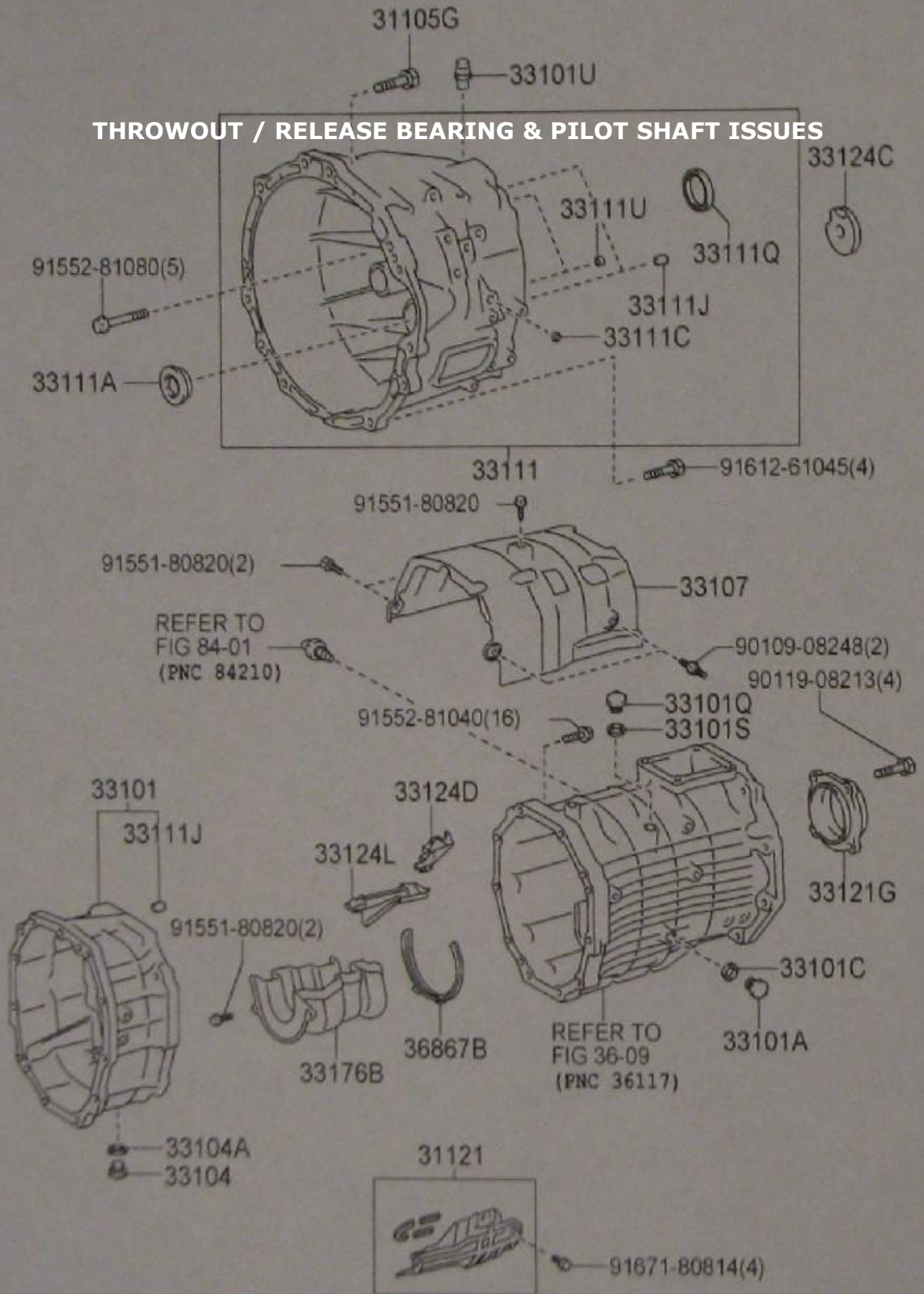


# THROWOUT / RELEASE BEARING & PILOT SHAFT ISSUES



Recent Toyota Tacomas and FJ Cruisers with Manual Transmissions have had identical problems. It is unclear whether the damage is caused by faulty Throwout / Release Bearings whose inner rings crack then damage the Pilot Shaft, or soft (Aluminum) Pilot Shafts wearing down then causing the Throwout / Release Bearing to wobble, vibrate, and then crack (vice versa). Oftentimes damage to the Pilot Shaft occurs without cracks on the bearing's inner ring. The issue has occurred on FJ Cruisers which have and haven't been subjected to strenuous off - roading and / or modifications.

