

ARTICLE BEGINNING

APPLICATION

TRANSMISSION APPLICATION

Vehicle Application	Transmission Model
1985-87 4WD Pickup, 4Runner	G52
1985-89 Van (2WD & 4WD)	G53

DESCRIPTION

The Toyota G52 and G53 5-speed transmissions are fully synchronized units. All forward gears are helical cut and in constant mesh. Reverse gear is spur cut. Reverse and 5th gears are mounted on the rear side of the intermediate plate. The floor shifter actuates a single control rod in the transfer adapter which operates 3 shift rails mounted in the intermediate plate and the main case.

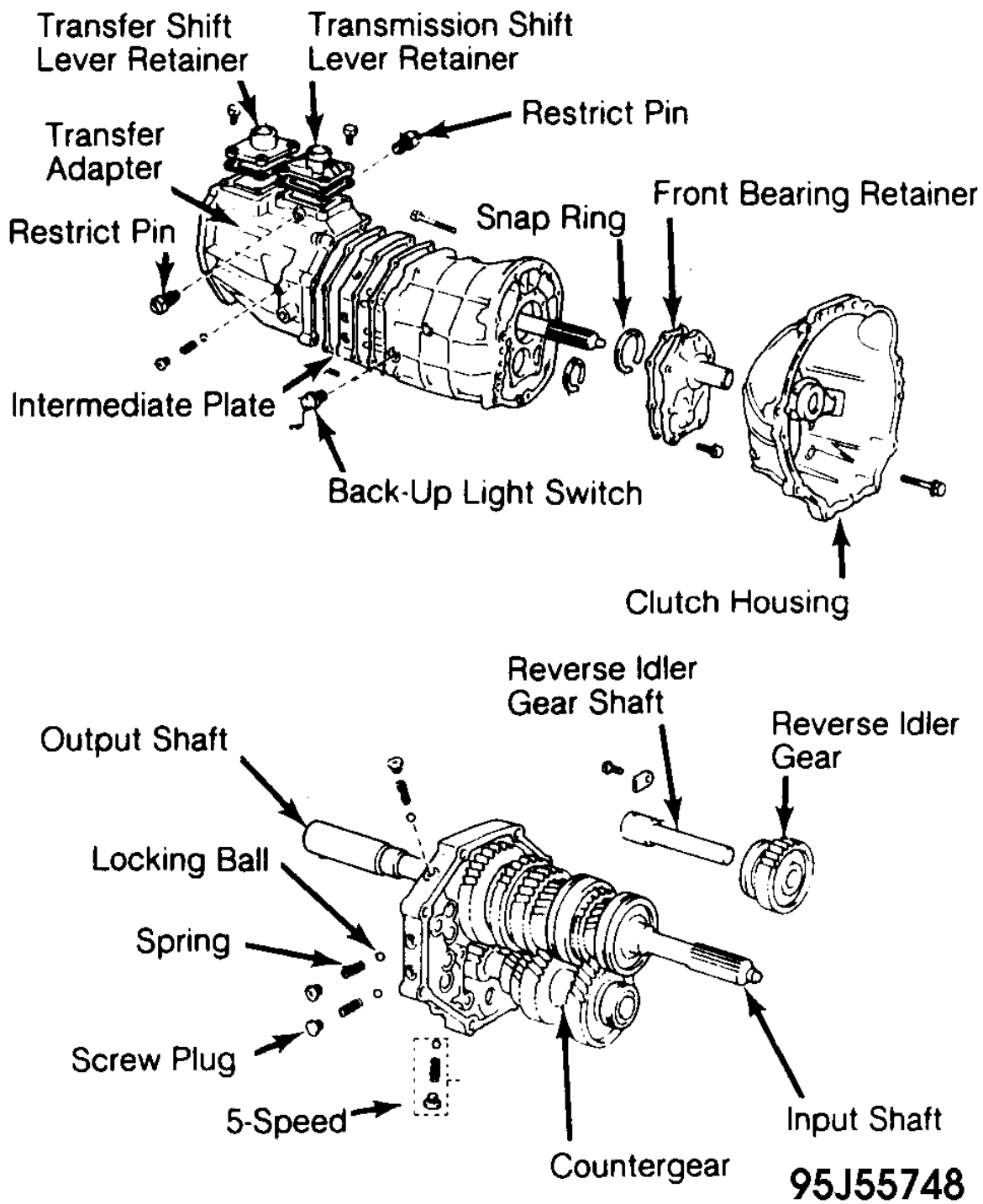


Fig. 1: Toyota G52 Transmission

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

LUBRICATION & ADJUSTMENTS

See appropriate TRANSMISSION SERVICING - M/T article in the MANUAL TRANS SERVICE section.

- For 1985 Toyota Vehicles, see [TRANSMISSION SERVICING - M/T](#)
- For 1986 Toyota Vehicles, see [TRANSMISSION SERVICING - M/T](#)
- For 1987 Toyota Vehicles, see [TRANSMISSION SERVICING - M/T](#)
- For 1988 Toyota Vehicles, see [TRANSMISSION SERVICING - M/T](#)
- For 1989 Toyota Vehicles, see [TRANSMISSION SERVICING - M/T](#)

TROUBLE SHOOTING

See [TROUBLE SHOOTING - BASIC PROCEDURES](#) in the GENERAL TROUBLE SHOOTING section.

