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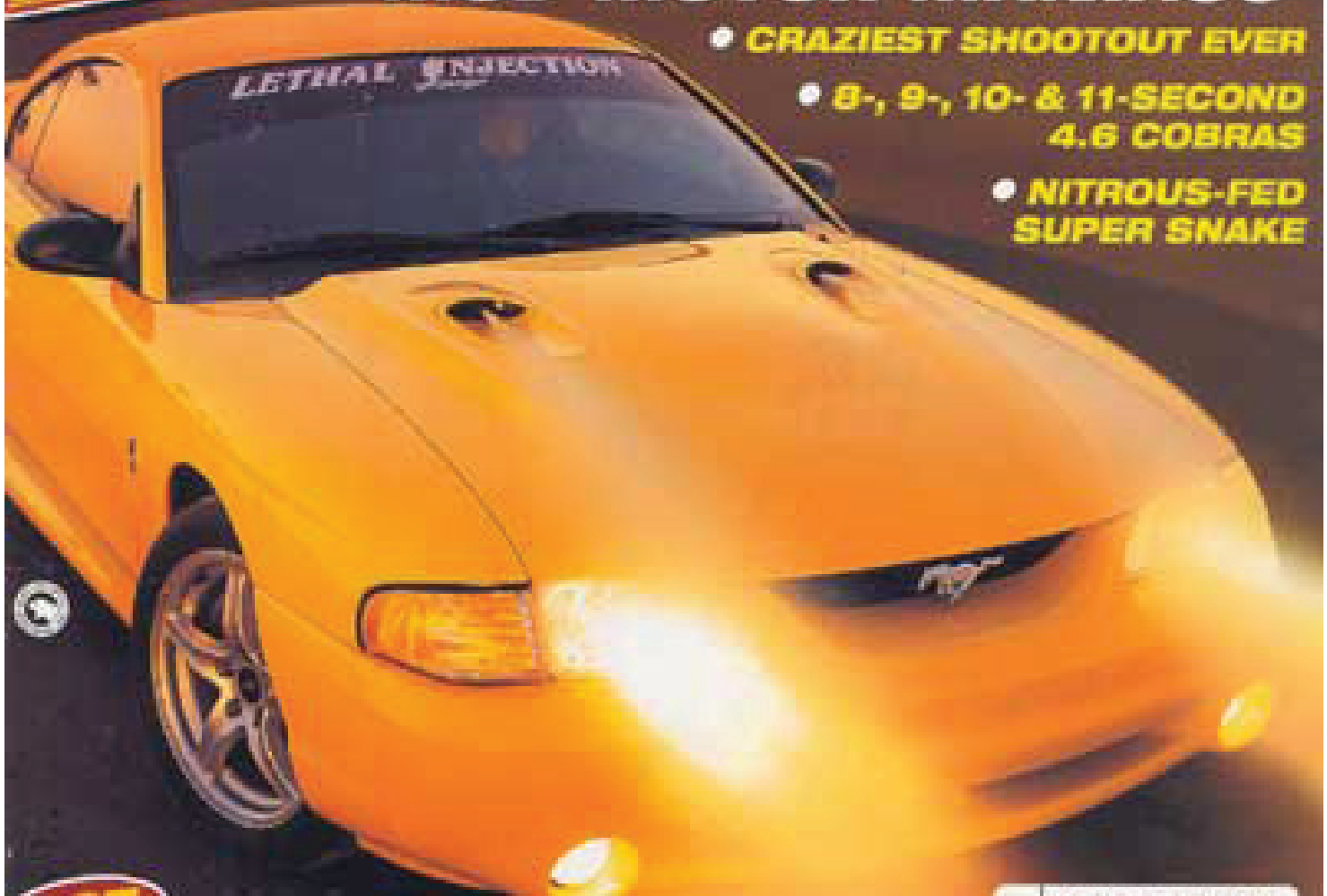

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PHOTO BY JIM CAMPISANO

Assistant tech editor John Hedenburg wheeled the Lighting to a best of 12.72 at 105 mph with our Precision Industries converter, Level 10 shift kit and M/T tires in place.

