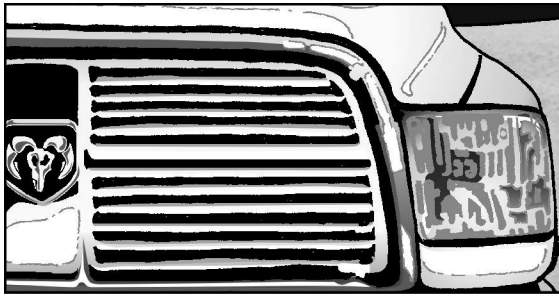




TURBO DIESEL

REGISTER





STILL PLAYS WITH TRUCKS

*Product installations, evaluations,
and gearhead commentary by James Langan.*

REFLECTIONS AT 100,000 MILES/10YEARS

What constitutes a long life? The answer varies, but maturity generally adds perspective. Because the TDR is a truck magazine, our focus is on getting more value, performance, and longevity out of the first and arguably best medium-duty diesel engine stuffed into a pickup.

Driving a vehicle for 100,000 miles is an achievement because many do not buy new vehicles and keep them that long, often upgrading to newer models or changing brands. I have purchased several new trucks during my decades of driving, but not kept many for 100,000 miles. Yet there have been a few notable exceptions.

My wife's daily-driver 2006 Toyota 4Runner, which was originally one of my toys, has reached 120,000 miles. We kept a 1996 F-350 for 18 years and 133,000 miles, our 2000 VW Golf TDI was purchased from a friend with 18k on the clock and we drove it to 125k. And, now, drumroll please... in July 2023, my 2014 Ram 2500 crew cab reached 100,000 miles!



Blank Canvas, June 2014.

100,000 Means Less Than It Did Decades Ago

It wasn't that long ago (1960s-1970s) when vehicles were relatively crude and much less efficient than today. Reaching 100,000 miles without major repairs or an overhaul was a bigger achievement. If modern vehicles don't easily reach 200,000 miles, I consider them to be substandard. Even after the original owner sells, subsequent owners typically use them daily and keep them on the road.

Some vehicles, like the aforementioned 4Runner, have a reputation for routinely going 300,000 miles! Ours is going to age-out or be sold before we get anywhere near those numbers, as we simply don't drive it enough.

As the odometer climbs, most platforms will need brake repairs, water pumps, alternators, timing belts or timing chains and such, but the core drivetrain should not have major issues within the first 100–200,000 miles. As with everything, one's duty-cycle and *vehicle sympathy* matters, but in general newer vehicles are excellent and should go much further than 100k with few hassles or repairs. Automatic transmissions are one drivetrain exception, particularly those behind Turbo Diesels that are worked hard, but the TDR's own Moses Ludel is one notable exception. With his diligent maintenance and sensible driving, he has 190,000 miles on the original 48RE transmission, and is shooting for 230,000 miles before a full bench rebuild.

The 2014 Ram 2500 Report

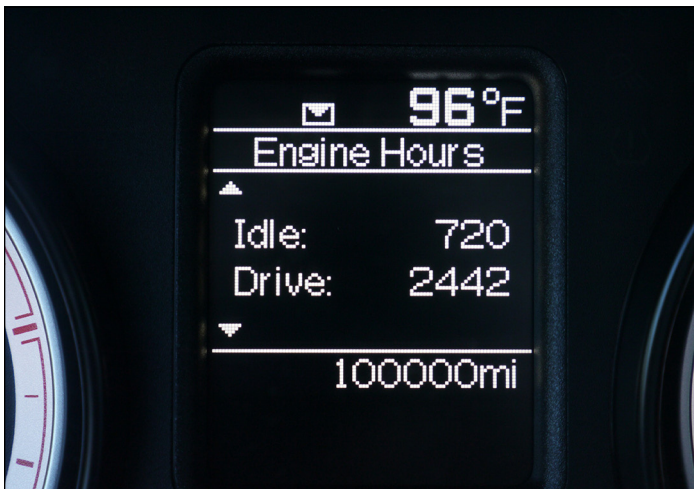
It took slightly more than nine years to reach 100,000 miles, which is slightly more than 11,000 per year. That's lower than the national average, which Kelly Blue Book says was 13,500 miles in 2021. If you will recall, I also purchased a 2500 Ram regular cab Turbo Diesel in 2017. I have averaged another 8,300 miles per year for the past six years on that chassis as well. Most of us think primarily about miles logged and use them to perform service intervals, myself included. In commercial applications it is common to use hours of operation instead, and the built-in hour meter gives us both idling hours and driving hours. Simple math tells us our average speed which can be another valuable indicator of duty-cycle.



