



BACKFIRE

"Backfire" is a forum for corrections, clarifications, and further explanation. Yes, you're reading between the lines correctly. "Backfire" is a column where the editor gets to eat crow.

MR EDITOR – CAN YOU READ? G56 MANUAL TRANSMISSION WOES by Joe Donnelly

Mr. Editor, thank you for bringing to my attention a recent thread on the TDR website forum concerning the G56 six-speed manual transmission used in '05 and newer trucks. I had followed the thread, but didn't contribute to it since my recent article in Issue 71 already gave my thoughts on the issues covered in the thread. However, these issues are important to the TDR members, and perhaps you did not search deeply enough in the article to discover them. Otherwise, you would not have asked for my response—again.

Let's take this opportunity to summarize the problems with the G56 transmission described by members who have them in their '05 and newer Turbo Diesels. I will also outline solutions, or partial solutions to them.

Justin Blackwell has a '06 Ram 2500, 4x4 truck. At around 25,000 miles, he added a programmer, which was later swapped out to the Smarty power-adder program. The South Bend OFE conversion single-mass flywheel and clutch was added at 27,000 miles. At 100,800 miles, his G56 started having a bad tick/rattle in the gears. He has owned the truck since new and changed the transmission lube at 25,000 mile intervals with ATF+4 (the factory recommended lubricant). His truck has about 10,000 towing miles, with about 1,500 of those miles being at 26,000# to 30,000# gross weight. Almost all of those heavily loaded miles were in fifth gear. The details he provided showed that he had not abused the transmission with such modifications as a high torque management setting on the programmer, or by clutchless shifting. His usage seemed pretty typical, possibly excluding the small amount of heavy towing. Maintenance by changing the lube was good. Standard Transmission in Fort Worth, Texas, told him that teeth were broken off of third, fourth, and sixth gears, and the transmission needed a new bearing kit. After the rebuild, Justin reported that the transmission shifted very well. He installed coolers at the PTO locations and added nine quarts of Amsoil.

Another TDR member, "Okie-Go," has a '06 Turbo Diesel 3500. He reported that his G56 transmission started howling at 213,000 miles. He took it to nearby Blumenthals in Oklahoma City. The bearings and one of the synchronizers in the G56 were bad.

Another member, CKelley1, reported that overfilling the G56 by one quart is essential. He feels that the dual mass flywheel

contributes to the G56's problems. He uses Pennzoil Synchronesh fluid because the ATF factory fill gets burnt easily. He often tows heavy loads (44,000 pounds gross combined weight). He also recommends transmission coolers and insulation wrap on the exhaust pipe near the transmission.

Eric Nafziger also has a '06 Turbo Diesel. He has a 3500 single rear wheel truck with TST and Smarty power adders as well as bigger injectors and twin turbochargers. His G56 failed at 103,000 miles, losing teeth off of fourth and sixth gears. Eric's analysis of the problem:

A large percentage of G56 equipped trucks are having failures not far past the 100,000 mile mark. Failures seem to be 3rd, 4th, and 6th gears, the front mainshaft bearing, and case cracking at the bellhousing. I understand that the heat treating of the gears is too hard, offering wear resistance and hardness, at the expense of toughness. The aluminum case flexes too much, allowing the mainshaft and countershaft to separate, resulting in poor gear mesh and high tooth loading. The stock dual-mass flywheels are known to fail prematurely. The fix is to take it out and replace with a solid flywheel. ATF is different from a gear lube, and a GL-6 specification gear lube would be best.

From Member's correspondence on the web and my ramblings in Issue 71, let's see if there is a consensus. Previously I had written:

A fairly large number of sixth gear failures have occurred, and it may be that the mild 0.79 overdrive ratio causes more drivers to use sixth gear when towing heavy trailers, when direct drive (fifth gear) should be used. The dual mass flywheel has been problematic. . . Now, five years later we find that the South Bend clutch conversion (see Issue 68, p. 88) is a "standardized" replacement for the OEM dual mass flywheel and clutch. Performance of the G56 has been flawed, according to Charlie Jetton and Richard Poels of Standard Transmission & Gear in Fort Worth, Texas. In lighter duty and moderate towing, the G56 transmission has been adequate. Hot shotters and other owners who do very heavy towing have experienced failures.