LIGHTNING FLASHES

Installing a Precision Industries converter and Level 10 shift kit equals low elapsed times for our '99 Lightning truck. And the M/T ET Streets didn't hurt, either.

BY EVAN J. SMITH
PHOTOGRAPHY BY THE AUTHOR

When confronted with the task of making our '99 Lightning truck accelerate quicker than stock, we knew there would be areas that could be improved and others that would have to be left alone. Today's vehicles are so advanced that simply tricking the EFI system won't prove beneficial in the performance game. Instead, performance enhancements must be cold and calculated. And, in addition, any changes (including chips, mass air meters, gear ratio, etc.) must be made with the entire list of aftermarket parts in mind. If not, you may end up with computer codes and/or an ill-running vehicle.

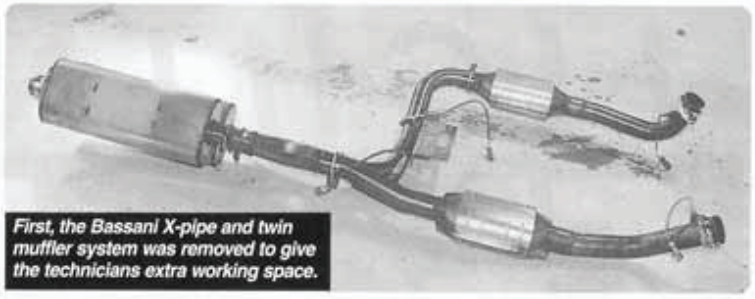
In stock trim, the Lightning 5.4 makes copious amounts of horsepower and torque, enough for our 4,700-lb. tester to run 13.30s in the quarter-mile. But, like other gearheads on the planet, we wanted more power and lower ETs. Quite frankly, we wanted 12s.

Now mind you, the pair of 13.37s that our truck produced had us thinking that 12s would be very, very easy. But if you recall, the 13.37s came on a day that was darn near perfect. The barometric pressure was high, the air temperature was cool, and, equally important to the brick of a truck, was the 10-15 mph tailwind. Additionally, the track had teeth and all the planets were aligned. What I'm saying is that the day was so good that it proved to be impossible for us to duplicate those numbers in stock trim—until now.

Not wanting to wait until November, we decided to modify the powertrain to

The Fridge was hoisted up on one the seven lifts at Level 10 and the 4R100 transmission was dropped out.

Our plan was to replace the stock 1200-rpm stall converter with a looser unit from Precision Industries. The PI converter stalls to 2400 and helped us drop four-tenths in ET.



First, the Bassani X-pipe and twin muffler system was removed to give the technicians extra working space.

Talk about a huge transmission. Gut this baby and you could live in it. Pat Barrett points out the input and output rpm sensors. These sensors tell the EEC computer the rpm of the input shaft and the output shaft, which helps dictate the performance of the transmission

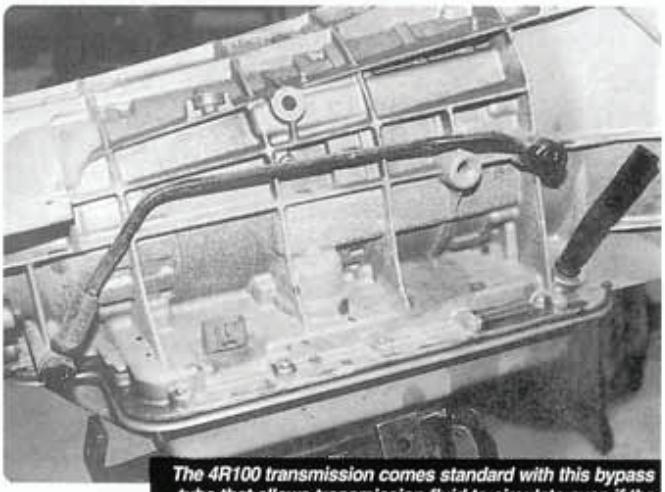
make more horsepower, while at the same time, learn to apply the power in a favorable fashion. We've accomplished this with a Superchips chip, a Pro-M meter, Cervini's Ram Air system and a complete Bassani exhaust. On the standard Goodyear F1 rubber we've run a best of 13.15 at 102 mph. Naturally, the engine was cool and the upper intake was treated with a bag of ice.

