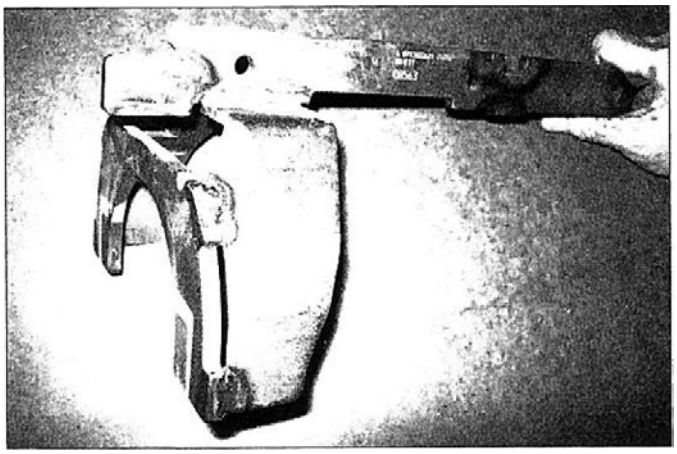
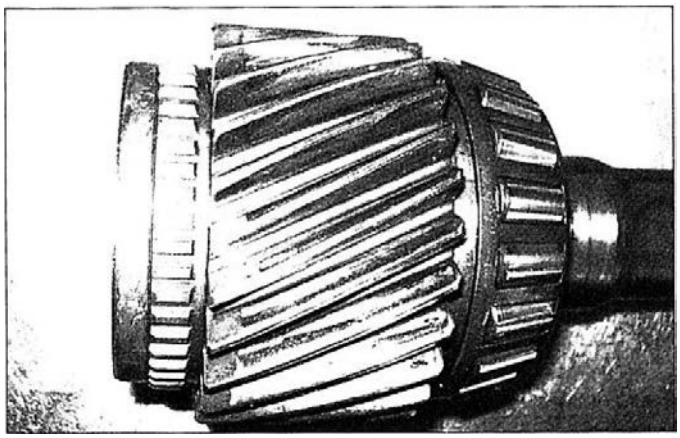
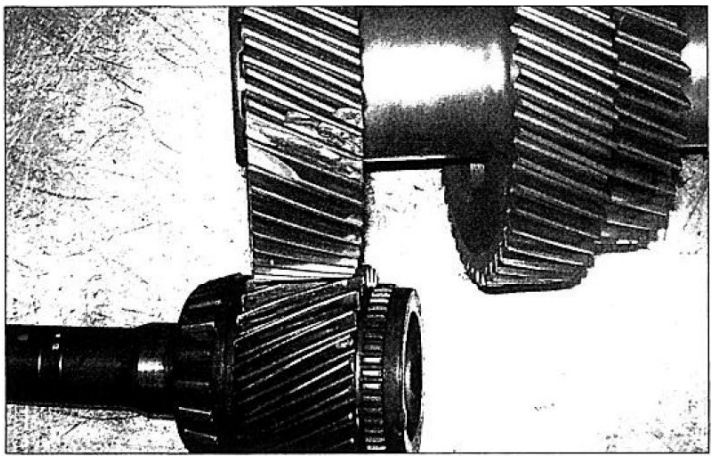


(71-17) **Heavy stamped steel shift fork with welds that are prone to failure.**

Standard often finds evidence of misalignment of the mainshaft gears versus 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.