Early in the truck's life, I took a picture of "Engine Hours."
Mileage 11,111 miles ÷ total hours 294 = 37.8 mph.

Hours versus Miles

When this 2014's odometer hit 100,000 miles, the engine had operated for 3,162 total hours; 720 idling and 2,442 driving. The average miles-per-hour: $100,000 \div 3162 = 31.6\text{mph}$. These numbers are likely accurate enough, yet it's worth noting that if you watch your trip meter when the key is on, but the motor is not running, the clock is actually ticking. I have always wondered if one is getting dinged with idle time under these circumstances. Similarly, while crawling around off-road in low-range, the motor is often just chugging along at low-idle, but the wheels are turning and there is a small amount of engine load. Are these considered idling hours because of the engine speed, even though I'm driving the truck, or because the wheels are turning, are they are drive hours? **Editor's note: Answer, "fake hours." See my comments at the end of the next paragraph.**



Now, 2,868 hours later: 31.6 mph average after 100,000 miles.

My 2014's average road speed has been 31.6 mph, which is a realistic, believable, and relatively healthy average. To state what should be obvious but is sometimes forgotten, sitting at red lights or stopped in traffic is going zero mph and contribute to idling hours. People that spend less time on highways or freeways, or have heavy traffic commutes, will have slower miles-per-hour averages.

Editor's note: See Issue 120, page 14. From my observation (unless we can have a beer with the programmer of the algorithm) it is impossible to know the meaning of "idle hours." I cited two of my EVIC displays as an example: Between the two pictures/intervals, the "idle hours" went backward, from 51 hours, 10,500 miles in September, 2022; to 49 hours, 12854 miles in March, 2023. Geez.

How Much Do You Idle?

In some circumstances I idle my diesels less than in the past, but in other ways quite a bit more. Unnecessary idling is avoided after start-up, as driving gets everything to operating temperature faster, which increases efficiency and is generally better. Extreme cold where the engine may not idle smoothly, or will be heavily-loaded immediately are possible exceptions, and also when I might use my BD High Idle Kit to help warm-up.

Life has changed some now that my wife and I have our first little dog, Elsie the Welsh Terrier, who goes almost everywhere with us and actually gets to ride in the cab instead of in a kennel in the bed of the truck like all our big dogs in the past (obviously I'm now old and soft).

During the cooler months Elsie can stay in the cab with the motor off if she's not welcome inside a home or business. During warmer weather the temperature inside vehicles gets ridiculously hot almost immediately, and leaving an animal inside is dangerous as well as illegal under most circumstances. During these conditions I idle the engine, blasting the air conditioning to keep the cabin cool. I lock the truck, routinely also use the BD V3 Throttle Sensitivity Booster security feature to deactivate accelerator, and sometimes connect a cable lock from the seat frame to the steering wheel (often chock the wheels too).



BD Diesel's V3 TSB is one of my favorite add-ons. I frequently use the security mode to deactivate the accelerator when parked.



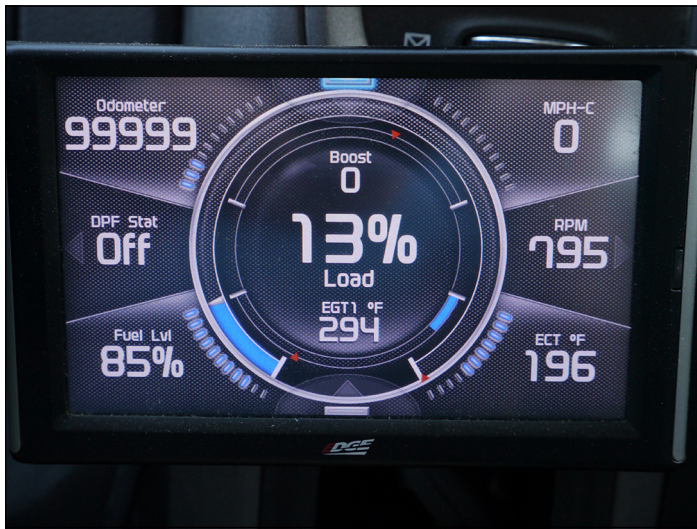
Cable and padlock theft deterrent when the engine is running and I'm not in the driver's seat.