The Release Bearing is designed to maintain contact with the pressure plate at all times; the outer ring is supposed to spin constantly, while the inner ring maintains a nice tight fit sliding back and forth about an inch or so on the Pilot Shaft. Once the inner ring of the Throwout / Release Bearing cracks or wears and begins to wobble, the Pilot Shaft wears down (or vice versa) - resulting in the "chirping." Depressing the clutch pedal slightly allows the fingers of the Fork to stabilize the bearing wobble.

The wobble is the cause of the chirping. Neither Grease nor a replacement Throwout / Release Bearing will fix the problem long term; the grease will extrude eventually, leaving the loose fit. Tensing the clutch pedal (see below) is likewise not addressing the true problem at hand.

To visualize the problem, lift the truck with the engine running, remove the Bell Housing Cover Plate and point a flashlight up to look at the Release Bearing (driver's side). You will see the outer ring of the Release Bearing spinning (normal). When it chirps, you should be able to see the Throwout / Release Bearing wobbling (abnormal). To confirm the problem, applying a small amount of pressure on the Slave Cylinder (a small cylinder with a rubber boot just below the opening you are looking in to) with a screw driver should cause the chirping to stop. This is identical in principle to depressing the clutch pedal 1/2 inch or so (which stops the chirping).

The only proper repair entails replacing the Bell Housing because the Pilot Shaft (unlike in earlier Tacomas with 5 - speed Manual Transmissions) is a non - serviceable or replaceable component. If you can get a new transmission, you'll be better off and the dealers will usually prefer to replace the transmission based on the time and difficulty of a rebuild. Theoretically, if Toyota made replacement Throwout / Release Bearings with different inner rings or replaceable Pilot Shafts, the repair would be far less costly. Many times, a technician will go through all the effort to give you a new Throwout / Release Bearing, Pressure Plate and Clutch Disc, Slave Cylinder, or various combinations of those components only to find you back in the shop within a couple of weeks or less. Worse, they might replace the Flywheel the second time around, which results from misdiagnosis of the "chirp."

Knowing that the Throwout / Release Bearing is steel and the Pilot Shaft is Aluminum, the issue of damage to that Pilot Shaft becomes clear. Since the Pilot Shaft is press - fit in to the Transmission Bell Housing, replacing the Pilot Shaft requires replacing the entire Bell Housing (a \$400 part and a massive amount of labor); dealers will often choose to replace the transmission.

**Cracked Throwout / Release Bearing, Pilot Shaft + Toyota spray – on Lithium Grease on a Toyota Tacoma; not an appropriate fix done by many dealers, which may even contaminate the Clutch Disk surface and Flywheel.**



**Throwout / Release Bearing positioned on the Pilot Shaft:**



**2 views through the cover plate:**



When viewing the operation of the Throwout / Release Bearing with the engine running and the cover removed (using a flashlight), the technician should be able to visualize a degree of Throwout / Release Bearing wobble. Applying a small amount of pressure to the Slave Cylinder shaft moves the Fork, and stabilizes the Throwout / Release Bearing enough to stop the chirp. It is this observation that leads some technicians to simply tense the Clutch Pedal as a fix (inappropriate). The next step is to drop the transmission and do a detailed inspection of the Pilot Shaft.

Measure the Pilot Shaft with some calipers and note the discrepancy in diameter along the length of travel of the Release Bearing.

The earlier Toyota Tacomas with 5 – speed Manual Transmissions (R155 and R155F) had a superior design because the Pilot Shaft was a replaceable bolt – on component to the Bell Housing. The FJ Cruisers with 6 – speed Manual Transmissions (RA61 and RA61F) are of similar design to Toyota Tacomas with 6 - speed Manual Transmissions (RA60 and RA60F).