For this month's exercise we dug a little deeper into the heart of the truck and added a Precision Industries torque converter, Level 10 shift kit and Mickey Thompson ET Street tires mounted on a set of aluminum spare wheels from an Expedition.

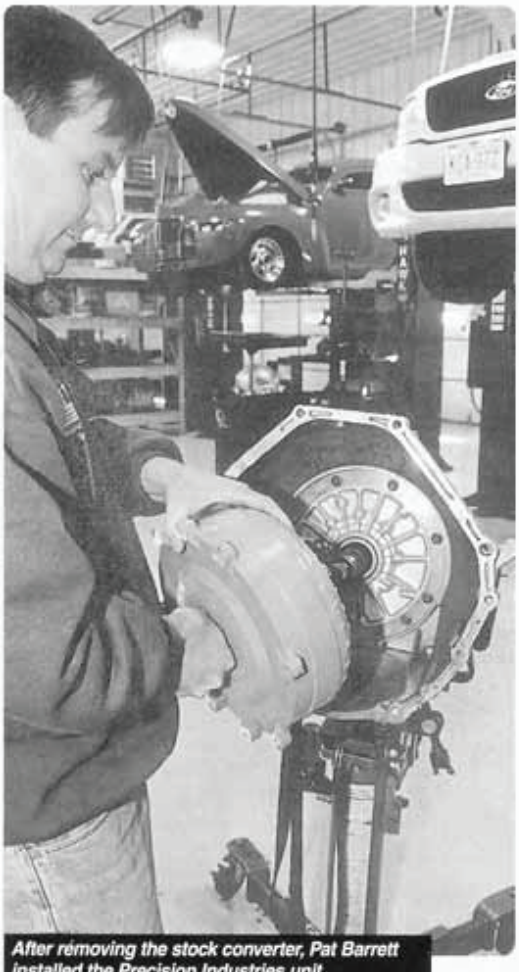
Pat Barrett of Level 10 and his crew were kind enough to install the converter and the shift kit. The Precision Industries converter features a

The stock torque converter is actually a pretty trick piece. According to Barrett, "The Lightning converter is designed with reinforcing plates to prevent ballooning." Apparently, ballooning was a problem caused by the high torque generated at low rpm by the supercharged 5.4.

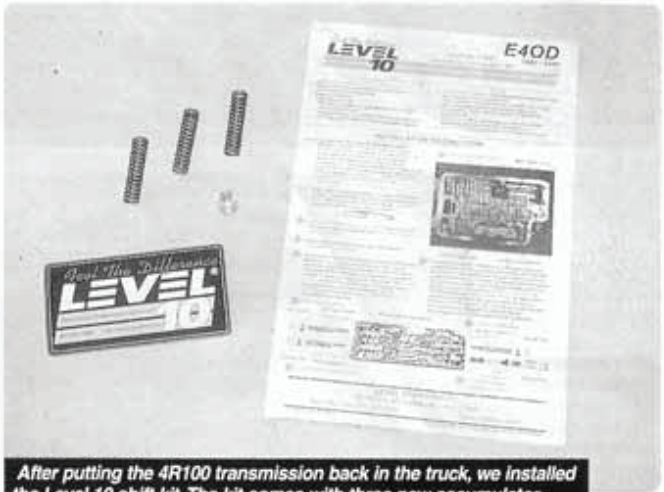
Three converters shown (from left) are the Precision Industries 10.5-inch, stock Lightning and stock F-150.



The 4R100 transmission comes standard with this bypass tube that allows transmission fluid to circulate even if the trans-cooling lines to the radiator become clogged.



After removing the stock converter, Pat Barrett installed the Precision Industries unit.



