

ARTICLE BEGINNING

APPLICATION

TRANSMISSION APPLICATION

Vehicle Application	Transmission Model
4-Speed	
Tercel	
1988-90 Sedan	C140
1987-94 Coupe	C141
5-Speed	
Camry (1985)	C51
Celica (1990-94)	C52 & C53
Corolla	
1985-88	C51
1988-93	C50 & C52
1987-88 FX/FX-16	C52
1990 (All-Trac 4WD)	C52
1994 (A-FE 1.6L)	C50
1994 (7A-FE 1.8L)	C52
MR2 (1985-89)	C52
Nova (1985-88)	C51
Paseo (1992-94)	C150
Prizm (1989-94, RPO MV5)	C52
Tercel (1987-94 Sedan)	C150

IDENTIFICATION

Transmission type is notated on ID label, located on driver door post.

LUBRICATION & ADJUSTMENTS

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

TROUBLESHOOTING

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

ON-VEHICLE SERVICE

DRIVE AXLE SHAFTS

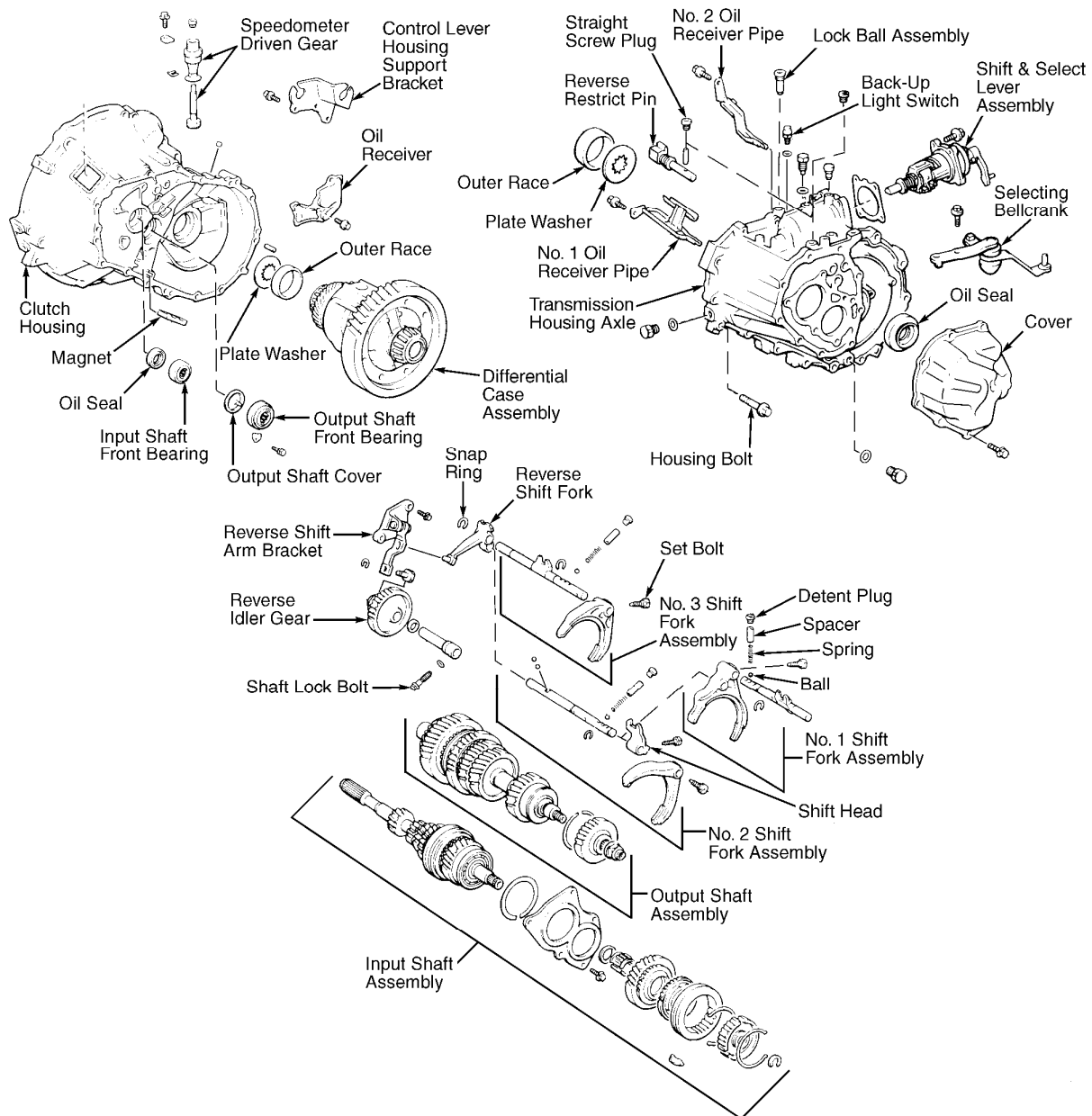
See appropriate AXLE SHAFTS - FRONT article in DRIVE AXLES section.