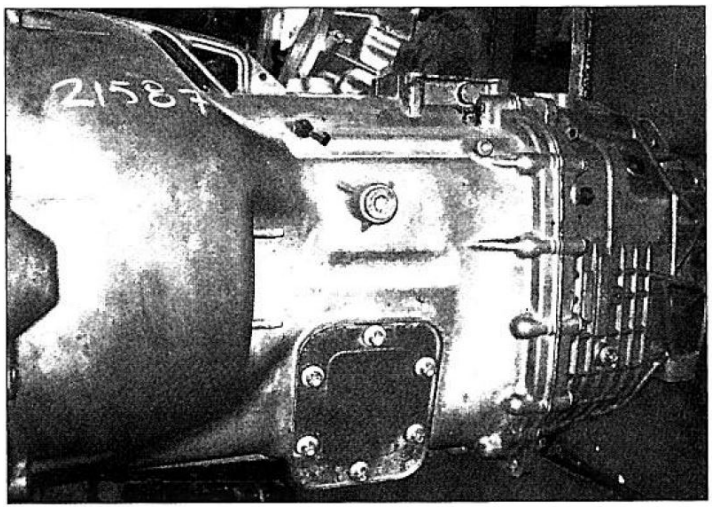


(71-18) **Input with wear indicating misalignment of gears**

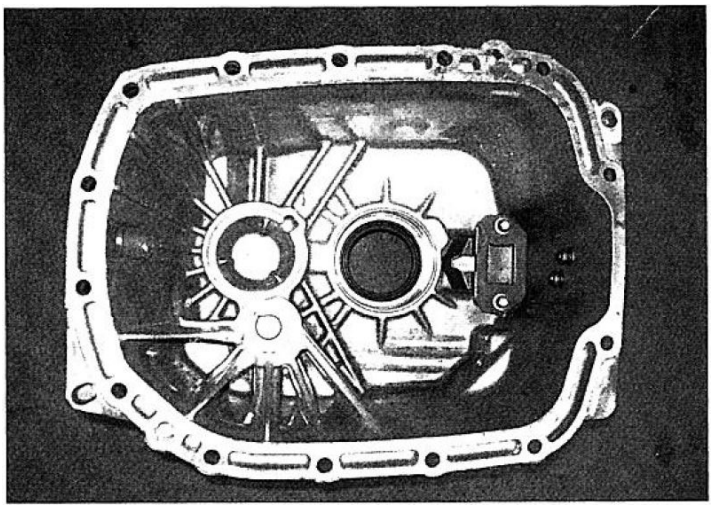


(71-19) **Input and cluster with broken teeth caused by poor alignment and heavy loading.**

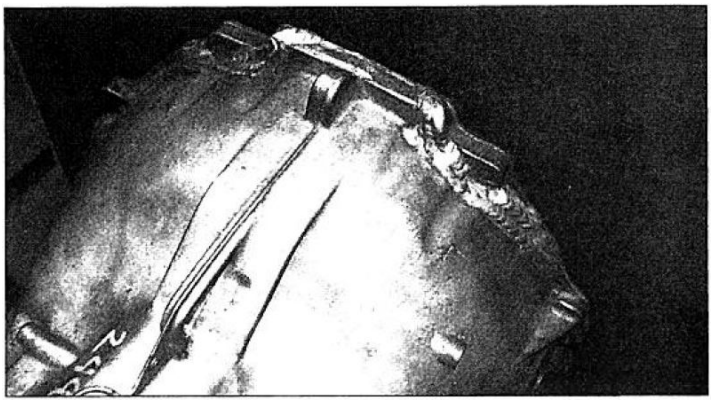
The stock transmission case is two-piece, split crosswise just behind the shifter tower area (photo 71-20). Inside, the front of the case can be seen to include supports for all internal components. The inside view of the rear housing shows corresponding bearing and shaft mounting supports (photo 71-22). 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).



