	3500HD		2500HD	
Ram	Minutes	12.48	Seconds	46.35
	Top Speed	59.9	Top Speed	79.38
Ford	Minutes	11.32	Seconds	47.42
	Top Speed	64.1	Top Speed	76.46
GM	Minutes	12.25	Seconds	53.19
	Top Speed	60.5	Top Speed	77.74

Performance/Eisenhower Pass:

Quoting from the PUTC staff:

> We don't think there is any more extreme test for a pickup truck to have to endure than taking it where the air is thin and the roads are steep, and that's what the Eisenhower Pass grade is all about. We tested on a 7.2-mile stretch of Interstate Highway 70 in Colorado, from the valley exit at Dillon to the entrance at the summit of the Eisenhower and Johnson tunnels. This stretch climbs more than 2,000 feet and is the worry of every eastbound big-rig trucker.
>
> This stretch of the I-70 is famous for its hair-raising emergency runaway truck ramps (there were three on our test stretch) and for the punishingly steep hill climbs that bring trucks' cooling systems to their knees as engine temperatures reach redlines they've never seen before.

The 3500HD trucks pulled a 21,000 pound trailer up the pass.

The 2500HD trucks pulled a trailer based on 90% of GCWR: 22K for Ram, 20K for GM, 19K for Ford. This disparity (and the Ram would hold the shift out of 1st gear until 4500rpm) resulted in Ram's being miserably behind the Ford in the time taken to go up the hill. Also note the Ram's 90% figure correlates to the load of 3000 more pounds than the Ford.

		3500HD	2500HD
Ram	Minutes	9.21	12.23
	Top MPH	62.6	66.5
Ford	Minutes	9.03	9.40
	Top MPH	65.3	65.4
GM	Minutes	9.03	10.05
	Top MPH	66.6	62.2

Exhaust Brake/Brakes:
The PUTC team completed the brake testing after each of the uphill timed runs and employed the same procedures as in the past. At the top of the Davis Dam grade, right at the Union Pass summit sign, they started the brake test by slowing the truck and trailer to 55mph, with each truck in Tow/Haul and with the exhaust brake button on. The range they allowed before a brake or an acceleration touch was allowed was between 50 and 60mph. If the vehicle speed fell to 50mph, they would throttle to 55mph; if vehicle speed went above 60mph, they would slow back down to 55mph.

They kept track of acceleration touches needed as well as braking events, and they scored each "touch" the same. The winner was the truck that needed the least number of touches (accels or brakes) to maintain the stipulated speed.

	3500HD			
Ram	Minutes	12.48	Accel	3
	Speed	59.9	Decel	3
Ford	Minutes	11.32	Accel	1
	Speed	64.1	Decel	6
GM	Minutes	12.25	Accel	1
	Speed	60.5	Decel	8

And the Winner Is...

PUTC's Summary for the 3500HD – Ram Wins (Sort Of)

The following is the summary from the PUTC staff concerning the 3500HD competition:

> Of the 19 empirical tests that we conducted—which included everything from quarter-mile times at a drag strip to how much each one-ton squatted with its gooseneck weight—eight of them were won by the 2015 GMC Sierra 3500 HD and seven were won by the 2015 Ford F-350. In fact, when looking at the point totals for the quantitative section, the Ford and GMC were virtually tied, with a statistical difference between them of 0.3 percent. The 2014 Ram 3500 HD won just four events because the majority of the tests rewarded off-the-line speed and quickness, something the Ram/Cummins has always struggled with.
>
> However, in the qualitative scoring section from our judges, the Ram had the most points, finishing in first or second place with each expert and winning the section by 40 points over the GMC (Editor's note: Ram wins, sort of). However, in the end, the GMC is our winner with the highest combined point total in one of our most comprehensive competitions to date, beating both of its competitors by a solid margin.

The overall point totals:

	Empirical	Judges	Total
GM	1792	1500	3292
Ram	1681	1540	3221
Ford	1786	1410	3196

PUTC's Summary for the 2500HD – Ram Wins (Without a Doubt)

The following is the summary from the PUTC staff concerning the 2500HD competition:

Interestingly, of the 16 empirical tests we conducted, the 2014 Ram 2500 won the most events with 10; the 2015 Chevrolet Silverado 2500 won three and the 2015 Ford F-250 won three. However, the Ram did not collect the most points in the empirical section. That happened because we allocate points equally in each event based on the percentage difference from the winning time, speed or distance. In several cases the winning and second-place scores were separated only by fractions, so many scores were very close. The Ford F-250 finished ahead in data points by a very small number, winning just three of 16 events but placing very close to the winner in many others.

Where the Ram 2500 did much better than either of the other two competitors was in our qualitative scoring, impressing each judge enough to get a unanimous first-place finish.

The overall point totals:

	Empirical	Judges	Total
Ram	1553	1515	3068
GM	1539	1445	2984
Ford	1560	1395	2955

CONCLUSION

Ram Wins (Sort Of) and Ram Wins (Without a Doubt) — That's the takeaway from this summary of the exhaustive test by PUTC. I'm hopeful you found it illuminating and helpful.

I know from the letters and emails that came in after our PUTC summary in Issue 83 that you readers really enjoyed the behind-the-scenes commentary from PUTC tester Kent Sundling. So, when I noticed Kent's name in these latest tests, I called to see if he would provide another report.

Where else would you get this kind of insight? —the kind of insight Kent provides TDR readers in the following report on the two 2014 HD Challenges!

2014 Ram 2500 Hemi

BEHIND THE SCENES WITH KENT SUNDLING

By Kent Sundling

It's always a privilege to be part of PickupTrucks.com truck shootouts. This go-round it was the "Ultimate 2014 HD Truck Challenge." My favorite part is towing trailers cross-country. So much data gets collected from the drivers and test equipment that I don't know how anyone could beat this much truck comparison information.

This is the longest truck contest I've participated in, or even heard of. Two weeks adjusting seats, mirrors, steering wheels, and of course Sirius radio. Behind the scenes of this comparison, the ordeal was even more intense, with cameras everywhere, photographers standing on Jeeps and hanging out windows, and us guys wheeling three big trailers through city traffic and around small cars (oops, that's a blind spot), it was stressful fun.

All three trucks had 3.73 axle ratios. We know the Ram HD 3500 with 4.10 axle has a higher trailer capacity, but we wanted this to be as close to an apples to apples comparison as possible. The 3.73 axle ratio is the only one GM has ever used with the Duramax diesel in a 3500.

Load Trail provided the Pro Max flatbed gooseneck trailers rated at 30,000 pounds. For trailer cargo our Ram Turbo Diesel pulled a 2500 with a 6.4-liter Hemi with ballast (water tanks) in the truck's bed.

I like to daydream when I'm cruising cross country, but on this kind of contest I had to register all the senses of how the trucks sounded, felt, and handled. So, let me give you my "full attention" review of the Ram.

Ram 3500 HD Review

The Ram Laramie Limited 3500 HD is as good as it gets for a high-end luxury cruiser. Like a kid declaring "shotgun," during the test I would call it "my office." The Ram interior has lots of soft touch, and big knobs for finding controls fast. Ram has the easiest console controls; the analog cluster was very good, with a dial for the DEF level. The Ram's big crew cab, with its rear floor storage and folding flat rear load floor, made hauling our equipment an easy task. You could say it was the crowd favorite, too.

Remember now, this was a test of both a 2500 and a 3500, so you'll want to read through my notes on the 2500 truck, too. (And you'll relish the commentary on it, for it was our particular winner.) The 2500 HD Ram has great visibility all around; the 3500 HD dually has great front visibility. The 2500 Ram with the new 6.4-liter Hemi impressed me. Its Multi-Displacement System (MDS) can give an unloaded truck good fuel mileage while tooling across the Plains, and you can still benefit from a 4.10 axle ratio for towing when you need it. The new 2500 HD five-link rear coil springs was my favorite ride of the six trucks for not spilling my truck-stop coffee. Really, the ride is that good.

As you log the miles, trailer towing visibility (I mentioned the oops/blind spot earlier) really means a lot to the driver. While the Ram didn't have the largest mirror glass area, it did have the farthest reach for mirrors, great for these 8.5-foot-wide trailers. Power fold mirrors for 2015 will make them even better. The Ram has an industry-only push button start; you don't have to bob your head to find the ignition switch. This feature will get copied.

Ram has improved the ride on the 3500 dually beyond the hydraulic cab mounts that were new in 2010, with their new three-link front suspension. The specification sheets and Ram guys tell me "no, there isn't," but something is different at the rear axle. The Hotchkiss leaf stack looks the same, but it seems to ride softer. I wish we could have had the new air assist rear suspension. In the last big contest we had in 2011, "Hurt Locker," the Ram dually bounced so badly on some sections of pavement through Moab to I-70 that I needed back support. This year the Ram 3500 was totally improved on the same road.

The Cummins Turbo Diesel has that distinctive sound that makes you feel like a big rig driver. Even the exhaust brake sounds more like that of a Peterbilt. Where the GMC and Ford sound more like gasoline engines, you won't mistake the Cummins diesel.

When we started in Detroit with the 16,000 pound test trailers, we used the factory Ram gooseneck balls in both the Ram and the Ford. A bit later Ford brought us a gooseneck ball. They both fit the under-bed hitch. I like the Ram ball better, as the latch is at the base of

the ball, whereas the Ford has a plastic clip on top of the "greasy ball" for unlatching the ball. For backing up to the gooseneck trailers, the Ram was better. With the high mount stop lamp and its backup camera, you could hit the target by yourself.

Earlier I told you that I laid claim to the Ram by calling it "my office." Here is another observation that the TDR members will like: the Ram 3500 seems to perform better with bigger loads, it just lumbers along like a big rig. With the highest GCWR of the dually diesels we tested, the Ram HD 3500 was rated at 29,880 pounds.

The Ram won the brake tests with trailers. Ram and GMC had their Class 5, receiver inlets tucked out of the way. The Ford receiver looked like it did 20 years ago.

What's to Complain About?

The Cummins diesel with Aisin transmission is the most expensive diesel/transmission combination. I remember when Dodge/Ram Turbo Diesel trucks were the best value/cost.

When we did the test at Davis Dam in Arizona, the trucks were tested using the SAE J2807 standards. I'm glad to see Ram test their whole truck line to that standard for 2015. SAE J2807 is a fair and true test of the entire vehicle.

The Ram integrated brake control is good, but in the last two major truck contests with PickupTrucks.com, there has been a problem with it. Last year it was with electric-over-hydraulic on gooseneck trailers. This year, after checking the trailer brakes at our starting point in Las Vegas, I couldn't get around the first corner before the dash read out "trailer disconnected." At the first truck stop I checked all the connections and got things working by switching the trailer plug from in the bed to the bumper. Then, almost to Arizona, the readout flashed "trailer disconnected" again. I checked all connections again. The dash readout showed 0 gain and defaulted to "light trailer electric brakes" from heavy trailer electric brakes. Then, limping along to a convenience store in Arizona for a sandwich at midnight, I backed up 30 feet to get out of the truck (truck stop coffee needed) and, voila, the trailer brakes all worked again. There were no more brake problems to the end of the trip in Denver.

The Ram's "smart" exhaust brake was great on 5% grades or lower. It seemed to learn the way you applied brakes. Full setting was needed for 6% and higher grades to benefit. Running downhill with the Ram 3500 towing almost 21,000 pounds, out of the Eisenhower tunnel at 11,000 feet down 7 miles to Dillon, Colorado, did take some brake touches, five to be exact; GM zero and Ford one. This was a big difference from the previous test when Ford would take 20 touches.

In Michigan, Ram's rain-sensitive wipers were the slowest in hard rain. Ram is the only one in the class without a telescoping steering wheel. The Ram 3500 has the largest rear fenders and the worst visibility. However, it looks really good and it really helps to have the farthest-reach towing mirrors in the market.

I'm not sure why Ram has the smallest fuel tank at 32 gallons. We've been told it's because of the new DEF tank, but how does Ford have a 38 gallon fuel tank and GM a 36 gallon tank with DEF? In our contest, Ram used twice as much DEF as Ford and GMC. I did like the DEF fill cap in the fuel door; it's easier to fill up at the fuel island, much easier than GM's DEF tank under the hood.

With the diesels, all three brands have their own acceleration characteristics. Ford is the fastest off the line, GM has the best midrange, and Ram chugs along like a locomotive forging ahead at a steady speed.

Conclusion

I really hope the readers find these truck contests to be usefully informative. From the data we collect, you can use what's important to you to pick your own winner. When you test drive a new truck, dealerships don't often allow you to hook up to a trailer. This is why all my reviews involve trailers. The data shows how close these trucks are, and this was the closest I can remember in a true race for power. If you didn't use the time sheets and computers to count the numbers, you wouldn't know who the winner was. The judge's-opinion-part of this comparison gave you our considered assessments, which you may or may not agree with. None of us knew how the other guy voted until after we sent in our ballots and they were totaled up.

Kent Sundling
TDR Writer

2013 RAM REVIEW

ISSUE 81 – HAVE RAM, WILL TRAVEL

by Joe Donnelly

Editor's note: Joe starts his article for Issue 81 with a brief introduction and then he goes into a "technical comparison" of a new truck to his '04 Turbo Diesel.

Don't be fooled by the technical comparison wording—Joe is shopping for a new truck. In fairness to Joe and those that are also looking at a new vehicle, you can read and follow the analytical process that he uses. For a guy like me, who simply goes back to my long-time dealer and says "let's make a deal," then drives a new truck off the lot, it seems to be an arduous process.

So, follow along with Joe and you'll see how an engineering-type of guy pours over the data and convinces himself that new is better.

Finally, the analytical Joe versus the emotional editor-guy Robert ties directly to the article that we have in this issue by Mark Barnes titled "Define Best." So, turn to page 66 and read about the focus on facts or the focus on feelings. And the next time you are in the market for a truck, give some thought as to where you fall in the truck purchasing process. Now, back to the article that should be titled "Joe Buys a New Truck."

INTRODUCTION

For the "Ten Back" theme of this issue, I performed a technical comparison of the 2004 I bought in October 2003 to today's 2013-2014. For background, see Issue 78, page 42, and Issue 80, page 58. Back then I focused on the 3500 series, 4x4, Quad Cab (the crew version was not yet available) with single rear wheels. As I will discuss, for 2013 I spent most of the time researching the same style 3500 series, because the 2500 is not available with the Aisin automatic transmission.

First, here is a summary of the basic features for each model of the 2013 model year 3500 single rear wheel Crew Cab series:

Tradesman Features Include:

- 18-Inch Styled Steel Wheels
- Standard Quad Halogen Headlamps
- Black Grille, Front and Rear Bumpers
- Black Door Handles and Mirrors
- Standard 17,000-lb Class V Trailer Tow Hitch Receiver w/ 4- and 7-pin Wire Harness
- Available Fifth-Wheel/Gooseneck provision
- Locking Tailgate w/ Torsion Bar

SLT Includes Everything on Tradesman, Plus:

- 18-Inch Chrome-Clad Wheels
- Body-Color/Chrome Door Handles
- Power Door Locks
- Bright Bumpers and Grille
- SiriusXM Satellite Radio
- Cloth 40/20/40 Split Bench Front Seat
- Chrome Accent Shift Knob
- Remote Keyless Entry
- Traveler/Mini Trip Computer

Big Horn Includes Everything on SLT, Plus:

- 18-Inch Polished Aluminum Wheels
- Chrome Grille w/ Chrome Insert
- Fog Lamps
- Leather-Wrapped Steering Wheel w/ Radio Controls
- Uconnect Voice Command w/ Bluetooth Connectivity
- 60/40 Split Folding Backseat
- Remote Start+
- Uconnect 5.0 (RA2) System w/ 5-Inch Touchscreen

Laramie Includes Everything on Big Horn, Plus:

- Dual-Zone Automatic Temperature Control
- Heated and Ventilated Front Seats
- Leather-Trimmed Seats
- Driver Preference Memory Control
- Passenger Memory Seats w/ 6-Way Power
- Heated Steering Wheel
- Woodgrain Instrument Panel
- Uconnect 8.4A (RA3) System w/ 8.4-Inch Touchscreen

Laramie Longhorn Includes Everything on Laramie, Plus:

- Mopar® Bright Sill Guards
- Accent Color Running Boards
- Spray-In Bedliner
- Full Screen Navigation w/ 3-D City Models and Landmarks Digital Terrain Modeling
- HD Radio
- SiriusXM Travel Link+
- Leather Premium Seats
- Uconnect 8.4AN (RA4) System w/ 8.4-Inch Touchscreen

Pricewise (again looking to compare a new truck to my existing '04, 3500, Quad Cab, 4x4), you can begin with a stripped down 3500 Tradesman Crew Cab, 4x4, with only the Cummins and the standard six-speed, G56 manual transmission at a basic list price of $48,285 with destination charge and $500 rebate. You can escalate features and price all the way to the fully loaded Laramie Longhorn with the Cummins and Aisin options added, for $64,255. Many other options are available, of course. For me, the important powertrain and heavy duty options,

besides the Cummins and Aisin, include the fifth-wheel/gooseneck towing prep group, spray-in bedliner, 4.10 axle ratio, cold weather group (engine block heater and front grill cover), and snow plow prep group (220 amp alternator and transfer case skid plate). At May Madness, I learned that the larger 8" touch screen system would allow gauges, etc. to be displayed. This option on the SLT model costs about $970, and on the mid-priced Big Horn which comes with the smaller 5" touch screen, it costs $505. It is not available with the Tradesman series.

If you go to www.ramtrucks.com and "build" your selection with options, you will find that single-cab Rams are limited in availability, as are Cummins power with 4.10 differential ratio and the Aisin transmission.

Dimensions

All Rams compared here are Crew Cab models with four-wheel drive and single rear wheels. Five inches is added to First Generation lengths for a rear bumper; bumpers are included in measurements I found for later Rams.

Dimensions

Generation	Cab	Bed	Wheelbase	Overall length	Height	Turning Circle 4x4 SRW	Brake dia. " ft, rear
First	Club	8'	149"	234"	69.8"		12.8, 12
Second	Club/ Quad	6'	139"	224"	77.2"	45.2'	12.5, 13-drum
		8'	155"	244"	77.1"	51.6'	
Third	Quad	6'	140.5"	228"	79.0"	39.3'	13.9, 13.9
		8'	160.5"	250"	78.9"	50.6'	
2013	Crew	6'	149.5"	237"	79.8"	44.5'	14.17, 14.09
		8'	169.5"	259"	79.6"	49.8'	

Several things can be immediately noticed. The new long bed Crew Cab is nine inches longer than the 2004 Quad Cab that I am replacing. In turn, the 2004 is six inches longer than the 1997 Club Cab I had before it. That is a growth of fifteen inches in length since the Club Cab era, mostly due to increased rear seat leg room. However, your garage may not be as happy to have a truck that much longer! The 2013-14 will be about 10" longer than a 2004 with the same bed type. If you can move from a long bed to a short bed truck this time, you will end up with a Ram that is seven inches shorter than a 1997 long bed, Club Cab. Otherwise, your garage needs to be longer inside than 21'7" or 22 feet to give a little room on each end.

The growth in height is not much, only about an inch since the 2004, but 2.5" since 1997. Most garages have a nominal 7-foot high door or better, although in many cases, 1-4" of that height aren't available. You may have to stay with stock height tires and suspension if you garage your Ram! That inch seems to correspond to the taller 18" tires used on the new 3500 versus the 17" tires used on the 2004 and on new 2500s.

I found my long bed, Quad Cab 2004 to have a really long turning circle. From the turn lane, I needed about three traffic lanes going the opposite way to make a U-turn. That 50.6 foot diameter has been trimmed slightly with the new Rams, but the overhang can still cause an issue. Again, if you go from a long bed to a short bed, you will benefit from the smaller size; in this case, the diameter of the turning circle will be six feet shorter. For me, that will make a big difference in maneuverability in the city.

Weights

Axle capacities (GAWR) of 3500s are significantly higher than the 2500s. The front is 6000 pounds versus 5500 for the 2500, and rear capacity is 7000 pounds for the 3500, versus 6200 for the 2500. I don't expect to overload either end, but the extra front capacity is worthwhile for those who plan to attach a heavy aftermarket front bumper and winch. In the past, it was all too easy to exceed the weight capacity of the front end of the Turbo Diesel by adding 300 to 500 pounds to the very front, where it has extra leverage against the front suspension. It is noteworthy that GAWR and GVWR (gross vehicle weight rating) numbers are higher for today's 3500 single rear wheel (SRW) Ram than First Generation dual rear wheel trucks (they had 6900 pound rear GAWR).

The new, higher capacity 3500 SRW axles come with larger ring gears (11.8" vs. 11.5" rear; specification not available at this time for the front axle). This would reduce ground clearance a bit at the center section, except that looking at the "fine print" you see that the Ram 3500 SRW comes with 275-70R18 tires rather than the 265-70R17 that the 2004 had. The new 18" tires for the 3500 are rated for 3640 pound load and have a design diameter of 33.2" instead of 31.8" for the 17" tires that are still used on 2500s with their lower GVWR.

Weight Ratings

Generation Cab	Bed Length	Front GAWR	Front weight	Rear GAWR	Rear weight	Empty weight	GVWR
Second ($) Club, Quad	82"	4850	3985	6200	2275	6260	8800
	102.2"						
Third-2500 Quad	75.9"	5200	4350*	6000	2740	6980*	9000
	97.9"		4550*		2770	7310*	
Third-3500 Quad	75.9"		4290*	6150	2820	7110*	9900
	97.9"		4490*		2790	7290*	
2013-2500 Crew	76.3"	5500	4660**	6200	2830	7490**	10,000
	98.3"		4810**		2860	7670**	
2013-3500 Crew	76.3"	6000	4820^	7000	2910@	7730#	11,700
	98.3"		4940^		2920@	7860#	12,300

Weights rounded off slightly and are in pounds.

$ actual weights estimated; long wheelbase, Club Cab numbers used here.
# with Aisin; about 110 pounds less with G56, 160 pounds less with 68RFE
^ with Aisin; about 95 pounds less with G56, 135 pounds less with 68RFE
@ with Aisin; about 30 pounds less with G56 or 68RFE.
** with G56; about 60 pounds less with 68RFE automatic.
* with NV5600; about 220 pounds less with automatic.

Towing Capacity

The new 2013 Ram has numerous changes to strengthen it and make it suitable for heavier towing than ever before. For example, the brakes are larger, the engine is more powerful, and the transmission is matched in strength. Alternator capacity has increased from 120 amps in 1995, to 160 amps in 2003 (with snow plow package) to 220 amps in 2013 (with snow plow package).

The 2013 frame for the 3500 is made of stronger, consistently alloyed, tested, and heat treated steel with a 50,000 psi (50KSI) rating, versus the older (and typical for pickups) 36,000 psi steel (ordinary mild steel). This high strength steel should not be welded by the average aftermarket hitch installer. If you ever plan on a fifth-wheel or gooseneck hitch, order the prep package which lists for $400. It consists of a very strong cross-member that facilitates the installation of a hitch. Compatible hitches for this new mounting system should be widely available by the time you read this article. Don't have your local trailer dealer install your old fifth wheel hitch! I have seen too many dangerous, poor installations of hitches—bad welds, some bolted only to the bed, etc. The rear portion of the frame is now fully boxed, giving better support to the trailer hitch system.

Tow Ratings

The values below are some of the maximums that I noted. Actual maximum values depend on the particular configuration of differential gearing, actual truck weight, transmission type, etc. The tremendous strengthening of the Ram and increases in power and capacity to its powertrain are reflected in the doubling of gross combined weight rating (GCWR) from 1995 to 2013, along with the maximum trailer weight increasing by roughly half again, or even two and a half times as much as in 1995.

Generation	Cab	GVWR	Max. GCWR	Max. trailer wt.
Second-2500	Club, Quad	8800	18,000	11,900
Second-3500	Club, Quad	11,000	18,000	11,500
Third-2500	Quad	9000	20,000	12,950
Third-3500	Quad	9900	23,000	16,500
	Quad	12,000	23,000	15,650
2013-2500	Crew	10,000	25,000	17,230
2013-3500	Crew 6'	11,700	25,000	17,320
	Crew 8'	12,300	25,000	17,000
		14,000	37,500	29,130

Fuel Capacity

According to some (not all) brochures and specification documents, the fuel tank in the new Ram has a capacity of 31 gallons (32 for long beds), a reduction of three gallons from the 2004 Ram.

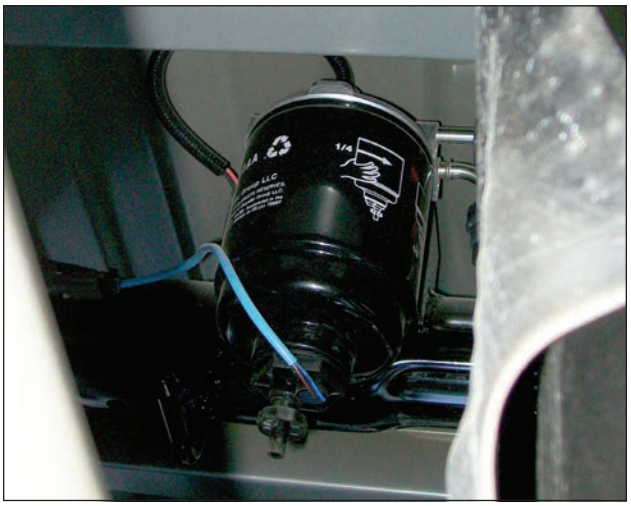
I am using the 98 gallon Transfer Flow tank in my 2004 long bed, which is 25" front-to-rear in the bed. The front lip of the bed is 1.5" and I placed the tank slightly back to use the mounting holes that the previous 74 gallon tank required. Thus, I had overall usage of 30" of the floor. The 2013-4 short bed is 21.6" shorter and the lip is 2" instead of 1.5" front-to rear, but I will install the tank closer to the front of the bed. I plan to get a 75 gallon tank that is Transfer Flow's largest for a short bed pickup; it is 18" front-to-rear. When installed, it should take up about 20.6" of bed space, measured at the floor. Therefore, the usable bed length will be 21.6" − 9.6" = 12" shorter than my 2004 Ram's setup. This is not as big a loss of bed space as it first appeared, when considering a short bed instead of a long bed for my new truck.

The new Ram will be at least 13" shorter overall, even if I get longer aftermarket bumpers for it. Those who might put their new Rams into a garage may need to consider overall length. The new trucks have a longer cab with more rear seat room, but the additional overall length of about nine inches has to be considered. I am happy to have a larger cab and feel it is a good trade-off to get the short bed with the smaller aftermarket fuel tank.

Fuel Filtration

In the editor's review of the 2013 truck (Issue 78, page 44) and the Cummins engine (Issue 80, page 63) he made a big to-do about improved fuel filtration.

From the pre-production picture in Issue 78 we noted that Ram was adding a frame-mounted fuel/water separator as a primary catch all item. The following is a picture of the production version (Mopar 68197867AA) that was relocated in back of the fuel tank/just in front of the spare tire and under the bed of the truck.

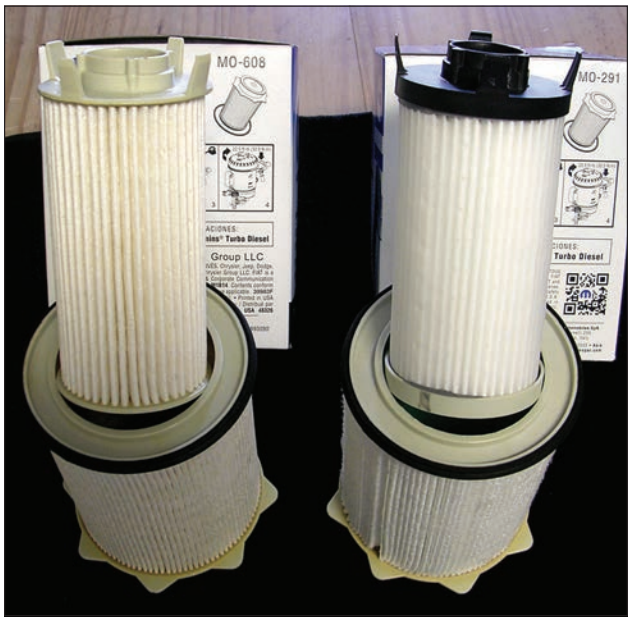


The new under-bed fuel filter.

Next up, the improvements to the secondary, on-the-engine fuel filter. Here is the verbage from the editor's Issue 80 report:

> "Now the news from Fleeetguard: they have changed the filter element inside the primary fuel filter that is located on the engine. The new part number is: Fleetguard FS53000, Mopar 68157291AA. The trade name for the new fuel filter media is Fleetguard "NanoNet." This filter will fit '10-'13 pickups and '11-'13 chassis cab.
>
> The new NanoNet fuel filter is a direct replacement for the existing Fleetguard FS43255 and Mopar 68065608AA. It has yet to be determined whether these old numbers will be superseded. Again, the new part numbers should be FS53000/68157291AA. I cannot imagine that customers would choose the old/less efficient filter…a supercession sounds logical to me."

The word-on-the-street about the NanoNet's "micron" rating: the old "608" part number was 5 micron; the new "291" part number is 3 micron. From the photo you can clearly see that both are a filter-in-a-filter design. With close inspection of the photo you can see a nylon screen around the inner filter of the "291" NanoNet.



Old "608" filter on the left and the new "291" filter on the right.

Finally, the fuel tank's venting system prevents dirt and water from entering the tank; a warning light tells when the high-capacity sump requires draining. However, I do not agree with Ram's approach to fitting the DEF and fuel inlets in the small, existing fuel recess. They ended up with no fuel cap, only a flapper valve. I'd rather have a real cap to keep dirt out of the system.

Open fuel door, showing DEF and diesel fuel inlets.

Transmissions

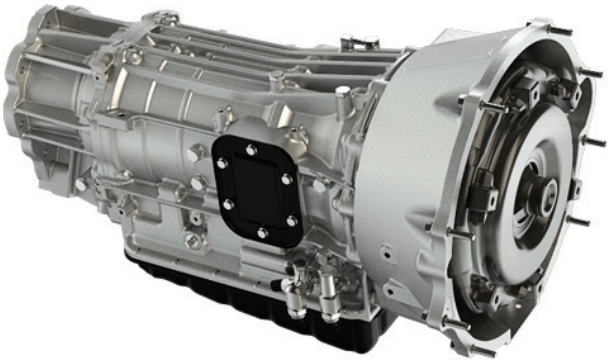
Manual transmissions represent one topic that I have studied over the past ten years! Most recently, manual transmissions for our Turbo Diesels were summarized in Issue 75, page 92.

While the five-speed NV4500 shifted well, it does not have enough rated torque capacity for today's Cummins engines. The NV5600 was a good transmission, with a few weaknesses, but is obsolete and parts availability is limited. It was replaced by the G56, which has several significant limitations, largely because of its two piece aluminum case, coupled with the factory fill of ATF instead of gear lube. The dual mass flywheel also is subject to failure. My conclusion was that the G56 would be a weak point and not my choice for an expensive new truck that would be used for towing.

I preferred manual transmissions in the past for my Turbo Diesels because earlier automatics gave little to no engine braking if the converter was not locked up. Lock-up at low speeds on mountain trails was problematic. The transmissions themselves had reliability issues, especially with power increases. Higher horsepower engines were offered with manual transmissions (175hp versus 160hp in 1994-1995, and 215hp versus 180hp in 1996-1998. In 1998.5-2002, manual transmission Turbo Diesels had 235 and 245hp, while automatics had 215hp).

Today the situation is reversed. The Aisin and 68RFE automatics are strong, and lock-up can be achieved for engine braking. Also, did I forget to mention that an exhaust brake is included, for further capability on the mountain trails! As summarized above, the G56 is problematic and of limited torque capacity, necessitating a lower power and torque rating for engines equipped with it (350hp, 660 ft-lb). In contrast, the upgraded and improved Chrysler-manufactured automatic, the 68RFE, comes with an engine power rating of 370hp and 800 ft-lb. Ram now offers the excellent Aisin automatic with engine power of 385hp, 850 ft-lb. I remember fifteen years ago when that much power was the subject of mystery and fable! Ram does use "torque management" to protect the

automatic transmission while shifting, etc. whereas they cannot do that with a manual transmission. Thus, Ram has to cut the torque of the engine under all conditions. The strongest transmission is from Aisin (pronounced eye-sin) Seiki, a Japanese manufacturer of transmissions, as well as other automotive components that was founded in 1949. This transmission weighs over 400 pounds, and the Ram incorporating it weighs about 50 pounds more than one with a G56, and 160 pounds more than one with a 68RFE transmission. At May Madness, Harald Harks of BD told us the shafts are about twice as big as those in the 68RFE. While acknowledging the higher price of the Aisin option, because Ram has to buy the transmission instead of making it in-house, Stan Gozzi said, "It doesn't break." I contrasted those features with the assessments of the 68RFE as "adequate" and "improved" and decided that the Aisin was the best choice.



