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VOLUME 3 — ISSUE 5

PROJECT LBMC



PROJECT LONG BED MEGA CAB 53,000-MILE TEST REPORT

STORY AND PHOTOS
BY NATE KING

In October, 2008, we bought a 2007 Dodge Ram Mega Cab 3500, DRW, 4x4, 5.9-liter Laramie from a dealer in Wisconsin. It was a factory overstock with 92 miles on the odometer. The most desirable aspect of this truck to us was the engine.

It was one of the early model 2007 trucks that shipped with the 5.9-liter Cummins, rather than the EPA challenged 6.7-liter engine. It also had a bunch of other great features: leather, power everything, sunroof, satellite radio and the rest of the accoutrements you'd want in a \$55,000 truck.

The second best part of this deal was the sticker price—\$36,999. Who doesn't love a good deal? But the best was yet to come because this truck was the baseline for our Project LBMC (Long Bed Mega Cab).

In a week's time, we began to build our heavy-haulin', cross-country cruisin', hot-shot pullin', daily driven project truck. Since then, we've logged more than 53,000 miles on the odometer. Our goal was to build a great truck that would suit the needs of a light-duty transporter while at the same time be something fun enough to drive on the weekends without a load. As we built this truck, we put it through the paces. Almost all of these miles were "action miles." We hauled heavy payloads in the bed and pulled giant trailers, ranging from 15,000

to 24,000 lbs. We drifted the rear end around corners on dry asphalt and we spun the hell out of four, 16-ply commercial truck tires. We pushed this thing to its limits to find out what they are and this is our report.

LONG BED CONVERSION

The first order of business on Project LBMC was to get rid of that silly short bed. Seriously, Dodge, you give us a truck with a giant, spacious cab, a rock-solid diesel tractor engine, solid drive train, and what ... a short bed? Really? What are we supposed to do with that? Put our kids' bicycles in the back? Or maybe an ATV if we leave the tailgate down? We need an 8-foot bed to haul motorcycles, ATVs and plywood. And especially to pull a 5th wheel or gooseneck trailer. Crunched cab corners tend to be a real eye sore.

We took the Mega Cab to Precision Bodyline in North Salt Lake, Utah, where they have performed more than 120 long bed Mega Cab conversions. They cut, lengthened and reinforced the frame, moved the rear axle back 20 inches, lengthened brake lines, exhaust, the driveline, wiring and installed a Dodge factory long bed. Precision also installed a Pop-Up 30,000-pound rated gooseneck hitch, a set of AirLift Load Lifter 5000 air bags, and finally, a WirelessAir compressor and wireless remote



control to regulate and adjust the airbags.

We are very happy with the long bed conversion on this truck. This is definitely our favorite upgrade. The long wheelbase of the LBMC is excellent for hauling heavy loads in the bed and pulling heavy trailers. It rides more smoothly than stock and with much more stability. When towing large gooseneck trailers down the highway at night, it's easy to forget they're behind you when you don't see them in the daylight. All of the welds and finish on the frame are in great shape. No cracks, indications of stress or sagging are present on the frame or body.

EXHAUST AND STEERING

For exhaust, we installed BD Diesel Performance's X-Hale stainless steel dual exhaust system. This turbo-back system is a high quality system that rivals anything we've ever installed on a truck to date. The 4-inch diameter tubing is mandrel bent 409 stainless steel with a polished 304 stainless steel muffler (straight-through design) and 5-inch exhaust tips.

The fit of the exhaust needed some

modification because BD doesn't offer a kit for the Long Bed Mega Cab, but the install was pretty straightforward once we acquired a 20-inch length of the same stainless to bridge the gap. The finish of the exhaust has held up well on the higher grade stainless tips and muffler. The stainless tubing shows some uniform rust on the finish, but no significant deterioration, which is to be expected after surviving a winter of nationwide travel on salt-covered roads. All hangers and brackets remain firmly in place as they should be. The exhaust allows the engine to breathe well and gives it a deep, soft bellow. We would choose this exhaust kit again for our next project truck.

Our steering was fairly sloppy after we added a set of steel hub adapters and 22.5-inch, 10-lug Alcoa rims with 255/75 R22.5 H-load rated tires. The added wheel weight and tire height (36.5 inches) proved to be a little much for the stock steering design. We added a BD SBS (Steering Box Stabilizer) to eliminate the road wander and wheel wobble we were experiencing. The SBS is basically a cross-brace that runs between the two main frame rails

(top) Our bone-stock Mega Cab shown here in its humble beginning.