The G56 transmission often came with too little lubricant, and further that automatic transmission fluid may not be suitable under some driving conditions. A slightly "heavier" lubricant is better at the elevated temperatures that the transmission may experience towing or at higher ambient temperatures. They recommend that lubricants successful in the NV5600 such as Pennzoil Synchronesh be used. My NV5600 did very well with Torco RTF (Issue 67, page 87) and it should be an excellent lubricant for the G56. [Torco

RTF has a GL6 rating.] Aluminum “grows” with heat at about three times the rate of cast iron, so endplay clearances can become excessive at high transmission temperatures. High ambient temperatures and heavy towing both increase transmission heat; the unit is “trapped” in a floor tunnel of the truck and gets limited airflow for cooling. Units run with the factory lube (ATF+4) often come in to Standard with browned bearings from lubricant degradation.”

The main drive bearing at the front of the case (the input shaft bearing) is prone to failure. If you hear a transmission noise, get it fixed immediately, before the main case is ruined. Virtually every G56 that comes in for rebuilding has large endplay on the input shaft. The rear bearings also can fail. The spot welded shifter forks [photo 71-17] may break at the weld; Standard re-welds them inside and outside. Due to case flex and “stretch” Standard often has to add 0.008” to 0.011” more shim to reduce endplay. The stock shim is generally 0.055” thick. In contrast, the cluster shaft usually takes the same shim, or at most 0.001” to 0.002” thicker shimming.

The folks at Standard Transmission often find evidence of misalignment of the mainshaft gears vs. the cluster gear, shown here on an input gear. [photo 71-18] Broken gear teeth can result [photo 71-19]. Wear patterns indicate that the teeth are spreading the transmission case, causing wobble in the input gear, and gear teeth are wearing closer to the edges of the teeth. Heavy loads then cause them to break.

The stock transmission case is two-piece, split crosswise just behind the shifter tower area [photo 71-20]. Inside, the front of the case can be seen to include supports for all internal components. [photo 71-21] The inside view of the rear housing shows corresponding bearing and shaft mounting supports. [photo 71-22] Owners have tried to repair cracked cases with poor success. This one was warped to 0.070” out of “square” by welding. [photo 71-23]

It appears that the transmission case is irreversibly spreading lengthwise more at the mainshaft (top) than at the cluster. The mainshaft being two-piece, with an input gear separate from the rest of the mainshaft, contributes to the forces spreading the case, and brings about the excessive endplay seen in the mainshaft and sloppy sideplay felt when wiggling an input shaft side to side. This is a “buckling” or “distortion” and not merely dimensional growth with heat, although that growth is no doubt involved also. I brought up the idea of building a “girdle,” possibly with “load bolts” to the top of the case, and Standard is looking into this modification in an effort to strengthen the G56 case which appears to be rather thin, inadequately reinforced at the top, and further weakened by being split cross-wise.

In summary, the G56 has proved itself as a fairly good transmission but several “upgrades” are worth considering: more and better lubricant, preventive teardown and rebuild before catastrophic failure, downshift to avoid heavy towing at low rpm, and change the clutch periodically, making sure to replace the pilot bearing as well. This transmission does not seem well suited to heavy towing, beyond manufacturer’s recommendations.

In summary, the major points in the website forum thread were already presented in the magazine. That is why I didn’t contribute to the thread. However, the thread does serve to put all G56 owners on notice. The problems with this transmission are fairly wide-spread. At a minimum, owners are well advised to avoid the browned and failed bearing problems with a better lubricant, and an extra quart of it. I continue to prefer Torco RTF, GL6 rated, and use it in all my manual transmissions, whether NV4500, NV5600, Richmond Super T10, or Jerico racing transmission. I have seen no evidence that the additive package attacks soft metals such as brass because of the more modern components compared to older additive packages that brought that “reputation” to GL6 rated lubricants. As I did with my NV5600, I feel that G56 transmissions should be checked out by an experienced company such as Standard Transmission when the mileage gets around 100,000.

The owner could save a lot of money compared to waiting until failure occurs. From TDR members’ experiences, it seems that failures are more likely and widespread with the G56, and at lower mileage, compared to the NV5600. Trans Coolers such as those offered by Geno’s Garage (mine are shown in Issue 61, page 99, and in Issue 67, page 84), and possibly wrapping the exhaust pipe with insulation are also worth considering, especially in hot climates and heavy towing. I hope other TDR members can benefit from the information in the magazine and on the forum to avoid G56 problems. I also hope Dodge introduces manual transmission improvements in the near future (and doesn’t simply drop manual six-speeds from the product line-up!).

Joe Donnelly
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