EGT and DPF

Letting the turbocharger cool and exhaust gas temperature drop before shutting down the engine is part of my standard operating procedure; no exceptions. It seems that many don't do this and are apparently fine. Of course, we don't know how long they keep their vehicles or what repairs they might need. My brother-in-law, who was a career professional mechanic and now does service contract warranty work, notes that he authorizes the replacement of many turbochargers, while observing that I've owned eight turbocharged diesels but have never had a turbo failure.

Letting the turbocharger cool and exhaust gas temperature drop before shutting down the engine is part of my standard operating procedure.

Excessive idling has always been considered suboptimal in the automotive world, maybe less so for diesels due to their lower fuel consumption and commercial use, except during the cold when incomplete combustion is a bigger concern. However, with modern emissions systems there is much added complexity, and we know that the diesel particulate filter (DPF) may need more frequent active regeneration cycles or become full sooner depending on the work it's asked to perform. Generally, it's better when the powertrain is loaded as intended, and idling is minimized.



Edge CTS2 says the DPF is OFF (it is rarely ON). Using the factory EGT1 sensor, I usually shutdown at 400°F. The EGT is well below that here because I'm taking pictures of 99,999!

Editor's note: I really do love the Edge CTS3 and CTS2 monitors. Not only do you have access to the factory ECU data, but the gauges also give you the ability to capture and erase diagnostic trouble codes (DTCs). So, why can't these "gauges" and DTCs be displayed on Ram's "big screen" infotainment console? Answer: they could be, but they aren't!

Will The Emissions System Fail Soon?

All of us would be happier without the complex emissions systems attached to our trucks, and there are those that *delete* these systems with apparently few complaints or repercussions. As the TDR often reports, the EPA's enforcement of existing laws and rules has increased, and one always has to ask themselves if the *juice is worth the squeeze*. Some, including me, have smog tests that must be passed to renew registration and prefer to avoid legal or administrative hassles.

If we want a Cummins with little to no emissions equipment installed we can always drive an older Turbo Diesel. But the newer trucks have so many desirable features, are extremely comfortable, are nice to drive, are possibly more reliable and robust overall, and make the kind of torque and horsepower only attained by the biggest hot-rodders of decades past. Buying a new, expensive vehicle and radically modifying or removing systems is not appealing to most, and immediately puts us in the position of being our own warranty station. I remain firmly in the camp of not tinkering with the aftertreatment and DEF systems.

As a hedge against emission systems problems (as reported in TDR 113), I started using Blue DEF Platinum which reportedly has an anti-clogging additive. Neither of my trucks have had any issues with the DEF system, but two acquaintances had catastrophic DEF-related failures well below 100,000 miles.

Active regeneration (regen) cycles are rare for both my trucks (the 2014 and 2017), or at least that's my observation based on what the Edge CTS2 says. I think this is because I usually don't spare the skinny pedal, so my engines are loaded and earning their keep, even when the chassis is lightly loaded. Limiting in-town driving and hurling my 9,000-pound Ram Crew Cab down the highway at 75 miles-per-hour does provide some load, and a headwind or grade adds more. As much as I was against having a Cummins that uses DEF, thus far I have little to complain about, and the fact that some engineers call DEF horsepower juice speaks volumes.



Hedging my bets by paying extra for Blue DEF Platinum, hoping to avoid premature DEF injector clogging or related problems.

100K MILES: NOT MUCH TO COMPLAIN ABOUT

Water Pump Recall And Headlight Switch

January 2019, the water pump was replaced under a recall campaign at 45,000 miles, and the occupant restraint module recall was performed at the same time.

