



ROCK THAT BOX

HAVING TROUBLE JAMMING IT IN? THEN GET YOUR T56 UPGRADED BY ROCKLAND STANDARD GEAR FOR SOME BANGIN' GOOD TIMES.

By Vinnie the Hitman Illustration by George Trosley

When the gods above blessed us with the six-speed T56 gearbox, we were beyond words. Here was this slick-shifting internal-rail gearbox built like a brick poophouse that could handle immense amounts of torque without breaking a sweat and, best of all, it bolted right up to any Chevy engine. The LT1 owners soon discovered that 500 or more rear-wheel horsepower could course through the T56's veins with little-to-no consequence.

Not long after, traditional small-block enthusiasts began retrofitting these boxes into their older rides with incredible results. These gearboxes ultimately proved themselves durable on the street and bulletproof on the track.

Having seen the inner workings of a T56 firsthand, we can certainly understand why the T56 is such an incredible transmission, right out of the box. Ease of service, robust construction, and lightweight design all come together in what must be the best six-speed on the planet. If there

was anything we could wish for, it would be Fifth being a direct 1:1 ratio for a tighter ratio set between First through Fourth gears. But we're being a picker of nits at that point because, really, what is there not to love?

As time passed, T56s started showing up at transmission shops at rebuild time. Many technicians treated it like any other transmission, often forgetting key processes while reassembling it, never realizing how significant the little details could make the T56 better than it was new. For

instance, by blueprinting a T56 for minimal endplay, overall torque capacity can some-

times improve by as much as 40 percent. So when it came time for us to rebuild the T56 in one of our LS1 Camaro projects, we decided to go to Rockland Standard Gear.

Located in Sloatsburg, New York, Rockland Standard Gear is a company that specializes in all sorts of on- and off-road performance drivelines. From rock-smashing transfer cases in rugged four-wheel-drive trucks to American Le Mans race series transmissions, Rockland has been versed in racers' needs for many years. We knew that Rockland's experience would be overkill for our measly street-driven and occasionally strip-beaten Camaro, so we went with its Race Ready rebuild that ups the torque capacity of the factory T56 to a staggering 650 lb-ft of torque. As a point of reference, the T56s that were



TECH | ROCK THAT BOX

installed in the '93-02 Camaros and the '97-present Corvettes were/are factory rated anywhere from 400 to 450 lb-ft capacity.

As the vice president of the re-manufacturing division at Rockland Standard Gear, George Kreppein Jr. showed us all the tricks that he had up both of his sleeves and didn't hesitate to tell us what works and what doesn't. Case in point: He wholeheart-

edly recommends carbon-fiber OE synchronizers and billet synchro keys with a steel shift fork on the commonly weak 3-4 gearset, but finds no value in bronze fork pads. He explained that the nylon OEM-style fork pads work very well and that the metallic units just beat up and wear the slider grooves unnecessarily.

As for why T56s fail, Kreppein mentioned that the reasons are typ-

ically ... er ... typical. That is, it's not usually the transmission's fault but everything that it's surrounded by. As he related, "The biggest cause for failure on these T56s is lubrication, which is the cause of most of the damage we see. Not enough fluid and the bearings and synchros get burned out real quick. Then it's usually the clutch. Most racers put in a heavy aftermarket clutch with one



1 A rebuilt T56 is only as good as who screws it back together. Rather than cheap out on a backyard rebuild, we went straight to the source and had it done right at Rockland Standard Gear. Here, a freshly re-bop'd T56 awaits its new owner.