REMOVAL & INSTALLATION

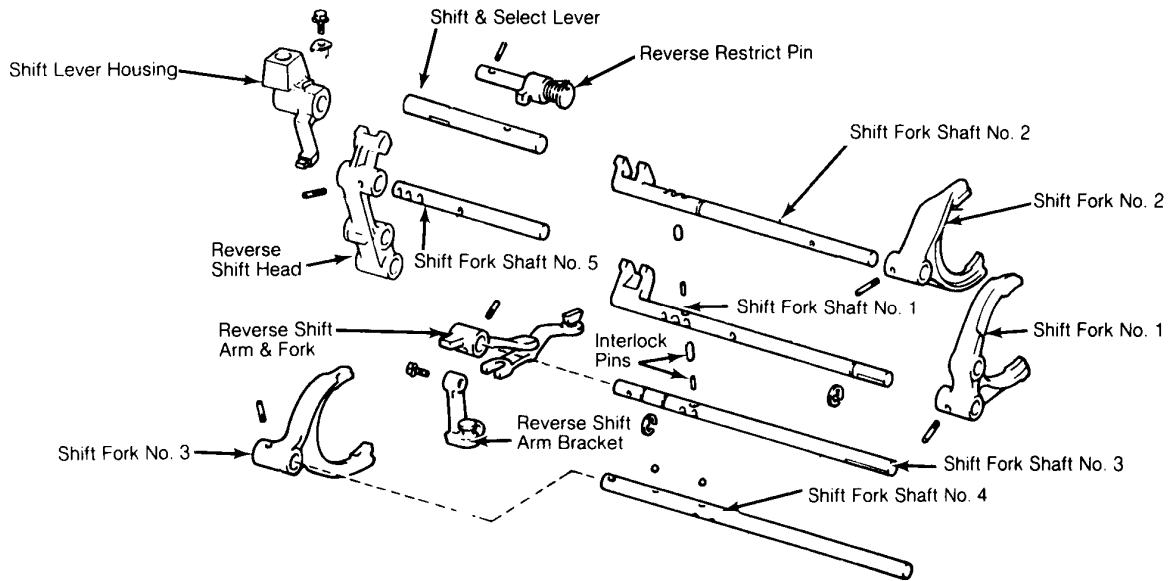
See appropriate TRANSMISSION REMOVAL & INSTALLATION - M/T article in the MANUAL TRANS SERVICE section.

- For 1985-86 Pickup & 4Runner, see [TRANSMISSION REMOVAL & INSTALLATION - M/T](#)
- For 1987 Pickup & 4Runner, see [TRANSMISSION REMOVAL & INSTALLATION - M/T](#)
- For 1985 Van, see [TRANSMISSION REMOVAL & INSTALLATION - M/T](#)
- For 1986 Van, see [TRANSMISSION REMOVAL & INSTALLATION - M/T](#)
- For 1987 Van, see [TRANSMISSION REMOVAL & INSTALLATION - M/T](#)

TRANSMISSION DISASSEMBLY

G52 TRANSFER ADAPTER

1. Remove back-up light switch, shift lever retainer and restrict pins. Remove 9 clutch housing bolts. Using plastic hammer, remove clutch housing from transmission case. See [Fig. 1](#) and [Fig. 2](#).
2. Using Torx head socket, remove screw plug from transfer adapter. Remove spring and ball. Remove Allen head plug from rear face of transfer adapter. Remove shift lever housing set bolt and lock washer.
3. Remove shift lever shaft and housing. Remove 8 transfer adapter bolts. Using plastic hammer, remove transfer adapter. Leave gasket attached to intermediate plate.



95A55749

Fig. 2: Exploded View of Shift Forks & Shafts

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

G53 EXTENSION HOUSING (2WD) OR TRANSFER ADAPTER (4WD)

1. Remove release fork and bearing. Remove back-up light switch and speedometer driven gear. Remove clutch housing from transmission.
2. Remove shift lever housing assembly. Remove 8 extension housing bolts. See [Fig. 3](#) . Using plastic hammer, tap extension housing and remove.
3. Remove shift lever housing and shift and select lever. Leave gasket attached to intermediate plate.