Aisin automatic transmission.

The Aisin option is restricted to the Ram 3500 series, so I dropped the 10,000 GVWR single rear wheel 2500 Crew Cab from my consideration. The short bed 3500 has a GVWR of 11,700, which is more than enough for my uses.

Transmission and differential ratios

Those of us who have owned Turbo Diesels for years tend to jump into differential gearing based on our experience with past models. These days we have to remember that the transmission ratios play more of a role than in the past. Both the Aisin and the 68RFE have double overdrive ratios. Unless you want sixth gear to be essentially unusable, pick a steeper differential ratio, even for economy, than you did in the past.

Ram is trying to improve fuel mileage every way they can for the average buyer. They have added a front axle disconnect (advertised as good for about 1 mpg improvement), synthetic Valvoline/Cummins engine oil, and selective catalyst reduction (SCR) with diesel exhaust fluid (DEF) for emissions control. The SCR is said to improve fuel mileage up to 10% compared to the older system that used the engine injectors to send fuel into the exhaust stream. The Aisin is supposed to be 1% more efficient than the 68RFE. They are reducing engine rpm with the standard 3.42 ratio, but on a diesel, that may not be the best approach.

While the engine can propel the Ram, particularly unloaded, at 1500rpm, the vibrations resulting from only three power strokes per revolution will hammer everything. It is far better to run at least 1700rpm, and I much prefer to drive with at least 1800rpm. I have the heavy duty hub in my South Bend clutch for the NV5600. I can hear the vibrations in the clutch hub at less than about 1600rpm.

Now look at tabulations of gear ratios and how the new combinations affect my typical driving (cruising, without a heavy load or trailer) at 1800rpm (61mph in 6th), highway cruising with or without a trailer at 2200rpm (74mph in 6th), and 2500rpm (towing in 5th, 62mph) with the NV5600 and 3.73 differential ratio. Because of the steep second overdrive ratio (.63) of the automatics, a 4.32 differential ratio would give the same overall gearing as the NV5600 with a 3.73. A 3.94 ratio with the 47 and 48 series automatics would compare to the final drive ratio of the NV5600 with 3.73. By final drive ratio, I mean the combination of drivetrain components that result in a particular engine rpm. The drivetrain combination will include transmission ratio, differential ratio, and tire diameter.

As of the date this was written, the 2014 was not available yet. The ST, SLT, and Big Horn 2013 can be ordered with the Cummins/Aisin/4.10 package. The 3.73 ratio is not available, and neither 3.73 nor 4.10 is available with Laramie or Laramie Longhorn packages. Thus, anyone wanting Cummins/Aisin 4.10 must order ST, SLT, or Big Horn. My preferences include 4.10 ratio, the 8.4" screen U-connect system and forged aluminum wheels, putting the SLT and Big Horn packages close in price. The Big Horn also can be ordered with protective side moldings. For me, the Tradesman package would not be suitable because it is not available with the 4.10 ratio, the 8.4" screen U-connect, or forged aluminum wheels.

Transmission Ratios

Gear	NV5600	47RH, 48RE	2005-7 G56	2007.5-up G56	NV4500	68RFE	Aisin AS69RC
1	5.63	2.45	6.29	5.94	5.61	3.23	3.75
2	3.38	1.45	3.48	3.28	3.04	1.84	2.00
3	2.04	1	2.10	1.98	1.67	1.41	1.34
4	1.39	0.69	1.38	1.31	1	1	1
5	1		1	1	0.73	0.82	0.77
6	0.73		0.79	0.74		0.63	0.63

Engine RPM changes with transmission and differential ratios for 17" wheels:

Trans/Rear	74 mph in 6th	61 mph in 6th	62 mph in 1:1 gear
NV5600/3.73	2200 rpm	1800 rpm	2500 rpm
Late G56/3.42	2046 rpm	1674 rpm	2292 rpm
68RFE/4.10	2090 rpm	1710 rpm	2375 rpm
68RFE/3.73	1899 rpm	1553 rpm	2158 rpm
68RFE/3.42	1738 rpm	1424 rpm	1975 rpm

The Aisin and the 68RFE have the same overdrive ratio so the same results will be achieved. The 68RFE is shown above because the 2013 Ram 2500 has 17" wheels and the Aisin is not available with it.

Now we come to another adjustment of the final drive ratios. The new tires 275-70R18) for the 3500 with its heavier rated axles are rated for 3640 pounds load, and have 33.2" design diameter, on 18" wheels. This situation contrasts with 3195 pounds load rating and 31.8" diameter for the 17" wheels and tires (265-70R17) previously used, and still used on the 2500 series with their lower GVWR of 10,000 pounds. The 18" wheels have correspondingly higher load ratings as well. This larger diameter restores or even increases the ground clearance at the "pumpkin" of the differential, but brings us to the need for adjusting the overall gear ratio calculations once again.

Therefore we will multiply the rpm calculations for the G56 and the Aisin/68RFE to apply to the 2013 model year 3500 by 31.8/33.2 and the adjusted table reads as follows:

Engine RPM changes with transmission and differential ratios and 18" tires, versus NV5600/3.73 with 17" tires:

Trans/Rear	74 mph in 6th	61 mph in 6th	62 mph in 1:1 gear
NV5600/3.73	2200 rpm	1800 rpm	2500 rpm
Late G56/3.42	1960 rpm	1603 rpm	2195 rpm
Aisin/4.10	2002 rpm	1638 rpm	2275 rpm
Aisin/3.73	1819 rpm	1487 rpm	2067 rpm
Aisin/3.42	1665 rpm	1364 rpm	1892 rpm

Thus, with the automatic transmission and 4.10 gears, the new 3500 will give about 200rpm less when cruising at 74mph than my old NV5600/3.73 combination. I wouldn't want to use a numerically lower ratio (like 3.73 or worse, 3.42) with a Cummins diesel powered Ram 3500 and either automatic transmission. With my old combination of NV5600/3.73, I would have the same final drive ratio with the Aisin and 4.51 ratio. With the Aisin/4.10, the final drive ratio is like the NV5600 with a 3.39 ratio. In summary, if you want low rpm and high fuel mileage with the NV5600 or G56, Ram offering the 3.42 ratio, and on some models making it mandatory, is sensible. However, transmissions like the 68RFE and Aisin with double overdrive gears will give highway rpm ranges low enough to bring in vibration issues, in my opinion. (Remember, I have not owned and experienced the combination directly).

I feel the 4.10 ratio with these automatics is close to ideal for good mileage and avoiding vibration problems from too low rpm ranges, sometimes called "lugging the engine." In fact, I would want to downshift to fifth gear for the 61 mph "cruising" scenario above. In fifth, engine rpm would be 2002rpm.

Editor's note: Here is another example of a difference of opinion between the editor and staff. My opinion—if it pulls the load and the truck is not struggling, leave it in high gear. My trucks have always had low numerical differentials. Also, TDR member, remember I live in the small rolling hills of North Georgia and only tow 12,000 pounds.

NEW FEATURES OF THE 2013 RAM

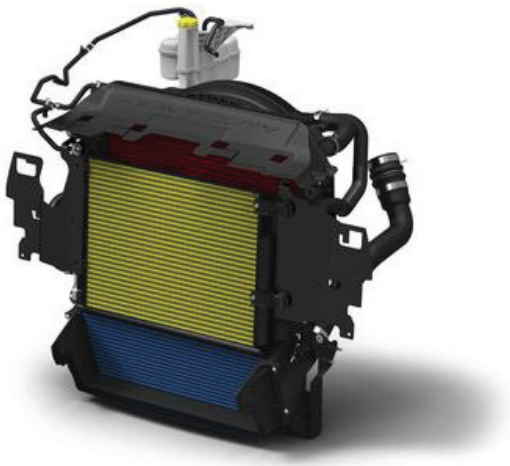
Changes made to the 2013 model year Turbo Diesel Ram are described in detail on the TDR webpage. When you go to this page, you will also see links to many other related topics on the 2013 Ram. The summary of some new features can be found here:

http://www.turbodieselregister.com/articlelive/articles/301/1/INTRODUCING-THE-NEW-2013-RAM-HEAVY-DUTY-TRUCKS/Page1.html

I will go over some of these features here to emphasize those which I feel are some of the more significant technical changes making this model year very important to us.

- New Aisin AS69RC six-speed automatic transmission mated to higher output diesel and offering enhanced power take-off (PTO) capability.
- The Ram Active Air intake system is triggered by new monitoring capabilities added to the engine controller. When the exclusive intake system senses extreme heat, it draws cooler air from the front of the vehicle–a function that also engages at high altitudes for superior throttle response in low oxygen environments. When conditions are wet from snow, ice or water-fording, the system pulls air from an underhood inlet, clear from snow packing and water.
- Ram reduces operating costs via new selective catalytic reduction (SCR) and diesel exhaust after-treatment to deliver 15,000-mile oil-change interval and contributes to a 10 percent fuel-economy gain.
- "Smart" exhaust brake gives a smoother transition to braking.
- Front-axle disconnect works with new transfer cases to boost fuel economy by up to 1mpg.

For 2013, all Ram Heavy Duty diesels benefit from an all-new cooling system: a high-efficiency fan, dual radiators, dual transmission coolers and low-slung charge air cooler.



2013 6.7-liter Cummins Turbo Diesel cooling system.

The new DEF system applied on the Heavy Duty brings the following features and benefits:

- An electric heater in the DEF tank to ensure the fluid is available in a liquid state regardless of climate. The result is a less complex system for enhanced durability. Competitive designs have used a network of glycol-circulated cooling/heating lines.
- A new passively cooled DEF injector that does not require engine coolant to control its temperature, which reduces the complexity of the system.
- Exhaust system refinements to improve the utilization of DEF for NOx reduction and to reduce the risk of side effects from DEF crystalline build-up.
- Exhaust system design improvements allows DEF to be used more efficiently and creates a system that requires less energy from the engine to reach target exhaust temperatures for optimal emissions conversion.
- Emissions system strategy revisions to reduce soot output from the engine and improve fuel economy, all while meeting the legislative requirements. Combined with a 10 percent improvement in fuel economy due in part to the engines' high-pressure common-rail fuel system, SCR promises a net reduction in Ram Heavy Duty operating costs.

More Changes

The Cummins engine uses a high-output viscous vibration damper [see Issue 80, page 61], and the rear driveshaft's new center bearing design incorporates mechanically trapped isolators, and a redesigned U-joint reduces launch vibration. The Ram Heavy Duty's front driveshafts and U-joints are sized larger to align with the truck's new Gross Vehicle Weight Rating (GVWR) and Gross Combination Weight Rating (GCWR). The 2013 Ram 3500 has a higher GCWR, with an 11.8-inch rear axle, a 4-pinion carrier, and a cooling-fin equipped aluminum differential cover.

Two new Borg-Warner part-time transfer cases are used: the BW 44-46 is an electric shifting part-time transfer case with 2WD, 4WD High, 4WD Low and Neutral. The BW 44-47 is a manual shifting transfer case with 2WD, 4WD High, 4WD Low and Neutral. Both options feature a low-range ratio of 2.64 and locking differential from front to rear.

BorgWarner 44-46 electric-shift transfer case.

The Cummins diesels have better cold-start performance and refinement, due to innovations such as the "smart" exhaust brake. Enabled by Cummins' sliding-nozzle turbine design, this setup electronically manages exhaust braking for smoother downhill driving, regardless of vehicle load. The brake allows the speed to drop to any previously selected cruise control speed. (Assuming you've not touched the brake pedal.) Cummins' variable-geometry turbocharger also affords more effortless operation at high altitudes, greater management of EGR flow rates and improved control over exhaust temperatures to accommodate de-sooting.

Uconnect system, gauge cluster, and audio

The next-generation Uconnect system uses Sprint as its wireless partner, and depends on the fast Powernet architecture. Powernet allows up to 40 individual modules; each module (e.g., stability control) can activate other systems (e.g., anti-lock brakes).

A new VSIM can communicate between aftermarket modules and Chassis Cab control modules. The VSIM up-fitter interface has 72 inputs and outputs, including lighting controls, door position, and power take-off (PTO) use. It is a secure gateway to electrical systems and data bus architecture to enable safe, secure plug-and-play connectivity.

A 3.5-inch vehicle information center screen is now standard on Tradesman and SLT, displaying vehicle operating functions on the gauge cluster. A 5-inch screen is standard on Big Horn. A thin-film transistor (TFT), fully customizable 8.4-inch multi-view display is now available on SLT and Big Horn, and standard on Laramie.

The 8.4" touch-screen is to the right of the steering wheel and shifter, above the console.

Close-up of the 8.4" touch-screen shows how it is nicely integrated into the dash compared to some other manufacturers.

Conclusion

Alright, that was my evaluation of the 2013 Ram. Did I mention that I was in the market to purchase one of these trucks?

No?

Perhaps the editor made mention of my purchase intentions. Regardless, as I look back over the material covered in my article, Greg Whale's article on pages 62–65 and the editor's two previous write-ups on the truck (Issue 78) and the engine (Issue 80), I think we have covered the vehicle in detail that you'll not find from any other source. Combine our thoughts with the daily updates from your fellow TDR members at our website's discussion forums and you realize we are a great resource for all things Turbo Diesel.

Thanks for reading my column. Good luck in your search for a new truck.

Joe Donnelly
TDR Writer

OVERVIEW OF 2013 RAM HEAVY DUTY 3500 FEATURES

ISSUE 82 – HAVE RAM, WILL TRAVEL

by Joe Donnelly

THEME FOR 82

The editor has proposed the theme for this issue to be that TDR is the best resource for accurate, unbiased information. In fact, this is our goal consistently. Where we include personal preferences or biases, we present them as such, not as fact. The assessment I was given to evaluate the 2013 Ram 3500s attempts to give objective rationale for selecting options or models, along with plus and minus features. It has not been possible to be 100% accurate because I am approaching a moving target.

For example, Ram put in their features list on www.ramtrucks.com for SLT and higher models that they have a fold-flat load floor. The window stickers and actual trucks do not have this feature. Instead, there are latched high-strength covers over the rear seat storage areas. Initially it also appeared that you must order the fifth-wheel/gooseneck prep package if you anticipated using such trailers. In actuality, that is the case only for 2500s in 2013, and supposedly all 2014s will have the crossmember for the gooseneck hitch, and the frame pockets or boxes for the fifth-wheel inserts. No doubt the aftermarket will step forward with complete hitch packages so the factory prep package won't be required. B&W already has a gooseneck hitch that requires the crossmember, but not the prep package inserts. As a third example, I assumed that the bedrails were similar to those on my 2004 Turbo Diesel. As our Editor pointed out to me, they are not. The rails now have a series of slots and holes stamped into them, so the factory plastic covers are pretty much unavoidable. In turn, that makes it less an issue whether you get the factory bedliner or an aftermarket one—in either case, you won't be getting the "over-the-rails" spray liner option.

In other situations, it is hard to get enough objective information to make the best decision. Only experience with things like the 7" upgraded instrument cluster and the 8.4" Uconnect system will enable you to make a personal decision; there simply isn't enough detail in the information about them that I found. After using those two systems, I like them and feel that either is worth having.

Even with these limitations, we TDR writers continue to work at giving you more and better information than is available elsewhere, without duplicating a lot of the effort we are making for you. Our goal is to help you make the best decision for yourself, not merely to present one approach that a writer happened to take (for whatever reason of his/her own). I hope we are succeeding for you.

OVERVIEW OF 2013 HD FEATURES – PART TWO

In the previous issue of the TDR I did a six page write-up comparing the new 2013 Turbo Diesel truck to my '04 Turbo Diesel. The editor was not fooled by this "technical comparison," I purchased a new truck. Nevertheless, let's continue to review the 2013 in detail—detail you'll only find in an article written by an enthusiast for an enthusiast.

Our magazine has provided some summaries of the technical advances for the 2013 Heavy Duty Rams. In Issue 78, Robert Patton introduced the new Rams with discussions on the selective catalyst reduction (SCR) approach that uses diesel exhaust fluid (DEF) to give us fuel mileage improvements. Another strategy that brings improved mileage to the 4x4 Rams is the axle disconnect system. It also has new transfer cases and stronger frame, suspension changes, etc. Details about the changes to the Cummins engine were described in Issue 80, pages 58-63. Since then, three events have added information and provided clarifications. Some technical features and a detailed "walk-around" tour were presented at May Madness 2013. Additional engine information was given to us by Cummins and Ram personnel at the Cummins Midrange Engine Plant tour in June, 2013. See the "Chapter News" discussion of this tour. Third, I have had many discussions with these factory personnel, read literature available on www.ramtrucks.com and on www.rambodybuilder.com and inspected about a dozen 3500 model 2013 Rams.

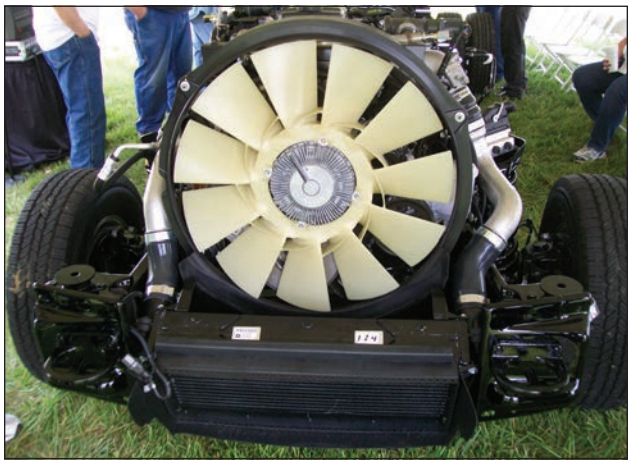
The editor finds a photo of a 2014 Ram and reminds Joe that the new model is now on the market.

The 2013 3500 is tremendously better than the 2012 in strength of components, brakes, and towing capacity. Since 2004.5 Cummins and Dodge/Ram have struggled to keep the engines from getting worse from emissions mandated changes. Finally, with the 2013 I think they now have an integrated approach that works well. Remember in 1973-4 when we all wanted to pull off the EGR hose and richen the carburetor of gas powered cars? You would never consider doing that sort of thing today with the power, mileage, and smoothness of today's integrated packages on gasoline-powered vehicles. I think that Cummins has gotten there with their diesels.

Presentations at May Madness

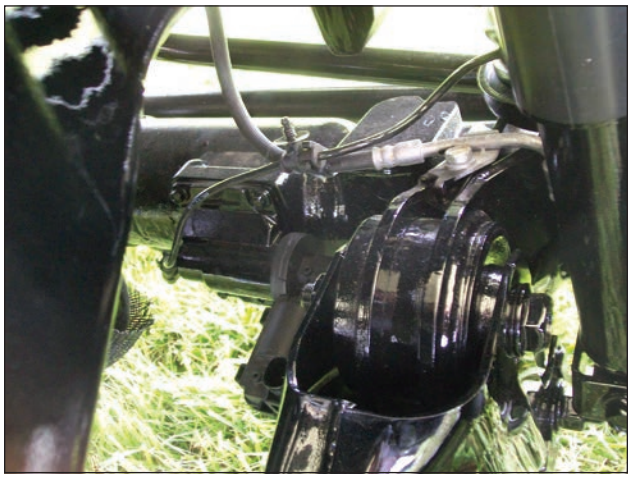
We received an excellent overview of the technical features and improvements that Ram has incorporated into the 2013 Ram from Stan Gozzi of Chrysler, and from Stuart Miller of the Chrysler Academy, at May Madness 2013. Here is a summary of some of what he presented, with some elaboration from Ram product literature. Some of this information has also been presented in the TDR magazine and on the website, but will be touched on again here for completeness. Additionally, Jamie Standring, the Ram Powertrain Integration Manager, provided clarification and further details.

- A few of the topics that particularly interested me were:
- Brake assist to hold the truck while engaging the transmission
- Power Net electrical architecture facilitates diagnosis
- Tire pressure monitoring at all wheels separately
- More efficient intercooler, radiators (two of them), and eleven blade fan
- Electronic stability control--the computer senses a skid and can apply braking to any combination of wheels, just enough to help the driver regain control
- Advanced air bag system to protect from all directions with just the amount of deployment needed
- Computerized sensing of panic stop—When the driver releases the accelerator pedal very quickly, the computer readies the brakes by moving the pads to the rotors without actually applying brakes before the driver does. This saves about 16 feet of braking distance from 70 mph to 0.
- Braking support for rainy conditions—The computer periodically brushes the pads against the rotors to dry the brakes
- Smart exhaust brake with a full mode to slow the truck/trailer fully, and a lighter application mode to maintain the set speed



Eleven blade fan and low-mounted intercooler.

The front axle continues as before with a 9.25” ring gear diameter and high pinion for driving on the drive side of the gears. However, the housing and axle tubes are stronger for the new 3500’s weight rating of 6000 pounds. The differential cover has a larger bolt circle and clearance to the steering and track bar is less, due in part to the beefier components now used to support the higher weight and towing ratings. Thus, your old Mag Hytec front cover won’t work. The Dana 60 used until 2002 had a conventional low mounted pinion and in front axle applications that resulted in the coast side of the gears being used in “drive” or forward motion. This setup resulted in about a 20% loss in strength. Thus, the smaller ring gear of the American axle ends up being quite comparable in strength.



Front axle disconnect is to the left of the suspension arm pivot and under the brake hose.

The rear axle is upgraded from 11.5” diameter to 11.8” for 385 HP/Aisin applications. It has the same cover bolt pattern as previous years. A Ram Box cargo management system is available. It includes boxes in the bed sides and a bed divider system.

The Borg Warner transfer case is new for 2013, and its features include:

- 2-Speed in 4WD
- Electrical or mechanical shift available
- Three Operating Modes: 2WD, 4 high-lock, 4 low-lock
- Neutral position for flat-towing the truck
- Flanged front output
- Flanged or slip yoke rear output

Upgrades made to the Cummins High Output / Aisin AS69RC-specific transfer case included case changes to strengthen the case as well as input shaft and bearing strength increases for the higher torque.

There is a new stiffener brace at the top of the engine block plate adapter. The automatic transmissions are easily differentiated by their oil pans; the 68RFE has cross and lengthwise ribs while the Aisin has lengthwise ribs and a drain plug towards the rear.

In previous magazines, we've discussed the fifth-wheel and gooseneck trailer hitch preparation package that is available for $400. On a 2500, the frame pockets are present only if this package is specified. On the 3500 frame, the pockets are already welded on the side rails. There also is a new cross-member designed to accept a factory gooseneck ball mount that is part of the prep package. The package includes an electrical 7-blade connector in the bed at the left rear, and holes punched in the bed (with plastic caps) for the fifth-wheel and gooseneck mounts. One of the four fifth-wheel hitch frame mounts and the gooseneck mount are shown in the photo. The factory under-bumper receiver hitch has been upgraded to Class V with 1700 pound tongue weight and 17,000 pound trailer weight ratings.

Frame showing welded pockets on the top of the rail for fifth-wheel hitch mounts, and the cross member that the gooseneck hitch mount bolts to, on the underside of the member.

One fifth-wheel mount pocket in the bed at the lower left, and the gooseneck ball mount in the upper right.

What Should I Do?

In Issue 79, pages 65-66, John Holmes described the two extremes for selecting a new Turbo Diesel. Back in August 2010, Robert Patton started with a stripped down, base ST model and bought a lot of aftermarket upgrades to make it what he wanted and to "personalize" the truck. This represents one approach. Intermediate models/trim levels include the SLT, and Big Horn (labeled Lone Star for Texas sales). The Laramie is a higher end trim level. At the high end extreme, John bought the top-of-the-line Laramie Longhorn model with even more options added to those it had as standard features. Who was right? What should be my approach, and why?

To answer this question let's look at features and options on the 2013 Turbo Diesels. I will discuss my preferences which is between the low line ST (Tradesman) and the mid trim level Big Horn. But a similar analysis could be performed between any two models, such as Big Horn and Laramie. I think the key is to determine which features you definitely need, which ones you really want, and which ones are nice but you want to carefully balance their costs versus desirability. I'll try to do that in the analysis that follows. Note that I am only considering the 2013 model year, 3500, four wheel drive, Crew Cab. Other models can have different features, options, and costs.

Features of the Uconnect Systems

You can download the 2013 Owner's Manual, the Diesel Supplement, and the U-connect Owner's Manual from the ramtrucks website. After a two page introduction in the Owner's Manual to help the owner identify which Uconnect system is on a particular truck, ten pages are devoted to the Uconnect 3.0 system. Uconnect 5.0 takes 22 pages, and Uconnect 8.4A takes 122 pages (that's right, 122!) and Uconnect 8.4AN with Navigation takes 117 pages. Thus, we get a quick overview of the number of features and their complexity. But the underlying question is this: What features do you want? Some of them take "subscriptions" costing money annually. For example, if you have a cell phone that is much more than just a phone, such as the Droid that I have, you already have navigation. The big 8.4" screen of Uconnect may be easier to see than a small cell phone screen while driving, but you aren't supposed to do that while driving anyway! You may or may not care about hooking Uconnect up to your cell phone. With more states adopting anti-cell phone laws for drivers, pairing the phone with a hands-off Uconnect system may be wise.

I seldom use the radio and don't know if I want to pay for Sirius satellite radio (after the initial one-year subscription that is included with the factory packages that offer the feature). What is all the other "stuff" on the Uconnect systems, and will I use it?

Editor's note: Since Joe's veering into a discussion about the truck's entertainment system, I had an opportunity to pause for reflection.

I guess I am showing my age. The pause for reflection was taken over by the Joni Mitchell song from 1970, "Big Yellow Taxi." that happened to be on the radio.

Don't it always seem to go
That you don't know what you've got
Till it's gone
They paved paradise
And put up a parking lot

I made a correlation: I enjoy the simple pleasure and entertainment of driving the truck.

Now, back to the new millennium. You can take the same lyrics and twist them 180 degrees as a segue to talk about new features.

Don't it always seem to go
That you don't know what you've got
Till you've got it?

Yes, often we do need time to adopt new technology.

Now, back to Joe's analysis of the Chrysler Uconnect system.

Uconnect 3.0 is standard on the base-line ST (Tradesman) model, and on the first upgrade model, the SLT. It gives you an AM/FM radio. The radio has familiar knobs and buttons to choose the stations you program into it. You get a year's subscription to Sirius satellite radio if you buy the "Popular Equipment Group" for your ST. That group also includes cloth seats, carpet, remote keyless entry, etc. Uconnect 3.0 switches to Media mode to play music from a USB stick, an iPod, bluetooth, etc. If you buy the CD player ($195), it will play them too. A clock is included.

Uconnect 3.0, HVAC knobs underneath the screen, electric transfer case switch to the left of the knobs, and ignition switch to the left of that, just right of the steering wheel.

Uconnect 5.0 is optional on the ST and SLT. The Big Horn and Lone Star packages include it. Where optional, the system costs about $500-650. What do you get? The radio has a volume button, but now you use soft keys on the screen to select stations you have programmed into the system. You also get a compass to tell what direction your Ram is going, and a clock. The Uconnect system can connect to your cell phone, and you can use voice commands and Bluetooth. This feature facilitates "hands-free" telephone calling. The 5.0 system connects to media also. It accepts voice commands for the radio, media inputs, and Bluetooth streaming.

Uconnect 5.0

Uconnect 5.0 on the ST costs $660 and includes:

- AM/FM radio.
- Media Hub with audio jack and USB port for music control and USB charging capability.
- SD Card Input for Music (according to ramtrucks.com but not in the owner's manual).
- Uconnect Voice Command w/Bluetooth, which includes Uconnect Phone Hands Free Calling, Voice Prompts, Voice Commands for Radio Functions and Bluetooth Streaming Audio.
- 5.0-Inch Touch Screen Display.
- GPS Antenna Input
- Media Hub (USB, Aux)
- Rearview Mirror with Microphone
- Overhead Console
- Remote USB Port - Charge Only
- SiriusXM Satellite Radio with One-Year subscription

On the SLT, the Uconnect 5.0 option costs only $465 because it does not include the last three items. Those three items come standard on SLT and above. Uconnect 5.0 allows you to change EVIC and HVAC settings. Uconnect 3.0 and 5.0 have three HVAC knobs in the panel below. Uconnect 8.4 equipped Rams have a single knob and buttons for HVAC control, as well as touch screen controls on the screen. Confused?

Uconnect 8.4 is available in two versions, A and AN with the latter including Navigation (maps and directions). They include the features of the lower level Uconnect systems, and add traffic and weather, and SD card media interface. The 8.4A system is "navigation ready" meaning that you can buy that feature later. The 8.4A system costs about $500 on Big Horn. It is included with Laramie and Laramie Longhorn models. The 8.4AN costs another $500 on models up through Laramie, and is included with the Longhorn. The "Favorites" feature allows you to access user defined menus for artists or individual songs on Sirius radio that are currently playing. Similarly, you can access games that are being played on Sirius radio. You can also access heating and cooling settings through the 8.4. The Uconnect 8.4 communicates with EVIC and can adjust settings in it, HVAC (heating, ventilating, air conditioning), the clock, etc.

Uconnect 8.4

You will get six speakers, or nine if a Laramie. Be aware, however, that those extra speakers have to go "somewhere." Ram decided to put them under the rear seat, so you lose the storage space that would otherwise be there.

Premium stereo speakers under the rear seat of a Laramie.

The above list is a brief overview, summarizing almost 300 owner's manual sized pages of text. I concluded that any of the systems will work for me, in the same mindset as I had with my previous Turbo Diesels, unless in the future I want to pair my cell phone to the Ram. With the ST, the Uconnect 5.0 option package has more music inputs (in case you want to use a memory stick, etc.) and the seemingly unrelated benefit of adding an overhead console with map lights. The higher level Uconnects allow the owner to access "new worlds" of information and settings that are available in EVIC. (See the EVIC section below).

Optional Equipment

Here I will discuss the various trim levels (models) of the 3500, single rear wheel, 4x4, Crew Cab Turbo Diesel.

If the "build" feature on the ramtrucks website is accurate, only the ST truck can be ordered with Park View using the rear view mirror to present the image. Higher level models require the 5.0 or 8.4 Uconnect as the display screen for this useful option. It shows the direction the truck will go in reverse with green, yellow, and red lines. Park View allows you to see an image of the rear surroundings of your vehicle whenever the shift lever is put into Reverse. The camera is in the tailgate latch escutcheon. Park View is standard on Laramie. On the SLT, Park View requires either Uconnect 5.0, Uconnect 8.4, or the center high mount stop light camera.

Park View screen

You can get a camera in the center high mounted stop light (CHMSL) area to help with connecting a fifth-wheel or gooseneck trailer. That CHMSL camera displays in the rear view mirror, and is available on SLT and above. It also requires Uconnect 5.0. If you want both Park View and the CHMSL camera, you need to order Uconnect 8.4 and Park View. This somewhat confusing situation results from the need to display views from two cameras and how the software allows such displays.

Another option to help with backing up the Ram is Park Sense, which uses sound waves to determine if there are obstacles in the way of backing the truck. It provides visual and audible indications of the distance between the rear fascia and a detected obstacle when backing up, e.g. during a parking maneuver. It can be ordered in SLT and higher models.

Fog lights are optional on SLT and included in higher trim levels (models). The fold-flat load floor under the rear seat is standard on Big Horn and above trim levels.

The fifth-wheel/gooseneck preparation package includes the cast inserts in the frame pockets and cross member, punched holes in the bed with plastic caps, and a 7-blade wiring connector in the bed on the left rear.

The factory bedliner seems to be well done, but does not wrap over the bed rails. The bed rails have factory-installed plastic caps.

The snow plow preparation package includes a 220-amp alternator and transfer case skidplate.

The cold weather group includes a grill cover system and an engine block heater cord.

If you plan to "upfit" a complex package, such as ambulances have, or Power Take Off accessories, the Vehicle System Interface Module, or Electronic Monitoring Module, order code XXS will provide electrical connections to various signals on the CAN BUS. You can also order auxiliary switches on the dash, under the radio. These options are described at rambodybuilder.

If you like a real lever to activate the four wheel drive feature of the transfer case, it is available, but only on the low trim level ST. It includes a floor mounted mini-console with trays and cup holders. The dash-mounted electrical switch for the transfer case (below and to the left of the radio) is a $245 option on ST and included with higher level models.

ST interior with cloth covered split bench seat and manual transfer case shifter.

Also note that the ST has a large open storage bin above the glove box. Higher level models have a second glove box there. It appears that a glove box could be purchased from a Mopar Parts Department and inserted pretty easily. Issue 74, page 49, has all the details. Parts needed:

- Door – 1NM86DX9AA
- Bin – 1RF25DX9AA
- Striker – 68050731AA
- Screws – 6505628AA x4

An adjustable trailer brake controller is optional on ST ($230) and standard on higher models. It is located below the radio, at the left of the bank of switches. The tow/haul mode switch is in the center of the bank.

