DOUBLE YOUR SHIFTING PLEASURE

Turn Your Turbo 400 into a Six-Speed With a Gear Vendors Unit

BY CHRIS RITTER

PHOTOGRAPHY BY THE AUTHOR
CHART PROVIDED BY GEAR VENDORS UNDER/OVERDRIVE

This age of spiraling gas prices has classic Pontiac owners searching for a way to drive their cars and not break the bank. Dennis Shearon loves cruising the boulevard in his drop-top '68 GTO, so cutting back on the quality time spent driving his Pontiac was not an option. With 3.42 gears in his Goat, relief in the form of an overdrive was in order.

Shearon decided to seek the advice of Bryan Blocker at Blocker's Performance and Restoration (Vilonia, Arkansas). After considering several options, Shearon did the math. You see, when he multiplied 2x3 he came up with a Gear Vendor's overdrive unit to install on his Turbo 400 transmission.

The lightweight, compact unit bolts directly to the back of the existing Turbo 400 transmission and allows each gear to be overdriven. Thus, a three-speed automatic can now become a six-speed.

This offers three major advantages to the classic Pontiac owner. One is the benefit of the 0.78 overdriven final gear, lowering highway rpm and allowing greater fuel economy. The second is allowing the use of higher numeric gears for better performance on the street and at the track. And the third is the ability to split the gears to provide close-ratio gear changes for improved acceleration.

Based in El Cajon, California, Gear Vendors has been supplying its overdrive devices for vehicles ranging from hot rods to motor homes. While not inexpensive (ours cost $2,395 for PN 3D0400FS), they are a proven alternative made to withstand the abuse of high-horsepower, high-torque engines.

Gear Vendors supplies a complete kit with concise and informative directions. There is also a toll-free tech line should you encounter problems.

The installation in the '68-'72 GTO is not a true bolt-on procedure, as you'll see in this article. Gear Vendors warns users up front that mounting the unit will require the installer to "massage" the floorpans around the transmission tunnel and shorten the driveshaft. Depending on the application, some changes might be needed on the transmission crossmember as well.

"Massage" means using a *big* hammer to round out the transmission tunnel from the front seat belt anchors forward to accommodate the unit. If you are reluctant to alter the originality of your car, this might not be the solution for you. The good news is, the section of the tunnel that is pounded out is concealed by the seats and console and is difficult to spot from inside the car. It looks mostly stock from the underside as well since the tunnel shape is only rounded out more.

Inside the car, you must mount the control head for the unit. This allows the driver to select the fully automatic overdrive that works like a modern four-speed automatic, or set the transmission to be manually shifted from one overdriven gear to the next. The latter is achieved via a floor-mounted switch just like the floor-mounted headlight dimmer switch, or you can add a shift button on your aftermarket shifter where the driver presses the button to make the shift.

The instructions for the kit are straightforward and complete. If an installer should have a problem, a tech line is available. Gear Vendors was helpful when we called regarding the proper installation of the speedometer plug.

We don't recommend this installation in the home garage. A lift and transmission jack make the job much easier. A good shop should be able to complete the job in four to six hours without any trouble. When they're done, you'll be cruising in style and going further than ever on your hard-earned gas dollars and enjoying the added performance of gear splitting.

The first step was to remove the existing speedometer cable and retaining bolt for the stock speedometer gear. Both will be discarded. The Gear Vendors kit supplies a plug to be used in the end of the speedometer gear housing, and it will be bolted back on to retain the transmission fluid.

Bryan Blocker of Blocker's Performance and Restoration then removed the transmission mounting bolts and raised the Turbo 400 with a transmission jack. Once the weight of the unit was off the crossmember, it was removed. For cars with a tight fit, the exhaust might need to be unbolted at the manifolds to allow room to remove the crossmember.

The six bolts that retain the stock transmission tailpiece are unbolted and the tailpiece is removed. Blocker recommends a few taps with a rubber mallet if it is stubborn and does not want to break loose. Be careful, since this is an aluminum housing and can be cracked or broken easily.

A new extension housing will take the place of the tailpiece that was removed. A large, rubber O-ring seals the new extension housing to the back of the transmission. Gear Vendors recommends lubricating the O-ring with some type of petroleum jelly. The company does not recommend any type of sealant when mounting the extension.

Blocker test fitted the extension to see how much the floorpans would need to be "massaged" to allow clearance for the Gear Vendors unit. The bolt holes would not line up even with the extension contacting the transmission tunnel.

A combination of a 2-pound sledge and a pneumatic hammer were employed to round out the floorpans from the seatbelt brace forward in the transmission tunnel. Blocker estimated the rounding to be as much as ½ inch at the brace end that tapered down to about ⅜ inch on the firewall end.

With the tunnel relieved, there was ample room for the extension section of the Gear Vendors overdrive. We lubricated the rear seal at this point so we didn't forget prior to installing the coupler shaft. Also, we tapped the extension lightly with a rubber mallet to be sure it was fully seated. The bolts to hold the original tailpiece on were reused to mount the extension. We used thread-locking compound on these bolts.

Blocker used a liberal amount of petroleum jelly on the seal and on the outside of the coupler shaft prior to sliding it onto the splines of the transmission output shaft. The lubrication is essential because the shaft will have to be pulled on and off several times while it is being shimmed for endplay.