(71-20) **G56 two-piece transmission case.**

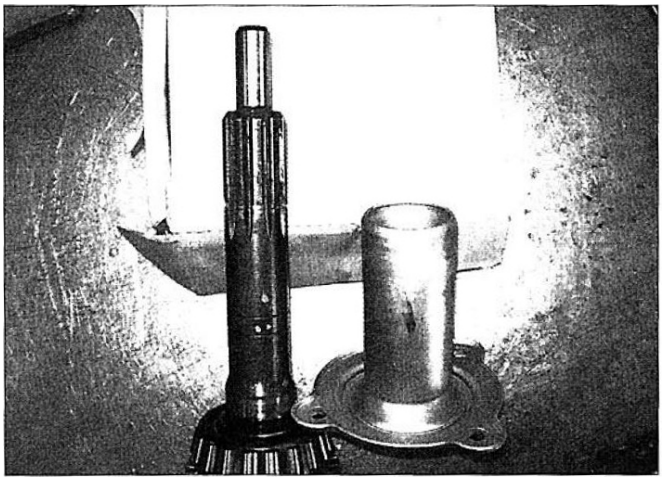


(71-22) **Rear half of G56 case viewed from the split at mid-case.**

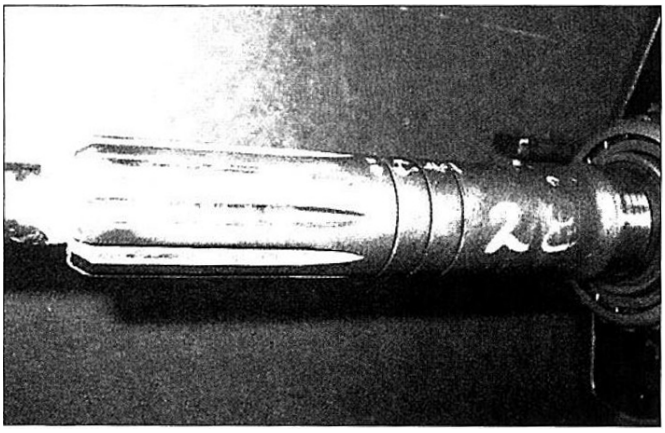


(71-23) **Welded but distorted G56 case at bell housing area.**

The six-speed manual transmission for the Turbo Diesel was changed by Dodge from the New Venture 5600 that had been used since 1999 until late in the 2005 model year, to a Mercedes Benz unit, the G56. The G56, as we are now aware, is an aluminum cased six-speed with integral bell housing, and a new (for Dodge) design dual-mass flywheel. The Chrysler noise/vibration/harshness engineering group wanted to ''elevate the customer experience" with the change in flywheel design. The G56 shifts easier and smoother, but reaching reverse seems easier with the NV5600 than the G56. Initially, the overdrive was not as steep (0.79 versus 0.73 for the NV5600) in the G56, but there was a change to an overdrive ratio of 0,74 in a new version of the G56 for the 6.7-liter Cummins (2007.5 year mode!). The early input shaft has two grooves, which can be seen by removing the front bearing retainer (a stamped steel part that costs $159) (photo 71-15). The late ratio input shaft has three grooves (photo 71-16). More reports of noise seem to be associated with the later design. 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.



(71-15) **Early G56 input gear (0.79 overdrive ratio) and front bearing retainer.**



(71-16) **Late G56 input (0.74 overdrive).**

The dual mass flywheel has been problematic. At the time Dodge introduced it, Peter Pyfer of South Bend Clutch described issues with the Duramax version of Luk's dual mass flywheel, and the scope and limitations of the concept (Issue 53, page 98). Specifically, the Luk design experienced some failures and was strengthened, but he felt the Dodge version was similar to the Duramax and "the problem was, and still is, not resolved."