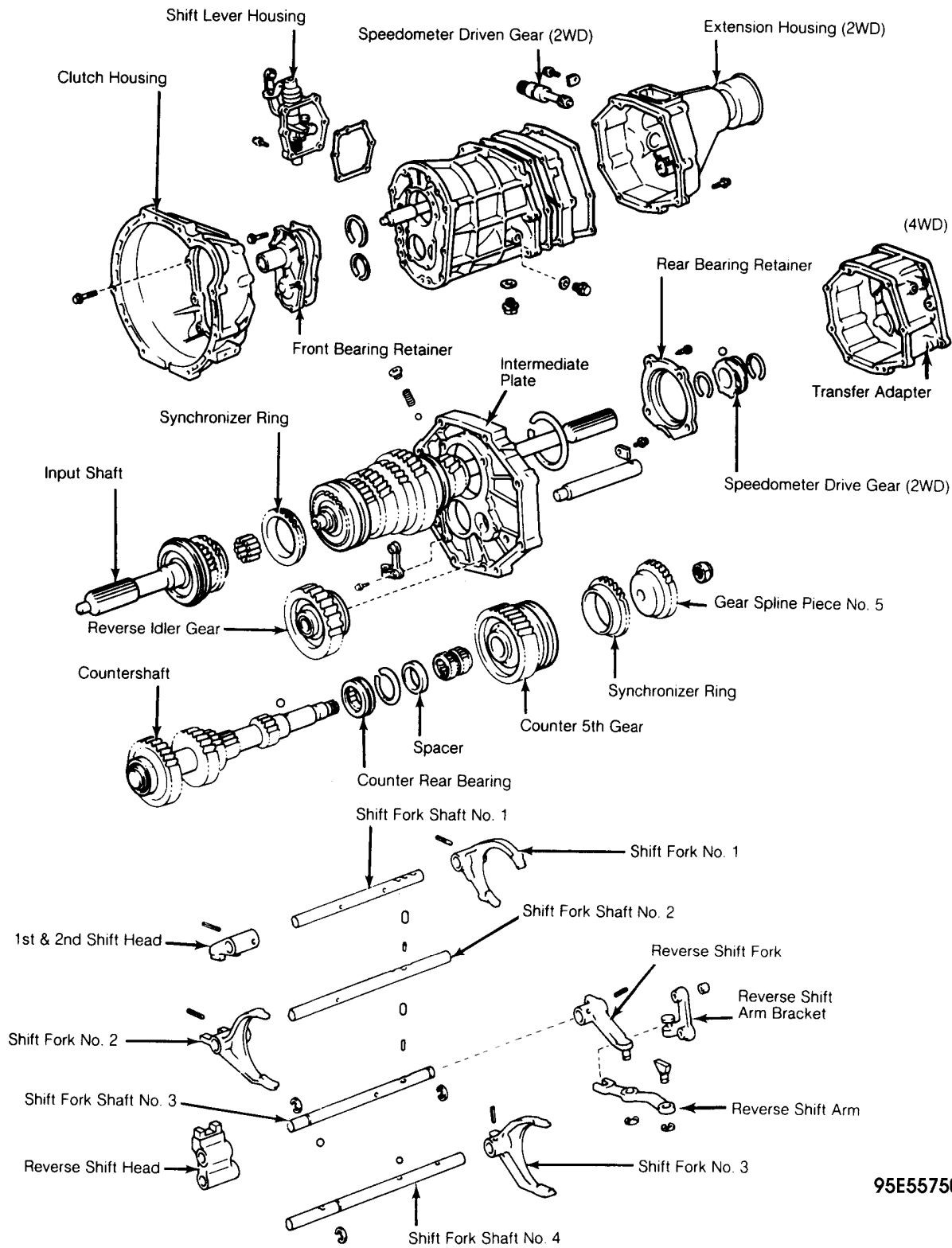


Fig. 3: G53 Case & Shifter Fork Assemblies
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INTERMEDIATE PLATE

G52 Shift Fork Shafts

1. Remove front bearing retainer and 2 bearing snap rings from front of transmission case. Using plastic hammer, carefully separate transmission case from intermediate plate.
2. Install 2 long clutch housing bolts, plate washers and nuts in 2 bottom holes of intermediate plate. Install plate washers in reverse of normal. Mount intermediate plate in vise, with vise jaw pressure on bolts. Increase or decrease plate washers so bolt tip and front tip surface of nut are aligned and mounted evenly.
3. Using Torx head socket, remove 4 screw plugs, locking balls and springs from intermediate plate. Drive out 5 shift fork-to-shift rail pins. Remove 2 shift rail "E" rings.
4. Pull out shift fork shaft No. 4 from intermediate plate catching 2 interlock balls and pin. If they do not fall out, remove with magnet. Remove shift fork shaft No. 4 and shift fork No. 3.
5. Pull out shift fork shaft No. 5 from intermediate plate, and remove with reverse shift head. Pull out shift fork shaft No. 3 from intermediate plate catching 2 interlock pins as they fall out. If they do not come out, remove with magnet.
6. Remove shift fork shaft No. 1 and interlock pin from intermediate plate catching interlock pin as it falls out. If it does not come out, remove with magnet. Pull out shift fork shaft No. 2 and remove shift forks No. 2 and No. 1.

G53 Shift Fork Shafts

1. Remove front bearing retainer and 2 snap rings. Using plastic hammer, carefully tap transmission case and separate from intermediate plate.
2. Install 2 clutch bolts, washers and nuts in 2 bottom holes of intermediate plate. Increase or decrease plate washers so bolt tip and front surface of nut are aligned. Mount intermediate plate in vise with pressure on nuts and bolts, NOT intermediate plate.
3. Using Torx socket, remove 4 plugs. Remove 4 springs and balls, catching them by hand as they fall out. If they do not fall out, use magnet to remove. Drive out 4 pins. Remove 3 "E" clips and No. 1 shift fork bolt. Pull out shift fork shaft No. 3 from intermediate plate.
4. Remove shift fork and shaft No. 3. Remove locking ball and reverse shift head. Pull out shift fork shaft No. 4 from intermediate plate, catching pins as they fall out. If they do not fall out, remove with magnet.
5. Remove shift fork shaft No. 4. Remove shift fork shaft No. 2 from intermediate plate. Catch pin by hand when it falls from hole. If it does not fall out, remove with magnet.
6. Remove shift fork shaft No. 2 and shift fork No. 2. Pull out shift fork shaft No. 1 and remove shift fork No. 2, No. 1 and 1st and 2nd shift head.

Input, Output & Countershafts

1. Remove reverse idler gear shaft stopper. Remove reverse idler gear and shaft. Remove reverse shift arm from reverse shift arm bracket. Measure countershaft 5th gear thrust clearance. See [Fig. 4](#).

COUNTERSHAFT 5TH GEAR THRUST CLEARANCE

Application	In. (mm)
Standard	.0039-.0118 (.10-.30)
Maximum	.0118 (.30)