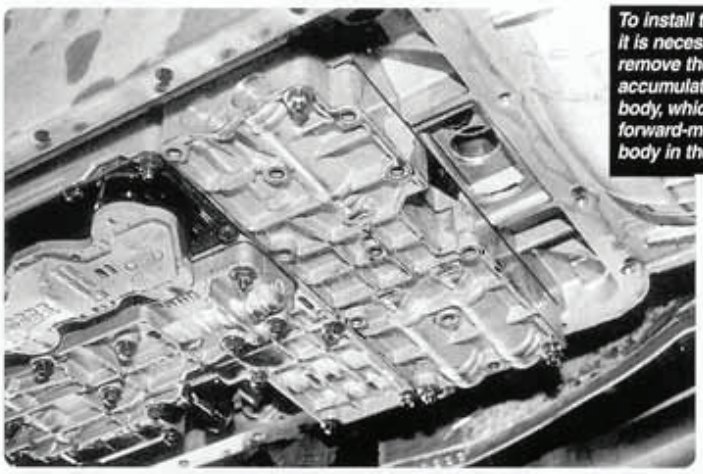
After putting the 4R100 transmission back in the truck, we installed the Level 10 shift kit. The kit comes with three new accumulator springs and a new line pressure modulator valve. Each kit also comes with a detailed and easy-to-read instruction sheet.

LIGHTNING
FLASHES

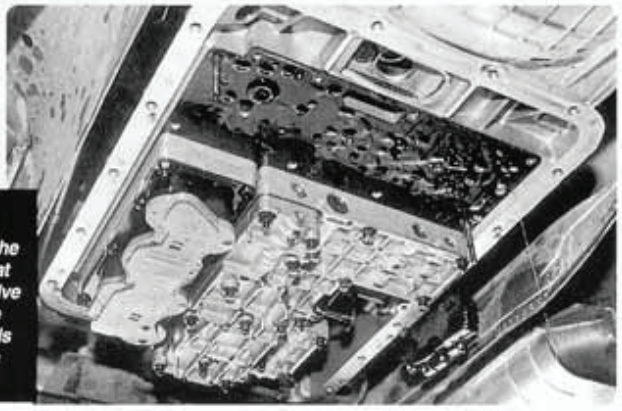
Once the transmission pan was removed we could access the transmission filter and the valve body.

Here is the transmission with the accumulator valve body removed.

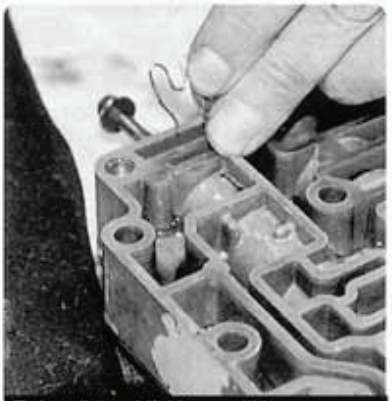
The line pressure modulator valve and housing (left) features a larger valve and will produce much firmer shifting than the stock one at right.



To install the kit, it is necessary to remove the accumulator valve body, which is the forward-most valve body in the 4R100.



We removed the accumulator valve body. What's left is the solenoid assembly at left and the main valve body at right. Notice the large heat shields on both sides of the transmission.

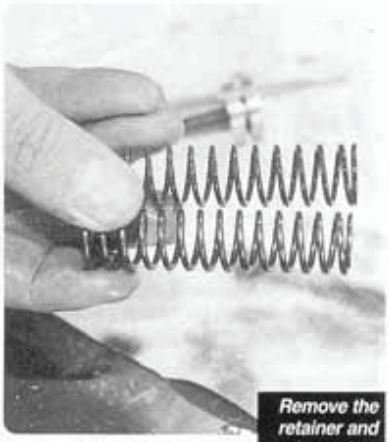


To install the shift kit you will have to partially disassemble the valve body. Begin by removing the spring clip that retains the line pressure module valve (refer to exploded view of valve body). Then discard the original valve and housing. Replace the housing with the new supplied valve and housing and replace the spring clip.