(lower) Here's the exhaust tubing and tips after a long winter and 48,000 miles. Also, note the effective use of an Amp Research Bed Step, PML diff cover and B&W Tow and Stow hitch.

where the steering gear is located. The brace has an integrated heavy bearing in it that surrounds the steering gear and holds it firmly between the frame rails. We also felt the need to dampen the steering by replacing the steering dampener with a dual steering dampener kit, which used the Skyjacker dual steering stabilizer bracket, but with two upgraded Bilstein steering shocks. After these upgrades, the steering feels nice and solid.

While we're talking about our heavy wheels and tires, we should mention that due to the higher un-sprung wheel weight, we experienced additional wheel hop. We remedied this problem with a Bilstein heavy-duty shock on each corner.



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PROJECT LBMC



EXHAUST BRAKE

With all this heavy towing, we needed some additional braking power, especially while towing heavy for those long downhill runs, such as Donner's Pass in the Sierra Nevadas or through the Appalachian Mountains in Pennsylvania.

We equipped the truck with a 4-inch diameter inline exhaust brake from BD. This brake is air actuated, driven by a compressor that hides inside the passenger fender well. It connects to the factory ECM, which will engage the brake when the truck is below operating temperature at idle, when the throttle is released when the truck is in motion, as well as in between shifts as the truck down shifts during deceleration. This brake is very effective.

The truck warms up quickly at idle

(top) The stainless dual exhaust system, shown from the rear axle, looking forward.

(middle left) When Precision Bodyline stretches the frame, they insert and weld a steel inner sleeve inside the frame, then reinforce the outside of the frame with an outer sleeve, shown here. They add 20 inches to the frame length.

(middle right) The SBS (Steering Box Stabilizer) was installed to brace the factory steering gear between the frame rails, which prevents excessive road wander and steering wobble.

and it provides solid braking power throughout the rpm range, due to BD's offset butterfly valve design. It actually seems to provide even better braking



(top) The Spek gauges we used have a 15 percent larger diameter face compared to a normal 2-1/16 inch gauge with a 280 needle sweep, so they're easy to read at a glance. They are also programmable with high and low set points, which allow them to control a variety of auxiliary items, such as a turbo timer, water-methanol or transmission cooler fan.

(bottom) The 4-inch remote-mount exhaust brake mounts cleanly under the truck, just above the transmission crossmember.

power at low rpm. Now those long downhill runs, where we'd usually have our heart pounding as we're timing the strategic use of our brakes, are kind of fun because we can simply take our foot

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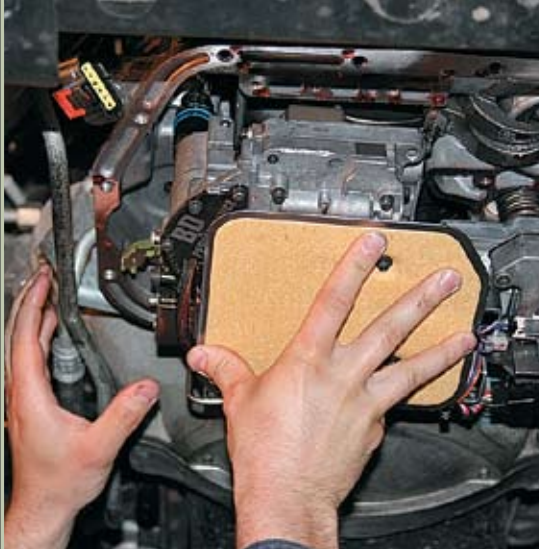
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off the throttle or set the cruise control to maintain a safe speed. The BD exhaust brake has been trouble-free except for an electric air pressure solenoid valve that had to be replaced due to water damage and corrosion.

There should have been a breather line in place from the valve up to the engine compartment that we failed to install when we put the brake in. This allowed water/debris to enter the valve and cause the failure. We also had to replace the sealing gaskets between the exhaust manifold and turbo exhaust housing due to the high amount of exhaust back pressure created by the brake when it's engaged. Even with the additional labor of changing the manifold gasket, this exhaust brake has proven itself worthy of the LBMC.

