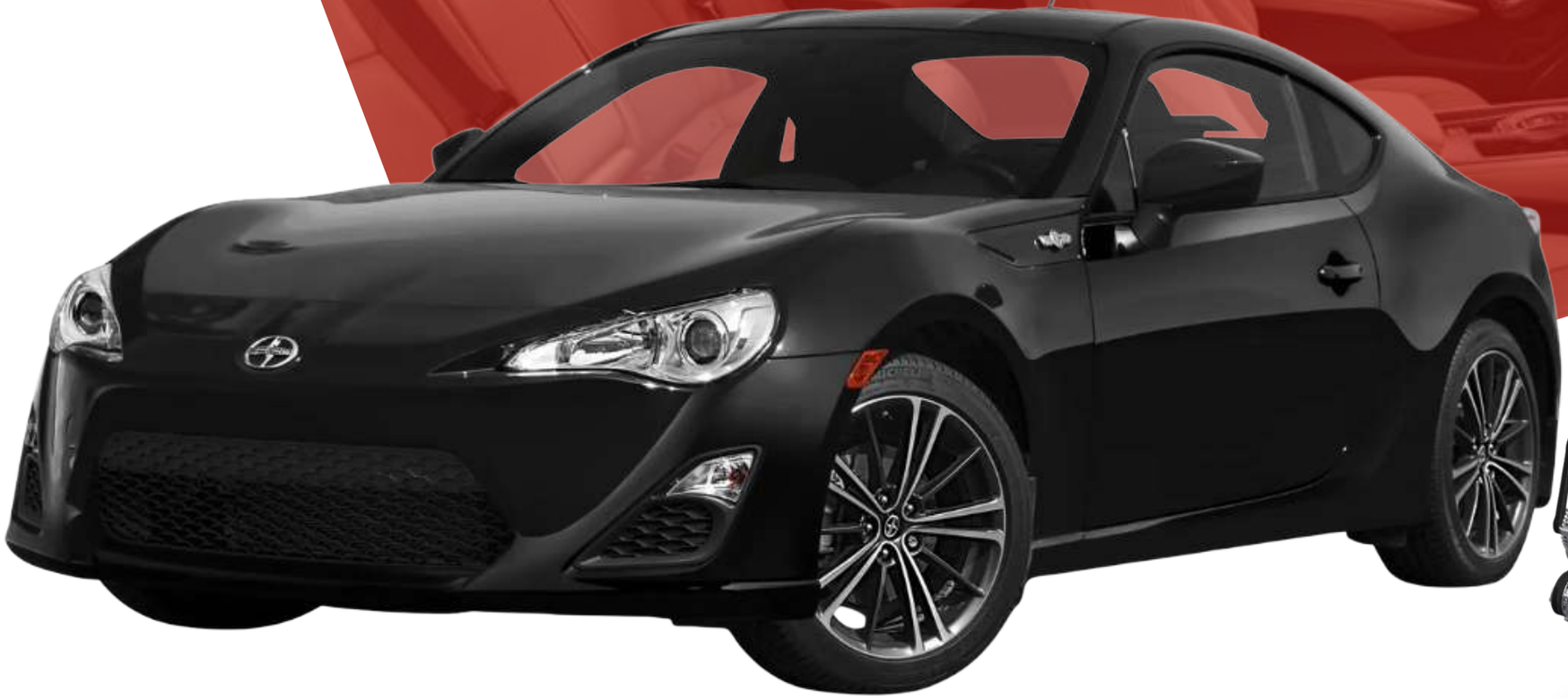
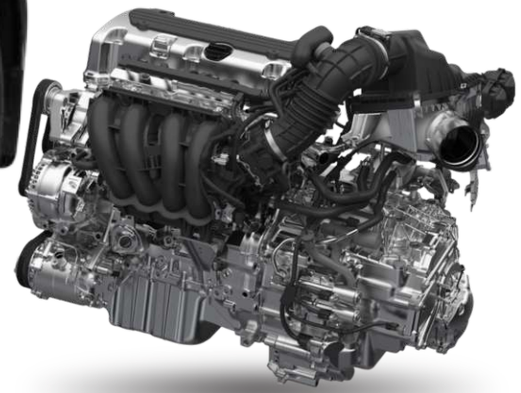
GearShift AUTO PARTS