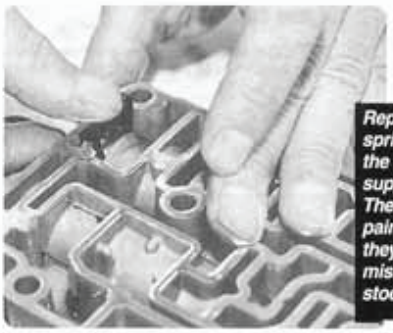
LIGHTNING FLASHES

Next, using a clip removal tool or simply a bent paper clip, remove the retaining spring for the second accumulator spring.

However, to maneuver the spring retainer into position, it may be necessary to screw in one of the valve body bolts to position the clip directly in the opening so you can access it.

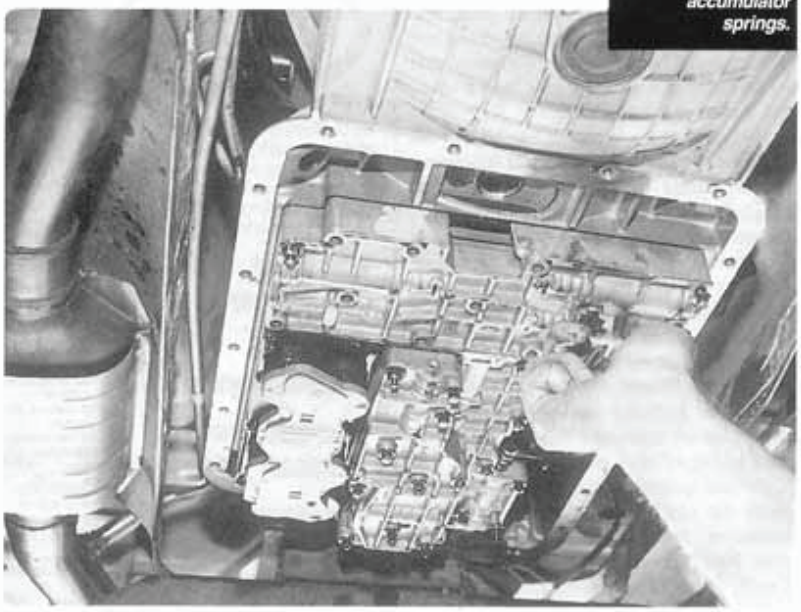


Remove the retainer and the spring.



Replace the stock spring with one of the heavier springs supplied in the kit. The new springs are painted orange so they can't be mistaken for the stock coils.

Install the new springs along with the retainer and pop in the retaining clip. Then repeat the process for the third and fourth accumulator springs.



stall speed that is about 1200 rpm higher than stock, which allows the engine to get up into the powerband quicker, and thus, allows the truck to accelerate faster. That's the concept, anyway.

According to Barrett, Ford Motor Company was posed with quite a challenge when they built the converter for the new Lightning. Barrett says high torque (440 lbs.-ft. stock) at low rpm causes converters to balloon, so Ford designed the Lightning converter with a special welded seam and also with additional reinforcing to prevent ballooning. The result is a converter that looks more like a racing unit than a stock OE torque converter.

Because of the low-rpm torque and the extreme weight of the truck, converter manufacturers have to be careful when building a converter for the Lightning. Generally speaking, a heavy vehicle needs a converter with low stall or else the engine will just rev and the vehicle won't move. On the other hand, high performance converters are often loose in order to let the engine rev quickly and get quickly into the powerband. Thankfully, the 5.4 mod monster in the Lighting makes great low-end power so the converter can still be pretty tight and it will still work well.

When powerbraking our Lightning (with the stock tires in place), the stock converter stalls to approximately 1200 rpm. Rev it higher and the tires will spin. Our new Precision converter is designed to stall between 2400-2600 rpm, and that should help quarter-mile ET.

Amazingly, the entire job, which included removing and replacing the mammoth 4R100 transmission and converter, took only about four hours. After swapping the stock converter for the Precision Industries unit, the transmission was back in the truck and Barrett removed the transmission pan so he could install the shift kit.