Three months later the headlight switch was replaced with an OE/Mopar unit, part number 6826 9910 AA-001, as the original would only turn off the headlights if it was on *auto*, but not in the *off* position. It was extremely easy, I merely needed to pull the headlight switch assembly out of the dash, unplug the OE part, plug the wiring harness into the rear of the new one, and push it into place.



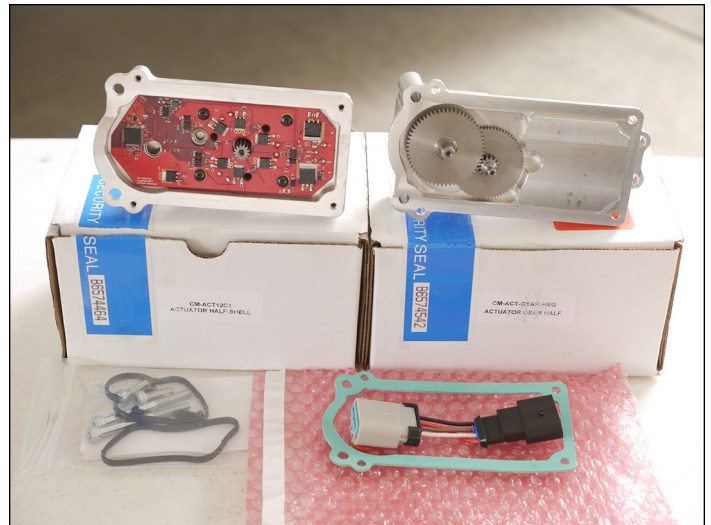
Newer vehicles can be easier to work on than older ones; this headlight switch assembly was a quick R&R.

Turbo Actuator Failure and the City Diesel Solution

Premature failure of the stock Holset turbo actuator is a known gremlin on late-model Turbo Diesels. On my 2014 truck it stopped working at 55,000 miles. When this happens you no longer have a boosted engine, the loss of torque and power is devastating, and it is almost like being in limp mode. Thankfully there is a superior aftermarket solution.

From Geno's Garage I purchased the City Diesel Electronic Turbo Actuator upgrade that currently sells for \$985. With a rated duty-cycle of up to 15,000 hours, which is three times that of the OEM piece, hopefully I have several years before I need to perform another actuator remove-and-replace.

There continues to be one issue with my City Diesel Actuator (they are aware, I wasn't the first), being that the exhaust/turbo brake will not work fully or correctly after a cold start, even if it is not cold outside. On a restart, there is no such gremlin. This was documented in my column in TDR 112. My updated workaround has been to simply turn the key to *on*, and after the wait to start light is displayed, I immediately cycle the key *off*, then back to *on/start*. For some reason the double cycling of the key always allows the exhaust brake to correctly work. (My previous method of waiting extra seconds with the key-on before turning-over the engine has proven unreliable.)



City Diesel Turbo Actuator is superior to the factory part and available from Geno's Garage.

Upper Inlet Radiator Hose With Y-Connector

September 2021, the Y-connector junction of the upper radiator hose started seeping coolant. The OEM replacement part (purchased from Geno's) is a complete assembly with the hoses permanently attached to the Y-pipe.

This was a pretty small and easy repair.

Again, this was a pretty small and easy repair, though I would observe that radiator and heater hoses traditionally can last much longer and my similar 2017 Ram 2500 has a different, simpler design (TDR 115). Next time I will use the aftermarket Dorman part now sold by Geno's Garage, which uses an aluminum Y-connector instead of plastic.



Upper radiator hose/Y-pipe assembly was one notable premature failure.

Loose Driver's Entry Handle

In 2023, the driver-side entry grab handle started feeling wiggly and loose. I am long-legged and don't put much load on the handle, mostly using it as a guide and slight assist as I hop into the driver's seat.

My brother-in-law was aware of this problem on older Rams and knew about the Geno's Garage repair reinforcement kit. We pulled the A-pillar trim piece to have a look behind the handle, but it was simply a matter of the nuts backing off and needing tightening.



Driver's grab handle was a little loose by 100k.