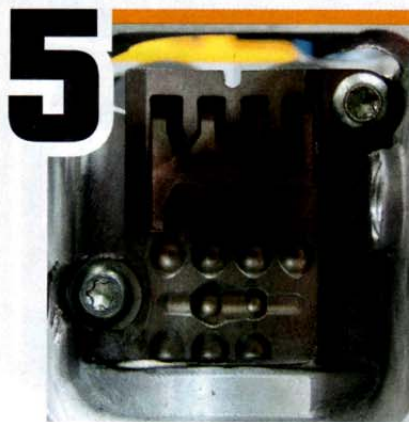
2 No transmission job is complete without a quality high-performance clutch. Considering the nature of our LS1-powered project car that has already run a best of 10.16 at 138 mph, we didn't want to skimp out. To meet our street/strip expectation, we relied on Zoom for one of its excellent clutch packages that includes a beefy Kevlar-lined disc and stout pressure plate covered in its trademark purple paint. The Kevlar clutch kit was coupled with a billet steel flywheel (same weight as stock) and a newer-style LS1 throwout bearing assembly for smooth actuation and incredible bite.



3 Our gearset was treated to a Super Finish polishing process. Compared to a stock gearset (left) it greatly reduces stress risers that can riddle the teeth and cause premature wear. In addition, it helps with lubrication and promotes quieter operation. This service sells for anywhere from \$250 to \$450, depending on the version of T56 that you have (Corvette or otherwise).



4 Using two circular magnets, a T56 is well protected against aquatic-borne materials that could wreak havoc on gears and synchronizers. T56s are one of the few transmissions in the world that boast such designs from the factory. We wiped everything down before assembly and chased every remaining particle down with a hand-held magnetic tool.



5 Located on top of the main case is the shift gate plate, which actually sits forward of a Camaro's shifter pad. Having this Super Finished by Rockland promotes slicker shifting and smoother gear change operation.



6 Here is an exploded view of our T56 before reassembly. As you can see, T56s rely on a bolt-on frontplate for easier serviceability and a rear tailhousing that houses the two overdrive gears (Fifth and Sixth) and of course, Reverse gear. Note that there are two shifter locations possible at the top of the T56. Camaros use the rear opening while Corvettes use the forward one and use a very short tailhousing.



or two discs and it beats up the synchros real fast.”

Kreppein warned us not to use a clutch disc setup that is much heavier than stock. If you think about it, it makes perfect sense. When rotational weight is added to the input shaft, it adds momentum and makes it harder for the synchronizer to slow down or speed up the gears inside to match them together as you reach for the

next cog. This will wear the synchros quicker and make your transmission rough shifting in short order. This issue is more common on C5 and C6 Corvettes because, unlike Camaros, they come with an incredibly long (read: heavy) input shaft extension, and the use of a multi-disc clutch just makes an already bad situation worse.

Lastly, Kreppein added, “The most uncommon cause for failure is driver

error by either missing a shift or going into the wrong gear. The mechanical failure rate on these T56s is so rare, it’s scary. You hardly see broken gears or hard parts. This transmission is one of the best engineered in the industry, and I’ve seen them all.”

A highly recommended option is a Super Finish micro polish for all the internals that help reduce operating temperatures and silken shift ac-

7



The very first order of business during initial assembly was to press the two bearings onto the countershaft to check endplay. This was accomplished by laying the countershaft onto the front cover, then bolting up the main housing. Here, we looked for 0.002-0.004 inch of clearance and shimmed accordingly.

8



Next up, we placed the rear auxiliary shaft into the rear of the main housing, then stacked on the tailhousing to check endplay.

9



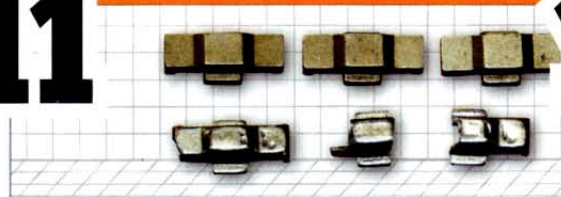
Because the auxiliary shaft connects to the countershaft, endplay is key as it sends torque to Fifth, Sixth, and Reverse gears. Here, we were looking for 0.005-0.006 inches and we were luckily spot-on with the first try.

10



To upgrade the weakest link (the 3-4 shift fork), we upgraded from the factory aluminum piece to Rockland Standard Gear’s steel unit (right). Rather than use bronze fork pads, like on the left, Kreppein installed new nylon pads because it makes the shifter quieter and reduces wear on the sliders. He added that bronze pads are more of a stopgap fix that never addresses the real issue, which is good synchronizer material and lubrication.