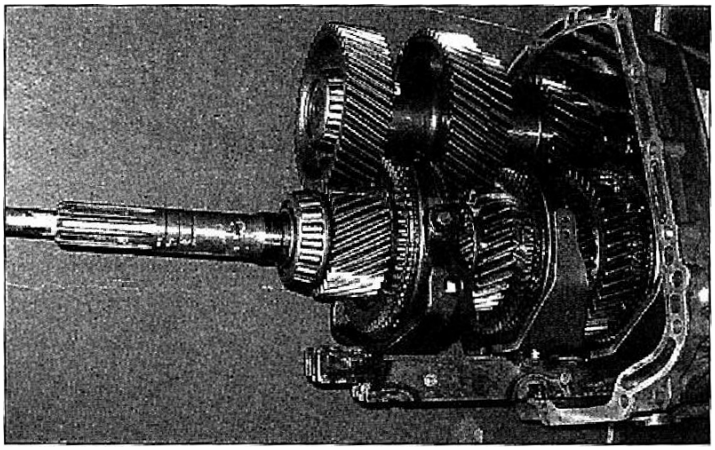
Now, five years later we find that the South Bend clutch conversion (see Issue 68, page 88) is a "standardized" replacement for the OEM dual mass flywheel and clutch. Performance of the G56 has been flawed, according to Charlie Jetton and Richard Poels of Standard Transmission and Gear in Fort Worth, 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 that are still not completely resolved. Conventional rebuilds help, but do not eliminate all problems for these owners.

Richard Poels of Standard Transmission explained that 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 Synchromesh, be used. My NV5600 did very well with Torco RTF (Issue 67, page 87) and it should be an excellent lubricant for the G56. 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) come in to Standard with browned bearings from lubricant degradation.

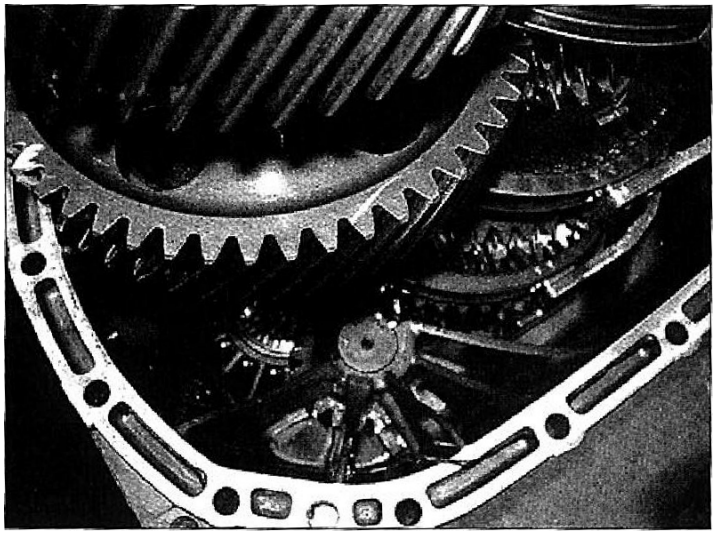
Richard Poels took me through the procedures for correctly rebuilding a G56 six-speed, aluminum-cased transmission. Standard Transmission stresses cleanliness and goes to extremes to ensure the parts and housing are clean. As with most manual transmissions, the gearbox does not have a filter, so any grit, metallic dust, or pieces will circulate and cause more damage. For clean-up, they use both solvent washers and a hot tank. They use a special assembly lube, with high pressure additives.

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.

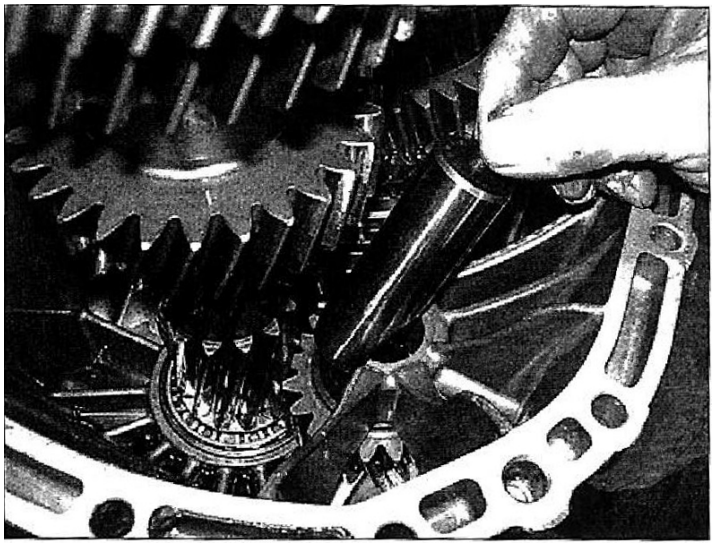
After splitting the case, the internal components remain in the rear case half (photo 71-24). A close-up view shows that the reverse idler gear prevents removal of the gear sets (photo 71-25). The secret to disassembly is to thread a metric bolt (M6 x 1.0 thread) into the end of the shaft, and remove the shaft (photo 71-26). Then, push the gear out of the way and separate the cluster and mainshaft (photo 71-27).