Transmission Mounting Points and Adapter Plate Guide for Toyota Scion FR-S

Client Success Story – Gearshift Auto Parts

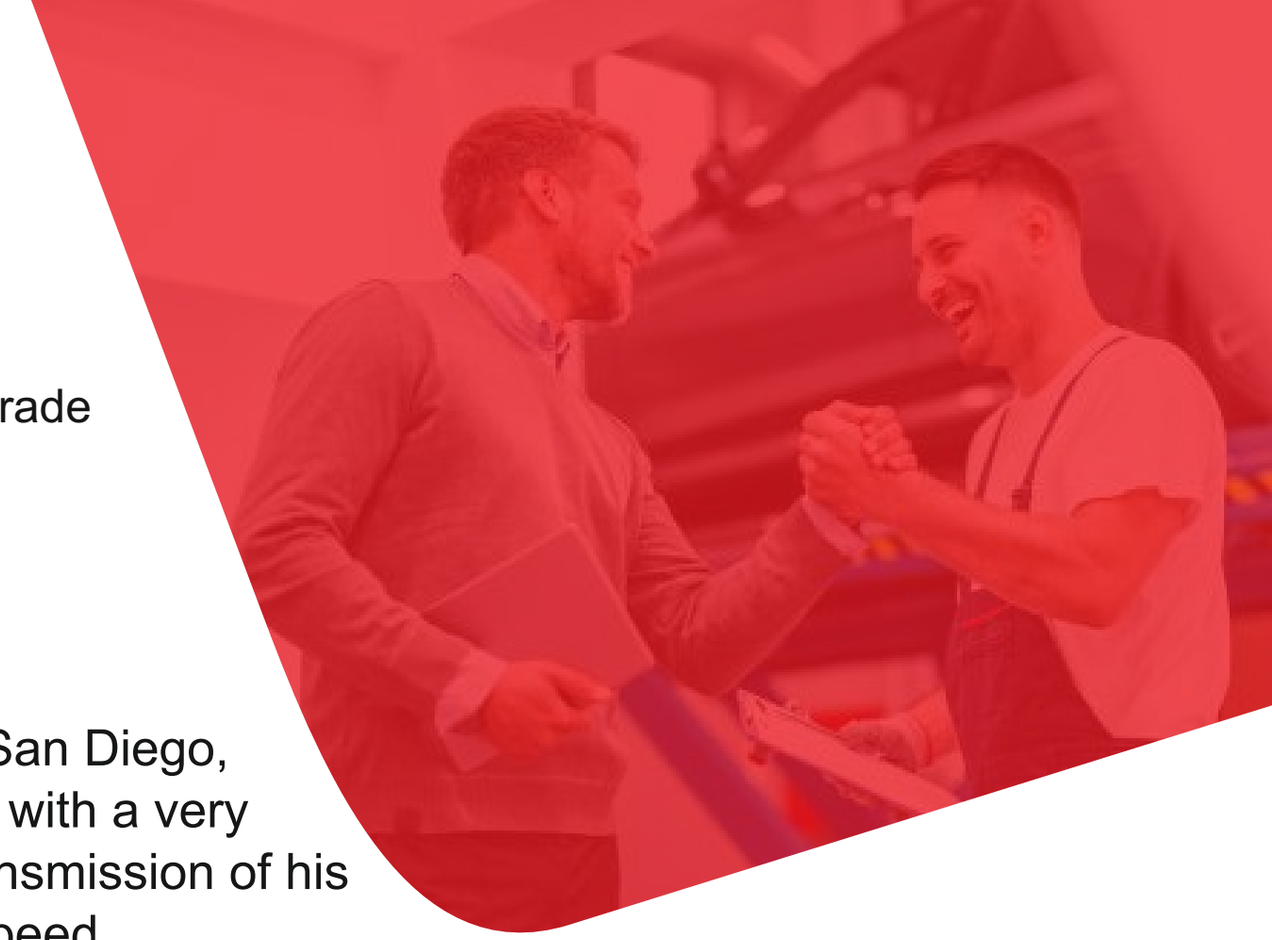




Scan the QR Code

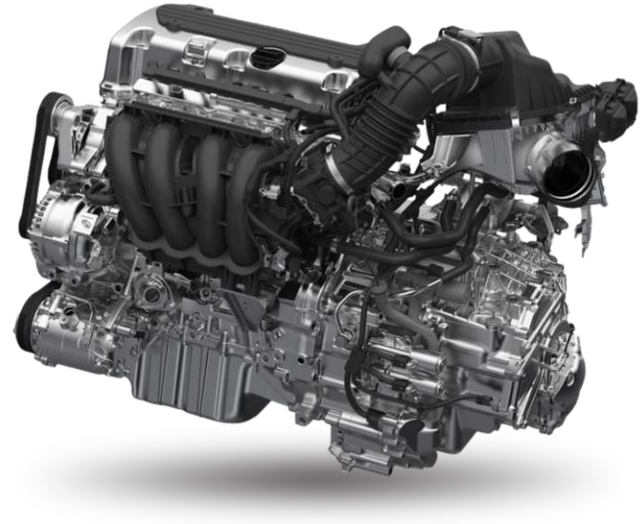
Client Overview

Client: James Roth,
Location: San Diego,
CaliforniaPurpose: Performance Transmission Upgrade with Real-World Fitment



Challenges and Fixes

James Roth, a performance car enthusiast from San Diego, California, reached out to us at gearshiftauto.part with a very specific goal. He wanted to upgrade the stock transmission of his 2015 Toyota Scion FR-S with a T56 Magnum 6-speed transmission for higher torque capacity and track reliability. The stock Aisin FA20 transmission had already shown signs of strain after repeated track use and power upgrades (including forced induction). He needed real support in finding accurate mounting points, adapter solutions, and clearance modifications to ensure the swap held up in real driving conditions—not just garage mockups.



Initial Setup and Assessment

The FR-S came into the project with a supercharged FA20 engine and a factory 6-speed manual. The issue wasn't just power delivery—it was gear holding under hard throttle and clutch engagement at the track. James noted regular grinds between 3rd and 4th gear, and a failing synchronization in 2nd.

Before jumping into the transmission change, we reviewed:

- Driveshaft angle vs tunnel clearance
- Factory cross-member alignment
- Bell-housing bolt pattern compatibility
- Clutch slave and pilot bearing depth

It was clear: this wasn't a bolt-in swap.

Selecting the Adapter Plate and Transmission