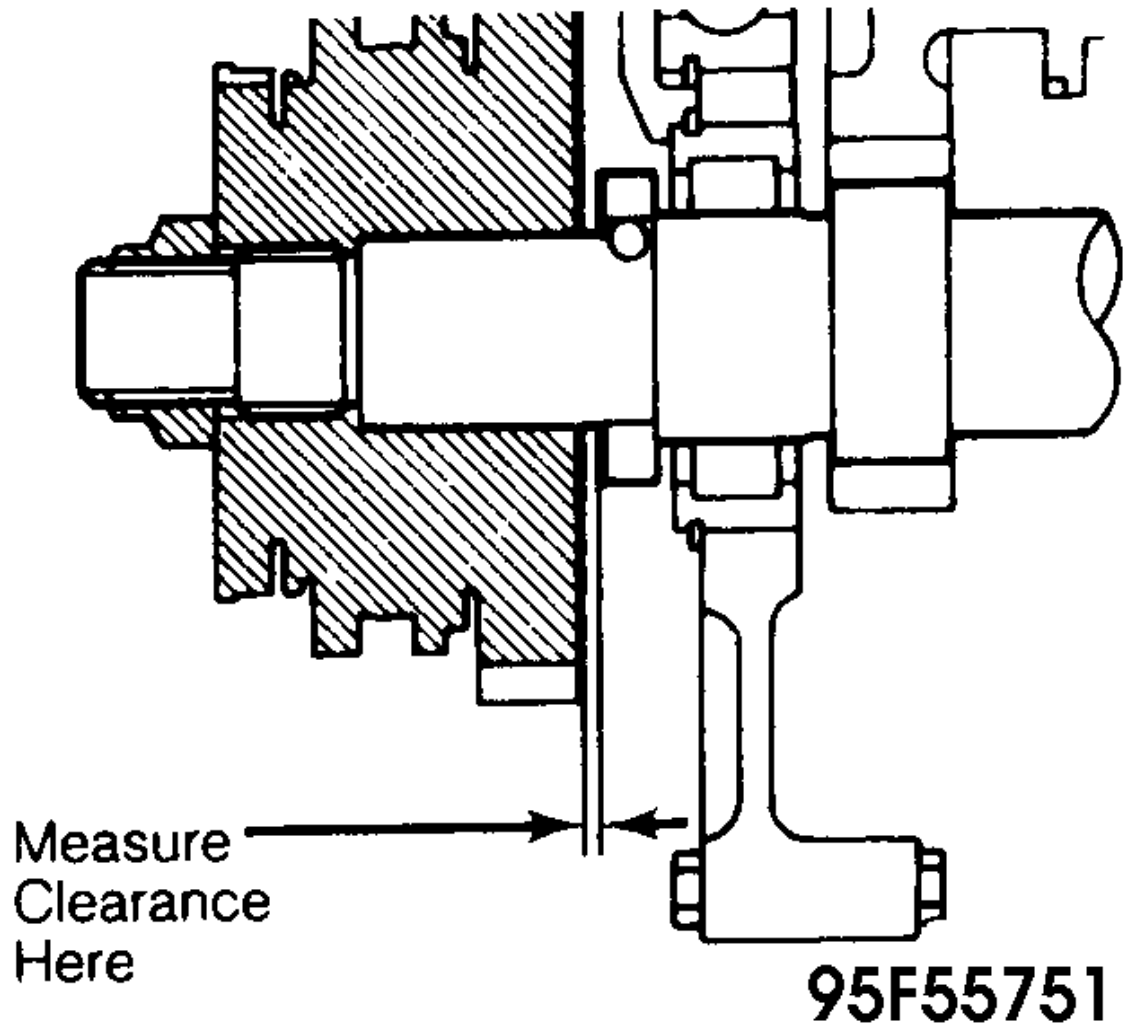


Fig. 4: Measuring Point For Countershaft 5th Gear Thrust Clearance

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- Loosen staked part of lock nut on gear spline piece No. 5. Remove lock nut. Using Puller (09213-27010), remove gear spline piece No. 5, synchro ring, needle roller bearing and counter 5th gear. Remove spacer and ball.
- Remove 2 bolts and reverse shift arm bracket. Using Torx head socket, remove 4 rear bearing retainer bolts. Remove rear bearing snap ring.

- Remove output shaft, countershaft and input shaft as a unit from intermediate plate by pulling on countergear and tapping intermediate plate with plastic hammer. Remove input shaft and needle roller bearings from output shaft. Remove countershaft rear bearing from intermediate plate using Driver (09608-12010). Remove sleeve from output shaft using Puller (09950-20016).

COMPONENT DISASSEMBLY & REASSEMBLY

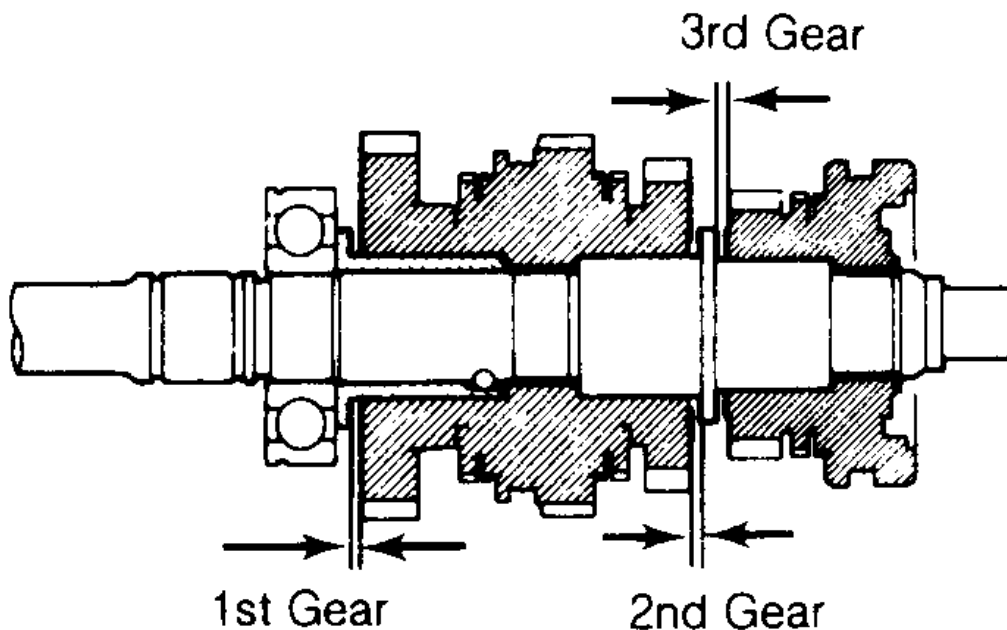
OUTPUT SHAFT

Disassembly

- Measure end play of each gear on output shaft. See [Fig. 5](#). Remove snap ring and press 5th gear, rear bearing, 1st gear and inner race from output shaft. Remove needle roller bearing.

OUTPUT SHAFT GEAR THRUST CLEARANCES

Application	In. (mm)
1st, 2nd & 3rd Gear	
Standard	.0039-.0098 (.10-.25)
Maximum	.0098 (.25)



95G55752

Fig. 5: Measuring Output Shaft Gear Thrust Clearances

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Remove synchro ring. Remove locking ball using magnet. Press hub sleeve No. 1, synchro ring and 2nd gear off output shaft. Remove needle roller bearing.
3. Remove snap ring and press hub sleeve No. 2, synchro ring and 3rd gear off output shaft. See [Fig. 6](#) or [Fig. 7](#) . Remove needle roller bearing.