11



Our slider keys on the bottom were damaged, which is why our car grinded so much going into Third gear. These fingers are what place initial pressure on the synchronizer before your slider actually grabs the next gear. Obviously, the numerous powershifts we made took a toll on these stamped steel units, so we upgraded them with Rockland Standard Gear’s billet steel ones for improved strength and reliability.

12



For comparison, the unit on the right is the billet piece that has seen 15 weekends of track duty and it barely looks used. This upgrade is only necessary on the 3-4 slider assembly as these two gears take the most abuse.



TECH | ROCK THAT BOX

tion for an extra \$250 (prices vary up to \$450, depending on the application of your T56.) This process may add seven days to the turnaround time on your gearbox, but we think it's worth it.

Kreppin also emphatically recommends a good synthetic fluid to keep temps down, improve synchronizer action, and prevent foaming. Because Rockland has done so much

testing in road race environments, it has come up with its own line of synthetic transmission fluid branded as "Tranzilla." It is designed to work with Rockland's own line of transmissions, but will work perfectly fine with your existing gearbox.

So, we went with his fluid recommendation and heeded his word on clutches by matching our freshly Race Ready T56 with a proven Zoom sin-

gle-disc Kevlar clutch and matching billet steel flywheel for reliable performance. Trademark features to the Zoom Kevlar setup include incredible clamping force, reasonable pricing and minimal pedal effort—all three attributes are ones that we can certainly live with. Besides, we were digging the purple paint.

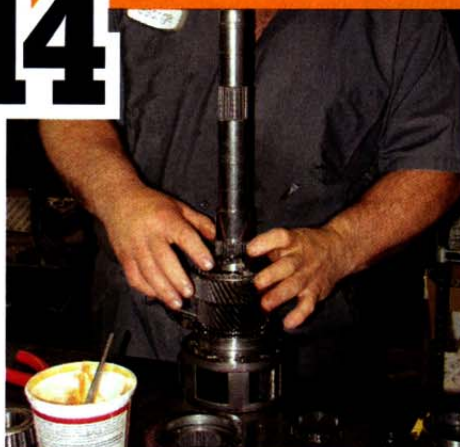
If you choose to buy one of Rockland Standard Gear's in-stock

13



A T56's success will greatly depend on the synchronizer you use. Kreppin only uses carbon-fiber synchros that have proven to be durable and long-lasting on both drag and road race environments, probably the two toughest places to test these.

14



Here, Kreppin began the assembly of the mainshaft by seating Second gear into place. Within minutes, he had this whole gearstack together with the deft precision of a neurosurgeon jacked-up on meth.

15



With all the speed gears in place, it was time to press the front pocket bearing onto the mainshaft that goes into the input shaft.

16



With all the speed gears in place, Kreppin moved each slider through the gears to make sure engagement was smooth and precise. Here, the rear slider was locked into Second.

17



The input shaft uses a tapered roller bearing to positively control thrust and provide very low friction. Here, we pressed on the bearing and used an old inner race as a collar.

18




Here, the shift fork assembly was trial fit. As you can see, the factory 1-2 fork is reused in all of its aluminum glory because failure is very rare here. But on the 3-4 shift fork, an upgrade to a steel unit is always necessary in a performance application.



boxes, then it will save you tons of time, but of course, will add to the total out-the-door price. For those who chase horsepower like it's covered in blond hair and tight jeans, Rockland Standard Gear also offers its Tranzilla series of transmissions that includes a custom gearset made of a unique proprietary alloy that can handle an incredible 1,200 lb-ft of torque (read

sidebar). Although it was offered to us, we thought it would have been more realistic to live with the standard \$1,695 Race Ready rebuild.