EVIC 4WD Warning

For the last couple years, when in four-wheel-drive (4WD), I frequently get a 4WD *shift-in-progress* warning spastically flashing on and off in the center of the EVIC display. Not until recently did I attempt diagnosis, but it does not seem like the driveline is actually shifting every time I see this, as I have not noticed a lack of traction. With my brother-in-law in the passenger seat we observed that it only happens in low-range, and we suspect a faulty sensor or short circuit. When I find the source of the problem and a solution, I'll provide an update. Maybe it is a known problem with an easy fix, but I've not yet researched.

Little Birdie Under the Dash

The clutch pedal squeaks when pushed or released and has done so for as long as I can remember. Others on the [Turbo Diesel Register](#) forum have the same complaint, including those who have unsuccessfully attempted to silence the noise with lubricant. My hearing is imperfect, and the clutch works fine in every other way, so for now I've accepted this nuisance as part of the truck's character and just keep driving.

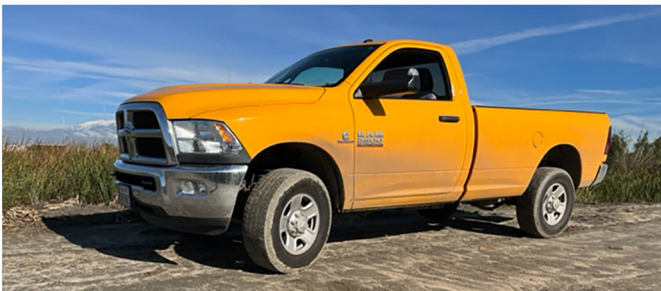
Positively Moving Forward

Maybe I have forgotten a few things but that's a relatively short list of niggles, and pales in comparison to my 1995 Second Generation Dodge 2500. That truck was a legitimate lemon that Chrysler bought back from me, and soured me on the Ram platform for several years.

Overall, this 2014 has been a great rig, with the turbo actuator repair being the most serious, annoying, and expensive failure, which was not covered under warranty. Few vehicles are flawless, and I remain happy driving and owning this Ram.

The following are components or systems that appear to be wearing slowly, have already outperformed previous baselines, and a few of my vehicle/mechanical sympathy practices.

PHOTOS FROM THE 2024 TDR CALENDAR CONTEST



Marina Del Ray



J Schuh

Brakes

This pickup has yet to need any brake work, which is not surprising because my driving style is intentionally easy on the brakes even though I am often hard on the go-pedal. As shared in previous columns, our 1996 F-350 *never* needed brake work during the 133,000 miles we owned it. The F-350 had a manual transmission but no exhaust brake, and I'm not a fan of unnecessary down-shifting.

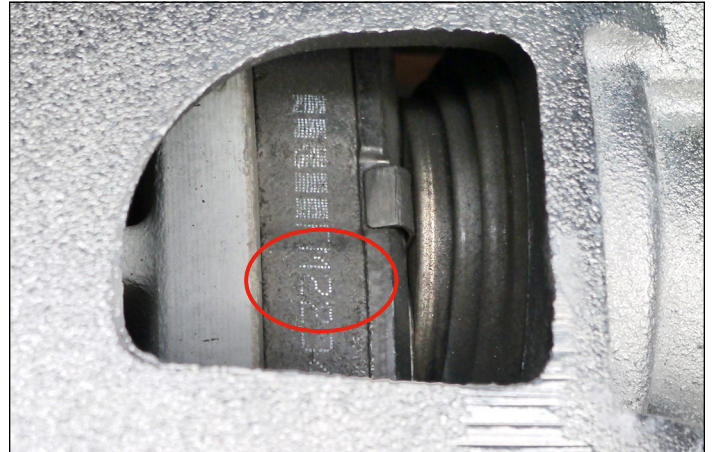


This is the front brake pad on my 1996 F-350 after 133,000 miles. Plenty of material remaining!