Knob for electric shift transfer case, HVAC knobs to the right of it. The switch panel is below, with the trailer brake controller at the left, and the Tow/Haul mode switch in the center.

Seating and Comfort

The ST (Tradesman) model has an option called "Popular Equipment Group." It replaces the standard vinyl covered seats and rubber floor covering:

- Cloth 40 / 20 / 40 Split Bench Seat
- Front Armrest with Cup Holders
- Rear Folding Seat
- Floor Covering – Carpet
- Front and Rear Floor Mats
- Remote Keyless Entry with All-Secure
- SiriusXM Satellite Radio with 1 Year Radio Subscription

The 7" multi-view display upgrade instrument panel allows the simultaneous display of multiple gauges and features in the EVIC (see the Electronic Vehicle Information Center section below). It is included with the "Luxury Group" on SLT and Big Horn models, and standard in the Laramie. It is not available on the ST, which has a standard instrument cluster with EVIC display in the center. You can watch transmission temperature (automatic transmissions) and boost, but not exhaust gas temperature (EGT). An aftermarket product such as the inexpensive Edge Insight (it plugs into the diagnostic port so installation is very easy) is another approach to viewing temperatures, EGT, boost, etc. simultaneously.

ST steering wheel and standard instrument cluster, with EVIC display screen in the center of the cluster.

Premium 7" multi-view instrument cluster.

In the SLT, the Luxury Group costs $665 and includes:

- Comfort Group: Heated Front Seats and Heated Steering Wheel
- 7-Inch Multiview Display in Instrument Cluster. This instrument cluster features easy-to-read gauges that are electroluminescent for glare-free nighttime driving visibility.
- Glove Box Lamp
- Leather-Wrapped Steering Wheel
- Overhead Console with Universal Garage Door Opener
- Rear Dome Lamp with On / Off Switch
- Auto-Dimming Rearview Mirror with Microphone
- Steering Wheel Mounted Audio Controls
- A power driver's seat with upgraded cloth is a $1000 option package on SLT models. It includes:
- 115-Volt Auxiliary Power Outlet
- 40 / 20 / 40 Split Bench Seat
- Folding Flat Load Floor Storage
- Front Armrest with Cup Holders
- Front Center Seat Cushion Storage
- Power 10-Way Driver Seat
- Power Lumbar Adjust
- Rear 60 / 40 Split Folding Seat
- Remote USB Port – Charge Only

In the Big Horn, the Luxury Group and Uconnect 8.4 must be ordered together. The leather wrapped steering wheel is standard on Big Horn and above, so is not in the Luxury Group.

The premium (power adjustments and upgraded cloth) seat is included with Big Horn. It is available in 40-20-40 bench or bucket styles, the latter with a full console. Laramie comes with power driver's and passenger's seats. Laramie Longhorn has highly upgraded leather seating, and a wood insert in the steering wheel. For me, manually operated seats are fine. I have had no trouble getting an adjustment I like, and any time I try to work under the dash of a Ram with power seats, I end up bumping the adjustment buttons and have to start over to get the seat where I want it. The power seat has better lumbar support, with some darker colored upholstery panels than the ST seats have.

Laramie interior, with cream colored leather bucket seats and leather-wrapped steering wheel.

Some buyers and passengers appreciate the leather seats and dual-zone air conditioning temperature control of the Laramie and Laramie Longhorn models. Of course, those higher trim levels have nicer appointments and more equipment as standard rather than optional.

An overhead console provides nicely located map lights. It is available on ST in the Uconnect 5.0 package, and is standard on SLT and above. An upgraded console is in the Luxury Package option on SLT and Big Horn, and standard on Laramie. The upgraded console includes a programmable garage door opener. The ST has a single dome light in the center of the headliner, just behind the front seat. Rams with the overhead console have a dome light at the back of the cab.

A polyurethane covered steering wheel comes on the ST. Leather covered wheels are standard or optional (luxury package) on higher models. Heated steering wheel and seats are in the luxury package (or comfort package) on SLT and Big Horn, standard on Laramie. A power sunroof is optional on SLT and higher models.

While searching an inventory of Rams out here in the west, I found that most come from the factory with the gray interior, except for Laramies which are usually brown with a few having black interiors. ST level Rams are available only in gray. White is the most popular exterior color, with black, silver, and gray following. The SLT and Big Horn models have brown and cream interiors with cloth seats as a no-cost option.

The ST comes with black bumpers and grille, and argent painted wheels. For $695 you can upgrade to chrome. Higher level Rams have chrome bumpers and grilles, with different grille inserts for different models. Fog lamps are included with Big Horn and above models. A trip mileage computer comes on SLT and above.

Black grille and front bumper on an ST model.

The ST comes with argent painted wheels. Chrome clad wheels are in the $695 chrome group. The SLT comes standard with the chrome-clad wheels. Big Horn and higher models have forged aluminum wheels.

The Sentry Key theft-deterrent comes on all Turbo Diesels. Note that it does not use a conventional metal "key" but rather has a plastic end or tongue that plugs into the instrument panel. Remote keyless entry is optional (Popular Equipment Group) on ST, standard on SLT and above.

Decisions, Decisions!

Without any further debate, I plan to get these features and options:

- 3500, Crew Cab, 4x4, with a six-foot bed. This length fits the garage comfortably, can be turned around easily, and has enough bed capacity for me (I think!)
- Cummins with Aisin transmission
- Fifth wheel and gooseneck prep package (just in case I ever need to tow those trailers)
- Park View back up camera (for hooking up a trailer and because my wife insists)
- Wheel-to-wheel side steps (my wife has spoken, again)
- Snow plow prep group (220 amp alternator in case I get a winch, and transfer case skid plate)
- White or Copperhead exterior paint. I thought about other colors, but white is coolest in the desert sun, looks good even dusty or ten years old, and is easy to match if repairs are needed. On the other hand, copper is attractive and is the color Oldsmobile painted my favorite engine (the 400 cubic inch for 4-4-2s in the 1960s). Copper is new for 2013 and the preliminary press release for the 2014 model does not show it. Timberline is a nice darker green but would be even hotter in the desert sun, and costs $450 whereas white and copper are no-cost colors.
- Trailer brake control – whether an option or standard on the model I choose
- Remote keyless entry – optional or standard depending on model
- Cloth seats – cooler in the Southwest desert heat

My Analysis and a Discussion

In 1997, an ST-equipped truck was a stripped down model, without power windows, cruise control, tilt steering wheel, air conditioning, front air dam under the bumper, or trailer towing mirrors (let alone power and heated mirrors!). It did not have a limited slip differential, or electronic stability control (back then all you could get was four-wheel antilock brakes, as an option). There was no such thing as a locking tailgate. Advanced variable intensity air bags with side curtain bags were not created or available. There was a basic, high force airbag in the hub of the steering wheel. The 2013 base-level ST Turbo Diesel has all these features. If you are th inking that you could not tolerate a "stripped-down" model, well, there isn't such a Ram anymore! Even the low-level trim package (ST) has a lot of features and some color/shading contrast. On the other end of the scale, a high trim level 2013 Laramie Longhorn model is far, far, more feature-laden and luxurious than the 1997 Laramie. So many features that are available now were unheard of sixteen years ago when I ordered my 1997 Turbo Diesel.

Editor's note: Again the Joni Mitchell song with the revised lyrics comes to mind:

> ***Don't it always seem to go***
> ***That you don't know what you've got***
> ***Till you've got it?***

As Joe reminds us, in the 17 years that have passed since his '97 truck, the creature comforts, performance, and safety features have found their way into the truck as standard equipment.

How does this influence the way in which you look at the price tag of a new truck or automobile?

I'm not sure about you, but I'll keep this idea in mind the next time I have a conversation with my wife about a new vehicle.

My Personal Choices

I have an interest in the brown/cream interior that is used in the SLT and Big Horn, a leather steering wheel, aluminum wheels, and the 7" instrument cluster. On the other hand, easy to clean plain gray door panels, dark seat belts, and all matching shades-of-gray interior have an attraction as well. I like the manual transfer case lever with mini-console on the ST. Painted bumpers make it easier to weld in reinforcements (if I go that route instead of an aftermarket front bumper). I am not sure I would ever use Bluetooth, but the capability might be nice ($660 on the ST model). However, to get all those things, the realistic package would be the Big Horn with some options, for a total list price of about $4500 more than the ST with the options that I want and can be ordered with that lower trim level of Ram. The limited information I have found on the Uconnect systems does not give me a clear direction, although getting the highest level (8.4) ensures that I would have everything I want later.

I still haven't decided between white and copper paint. It is one of many decisions to be made between "what I like" and "what is most practical."

My wife prefers the Big Horn, or at least some of its features. She likes the premium cloth power seats with lumbar support and the brown/cream interior. She wants the 8.4 Uconnect to give the bigger Park View display. She insists on Park View, automatic transmission, and the side steps. She also likes the "his-and-hers" dual glove boxes, and wants the map lights. She wants a nice truck, not just utilitarian.

Thus, my personal decision is between two packages, both Ram 3500, Crew Cab, 4x4, short bed with Cummins 385hp High Output engine and Aisin transmission. Both would have these options: Park View, fifth-wheel/gooseneck hitch prep package, wheel-to-wheel side steps, and snow plow prep group. In addition to those options, the trailer brake controller, cloth seats, Sirius radio, remote keyless entry, Uconnect 5.0, overhead console, and rear folding seat are options I would choose on the ST model. These latter features are standard on Big Horn. The manually shifted transfer case is available only on the ST. The brown/cream interior, Uconnect 8.4, forged aluminum wheels, and 7" instrument cluster are not available on the ST but I might order them on the Big Horn.

The two choices, then, are:

1. ST model with the above options (as available on that model) and Uconnect 5.0.
2. Big Horn model with the upgraded brown/cream interior, Uconnect 8.4, and the Luxury Group (mostly for the 7" multi-view instrument cluster) in addition to the above-listed features and options.

It could help to justify buying the Big Horn if we look at what that $4500 difference buys. The Uconnect 8.4 and the Luxury Group account for $940 of that amount. Chrome bumpers, grille surround, and wheels cost $695, and aluminum wheels another $300. The Big Horn includes the 60-40 split rear seat, the power driver's seat with lumbar support, and premium cloth. These items all together account for about $3000. The Big Horn also has a power sliding rear window, electric shift transfer case, upgraded interior door panels and other trim, fog lamps, chrome accent trim on door handles, shifter, interior, and mirrors. While it is hard to set "usefulness" values to the trim, door panel enhancements, etc. they do make the truck more attractive.

AFTERMARKET ACCESSORIES

Going back ten years, I made a list of some accessories and toys that are (or once were) installed on my 2004 Turbo Diesel. Next, I went through the list and picked some of those items for discussion of "Then versus Now."

Reunel Bumpers

My highly polished, stainless steel Reunel bumpers are light for their strength, have excellent, maintenance-free appearance, serve as stout winch mounts, and have saved my Turbo Diesel from severe damage in accidents. They tie the frame rails together, keeping it from being twisted even in a corner-of-the-truck impact. The rear bumper/trailer hitch setup from Reunel is extremely strong and eminently useful for towing.

I will probably get higher strength aftermarket bumpers for my new truck soon after buying it.

Warn 16.5ti and XD9000 Winches

These winches are relatively compact and light weight yet strong, reliable, and very capable. Even owners who don't plan to use winches frequently can benefit from the peace of mind that the truck can be recovered from the ditch, etc. without relying on help from someone else. Along with the winches, auxiliary equipment such as straps, shackles, and chains are worth carrying under the back seat or in your in-bed tool box. See TDR 47, page 14, and TDR 51, page 28 for extensive discussions of winches, Reunel bumpers, and related equipment.

Today, I still see substantial value to aftermarket winch-mount bumpers not only for protection of the truck but as solid winch mounts. The winch for the 2013 model will have to be a new design in order to protect and yet provide air flow to the low-mounted intercooler.

BD Exhaust Manifold, Air Box, Compound Turbos

In TDR 60, page 94, I noted that I had used at least eight aftermarket single turbochargers on my '97 Turbo Diesel, and four on my '04. I was also unhappy with the accessibility of the turbo on the Third Generation '04 Turbo Diesel for replacement purposes. While a twin or compound turbocharger setup is much more complex, the accessibility of components and the ease of disassembly favor the BD Twins significantly. The great reliability of the compound turbocharger setup gives me considerable peace of mind since I often drive for hundreds of miles where a breakdown would be very inconvenient, cell phone coverage is non-existent, and help is unavailable.

Where are we today? We can get 385hp from the factory and the turbocharger mated to it is under factory warranty. The factory type paper air filter works very well, and the new Ram Active Air pulls air from under the hood or from the front of the truck, as needed. If we are satisfied with that power level, we can leave the engine and the turbocharger alone, at least until something more wonderful comes along.

Dynomite Diesel Performance (DDP) Injectors

I am currently running a set of DDP Stage 1 injectors (50hp) on the '04 Turbo Diesel for a combination of power and mileage. I am very happy with them.

Today with 385hp from the factory, can we leave the engine alone?

South Bend Con-Fe Clutch
I have been running this clutch in my '04 Turbo Diesel since 2003, when the truck was almost new. It is meeting and exceeding all my expectations for longevity, torque capacity, and user friendliness.

Today we have the choice of a somewhat lower horsepower engine (350hp) with the aluminum-cased G56 manual transmission, or at the other end of the scale, the 385hp engine with the massive and very strong Aisin transmission. I wanted a manual transmission ten years ago for engine braking going down mountain trails, higher strength and durability of the NV5600 transmission, avoiding torque converter lockup issues, and good control of gearing. Today the automatic transmission with advanced computerized controls, coupled with the integral smart exhaust brake, does what I need.

Mag Hytec Differential Covers
These covers are the gold standard for Turbo Diesel owners. They fit perfectly, make it easy to check lube level and to change lube, look good, and add lube capacity. The front cover has a ramp at the bottom to help the differential to run up over an unseen big rock instead of merely crushing the cover.

Today, with the "Max Tow" package, Ram offers an aluminum rear cover, but it does not look as substantial, nor does it appear to add lubricant capacity.

11.8" (300 mm) ring-geared American Axle differential with finned aluminum cover, for the Cummins/Aisin/dually application.

Transfer Flow Fuel Tanks
When I want a reliable measurement of the amount of diesel fuel in my fuel tanks on my '04, I simply look at the TRAX II readout on my dash. Otherwise, I forget all about these excellent, trouble-free fuel tanks. They never leak, the associated electrical and electronic components work perfectly, and so they basically get no further attention. However, I would not want to be without them or their reliability. I live in the West and travel long distances without fuel stations along the route. Furthermore, the price of fuel often varies 25 cents or more per gallon from one location to another, so I want to get enough fuel for the trip where it is cheaper.

Today, the stock fuel tank has only a 31 or 32 gallon capacity, making a Transfer Flow system even more important than before when the stock capacity was 34 or 35 gallons.

FASS 220 Lift Pump, Filters
I find the three micron fuel filter to be essential with the HPCR fuel system. The pump is just loud enough so that I know it is running when I am starting the engine, but is non-intrusive when driving. The high flow capacity is necessary for those high horsepower dyno runs. Today, 3 micron filtration is available from the factory but the reliability and capacity of the stock lift pump are not. Capacity should be plenty for the factory-rated horsepower. I don't trust any electrical lift pump, and one in the tank is not easy to change. I don't have any answer. Maybe I'll look at what Editor Patton did with his dual fuel transfer pump, accessory project "Fool Pump Retrofit" that he detailed in Issue 76, pages 16-21.

Optima Batteries
Put them in before your stock batteries fail or leak acid all over your fenders and under the hood onto the sensors and wiring harnesses.

Today, gel mat or other non-liquid batteries are still a great idea. Acid inevitably leaks from conventional batteries, corroding whatever it can.

Boost; Exhaust Gas Temperature; Transmission Temperature; Supply Pump Fuel Pressure; and Rail Pressure Gauges
Today, the Engine Control Module monitors almost everything we want to see, but won't let us look at everything (such as EGT). The Edge Insight provides us with a view of those things by simply plugging into the diagnostic port at the bottom of the dash. However, if I want EGT, I'll still have to add a probe.

Line-X Bed Liner
This bed liner has been good and reliable for the rather light use I give it. The Rhino liner I had in my '97 Turbo Diesel was also good. Next time I will probably consider whatever similar brands are available, price, and quality of preparation and application by the local franchisers.

Engine Performance

The 370hp 800 ft-lb engine gave 332hp, 765 ft-lb at the wheels, on the H&S dynamometer:

http://www.youtube.com/watch?v=Nb_amIQa1zQ
H&S Performance
4160 S. River Road
St. George, UT 84790
888-628-1730
435-628-1730

I feel the new Cummins engine will perform as advertised. The 385hp High Output version that I plan to get should give around 345hp or so, pretty close to what we used to take older engines up to—and this will be factory with a warranty! Just like I want and hope for, finally a Ram that is ready as delivered, with no aftermarket performance stuff needed. Reports on the TDR forum indicate the mpg is close to what my '04 gets, so the new emissions recipe is working for us. I expect this will be another "pinnacle" year, like the 215hp 12-valve and the '03 305hp. The former gave 207-215 on the dyno, and the 305 gave 280. Cummins and Dodge knew the 12-valve engines were a little stronger at the flywheel than advertised, but customers were happy so they continued producing them that way.

Editor's note: In the preceding paragraphs where Joe has mentioned the engine's horsepower and the new-for-2013 Aisin automatic transmission. I'm reading between the lines—Joe is saying that "stock is 'gooder'."

Did you read the same thing? (Well, not necessarily with my goofy made-up word "gooder.")

Now, all that's left in Joe's decision making process is what differential ratio he should choose.

In his Issue 81 write-up (page 89) he compared the engine RPM changes that he could expect in an old truck versus new truck chart. Here is the data:

Engine RPM changes with transmission and differential ratios and 18" tires, versus his existing truck with the NV5600/3.73 with 17" tires:

Trans/Rear	74 mph in 6th	74 mph in 5th	61 mph in 6th	62 mph in 1:1
NV5600/3.73	2200 rpm	3014 rpm	1800 rpm	2500 rpm
Late G56/3.42	1960 rpm	2649 rpm	1603 rpm	2195 rpm
68RFE/4.10	2002 rpm	2606 rpm	1638 rpm	2275 rpm
68RFE/3.73	1819 rpm	2368 rpm	1487 rpm	2067 rpm
68RFE/3.42	1665 rpm	2167 rpm	1364 rpm	1892 rpm
Aisin/4.10	2002 rpm	2447 rpm	1638 rpm	2275 rpm
Aisin/3.73	1819 rpm	2223 rpm	1487 rpm	2067 rpm
Aisin/3.42	1665 rpm	2035 rpm	1364 rpm	1892 rpm

Rereading Joe's Issue 81 article, my impression is that Joe would stick with a 4.10 ratio differential. I opined that the 3.42 would be best for me.

The final drive ratio decision for every owner is different and, often times, made by what happens to be in stock at the dealership.

I will mention that Cummins and Ram personnel did presentations at the CMEP open house event (coverage on page 111-115) that would lead me in the direction of the 3.42 ratio.

Here is what Joe noted in his summary of the presentation. Joe writes:

The "rest of the story" is that lower rpm is acceptable under light loads on level ground. When in tow/haul mode, in fifth gear, the rpm will be higher, which you would want when towing. However, the new engine has good torque and fuel efficiency from 1200 rpm to 2000 rpm, according to Jamie Standridge, the Ram Powertrain Integration Manager. These situations suggest that 3.42 is a good ratio for Rams that will be used solo a good percentage of the time, or in tow/haul mode when towing medium weight trailers. In fact, when towing a heavy trailer and locked into tow/haul mode, fifth gear with the 3.42 ratio may be the best for interstate highway speeds.

The engine rpm at 74 mph will be 2035 with the Aisin and 2167 with the 68RFE. With the 17" tires, again the 3.42 ratio works well with the automatics because rpm is low for economy under light loads. Running solo at 74 mph, 1665rpm in sixth gear is acceptable under light load and will give enhanced fuel economy. Under heavier loads, use tow/haul or manually downshift to fifth and then the rpm will be 2035 (Aisin) or 2167 (68RFE).

The 4.10 ratio in tow/haul mode, with a locked torque converter and in fifth gear, will give 2606 rpm with the 68RFE, and 2447 rpm with the Aisin. These numbers are just a bit high (but acceptable) for the 68RFE but about right with the Aisin for the Cummins 6.7 liter engine under heavy load. Thus, the 3.42 gears works well for any Ram not trying to approach the 37,000 pound GCWR advertised for a dually 3500 with the Max Tow package (4.10 ratio, dual transmission coolers, finned aluminum rear differential cover). The DEF emissions strategy and the front axle disconnect are two other significant contributors to help Ram give us considerably better fuel mileage in the 2013 model Turbo Diesels.

Joe Donnelly
TDR Writer

LIFE WITH THE 2013-UP EMISSIONS SYSTEM

ISSUE 91 – HAVE RAM, WILL TRAVEL

by Joe Donnelly

INTRODUCTION

During a presentation by Cummins at the 2013 Cummins Midrange Engine Plant, we were told that with the new emissions strategy, the exhaust from a Ram Turbo Diesel is cleaner than urban air. We were told that Tenneco makes the emissions system/exhaust system.

So, does it work and is it reliable and "transparent" to the user? In the case of my 2013 Turbo Diesel, I can say, after 40,000 miles, that it seems to work and is completely reliable. I did discuss in Issues 88 and 89 that there was a recall to switch two exhaust gas temperature connectors in the wiring harness. I noted no issues before or after, and it seems that usage of diesel exhaust fluid has been less afterwards. Drivability has been perfect, and the tailpipe is still clean and almost free of soot. Because I have the Edge Insight (Issue 85, page 78), I am able to see when the regeneration process occurs, by watching the "DPF Status," EGT2 and EGT3 monitoring gauges. There have been only a few brief regenerations, with those EGT probes registering a bit over 1000° where otherwise they show up to 800°. Without the Insight, I would not have known a regeneration was occurring, and, as I noted, the time involved was pretty short, a few minutes each time. I am very pleasantly surprised that the truck has behaved so well and that the computers, sensors, probes, and modules have been completely trouble free. While it is distressing to look at the complex attachments to the 2013 engine compared to the simplicity of my old '97 12-valve, I have to admit that the engine has needed no attention from me beyond changing oil and fuel filters.

Ram Turbo Diesel tailpipe after 40,000 miles.

The oil change is a little more difficult than it was on the 1997 (Issue 84, page 90), while the engine-mounted fuel filter change is far easier on the 2013 (Issue 86, page 106) than on the 12-valve. Ash production is minimized by use of the proper engine oil, along with engine characteristics that minimize oil entering the combustion chamber. As John Martin has said in the TDR magazine (Issue 76, page 52), oils today are almost a commodity—just make sure they meet manufacturer's specifications.

The only attention I have paid to the emissions system is to add diesel exhaust fluid (DEF) as needed. DEF is made from highly purified water because low grade water with dissolved metal ions can contaminate and deactivate the catalyst of the selective catalytic reduction (SCR) emissions system. It is worthwhile to point out once again that the lifespan for DEF is temperature dependent. This is more of a concern in the desert southwest, of course, where daytime temperatures can reach or exceed 110°, and pavement temperatures can be even higher.

DEF LIFETIME

According to Chrysler TSB 25-005-14:

Temperature	Estimated Useful Life
50°F	36 Months
77°F	18 Months
86°F	12 Months
95°F	6 Months
104°F	2 Months

THE CUMMINS STRATEGY

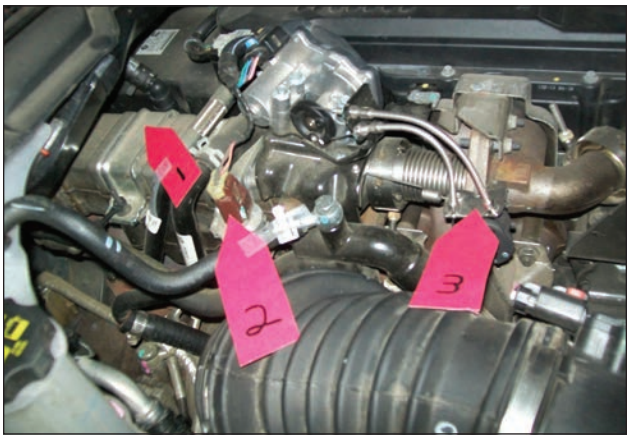
The emissions reduction strategy employed in the 2013-up Cummins Turbo Diesels includes two major approaches: internal, in-cylinder emissions controls; and external, exhaust aftertreatment components.

Engine Controls

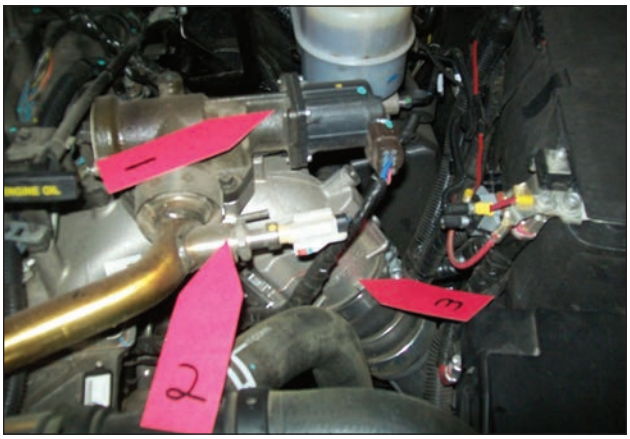
Emissions controls begin with engine parameters such as piston bowl shape; airflow characteristics (swirl or tumble) of the intake air entering the cylinder; injection rail pressure, timing, and quantities of each fuel pulse during the overall injection event; and engine control module (ECM) control of fueling versus boost pressure from the turbocharger. Atomization of the fuel is critical and is influenced by such things as rail pressure, injector nozzle hole placement and number, and air pressure and turbulence in the cylinder.

Exhaust gas recirculation (EGR) was applied to the Cummins B engine in 1996 in California; but that primitive system was "hot," meaning that the exhaust gas was not cooled before being sent into the air intake horn. Today, the exhaust gas is cooled in a chamber with engine coolant circulating around the exhaust gas. The EGR system is designed to reduce nitrogen oxides (NO_X) in the exhaust stream. High combustion temperatures form these nitrogen

oxides, and the peak combustion temperature is reduced by introducing "inert" gas, meaning exhaust gas into the air intake. As a note, do not remove the stamped steel plug on the end of the 6.7L EGR valve to inspect or clean the valve. You won't be able to adequately reseal the port. The EGR cooler incorporates a cooler bypass valve to maintain a desired EGR gas temperature with a cold engine, and to aid in engine warm-up. The cross-over tube has a temperature sensor to measure the temperature of the EGR gas flowing after the gas has exited the EGR cooler. EGR cooler failures are often caused by improper coolant filling procedures—allowing an air pocket to form in the cooler, which causes it to overheat and crack. A stuck EGR cooler bypass valve can also cause the cooler to crack.



Arrow #1, EGR cooler. Arrow #2, exhaust pressure module. Arrow #3, EGR cooler bypass valve.

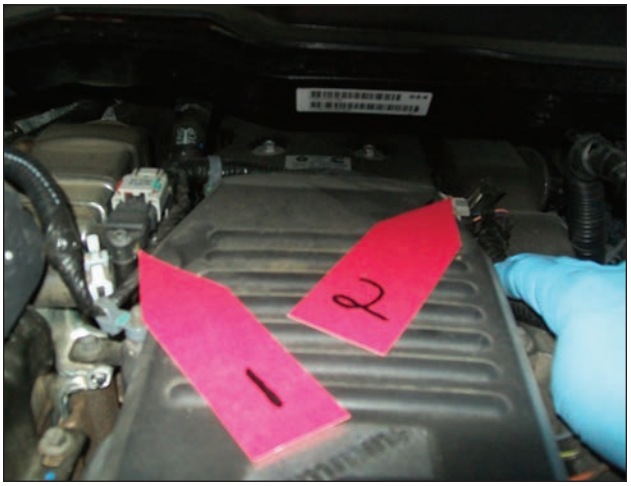


Arrow #1 EGR flow control valve. Arrow #2, EGR temperature sensor. Arrow #3, intake air throttle valve with the controller shown to the right of Arrow 2.

Another device, this one at the air intake, is the airflow control valve. The Edge Insight calls it the Intake Air Throttle and the Insight can monitor its position, from open (100) to closed (0). The valve is attached to the air intake horn and the position of the valve is controlled by the ECM. The purpose of the throttle or airflow control valve is to help regulate EGR flow by creating a pressure differential between the exhaust system and the boosted intake air system. The valve position depends on the blended quantity of exhaust gas needed in the engine for the exhaust gas NO_X to remain at the target level.

The engine has a closed crank case ventilation (CCV) system with these features:

- Blow-by gases from the crankcase are forced through the block to the cylinder head
- The gases are then forced into the CCV filter where the impactor nozzles and the filter separate oil from the gas
- The oil droplets flows through the drains to the breather cover and back to the oil pan
- Crankcase pressure is monitored by two sensors
- Blow-by gases then pass through the crankcase depression regulator (CDR) valve
- After passing through the CDR valve, the gases exit to the breather tube, then to the turbocharger air inlet
- The CDR valve is a safety device on the inside of the engine top cover that regulates crankcase pressure. In the event of excessive vacuum in the fresh air inlet due to a restricted air filter, the CDR valve closes, preventing vacuum from building up in the crankcase. The CDR valve also acts as a one-way check valve that stops oil from being drawn into the turbocharger. Engine oil greatly increases the soot load in the exhaust, and a failing turbocharger that sends oil to the exhaust system will damage the emissions traps. Also, a plugged air filter will cause excessive soot load in the DPF.



Crankcase pressure sensors.

The CDR valve gives our engines a big advantage over the approach some other manufacturers used (and maybe still do?) which sent the crankcase air with oil in it through the intercooler and into the turbocharger. Oil on the intercooler tube surfaces insulates them from transferring heat efficiently, especially if the oil cokes onto the tubes, which can occur if they are hot from high temperature turbocharged intake air passing through them.

The variable geometry turbocharger (VGT) is key to producing high horsepower with low exhaust emissions. It has a patented one-piece sliding nozzle that moves continuously to vary the effective size of the turbine (exhaust) housing and thus the amount of air (boost level) delivered to the engine. From our experience with earlier Turbo Diesels, we know that the small turbine housings

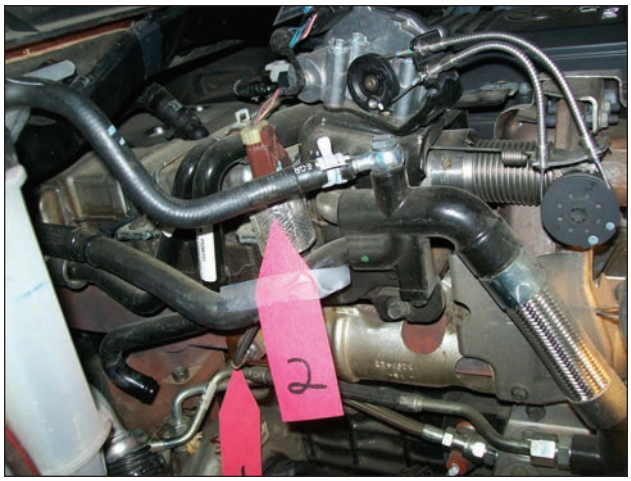
such as the 12sq.cm. used from '94-'02 was good for producing boost quickly and lowering smoke levels, but was restrictive at high power and high boost levels. Many of us changed that waste-gated housing to the 16sq. cm. housing and realized a power gain from the lower restriction and better balance of the exhaust and intake sides of the turbo system. However, the downside was that the engine tended to produce more soot as it built boost. Ideally, the turbo would vary the size of the turbine housing, depending on the amount of boost needed and the amount of exhaust restriction that would produce the ideal power level. Today's VGT system basically accomplishes that goal. I have watched the "VGT Position" on the Edge Insight and can tell that the ECM is doing a good job of optimizing the position of the sliding nozzle for soot minimization without killing power under load.

The 2013-up model year Cummins VGT actuator is flash programmable. It features an electronically controlled actuator that is replaceable separately. This system provides an exhaust brake with smooth engagement via the gear-train controlled sliding nozzle. The ECM based controller allows the exhaust brake to have "smart" modes—full on, or partial and variable to maintain the set road speed downhill. The VGT actuator is water cooled, with coolant flowing through a passage in the bearing housing. Water cooling adds to the reliability and durability of the turbocharger. The turbo is equipped with a speed sensor, which is used by the ECM for diagnostic purposes. There is also an exhaust pressure sensor, upstream of the turbocharger, at the end of a stainless steel tube fitted to a port on the exhaust manifold. This exhaust pressure sensor is used by the ECM to control emissions and EGT valve operation.

Arrow #1, turbocharger speed sensor under the foil cover for the wiring harness.