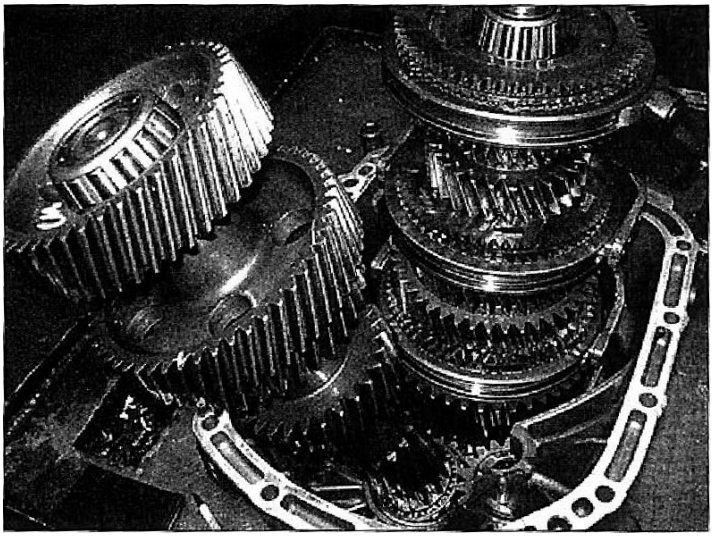
(71-24) **Rear half of the case with mainshaft and cluster assembles.**



(71-25) **Close up view of reverse idler gear in rear half of case.**

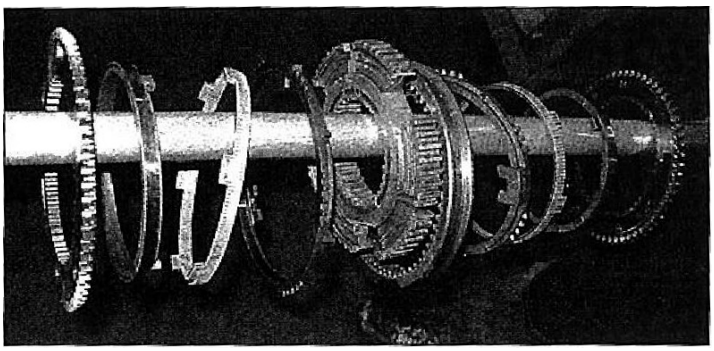


(71-26) **Removal of idler gear shaft.**



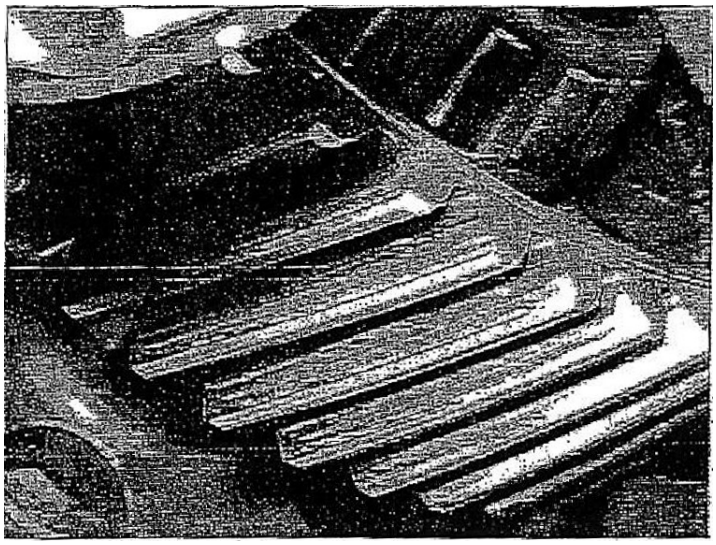
(71-27) **Separation of cluster and mainshaft assemblies after moving reverse idler gear out of the way.**