Once completed, we reinstalled this gearbox into our 10-second '01 Camaro test vehicle. The Zoom clutch held up to the hellacious punishment without a peep and on the street, its silken action made driving a plea-

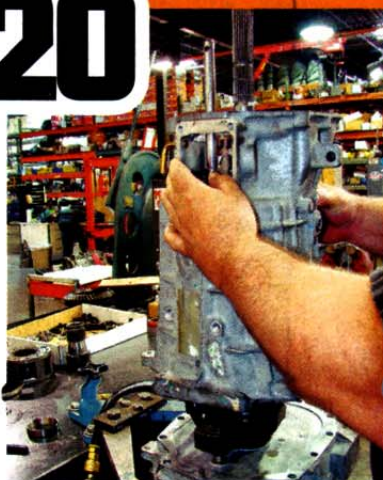
sure. In the end, any rough-shifting T56 deserves a thorough rebuild done right. Just make sure that the next time you plan a project that will include a T56 gearbox, have it gone over properly and let an expert go through it, not some fly-by-night operation. You'll save yourself considerable amounts of time and energy in the end. 

19



Ah, the home stretch. With all the sub-assemblies put together, it was now time to put the entire box together. Starting with the front plate, Kreppin lined up the shift fork assembly with the mainshaft and all the speedgears. The countershaft was also laid into place and everything checked for free movement.

20



Next up, a thin bead of silicone was placed on the front face of the center housing, then placed over the front cover. As Kreppin said, this process separates the men from the boys as he placed the shift rail's detent block onto the shifter shaft while lowering the housing. It's difficult for the untrained technician, but he did it with no fanfare and just kept going about his business. Sheesh, what a show-off.

21



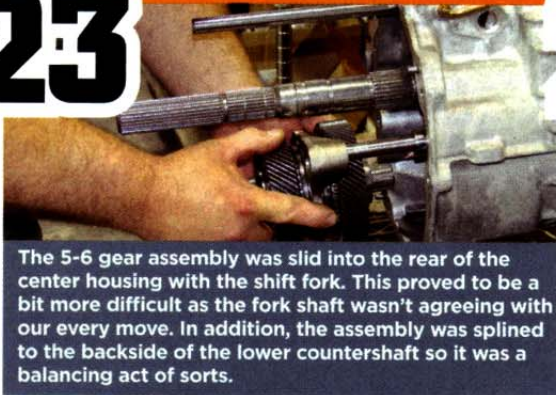
A roll pin was gently tapped into place to lock the shift rail's detent block into place. This finished up the center housing assembly as we moved to the rear section where Fifth, Sixth, and Reverse reside.

22



The fifth and sixth speedgears were assembled together separately. A dedicated slider was used here with synchros and roller bearings on each gear.

23



The 5-6 gear assembly was slid into the rear of the center housing with the shift fork. This proved to be a bit more difficult as the fork shaft wasn't agreeing with our every move. In addition, the assembly was splined to the backside of the lower countershaft so it was a balancing act of sorts.

24



With the case set upright, it was much easier to get everything into place. Here, Reverse gear was locked in.



25



Reverse's speed gear was then placed onto the output shaft and the remaining bearings were slid into place. Here, the VSS reluctor wheel is being secured with its C-clip. Note that on a T56, Reverse is synchronized, which is why there is no nasty crunch when you jamb that handle into "R."

26



The rear tailhousing got a thin bead of silicone sealant and was lowered into place. Because Reverse's idler gear is in here, it may require a quick wiggle to get the cover fully seated.

27

Well, here it is in its race-ready glory. Note that the forward solenoid with the white connector is for the infamous Skip Shift feature and the solenoid (not shown) that occupies the hole in the shifter housing is for reverse lockout. Many people confuse the two and inadvertently remove the reverse lockout solenoid, thinking they have removed the Skip Shift solenoid. This is bad, as it will allow you to go into Reverse at speed.

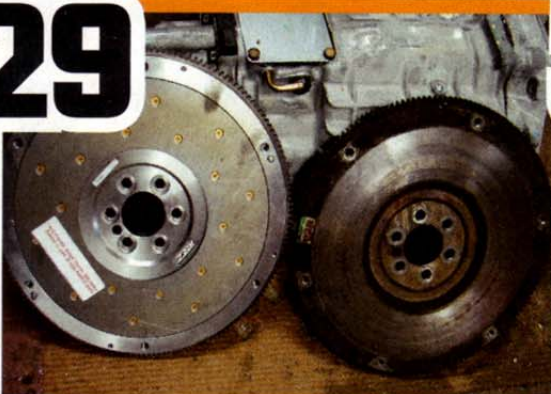


28



Rockland Standard Gear recommends its Tranzilla fluid for all of its gearboxes. It has many anti-foam inhibitors, and with its synthetic composition, provides incredibly long life and smooth shifting.