Arrow #2, pressurized oil inlet to the turbocharger center housing.

Arrow #3, coolant line. Arrow #4, VGT controller.



Arrow #1, exhaust gas pressure tube and fitting in the exhaust manifold. Arrow #2, electronic sensor for pressure readings.

The automatic transmission has been programmed to downshift more aggressively when the exhaust brake is enabled, and when tow/haul mode is activated. The exhaust brake feature can also be used to reduce engine warm-up time when the following parameters are met:

- Vehicle speed is less than 5mph
- Exhaust brake switch is on
- Coolant temperature is below 180°
- Ambient temperature is below 60°

Exhaust Aftertreatment

Diesel emission requirements have become far more stringent over the past 10 years—reductions of 98% since 2004 levels. Cummins has become the industry leader in producing engines with better power levels than ever, while meeting these extremely low allowable emissions levels. Integral to the emissions recipe for meeting these stringent requirements is a suite of aftertreatment systems. Visually, the aftertreatment components appear to be two large cylinders, one after the other, underneath the truck. The first cylinder contains the diesel oxidation catalyst (DOC) and the diesel particulate filter (DPF), with temperature and pressure sensors attached. The second cylinder contains the selective catalytic reduction (SCR) system, which is where the DEF is introduced to convert the nitrogen oxides to nitrogen. The amount of DEF needed has been greatly reduced because EGR is used to moderate combustion temperatures and hence the amount of NO_X that is produced in the engine.

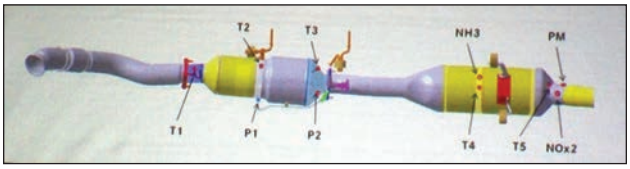
The aftertreatment processes include:

- Hydrocarbons and trace carbon monoxide are reduced with the diesel oxidation catalyst. This process also produces heat and combustion by-products that support the regeneration of the DPF.

- Particulate matter is a mixture of solids including soot, ash, metallic abrasion particles, sulfates, and silicates. The diesel particulate filter removes these contaminants from the exhaust stream. Additional heat to burn off particulate matter into gases and ash is used with diesel fuel that the engine injectors inject post-combustion on the exhaust stroke. Eventually the DPF will be filled with ash, depending on engine duty cycles.

- Nitrogen oxides are reduced with selective catalytic reduction and urea (DEF) injection.

The temperature and pressure sensors in the exhaust system are shown schematically below.



Schematic of the after-treatment system with temperature sensors T1-T5, and DPF differential pressure sensors P1 and P2.

Exhaust Temperature Sensors

The diesel exhaust temperature sensors are thermistors and change resistance based on the temperature being measured. The powertrain control module (PCM) provides a 5 volt reference voltage to the sensor. The PCM monitors the change in signal voltage and converts this to a temperature value.

For 2013-up there are five exhaust temperature sensors:

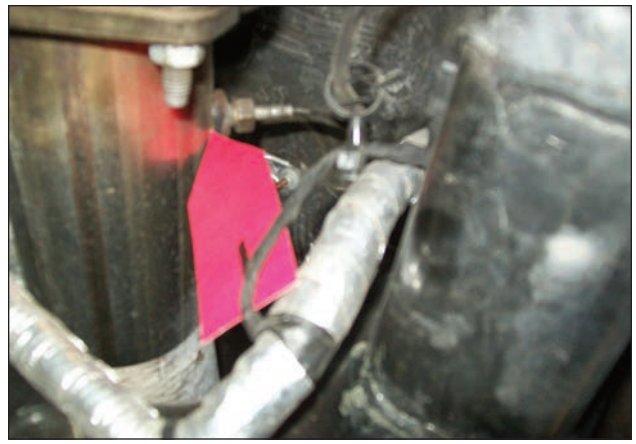
- Exhaust Temperature Sensor (T1) is located in the front exhaust pipe. It is close to the diesel oxidation catalyst and a couple feet from the turbocharger, but I have been using it to measure EGT to know when the exhaust temperature is low enough to shut down the engine safely.

- Exhaust Temperature Sensor (T2) is located at the rear of the diesel oxygen catalyst (DOC).

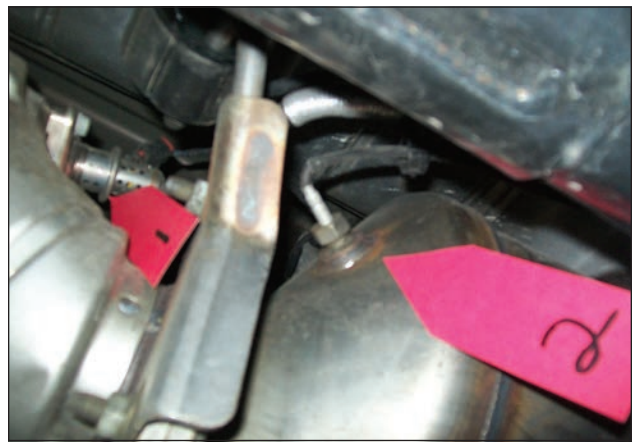
- Exhaust Temperature Sensor (T3) is located at the rear of the diesel particulate filter (DPF). [photo 11, arrow #2]

- Exhaust Temperature Sensor (T4) is located in the center of the selective reduction catalyst (SCR), near the ammonia sensor.

- Exhaust Temperature Sensor (T5) is located at the rear of the SCR.



Arrow #1, EGT1 sensor in the exhaust pipe before the DOC/DPF housing



Arrow #1, DEF dosing valve. Arrow #2, EGT3 sensor

There are different types of regeneration. The PCM continuously monitors the level of soot and hydrocarbons and triggers regeneration when needed. A differential pressure system is used before and after the DPF. This pair of sensors is critical for regeneration strategies because it translates the pressure drop into a measure of soot loading in the DPF. DeSoot removes particulate matter by oxidizing it through operation in a fuel-rich mode. This event lasts for 20-40 miles of driving. HC-Desorp or hydrocarbon desorption is infrequent and will typically occur only during extended idle or low speed operation. This mode helps prevent excessive soot loading.

12. Pressure sensors before and after the DPF, with electronic module above them (in the photo, partially hidden behind the driveshaft universal joint).

Passive regeneration occurs when the system generates enough heat based on the engine duty cycle. If not enough heat is present and regeneration is needed, active regeneration is used. This is the mode that injects fuel into the exhaust stream by means of fuel injection into the cylinders during the exhaust stroke. There is also a manual regeneration mode that can be accessed using the Wi-Tech diagnostic tool.

The DEF tank has a dosing control module on top. The tank also includes a DEF pump, level sensors, heater, and a temperature sensor inside the tank. The dosing valve at the SCR housing is shown in the last photo on the previous page (arrow #1).

13. Dosing control module on top of the DEF tank.

The Wi-Tech scan tool has extensive diagnostic tests to make repairs of the relatively complex emissions system more straightforward. It can access data from sensors and modules, such as:

- Ammonia sensor for the SCR catalytic bed
- NO_X going into the exhaust stream
- NO_X in the exhaust stream after SCR
- Boost pressure
- Calculated engine load
- Charge air temperature, before and after the aftercooler
- Coolant temperature
- Crankcase pressure
- Desired VGT position, and actual position
- EGR flow
- EGR orifice temperature
- EGR valve position
- Engine speed
- Estimated soot load based on pressure differential [photo 90-12]
- Exhaust gas temperatures 1-5
- Exhaust pressure
- Mass airflow
- DPF operating state

Joe Donnelly
TDR Writer

TECHNICAL SERVICE BULLETINS FOR 2013

ISSUE 82 – TDRESOURCE

Have we not all heard comments by those unfamiliar with the Ram Turbo Diesel (a prospective buyer of either a new or used truck, or a visitor on the internet or at the truck show) that "the Turbo Diesel certainly has its share of problems"? To them, no doubt, the grass looks greener on the other side. However, thanks to the TDR membership group and the support from Chrysler and Cummins, we are equipped with answers and solutions, rather than the dismay and isolation that would exist without a support group.

THIS YEAR'S TECHNICAL SERVICE BULLETINS

Each year as a service for the TDR membership I purchase a subscription to Chrysler's online service and data system (www.techauthority.com). As in years past, the TechAuthority site offers an index of factory technical service bulletins (TSBs) that have been released in the past year. I scroll through the index and print those bulletins that are pertinent to all Turbo Diesel trucks (all years, all models with cab and chassis included). With the bulletins in hand, I summarize the bulletin for publication in the magazine. Should you need a complete copy of the bulletin, you can contact your dealer with this Issue 82 in hand; or armed with your truck's vehicle identification number (VIN) and a credit card you can log on to www.techauthority.com and, for $35, you can view/print all of the TSBs that apply to your vehicle. The $35 buys you three consecutive days of access. However, just like last year I found theTechauthority website to be cumbersome to navigate. More on this later.

In an effort to consolidate the TSBs for the magazine, we're going to use the same index system categories as Chrysler. Below are the index categories.

2	Front Suspension	14	Fuel
3	Axle/Driveline	16	Propeller Shafts and U-Joints
5	Brakes	18	Vehicle Performance
6	Clutch	19	Steering
7	Cooling	21	Transmission
8	Electrical	22	Wheels & Tires
9	Engine	23	Body
11	Exhaust	24	Air Conditioning
13	Frame & Bumpers	25	Emissions Control
		26	Miscellaneous

A note concerning the TSBs and their use: The bulletins are intended to provide dealers with the latest repair information. Often the TSB is specific to the VIN. VIN data on the Chrysler service network helps the dealer in his service efforts. A TSB is not an implied warranty.

WHAT DO THE MODEL CODES MEAN?

Throughout our summary pages you'll see model codes listed for the various Dodge trucks. The following is a chart of the model code meanings.

Series	'10	'11	'12
2500 Pickup	DJ	DJ	DJ
3500 Pickup	D2	D2	D2
3500 C/C	DC	DD	DD
4500 C/C	DM	DP	DP
5500 C/C	DM	DP	DP

NEW RELEASES

Again, with the service at www.techauthority.com we've gathered information on Ram Technical Service Bulletins that have been released *only* during the past year. If you wish to review *all* of the TSBs for Third or Fourth Generation trucks, we have archived those as well as this update at the TDR's web site (Site Features: TSBs). Also, TDR Issues 66 and 58 have larger listings that allow the Third Generation owner to review the TSBs issued from 2003 to 2009.

Likewise, using Issue 78, 74 and 70 as your resource, you can review the TSBs that were issued in calendar years 2012, 2011 and 2010.

TECH AUTHORITY STUMBLES

Call my wife and she will tell you that I can spend money at internet web sites. The UPS man brings something new every day. However, again this year I found it cumbersome to spend money/retrieve data at TechAuthority. The search for data is cumbersome.

So, with this magazine's summary we've saved you from fumbling around. That is part of the reason you're reading the TDR, right? You trust the TDR's writers and staff to sift through the minutiae and bring you only the important details.

As a secondary feature to the TSB review, I find myself saying, "we've been there, done that." So, after my summary of a TSB, you may find additional commentary and/or page numbers from previous TDR magazines to give you further insight into the story.

I'm hopeful our yearly TSB summary is helpful to you.

Robert Patton
TDR Staff

Only DURING THE PAST YEAR

Elsewhere I made mention that gathering the TSB data is not easy. Long story, short version: the TechAuthority web site will give you a list of all the bulletins for 2013, but you cannot review a bulletin from that listing. In order to download or review the bulletin, you must submit a truck VIN. Understandably, this makes it easy for an individual search as one is not distracted by bulletins that do not apply.

In my efforts to bring you this yearly summary, I gather a large sample of VINs, everything from a two-wheel drive 2500 to a four-wheel drive 5500. These VINs are submitted and I gather the data. Hence the model code index that I provided and the listing of these codes beside the TSB summary that is presented.

Now, for a bit of good news.

If you throw out section "8 Electrical" (mostly "media center" reflashes) and ignore the reflashes in section "18 Vehicle Performance," the TSB list for 2013 is not too big. This is good news for the service network and good news for 2013 owners. The truck is solid, the quality is good.

More good news: With my list of 20 different VINs, I went back to the 2010 model year and the first Fourth Generation trucks. There are only a few newly-written TSBs for the older trucks. Wow!

As stated before, this process is cumbersome and I'm not immune to mistakes. Therefore you'll see some TSBs from 2012 that I did not include in the Issue 78 summary of TSBs. These are easy to recognize, the TSB number has a xx-xxx-12 and the date is from 2012.

Final comment: As mentioned above, if you have a 2010, 2011, or 2012 truck, you'll find many of these 2013 bulletins are not applicable to your vehicle. So, keep those old TDR magazines, specifically numbers, 70, 74, 78, etc., in hand if you have an older truck. As an example of how important the old data can be to you, let me give you three of the TSB summaries for a 2010/2011/2012 truck that you would not know about had you not been prompted to do a review of the old 70, 74 and 78 magazines.

From Issue 70:

TSB 14-001-10; date 2/2/10

Title: Electronic Fuel Control Actuator Available for Service/ DTC 0251

Subject: Should there be a surge at idle or DTC 0251 a new actuator, part number 05183245AA has been released.

TSB 14-002-10; date 2/11/10

Title: Heavy-Duty Filtration Parts Available

Subject: Mopar announces a new design fuel filter (FS2), fuel tank vent hose and upgraded air filter for 6.7 and 5.9 customers.

TSB 09-001-10; date 7/2/10

Title: Dust-out Diagnostics for Diesel Engines

Subject: The information-only bulletin gives the service network the procedure to determine an engine dust-out condition.

From Issue 74:

TSB 18-004-11; date 2/18/11

Title: Diagnostic and System Improvements

Subject: This bulletin describes a number of software improvements that are available to 2010/2011 diesel owners.

TSB 19-001-11; 8/9/11

Title: Rod Ball Stud Housing Alignment

Subject: The bulletin describes the proper procedure for tie rod ball stud housings and covers 4X4 models back to 2003.

From Issue 78:

TSB 09-004-11; 9/2/11

Title: Dust-out Diagnosis for Cummins Diesel Engines

Subject: This 9-page information-only bulletin updates TSB 09-001-10 and reemphasizes that improper air filtration and dust-out conditions are not warrantable.

TSB 14-004-11; date 4/1/11

Title: Heavy-Duty Filtration Parts Available

Subject: The bulletin updates TSB 14-002-10 by again discussing the new FS2 fuel filter, a Mopar tank vent filter and a new air filter. This bulletin added discussion about an auxiliary fuel filter kit that could be added to the '03-'11 trucks.

TSBs FOR 2013

Okay, with all of the background information and previous reference locations duly noted, let's get on with the TSBs for 2013. Using the model codes listed on page 40 (the DJ, D2, DD, DP designations), note the year model and the directions from Chrysler for the proper repair of a problem.

CATEGORY 7 COOLING

TSB#	MODEL	SUBJECT/DESCRIPTION
07-001-12 2/14/12	’11 DJ/D2	*Transmission cooler Hose Weepage.* Some of the listed vehicles have been built with a transmission cooler hose that may experience fluid weepage. This bulletin involves inspecting the upper transmission cooler hose for a specific date code and time stamp. If found within the suspect range, the transmission cooler hose must be replaced. The vehicle range is from 9/20/10 to 1/17/11. ***Editor’s Comment: This is a TSB from last year (2012) that we missed including in our Issue 78 summary.***

CATEGORY 8 ELECTRICAL

Editor’s Comments: Section 8/Electrical – Radios and Media Center Units

Wow! As I mentioned, were it not for reprogramming radio units, our list of TSBs for 2013 would be very small. As you look through the following you’ll see what I mean.

And, from conversations with suppliers to Chrysler, I know it is expensive to have a TSB issued due to a flash or electronic update being necessary. So, who makes the Chrysler radio/media center unit? Makes you wonder…

TSB#	MODEL	SUBJECT/DESCRIPTION
08-065-12 12/20/12	’12 DJ/D2	*RHR Navigation Map Enhancements* This bulletin applies to vehicles built with an Uconnect 730N Navigation Radio (sales code RHR). This bulletin involves updating the RHR radios navigation map database software.
08-010-13 2/28/13	’10-’11 DJ/D2 ’11 DD/DP	*Fluid Leak from Washer Reservoir* A customer may have a condition where fluid is leaking from the washer reservoir. On further inspection the technician may find cracks in the reservoir by the washer pump pocket. This bulletin involves inspecting and/or replacing the washer reservoir. This bulletin applies to vehicles built before March 30, 2012, equipped with a diesel engine.
08-021-13 3/29/13	’12 DJ/D2/DD/DP	*Flash: Hands Free Module Customer Satisfaction Enhancements* This bulletin applies to vehicles built up to January 1, 2012, with media center sales code RSP, RSQ. This 12 page bulletin gives the instructions for performing a USB service flash of the Hands Free Module (HFM).
08-042-13 7/20/13	’13 DD/DP	*Flash: Remote Start Will Not Shut Vehicle Off* This bulletin applies to vehicles built on or after March 02, 2013, and on or before April 19, 2013, equipped with Hard Wired Remote Start (sales code XBV). The customer may note the remote start works properly when starting the vehicle. The remote may not be able to turn off the vehicle. This bulletin involves reprogramming the Radio Frequency Hub (RF-Hub) with updated software.
08-049-13 Rev C 8/14/13	’13 DJ/D2/DD/DP	*RA3 And RA4 Radio Enhancements* A customer may experience problems with the Uconnect 8.4 radio, sales code RA3 or RA4. This bulletin applies to vehicles built before June 15, 2013. This bulletin involves upgrading the software on the RA3 and RA4 Radio.
08-057-13 7/30/13	’13 DD/DP	*Flash: Power Take Off (PTO) Enhancements* A customer may experience that the PTO will shut off after 30 minutes of operation. The PTO will start working again after the ignition is cycled. This bulletin involves updating the Vehicle System Interface Module (VSIM) software. This bulletin applies to vehicles built on or after January 16, 2013, on or before May 10, 2013, equipped with Electronic Monitoring Module (sales code XXS) and Power Take Off Prep (sales code LBN).

TSB#	MODEL	SUBJECT/DESCRIPTION
08-058-13 7/31/13	’13 DJ/D2/DD/DP	*After Radio Replacement, Cannot Register Uconnect Access or Critical VIN Error Message Is Displayed* This service bulletin applies to vehicles equipped with a Uconnect 8.4 radio (sales code RA3or RA4). After head unit replacement it is important to verify that a consistency check has occurred to ensure the Uconnect Access features are capable of connecting to the cloud. A consistency check occurs to register the replaced head unit’s data with vehicle VIN into the databases associated with the Uconnect Access features. This check occurs over the cloud and under most conditions, the consistency check completes automatically and only verification of connectivity is required.
08-060-13 8/8/13	’13 DD/DP	*Backup Camera Display Screen Is Blank* This bulletin applies to vehicles built on or before May 10, 2013, equipped with ParkView Rear Back-up Camera (sales code XAC). A customer may experience that the screen for the back-up camera is blank when the truck is in reverse. This bulletin involves installing a jumper harness to correct the problem.
08-061-13 8/9/13	’12 DJ/D2/DD/DP	*RBZ or RHB Radio Software Enhancements* This bulletin applies to vehicles built on or before April 30, 2013, equipped with a sales code RBZ or RBH Media Center. The customer may experience one or more of the following. • Digital photos loaded onto the hard drive intermittently get lost • CD/DVD will not play (RHB only) • Navigation accept screen will not clear (RHB only) • Navigation shows “acquiring signal” for an extended period of time (RHB only) • New navigation graphics (RHB only) • Sirius audio pop on power up • HFM audio pop on power up • Trip planner does not save a route after it was created (RHB only) • Route guidance does not activate after the vehicle shuts down (RHB only) • Longitude entry does not allow enough digits (RHB only) If the customer experiences any of the above problems, an upgrade to the media center software is to be performed.
08-066-13 8/21/13	’11-’12 DJ/D2	*RHR, RHW, or RHP Radio Software Enhancements* This bulletin applies to vehicles equipped with Media Center 730N radio sales code RHW, RHR, or RHP. The customer may experience one or more of the following conditions. • Lost channel presets, home addresses, address book entries and travel link favorites • Not able to change default country and state then route • Unable to load.jpeg files onto hard drive to display on touch screen • Incomplete Travel Link temperature displayed when the temperature is over 100°F • iPhone4 dial not possible after second call • Missing Travel Link buttons from SAT menu • Devices button disabled in VES menu • Unable to route to a recent route after a map update. • Remove Travel Link disclaimer popup • During active call and on hold, DIAL button should be displayed (not “TONE” button) • Point of Interest (POI) Search enhancements • When video in remote DVD player is stopped, devices button wrongly labeled as DVD • Access Travel Link immediately after radio no update when staying on TL screen • iPod, track selection enhancements. This bulletin involves upgrading the software on the RHR, RHW, or RHP radio.

CATEGORY 18 VEHICLE PERFORMANCE

TSB#	MODEL	SUBJECT/DESCRIPTION
18-001-13 1/5/13	’12 DJ/D2	*Flash: Diagnostic and System Improvements* The following improvements/enhancements are available for the listed DTCs: • P049D – EGR control position exceeded learning limit • P0101 – Mass air flow sensor “A” circuit performance • P0191 – Fuel rail pressure sensor circuit performance • P2000 – NOx absorber efficiency below threshold (diagnostic improvements) • P2002 – Diesel particulate filter efficiency below threshold (for high altitude failures) • P2195 – 02 sensor 1/1 out of range high • P2196 – 02 sensor 1/1 out of range low • P2270 – 02 sensor 1/2 out of range high • P2271 – 02 sensor 1/2 out of range low • P241A – 02 sensor 1/1 and 1/2 oxygen concentration mismatch • P242F – Diesel particulate filter restriction – ash accumulation • P2453 – Diesel Particulate filter pressure sensor a circuit performance • P2609 – Intake air heater system performance This bulletin involves selectively erasing and reprogramming the Engine Control Module (ECM) with new software.
18-005-13 1/23/13	’10 DJ/D2	*Flash: Diagnostic and System Improvements* The following improvements/enhancements are available for the listed DTCs: • P2000 – NOx absorber efficiency below threshold • P1451 – Diesel particulate filter system performance • P0101 – Mass air flow sensor “A” circuit performance • P046C – EGR position sensor performance • P049D – EGR control position exceeded learning limit • P051B – Crankcase pressure sensor circuit range/performance • P2002 – Diesel particulate filter efficiency below threshold • P2262 – Turbocharger boost pressure not detected – mechanical • P2609 – Intake air heater system performance Improvements other than DTC robustness or enhancements: • O2 Sensor cleaning cycle • Correct Charge Air Cooler (CAC) out voltage reading in WiTech • Improve idle shutdown messages • Add ability to read Exhaust Manifold Pressure (EMP) sensor value in WiTech • Display correct Exhaust Gas Recirculation (EGR) position in WiTech • Make Grid Heater off time selectable in WiTec • Display correct alternator voltage in WiTech • Turn Low voltage Idle Up Off • Other drivability enhancements • MIL on with no DTC • Ability to read EGR valve gap on WiTech • Erroneous, brief brake lamp flash at key on DTC U1601 set outside of the dealership with a no crank (towed in), no start condition caused by unauthorized (up-rate) software will not be covered under the terms of the warranty. Truck exhibiting any DTC related to Oxygen Sensor, Oxygen Sensor Module or communication to the Oxygen Sensor Module also require that service bulletin 25-004-12 (or later bulletin) be performed (if not previously performed).

TSB#	MODEL	SUBJECT/DESCRIPTION
18-013-13 3/14/13	’11 DD/DP	*Flash: Diagnostic and System Enhancements* Cab chassis trucks equipped with a 6.7-liter Cummins diesel have a number of software improvements available. This latest service bulletin(SB) will include: Improvements to prevent unnecessary Malfunction Indicator Lamp (MIL) illumination for: • P061A – ETC level 2 torque performance • P229F – Aftertreatment NOx sensor circuit performance – Bank 1 Sensor 2 • P2453 – Diesel particulate filter pressure sensor a circuit performance • P2609 – Intake air heater system performance • P1123 – Power take off system monitor control error • U010E – Lost communication with diesel exhaust fluid control unit • P20EE – SCR NOx catalyst efficiency below threshold – Bank 1; for DTC’s set at highway speed and/or high load drive cycles. Enhanced diagnostics for: • Selective catalyst reduction (SCR) efficiency diagnostic improvements Other updates: • Too frequent regeneration readiness improvement • Correct CAC out voltage in WiTech • Add ability to read EMO sensor value in WiTech • Enable EMP de-icing algorithm • Display correct crankcase pressure in WiTech • Display correct EGR position in WiTech • Improve idle shutdown messages – extra message removed • Display correct alternator voltage in WiTech • Idle shutdown message on EVIC • Turbo protection feature (not displayed if vehicle is in park or no vehicle speed). Limits RPM at cold ambient to prevent turbo damage • Scan tool display updates • Correct operation of remote PTO • System robustness improvements This bulletin involves selectively erasing and reprogramming the Engine Control Module (ECM) with new software.

TSB#	MODEL	SUBJECT/DESCRIPTION
18-013-13 3/14/13	’11 DD/DP	*Flash: Diagnostic and System Improvements* Several software improvements are available for vehicles equipped with the 6.7-liter diesel engine: Prevent or reduce unnecessary Malfunction Indicator Lamp (MIL) illumination for the following transmission faults. These faults are currently tripped as a one trip fault and should have been a two trip fault: • P049D – EGR control position exceeded learning limit • P0711 – Transmission temperature sensor performance • P0712 – Transmission temperature sensor low • P0713 – Transmission temperature sensor high • P0714 – Transmission temperature sensor intermittent • P0740 – TCC out of range • P0869 – Line pressure high • P0933 – Hydraulic pressure sensor range/performance • P0934 – Line pressure sensor circuit low • P0935 – Line pressure sensor circuit high • P1775 – Solenoid switch valve latched in TCC position • P1776 – Solenoid switch valve latched in LR position • U0100 – Lost communication with ECM/PCM • U0002 – Can C bus off performance – bus off Improvements to prevent or reduce unnecessary Malfunction Indicator Lamp (MIL) illumination for: • P026A – Charge air cooler efficiency below threshold • P0544 – Exhaust gas temperature sensor circuit – Bank 1 Sensor 1 • P0562 – Battery voltage low • P20EE – SCR NOx catalyst efficiency below threshold – Bank 1 (additional software enhancements to prevent false MIL) • P2201 – Aftertreatment NOx sensor circuit performance – Bank 1 Sensor 1 • P2281 – Air leak between MAF and throttle body • P24A5 – EGR cooler bypass Bank 1 control stuck • P2459 – Diesel particulate filter regeneration too frequent (additional software enhancements to prevent false MILL) • P249E – Closed loop SCR reductant injection control at limit – flow too high Other Updates: • With the ignition in the “Run” position, engine not running, a small number of customers may experience a message in the Vehicle Information Center that states “Service Exhaust System – see dealer” erroneously • Doser thaw calibrations (with proper doser calibration ensure SB 18-xxx-13 (or later bulletin) is also completed to update Doser Control Unit (DCU) • I/M OBD II readiness – DTC P2002 improvements help Particulate Matter (PM) filter monitor group to be set to ready more often • Add engine run time to fuel filter minder • Remove MIL for DTC; P1C70 – SCR error detected – engine disabled • Frozen CAC diagnostic improvement • WiTech – Reset fix (PTO request on pickup) • WiTech – Road governor speed upper limit adjustment • SCR performance test This bulletin involves selectively erasing and reprogramming the Powertrain Control Module (PCM) with new software.

CATEGORY 18 VEHICLE PERFORMANCE

TSB#	MODEL	SUBJECT/DESCRIPTION
18-022-13 5/22/13	’07-’09 DH/D1 ’07-’10 DC/DM ’10-’13 DJ/D2 ’11-’13 DD ’11-’12 DP	*Cummins 6.7L Turbo Diesel Common Diagnostic Process* This bulletin applies to all vehicles equipped with the 6.7-liter Cummins Turbo Diesel engine. This common diagnostic process was developed for any drivability concern on the engine. Non-drivability engine issues or engine cooling system issues are not in the scope of this process. The process begins by identifying the customer’s concern and applying it to one of the following symptoms: • MIL illumination • Engine cranks but does not start or starts and immediately stalls • Engine surges, bucks, runs rough – no MIL • Engine noise – no MIL • Excessive black smoke out exhaust – no MIL • Excessive white smoke out exhaust – no MIL • Excessive blue smoke out exhaust – no MIL In each case, the test procedure will request that a Diesel diagnostic Worksheet be completed before proceeding. Once the data has been collected and analyzed, then the diagnostic process can continue. The worksheet takes the technician through several basic steps (fuel system checks, battery system checks, air filtration, previous flash updates) before the repair to the engine is started.
18-025-13 7/2/13	’13 DD/DP	*Flash: Diagnostic and System Improvements* Several software improvements are available for cab and chassis trucks built before 6/11/13. These improvements include: Improvements to prevent or reduce unnecessary Malfunction Indicator Lamp (MIL) illumination for: • P0234 – Turbocharger overboost condition • P026A – Charge air cooler efficiency below threshold • P0299 – Manifold pressure sensor out of range low • P0544 – Exhaust gas temperature sensor circuit – Bank 1 Sensor 1 • P0562 – Battery voltage low • P20EE – SCR NOx catalyst efficiency below threshold – Bank 1 • P2201 – Aftertreatment NOx sensor circuit performance – Bank 1 Sensor 1 • P2281 – Air leak between MAF and throttle body • P24A5 – EGR cooler bypass Bank 1 control stuck • P2459 – Diesel particulate filter regeneration too frequent • P249E – Closed loop SCR reductant injection control at limit – flow too high Other Updates: • With the ignition in the “Run” position, engine not running, a small number of customers may experience a message in the Vehicle Information Center that states “Service Exhaust System – see dealer” erroneously • Add engine run time to fuel filter minder • Remove MIL for DTC; P1C70 – SCR error detected – engine disabled • Wait To Start (WTS) bulb check timing improvements (1 second) • Set PTO maximum speed to 2,000 RPM • Allow Mobile PTO operation in neutral • Dual Fuel tank corrections • Dual alternator voltage variation improvements • Frozen CAC diagnostic improvement • WiTech – Reset fix (PTO request on pickup) • WiTech – road governor speed upper limit adjustment • SCR performance test This bulletin involves selectively erasing and reprogramming the Engine Control Module (ECM) with new software.

CATEGORY 18 VEHICLE PERFORMANCE

TSB#	MODEL	SUBJECT/DESCRIPTION
18-026-13 7/2/13	’13 DJ/D2	*Flash: Diagnostic and System Improvements* Several software improvements are available for consumer vehicles equipped with a Cummins Turbo Diesel. This bulletin applies to those trucks built before 6/11/13 that were equipped with an Aisin (DF2) or manual transmission (DEG). Prevent or reduce unnecessary Malfunction Indicator Lamp (MIL illumination for the following transmission faults. These faults are currently tripped as a one trip fault and should have been a two trip fault: • P0711 – Transmission temperature sensor performance • P0712 – Transmission temperature sensor low • P0713 – Transmission temperature sensor high • P0714 – Transmission temperature sensor intermittent • P0740 – TCC out of range • P0869 – Line pressure high • P0933 – Hydraulic pressure sensor range/performance • P0934 – Line pressure sensor circuit low • P0935 – Line pressure sensor circuit high • P1775 – Solenoid switch valve latched in TCC position • P1776 – Solenoid switch valve latched in LR position • U0100 – Lost communication with ECM/PCM • U0002 – can C bus off performance – bus off Improvements to prevent or reduce unnecessary Malfunction Indicator Lamp (MIL) illumination for: • P026A – Charge air cooler efficiency below threshold • P0544 – Exhaust gas temperature sensor circuit – Bank 1 Sensor 1 • P0562 – Battery voltage low • P20EE – SCR NOx catalyst efficiency below threshold – Bank 1 • P2201 – Aftertreatment NOx sensor circuit performance – Bank 1 Sensor 1 • P2281 – Air leak between MAF and throttle body • P24A5 – EGR cooler bypass Bank 1 control stuck • P2459 – Diesel particulate filter regeneration too frequent (additional software enhancements to prevent false MIL) • P249E – Closed loop SCR reductant injection control at limit – flow too high Other Updates: • With the ignition in the “Run” position, engine not running, a small number of customers may experience a message in the Vehicle Information Center that states “Service Exhaust System – see dealer” erroneously • Add engine run time to fuel filter minder • Remove MIL for DTC; P1C70 – SCR error detected – engine disabled • Dual fuel tank corrections • Frozen CAC diagnostic improvement • WiTech – Reset fix (PTO request on pickup) • WiTech – road governor speed upper limit adjustment • SCR performance test This bulletin involves selectively erasing and reprogramming the Powertrain Control Module (PCM) with new software.
18-025-13 7/2/13	’13 DD/DP	*Flash: Doser Module, System Enhancements* Software improvements are available for the Diesel Exhaust Fluid (DRF) system on vehicles equipped with a Cummins Turbo Diesel. These improvements are designed to prevent or reduce unnecessary Malfunction Indicator Lamp (MIL) illumination for: • P202E – (Diesel Exhaust Fluid) reductant injector performance Service bulletin 18-018-13 (flash PCM) should be performed in conjunction with this bulletin.