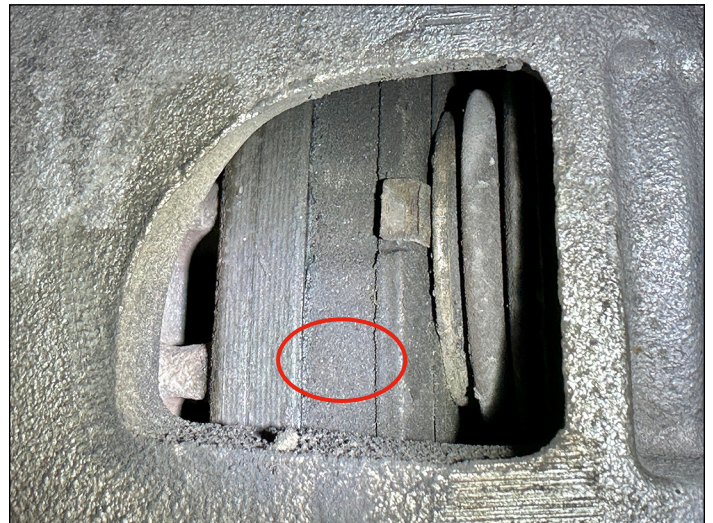
Making the brake friction material last has much to do with maintaining a long visual horizon when driving, releasing the accelerator sooner rather than later based on what is developing far ahead, not going directly to the service brakes, and benefiting from some coasting. I don't drive slow or impede traffic, in fact, I'm often one of the faster vehicles on the roads. But, I'm actually actively piloting the truck, being proactive not reactive, and routinely slowing without using the brakes. How many seconds ahead are you looking when driving?

The factory exhaust/turbo brake on the 2014 Ram makes light brake pedal use even easier, and on the manual transmission trucks the exhaust brake works to much lower mph and rpm. Recently I started using the exhaust brake on *full* instead of *auto*, which means it is controlled and activated by the accelerator instead of the brake pedal. This is my version of *one-pedal driving*, but in a diesel not an electric vehicle.

The pads on both the front and rear axles remain thick and meaty. Barring some kind of mechanical problem, sticking, or debris that causes uneven wear, I can see the stock pads going to 200,000 miles.



Brake pad thickness on this 2014 Ram 2500 when new.



Brake pad after 100,000 miles. It's a little thinner, but not much, and there's obviously tens of thousands of miles remaining.

Editor's note: James is very, very easy on the brakes. You would like riding in the passenger seat, very smooth. I can hardly see any evidence of wear.



I thought I'd add a picture of a worn-out brake pad. Yep, it is a front brake pad from the E30 race car that was discussed on page 9. Yep, the rotors in the background are cracked-out. I've learned a lot about brakes!

Clutch And Dual Mass Flywheel

Just being able to get down the road and roll through the gears does not equal proficient operation of a manual transmission. Limiting the amount of clutch slippage, particularly at higher rpm, can do much for preserving the friction material. Loading also affects wear, and trucks that are routinely operated at or above GVWR/GCWR will likely experience less longevity than those operated under light-duty conditions. Duty-cycle and drivers matter much, but the design and engineering of components can hurt or help as well.

*Just being able to get down the road
and roll through the gears does not equal
proficient operation of a manual transmission.*

At a mere 106,000 miles, my '96 Ford F-350 (Project Pull Dog) developed a noticeable knock, which could have been mistaken for a rod knock. That seemed unlikely, and some research indicated it may have been the factory dual-mass flywheel. It was.

The clutch assembly was replaced at 113,000 miles with an aftermarket traditional flywheel design. While hanging out with the mechanic and shooting photos for an article in the now defunct Power Stroke Registry, the technician noticed that there was minimal degradation of the friction material. It could have gone many, many more thousands of miles, at least double. Yet, I had to contend with the OEM dual-mass flywheel self destructing.

Preventing Premature Overdrive and Dual Mass Flywheel Failure

Shortly after buying my 2014 truck, I did much research on the G56 six-speed gearbox. I noted the maintenance and operation suggestions from those who seemed to know about using the G56 in severe-duty applications. This included guys using Ram/Cummins platforms for hotshot freight delivery. The result of my study was that I implemented two driving habits in an effort to increase durability and longevity of both the top overdrive gear, and the dual-mass flywheel.

The first technique I adopted was that I limit the load applied to sixth gear to 20-psi of boost. This is accomplished by either backing off the accelerator a little when climbing hills under load, or downshifting. The higher rpm in fifth/direct does create more engine heat, typically visible in the coolant and oil temperatures, but lower gears multiply torque and reduce *load*. *Load* is easy to measure if you have an EDGE CTS, it's one of the many gauges available, and is quite informative when combined with boost pressure and the EGT.