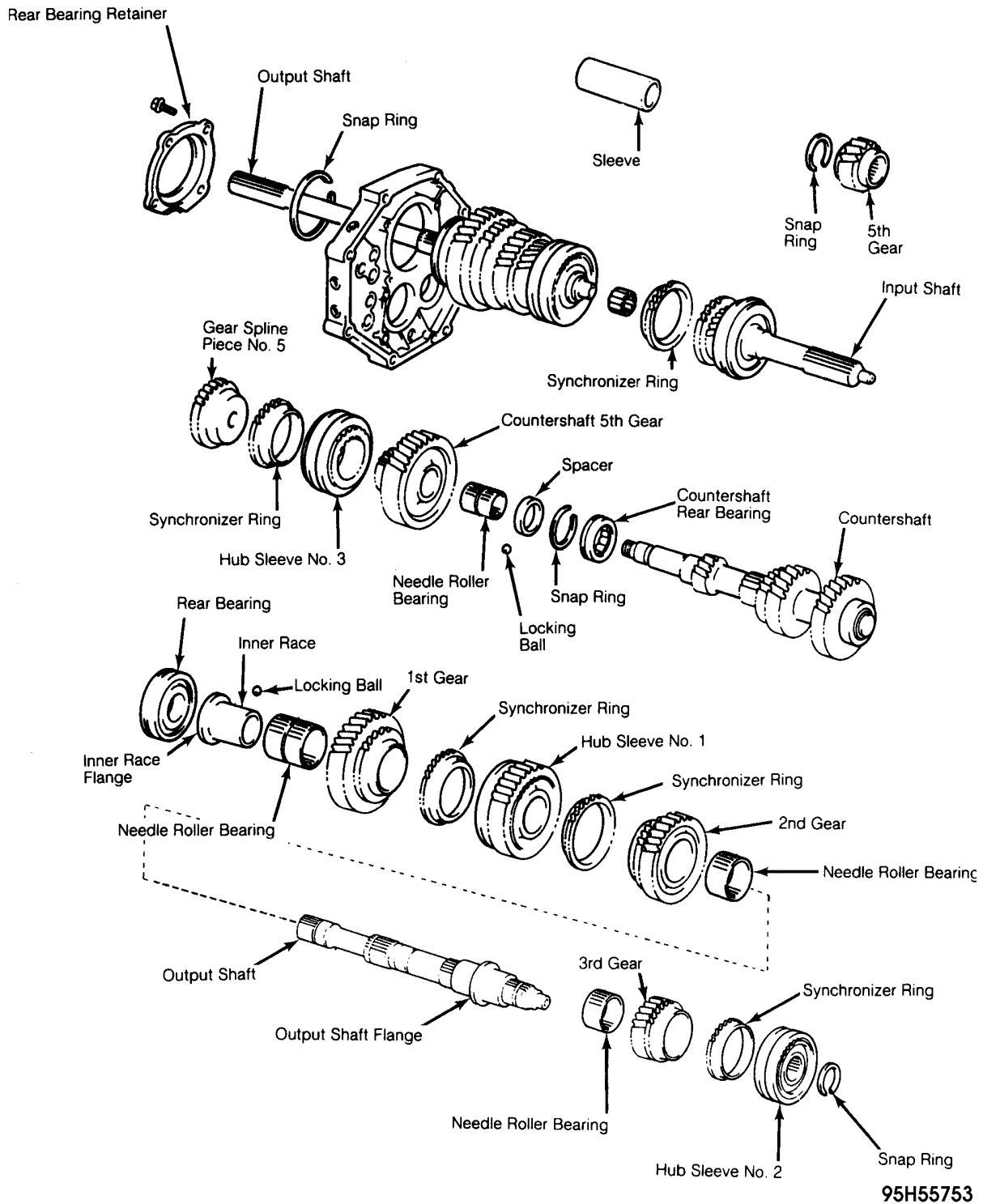


Fig. 6: Exploded View of Toyota G52 Transmission Gears
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3