**Damaged Parts from FJ Cruiser (Pressure Plate, Pilot Shaft, Throwout / Release Bearing inner ring):**



## More Parts from FJ Cruiser

Undamaged Throwout / Release Bearing



Old Quill (note scoring on shaft) and Housing

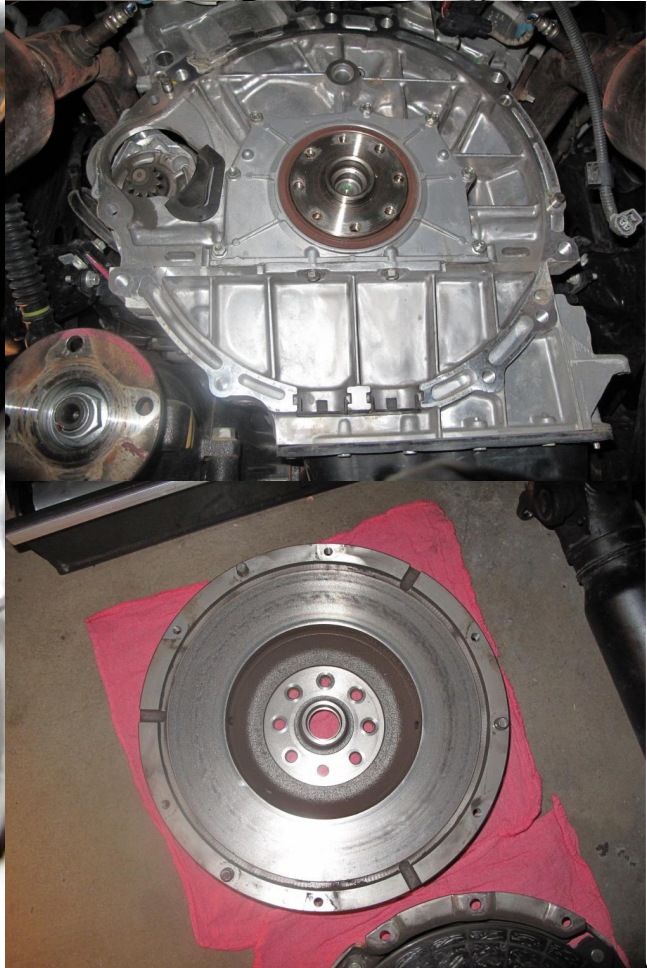
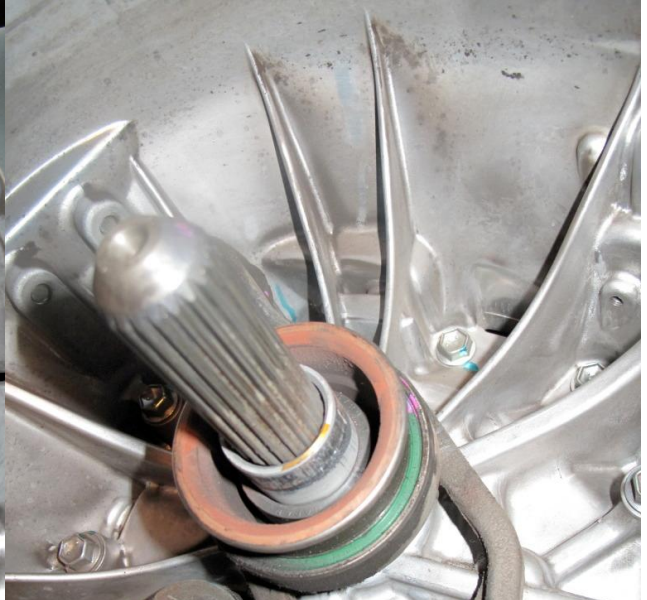


New Quill and Housing



## Even More Parts from FJ Cruiser

Resealing the Bell Housing requires a replacement Crush Ring / Gasket with the assembly torqued together at around 400 ft – lbs.





**Typical Repairs:**

CUSTOMER #: 49587

167145



INVOICE

FERRIS CHEVROLET, INC.  
 DBA FERRIS CHEVROLET-BUICK-CADILLAC  
 FERRIS TOYOTA  
 634 Wabash Ave. - NEW PHILADELPHIA, OHIO 44663  
 (330) 343-7761  
 www.ferris.com

PAGE 1

BUS: CONT:N/A CELL: SERVICE ADVISOR: 115 DAVID A SCHAFF

COLOR	YEAR	MAKE/MODEL	VIN	LICENSE	MILEAGE IN/OUT	TAG	
	08	TOYOTA FJ CRUISER	JTEBU11F28K037293		35359/35359		
DEL DATE	PRD. DATE	WARR. EXP.	PROMISED	PO NO.	RATE	PAYMENT	INV. DATE
12FEB09	12FEB09	17:30	16OCT09			CASH	09NOV09
R.O. OPENED		READY	OPTIONS: STK:8866 DLR:100 ENG:4.0 LITER				