REMOVAL & INSTALLATION

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

TRANSMISSION DISASSEMBLY

1. Remove speedometer driven gear. Using Socket (09817-16011), remove back-up light switch. Remove control lever housing support bracket. Remove selecting bell crank. On C50, C51, and C52, remove bearing retainer. Remove transmission case cover. See [Fig. 1](#).
2. On C50, C51, C52 and C150, measure 5th gear clearance. See [Fig. 4](#). Using a dial indicator, measure thrust clearance. Standard clearance should be .004-.022" (.10-.57 mm). Service limit is .026" (.65 mm). Record clearance for reassembly reference. Remount dial indicator to measure lateral movement (gear oil clearance) of 5th gear. See [Fig. 4](#). Standard clearance should be .0006-.0023" (.015-.058 mm). Service limit is .0028" (.070 mm).
3. Remove shift and select lever assembly lock bolt. Remove shift and select lever shaft assembly. Lock transmission in 2 gears. Using chisel, lift staked section of output shaft (countershaft) nut. Remove lock nut. On C140 and C141, remove spacer. On all models, unlock transmission from 2 gears.
4. On C50, C51, C52 and C150, remove input shaft (mainshaft) snap ring. Remove bolt from No. 3 shift fork. Remove No. 3 hub sleeve and shift fork. Using 2-jaw puller, remove 5th gear, No. 3 hub, synchronizer ring, needle bearings and spacer. Remove 5th driven gear from output shaft using puller.
5. On all models, remove rear bearing retainer. Remove bearing snap rings. Pull up on both shafts to assist in snap ring removal. Remove reverse idler gear shaft lock bolt. Remove snap ring from No. 2 shift fork shaft. Remove all plugs, lock balls, seats and springs. Remove attaching bolts from transmission housing. Use soft-faced hammer to loosen and remove housing. Remove reverse idler gear, thrust washer and shaft. Remove reverse shift arm bracket. Remove input and output shafts with shift forks as a single assembly. Remove differential assembly. Remove magnet and oil receiver.



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Fig. 1: Transmission Assembly (C150 Shown; C50, C52 & C141 Similar)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