CATEGORY 21 TRANSMISSION AND TRANSFER CASE

TSB#	MODEL	SUBJECT/DESCRIPTION
21-005-12 2/10/12	’12 DJ/D2/DD/DP	*Flash: Service 4WD Light Illuminated With C2201 Set* This Service Bulletin applies to vehicles equipped with an electronic transfer case built before 1/6/2012. Some customers may get a “Service 4WD” light in the Cabin Compartment Node (CCN). Upon further investigation the Technician may find that C2201 – FDCM/DTCM Internal diagnostic trouble code (DTC) is set in the DTCM. When the system detects this, it shuts down the 4WD capability for the remainder of the drive cycle. This condition is not monitored when operating in 2WD mode. Updating the DTCM software will correct the conditions above. This bulletin involves flash reprogramming the Drive Train Control Module (DTCM) with new software. ***Editor’s Comment: This is a TSB from lat year (2012) that we missed including in our Issue 78 summary.***

CATEGORY 25 EMISSIONS CONTROL

TSB#	MODEL	SUBJECT/DESCRIPTION
25-001-13 Rev A 5/10 13		*MIL Illumination due to P2000, P2A00 and/or P2A01* This bulletin applies to vehicles equipped with a 6.7L Cummins Diesel engine (sales code ETJ) built before 8/2/2010. Customer may experience MIL illumination. Further investigation by the technician may find one or more of the following DTC(s) present: • P2000 – NOx absorber efficiency below Threshold – Bank 1 • P2A00 – O2 Sensor 1/1 circuit performance • P2A01 – O2 Sensor 1/2 circuit performance This bulletin involves inspecting both Oxygen (O2) sensors and either cleaning or replacing the sensors and installing an O2 Sensor Heat Shield on the exhaust pipe in the area in the FRONT O2 sensor.
25-002-13 2/28/13	’11 DD/DP	*MIL Illumination Due To P1C56 – NOx Sensor Intermittent – Bank 1 Sensor 2* Customer may experience MIL illumination. Further investigation by the technician may find P1C56 – NOx sensor Intermittent – Bank 1 Sensor 2 is set active or stored. This condition may be caused by insufficient heat retention in the exhaust at or near the DEF doser. This bulletin involves verifying excessive Diesel Exhaust Fluid (DEF) deposits in the decomposition tube collected and if present, replacing the Catalytic Converter Shield with a “clam shell” shield with a metal exterior.

TSB#	MODEL	SUBJECT/DESCRIPTION
25-004-13 8/15/13	'10-'12 DJ/D2	*Malfunction Indicator Lamp Illumination Due To Oxygen Sensor* • If the vehicle has any of the following DTC's for O2 sensors, stored, pending or active, perform the repair procedure. • P013A O2 Sensor 1/2 Slow Response – Rich To Lean • P013B O2 Sensor 1/2 Slow Response – Lean To Rich • P013C O2 Sensor 1/1 Slow Response – Rich To Lean • P013D O2 Sensor 1/1 Slow Response – Lean To Rich • P0030 O2 Sensor 1/1 Heater Circuit • P0031 O2 Sensor 1/1 Heater Circuit Low • P0032 O2 Sensor 1/1 Heater Circuit High • P0036 O2 Sensor 1/1 Heater Circuit Malfunction • P0037 O2 Sensor Heater Circuit Low 1/2 • P0038 O2 Sensor Heater Circuit High 1/2 • P0053 O2 Sensor Heater 1/1 Resistance • P0054 O2 Sensor Heater 1/2 Resistance • P064D Internal Control Module O2 Sensors Processor Performance – Bank 1 • P0131 1/1 O2 Sensor Shorted To Ground • P0132 1/1 O2 Sensor Shorted To Voltage • P0135 O2 Sensor 1/1 Heater Performance • P0137 1/2 O2 Sensor Shorted To Ground • P0138 1/2 O2 Sensor Shorted To Voltage • P0141 O2 Sensor 1/2 Heater Performance • P113C O2 Sensor Power Supply Circuit Performance • P2195 O2 Sensor 1/1 Out Of Range High • P2196 O2 Sensor 1/1 Out Of Range Low • P22AB O2 Sensor Positive Current Control Circuit/Open – Bank 1 Sensor 2 • P22AE O2 Sensor Reference Voltage Control Circuit/Open – Bank 1 Sensor 2 • P22B2 O2 Sensor Negative Current Control Circuit/Open – Bank 1 • P22B5 O2 Sensor 1/2 Pump Cell Current Trim Circuit Open • P2237 O2 Sensor 1/1 Pump Cell Current Circuit Low • P2243 O2 Sensor 1/1 Reference Voltage Control Open • P2251 O2 Sensor 1/1 Negative Current Control Circuit/Open • P2270 O2 Sensor 1/2 Out Of Range High • P2271 O2 Sensor 1/2 Out Of Range Low • P241A O2 Sensor 1/1 And 1/2 Oxygen Concentration Mismatch • P2626 O2 Sensor 1/1 Pump Cell Current Trim Circuit/Open • P2A00 O2 Sensor 1/1 Circuit Performance • P2A00 O2 Sensor 1/2 Circuit Performance • U011A Lost Communication With Exhaust Gas Sensor Module The repair procedure requires that both Oxygen Sensor connectors should be removed and new connectors with pigtails installed. The pigtail splice points should be staggered to eliminate bulk in the harness.

CATEGORY 31 COLLISION BULLETIN

TSB#	MODEL	SUBJECT/DESCRIPTION
31-001-13 1/11/13	All	*Overspray Removal* This bulletin describes the proper procedure for removing overspray which can be a result of industrial fallout and/or a poor refinishing process. Depending on the severity and extent of overspray on painted surfaces, the removal process will vary. Always begin using the least aggressive method. The bulletin discusses use of Meguiar's products to refinish and polish the paint.
31-002-13 1/31/13	All	*Blending Clearcoat During The Refinish Process* This bulletin discusses Chrysler's position against the use of partial clearcoat blending. Partial clearcoat blending is not an approved warranty repair process for Chrysler vehicles. Clearcoat should always be applied to the entire surface area of a body panel and mixed to manufacturer's specifications. Any vehicle repaired with the partial clearcoat blending process will prematurely fail and eventually result in a clearcoat delaminating condition.

RECALLS ISSUED THIS YEAR

CALIFORNIA EMISSIONS RECALL K01
REPROGRAM ECM—OBD READINESS

Date: May 2010

Models: '03 (DR) Dodge Ram 2500/3500 Pickup Truck

'06-'07 (DH/D1) Dodge Ram 2500/3500 Pickup Truck

'07 (DC) Dodge Ram 3500 Cab/Chassis

This recall applies only to the above vehicles equipped with a 5.9-liter diesel engine (sales codes ETC and ETH) and a California emission control system (sales code NAE). And to above vehicles equipped with a 6.7-liter diesel engine (sales code ETJ) and a California emission control system (sales code NAE) built through January 5, 2007.

The Engine Control Module (ECM) on the above vehicles may fail to accurately report diagnostic system information with some generic scan tools This may cause the vehicle to be rejected or fail an Inspection/Maintenance Test (also known as a Smog Check).

Repair: The Engine control Module (ECM) must be reprogrammed (flashed).

EMISSIONS RECALL J35
REPROGRAM ECM—REGENERATION STRATEGY

Date: April 2010

Models: '07.5-'09 (DH/D1) Dodge Ram 2500/3500 Pickup Truck

This recall applies only to the above vehicles equipped with a 6.7-liter diesel engine (sale code ETJ). The Engine Control Module (ECM) software program on the above vehicles may cause illumination of the Malfunction Indicator Lamp (MIL) when no problem exists or under certain conditions allow heavy sooting of the turbocharger, exhaust gas recirculation valve and diesel particulate filter. Heavy sooting could damage emissions components and result in increased emissions.

Repair: The Engine Control Module must be reprogrammed (flashed). The bulletin describes the service procedure that the dealership technician is to follow. Using the dealership's scan tools, the time allowance for the reprogramming operation is less than one hour. As a part of the recall and ECM update the technician has to verify that the previous emissions recall, recall G30, October 2007, has been performed. The G30 recall contains software that must be installed to prevent damage to the ECM. There are no parts involved in the J35 recall notice.

www.techauthority.com
A HIGHLY RECOMMENDED RESOURCE

After a five-year absence of providing the service of listing new technical service bulletins for a given year, the folks at TechAuthority (www.techauthority.com) have reinstated this service feature. This is both good and not-so-good for the TDR audience.

How so?

Good: It allows the editor to list only those TSBs issued during a given year. This cuts down on my research and trims the page count as we don't have to print a compilation of TSBs that go on for three or four years.

Not-so-good: As the owner you only get to see a limited, one-year window of bulletins printed in the magazine. How can we make this news to you more agreeable? First, realize that a compilation of the yearly TSB updates is always available to you at the TDR's web site under the listing of "TSBs." Second, if you want to search the TSBs the old-fashioned way you can go back to your printed magazines and look specifically at our annual summaries (starting with a progression of four) at 66, 62, 58, 54, etc.

Elsewhere in the magazine I've already talked about TechAuthority as an outstanding resource for information. The value of the information available for your truck's VIN at www.techauthority.com far exceeds the TechAuthority subscription price of $20. Using your VIN (I even tried a '97 truck's VIN and got the information), you'll be able to pull up and print all the TSBs and recall notices specific to your truck. And, as mentioned on page 53, you'll be able to scroll through the entire factory service manual for your vehicle.

Robert Patton
TDR Staff

FOURTH GENERATION RECAP – WHAT I HAVE LEARNED WITH MY 4G

ISSUE 82 – YOUR STORY

by Robert Patton

With a modest economic recovery occurring, sales figures for the Fourth Generation truck are finally gaining momentum in the marketplace. So, I find that many are now looking at 4G trucks in either the new or used marketplace. A familiar question, "Where can I get some more information?"

In the last issue of the TDR my editorial on page 4 talked about engine performance tuners and hardware for the 6.7-liter engine. A recap: without the latest gonzo turbocharger, mega performance module or super-size air system to evaluate, well, what do we have to discuss for the Fourth Generation audience?

As it turns out, lots of material. And, in this issue, I'm going to use several older articles as the background for a three-year update on my Fourth Generation, 2010 Turbo Diesel truck. Again, more folks are looking at 4G trucks and, even if you have a 2010-2012 truck, there may be some information that you've missed.

So, here goes…

My 4G truck was purchased in August of 2010 and the first mention of the truck was in the Issue 70 magazine. There is no need to scramble to find that particular text. However, Issue 70 does have three articles that may be of interest to Fourth Generation owners: First there is evaluation of the noise level versus two Third Generation trucks; a '06, 5.9-liter truck and a '07.5, 6.7-liter truck (pages 40, 41). Also of interest, a turbocharger article covering the 6.7-liter engine's variable geometry turbocharger (VGT) (pages 46-51). Then Jim Anderson talks about accessories that he has added to his 2010 truck (pages 74-79).

More articles on Fourth Generation trucks:

Issue 71: "Purchase Confirmation or Buyer's Remorse," pages 54-59

"New 4G Accessories," pages 140-148

Issue 72: "6.7-Liter Engine Report," pages 32-37
"Accessorizing a 4G Truck," pages 68-75

Issue 73: "Mr. Schwarz/2010 Accessories," pages 56-61

Issue 74: "Insight – Cost of Regeneration," pages 48-53

Issue 75: "One Year Follow Up," pages 50-53
"Some Gotta Win/3500 Evaluation," pages 66-69
"New Truck," pages 85-89

Issue 76: "Under the Hood of Mr. Schwarz," pages 46-51

Issue 78: "New 2013 Ram Heavy Duty Trucks," pages 42-45
"6.7-Liter Aftertreatment Delete," pages 40-41

Issue 79: "Performance Parts Update 2013," pages 46-51

Issue 80: "The 2013 Cummins Engine," pages 58-63

And, folks, this list doesn't include the quarterly feature columns "6.7-Liter Engines" or "Fourth Generation." Also not mentioned, articles by Donnelly about injector replacement; Holmes about codes and code retrieval; Patton about fuel transfer pumps; Anderson about customer concerns; Redmond about 6.7-liter injector codes; etc. Clearly there is data available for those wanting to research the purchase of a Fourth Generation truck.

Whew, that is a lot of stuff-n-such. Now, on to the story, my update on "What have I learned with my 4G?"

The simple answer—go read those TDR back issues, specifically Issues 71, 73, 75 and 76. Kidding aside, you should expect more from those that write for the TDR. How about a summary, Mr. Editor?

First, a disclaimer: My recommendations for the truck often lead to the part being incorporated into the parts catalog at Geno's Garage. Along with the Geno's staff we have been evaluating aftermarket parts for almost 20 years and, in typical TDR/Geno's style, we'll tell you if it works well on your truck. And, to make it interesting, we'll tell you the goof-ups, too. So, what have I learned with my 4G?

I'll keep the correspondence brief with a ★ symbol as the approval rating for an accessory (one=least; five=best). For the record, most of these evaluations are updates from Issue 75.

Interior

Cup Holder ★★★★★

Geno's Garage. The cup holder continues to be the first item that I install on a new truck. After three years this statement still holds true.

Close inspection of the 2013 truck's interior shows that:

a) After all these years, the Ram folks copied the Geno's cup holder idea

b) Geno's future cup holder sales will decline

c) both a and b

d) editor is crazy and there is no correlation

Pictured below are the console/cup holder in my ’10 truck and the factory integrated unit from the ’13 truck.

My 2010 **Ram’s 2013**

I think the answer to the quiz is answer e) – “all of the above.”

Seat Heater: Rostra ★★★★

Geno’s Garage. The seat heaters would get a good five-stars were it not for the fact that the Ram folks have changed the way that their seat covers attach to the seat foam. That is correct: they use those dreaded hog-rings instead of the Velcro attachments used on ’03-’09 seats. So, installation is a tad more difficult (Issue 72, page 73). The hassle of installation is outweighed by the effectiveness of the heaters on a bad back. After three years, this statement still holds true.

Seat Covers: Covercraft ★★★★

Geno’s Garage. Great fit. I’ve used Covercraft seat covers in all of my trucks since 1996. After three years, this statement still holds true.

Floor Mats: Husky and Avery ★★★★

Geno’s Garage. Either they catch water and muck or they don’t. Four stars means the Husky liners do the job. After three years, this statement still holds true.

Stereo Unit: JVC ★★★

Crutchfield. I purchased the unit because I was spoiled by my previous 2003 truck’s remote radio controls and this JVC stereo has a remote control fob. Occasionally the remote has a mind of its own and the unit is difficult to program (time, and radio outputs). It is not user friendly. However, the smaller size of the unit with the Crutchfield mounting kit gives you room underneath the stereo for miscellaneous storage.

I’ll also add to the stereo discussion that I’ve been influenced by those that love to tinker (think TDR’s Scott Dalgleish and his ’98 Red Ryder truck). Scott wrote about his stereo (dare we say entertainment system) in Issue 80.

Scott has been writing for the TDR for 18 years. From reading his articles it may seem that he has contractors and shops do the majority of the work on his truck. However, I can tell you that is not the case. He is gracious in giving credit where credit is due and good PR for the shops. But, he is as much hands-on a mechanic as you’ll find.

His purchase of the ’98 Red Ryder truck was as a used vehicle. While I’ve not yet seen the ’98, but his previous ’95, ’98 and ’05 trucks were show-stoppers. His attention to detail—I would say is unmatched—but that is a big statement. If you have ever seen a Blair Pine or David Magnoli truck, or seen the workmanship of vehicles at the SEMA show or an Autorama you know that “unmatched” has Scott’s detail in with some top-shelf builders. He is that good.

Sorry, I was off on a little tangent. Way back when he started Red Ryder Scott stated, “In the world of $12,000/used 15-year-old pickups, I’m not going crazy on this one.” I knew not to believe him. So while his articles typically capture the professional way to do a project, I subscribe to the “bubba knows best” theory.

Examples: Scott uses Hushmat as sound deadening around his Kenwood speakers. Robert uses speakers that sound good at the Wally World audio display and lines the interior cavity of *his* truck’s *door* with cut pieces of thick rubber floor mats purchased at the Home Depot.

Notice I said “door.” Scott lines all four cabin doors. I only lined the driver’s door of my truck—I don’t open or close the other three doors. *My* door does have a solid thunk when it closes.

Likewise, Scott built a custom enclosure for the subwoofer. My subwoofer speakers are open to the elements/protected with an old t-shirt. However, the one speaker under the driver’s seat gives new meaning to the phrase “feel the music.” Turn up the volume and there is thump in the rump. Try it in your truck!

Scott’s enclosure.

Robert's under the rear seat t-shirt enclosure.

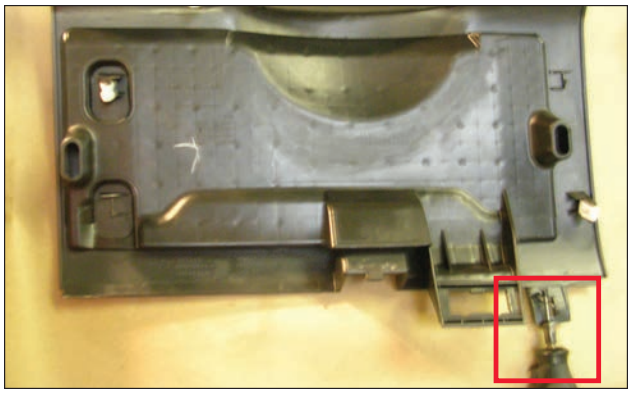
Robert's under the driver's seat, thump in the rump.

So, Scott and Robert are two ends of the accessory installation spectrum. Perhaps you can learn a little bit from both of us as we good-naturedly banter with one another in print.

Electrical Accessories:
Painless Wiring/Fuse Panel ★★★★

Geno's Garage. Since my truck did not come with a big list of options from the factory, I knew that I would need both of these electrical building blocks. The blocks are positioned under the dash for easy access. I made access to these two blocks a quick "snap," but not without some modifications to the knee bolster panel. With the panel on the workbench, I removed several of the plastic tabs that keep it in place—less is more. I permanently removed the two Phillips screws that are over-kill for the positioning of the knee bolster. I permanently removed the OBDII connector and tie wrapped it just to the left of the knee bolster. I modified the tangs on the hood release lever so that it easily drops off of the knee bolster.

If you have a Fourth Generation truck and you need an easy-to-access area for electrical goodies, I highly recommend these modifications to your knee bolster panel.



The knee bolster panel has been removed and the Dremel tool wil soon be cutting the tab where the Phillips head screws were located.

Parking Partner: Sonadar ★★

Geno's Garage. I love this item, but as technology changes, and as the price of electronic gadgets (see rear view camera below) does a freefall, the Parking Partner has reached obsolescence. When I started accessorizing the truck. I had to look through all of the Geno's product returns to piece together a working unit.

Rear View Camera: V3P/Peak ★★

Pep Boys/Advance/Auto Zone. On TDR writer Sam Memmolo's recommendation I purchased the camera kit. I like having this camera because it allows you to hook up to a trailer hitch without getting out of the truck. There are so many of these units available and the price can be as low as $59 on sale. The camera is a wireless unit. I would give it a five-star rating if it weren't so temperamental and fuzzy some of the time. Regardless, it is only needed for hitch-up and the price was right.

I was really clever and tried to mount the display screen in one of the small storage compartments. I cut the back of the compartment off. Try as I might, first with Velcro then JB Weld, I could not get the screen to stay in place. So, what could be a five-star was pulled out of the truck and a new storage compartment put back in place. For backup viewing I broke down and purchased a camera from Edge (see below).

The Edge camera is wired to the back of the Edge Insight monitor and it gives a great view of the backup.

Gauges: Edge Insight ★★★★

Geno's Garage. Adding gauges to your truck has never been so easy. Just plug it into the OBDII sensor and it is ready to display more information than I care to know, with up to 20+ data points from which to choose. With the Insight ($399) and the addition of an EGT probe ($99), it accomplishes the big three gauge functions (boost, EGT, transmission temperature) for about the same price as a set of independent gauges and a pod.

Another feature that the Insight offers is the ability to display and clear fault codes. And, should you have a code on the family automobile, the Insight can be removed from your truck and likely it can read and clear that code, too. So, the Insight is a valuable tool to have.

I know, this sounds like a sales pitch, so I'll stop and give you something to think about. The Insight simply displays data that is available on the OBDII. Why doesn't Ram give you access to all of the data at the electronic vehicle information center (EVIC) display?

I asked that question at Ram's 2013 new truck introduction. The answer is one that has to do with product evolution. With the EVIC and the color touch screen/radio/entertainment/navigation system, there are so many options now available to you that it will make your head spin. However, as of this writing there is still not a factory exhaust gas temperature read-out. As was mentioned on page 35, the sensor is in place. I'm waiting for Edge to announce software changes whereby they can "read" the sensor.

Finally, the last pitch for the Insight is the fact that you can add their backup camera to the unit and, with great clarity, see the hitch behind your truck's bumper. I went ahead with the camera based on writer Scott Dalgleish's recommendation in Issue 74, pg. 109.

This photo is my Edge Insight. Note that I have an EGT reading by using an accessory sensor that is sold by Edge.

Fourth Generation Cabin Filter Kit: Mopar ★★★★

Geno's Garage. In Issue 74 I made the discovery of the cabin filter and Mopar air box door that could easily be added to your truck's ventilation system. Get out your box cutter, heat it with a torch, cut the vent at the already indented location and add this filter to your vehicle.

I was surprised to see the amount of dust-n-such that the filter had caught in its 1.75 years of use. The filter and Mopar air box door make a nice addition to your truck's interior.

Underhood

Compressor and Air Horns: Pacbrake and Chrome City ★★★★

I purchased the compressor kit direct from Pacbrake. I love the compressor, air tank and horns. I also love the quick disconnect that I added at the area of the truck's license plate. This comes in real handy when you have to air up a trailer tire on the side of the road.

Likewise, I added an air fitting under the hood.

Now, with all these fittings and plumbing the inevitable occurred—an air leak. So, I crawled under the truck and pulled the power lead off of the compressor and the problem went away—until such time that I needed some air. Wow.

The problem was traced to a faulty/cracked pressure sending unit. I finally replaced the unit only to find that the air horns would no longer operate. An air horn is nothing more than a solenoid—why wouldn't the solenoid pull in/out? Upon disassembly I found that rust was the problem. Lesson learned: do not mount air horns in a horizontal location underneath the truck. The horns were moved vertically behind the front bumper. Live and learn.

Don't you love having to troubleshoot accessories that you've added to your vehicle?

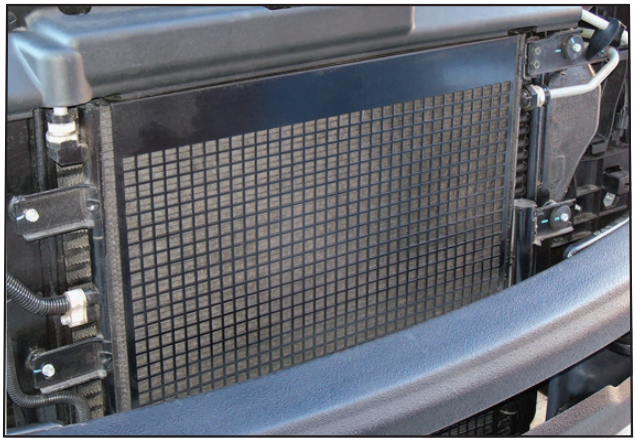
Engine Oil Drain Valve: Fumoto ★★★★★

Geno's Garage. This cost-effective item solves the truck's infamous oil drain problem. This is a great item for any Turbo Diesel truck.

Quick Grill Release Kit: Geno's Garage ★★★★★

Geno's Garage. Since I'm the guy that developed this kit, you can rest assured that it gets a five star rating. For the do-it-yourselfer, the instructions are in Issue 71, pages 141-143. The removal of the grill allows you to use the bumper as a step—just like the '94-'09 trucks that we've all become accustomed to.

With the QGRK modification your grill comes off in three-seconds. Really. I'm not kidding. Make this modificaton to your Fourth Generation truck, now! It works on 2010-2014 models.



Condenser Guard: Lanier Metal ★★★★★
Geno's Garage. The guard goes hand-in-hand with the QGRK. It keeps the condenser's fins from getting bent. Sandwich some nylon window screen between the guard and the condenser and you can eliminate the bug splatter problem. It works on 2010-2014 models.

Cab Fresh Air Filter Kit: Cab Fresh ★★★★
Geno's Garage. I like the fact that the filters help clean the outside air. I do not like the cheap, quick-to-rust screws provided with the kit. So the Geno's folks now send stainless screws with the kit.

FASS Fuel Pump (Platinum Series '05-'12) ★★★★
Geno's Garage. You can read all about the quest for better filtration of fuel for the '03 and newer trucks with the HPCR 5.9 or 6.7 engine in the articles in Issue 77, "Fool Transfer Pump – part Two" (pages 14-16); and Issue 76, "Fool Pump Retrofit" (pages 16-21).

Since I am 1.5 years into the retrofit, I can positively say the retrofit was a good addition to the truck. I can rest assured that the engine is getting good, clean fuel, and that I have a great "Boy Scout" backup system should I have trouble with the fuel transfer pump. I can also say that the installation and workmanship has proven to be tight and tidy. It gets the "Bubba Knows Best" seal of approval.

Finally, please see the side bar, "Lessons Learned the Hard Way" for a further explanation about the capacity of the truck's fuel tank.

Exterior

Tailgate Up/Down Assist: Gate Glide II
★★★★★
Geno's Garage. I'll start my list of exterior items with a must-have item. Every truck should have tailgate-up and tailgate-down assist. Many of the TDR writers have also given the Gate Glide II a big thumbs-up. If you haven't already purchased one, you need to give it a try.

Bed Liner: Spray-in, Line-X brand ★★★★
Local installation at Super Trucks, Cumming, Georgia. The Super Trucks guys continue to do a great job on my trucks. As a side note, have you noticed that a spray-in bed coating is now available as a factory option? Compare/contrast the thickness of the factory option to the aftermarket guy in your area and I think you'll choose to stay with the aftermarket product. And, although I've tried, I can't match the thickness of the Line-X with any of the do-it-yourself kits (even the U-POL that I wrote favorably about in Issue 73).

Bed Step: AMP Research
★★★★★
Geno's Garage. With a drop in the price to $199 this easy-to-use easy-to-install step is a five-star item. It bolts on in less than five minutes.

Cabin/Running Board Steps: AMP Research ★★★★
Geno's Garage. I love these steps! I love how they tuck under the truck's cabin and they enhance the side view of the truck. I love the comments from passengers and onlookers as I open the door and the steps drop down to make truck entry a simple step-up. They are pricey, thus I give them only four stars.

Side Step: AMP Research ★★
This step is just too quirky for me. To install the step it takes more patience than I possess. It requires that three blind nuts be lined-up inside the truck's frame rail. Okay, I finally got it installed, but I find that the step doesn't give me too much of a step advantage and this probably has something to do with mine being a two-wheel drive truck.

Foglights: Pilot ★★★★

Auto Zone. I installed some small sized, inexpensive lights from the local auto parts store for use on the front and rear (backup) of the truck. Using relays, the front lights come on whenever the low beams are operating, and the rear lights come on whenever reverse is selected.

Bed Cover: Agri-Cover Lite Rider ★★★★

Geno's Garage. Cost-effective, 99% waterproof, easy to install, and, most importantly, it rolls/unrolls in about 10 seconds. Three years later, still a big thumbs-up. Oops, I should also mention I've used their cover on every truck I've owned since 1999.

Wheels:
American Racing ATX-181 Artillery 20"x9" ★★★★

Tire Barn Custom Wheel Warehouse. The Geno's staff purchased these wheels at the 2010 Scheid Diesel Extravaganza. The offset is not quite right or these wheels would get a five-star rating. Yes, they stick out too far, which necessitated Mopar fender flares to make the wheels/tires look correct. That is the drawback.

The big plus about these wheels: they are Teflon-coated. Initially I thought this was a bunch of bunk—kind of like Teflon that was used in Slick 50 lubricants back in the 90s. But, the ease of clean up has made me a believer in the Teflon coating idea for truck wheels. It works on the wife's pots and pans, right? Should I need to purchase wheels in the future I will look for those with a Teflon coating. Three years later, still a big thumbs-up.

Fender Flares: Mopar ★★★

Local Dodge dealer. As noted above, the fender flares were necessary to compensate for the incorrect (too wide) offset of the aftermarket wheels. The truck's wheels/tires now look acceptable. Three years later, there is some minor release from the double stick tape areas.

Tire: Cooper 275/60/R20 Discover HT Plus ★★★★

Tire Barn Custom Wheel Warehouse. When the Geno's guys returned from the Scheid event with the 20" wheels and tires I was really concerned that these wider tires with their somewhat aggressive tread pattern (the stock tires were Michelin LTXs) would be louder. I was also concerned about the larger diameter—the Cooper's are 630 revolutions per mile, the OEM Michelins are 690. So I have effectively changed the rear end gearing by 60rpm or 60/690 = 8.6%. The stock 3.73 gearing is now a 3.41. But the truck pulls my 12,000-pound load okay through the rolling hills of Georgia and the southeast. And, I can always downshift to fifth-gear.

The tires were installed at 2,000 miles. Now at 32,000 miles, the tread is down to the wear bars. I really don't drive hard, so I find the 30K life to be a bit underwhelming. However, the ride is comfortable and the tires are quiet. Will I replace the Coopers with the same tire? The answer: yes.

Mudflaps:
Husky/Winfield Products ★★★

Geno's Garage. Those mudflaps are perfectly contoured to the truck's wheelwells. Pricewise, they are about 25% less than the Mopar part. You can't go wrong with that! However, they aren't as long as the Mopar brand (6.5" versus 8") and lately we've noticed more folks paying the higher price for the Mopars.

This inset photo shows the addition of Husky mud guards.

The correction for a wheel/tire that sticks out too far? A lighter wallet ($327) and Mopar wheel flares, part number 82212208 (molded black, grain texture, same as Power Wagon wheel flares).

Not So Good

All right, you've looked at my list of goodies that have a favorable rating. How about those that did not make the cut and were not installed on the truck?

I would be remiss if I did not give you an update. Here goes.

Fuel Door: Bully or All Sales

I don't think a chrome fuel door would look right on this all-black truck. The Geno's folks no longer sell the cheap chrome Bully door as it would rust too easily. The All Sales polished aluminum doors are a nice addition for those that like shiny things.

Lights: Anzo or Recon

The Geno's folks reported too many warranty problems with the Anzo lights. I tried the lights from a competitor, Recon, and I had too many problems with poor electrical connections. I cannot recommend either light to you. The Geno's folks have settled on selling lights from "Depo" and we really like their products.

Conclusion

Any item with four stars or better you can correctly assume that I would use on my next truck. Three or less… time to evaluate the product or the poor workmanship of the installer. I'm hopeful my list of items is helpful to you as you upfit your truck.

Robert Patton
TDR Staff

THE NEW 2013 RAM HEAVY DUTY TRUCKS

ISSUE 78 – Blowin' In The Wind

by Robert Patton

back.ground.er: noun, an off-the-record briefing for reporters

The term "backgrounder" was used for the Ram press conference on September 27 at the Texas State Fair where the 2013 Ram Heavy Duty pickup trucks were unveiled to the public. Although I had not used the word before, the on-line Webster dictionary states that the first known use of "backgrounder" was in 1960. Once again I find myself behind the times.

Regardless of the fine points of usage, what was learned at the Ram presentation?

First off, it was a presentation by *Ram*—not Dodge, not Dodge Ram—simply Ram. We are all familiar with Chrysler's new branding of the truck as Ram, effective back in the 2009/2010 timeframe. However, traditionalists continued with the "Dodge" nomenclature and insisted that it could only be called "Ram" if there was a new entry on the vehicle identification number (VIN) plate designating Ram as the manufacturer. However, my VIN research for positions 1-3 of the VIN shows they were using "Chrysler Group LLC-Truck" as far back as 2005, before the Cerberus Capital Management ownership. Others tell me that position 5 has recently been changed from "D" to "R". Regardless, to make it an official stand-alone Ram truck took time: lots of legal and government mumbo-jumbo to go through, not to mention separate franchise agreements which every Chrysler, Dodge, Jeep and now Ram dealership was required to sign. So let it be known: the 2013 truck is a Ram. The Ram franchises have been signed.