7-1

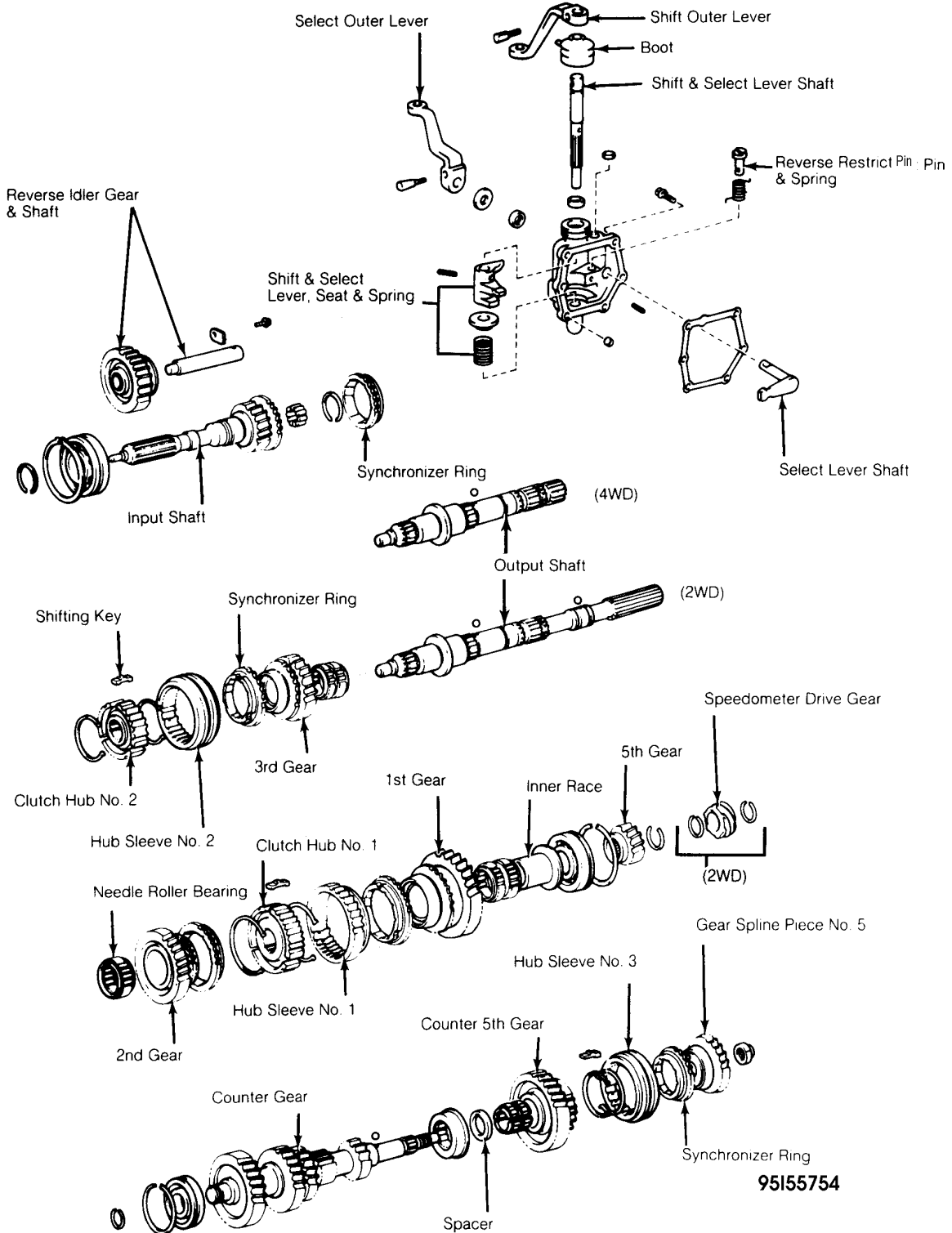


Fig. 7: Exploded View of Toyota G53 Transmission Gears

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Cleaning & Inspection 

1. Clean all parts in solvent. Inspect output shaft and inner race for wear or damage. Using caliper, measure output shaft flange thickness and inner race flange thickness. See OUTPUT SHAFT SPECIFICATION table.
2. Using micrometer, measure outer diameter of output shaft journal surface and outer diameter of inner race. Mount output shaft between 2 "V" blocks and measure shaft runout at center of shaft.

OUTPUT SHAFT SPECIFICATIONS

Application	In. (mm)
Output Shaft Flange	
Minimum Thickness	.1890 (4.80)
Inner Race Flange	
Minimum Thickness	.1571 (3.99)
Inner Race Outer Diameter	
Minimum Diameter	1.5348 (38.985)
Output Shaft Journal (Outer Diameter)	
Minimum Diameter	
2nd Gear	1.4954 (37.984)
3rd Gear	1.3773 (34.984)
Maximum Runout	.002 (.05)

3. Using dial indicator, measure oil clearance between 1st gear and inner race with needle roller bearing installed. See GEAR-TO-SHAFT OIL CLEARANCE SPECIFICATIONS table. If clearance exceeds limit, replace gear, inner race or needle roller bearing.
4. Measure oil clearance between output shaft and 2nd gear between shaft and 3rd gear. Measure oil clearance between countershaft and 5th gear. If clearance exceeds limit, replace gear, needle roller bearing or shaft.

GEAR-TO-SHAFT OIL CLEARANCE SPECIFICATIONS

Application	Standard In. (mm)	Maximum In. (mm)
1st Gear-to-Inner Race	.00035-.00126	.00126
	(.009-.032)	(.032)
2nd Gear-to-Shaft	.00035-.00130	.00130
	(.009-.033)	(.033)
3rd Gear-to-Shaft	.00035-.00130	.00130
	(.009-.033)	(.033)
5th Gear-to-Countershaft	.00035-.00126	.00126
	(.009-.032)	(.032)

5. Check all synchro rings for wear or damage. Turn ring and push in to check braking action. Measure clearance between synchro ring back and gear spline end. See SYNCHRO RING CLEARANCE SPECIFICATIONS table.

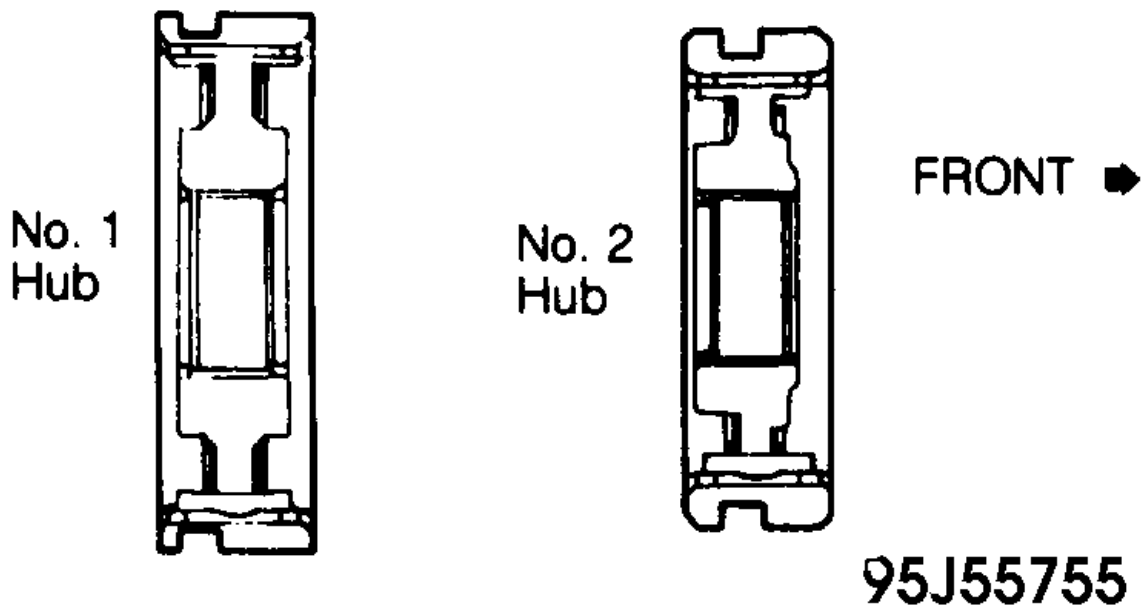
SYNCHRO RING CLEARANCE SPECIFICATIONS

Application	In. (mm)
Standard	.039-.079 (1.0-2.0)
Maximum	.031 (.80)

6. Measure clearance between shift forks and hub sleeves. Maximum clearance is .039" (1.0 mm).

Reassembly

1. Install clutch hub and shifting keys in hub sleeve. See [Fig. 8](#). Install shifting key springs under shifting keys. Install key springs so end gaps are not in line.