This transmission is a German design, but manufactured in Brazil. Currently, parts have to be purchased from Dodge at high prices. For example, each synchronizer assembly (photo 71-28) is a complete set for a pair of gears (1-2; 3-4; 5-6) and costs as much as $740, The input shaft/gear costs $750; the cluster gear, $1385; mainshaft, $474; sixth gear, $450.



(71-28) **Synchronizer assembly for one pair of gears (1.2, etc.)**

Standard has seen electrolytic pitting of gear teeth (photo 71-29) similar to that seen in automatic transmissions which also have aluminum cases. An extra ground strap as is sometimes added to automatics may be the cure for this issue. That damage is seen on the leading drive side and edge of cluster an main gear teeth, presumably from an electric field being generated.



(71-29) **Electrolytic pitting of gear teeth**

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 breaking or distortion andnot merely dimensional growth with heat, although that growth is no doubt involved also. I brought the idea of building a “girdle” possibly with load bolts to the top of the case, and Standard is looking into this midificaiton in an effort to strengthen the G56 case which appears to be rather thin. Inadequately reinforced at the top, and further weakened by 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, downshifting to avoid heavy towing at low RPM, and changing the clutch periodically, making sure to replace the pilot bearing as well. This transmission does not seem well suited to heavy towing beyond manufacturers recommendations.

Standard Transmission and Gear

1000 NE 29th Street

Forth Worth, TX 76106

1-800-STD-TRAN

Joe Donnelly, TDR Writer

Important Information for SDD clutches

RE: South Bend Dual Disc clutches for Dodge & Ford diesel pick-up trucks.

This notice is an attempt on our part to respond to some complaints we have had about our products. Our goal is to try to help our customers gain a better understanding of what goes on in their drive train when upgrades are introduced, and how some simple changes in driving habits can help.

When a gas engine runs, it has a smooth, uninterrupted rotation. When a diesel engine runs, the opposite is true. A diesel has a pulsation, which is caused by small, quick spikes in torque (4-8 times per revolution, depending on how many cylinders the engine has). This causes a vibration, most apparent at idle speeds, which needs to be dampened so that it is not transferred to the transmission, causing the gears to "clatter" and make noise.

When Dodge and Ford introduced the Dual Mass Flywheel (DMF) they successfully dampened the vibration. The DMF worked well when the engine ran at factory specifications, and when the towing limits were not exceeded. As soon as these trucks started being used beyond the OEM recommendations, problems started to occur.

Horsepower and torque upgrades, excessive towing loads and poor driving habits caused the DMF to wear out and eventually fail. Keep in mind that while it was wearing out, it was still dampening the vibration, until it failed completely.

Because it became increasingly more common to use these trucks beyond their limitations, we were impelled to come up with a clutch system that could, not only hold the extra torque, but would also provide a reasonable amount of dampening.

We succeeded in doing that. However, there are some distinct differences between how our system operates, compared to.the OEM design. In order to make a clutch withstand dramatic increases in torque and load, certain aspects of the system needed to be improved and strengthened. For example, the dampening springs in the clutch discs had to be stronger, or they would fail just like the DMF. Our original design was made too strong in that area, which caused some noise at idle. Our new hub design has eliminated that problem in most trucks, without sacrificing it's capacity for torque. Keep in mind that noise is not always caused by the clutch. The way that the engine runs, and the amount of wear in the transmission (and usually a combination of both) directly affect the likelihood of noise when the engine is idling.