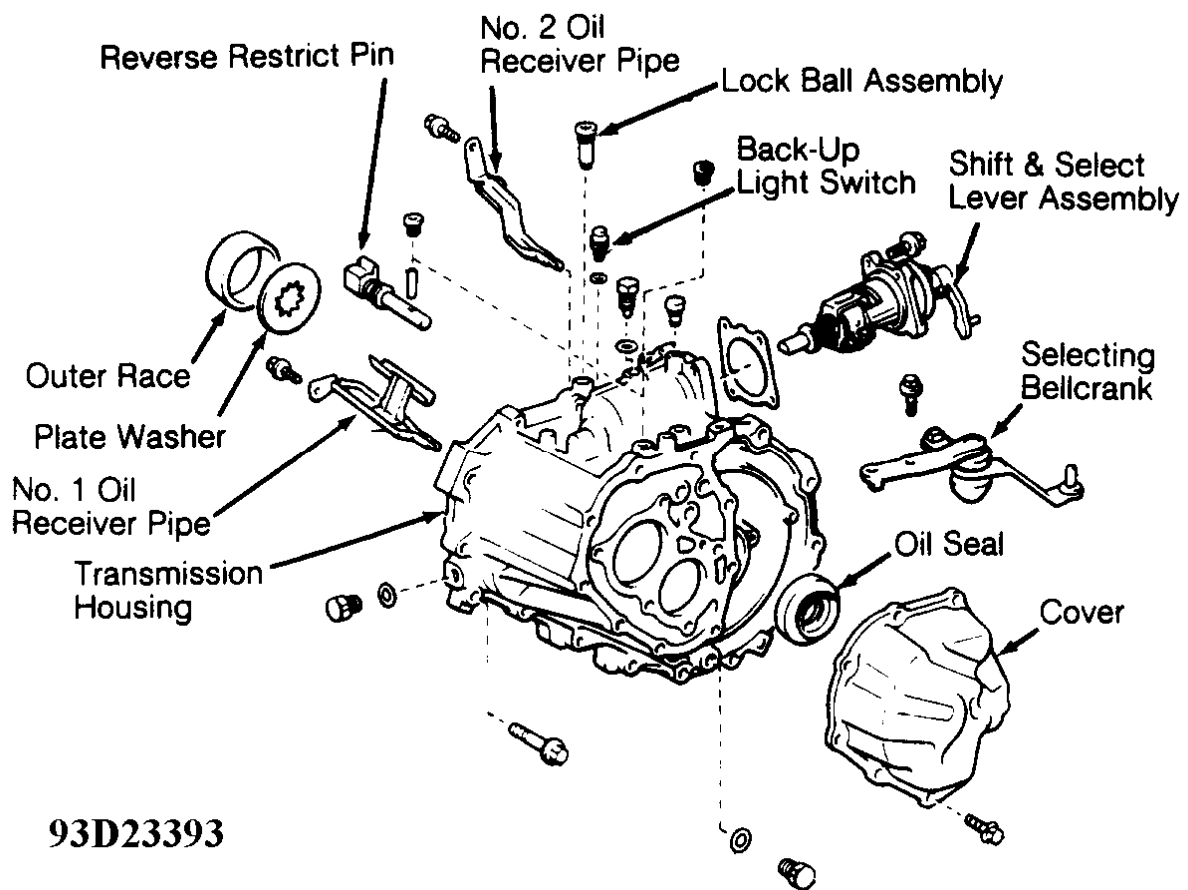
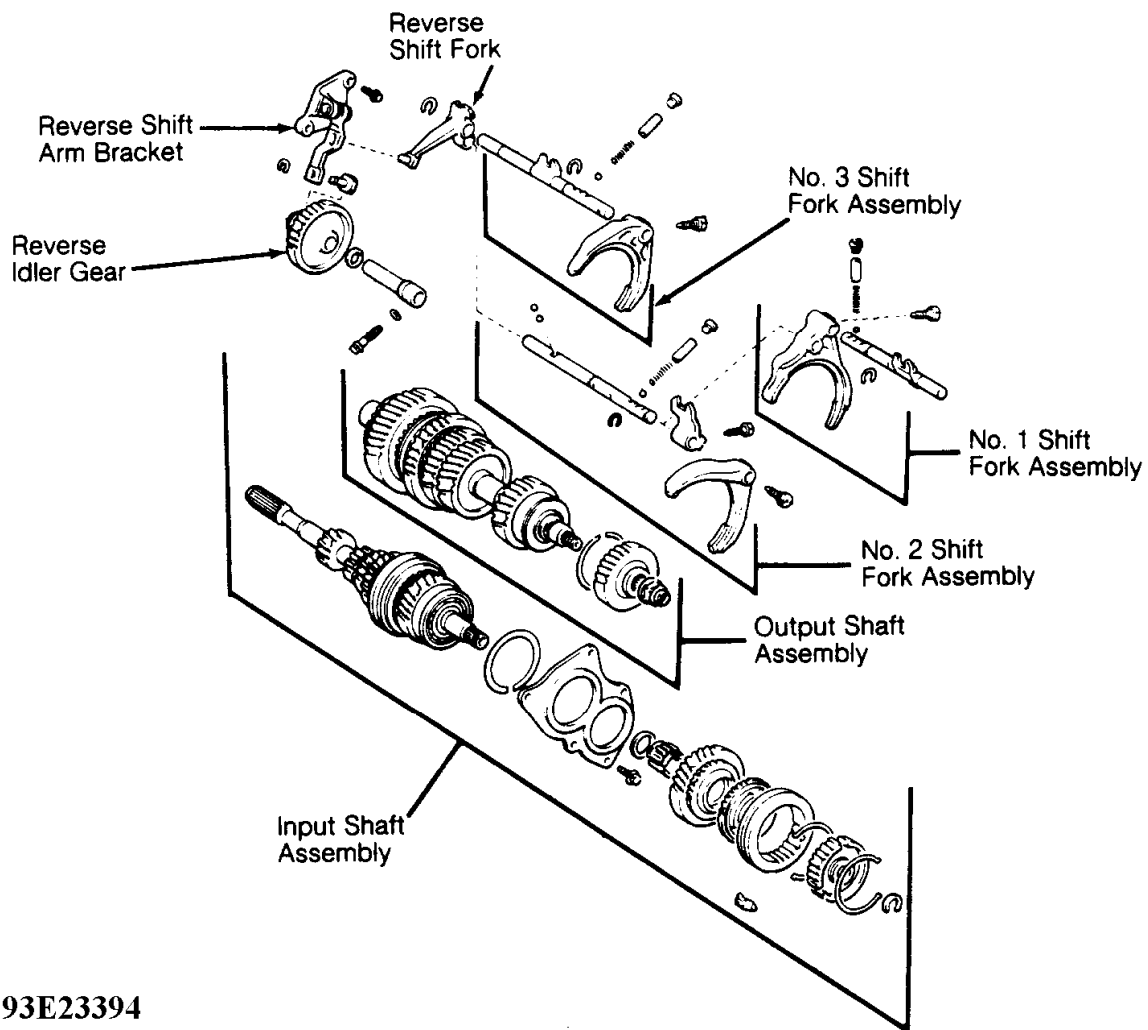