[Fig. 8: Sectional View of Clutch Hubs](#)

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Apply gear oil to shaft and needle roller bearing. Place synchro ring on gear and align ring slots with shifting keys. Install needle roller bearing in 3rd gear.

- Press 3rd gear and No. 2 hub sleeve on output shaft. Select and install snap ring from NO. 2 HUB SLEEVE SNAP RINGS table that will allow minimum axial end play. Using feeler gauge, measure 3rd gear thrust clearance to ensure it is correct.

NO. 2 HUB SLEEVE SNAP RINGS

Mark	Thickness (mm)
C-1	1.75-1.80
D	1.80-1.85
D-1	1.85-1.90
E	1.90-1.95
E-1	1.95-2.00
F	2.00-2.05
F-1	2.05-2.10

- Install synchro ring on 2nd gear and align ring slots with shifting keys. Install needle roller bearing in 2nd gear. Press 2nd gear and No. 1 hub sleeve onto shaft.
- Install locking ball in output shaft. Apply gear oil to needle roller bearing and assemble 1st gear, synchro ring, needle roller bearing and bearing inner race.
- Install assembly on output shaft with synchro ring slots aligned with shifting keys. Turn inner race to align with locking ball.
- Press bearing on output shaft with outer snap ring groove toward rear. Using feeler gauge, measure 1st and 2nd gear thrust clearance to ensure it is correct. See [Fig. 5](#).
- Press 5th gear on end of output shaft. Select and install snap ring from [5TH GEAR SNAP RINGS](#) that will allow minimum axial end play.

5TH GEAR SNAP RINGS

Mark	Thickness (mm)
A	2.67-2.72
B	2.73-2.78
C	2.79-2.84
D	2.85-2.90
E	2.91-2.96
F	2.97-3.02
G	3.03-3.08
H	3.09-3.14
J	3.15-3.20
K	3.21-3.26
L	3.27-3.32

INPUT SHAFT & FRONT BEARING RETAINER

- Inspect input shaft and bearing for wear or damage. If necessary, press new bearing on input shaft. Select and install snap ring from INPUT SHAFT SNAP RINGS table that will allow minimum axial end play.

2. Inspect front input shaft bearing retainer for damage. Replace oil seal. Install oil seal .48-.52" (12.2-13.2 mm) below transmission case surface.

INPUT SHAFT SNAP RINGS

Mark	Thickness (mm)
0	2.05-2.10
1	2.10-2.15
2	2.15-2.20
3	2.20-2.25
4	2.25-2.30
5	2.30-2.35

COUNTERSHAFT

1. Inspect countershaft gear teeth for wear or damage. Check front bearing for wear or damage. Replace worn parts if necessary.
2. Bearing may be pressed off shaft after removing snap ring. When pressing new front bearing on countershaft, select and install snap ring from COUNTERSHAFT SNAP RINGS that will allow minimum axial end play.

COUNTERSHAFT SNAP RINGS

Mark	Thickness (mm)
1	2.05-2.10
2	2.10-2.15
3	2.15-2.20
4	2.20-2.25
5	2.25-2.30
6	2.30-2.35

REVERSE RESTRICT PIN

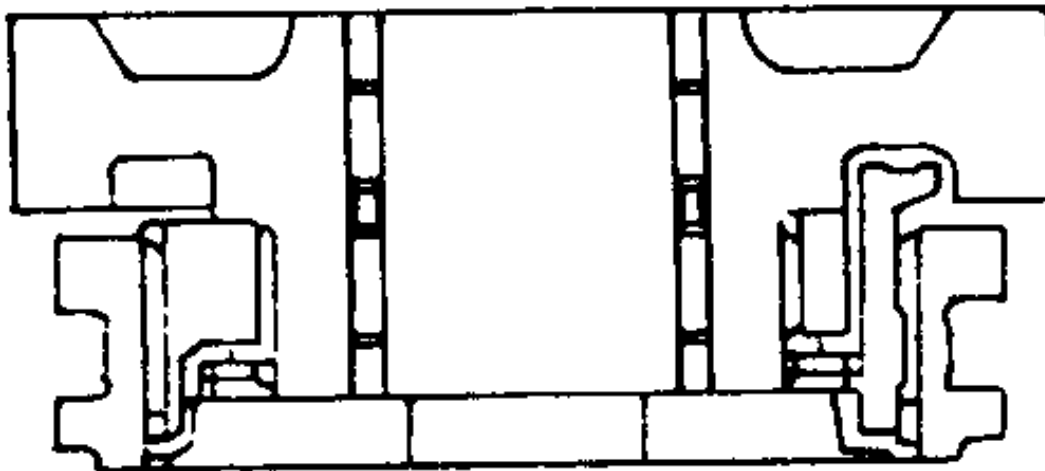
1. Check reverse restrict pin for wear or damage. To replace restrict pin, remove screw plug using Torx head socket. Drive out slotted spring pin with punch and hammer.
2. Pull off lever housing and slide out shaft. Install lever housing and drive in slotted spring pin. Install and tighten screw plug.

TRANSMISSION REASSEMBLY

INTERMEDIATE PLATE

Input, Output & Countershafts

1. Install sleeve on output shaft using plastic hammer. Place intermediate plate in vise. Apply grease to needle roller bearings and install in input shaft. Install output shaft in intermediate plate by pulling on output shaft and tapping on plate.
2. Apply grease to needle roller bearings and install in output shaft. Install input shaft on output shaft with synchro ring slots aligned with shifting keys. Install countershaft on intermediate plate.
3. Install countershaft rear bearing using hammer and Installer (09316-60010). Install output shaft rear bearing snap ring. Ensure snap ring is flush with intermediate plate surface. Install rear bearing retainer.
4. Install reverse shift arm bracket. Install ball and spacer. Install shifting keys and hub sleeve No. 3 onto the countershaft 5th gear. See [Fig. 9](#) . Install shifting key springs under shifting keys, being sure end gaps are not in line.