James decided on a T56 Magnum from a 2002 Camaro SS donor. The key here was that the bell housing pattern didn’t match the FA20 block. An adapter plate was needed, and flywheel spacing had to be recalculated. We helped him source an aluminum adapter plate made for FA20-to-GM LS bell-housing interface.

Key Specs Chosen:

- **Adapter Plate:** FA20 to GM LS 6061 Aluminum, 1" thickness
- **Clutch:** McLeod RST twin-disc, modified to work with custom flywheel spacing
- **Flywheel:** Chrome, neutral balance, stepped down for pilot bearing alignment
- **Mount:** Universal cross member mount with custom brackets for tunnel fitting

All parts were either sourced through gearshiftauto.part or verified through local machine shops in Southern California.

Transmission Mounting Point Fabrication

This was the most critical part of the swap.

The T56 is longer and heavier than the stock unit. The factory Scion transmission tunnel wasn't designed to accommodate the T56 without interference. Tunnel trimming was required just ahead of the shifter housing to give clearance for transmission movement and heat expansion.

Steps Taken:

- **Mark & Trim:** A 3-inch section was cut from the top side of the tunnel using a cutoff wheel and sealed after install.
- **Cross member Fabrication:** The stock mounting points on the Scion were measured at 13.75" apart, center-to-center. The T56 mount needed 16.5" spacing, so custom side brackets were fabricated using 1/4" steel plate and MIG welded.
- **Driveshaft:** One-piece aluminum driveshaft with 1350 U-joint yoke was custom ordered to fit the new length and output spline.
- **Angle Check:** Using an angle finder, the driveshaft slope was corrected to 3.1°, well within the safe range.