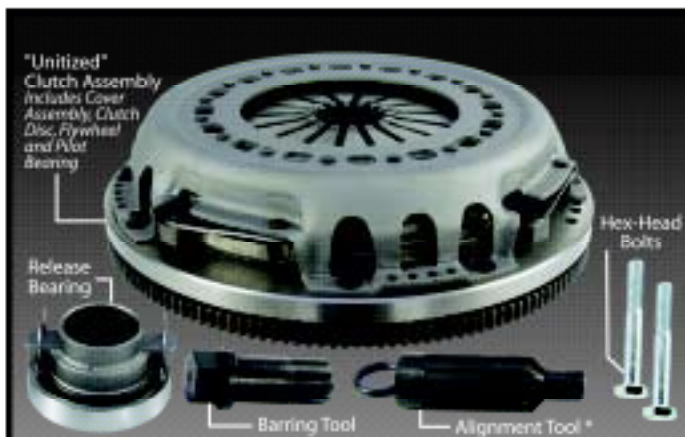
(left) The BD transmission valve body mechanically addresses issues such as "shuttle shift." It changes shift patterns, increases fluid pressure and provides tight, quick shifts.

(right) The upgraded flex plate is made of forged steel. It effectively transfers big torque to the torque converter. The stock flex plate would shatter.

TRANSMISSION

The transmission in the LBMC needed to be built for severe duty. So we chose a few products from BD's line of tranny upgrades to improve the stock tranny.

The first thing we did was replace the stock



The above "unitized" conventional non-self adjusting clutch set with solid flywheel is designed to replace the original equipment self adjusting clutch with dual mass flywheel. This design makes the clutch set easier to install because the disc is pre-aligned and the cover assembly is already bolted to the flywheel in one unitized package. The two included hex head bolts can be inserted in bolt holes on the engine side of the flywheel for lifting the assembly onto the input shaft of the transmission. The included barring tool is for rotating the flywheel via the starter ring gear teeth so that the flywheel-to-flex plate bolts can be inserted and tightened. The set comes with complete installation instructions.

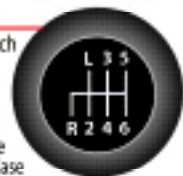
* The alignment tool should not be needed at all but is included just in case the cover assembly has to be unbolted from the flywheel. Unbolting the cover assembly is not recommended.

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TECH TIP

Please note that an MU52179-1SK clutch set is **ONLY** for trucks with the G56 transmission! An easy way to identify which transmission the truck has is to look at the pattern on the gear shifter knob. See illustration at right. Also, the G56 transmission uses an Aluminum Case where a NV5600 has a Cast Iron Case.



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(left) The smaller S300 turbo (top) is the same turbo used in BD's Super B single turbo setup. They change the compressor and turbine wheels for compound application. The larger S400 turbo (bottom) functions as the primary turbo, while the upper S300 acts as the secondary turbo in the compound. Both are shown here without the compressor housing (compressor wheels exposed).

(right) Our Cool-It Intercooler is 57 percent larger than stock with much more efficient air flow design.

valve body with BD's valve body. We eliminated shuttle shifting, increased line pressure and gained firmer shifts and better shift points. Next, we dumped our stock transmission pan and upgraded to BD's cast aluminum pan, which gave us more fluid capacity, which helps keep the fluid cooler. Then we removed the tranny and replaced the torque converter with a BD heavy-duty converter.

While the tranny was out, we swapped the stock flex plate for BD's heavy-duty forged steel flex plate. That concluded our transmission build, which was our biggest mistake to date on this project. With the power output LBMC would later have, we proved that the heavy dual Alcoa rear wheels were too much for the stock transmission output shaft. Under heavy fueling (around 550 rwhp) and aggressive acceleration, the output shaft snapped like a dry tree branch. It was necessary to replace the input, intermediate and output shafts with billet shafts. It would have been so much easier to do this in the beginning when we had the transmission out of the truck in the first place. The upgraded BD transmission was great. It had excellent torque converter lockup

Continued on page 48

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Continued from page 35
in all gears, with sharp, tight shifts. We noted increased fuel efficiency because the engine had a more positive, direct connection to the road through the transmission.