Okay, back to the Ram backgrounder: The Webster definition suggests that a backgrounder is an "off the record" briefing. Perhaps I should modify my definition of backgrounder to read "product presentation that still allows for surprises, interleaved with unequivocal, take-it-to-the-bank fact." Such was the take-away from the Texas unveiling: there are still some surprises to be revealed at a location and date to be determined.

Did the Texas backgrounder serve its PR purpose, to build anticipation for the new-and-improved, and leave me wanting still more facts? Without a doubt. Let's jump into the material that I can share with you.

The new 2013 Heavy-Duty truck.

UNKNOWNS

Where do I start? How 'bout with the big unknowns:

Availability – sometime after 1/1/2013
Pricing – To be determined

Now add two big questions: What are the tow and haul ratings for the consumer 2500 and 3500 trucks; as well as those for the 3500/4500/5500 cab and chassis trucks?

KNOWNS

Moving on to the knowns—perhaps the best way to present the data is to list the changes to the truck's components made specific in Ram's backgrounder: engine, driveline, frame, suspension, etc.

Note: if some of the text sounds like marketing-speak, it is. The preview of the truck(s), text, and pictures for this article arrived after the regular due date for magazine proofs to be submitted to our printer. Rest assured that the Dodge, oops Ram, guys will re-invite the press for a ride-and-drive event in the spring for a head-to-head evaluation against competitive trucks. The words you'll read from the forthcoming test drive will be the genuine stuff.

Engine

For the 2500/3500 pickup trucks there are some big changes to the engine for 2013. The Cummins 6.7-liter engine is now available in three versions. The first version is paired with Ram's six-speed manual transmission, and delivers 350 horsepower at 2,800rpm and 660ft-lb of torque at 1,500rpm—a significant boost from the 2012 model-year maximum of 600ft-lb.

The second option matches the Cummins to the 68RFE six-speed automatic transmission. The rating: 370 horsepower at 2,800rpm and 800ft-lb of torque at 1,600rpm. This engine/transmission is available in the 2500 truck.

Finally, an upgraded 6.7-liter high-output engine is available for the Ram 3500 (single or dual rear wheels) with an Aisin six-speed automatic transmission (AS69RC). In addition to 385 horsepower at 2,800rpm, the most powerful Cummins generates best-in-class torque of 850ft-lb at 1,600rpm. The new AS69RC transmission features wide gear ratios that contribute to upgraded shift performance, an approximate 1 percent gain in transmission efficiency, and improved drivability when compared to the previous design.

For the Ram 3500/4500/5500 Chassis Cab trucks, the 6.7-liter Cummins engine will be rated at 325 horsepower at 3,000rpm and best-in-class 750ft-lb of torque when coupled with a new AS56RC Aisin six-speed automatic transmission. For those who want a manual transmission, the existing G56 manual is matched to an engine rated at 320hp at 2800rpm, 650 torque at 1500rpm.

For 2013, all Ram Heavy Duty diesels will benefit from an all-new cooling system. A high-efficiency fan, dual radiators, dual transmission coolers, and charge-air cooler will afford 25 percent more heat-rejection capacity. Lower operating temperatures deliver improved performance, better durability and lower operating costs.

Diesel-equipped Ram Heavy Duty pickups feature an industry-exclusive Ram Active air intake system, activated by new monitoring capabilities added to the engine controller. When the intake system senses extreme heat, it draws cool air from the front of the vehicle—a function that also engages at high altitudes for superior throttle response in low oxygen environments. When conditions are wet from snow, ice or water fording, the system pulls air from the standard/conventional underhood inlet, clear from snow packing and water ingestion.

The Cummins power plants benefit from a larger exhaust-gas recirculation (EGR) cooler, which complements the debut of selective catalytic reduction (SCR) and accommodates a best-in-class oil-change interval of 15,000 miles. Oil life is increased by reducing soot production and reducing fuel dilution of the oil.

SCR promises a net reduction in Ram Heavy Duty operating costs. The change to SCR in 2500/3500 pickup trucks (the 3500/4500/5500 trucks debuted in 2010 with SCR) should result in a net 10% increase in fuel mileage. The SCR-equipped diesels, which can run on B-20 biofuel, also operate cleaner by lowering greenhouse-gas emissions and better managing soot production than the previous NOx adsorber technology.

When needed, the diesel exhaust fluid (DEF) is injected into the exhaust to reduce NOx (Nitrogen Oxides) emissions coming out of the tail pipe. Unlike the competition, the Ram Heavy Duty maintains full power when fluid is low. The state-of-the-art DEF system applied on the Heavy Duty brings the following features and benefits:

- An electric heater in the DEF tank to ensure the fluid is available in a liquid state regardless of climate. The result is a less complex system for enhanced durability. Competitive designs have used a network of glycol-circulated cooling/heating lines
- A new passively cooled DEF injector that does not require engine coolant to control its temperature, which reduces the complexity of the system
- Exhaust-system refinements to improve the utilization of DEF for NOx reduction and to reduce the risk of side effect from DEF crystalline build-up
- Emissions-system strategy revisions to reduce soot output from the engine and improve fuel economy, all while meeting the legislative requirements

Fill DEF on the left, diesel fuel on the right.

The DEF tank holds eight gallons (9.25 in Chassis Cabs trucks) and refill intervals are based on vehicle usage and duty cycles. DEF is commonly available at fuel stations and is also offered by Mopar, the Chrysler Dealer Network, and Cummins dealers and distributors. The DEF refill port is conveniently located at the rear of the cab on the driver's side of the vehicle, a configuration that ensures easy access at fuel stations when compared to the competition.

Driveline

The Ram Heavy Duty also features a segment-exclusive front axle disconnecting system. When conditions warrant, selected drivetrain components are disconnected, improving overall efficiency and enabling a gain in fuel efficiency of up to 1mpg.

Two new Borg-Warner part-time transfer cases make their debut on the 2013 Ram Heavy Duty (pickups and Chassis Cabs). The BS 44-46 is an electric shifting part-time transfer case with 2WD, 4WD High, 4WD Low and Neutral. BW 44-47 is a manual shifting transfer case with 2WD, 4WD High, 4WD Low and Neutral. Both options feature a low-range ratio of 2.64 and locking differential from front to rear.

Frame

For 2013, Ram Heavy Duty trucks feature new frames built with high-strength 50 KSI steel, including eight separate cross-members, hydroformed main rails and fully boxed rear rails for optimal strength and mass efficiency. Wider front frame rails (approximately one inch per side; two inches overall) enable front suspension springs to be positioned slightly outboard, an enabler for generating more positive roll stiffness. A new front suspension cross member is now a two-piece welded component between the front axle and oil pan.

Center frame rail sections are roll-formed, an efficient means for maintaining consistent strength in less complex longitudinal sections. In the rear portion of the new frame, the structure includes fully boxed rear rails and a factory-installed rear axle cross member with provisions for fifth-wheel and gooseneck hitches. A new conventional trailer hitch system is upgraded to Class 5 with a 17,000-pound load capability and 1,800 pounds of tongue weight for use with 2-inch or 2.5-inch receiver hitches.

Suspension

To support the best-in-class towing and payload capability of the new Ram Heavy Duty, a new front and rear suspension system with advanced geometry builds upon the chassis improvements and greatly improves overall roll stiffness. An advanced three-link front suspension on the Ram 3500 is necessary for the vehicle's higher GVWR and for use with heavy front loads, including snow plows. Additionally, a newly designed Hotchkiss leaf spring rear suspension on the Ram 3500 offers improved ride and handling while delivering higher towing and payload capability.

Steering

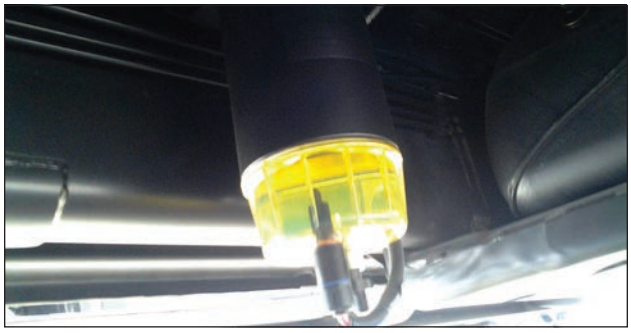
The new premium reciprocating ball steering gear, redesigned steering knuckles, ball joints and more robust steering linkages deliver enhanced and precise on-center feel, despite the vehicle's higher towing and payload capability.

Exterior

The new truck comes equipped with an updated engine, transmission and body mounts, including pioneering hydro-mounts at C-pillar positions for class-leading NVH characteristics, despite the truck's capability for higher payloads and towing.

The Ram 3500 features a factory-installed trailer tow connector in the truck bed, included with the optional fifth-wheel or gooseneck tow prep package. New structural support is designed into the body to support the payload increase and improve durability performance. Additionally, new reinforced tie-down points with enhanced strength are designed for heavier loads.

A new fuel filter/water separator has been implemented. The frame-mounted unit delivers best-in-class, 3 micron particulate filtration and water stripping for improved engine performance and durability.



New fuel/water separator.

A new quad headlamp design has improved light spread, pattern consistency and distance. An all-new premium headlamp and lighting system features bi-functional halogen projectors and LEDs for park/turn and tail lamps.

Optional premium headlights.

New power-folding 6x9-inch outside mirrors help to monitor traffic and obstacles to the side of the truck and allow a better view of the trailer when towing.

A tailgate handle-mounted rear camera back-up system has been upgraded for 2013. Also, a new center high-mounted stoplight camera provides a view of the bed for easier connecting of fifth-wheel or gooseneck trailers as well as for monitoring bed loads.

An all-new premium tail lamp is standard on Laramie Longhorn and optional on Laramie. The stop/tail/turn functions consist of 15 red LEDs with three red LEDs for the side marker. A frosted inner lens creates visual entertainment and softens the flow of the segment-exclusive LEDs.

Available RamBox cargo-management system with remote lockable and lighted bedside storage on Ram 2500 and 3500 SRW.

Interior

New Ram Heavy Duty features and technologies create an opportunity for a redesigned interior with material upgrades, improved fit and finish, new colors, HVAC controls and new multi-media systems.

Electrical

A majority of the commercial truck customers need to tie into the electrical system. A new best-in-class vehicle system interface module (VSIM) is capable of communicating between aftermarket modules and various factory control modules. The VSIM up-fitter interface module features a total of 72 inputs and outputs, including lighting controls, door position and throttle and transmission position. The class-exclusive module acts as a secure gateway to the vehicle's electrical system.

Safety and Security

Electronic Stability Control (ESC) is now standard on 3500 dual rear wheel pickup and all chassis cab trucks.

ESC enhances driver control and helps maintain directional stability under all conditions. It provides the greatest benefit in critical driving situations such as turns, and is especially valuable when driving on mixed surface conditions including snow, ice or gravel. If there's a discernible difference between what the driver asks through the steering wheel and the vehicle's path, ESC applies selective braking and throttle input to put the vehicle back onto the driver's intended path.

Newly introduced trailer-sway control reduces trailer sway and improves handling in adverse towing conditions caused by crosswinds and traffic. The system monitors the vehicle's movement relative to the driver's intended path, then applies alternating brake pressure to slow the vehicle, and then increases the pressure on one front wheel in order to counteract the sway induced by the trailer.

Other Features

New for 2013: central locking includes the RamBox cargo management system and tailgate power locks, creating a convenient solution for locking all exterior doors and storage with one push of a button. Auto rain-sensing wipers and SmartBeam headlamps also find their way into the feature availability list of the new 2013 Ram Heavy Duty.

IMPRESSIONS

I spoke earlier of the meet-the-deadline nature of this report, so I'll apologize in advance for any errors or omissions. As an example, my 2010 truck still uses a key to start the vehicle, not a key fob thingee. It appears that some of the 2013 trucks will use the "Keyless Enter 'n Go" technology that allows you to do all kinds of things to the truck (remote start, illuminated entry, panic alerts, etc.) with only a transmitter in hand. Now, I ask myself, is the "keyless" an extra-cost option or the new standard? Aside from the question of whether option or standard, is it to be a feature for both the 2500/35 pickup trucks as well as the commercial 3500/4500/5500 chassis cab trucks? As you can imagine, it is difficult to decode and condense 65 pages of press-release text into four pages of highlight material.

Much like the "keyless" system, I'm not going to attempt to describe the many features touted in Ram's next-generation radio platform. Actually "radio" is not the right word—the box in the center of the dashboard is there to support many "vehicle connectivity activities." Uconnect Access is the name for the system. There are a multitude of WiFi, sweet-tooth or blue-hair activities that you can order (technology terms intentionally blundered). Myself, I wonder what happened to the push button AM radio, which probably makes me an old geek. (And how 'bout those FM stations that were introduced in the 60s?)

The new center control panel.

Enough rambling about optional electronic items that are left to personal choice. I could also ramble on about the many changes to the interior fabrics/textures/colors for both the interior and exterior, but I'll stick to my limit of four pages and leave these details to you and your dealer to sort through.

Time for Point/Counter-Point

A key and final item to discuss here about the consumer 2500/3500 pickup trucks or the Chassis Cab trucks, do zxyou purchase the 2012 or wait for the 2013?

I can equally argue both sides of the question.

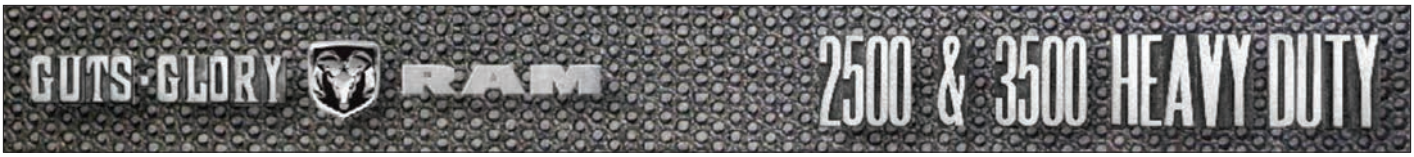
2012: Known specifications; known pricing; availability on the dealer's lot; proven technology; no DEF to fill on consumer 2500/3500.

2013: Unknown specifications; unknown price; unknown availability. I do expect the consumer engine/drivetrain to deliver better fuel economy. You will now have to use DEF on the 2500/3500.

Additionally, although it is not stated anywhere in the press material, the engine used in the pickup is not simply an adaptation of the Chassis Cab engine's DEF system that has been in use since 2010. And, whereas both the pickups and Chassis Cab trucks will use the DEF, there are other updates to the engines to meet a new round of emissions legislation. I hope to provide insight into the emissions requirements in the next issue of the TDR.

Ram representatives made a big to-do about the forthcoming tow and haul ratings. The press was assured that these numbers would kick…, oops, would be well beyond the numbers posted by the competition. But, true to my modified definition of "backgrounder," they did not disclose the values, choosing to wait until a date closer to the truck's availability date of 1/1/2013. We will both have to "stay tuned to the same channel" for further updates. I look forward to sharing the announcement(s) with you.

Robert Patton
TDR Staff



2013 RAM 2500 & 3500 HEAVY DUTY
SPECIFICATIONS

All dimensions are in inches (millimeters) unless otherwise noted.
All dimensions measured at curb weight with standard tires and wheels.

GENERAL INFORMATION	
Vehicle Type	Regular Cab, Crew Cab and Mega Cab
Assembly Plants	Saltillo Truck Assembly Plant, Coahuila, Mexico
EPA Vehicle Class	Standard Pickup

ENGINE: 5.7-LITER HEMI® V-8	
Availability	2500 and 3500
Type and Description	Eight-cylinder, 90-degree V-8, liquid-cooled with variable-valve timing (VVT)
Displacement	345 cu. in. (5,654 cu. cm)
Bore x Stroke	3.92 x 3.58 (99.5 x 90.9)
Valve System	Pushrod-operated overhead valves, 16 valves, hydraulic lifters with roller followers
Fuel Injection	Sequential, multi-port, electronic, returnless
Construction	Deep-skirt cast-iron block with cross-bolted main bearing caps, aluminum alloy heads with hemispherical combustion chambers
Compression Ratio	10.5:1
Power (SAE net)	383 bhp (286 kW) @ 5,600 rpm,
Torque (SAE net)	400 lb.-ft. (542 N•m) @ 4,000 rpm
Max. Engine Speed	5,800 rpm
Fuel Requirement	Unleaded mid-grade, 89 octane (R+M)/2 — recommended Unleaded regular, 87 octane (R+M)/2 — acceptable
Oil Capacity	7.0 qt. (6.6 liter)
Coolant Capacity	18 qt. (17.7 liter)
Emission Control	Three-way catalytic converters, heated oxygen sensors and internal engine features
ENGINE: 6.7-LITER CUMMINS TURBO DIESEL I-6 (three versions)	
Availability	2500 and 3500
Type and Description	Six-cylinder, inline, liquid-cooled, turbocharged, intercooled
Displacement	408 cu. in. (6,690 cu. cm)
Bore x Stroke	4.21 x 4.88 (107 x 124)
Valve System	OHV, 24 valves, solid lifters
Fuel Injection	Electronic high-pressure common rail
Construction	Cast-iron block and head
Compression Ratio	16.5:1
Power (SAE net)	350 bhp (261 kW) @ 2,800 rpm (G56 manual transmission)
Torque (Manual SAE net)	660 lb.-ft. (881 N•m) @ 1,500 rpm
Power (SAE net)	370 bhp (276 kW) @ 2,800 rpm (68RFE automatic transmission)

Torque (Automatic SAE net)	800 lb.-ft. (1084 N•m) @ 1,600 rpm
Power (SAE net)	385 bhp (287 kW) @ 2,800 rpm (AS69RC automatic transmission — 3500 only)
Torque (Automatic SAE net)	850 lb.-ft. (1152 N•m) @ 1,600 rpm (3500 only)
Maximum High-idle Engine Speed	3,500 rpm
Fuel Requirement	Ultra low sulfur diesel
Oil Capacity	12.0 qt. (11.3 liter) with filter
Coolant Capacity	29.5 qt. (28.0 liter)
Emission Controls	Diesel exhaust fluid

TRANSMISSION: G56 — MANUAL SIX-SPEED OVERDRIVE

Availability	6.7-liter diesel
Description	Synchronized in all gears
Gear Ratios	
1st	5.94
2nd	3.28
3rd	1.98
4th	1.31
5th	1.0
6th	0.74
Reverse	5.42

TRANSMISSION: 66RFE — AUTOMATIC SIX-SPEED

Availability	5.7-liter gas
Description	Three planetary gear sets, one overrunning clutch, full electronic control, electronically controlled converter clutch
Gear Ratios	
1st	3.23
2nd	1.84
3rd	1.41
4th	1.00
5th	0.82
6th	0.63
Reverse	4.44
Overall Top Gear	2.35 with 3.73 axle ratio; 2.58 with 4.10 axle ratio; 2.87 with 4.56 axle ratio

TRANSMISSION: 68RFE — AUTOMATIC SIX-SPEED

Availability	6.7-liter diesel
Description	Three planetary gear-sets, one overrunning clutch, full electronic control, electronically controlled converter clutch
Gear Ratios	
1st	3.23
2nd	1.84

3rd	1.41
4th	1.0
5th	0.82
6th	0.63
Reverse	4.44
Overall Top Gear	2.15 with 3.42 axle ratio; 2.35 with 3.73 axle ratio; 2.58 with 4.10 axle ratio

TRANSMISSION: AS69RC — AUTOMATIC SIX-SPEED

Availability	6.7-liter Diesel
Description	Three planetary gear-sets, one overrunning clutch, full electronic control, electronically controlled converter clutch
Gear Ratios	
1st	3.75
2nd	2.0
3rd	1.34
4th	1.0
5th	0.77
6th	0.63
Reverse	3.54
Overall Top Gear	2.15 with 3.42 axle ratio; 2.35 with 3.73 axle ratio; 2.58 with 4.10 axle ratio

TRANSFER CASES: BW 44-46, BW 44-47

Availability	Optional on 6.7-liter diesel and 5.7-liter gas
Type	Part-time - BW 44-47 Manual shift and BW 44-46 Electric shift
Operating Modes	2WD; 4WD High; Neutral; 4WD Low
Low-range Ratio	2.64
Center Differential	None

ELECTRICAL SYSTEM

Alternator	
Rating	160-amp standard with 5.7-liter
Rating	180-amp included with Snow Plow Prep Package standard with 6.7-liter, optional on 5.7-liter
Rating	Dual 220-amp (optional)
Battery	
Description	Group 65, maintenance-free, 750 CCA

2013 RAM 2500 HEAVY DUTY
DIMENSIONS AND CAPACITIES

REGULAR CAB 140.5"WB 8' 0" BOX SRW	4x2	4x4
Wheelbase	140.5	140.0
Track Width – Front	68.6	68.3
Track Width – Rear	68.2	68.2
Overall Length	231.0	231.0
Overall Width @ SgRP Front	78.9	78.9
Overall Height	73.3	75.7
Suspension or Axle to Ground – Front	7.6	7.5
Suspension or Axle to Ground – Rear	7.4	7.4
Approach Angle	13.2	23.0
Ramp Breakover Angle	16.5	16.9
Departure Angle	18.1	21.6

CREW CAB 149.5"WB 6' 4" BOX SRW	4x2	4x4
Wheelbase	149.4	148.9
Track Width – Front	68.6	68.3
Track Width – Rear	68.2	68.2
Overall Length	237.4	237.4
Overall Width @ SgRP Front	79.1	79.1
Overall Height	73.7	77.7
Suspension or Axle to Ground – Front	7.1	7.4
Suspension or Axle to Ground – Rear	7.3	7.1
Approach Angle	13.4	21.8
Ramp Breakover Angle	15.1	18.2
Departure Angle	18.8	22.3

CREW CAB 169.5"WB 8' 0" BOX SRW	4x2	4x4
Wheelbase	169.4	168.9
Track Width – Front	68.6	68.3
Track Width – Rear	68.2	68.2
Overall Length	259.4	259.4
Overall Width @ SgRP Front	79.1	79.1
Overall Height	73.5	77.6
Suspension or Axle to Ground – Front	7.1	7.3
Suspension or Axle to Ground – Rear	7.3	7.2
Approach Angle	13.4	21.7
Ramp Breakover Angle	14.1	16.5
Departure Angle	18.0	21.4

MEGA CAB 160.5"WB 6' 4" BOX SRW	4x2	4x4
Wheelbase	160.5	160.0
Track Width – Front	68.6	68.3
Track Width – Rear	68.2	68.2
Overall Length	248.4	248.4
Overall Width @ SgRP Front	79.1	79.1
Overall Height	74.1	78.3
Suspension or Axle to Ground – Front	7.8	8.1
Suspension or Axle to Ground – Rear	7.8	7.7
Approach Angle	14.0	23.9
Ramp Breakover Angle	15.8	18.3
Departure Angle	19.1	23.0

Cargo Box		
Nominal Box Size	6 ft. 4 in. (Crew or Mega)	8 ft. (Regular or Crew)
SAE Volume, cu. ft. (cu m)	57.5 (1.6)	74.7 (2.1)
Length at Floor, Tailgate Closed – in. (mm)	76.3 (1938.5)	98.3 (2496.5)
Cargo Width – in. (mm)	66.4 (1686.9)	66.4 (1686.9)
Distance Between Wheelhouses – in. (mm)	51 (1295.4)	51 (1295.4)
Depth – in. (mm)	20.1 (511.1)	20.2 (513.2)
Tailgate Opening Width in. – (mm)	60.4 (1535.3)	60.4 (1535.3)

ACCOMMODATIONS			
Model			
	Regular Cab	***Crew Cab***	***Mega Cab®***
Seating Capacity, F/R	3/0 or 2/0	3/3 or 2/3	3/3 or 2/3
Front			
Head Room – in. (mm)	39.9 (1013.5)	41.0 (1040.5)	41.0 (1040.5)
Legroom – in. (mm)	41 (1041.4)	41 (1041.4)	41 (1041.4)
Shoulder Room – in. (mm)	66 (1676.4)	66 (1676.4)	66 (1676.4)
Hip Room – in. (mm)	62.9 (1598.7)	63.2 (1605.3)	63.2 (1605.3)
Seat Travel – in. (mm)	9.0 (230.0)	9.0 (230.0)	9.0 (230.0)
Recliner Range (degrees)	85° (38 rwd, 47 fwd)	56° (38 rwd, 18 fwd)	56° (38 rwd, 18 fwd)
Rear			
Head Room – in. (mm)	N/A	39.9 (1013.5)	40.3 (1023.6)
Legroom – in. (mm)	N/A	40.3 (1023.3)	43.3 (1099.5)
Shoulder Room – in. (mm)	N/A	65.7 (1668.8)	65.7 (1668.8)
Hip Room – in. (mm)	N/A	63.2 (1605.3)	63.2 (1605.3)
Interior Volume			
Front – cu. ft. (cu m)	62.5 (1.8)	64.2 (1.8)	64.2 (1.8)
Rear – cu. ft. (cu m)	N/A	61.1 (1.7)	66.3 (1.9)

BODY AND CHASSIS

Model	***2WD***	***4WD***
Layout	Longitudinal, front engine	Longitudinal, front engine, transfer case
Construction	Ladder-type frame, steel cab, double-wall steel pickup box	Ladder-type frame, steel cab, double-wall steel pickup box

SUSPENSION

Model	***2WD***	***4WD***
Front	Upper and lower "A" arms, coil springs, stabilizer bar	Five-link with track bar, coil springs, stabilizer bar, solid axle
Rear	Hotchkiss leaf spring suspension, solid axle	Hotchkiss leaf spring suspension, solid axle

STEERING

Regular Cab Pickup

Model	***2WD***	***4WD***
Box Length	Long	Long
Wheelbase (nominal) – in. (mm)	140.5	140.0
Turning Diameter – ft. (m)[(a)]	45.1	41.6

Crew Cab® Pickup

Model	***2WD***	***2WD***	***4WD***	***4WD***
Box Length	Short	Long	Short	Long
Wheelbase (nominal) – in. (mm)	149.4	169.4	148.9	168.9
Turning Diameter –ft. (m)[(a)]	47.5	53.2	43.9	49.2

Mega Cab Pickup

Model	***2WD***	***4WD***
Wheelbase (nominal) – in. (mm)	160.5	160.0
Turning Diameter – ft. (m)[(a)]	50.67	46.86

(a) Turning diameter is measured at the outside of the tires at curb height. Turning diameters and steering wheel turns, lock-to-lock may differ with optional tires and wheels.

BRAKES

Front	
Size and Type – in. (mm)	Rotors 14.17 x 1.54-in. disc with twin-piston pin-slider caliper and ABS
Rear	
Size and Type – in. (mm)	Rotors 14.09 x 1.34-inch disc with twin-piston pin-slider caliper and ABS
Power-assist Type	Dual-rate, tandem diaphragm vacuum (gas) Hydro-boost (diesel)

2013 RAM 3500 HEAVY DUTY
DIMENSIONS AND CAPACITIES

REGULAR CAB 140.5"WB 8' 0" BOX DRW	4x2	4x4
Wheelbase	140.0	140.4
Track Width – Front	68.6	69.5
Track Width – Rear	75.8	75.8
Overall Length	230.4	230.4
Overall Width @ SgRP Front	78.9	78.9
Overall Height	76.9	78.5
Suspension or Axle to Ground – Front	6.5	8.5
Suspension or Axle to Ground – Rear	7.9	7.9
Approach Angle	19.1	23.6
Ramp Breakover Angle	17.2	19.7
Departure Angle	23.2	23.8

CREW CAB 149.5"WB 6' 4" BOX SRW	4x2	4x4
Wheelbase	148.9	149.3
Track Width – Front	67.7	67.7
Track Width – Rear	67.1	67.1
Overall Length	237.3	237.3
Overall Width @ SgRP Front	79.1	79.1
Overall Height	78.4	79.8
Suspension or Axle to Ground – Front	7.3	9.2
Suspension or Axle to Ground – Rear	8.6	8.6
Approach Angle	20.9	25.1
Ramp Breakover Angle	20.8	21.3
Departure Angle	24.8	25.6

CREW CAB 169.5"WB 8' 0" BOX SRW	4x2	4x4
Wheelbase	168.9	169.3
Track Width – Front	67.7	67.7
Track Width – Rear	67.1	67.1
Overall Length	259.3	259.3
Overall Width @ SgRP Front	79.1	79.1
Overall Height	78.2	79.6
Suspension or Axle to Ground – Front	7.3	9.1
Suspension or Axle to Ground – Rear	8.6	8.6
Approach Angle	21.0	25.1
Ramp Breakover Angle	19.5	19.3
Departure Angle	23.7	24.4

CREW CAB 169.5"WB 8' 0" BOX DRW	4x2	4x4
Wheelbase	168.9	169.3
Track Width – Front	68.6	69.5
Track Width – Rear	75.8	75.8
Overall Length	259.3	259.3
Overall Width @ SgRP Front	79.1	79.1
Overall Height	77.4	78.9
Suspension or Axle to Ground – Front	6.4	8.4
Suspension or Axle to Ground – Rear	7.9	7.9
Approach Angle	19.2	23.6
Ramp Breakover Angle	14.6	16.9
Departure Angle	22.9	23.6

MEGA CAB 160.5"WB 6' 4" BOX SRW	4x2	4x4
Wheelbase	160.0	160.4
Track Width – Front	67.7	67.7
Track Width – Rear	67.1	67.1
Overall Length	248.4	248.4
Overall Width @ SgRP Front	79.1	79.1
Overall Height	78.3	79.7
Suspension or Axle to Ground – Front	7.3	9.1
Suspension or Axle to Ground – Rear	8.6	8.7
Approach Angle	20.9	25.1
Ramp Breakover Angle	20.1	20.1
Departure Angle	24.7	25.5

MEGA CAB 160.5"WB 6' 3" BOX DRW	4x2	4x4
Wheelbase	160.0	160.4
Track Width – Front	68.6	69.5
Track Width – Rear	75.8	75.8
Overall Length	248.4	248.4
Overall Width @ SgRP Front	79.1	79.1
Overall Height	77.5	79.0
Suspension or Axle to Ground – Front	6.4	8.4
Suspension or Axle to Ground – Rear	7.9	7.8
Approach Angle	19.1	23.6
Ramp Breakover Angle	15.2	17.6
Departure Angle	23.9	24.6

Cargo Box

Nominal Box Size	***6 ft. 4 in (Crew or Mega)***	***8 ft. (Regular or Crew)***
SAE Volume, cu. ft. (cu m)	57.5 (1.6)	74.7 (2.1)
Length at Floor, Tailgate Closed – in. (mm)	76.3 (1938.5)	98.3 (2496.5)
Cargo Width – in. (mm)	66.4 (1686.9)	66.4 (1686.9)
Distance Between Wheelhouses – in. (mm)	51 (1295.4)	51 (1295.4)
Depth – in. (mm)	20.1 (511.1)	20.2 (513.2)
Tailgate Opening Width in. – (mm)	60.4 (1535.3)	60.4 (1535.3)

ACCOMMODATIONS

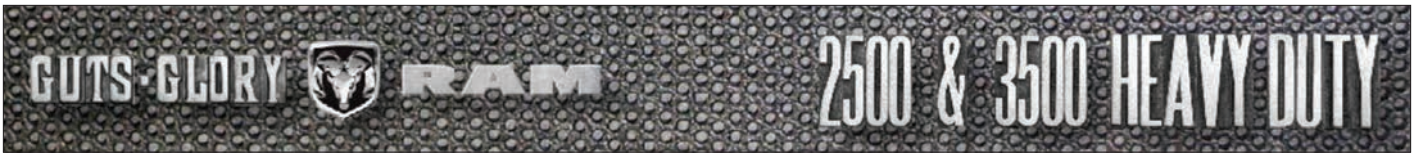
Model	***Regular Cab***	***Crew Cab***	***Mega Cab®***
Seating Capacity, F/R	3/0 or 2/0	3/3 or 2/3	3/3 or 2/3
Front			
Head Room – in. (mm)	39.9 (1013.5)	41.0 (1040.5)	41.0 (1040.5)
Legroom – in. (mm)	41 (1041.4)	41 (1041.4)	41 (1041.4)
Shoulder Room – in. (mm)	66 (1676.4)	66 (1676.4)	66 (1676.4)
Hip Room – in. (mm)	62.9 (1598.7)	63.2 (1605.3)	63.2 (1605.3)
Seat Travel – in. (mm)	9.0 (230.0)	9.0 (230.0)	9.0 (230.0)
Recliner Range (degrees)	85° (38 rwd, 47 fwd)	56° (38 rwd, 18 fwd)	56° (38 rwd, 18 fwd)
Rear			
Head Room – in. (mm)	N/A	39.9 (1013.5)	40.3 (1023.6)
Legroom – in. (mm)	N/A	40.3 (1023.3)	43.3 (1099.5)
Shoulder Room – in. (mm)	N/A	65.7 (1668.8)	65.7 (1668.8)
Hip Room – in. (mm)	N/A	63.2 (1605.3)	63.2 (1605.3)
Interior Volume			
Front – cu. ft. (cu m)	62.5 (1.8)	64.2 (1.8)	64.2 (1.8)
Rear – cu. ft. (cu m)	N/A	61.1 (1.7)	66.3 (1.9)