29



For our flywheel, we dumped the stock iron unit and installed one of Zoom's new billet steel units. It bolts directly into place and allows an owner to use up to a massive 12-inch clutch, should he or she desire. Overall diameter and tooth count is the same, just in case you were wondering.

30



At this point, it's real smart to replace the rear main seal and pilot bearing. Not easy to get to, these could cause major headaches later on, so put fresh ones in. We ran out of money so we re-used our low-mileage pieces, much to our chagrin. Do as we say, not as we do.



TECH

ROCK THAT BOX

31

The Zoom flywheel allows you to use stock flywheel bolts or any aftermarket ones that are similar in head size. Since LS1 flywheels are zero balance, you could theoretically bolt it in at any of the six positions, but we lined up the large alignment hole with where the stock one was by lining up the dirt and dust.



32

The Zoom pressure plate and Kevlar clutch were then bolted up, using the stock pressure plate bolts. The alignment tool then came out and we were ready to move on.



By Upgrading To RSG's

TERMINATOR

Direct Bolt-In 5-Speed

- Smooth & Quiet Operation
- More Torque Capacity
- Uses O.E Shifter In Stock Location
- Extremely Affordable
- O.E. Replacement Parts Guaranteed Available for 10 Years.



Rockland Standard Gear Inc.

CALL 1-800-227-1523

As you know, the T56 has been the favorite six-speed of choice by the Big Three for all of its performance applications. From Viper GTS Coupes to Z06 Corvettes and even SVT Mustang Cobras, this gearbox has come in many different forms over the years for specific applications. As such, different variants have come out of the T56's Tremec factory in Mexico, allowing the aftermarket to mix and match its own combination of OEM parts to make transmissions handle immense amounts of torque. But Rockland Standard Gear goes a step further and offers its own unique 9310 alloy gearset for the T56 and calls the finished product the "Tranzilla T56."

The Tranzilla T56 is designed to handle 1,200 lb-ft of torque (yikes!) and is available with an incredible variety of ratios as steep as a 2.29 or as short as 2.98 for First. Ratios for all the remaining gears can be suited for your needs as road racers and drag racers alike would want to take advantage of the four available combos. The gears themselves have a less helical profile (of just 22 degrees) to handle more torque. It does increase gear noise ever so slightly, but the increase in power capacity is certainly worth it. Units retail from \$5,200

33

T56s use a separate bellhousing to ease serviceability. Here, we bolted it onto the engine, reusing all of the factory fasteners. Our car is running well into the 10s, so an SFI-approved bellhousing is on our shopping list. The tranny goes in next and with a 15mm socket and some swivel extensions, we had a complete streetable and track-ready drivetrain upgrade that was ready to go.



to \$8,200, depending on the applications, and come with a one-year unlimited mile warranty. This is the T56 to get if you're serious about power.

In total, the sum of all these parts allows you to pound ludicrous amounts of power to the ground. Just pray that the rest of your driveline can handle it.

SOURCES

ROCKLAND STANDARD GEAR

877/774-4327
www.rsgear.com

ZOOM PERFORMANCE PRODUCTS

704/799-0577
www.zoomperformance.com

AIR RIDE TECHNOLOGIES

see it
drive it
feel it
KNOW IT.

Performance
air suspension
for your hot rod...

AirBAR
by Air Ride Technologies

PATENT APPROVED!
U.S. Patent
#6581918

Call today or
go online
for your
FREE catalog!

55-57 Chevy AirBAR®
Other AirBAR® applications available.

ridetech.com
Sales/Technical Support
812-481-4772

WE PROUDLY USE
Firestone
AIRSPRINGS