Due to the fact that we have had a vast amount of experience with the late model G-56 transmissions, we have come to learn that the internal components (especially the aluminum case) are prone to wear. In order to reduce the risk of your system making -noise after your new clutch is installed, YOU MUST INSPECT THE TRANSMISSION.

A qualified transmission specialist needs to check the amount of play in your input shaft. Even a small amount of movement could indicate a problem, which will just get worse and could cause a catastrophic failure.

Occasionally, we hear people complain of noise while accelerating. This is where the bad driving habits come in. We have come to realize that some people (in order to conserve fuel) shift into the next gear too soon. If the transmission is in too high a gear, at a low wheel speed, it causes a lugging effect on the engine we have all experienced this if we were trying to shift into 2114 gear, but instead hit 4th). This lugging will cause a backlash in the splined hubs of the clutch discs, and can cause an unnecessary noise. This seems to be most apparent in late model, aluminum cased transmissions. The solution is simple. Keep the RPM's up while shifting. This will prolong the life of the entire drivetrain.

We try to explain to our customers that they may need to adapt to the new system. In other words, "you may need to change the way you drive". People don't like to hear that. Remember, even though you may not have had any noise before, the way you drove (along with your power upgrades and loads) definitely attributed to the short life of the DIME. You can't make dramatic changes in your truck, without realizing that you might need to make some changes in your behavior and your expectations.

We feel that the most important thing we can provide to our customers, is a clutch that drives nice, and lasts. We have done just that. We make every effort to improve our products as needs arise, and will continue to do so. We listen to our

customer's concerns and try to take them all into consideration. This is the reason that we have been able to provide the best clutch in the industry....hands down.

Keep calling. We want to hear from you.

Important information about all SBC 's G56 clutch assemblies

In 2005, Chrysler redesigned their 6-speed, manual transmission and clutch for the Dodge diesel pick-up trucks. Since the inception of the Mercedes built G56 trans and the LUK designed Dual Mass clutch system, Dodge owners have been experiencing problems at an alarming rate, especially if the power of the engine has been turned up, or the factory towing limitations are exceeded.

Noise, vibration and slippage are common an obvious symptoms of a system failure, resulting in the need for a new clutch.

However, many people do not realize that the transmission may be worn as well. Too often, the clutch is the only thing that is replaced or upgraded. It is important to note that a failed dual mass flywheel, and the vibration it creates, can also damage the transmission regardless of how many miles are on it.

Our new clutch design has significantly increased the longevity and the capacity of the system, but that advantage will not be realized if a worn transmission is installed behind it.

Overloading the drive-train can result in excessive wear of a transmission in relatively short amount of time. The aluminum casing of the G56 is prone to wear under, even, normal conditions. Excessive end-play or movement of the input shaft, caused by worn bearings or housings, is a very common and often overlooked problem. This can result in a variety of symptoms, such as noises, clutch release issues or pilot bearing failure.

** The installation of a worn transmission, which has not been thoroughly inspected by a qualified professional, will void any and all warranty on the clutch parts.

South Bend Ford/Dodge DD Installation Instructions

Torque Specifications:

Flywheel to crank 90-100 ft. lbs.

Pressure plate to flywheel is 45. lbs

Instructions:

Unbolt pressure plate from flywheel in a star pattern with quarter turns.

Check discs on input shaft for free movement before installation.

Bolt flywheel to crank with provided specs.

Line up paint marks on pressure plate, center plate, and flywheel.

Install discs according to sticker (located on disc) for correct hub direction.

Install pressure plate bolts in crossing pattern, one quarter turn at a time (do not use air powered for this step).

Refer to important Information Form (included) for more installation information.