BODY AND CHASSIS

Model	***2WD***	***4WD***
Layout	Longitudinal, front engine	Longitudinal, front engine, transfer case
Construction	Ladder-type frame, steel cab, double-wall steel pickup box	Ladder-type frame, steel cab, double-wall steel pickup box

SUSPENSION

Model	***2WD***	***4WD***
Front	Upper and lower “A” arms, coil springs, stabilizer bar	Five-link with track bar, coil springs, stabilizer bar, solid axle
Rear	Hotchkiss leaf spring suspension, solid axle	Hotchkiss leaf spring suspension, solid axle



2013 Ram Heavy Duty Weight Charts

2013 RAM 2500											
Engine	Transmission	Axle Ratio	GVWR	Payload (2)	Base Weight			GAWR		GCWR	Max Trailer Weight
					Total	Front	Rear	Front	Rear		
REG CAB LONG BOX 4X2 ST/TRADESMAN											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,650	3,170	5,476	3,067	2,410	4,750	6,000	18,000	12,350
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,650	3,170	5,476	3,067	2,410	4,750	6,000	20,000	14,350
6.7 DIESEL - ETK	6-SPEED MANUAL - DEG	3.42	9,000	2,420	6,576	4,018	2,557	5,000	6,000	24,000	17,250
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	9,000	2,520	6,477	3,942	2,534	5,000	6,000	25,000	18,350
REG CAB LONG BOX 4X2 SLT											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,650	3,090	5,565	3,106	2,459	4,750	6,200	18,000	12,270
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,650	3,090	5,565	3,106	2,459	4,750	6,200	20,000	14,270
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	9,000	2,390	6,611	4,038	2,573	5,000	6,200	25,000	18,220
REG CAB LONG BOX 4X4 ST/TRADESMAN											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,650	2,710	5,943	3,459	2,484	5,200	6,000	18,000	11,890
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,650	2,710	5,943	3,459	2,484	5,200	6,000	20,000	13,890
6.7 DIESEL - ETK	6-SPEED MANUAL - DEG	3.42	9,000	1,970	7,033	4,421	2,612	5,500	6,000	24,000	16,800
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	9,000	2,050	6,946	4,350	2,596	5,500	6,000	25,000	17,880
REG CAB LONG BOX 4X4 SLT											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,650	2,630	6,023	3,513	2,510	5,200	6,200	18,000	11,810
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,650	2,630	6,023	3,513	2,510	5,200	6,200	20,000	13,810
6.7 DIESEL - ETK	6-SPEED MANUAL - DEG	3.42	9,000	1,860	7,139	4,478	2,661	5,500	6,200	24,000	16,690
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	9,000	1,950	7,052	4,407	2,645	5,500	6,200	25,000	17,780

2013 RAM 2500

Engine	Transmission	Axle Ratio	GVWR	Payload (2)	Base Weight			GAWR		GCWR	Max Trailer Weight
					Total	Front	Rear	Front	Rear		
CREW CAB SHORT BOX 4X2 ST/TRADESMAN											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,930	5,870	3,244	2,627	4,750	6,000	18,000	11,960
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,930	5,870	3,244	2,627	4,750	6,000	20,000	13,960
6.7 DIESEL - ETK	6-SPEED MANUAL - DEG	3.42	10,000	3,060	6,939	4,188	2,751	5,000	6,000	24,000	16,890
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	3,120	6,876	4,130	2,746	5,000	6,000	25,000	17,950
CREW CAB SHORT BOX 4X2 SLT / BIGHORN / LONE STAR											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,870	5,932	3,263	2,669	4,750	6,200	18,000	11,900
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,870	5,932	3,263	2,669	4,750	6,200	20,000	13,900
6.7 DIESEL - ETK	6-SPEED MANUAL - DEG	3.42	10,000	2,960	7,041	4,249	2,791	5,000	6,200	24,000	16,790
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	3,020	6,978	4,191	2,787	5,000	6,200	25,000	17,850
CREW CAB SHORT BOX 4X2 LARAMIE											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,830	5,972	3,301	2,672	4,750	6,200	18,000	11,860
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,830	5,972	3,301	2,672	4,750	6,200	20,000	13,860
6.7 DIESEL - ETK	6-SPEED MANUAL - DEG	3.42	10,000	2,850	7,151	4,310	2,841	5,000	6,200	24,000	16,680
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,910	7,088	4,251	2,837	5,000	6,200	25,000	17,740
CREW CAB SHORT BOX 4X2 LONGHORN											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,700	6,103	3,360	2,743	4,750	6,200	18,000	11,730
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,700	6,103	3,360	2,743	4,750	6,200	20,000	13,730
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,800	7,196	4,292	2,904	5,000	6,200	25,000	17,630
CREW CAB LONG BOX 4X2 ST/TRADESMAN											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,770	6,032	3,356	2,676	4,750	6,000	18,000	11,800
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,770	6,032	3,356	2,676	4,750	6,000	20,000	13,800
6.7 DIESEL - ETK	6-SPEED MANUAL - DEG	3.42	10,000	2,850	7,145	4,342	2,803	5,000	6,000	24,000	16,680
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,920	7,078	4,282	2,796	5,000	6,000	25,000	17,750
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	9,900	2,780	7,123	4,282	2,841	5,000	6,000	25,000	17,710
CREW CAB LONG BOX 4X2 SLT / BIGHORN / LONE STAR											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,680	6,119	3,400	2,719	4,750	6,200	18,000	11,710
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,680	6,119	3,400	2,719	4,750	6,200	20,000	13,710
6.7 DIESEL - ETK	6-SPEED MANUAL - DEG	3.42	10,000	2,820	7,184	4,380	2,804	5,000	6,200	24,000	16,650
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,880	7,117	4,321	2,797	5,000	6,200	25,000	17,710
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	9,900	2,740	7,161	4,320	2,841	5,000	6,200	25,000	17,670
CREW CAB LONG BOX 4X2 LARAMIE											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,630	6,173	3,431	2,742	4,750	6,200	18,000	11,660
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,630	6,173	3,431	2,742	4,750	6,200	20,000	13,660
6.7 DIESEL - ETK	6-SPEED MANUAL - DEG	3.42	10,000	2,740	7,256	4,408	2,848	5,000	6,200	24,000	16,570
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,810	7,189	4,348	2,841	5,000	6,200	25,000	17,640
CREW CAB LONG BOX 4X2 LONGHORN											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,510	6,291	3,487	2,804	4,750	6,200	18,000	11,540
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,510	6,291	3,487	2,804	4,750	6,200	20,000	13,540
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,680	7,325	4,389	2,936	5,000	6,200	25,000	17,510
CREW CAB SHORT BOX 4X4 ST/TRADESMAN											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,510	6,289	3,616	2,673	5,200	6,000	18,000	11,540
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,510	6,289	3,616	2,673	5,200	6,000	20,000	13,540
6.7 DIESEL - ETK	6-SPEED MANUAL - DEG	3.42	10,000	2,550	7,450	4,613	2,837	5,500	6,000	24,000	16,380
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,620	7,383	4,552	2,831	5,500	6,000	25,000	17,450
CREW CAB SHORT BOX 4X4 SLT / BIGHORN / LONE STAR / OUTDOORSMAN											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,430	6,371	3,661	2,710	5,200	6,200	18,000	11,460
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,430	6,371	3,661	2,710	5,200	6,200	20,000	13,460
6.7 DIESEL - ETK	6-SPEED MANUAL - DEG	3.42	10,000	2,540	7,463	4,634	2,828	5,500	6,200	24,000	16,370
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,600	7,396	4,574	2,822	5,500	6,200	25,000	17,430
CREW CAB SHORT BOX 4X4 LARAMIE											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,400	6,399	3,684	2,715	5,200	6,200	18,000	11,430
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,400	6,399	3,684	2,715	5,200	6,200	20,000	13,430
6.7 DIESEL - ETK	6-SPEED MANUAL - DEG	3.42	10,000	2,510	7,491	4,658	2,833	5,500	6,200	24,000	16,340
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,580	7,424	4,597	2,827	5,500	6,200	25,000	17,410
CREW CAB SHORT BOX 4X4 LONGHORN											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,280	6,524	3,738	2,786	5,200	6,200	18,000	11,310
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,280	6,524	3,738	2,786	5,200	6,200	20,000	13,310
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,460	7,536	4,633	2,903	5,500	6,200	25,000	17,290
CREW CAB 4WD SHORT BOX POWER WAGON TRADESMAN											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.56	8,510	1,900	6,607	3,905	2,702	4,500	6,200	18,000	11,220
CREW CAB 4WD SHORT BOX POWER WAGON LARAMIE											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.56	8,510	1,710	6,800	4,011	2,788	4,500	6,200	18,000	11,030
CREW CAB 4WD SHORT BOX POWER WAGON											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.56	8,510	1,800	6,707	3,976	2,730	4,500	6,200	18,000	11,120

CREW CAB LONG BOX 4X4 ST/TRADESMAN											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,310	6,491	3,745	2,746	5,200	6,000	18,000	11,340
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,310	6,491	3,745	2,746	5,200	6,000	20,000	13,340
6.7 DIESEL - ETK	6-SPEED MANUAL - DEG	3.42	10,000	2,400	7,602	4,743	2,859	5,500	6,000	24,000	16,230
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,470	7,532	4,680	2,852	5,500	6,000	25,000	17,300
CREW CAB LONG BOX 4X4 SLT / BIGHORN / LONE STAR / OUTDOORSMAN											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,220	6,578	3,782	2,796	5,200	6,200	18,000	11,250
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,220	6,578	3,782	2,796	5,200	6,200	20,000	13,250
6.7 DIESEL - ETK	6-SPEED MANUAL - DEG	3.42	10,000	2,390	7,614	4,766	2,849	5,500	6,200	24,000	16,220
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,460	7,544	4,702	2,842	5,500	6,200	25,000	17,290
CREW CAB LONG BOX 4X4 LARAMIE											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,170	6,633	3,814	2,819	5,200	6,200	18,000	11,200
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,170	6,633	3,814	2,819	5,200	6,200	20,000	13,200
6.7 DIESEL - ETK	6-SPEED MANUAL - DEG	3.42	10,000	2,330	7,668	4,809	2,859	5,500	6,200	24,000	16,160
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,400	7,597	4,745	2,853	5,500	6,200	25,000	17,230
CREW CAB LONG BOX 4X4 LONGHORN											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,070	6,735	3,881	2,853	5,200	6,200	18,000	11,100
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,070	6,735	3,881	2,853	5,200	6,200	20,000	13,100
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,290	7,710	4,775	2,934	5,500	6,200	25,000	17,120
CREW CAB LONG BOX 4X4 CNG ST/TRADESMAN											
5.7 CNG HEMI - EZF	6-SPEED AUTOMATIC - DFP	3.73	8,800	1,560	7,237	3,957	3,280	5,200	6,000	18,000	10,590
CREW CAB LONG BOX 4X4 CNG SLT											
5.7 CNG HEMI - EZF	6-SPEED AUTOMATIC - DFP	3.73	8,800	1,510	7,286	3,964	3,322	5,200	6,200	18,000	10,540
CREW CAB LONG BOX 4X4 ST/TRADESMAN CANADA FLEET											
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	9,900	2,350	7,552	4,686	2,866	5,500	6,000	25,000	17,280
CREW CAB LONG BOX 4X4 SLT CANADA FLEET											
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	9,900	2,320	7,581	4,717	2,864	5,500	6,200	25,000	17,250

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Engine	Transmission	Axle Ratio	GVWR	Payload (2)	Base Weight			GAWR		GCWR	Max Trailer Weight
					Total	Front	Rear	Front	Rear		
CREW CAB RAM BOX 4X2 ST/TRADESMAN											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,770	6,032	3,224	2,808	4,750	6,000	18,000	11,800
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,770	6,032	3,224	2,808	4,750	6,000	20,000	13,800
6.7 DIESEL - ETK	6-SPEED MANUAL - DEG	3.42	10,000	2,890	7,114	4,190	2,924	5,000	6,000	24,000	16,720
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,950	7,051	4,132	2,919	5,000	6,000	25,000	17,780
CREW CAB RAM BOX 4X2 SLT / BIGHORN / LONE STAR - RAMBOX											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,720	6,083	3,274	2,809	4,750	6,200	18,000	11,750
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,720	6,083	3,274	2,809	4,750	6,200	20,000	13,750
6.7 DIESEL - ETK	6-SPEED MANUAL - DEG	3.42	10,000	2,790	7,213	4,229	2,984	5,000	6,200	24,000	16,620
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,850	7,151	4,171	2,979	5,000	6,200	25,000	17,680
CREW CAB RAM BOX 4X2 LARAMIE - RAMBOX											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,680	6,118	3,275	2,843	4,750	6,200	18,000	11,710
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,680	6,118	3,275	2,843	4,750	6,200	20,000	13,710
6.7 DIESEL - ETK	6-SPEED MANUAL - DEG	3.42	10,000	2,670	7,330	4,312	3,018	5,000	6,200	24,000	16,500
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,730	7,267	4,253	3,014	5,000	6,200	25,000	17,560
CREW CAB RAM BOX 4X2 LONGHORN - RAMBOX											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,560	6,242	3,355	2,887	4,750	6,200	18,000	11,590
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,560	6,242	3,355	2,887	4,750	6,200	20,000	13,590
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,630	7,369	4,289	3,080	5,000	6,200	25,000	17,460
CREW CAB RAM BOX 4X4 ST/TRADESMAN - RAMBOX											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,350	6,451	3,597	2,854	5,200	6,000	18,000	11,380
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,350	6,451	3,597	2,854	5,200	6,000	20,000	13,380
6.7 DIESEL - ETK	6-SPEED MANUAL - DEG	3.42	10,000	2,370	7,625	4,615	3,011	5,500	6,000	24,000	16,200
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,440	7,558	4,554	3,005	5,500	6,000	25,000	17,270
CREW CAB RAM BOX 4X4 SLT / BIGHORN / LONE STAR / OUTDOORSMAN - RAMBOX											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,260	6,536	3,663	2,873	5,200	6,200	18,000	11,290
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,260	6,536	3,663	2,873	5,200	6,200	20,000	13,290
6.7 DIESEL - ETK	6-SPEED MANUAL - DEG	3.42	10,000	2,430	7,573	4,604	2,969	5,500	6,200	24,000	16,260
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,490	7,506	4,543	2,963	5,500	6,200	25,000	17,320
CREW CAB RAM BOX 4X4 LARAMIE - RAMBOX											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,230	6,568	3,701	2,867	5,200	6,200	18,000	11,260
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,230	6,568	3,701	2,867	5,200	6,200	20,000	13,260
6.7 DIESEL - ETK	6-SPEED MANUAL - DEG	3.42	10,000	2,370	7,626	4,635	2,991	5,500	6,200	24,000	16,200
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,440	7,559	4,574	2,985	5,500	6,200	25,000	17,270
CREW CAB RAM BOX 4X4 LONGHORN - RAMBOX											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,140	6,662	3,730	2,932	5,200	6,200	18,000	11,170
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,140	6,662	3,730	2,932	5,200	6,200	20,000	13,170
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,330	7,669	4,621	3,048	5,500	6,200	25,000	17,160
CREW CAB 4WD SHORT BOX POWER WAGON - RAMBOX TRADESMAN											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.56	8,510	1,740	6,765	3,873	2,892	4,500	6,200	18,000	11,060
CREW CAB 4WD SHORT BOX POWER WAGON - RAMBOX LARAMIE											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.56	8,510	1,570	6,939	4,006	2,933	4,500	6,200	18,000	10,890
CREW CAB 4WD SHORT BOX POWER WAGON - RAMBOX											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.56	8,510	1,630	6,878	3,978	2,900	4,500	6,200	18,000	10,950

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Engine	Transmission	Axle Ratio	GVWR	Payload (2)	Base Weight			GAWR		GCWR	Max Trailer Weight
					Total	Front	Rear	Front	Rear		
MEGA CAB SHORT BOX 4X2 SLT / BIGHORN / LONE STAR											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,580	6,217	3,379	2,837	4,750	6,200	18,000	11,610
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,580	6,217	3,379	2,837	4,750	6,200	20,000	13,610
6.7 DIESEL - ETK	6-SPEED MANUAL - DEG	3.42	10,000	2,670	7,328	4,379	2,949	5,000	6,200	24,000	16,500
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,740	7,261	4,318	2,943	5,000	6,200	25,000	17,570
MEGA CAB SHORT BOX 4X2 LARAMIE											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,530	6,269	3,381	2,888	4,750	6,200	18,000	11,560
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,530	6,269	3,381	2,888	4,750	6,200	20,000	13,560
6.7 DIESEL - ETK	6-SPEED MANUAL - DEG	3.42	10,000	2,630	7,367	4,420	2,947	5,000	6,200	24,000	16,460
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,700	7,300	4,359	2,941	5,000	6,200	25,000	17,530
MEGA CAB SHORT BOX 4X2 LONGHORN											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,450	6,348	3,456	2,892	4,750	6,200	18,000	11,480
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,450	6,348	3,456	2,892	4,750	6,200	20,000	13,480
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,590	7,410	4,397	3,013	5,000	6,200	25,000	17,420
MEGA CAB SHORT BOX 4X4 SLT / BIGHORN / LONE STAR											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,110	6,685	3,789	2,896	5,200	6,200	18,000	11,140
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,110	6,685	3,789	2,896	5,200	6,200	20,000	13,140
6.7 DIESEL - ETK	6-SPEED MANUAL - DEG	3.42	10,000	2,220	7,781	4,784	2,996	5,500	6,200	24,000	16,050
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,290	7,713	4,722	2,991	5,500	6,200	25,000	17,120
MEGA CAB SHORT BOX 4X4 LARAMIE											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,090	6,710	3,781	2,929	5,200	6,200	18,000	11,120
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,090	6,710	3,781	2,929	5,200	6,200	20,000	13,120
6.7 DIESEL - ETK	6-SPEED MANUAL - DEG	3.42	10,000	2,230	7,772	4,802	2,970	5,500	6,200	24,000	16,060
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,300	7,704	4,740	2,964	5,500	6,200	25,000	17,130
MEGA CAB SHORT BOX 4X4 LONGHORN											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	1,990	6,812	3,829	2,984	5,200	6,200	18,000	11,020
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	1,990	6,812	3,829	2,984	5,200	6,200	20,000	13,020
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,160	7,841	4,788	3,054	5,500	6,200	25,000	16,990

2013 RAM 2500

Engine	Transmission	Axle Ratio	GVWR	Payload (2)	Base Weight			GAWR		GCWR	Max Trailer Weight
					Total	Front	Rear	Front	Rear		
MEGA CAB RAM BOX 4X2 SLT / BIGHORN / LONE STAR - RAMBOX											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,410	6,392	3,385	3,007	4,750	6,200	18,000	11,440
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,410	6,392	3,385	3,007	4,750	6,200	20,000	13,440
6.7 DIESEL - ETK	6-SPEED MANUAL - DEG	3.42	10,000	2,500	7,497	4,377	3,120	5,000	6,200	24,000	16,330
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,570	7,430	4,316	3,113	5,000	6,200	25,000	17,400
MEGA CAB RAM BOX 4X2 LARAMIE - RAMBOX											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,360	6,445	3,387	3,058	4,750	6,200	18,000	11,390
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,360	6,445	3,387	3,058	4,750	6,200	20,000	13,390
6.7 DIESEL - ETK	6-SPEED MANUAL - DEG	3.42	10,000	2,460	7,536	4,418	3,118	5,000	6,200	24,000	16,290
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,530	7,469	4,358	3,111	5,000	6,200	25,000	17,360
MEGA CAB RAM BOX 4X2 LONGHORN - RAMBOX											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	2,250	6,555	3,471	3,084	4,750	6,200	18,000	11,280
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	2,250	6,555	3,471	3,084	4,750	6,200	20,000	13,280
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,420	7,578	4,390	3,188	5,000	6,200	25,000	17,250
MEGA CAB RAM BOX 4X4 SLT / BIGHORN / LONE STAR - RAMBOX											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	1,940	6,861	3,795	3,066	5,200	6,200	18,000	10,970
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	1,940	6,861	3,795	3,066	5,200	6,200	20,000	12,970
6.7 DIESEL - ETK	6-SPEED MANUAL - DEG	3.42	10,000	2,050	7,950	4,783	3,167	5,500	6,200	24,000	15,880
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,120	7,882	4,721	3,161	5,500	6,200	25,000	16,950
MEGA CAB RAM BOX 4X4 LARAMIE - RAMBOX											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	1,880	6,916	3,796	3,120	5,200	6,200	18,000	10,910
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	1,880	6,916	3,796	3,120	5,200	6,200	20,000	12,910
6.7 DIESEL - ETK	6-SPEED MANUAL - DEG	3.42	10,000	2,020	7,981	4,821	3,160	5,500	6,200	24,000	15,850
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,090	7,913	4,759	3,154	5,500	6,200	25,000	16,920
MEGA CAB RAM BOX 4X4 LONGHORN - RAMBOX											
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	3.73	8,800	1,810	6,988	3,834	3,153	5,200	6,200	18,000	10,840
5.7 GAS HEMI - EZC	6-SPEED AUTOMATIC - DFP	4.10	8,800	1,810	6,988	3,834	3,153	5,200	6,200	20,000	12,840
6.7 DIESEL - ETK	6-SPEED AUTOMATIC - DG7	3.42	10,000	2,020	7,983	4,778	3,205	5,500	6,200	25,000	16,850

NOTES:

1 All weights are shown in pounds unless otherwise stated
2 Payload is rounded to the nearest 10 lbs. Payload = GVWR - Base Wt.
3 Optional equipment weight for HD (> 8500 lbs of GVWR).
4 If not already included in the EPA options. This is the weight of the entire trailer tow package, not just the hitch.
5 Payload and maximum trailer weight are mutually exclusive.
6 GCWR is a defined value from Vehicle Development in lbs
7 Per SAE regulation (SAE J2807) GCW = Base Weight + EPA Options + Trailer Pkg Weight + Max Trailer + 400 lbs (Passenger + Driver+ Optional Equipment)

2013 Ram 3500 TRAILER TOWING CHART

Engine	Transmission	Axle Ratio	GVWR	Payload	Base Weight			GAWR		GCWR	Trailering Equip. Wgt.
					Total	Front	Rear	Front	Rear		
REGULAR CAB LONG BOX 4X2 ST / TRADESMAN SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	10,100	4,130	5,969	3,427	2,542	5,000	7,000	18,000	11,860
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	10,100	4,130	5,969	3,427	2,542	5,000	7,000	20,000	13,860
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	11,100	4,160	6,938	4,308	2,629	5,500	7,000	24,000	16,890
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,100	4,210	6,892	4,272	2,620	5,500	7,000	25,000	17,940
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,100	4,060	7,044	4,386	2,658	5,500	7,000	25,000	17,790
REGULAR CAB LONG BOX 4X2 ST / TRADESMAN DRW											
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	14,000	6,690	7,315	4,364	2,950	5,500	9,750	24,000	16,520
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.73	14,000	6,690	7,315	4,364	2,950	5,500	9,750	26,000	18,520
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	14,000	6,730	7,269	4,328	2,941	5,500	9,750	25,000	17,560
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.73	14,000	6,730	7,269	4,328	2,941	5,500	9,750	27,000	19,560
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	4.10	14,000	6,730	7,269	4,328	2,941	5,500	9,750	30,000	22,560
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	14,000	6,580	7,421	4,443	2,979	5,500	9,750	29,000	21,410
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.73	14,000	6,580	7,421	4,443	2,979	5,500	9,750	32,000	24,410
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	4.10	14,000	6,580	7,421	4,443	2,979	5,500	9,750	37,600	30,010
REGULAR CAB LONG BOX 4X2 SLT SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	10,100	4,090	6,010	3,460	2,550	5,000	7,000	18,000	11,820
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	10,100	4,090	6,010	3,460	2,550	5,000	7,000	20,000	13,820
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	11,100	4,120	6,979	4,341	2,638	5,500	7,000	24,000	16,850
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,100	4,170	6,933	4,305	2,628	5,500	7,000	25,000	17,900
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,100	4,010	7,085	4,419	2,666	5,500	7,000	25,000	17,740
REGULAR CAB LONG BOX 4X2 SLT DRW											
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	14,000	6,640	7,355	4,397	2,958	5,500	9,750	24,000	16,470
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.73	14,000	6,640	7,355	4,397	2,958	5,500	9,750	26,000	18,470
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	14,000	6,690	7,309	4,361	2,948	5,500	9,750	25,000	17,520
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.73	14,000	6,690	7,309	4,361	2,948	5,500	9,750	27,000	19,520
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	4.10	14,000	6,690	7,309	4,361	2,948	5,500	9,750	30,000	22,520
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	14,000	6,540	7,462	4,476	2,986	5,500	9,750	29,000	21,370
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.73	14,000	6,540	7,462	4,476	2,986	5,500	9,750	32,000	24,370
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	4.10	14,000	6,540	7,462	4,476	2,986	5,500	9,750	37,600	29,970

REGULAR CAB LONG BOX 4X4 ST / TRADESMAN SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	10,300	4,130	6,168	3,598	2,571	5,250	7,000	18,000	11,660
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	10,300	4,130	6,168	3,598	2,571	5,250	7,000	20,000	13,660
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	11,500	4,310	7,185	4,481	2,705	6,000	7,000	24,000	16,640
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,500	4,360	7,135	4,441	2,694	6,000	7,000	25,000	17,690
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,500	4,210	7,295	4,561	2,734	6,000	7,000	25,000	17,540
REGULAR CAB LONG BOX 4X4 ST / TRADESMAN DRW											
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	14,000	6,480	7,522	4,506	3,016	6,000	9,750	24,000	16,310
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.73	14,000	6,480	7,522	4,506	3,016	6,000	9,750	26,000	18,310
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	14,000	6,530	7,472	4,466	3,005	6,000	9,750	25,000	17,360
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.73	14,000	6,530	7,472	4,466	3,005	6,000	9,750	27,000	19,360
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	4.10	14,000	6,530	7,472	4,466	3,005	6,000	9,750	30,000	22,360
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	14,000	6,370	7,631	4,586	3,045	6,000	9,750	29,000	21,200
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.73	14,000	6,370	7,631	4,586	3,045	6,000	9,750	32,000	24,200
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	4.10	14,000	6,370	7,631	4,586	3,045	6,000	9,750	37,500	29,700
REGULAR CAB LONG BOX 4X4 SLT SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	10,300	4,070	6,226	3,630	2,596	5,250	7,000	18,000	11,600
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	10,300	4,070	6,226	3,630	2,596	5,250	7,000	20,000	13,600
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	11,500	4,270	7,234	4,513	2,721	6,000	7,000	24,000	16,600
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,500	4,320	7,184	4,473	2,710	6,000	7,000	25,000	17,650
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,500	4,160	7,343	4,593	2,750	6,000	7,000	25,000	17,490
REGULAR CAB LONG BOX 4X4 SLT DRW											
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	14,000	6,420	7,579	4,538	3,041	6,000	9,750	24,000	16,250
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.73	14,000	6,420	7,579	4,538	3,041	6,000	9,750	26,000	18,250
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	14,000	6,470	7,529	4,499	3,030	6,000	9,750	25,000	17,300
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.73	14,000	6,470	7,529	4,499	3,030	6,000	9,750	27,000	19,300
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	4.10	14,000	6,470	7,529	4,499	3,030	6,000	9,750	30,000	22,300
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	14,000	6,310	7,689	4,618	3,070	6,000	9,750	29,000	21,140
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.73	14,000	6,310	7,689	4,618	3,070	6,000	9,750	32,000	24,140
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	4.10	14,000	6,310	7,689	4,618	3,070	6,000	9,750	37,500	29,640

2013 Ram 3500 TRAILER TOWING CHART

Engine	Transmission	Axle Ratio	GVWR	Payload	Base Weight			GAWR		GCWR	Trailering Equip. Wgt.
					Total	Front	Rear	Front	Rear		
CREW CAB SHORT BOX 4X2 ST / TRADESMAN SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	10,050	3,710	6,343	3,626	2,717	5,000	7,000	18,000	11,490
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	10,050	3,710	6,343	3,626	2,717	5,000	7,000	20,000	13,490
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	11,500	4,170	7,334	4,540	2,794	5,500	7,000	24,000	16,500
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,500	4,210	7,290	4,505	2,785	5,500	7,000	25,000	17,540
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,500	4,060	7,442	4,622	2,820	5,500	7,000	25,000	17,390
CREW CAB SHORT BOX 4X2 SLT / BIGHORN / LONE STAR SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	10,050	3,660	6,389	3,636	2,753	5,000	7,000	18,000	11,440
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	10,050	3,660	6,389	3,636	2,753	5,000	7,000	20,000	13,440
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	11,500	4,120	7,380	4,550	2,829	5,500	7,000	24,000	16,450
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,500	4,160	7,336	4,516	2,821	5,500	7,000	25,000	17,490
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,500	4,010	7,488	4,632	2,856	5,500	7,000	25,000	17,340
CREW CAB SHORT BOX 4X2 LARAMIE SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	10,050	3,620	6,433	3,698	2,735	5,000	7,000	18,000	11,400
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	10,050	3,620	6,433	3,698	2,735	5,000	7,000	20,000	13,400
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	11,500	4,080	7,423	4,612	2,811	5,500	7,000	24,000	16,410
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,500	4,120	7,380	4,577	2,803	5,500	7,000	25,000	17,450
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,500	3,970	7,532	4,694	2,838	5,500	7,000	25,000	17,300
CREW CAB SHORT BOX 4X2 LONGHORN SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	10,050	3,540	6,507	3,716	2,791	5,000	7,000	18,000	11,320
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	10,050	3,540	6,507	3,716	2,791	5,000	7,000	20,000	13,320
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,500	4,040	7,458	4,595	2,863	5,500	7,000	25,000	17,370
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,500	3,890	7,610	4,712	2,898	5,500	7,000	25,000	17,220
CREW CAB LONG BOX 4X2 ST / TRADESMAN SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	11,000	4,500	6,497	3,711	2,786	5,000	7,000	18,000	11,330
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	11,000	4,500	6,497	3,711	2,786	5,000	7,000	20,000	13,330
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	12,000	4,530	7,469	4,625	2,844	5,500	7,000	24,000	16,360
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	12,000	4,580	7,424	4,588	2,836	5,500	7,000	25,000	17,410
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	12,000	4,420	7,576	4,709	2,867	5,500	7,000	25,000	17,250
CREW CAB LONG BOX 4X2 ST / TRADESMAN DRW											
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	14,000	6,150	7,853	4,677	3,176	5,500	9,750	24,000	15,980
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.73	14,000	6,150	7,853	4,677	3,176	5,500	9,750	26,000	17,980
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	14,000	6,190	7,808	4,640	3,168	5,500	9,750	25,000	17,020
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.73	14,000	6,190	7,808	4,640	3,168	5,500	9,750	27,000	19,020
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	4.10	14,000	6,190	7,808	4,640	3,168	5,500	9,750	30,000	22,020
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	14,000	6,040	7,960	4,761	3,200	5,500	9,750	29,000	20,870
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.73	14,000	6,040	7,960	4,761	3,200	5,500	9,750	32,000	23,870
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	4.10	14,000	6,040	7,960	4,761	3,200	5,500	9,750	37,500	29,370