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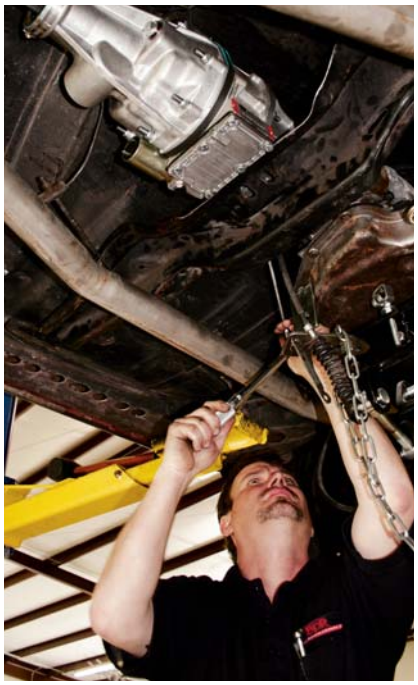
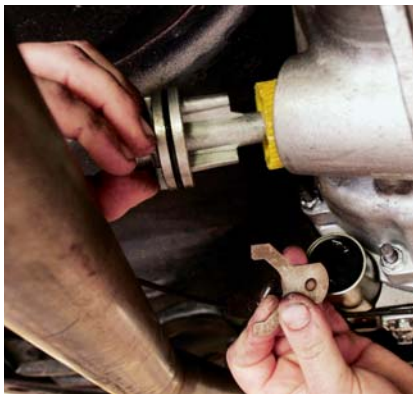
Once the extension is in place, the crossmember needs to be bolted back in and the transmission mount attached prior to checking the endplay of the coupler. Endplay should be between 0.005 and 0.035 inch. Blocker checked this per Gear Vendors' instructions, employing a machinist straight edge across the flange of the extension and using a feeler gauge.

The provided shims drop into the transmission side of the coupler shaft. Adding or removing these shims will allow us to achieve the proper endplay. Not setting the endplay can result in the overdrive engaging by itself and could damage the unit.



With the extension and coupler in place, we're ready to bolt up the main OD assembly. Blocker decided to reinstall the transmission crossmember per the Gear Vendors instructions prior to bolting the assembly into place. On our GTO, this meant flipping the crossmember around and installing it backward. A hole must be drilled for the emergency brake cable in the configuration.

A supplied gasket is used between the assembly and the extension housing. Blocker also trimmed the ends of two bolts on the top of the assembly to offer a bit more clearance between it and the seatbelt brace.

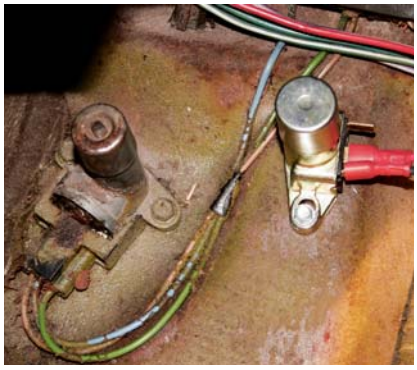


The new speedometer gear is installed on the OD assembly, with proper lubrication applied. It's held in place with the provided fork and bolt. Another benefit is that now your speedometer will be correct even if it was in error before as the Gear Vendor units are shipped for your tire size and rear gear ratio.

The stock speedometer cable is mated to a signal generation unit. This feeds information back to the overdrive's main controller regarding speed and shift points. An additional speedometer extension is then connected to the new speedometer gear assembly in the overdrive.

With the basic mechanical installation done, Blocker turned his attention to the electrical portion. His first step was to mount the head unit, which allows the driver to select whether he wants an automatic overdrive or if he will control it via (in this installation) the manual floor switch. The head unit was attached using Velcro fasteners to avoid marring an original GTO dash.

Next up was the main controller box. Blocker connected the color-coded wiring prior to mounting the unit under the dash with sheet-metal screws. He located a brace under the steering column to attach the unit and keep it out of sight.



After peeling back the carpet, the floor-mounted manual control switch was mounted. Blocker elected to put it higher and inboard of the stock lighting dimmer switch. He felt there would be less chance of the driver accidentally tripping the overdrive switch instead of the high beams in that position.

Next was to pull the wires to their various destinations. The stock wiring route through a rubber grommet on the driver-side firewall was the path for wires that had to be connected at the overdrive.

With the wires pulled through, it was time to go under the car again. Gear Vendors made this part of the installation virtually idiotproof with one-way connectors and color-coded wires. We connected the wires to the overdrive solenoid…

…and to the signal generators. The excess wire was pulled back to the controller unit and tied out of sight under the dash.

It was now time to fill the overdrive with the recommended fluid. The fill plug was located opposite the speedometer gear housing. Gear Vendors recommends using GM 12346190 or Mopar 04874459 synthetic gear oil. GM 1052271 petroleum-based gear oil is allowed but will result in a firmer shift.

SOURCES

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The addition of the Gear Vendors overdrive unit requires the shortening of the driveshaft. Blocker elected to wait until it was installed to take his measurements for cutting the shaft. Once the shop returned the shortened unit, all that was left to do was bolt it in, run the car for five minutes to ensure proper lubrication, and take it for its first gas-saving cruise.

FINAL DRIVE RATIOS

Gear	Trans Ratio	Axle Ratio						
		4.88	4.56	4.10	3.73	3.55	3.42	3.08
1st	2.48	12.10	11.31	10.17	9.25	8.95	8.48	7.64
Over	1.93	9.44	8.82	7.93	7.22	6.98	6.60	5.96
2nd	1.48	7.22	6.75	6.07	5.52	5.40	5.06	4.56
Over	1.15	5.63	5.27	4.73	4.31	4.20	3.95	3.56
3rd	1.00	4.88	4.56	4.10	3.73	3.55	3.42	3.08
Over	0.78	3.81	3.56	3.20	2.91	2.77	2.67	2.40