FUEL AND AIR

After the LBMC had a strong platform for power from the ground up, we upped the stakes by adding more fuel and air to the equation. The first step was installing

a set of Spek gauges so we could keep tabs on our engine vitals. Next were larger injectors. We chose 90 hp injector nozzles from Dynamite Diesel Performance in Monroe, WA. DDP uses extrude honing technology on their nozzles, which provides better fuel atomization than stock Bosch injectors, while still providing higher fuel volume. The 90 hp nozzles are not quite as fuel efficient as the company's 50 hp nozzles, but we need the added fuel to push the larger turbos.

After we added the injectors, we

had Industrial Injection in Salt Lake City, UT, modify our CP3 pump for a 30 percent fuel increase. They also added dual-feed line from the CP3 pump to the common fuel rail to keep up with rail pressure demand under heavy fueling.

Next came a high volume lift pump from BD. The Flow-Max pump provides a full 150 gallons per hour, replacing the need for the factory in-tank lift pump, which could not supply the CP3 with enough fuel.

After our fuel upgrades, it was time for a set of turbos that would compress enough air to utilize all that fuel. For this we chose BD's R700 compound turbo kit, which uses a combination of the Borg Warner S300 and S400 turbos with a unique combination of compressor wheels, turbines and housings that BD's engineers hand-picked for this application. This fuel and air combo will quickly and easily provide 60 psi boost pressure to the engine before the wastegate on the secondary turbo will open. Love is a strong word and shouldn't be used lightly. Having qualified this statement, we LOVE these turbos. With this fuel setup, they are easy to light, and clean up the smoke quickly, utilizing all of our available fuel, yet still keeping EGTs low. The power curve is very linear and smooth. When you roll on the throttle, it's like someone flipped the switch on a giant electric motor. Torque instantly hits the ground, you sink back in the seat, and the truck shoots forward until you take your foot off the throttle. Our favorite part about these turbos is the fact that after tens of thousands of miles, we haven't had to touch them. The fit on this kit is A1, top quality. This is refreshing when twin turbo kits typically have a reputation for being high maintenance and less reliable than single turbo applications. Not one loose bolt, no boost tube leaks and no exhaust leaks. Hats off to you on this R700 kit, BD.

INTERCOOLER

Shortly after we installed the compound turbo kit, we installed one of BD's larger Cool-It intercoolers. This intercooler is 57 percent larger than stock and has a 33 percent thicker core than stock. This increases our charge air cooling capacity by 20 percent, providing cooler, denser air to the engine.

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FUTURE MODS

We still have a few items on our Project LBMC to-do list. We'd like a bigger fuel tank to extend the distance between needed fuel stops. We'd like to stop a bit faster when we really need to. And we'd like to dramatically increase our fuel economy. The truck currently gets between 16 and 18 mpg when empty traveling on the highway at 70 to 75 mph. With a heavy payload (2,000 lbs), mileage drops to 12 to 13 mpg. When towing a 17,000-lb, 30-foot gooseneck with that is almost 13 feet tall, it will get between 6 and 12 mpg, depending on headwinds and tailwinds.

CONCLUSION

Project LBMC is a solid hauling machine. So far, it's taken what we've thrown at it in stride, completing tasks with relative ease and grace. However, if we had it to do all over again, we would consider changing at least one of these things:

Automatic transmission. Maybe. We would like to push this thing a little harder up the mountains while towing heavy (10,000 lbs. plus), but we're nervous about grenading the transmission overdrive with excessive pressure. We have enough power that the transmission won't shift out of overdrive unless we do it manually, which means we have to keep a close eye on our boost pressure to avoid exceeding that threshold where our overdrive will blow. We would consider purchasing a six-speed manual, which should take more abuse than the overdrive in an automatic.

Gears. Possibly. We may swap our axle gears to 4:10s to ease a little of that pressure on the overdrive. We'll let you know about this.

Under/Overdrive. Could be amazing. If we add an under/overdrive unit (auxiliary transmission), we will be adding another gear set which will allow us to run in third gear in the transmission (best for strength) and gear up to overdrive speeds through the auxiliary transmission. We'll look into these options and keep you posted. **DT**

If you have suggestions or ideas for Project LBMC, e-mail them to dteditor@dieseltechmagazine.com.

SOURCES:

BD Diesel Performance
www.dieselperformance.com
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www.longbedmegacab.com
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