FRONT OF VEHICLE ▲

95A55756

[Fig. 9: Sectional View of 5th Countershaft Gear & No. 3 Hub Sleeve](#)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. Install 5th gear, hub sleeve No. 3 and bearings onto countershaft. Install synchro ring on gear spline piece No. 5. Using Installer (09316-60010), support front of countershaft with 5

lb. hammer and drive in gear spline piece No. 5 with synchro ring slots aligned with shifting keys.

6. Install and tighten lock nut on rear of countershaft. Stake nut after installation. Measure countershaft 5th gear thrust clearance to ensure it is correct. See [Fig. 4](#).
7. Connect reverse shift arm to reverse shift arm bracket. Install reverse idler gear on countershaft. Align reverse shift arm shoe to reverse idler gear groove. Insert reverse idler gear shaft in intermediate plate. Install reverse idler gear shaft stopper and tighten bolt.

G52 Shift Fork Shafts

1. Place shift forks No. 1 and No. 2 in groove of hub sleeves No. 1 and No. 2. Install fork shaft No. 2 through intermediate plate and in shift forks No. 1 and No. 2.
2. Apply grease to interlock pins. Using magnet and screwdriver, install No. 1 shift fork shaft interlock pin in intermediate plate.
3. Place interlock pin in hole in No. 1 shift fork shaft. Install No. 1 shift fork shaft through intermediate plate and into shift fork No. 1.
4. Install No. 3 shift fork shaft interlock pin in intermediate plate. Install interlock pin in No. 3 shift fork shaft hole. Install No. 3 shift fork shaft through intermediate plate and into reverse shift arm.
5. Install reverse shift head onto fork shaft No. 5. Insert fork shaft No. 5 through intermediate plate while sliding reverse shift head into shift fork shaft No. 3. Using magnet and screwdriver, install locking ball into reverse shift head hole. Shift hub sleeve No. 3 to 5th gear position.
6. Place shift fork No. 3 onto No. 3 hub sleeve. Slide shift fork shaft No. 4 through No. 3 shift fork and into reverse shift head. Install shift fork shaft No. 4 locking ball in intermediate plate. Slide shift fork shaft No. 4 through intermediate plate.
7. Check shaft operation. Slide shift fork shaft No. 1 to 1st gear position. No other fork shaft should move. Drive roll pins into each shift fork, reverse shift arm and reverse shift head. Install 2 fork shaft "E" rings.
8. Install remaining locking balls and springs in intermediate plate. Short spring is installed in bottom hole of intermediate plate. Apply liquid sealer to plugs and install.

G53 Shift Fork Shafts

1. Install shift fork and shaft No. 1, 1st and 2nd shift head, and interlock pin. Install shift fork shaft No. 2, shift fork No. 2, and interlock pin. Install shift fork shaft No. 4 and reverse shift head.
2. Install shift fork shaft No. 3, shift fork No. 3, and 2 locking balls. Check interlock for movement. When shifter shaft No. 1 is in 1st speed position, fork shafts No. 2, No. 3 and No. 4 should not move.
3. Install 4 slotted spring pins. Install 2 fork shaft "E" rings. Install locking balls, springs and screw plugs.

G52 TRANSFER ADAPTER

1. Dismount intermediate plate from vise and remove nuts, bolts and washers. Using new gasket, install transmission case to intermediate plate. Install 2 front bearing snap rings.

2. Install front bearing retainer with new gasket. Apply liquid sealer to retainer bolts. Install and tighten bolts. Install new gasket on intermediate plate. Install transfer adapter with 8 attaching bolts.
3. Insert shift lever housing to transfer adapter and connect fork shafts. Insert shift lever shaft to transfer adapter and shift lever housing. Install and tighten shift lever housing bolt. Install and tighten Allen plug on rear of transfer adapter. Apply liquid sealer to locking ball plug. Install locking ball, spring and plug.
4. Ensure input and output shaft rotate smoothly. Ensure transmission shifts easily into all gear positions.
5. Install and tighten restrict pins in transmission case. Black pin is installed on reverse-5th gear side. Install clutch housing and attaching bolts. Install shift lever retainer. Install back-up light switch.

G53 EXTENSION HOUSING (2WD) OR TRANSFER ADAPTER (4WD)

1. Remove intermediate plate from vise. Install transmission case with new gasket to intermediate plate.
2. Install 2 bearing snap rings, front bearing retainer, and new gasket. Install extension housing with new gasket, shift and select lever, and shift lever housing. Install shift lever housing assembly and new gasket.
3. After installing extension housing, check that input shaft and output shaft rotate smoothly and shifting is smooth to all positions. Install clutch housing. Tighten bolts to 27 ft. lbs. (37 N.m). Install back-up light switch, speedometer drive gear, release fork and bearing.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Allen Plug	27 (37)
Back-Up Light Switch	27 (37)
Clutch Housing Bolts	27 (37)
Countershaft Rear Nut ⁽¹⁾	87 (118)
Transfer Adapter Bolts	27 (37)
Front Bearing Retainer Bolts	12 (17)
Locking Ball Screw Plugs	14 (19)
Rear Bearing Retainer	13 (18)
Restrict Pins (G52)	20 (27)
Reverse Idler Gear Shaft Stopper Bolt	13 (18)
Reverse Restrict Pin Plug	14 (19)
Reverse Shift Arm Bracket Bolts	13 (18)
Shift Lever Housing Bolt	28 (38)
Shift Lever Retainer Bolts	13 (18)
Transfer Adapter Bolts	27 (37)
	INCH Lbs. (N.m)

Application	Ft. Lbs. (N.m)
Shift Outer Lever Nut	108 (12)
Select Outer Lever Nut	69 (8)
⁽¹⁾ Stake nut after installation.	

© 2008 Mitchell Repair Information Co., LLC.