"Our shift kit for the Lightning will firm up the shifting based on throttle pressure," says Pat Barrett. "It calibrates the shifting of the 1-2 and the 3-4 upshifts by increasing line pressure and it takes the shifting from sluggish to performance oriented. The whole idea is to make the transmission shift firmly and quickly so it does not slip. Slip in

an automatic creates heat and that's what kills transmissions," he added.

Lighting owners who have already installed an aftermarket chip may have noticed increased shift firmness, but Barrett says the proper way to achieve better shifting is by modifying the valve body.

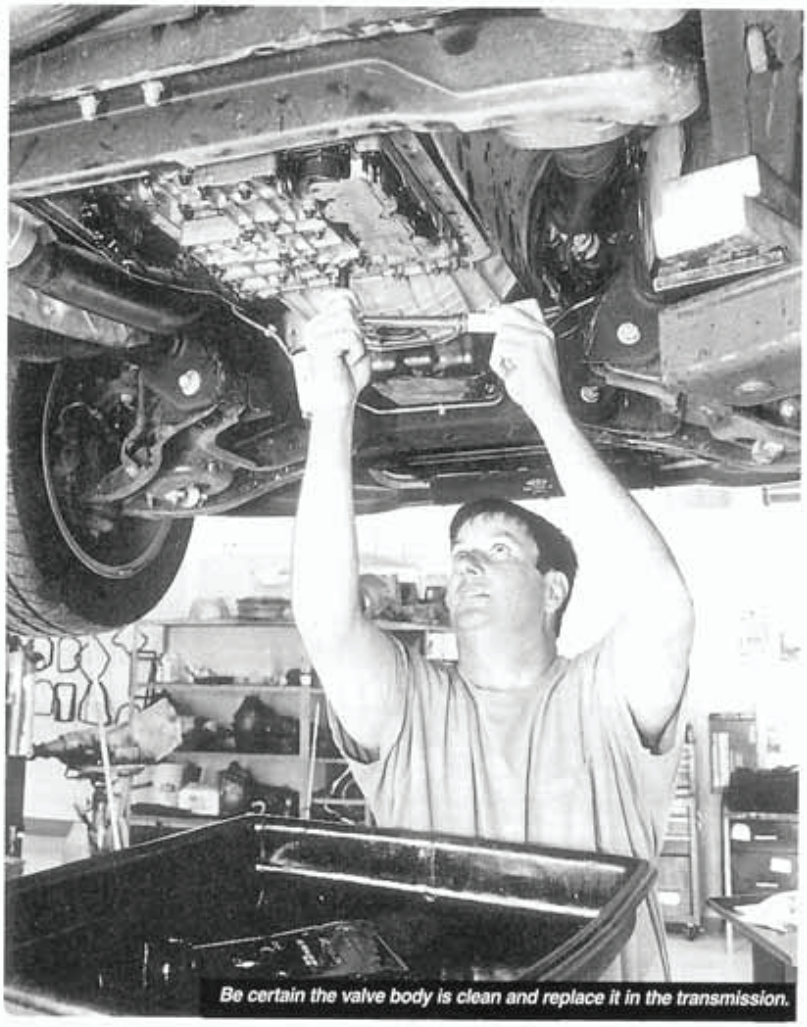
"A chip can tell the computer to increase the internal line pressure, but I would rather see it done mechanically," stated Barrett.

Once all the pieces were back in place, we journeyed to Raceway Park (Englishtown, N.J.) for the standard MM&FF test session. This included ice and the Mickey Thompson ET Street tires. For those interested in finding traction with a Lightning truck, we highly recommend a set of these tires. As for rims to mount them on, we used a set of wheels from an Expedition truck. But you'll have to find one (or two) with the aluminum spares. They measure 16x7 inches and work great with the M/T tires.

But wait. Before going any further we have to backtrack. To give the new parts an honest test, I couldn't just add a converter and slicks at the same time. How would we know whether the ET drop was due to the tires or the converter? So, a few days before swapping in the converter, we got down to E-Town and made a few laps with the M/T tires and the stock converter. With associate technical editor John Hedenburg mashing the gas, the Fridge recorded a best lap of 13.132 at 103.83 mph. Editor Campy knocked off a 13.16 at 103.23 and I jumped in for a run of 13.19 at 103.40.