CREW CAB LONG BOX 4X2 SLT / BIGHORN / LONE STAR SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	11,000	4,450	6,546	3,730	2,815	5,000	7,000	18,000	11,280
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	11,000	4,450	6,546	3,730	2,815	5,000	7,000	20,000	13,280
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	12,000	4,480	7,517	4,644	2,873	5,500	7,000	24,000	16,310
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	12,000	4,530	7,472	4,607	2,865	5,500	7,000	25,000	17,360
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	12,000	4,380	7,624	4,728	2,897	5,500	7,000	25,000	17,210
CREW CAB LONG BOX 4X2 SLT / BIGHORN / LONE STAR DRW											
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	14,000	6,050	7,945	4,711	3,235	5,500	9,750	24,000	15,880
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.73	14,000	6,050	7,945	4,711	3,235	5,500	9,750	26,000	17,880
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	14,000	6,100	7,900	4,673	3,227	5,500	9,750	25,000	16,930
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.73	14,000	6,100	7,900	4,673	3,227	5,500	9,750	27,000	18,930
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	4.10	14,000	6,100	7,900	4,673	3,227	5,500	9,750	30,000	21,930
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	14,000	5,950	8,052	4,794	3,258	5,500	9,750	29,000	20,780
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.73	14,000	5,950	8,052	4,794	3,258	5,500	9,750	32,000	23,780
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	4.10	14,000	5,950	8,052	4,794	3,258	5,500	9,750	37,500	29,280
CREW CAB LONG BOX 4X2 LARAMIE SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	11,000	4,430	6,570	3,767	2,803	5,000	7,000	18,000	11,260
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	11,000	4,430	6,570	3,767	2,803	5,000	7,000	20,000	13,260
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	12,000	4,460	7,542	4,681	2,860	5,500	7,000	24,000	16,290
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	12,000	4,500	7,497	4,644	2,852	5,500	7,000	25,000	17,330
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	12,000	4,350	7,649	4,765	2,884	5,500	7,000	25,000	17,180
CREW CAB LONG BOX 4X2 LARAMIE DRW											
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	14,000	6,040	7,962	4,749	3,212	5,500	9,750	24,000	15,870
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.73	14,000	6,040	7,962	4,749	3,212	5,500	9,750	26,000	17,870
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	14,000	6,080	7,917	4,712	3,204	5,500	9,750	25,000	16,910
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.73	14,000	6,080	7,917	4,712	3,204	5,500	9,750	27,000	18,910
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	4.10	14,000	6,080	7,917	4,712	3,204	5,500	9,750	30,000	21,910
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	14,000	5,930	8,069	4,833	3,236	5,500	9,750	29,000	20,760
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.73	14,000	5,930	8,069	4,833	3,236	5,500	9,750	32,000	23,760
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	4.10	14,000	5,930	8,069	4,833	3,236	5,500	9,750	37,500	29,260
CREW CAB LONG BOX 4X2 LONGHORN SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	11,000	4,310	6,686	3,809	2,878	5,000	7,000	18,000	11,140
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	11,000	4,310	6,686	3,809	2,878	5,000	7,000	20,000	13,140
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	12,000	4,390	7,613	4,686	2,928	5,500	7,000	25,000	17,220
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	12,000	4,230	7,765	4,806	2,959	5,500	7,000	25,000	17,060
CREW CAB LONG BOX 4X2 LONGHORN DRW											
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	14,000	5,970	8,028	4,756	3,272	5,500	9,750	25,000	16,800
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.73	14,000	5,970	8,028	4,756	3,272	5,500	9,750	27,000	18,800
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	4.10	14,000	5,970	8,028	4,756	3,272	5,500	9,750	30,000	21,800
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	14,000	5,820	8,180	4,877	3,303	5,500	9,750	29,000	20,650
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.73	14,000	5,820	8,180	4,877	3,303	5,500	9,750	32,000	23,650
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	4.10	14,000	5,820	8,180	4,877	3,303	5,500	9,750	37,500	29,150

CREW CAB SHORT BOX 4X4 ST / TRADESMAN SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	10,700	4,240	6,456	3,771	2,685	5,250	7,000	18,000	11,370
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	10,700	4,240	6,456	3,771	2,685	5,250	7,000	20,000	13,370
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	11,700	4,140	7,558	4,676	2,882	6,000	7,000	24,000	16,270
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,700	4,190	7,514	4,639	2,875	6,000	7,000	25,000	17,320
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,700	4,030	7,674	4,761	2,912	6,000	7,000	25,000	17,160
CREW CAB SHORT BOX 4X4 SLT / BIGHORN / LONE STAR SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	10,700	4,170	6,533	3,820	2,714	5,250	7,000	18,000	11,300
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	10,700	4,170	6,533	3,820	2,714	5,250	7,000	20,000	13,300
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	11,700	4,130	7,569	4,700	2,869	6,000	7,000	24,000	16,260
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,700	4,170	7,525	4,664	2,862	6,000	7,000	25,000	17,300
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,700	4,020	7,685	4,786	2,899	6,000	7,000	25,000	17,150
CREW CAB SHORT BOX 4X4 LARAMIE SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	10,700	4,120	6,582	3,856	2,726	5,250	7,000	18,000	11,250
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	10,700	4,120	6,582	3,856	2,726	5,250	7,000	20,000	13,250
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	11,700	4,080	7,618	4,737	2,881	6,000	7,000	24,000	16,210
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,700	4,130	7,574	4,700	2,874	6,000	7,000	25,000	17,260
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,700	3,970	7,734	4,822	2,911	6,000	7,000	25,000	17,100
CREW CAB SHORT BOX 4X4 LONGHORN SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	10,700	4,030	6,671	3,881	2,791	5,250	7,000	18,000	11,160
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	10,700	4,030	6,671	3,881	2,791	5,250	7,000	20,000	13,160
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,700	4,030	7,667	4,725	2,943	6,000	7,000	25,000	17,160
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,700	3,870	7,827	4,847	2,980	6,000	7,000	25,000	17,000
CREW CAB LONG BOX 4X4 ST / TRADESMAN SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	11,300	4,640	6,661	3,890	2,771	5,250	7,000	18,000	11,170
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	11,300	4,640	6,661	3,890	2,771	5,250	7,000	20,000	13,170
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	12,300	4,580	7,720	4,827	2,893	6,000	7,000	24,000	16,110
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	12,300	4,630	7,673	4,787	2,886	6,000	7,000	25,000	17,160
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	12,300	4,470	7,832	4,913	2,919	6,000	7,000	25,000	17,000
CREW CAB LONG BOX 4X4 ST / TRADESMAN DRW											
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	14,000	5,910	8,091	4,854	3,237	6,000	9,750	24,000	15,740
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.73	14,000	5,910	8,091	4,854	3,237	6,000	9,750	26,000	17,740
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	14,000	5,960	8,043	4,814	3,230	6,000	9,750	25,000	16,790
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.73	14,000	5,960	8,043	4,814	3,230	6,000	9,750	27,000	18,790
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	4.10	14,000	5,960	8,043	4,814	3,230	6,000	9,750	30,000	21,790
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	14,000	5,800	8,203	4,940	3,262	6,000	9,750	29,000	20,630
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.73	14,000	5,800	8,203	4,940	3,262	6,000	9,750	32,000	23,630
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	4.10	14,000	5,800	8,203	4,940	3,262	6,000	9,750	37,500	29,130
CREW CAB LONG BOX 4X4 SLT / BIGHORN / LONE STAR SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	11,300	4,610	6,690	3,916	2,774	5,250	7,000	18,000	11,140
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	11,300	4,610	6,690	3,916	2,774	5,250	7,000	20,000	13,140
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	12,300	4,550	7,749	4,854	2,896	6,000	7,000	24,000	16,080
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	12,300	4,600	7,701	4,813	2,889	6,000	7,000	25,000	17,130
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	12,300	4,440	7,861	4,939	2,921	6,000	7,000	25,000	16,970

CREW CAB LONG BOX 4X4 SLT / BIGHORN / LONE STAR DRW											
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	14,000	5,850	8,146	4,889	3,257	6,000	9,750	24,000	15,680
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.73	14,000	5,850	8,146	4,889	3,257	6,000	9,750	26,000	17,680
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	14,000	5,900	8,099	4,848	3,250	6,000	9,750	25,000	16,730
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.73	14,000	5,900	8,099	4,848	3,250	6,000	9,750	27,000	18,730
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	4.10	14,000	5,900	8,099	4,848	3,250	6,000	9,750	30,000	21,730
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	14,000	5,740	8,258	4,975	3,283	6,000	9,750	29,000	20,570
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.73	14,000	5,740	8,258	4,975	3,283	6,000	9,750	32,000	23,570
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	4.10	14,000	5,740	8,258	4,975	3,283	6,000	9,750	37,500	29,070
CREW CAB LONG BOX 4X4 LARAMIE SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	11,300	4,540	6,761	3,963	2,798	5,250	7,000	18,000	11,070
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	11,300	4,540	6,761	3,963	2,798	5,250	7,000	20,000	13,070
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	12,300	4,480	7,820	4,900	2,920	6,000	7,000	24,000	16,010
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	12,300	4,530	7,772	4,860	2,913	6,000	7,000	25,000	17,060
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	12,300	4,370	7,932	4,986	2,946	6,000	7,000	25,000	16,900
CREW CAB LONG BOX 4X4 LARAMIE DRW											
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	14,000	5,790	8,209	4,937	3,272	6,000	9,750	24,000	15,620
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.73	14,000	5,790	8,209	4,937	3,272	6,000	9,750	26,000	17,620
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	14,000	5,840	8,161	4,897	3,265	6,000	9,750	25,000	16,670
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.73	14,000	5,840	8,161	4,897	3,265	6,000	9,750	27,000	18,670
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	4.10	14,000	5,840	8,161	4,897	3,265	6,000	9,750	30,000	21,670
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	14,000	5,680	8,321	5,023	3,298	6,000	9,750	29,000	20,510
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.73	14,000	5,680	8,321	5,023	3,298	6,000	9,750	32,000	23,510
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	4.10	14,000	5,680	8,321	5,023	3,298	6,000	9,750	37,500	29,010
CREW CAB LONG BOX 4X4 LONGHORN SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	11,300	4,430	6,866	3,999	2,868	5,250	7,000	18,000	10,960
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	11,300	4,430	6,866	3,999	2,868	5,250	7,000	20,000	12,960
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	12,300	4,420	7,878	4,895	2,983	6,000	7,000	25,000	16,950
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	12,300	4,260	8,037	5,022	3,015	6,000	7,000	25,000	16,790
CREW CAB LONG BOX 4X4 LONGHORN DRW											
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	14,000	5,740	8,262	4,935	3,327	6,000	9,750	25,000	16,570
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.73	14,000	5,740	8,262	4,935	3,327	6,000	9,750	27,000	18,570
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	4.10	14,000	5,740	8,262	4,935	3,327	6,000	9,750	30,000	21,570
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	14,000	5,580	8,421	5,061	3,360	6,000	9,750	29,000	20,410
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.73	14,000	5,580	8,421	5,061	3,360	6,000	9,750	32,000	23,410
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	4.10	14,000	5,580	8,421	5,061	3,360	6,000	9,750	37,500	28,910

2013 Ram 3500 TRAILER TOWING CHART

Engine	Transmission	Axle Ratio	GVWR	Payload	Base Weight			GAWR		GCWR	Trailering Equip. Wgt.
					Total	Front	Rear	Front	Rear		
CREW CAB RAMBOX 4X2 ST / TRADESMAN SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	10,050	3,580	6,465	3,615	2,850	5,000	7,000	18,000	11,360
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	10,050	3,580	6,465	3,615	2,850	5,000	7,000	20,000	13,360
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	11,500	4,040	7,460	4,529	2,931	5,500	7,000	24,000	16,370
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,500	4,080	7,416	4,494	2,922	5,500	7,000	25,000	17,410
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,500	3,930	7,568	4,611	2,957	5,500	7,000	25,000	17,260
CREW CAB RAMBOX 4X2 SLT / BIGHORN / LONE STAR SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	10,050	3,530	6,517	3,618	2,899	5,000	7,000	18,000	11,310
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	10,050	3,530	6,517	3,618	2,899	5,000	7,000	20,000	13,310
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	11,500	3,990	7,512	4,532	2,980	5,500	7,000	24,000	16,320
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,500	4,030	7,468	4,497	2,971	5,500	7,000	25,000	17,360
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,500	3,880	7,620	4,614	3,007	5,500	7,000	25,000	17,210
CREW CAB RAMBOX 4X2 LARAMIE SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	10,050	3,480	6,575	3,689	2,885	5,000	7,000	18,000	11,260
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	10,050	3,480	6,575	3,689	2,885	5,000	7,000	20,000	13,260
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	11,500	3,930	7,569	4,603	2,966	5,500	7,000	24,000	16,260
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,500	3,970	7,526	4,569	2,957	5,500	7,000	25,000	17,300
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,500	3,820	7,678	4,685	2,993	5,500	7,000	25,000	17,150
CREW CAB RAMBOX 4X2 LONGHORN SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	10,050	3,390	6,657	3,715	2,942	5,000	7,000	18,000	11,170
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	10,050	3,390	6,657	3,715	2,942	5,000	7,000	20,000	13,170
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,500	3,890	7,608	4,594	3,014	5,500	7,000	25,000	17,220
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,500	3,740	7,760	4,711	3,050	5,500	7,000	25,000	17,070
CREW CAB RAMBOX 4X4 ST / TRADESMAN SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	10,700	4,090	6,613	3,779	2,834	5,250	7,000	18,000	11,220
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	10,700	4,090	6,613	3,779	2,834	5,250	7,000	20,000	13,220
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	11,700	3,980	7,718	4,683	3,035	6,000	7,000	24,000	16,110
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,700	4,030	7,675	4,647	3,028	6,000	7,000	25,000	17,160
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,700	3,870	7,834	4,769	3,065	6,000	7,000	25,000	17,000
CREW CAB RAMBOX 4X4 SLT / BIGHORN / LONE STAR SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	10,700	4,040	6,661	3,801	2,860	5,250	7,000	18,000	11,170
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	10,700	4,040	6,661	3,801	2,860	5,250	7,000	20,000	13,170
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	11,700	4,000	7,701	4,682	3,019	6,000	7,000	24,000	16,130
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,700	4,040	7,657	4,645	3,012	6,000	7,000	25,000	17,170
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,700	3,880	7,817	4,767	3,049	6,000	7,000	25,000	17,010
CREW CAB RAMBOX 4X4 LARAMIE SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	10,700	3,980	6,724	3,847	2,877	5,250	7,000	18,000	11,110
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	10,700	3,980	6,724	3,847	2,877	5,250	7,000	20,000	13,110
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	11,700	3,940	7,764	4,728	3,036	6,000	7,000	24,000	16,070
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,700	3,980	7,720	4,692	3,029	6,000	7,000	25,000	17,110
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,700	3,820	7,880	4,814	3,066	6,000	7,000	25,000	16,950

2013 Ram 3500 TRAILER TOWING CHART

Engine	Transmission	Axle Ratio	GVWR	Payload	Base Weight			GAWR		GCWR	Trailering Equip. Wgt.
					Total	Front	Rear	Front	Rear		
CREW CAB RAMBOX 4X2 ST / TRADESMAN SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	10,050	3,580	6,465	3,615	2,850	5,000	7,000	18,000	11,360
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	10,050	3,580	6,465	3,615	2,850	5,000	7,000	20,000	13,360
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	11,500	4,040	7,460	4,529	2,931	5,500	7,000	24,000	16,370
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,500	4,080	7,416	4,494	2,922	5,500	7,000	25,000	17,410
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,500	3,930	7,568	4,611	2,957	5,500	7,000	25,000	17,260
CREW CAB RAMBOX 4X2 SLT / BIGHORN / LONE STAR SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	10,050	3,530	6,517	3,618	2,899	5,000	7,000	18,000	11,310
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	10,050	3,530	6,517	3,618	2,899	5,000	7,000	20,000	13,310
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	11,500	3,990	7,512	4,532	2,980	5,500	7,000	24,000	16,320
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,500	4,030	7,468	4,497	2,971	5,500	7,000	25,000	17,360
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,500	3,880	7,620	4,614	3,007	5,500	7,000	25,000	17,210
CREW CAB RAMBOX 4X2 LARAMIE SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	10,050	3,480	6,575	3,689	2,885	5,000	7,000	18,000	11,260
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	10,050	3,480	6,575	3,689	2,885	5,000	7,000	20,000	13,260
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	11,500	3,930	7,569	4,603	2,966	5,500	7,000	24,000	16,260
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,500	3,970	7,526	4,569	2,957	5,500	7,000	25,000	17,300
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,500	3,820	7,678	4,685	2,993	5,500	7,000	25,000	17,150
CREW CAB RAMBOX 4X2 LONGHORN SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	10,050	3,390	6,657	3,715	2,942	5,000	7,000	18,000	11,170
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	10,050	3,390	6,657	3,715	2,942	5,000	7,000	20,000	13,170
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,500	3,890	7,608	4,594	3,014	5,500	7,000	25,000	17,220
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,500	3,740	7,760	4,711	3,050	5,500	7,000	25,000	17,070
CREW CAB RAMBOX 4X4 ST / TRADESMAN SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	10,700	4,090	6,613	3,779	2,834	5,250	7,000	18,000	11,220
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	10,700	4,090	6,613	3,779	2,834	5,250	7,000	20,000	13,220
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	11,700	3,980	7,718	4,683	3,035	6,000	7,000	24,000	16,110
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,700	4,030	7,675	4,647	3,028	6,000	7,000	25,000	17,160
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,700	3,870	7,834	4,769	3,065	6,000	7,000	25,000	17,000
CREW CAB RAMBOX 4X4 SLT / BIGHORN / LONE STAR SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	10,700	4,040	6,661	3,801	2,860	5,250	7,000	18,000	11,170
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	10,700	4,040	6,661	3,801	2,860	5,250	7,000	20,000	13,170
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	11,700	4,000	7,701	4,682	3,019	6,000	7,000	24,000	16,130
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,700	4,040	7,657	4,645	3,012	6,000	7,000	25,000	17,170
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,700	3,880	7,817	4,767	3,049	6,000	7,000	25,000	17,010
CREW CAB RAMBOX 4X4 LARAMIE SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	10,700	3,980	6,724	3,847	2,877	5,250	7,000	18,000	11,110
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	10,700	3,980	6,724	3,847	2,877	5,250	7,000	20,000	13,110
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	11,700	3,940	7,764	4,728	3,036	6,000	7,000	24,000	16,070
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,700	3,980	7,720	4,692	3,029	6,000	7,000	25,000	17,110
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,700	3,820	7,880	4,814	3,066	6,000	7,000	25,000	16,950
CREW CAB RAMBOX 4X4 LONGHORN SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	10,700	3,880	6,822	3,878	2,943	5,250	7,000	18,000	11,010
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	10,700	3,880	6,822	3,878	2,943	5,250	7,000	20,000	13,010
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,700	3,880	7,818	4,722	3,095	6,000	7,000	25,000	17,010
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,700	3,720	7,977	4,845	3,133	6,000	7,000	25,000	16,850

2013 Ram 3500 TRAILER TOWING CHART

Engine	Transmission	Axle Ratio	GVWR	Payload	Base Weight			GAWR		GCWR	Trailering Equip. Wgt.
					Total	Front	Rear	Front	Rear		
MEGA CAB SHORT BOX 4X2 SLT / BIGHORN / LONE STAR SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	11,000	4,430	6,571	3,795	2,777	5,000	7,000	18,000	11,260
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	11,000	4,430	6,571	3,795	2,777	5,000	7,000	20,000	13,260
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	11,600	3,990	7,608	4,647	2,961	5,500	7,000	24,000	16,220
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,600	4,040	7,557	4,604	2,953	5,500	7,000	25,000	17,270
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,600	3,890	7,709	4,723	2,986	5,500	7,000	25,000	17,120
MEGA CAB SHORT BOX 4X2 SLT / BIGHORN / LONE STAR DRW											
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	14,000	5,980	8,023	4,712	3,311	5,500	9,750	24,000	15,810
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.73	14,000	5,980	8,023	4,712	3,311	5,500	9,750	26,000	17,810
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	14,000	6,030	7,972	4,669	3,303	5,500	9,750	25,000	16,860
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.73	14,000	6,030	7,972	4,669	3,303	5,500	9,750	27,000	18,860
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	4.10	14,000	6,030	7,972	4,669	3,303	5,500	9,750	30,000	21,860
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	14,000	5,880	8,124	4,788	3,337	5,500	9,750	29,000	20,710
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.73	14,000	5,880	8,124	4,788	3,337	5,500	9,750	32,000	23,710
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	4.10	14,000	5,880	8,124	4,788	3,337	5,500	9,750	37,500	29,210
MEGA CAB SHORT BOX 4X2 LARAMIE SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	11,000	4,370	6,631	3,837	2,794	5,000	7,000	18,000	11,200
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	11,000	4,370	6,631	3,837	2,794	5,000	7,000	20,000	13,200
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	11,600	3,930	7,668	4,689	2,978	5,500	7,000	24,000	16,160
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,600	3,980	7,617	4,646	2,970	5,500	7,000	25,000	17,210
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,600	3,830	7,769	4,765	3,004	5,500	7,000	25,000	17,060
MEGA CAB SHORT BOX 4X2 LARAMIE DRW											
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	14,000	5,950	8,053	4,749	3,304	5,500	9,750	24,000	15,780
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.73	14,000	5,950	8,053	4,749	3,304	5,500	9,750	26,000	17,780
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	14,000	6,000	8,002	4,706	3,296	5,500	9,750	25,000	16,830
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.73	14,000	6,000	8,002	4,706	3,296	5,500	9,750	27,000	18,830
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	4.10	14,000	6,000	8,002	4,706	3,296	5,500	9,750	30,000	21,830
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	14,000	5,850	8,154	4,825	3,329	5,500	9,750	29,000	20,680
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.73	14,000	5,850	8,154	4,825	3,329	5,500	9,750	32,000	23,680
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	4.10	14,000	5,850	8,154	4,825	3,329	5,500	9,750	37,500	29,180
MEGA CAB SHORT BOX 4X2 LONGHORN SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	11,000	4,250	6,747	3,884	2,863	5,000	7,000	18,000	11,080
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	11,000	4,250	6,747	3,884	2,863	5,000	7,000	20,000	13,080
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,600	3,970	7,633	4,694	2,940	5,500	7,000	25,000	17,200
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,600	3,810	7,786	4,813	2,973	5,500	7,000	25,000	17,040
MEGA CAB SHORT BOX 4X2 LONGHORN DRW											
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	14,000	5,880	8,118	4,746	3,372	5,500	9,750	25,000	16,710
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.73	14,000	5,880	8,118	4,746	3,372	5,500	9,750	27,000	18,710
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	4.10	14,000	5,880	8,118	4,746	3,372	5,500	9,750	30,000	21,710
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	14,000	5,730	8,270	4,865	3,405	5,500	9,750	29,000	20,560
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.73	14,000	5,730	8,270	4,865	3,405	5,500	9,750	32,000	23,560
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	4.10	14,000	5,730	8,270	4,865	3,405	5,500	9,750	37,500	29,060

MEGA CAB SHORT BOX 4X4 SLT / BIGHORN / LONE STAR SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	11,300	4,550	6,747	3,902	2,845	5,250	7,000	18,000	11,080
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	11,300	4,550	6,747	3,902	2,845	5,250	7,000	20,000	13,080
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	12,400	4,600	7,803	4,798	3,005	6,000	7,000	24,000	16,030
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	12,400	4,650	7,753	4,757	2,996	6,000	7,000	25,000	17,080
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	12,400	4,490	7,912	4,881	3,031	6,000	7,000	25,000	16,920
MEGA CAB SHORT BOX 4X4 SLT / BIGHORN / LONE STAR DRW											
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	14,000	5,790	8,208	4,841	3,368	6,000	9,750	24,000	15,620
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.73	14,000	5,790	8,208	4,841	3,368	6,000	9,750	26,000	17,620
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	14,000	5,840	8,158	4,799	3,359	6,000	9,750	25,000	16,670
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.73	14,000	5,840	8,158	4,799	3,359	6,000	9,750	27,000	18,670
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	4.10	14,000	5,840	8,158	4,799	3,359	6,000	9,750	30,000	21,670
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	14,000	5,680	8,317	4,924	3,393	6,000	9,750	29,000	20,510
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.73	14,000	5,680	8,317	4,924	3,393	6,000	9,750	32,000	23,510
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	4.10	14,000	5,680	8,317	4,924	3,393	6,000	9,750	37,500	29,010
MEGA CAB SHORT BOX 4X4 LARAMIE SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	11,300	4,460	6,841	3,960	2,881	5,250	7,000	18,000	10,990
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	11,300	4,460	6,841	3,960	2,881	5,250	7,000	20,000	12,990
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	12,400	4,500	7,898	4,856	3,042	6,000	7,000	24,000	15,930
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	12,400	4,550	7,847	4,815	3,032	6,000	7,000	25,000	16,980
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	12,400	4,390	8,006	4,939	3,067	6,000	7,000	25,000	16,820
MEGA CAB SHORT BOX 4X4 LARAMIE DRW											
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	14,000	5,760	8,240	4,877	3,363	6,000	9,750	24,000	15,590
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.73	14,000	5,760	8,240	4,877	3,363	6,000	9,750	26,000	17,590
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	14,000	5,810	8,189	4,836	3,353	6,000	9,750	25,000	16,640
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.73	14,000	5,810	8,189	4,836	3,353	6,000	9,750	27,000	18,640
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	4.10	14,000	5,810	8,189	4,836	3,353	6,000	9,750	30,000	21,640
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	14,000	5,650	8,348	4,960	3,388	6,000	9,750	29,000	20,480
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.73	14,000	5,650	8,348	4,960	3,388	6,000	9,750	32,000	23,480
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	4.10	14,000	5,650	8,348	4,960	3,388	6,000	9,750	37,500	28,980
MEGA CAB SHORT BOX 4X4 LONGHORN SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	11,300	4,350	6,949	3,998	2,951	5,250	7,000	18,000	10,880
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	11,300	4,350	6,949	3,998	2,951	5,250	7,000	20,000	12,880
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	12,400	4,440	7,955	4,852	3,103	6,000	7,000	25,000	16,870
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	12,400	4,290	8,115	4,977	3,137	6,000	7,000	25,000	16,720
MEGA CAB SHORT BOX 4X4 LONGHORN DRW											
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	14,000	5,710	8,291	4,874	3,417	6,000	9,750	25,000	16,540
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.73	14,000	5,710	8,291	4,874	3,417	6,000	9,750	27,000	18,540
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	4.10	14,000	5,710	8,291	4,874	3,417	6,000	9,750	30,000	21,540
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	14,000	5,550	8,450	4,998	3,452	6,000	9,750	29,000	20,380
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.73	14,000	5,550	8,450	4,998	3,452	6,000	9,750	32,000	23,380
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	4.10	14,000	5,550	8,450	4,998	3,452	6,000	9,750	37,500	28,880

2013 Ram 3500 TRAILER TOWING CHART

Engine	Transmission	Axle Ratio	GVWR	Payload	Base Weight			GAWR		GCWR	Trailering Equip. Wgt.
					Total	Front	Rear	Front	Rear		
MEGA CAB RAMBOX 4X2 SLT / BIGHORN / LONE STAR SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	11,000	4,300	6,698	3,793	2,905	5,000	7,000	18,000	11,130
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	11,000	4,300	6,698	3,793	2,905	5,000	7,000	20,000	13,130
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	11,600	3,870	7,735	4,645	3,090	5,500	7,000	24,000	16,100
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,600	3,920	7,684	4,602	3,082	5,500	7,000	25,000	17,150
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,600	3,760	7,836	4,721	3,115	5,500	7,000	25,000	16,990
MEGA CAB RAMBOX 4X2 LARAMIE SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	11,000	4,220	6,777	3,839	2,938	5,000	7,000	18,000	11,050
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	11,000	4,220	6,777	3,839	2,938	5,000	7,000	20,000	13,050
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	11,600	3,790	7,814	4,691	3,122	5,500	7,000	24,000	16,020
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,600	3,840	7,763	4,649	3,114	5,500	7,000	25,000	17,070
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,600	3,680	7,915	4,768	3,148	5,500	7,000	25,000	16,910
MEGA CAB RAMBOX 4X2 LONGHORN SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	11,000	4,100	6,896	3,884	3,012	5,000	7,000	18,000	10,930
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	11,000	4,100	6,896	3,884	3,012	5,000	7,000	20,000	12,930
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,600	3,720	7,882	4,693	3,189	5,500	7,000	25,000	16,950
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,600	3,570	8,034	4,812	3,222	5,500	7,000	25,000	16,800
MEGA CAB RAMBOX 4X4 SLT / BIGHORN / LONE STAR SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	11,300	4,410	6,889	3,900	2,989	5,250	7,000	18,000	10,940
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	11,300	4,410	6,889	3,900	2,989	5,250	7,000	20,000	12,940
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	12,400	4,450	7,946	4,796	3,150	6,000	7,000	24,000	15,880
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	12,400	4,500	7,895	4,755	3,141	6,000	7,000	25,000	16,930
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	12,400	4,350	8,055	4,879	3,175	6,000	7,000	25,000	16,780
MEGA CAB RAMBOX 4X4 LARAMIE SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	11,300	4,320	6,984	3,958	3,025	5,250	7,000	18,000	10,850
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	11,300	4,320	6,984	3,958	3,025	5,250	7,000	20,000	12,850
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	12,400	4,360	8,040	4,854	3,186	6,000	7,000	24,000	15,790
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	12,400	4,410	7,989	4,813	3,177	6,000	7,000	25,000	16,840
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	12,400	4,250	8,149	4,937	3,212	6,000	7,000	25,000	16,680
MEGA CAB RAMBOX 4X4 LONGHORN SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	11,300	4,210	7,093	3,993	3,100	5,250	7,000	18,000	10,740
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	11,300	4,210	7,093	3,993	3,100	5,250	7,000	20,000	12,740
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	12,400	4,300	8,099	4,847	3,252	6,000	7,000	25,000	16,730
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	12,400	4,140	8,258	4,972	3,287	6,000	7,000	25,000	16,570

NOTES:

1 All weights in pounds unless stated. Payload and Max Trailer values are rounded to the nearest 10 lbs.
2 Payload = GVWR - Base Wt.
3 Payload and maximum trailer weight are mutually exclusive.
4 GCWR is a defined value from Vehicle Development in lbs.
5 Max Trailer= GCW - Base Weight - 170 lbs (Driver weight + 20 lbs. Optional Equipment).

2013 Ram 3500 TRAILER TOWING CHART

Engine	Transmission	Axle Ratio	GVWR	Payload	Base Weight			GAWR		GCWR	Trailering Equip. Wgt.
					Total	Front	Rear	Front	Rear		
MEGA CAB RAMBOX 4X2 SLT / BIGHORN / LONE STAR SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	11,000	4,300	6,698	3,793	2,905	5,000	7,000	18,000	11,130
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	11,000	4,300	6,698	3,793	2,905	5,000	7,000	20,000	13,130
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	11,600	3,870	7,735	4,645	3,090	5,500	7,000	24,000	16,100
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,600	3,920	7,684	4,602	3,082	5,500	7,000	25,000	17,150
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,600	3,760	7,836	4,721	3,115	5,500	7,000	25,000	16,990
MEGA CAB RAMBOX 4X2 LARAMIE SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	11,000	4,220	6,777	3,839	2,938	5,000	7,000	18,000	11,050
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	11,000	4,220	6,777	3,839	2,938	5,000	7,000	20,000	13,050
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	11,600	3,790	7,814	4,691	3,122	5,500	7,000	24,000	16,020
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,600	3,840	7,763	4,649	3,114	5,500	7,000	25,000	17,070
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,600	3,680	7,915	4,768	3,148	5,500	7,000	25,000	16,910
MEGA CAB RAMBOX 4X2 LONGHORN SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	11,000	4,100	6,896	3,884	3,012	5,000	7,000	18,000	10,930
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	11,000	4,100	6,896	3,884	3,012	5,000	7,000	20,000	12,930
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	11,600	3,720	7,882	4,693	3,189	5,500	7,000	25,000	16,950
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	11,600	3,570	8,034	4,812	3,222	5,500	7,000	25,000	16,800
MEGA CAB RAMBOX 4X4 SLT / BIGHORN / LONE STAR SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	11,300	4,410	6,889	3,900	2,989	5,250	7,000	18,000	10,940
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	11,300	4,410	6,889	3,900	2,989	5,250	7,000	20,000	12,940
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	12,400	4,450	7,946	4,796	3,150	6,000	7,000	24,000	15,880
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	12,400	4,500	7,895	4,755	3,141	6,000	7,000	25,000	16,930
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	12,400	4,350	8,055	4,879	3,175	6,000	7,000	25,000	16,780
MEGA CAB RAMBOX 4X4 LARAMIE SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	11,300	4,320	6,984	3,958	3,025	5,250	7,000	18,000	10,850
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	11,300	4,320	6,984	3,958	3,025	5,250	7,000	20,000	12,850
6.7L DIESEL TURBO - ETK	6-SPD MAN G56 - DEG	3.42	12,400	4,360	8,040	4,854	3,186	6,000	7,000	24,000	15,790
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	12,400	4,410	7,989	4,813	3,177	6,000	7,000	25,000	16,840
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	12,400	4,250	8,149	4,937	3,212	6,000	7,000	25,000	16,680
MEGA CAB RAMBOX 4X4 LONGHORN SRW											
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	3.73	11,300	4,210	7,093	3,993	3,100	5,250	7,000	18,000	10,740
5.7L GAS HEMI - EZC	6-SPD AUTO 66RFE - DFP	4.10	11,300	4,210	7,093	3,993	3,100	5,250	7,000	20,000	12,740
6.7L DIESEL TURBO - ETK	6-SPD AUTO 68RFE - DG7	3.42	12,400	4,300	8,099	4,847	3,252	6,000	7,000	25,000	16,730
6.7L DIESEL TURBO - ETK	6-SPD AUTO HD - DF2	3.42	12,400	4,140	8,258	4,972	3,287	6,000	7,000	25,000	16,570