With the relatively high 3.42:1 final drive gearing combined with 35-inch-tall tires, there is plenty of highway speed available in fifth. Spinning the engine faster will generally use more fuel, but when it comes to climbing hills with loads, it's likely worth the extra diesel to avoid excessive drivetrain loading.

The second driving technique: After talking to a diesel mechanic about what happens when the Cummins is turned-off while the clutch is engaged, he confirmed that my idea of disengaging the clutch when stopping the engine might reduce unnecessary shock-loading of the dual-mass flywheel. So, I press the clutch pedal to the floor not only to start the engine, but also before shutdown. We shall see how long the factory clutch and flywheel lasts in the 2014 truck. My 2017 regular cab has a South Bend Clutch and regular flywheel installed (TDR 100), and it has half as many miles, so a durability comparison will take several years.



This South Bend Clutch and traditional flywheel in my 2017 Regular Cab will probably last longer than the factory dual-mass flywheel and my 2014 Crew Cab. Time will tell.

PHOTOS FROM THE 2024 TDR CALENDAR CONTEST



C Harlan

Parking Brake Use

Using the often-forgotten parking brake is part of my routine, which won't surprise the manual gearbox minority, but I intentionally use the parking brake in automatic transmission vehicles as well. It's not only that I use the parking brake as designed, I have a release technique that focuses on mechanical "sympathy," too.

Starting with my 2014 Crew Cab I stopped simply releasing the parking brake and letting it slam against its stop. There is substantial force involved, and one can hear it and feel it. Instead, I put my left foot on the pedal before pulling the release and damp the up-travel. It seems like a good idea and has become a routine, not a chore, but it might take another hundred thousand miles to see any possible benefit.

Duty-Cycle Considerations

Work trucks like to be loaded. While it is certainly possible to stress and abuse a vehicle, it is also possible to drive them too softly. One extreme example might be a one-mile daily drive to work, never getting systems up to operating temperature. Combine that with little to no long-distance drives, and many parts of traditional internal combustion vehicles will eventually be unhappy. **Editor's note: Especially a diesel-powered truck. Ours is not a grocery-getter. Duh!**

After buying the 2017 truck as a dedicated camper, the 2014 became a general purpose daily driver, and lives a fairly easy life compared to what modern diesel pickups are capable of handling. But I do not baby it, often accelerate briskly, and I think this may be why I see few active regenerations pop up on my Edge CTS.

During the first 40,000 miles, 75% were loaded to or above the GVWR with a Hallmark slide-in camper in the bed, plus all the other tools, bumpers, and recovery gear that I always carry. My wife and I are considering getting another travel trailer, maybe as soon as next year, if so the 2014 will likely handle the towing chore.



2014 Ram 2500 was loaded to or above the GVWR for 30,000 of the first 40,000 miles.

4WD Use

Engaging the front axle, frequently low-range, and driving off-road is something I do several times a month and countless times each year. It's difficult to accurately estimate how many dirt miles this truck has seen, but it is surely into the thousands. My guess is that at least 5,000 miles, or 5% of my use has been recreational off pavement travel.

While it is certainly possible to stress and abuse a vehicle, it is also possible to drive them too softly.

Would I Do The Same Modifications Again?

Likely yes. Partially because I have had the good fortune to purchase and upgrade several new four-wheel-drives, I am familiar with what I like and have a formula that works for me. Rarely have I disliked a newly installed accessory that I immediately removed it. The only example I can think of is aftermarket suspension on the front of my '96 F-350. The build-up of this Crew Cab has been documented in this "Still Plays With Trucks" column beginning since late 2014.

The Next 100,000

It is fun to write about reaching 100,000 miles, but as shared in my introduction it's a small accomplishment with a good modern vehicle. What will arguably be more interesting are problems or repairs needed (or not) moving towards 200,000 miles. Enjoy the journey with us here at the TDR.

Drive diesel and tell 'em you saw it in the TDR!

THANKS, DAD

I may not have become a photographer or journalist and likely would have followed different paths had it not been for the discipline, guidance, love, and lifelong tutelage from my dad, Lee Langan.

He was my personal editor for 25 years and so much more. I am eternally grateful and will miss him so.

Leon Verdin Langan
July 29, 1932 – August 20, 2023

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