LINE	OPX/CK	TRCH	TYPE	HOURS	LIST	NET	TOTAL
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A NOISE FROM REAR F ENG CUSTOMER STATES  
 CAUSE: PART DEFECT

335012	TRANSMISSION ASSEMBLY OH						
	121	MT1					(N/C)
1	33101-35111	CASE SUB-ASSY, TRANS					(N/C)
2	90080-43036	GASKET, EXHAUST PIPE					(N/C)
1	17451-74051	GASKET, EXHAUST PIPE					(N/C)
1	90917-06083	GASKET, EXHAUST PIPE					(N/C)
1	31210-60280	COVER ASSY, CLUTCH					(N/C)
1	31230-60240	BEARING ASSY, CLUTCH					(N/C)
1	31250-35451	DISC ASSY, CLUTCH					(N/C)
6	90119-08134	BOLT, W/WASHER					(N/C)
1	33101-35111	CASE SUB-ASSY, TRANS					(N/C)
1	90179-48004	NUT					(N/C)
1	00295-01281	F.I.P.G., TRANS.					(N/C)
1	90501-12212	SPRING, COMPRESSION					(N/C)
2	08885-02506	GEAR OIL, LT 75W-85					(N/C)

Concern Code: 91  
 PC: 10  
 PART#: 33101-35111  
 COUNT: 1  
 CLAIM TYPE:  
 AUTH CODE:

SUBL LOANER POW925

PARTS:	0.00	LABOR:	0.00	OTHER:	0.00	TOTAL LINE A:	0.00
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LABOR & PARTS  
 J# 1 10TOZ DRIVEABILITY TECH(S):1003 574 WARRANTY  
 CUSTOMER REPORTS THERE IS A SQUEAK, THE NOISE WILL GO AWAY AS SOON AS THE CLUTCH PEDAL IS DEPRESSED ABOUT A HALF INCH CUSTOMER WILL BE AVAIALBE FOR A TEST DRIVE IF NEEDED CHECK AND ADVISE  
 WILL OCCUR AT IDLE, BUT WILL OCCUR  
 FOUND CASE AROUND INPUT SHAFT HOUSING SCORED UNDER T/O BRGIN 335991, T-1=91, T-2=11  
 R&R TRANSMISSION AND REPLACED FRONT CASE/BELLHOUSING AND T/O BEARING AND FORK. DONE  
 BACK ORDER NO ACS 35858  
 SEE ATTACHED PART ORDER SHEETS, THREE DIFFERENT DAYS PARTS WERE ORDERD ON THIS VEHICLE

PARTS	QTY	FP	NUMBER	DESCRIPTION	UNIT PRICE	WARRANTY
JOB # 1	1		31204-35060	FORK SUB-ASSY, CL		WARRANTY
JOB # 1	1		31230-60240	BEARING ASSY, CLU		WARRANTY
JOB # 1	1		31236-60060	SUPPORT, RELEASE		WARRANTY
JOB # 1	1		33101-35111	CASE SUB-ASSY, TR		WARRANTY
JOB # 1	1		90341-42001	PLUG, STRAIGHT SC		WARRANTY
JOB # 1	1		33124-35130	PIPE, OIL RECEIVE		WARRANTY
JOB # 1	1		90930-03075	PLUG SUB-ASSY, BR		WARRANTY
JOB # 1	1		90179-48004	NUT		WARRANTY
JOB # 1	1		00295-01281	F.I.P.G., TRANS.		WARRANTY
JOB # 1	1		35469-35030	SPACER		WARRANTY
JOB # 1	1		31210-60280	COVER ASSY, CLUTC		WARRANTY
JOB # 1	1		31250-60370	DISC ASSY, CLUTCH		WARRANTY

JOB # 1 TOTAL PARTS 0.00  
 JOB # 1 TOTAL LABOR & PARTS 0.00

**Performance Development & Manufacturing's (<http://www.pdmtsk.com/>) TranQuil Sleeve Kit Solution for Subarus with Manual Transmission, since made available for the Toyota Tacoma and FJ Cruiser (for the latter, TranQuil Sleeve Kit TSK44 replaces Part #31230 - 60240; replacement bearing is Part # TSK - 44B from PDM):**