With these baseline numbers set in stone, we got the converter and shift kit in place and returned to the track, bolted up the M/Ts and iced the intake. Once again, we had pretty good conditions, including track, weather and wind direction. And believe me, wind direction is something you learn to watch when you're running a 4,700-lb. vehicle that's the size of a wall.

Running in front of the Modular Army (on the same day we hosted the Modular Shootout elsewhere in this issue), I heated the tires, staging the fronts as shallow as I could. The coolant temperature gauge was just cracked off the cold position on the factory gauge, the revs were at 2000 rpm, and on green I planted the throttle to the stop. The Lighting ripped away, accelerating like it never had before. I could hear the tires fighting the track while the blower screamed as it sucked in atmosphere. Ahh, the atmosphere. The PI converter allowed the 5.4 to sail through the rev range and at (well, about) 5400 rpm it shifted into second with an instant snap. The revs never dropped below 4000 and the acceleration party continued. In third, I suspect the computer locked up the converter which pulled the engine down and slowed acceleration just a bit. Still, the big truck crossed the line in 12.773 seconds at 104.61 mph. The 60-foot was a mean 1.75, our best by .15 second.



Be certain the valve body is clean and replace it in the transmission.

After a one-hour rest, I backed the first run up with a 12.760 at 105.02 before turning the truck over to the lighter Jill Caliendo. Caliendo clicked off a let-me-get-to-know-the-truck 12.772 at 104.96, before laying down a quick 12.737 at 105.40 mph. On behalf of the Mod Army, Paul Svinicki then awarded her the #1 prize, a beautiful Hertz rent-a-car ice scraper in the shape of number one. After making her two runs, she flipped the keys to the waiting hands of Hedenburg. "Super Stock" John climbed aboard and on his first pass topped Caliendo's 12.73 with the quickest run of the day, a well executed 12.723 at 104.84 mph. Hot lapping, he backed it up with yet another 12.772 and then another 12.77 at 105.15, proving the Lighting can be quick and consistent.

Just to seal the deal, Hedenburg entered the Friday night gambler race at RP and by night's end our man was the Top Eliminator, winning over the 40 other racers in the class.

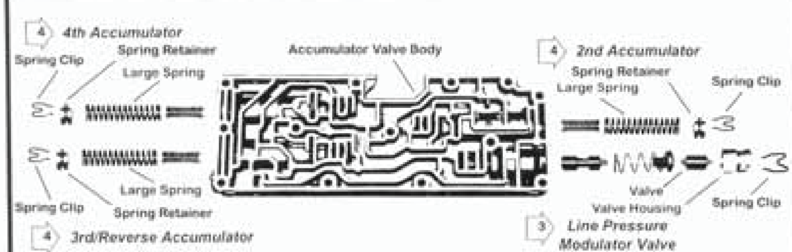
In conclusion, we've got to say the Precision Industries converter and the Level 10 shift kit work perfectly together, both on the street and on the track. We love the instant acceleration and the crisp shifts when the power is on. The combination is even better around town than we expected. Part-throttle shifts are firm, but not back breaking at all, and first to second upshifts with the pedal down will break the tires loose and lay a patch of rubber.

This we like.

Finish the job by cleaning out the pan and replacing it using the stock reusable gasket.

Using an inch-pound torque wrench, torque the valve body bolts to 80 in./lb.

Traction comes by way of Mickey Thompson ET Street tires measuring 26x10.5-inches. We had no computer/speed sensor problems with the short tires, despite what we've heard from other Lightning owners. In fact, Superchips says they can tailor a chip that is calibrated for the short tires if we have a problem. The tires helped us hook hard and run 60-foot times in the 1.70-1.80 range.



This is the exploded view of the accumulator valve body. By replacing the large (stock) accumulator springs with stiffer springs from Level 10, the transmission will shift firmer and firmer as throttle pressure is increased. With the kit installed our truck shifts smooth during part-throttle and crisp at wide-open throttle.

SOURCES

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