Clearance Notes:

Even with trimming, tunnel-to-case clearance was tight. We used DEI transmission tunnel insulation to protect the body from excessive heat. Shift linkage required a slight offset bracket to bring the stick back to the factory center console opening.

Clutch Line, Hydraulics, and Slave Cylinder

Another real-world issue was the clutch line. The FA20 used an internal slave with a short hard line. The T56 had external slave requirements. James opted for a Tilton external hydraulic throw out bearing with AN-3 lines routed through a new hole in the bell housing.

He also had to measure master cylinder volume output. The stock unit didn’t give full travel, so it was replaced with a Wil-wood 7/8" bore master. This alone fixed a major issue: pedal throw and full clutch engagement were now reliable.

Final Fitment and Test Drive

After all components were fitted, James did a full torque check of:

- **Bell housing bolts:** 37 lb-ft with Loctite
- **Cross member mount bolts:** 45 lb-ft
- **Driveshaft flange:** 55 lb-ft
- **Clutch assembly:** 90 lb-ft (torqued in star pattern)

Fluids used:

- **Transmission:** 3.8 quarts of Dexron III synthetic
- **Hydraulic:** DOT 4
- **Rear differential:** 75W-90 synthetic

Startup was clean. No abnormal noise. First test drive showed no driveline vibration, no clutch chatter, and clean shifts under load. Tuning wasn't needed as the swap didn't change ECU behavior (same engine, just new transmission behavior).

Lessons Learned

This wasn’t a “plug and play” job, and James was aware of that. The biggest pain points weren’t getting the T56 to bolt up—it was ensuring the mounting angles, hydraulic behavior, and shift alignment matched real driving expectations.

Here’s what mattered most:

- **Adapter Plate Fitment:** Ensure tolerances are checked, especially dowel pin alignment.
- **Transmission Mounting:** If you skip the angle alignment, you’ll end up with vibration or premature wear.
- **Clutch Engagement:** Always test slave throw before final install.
- **Tunnel Clearance:** Give it room. These transmissions get hot and expand under load.

Why gearshiftauto.part was Used

James sourced the adapter plate, bell housing, slave cylinder, and mount hardware directly from gearshiftauto.part. Why?

Here’s what mattered most:

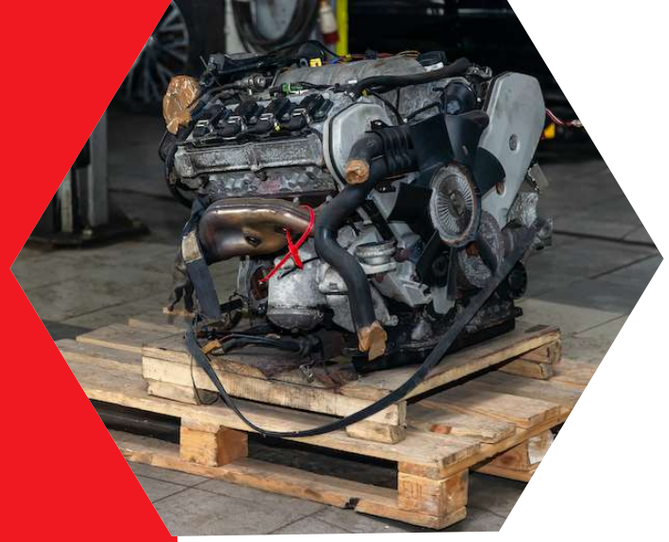
- We list real-world compatibility—not just SKU matchups.
- Each part includes actual install notes from mechanics.
- No gimmicks, no delays. Every part shipped within 48 hours.
- Support staff helped James verify bore size and slave throw requirements.

Final Result

James now runs regular track sessions with the new T56 and has logged over 6,000 miles since the install. No issues, no clutch fade & no shift grinding. The upgraded transmission not only handles the extra torque but has proven reliable under high RPM downshifts and launch control starts.

This case was a textbook example of what happens when you mix precision planning, solid fabrication, and trusted parts.

gearshiftauto.parts helped make it possible—with real parts, real fitment, and no guesswork.



GearShift
AUTO PARTS

Thank You

www.gearshiftauto.parts

info@gearshiftauto.parts