Fig. 2: Exploded View of Transmission Assembly (2 of 3)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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Fig. 3: Exploded View of Transmission Assembly (3 of 3)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

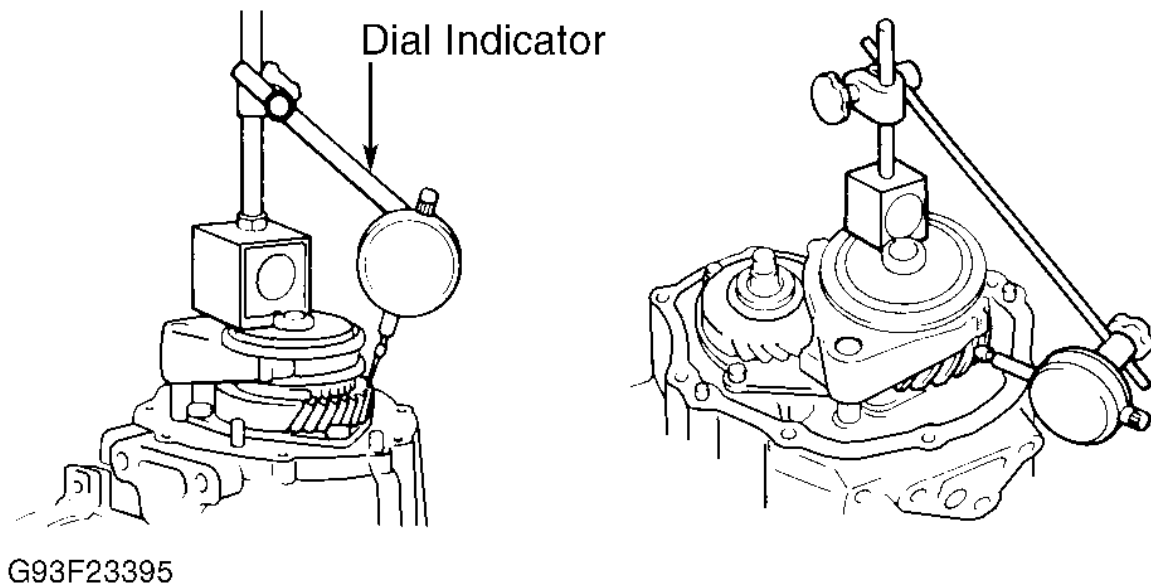
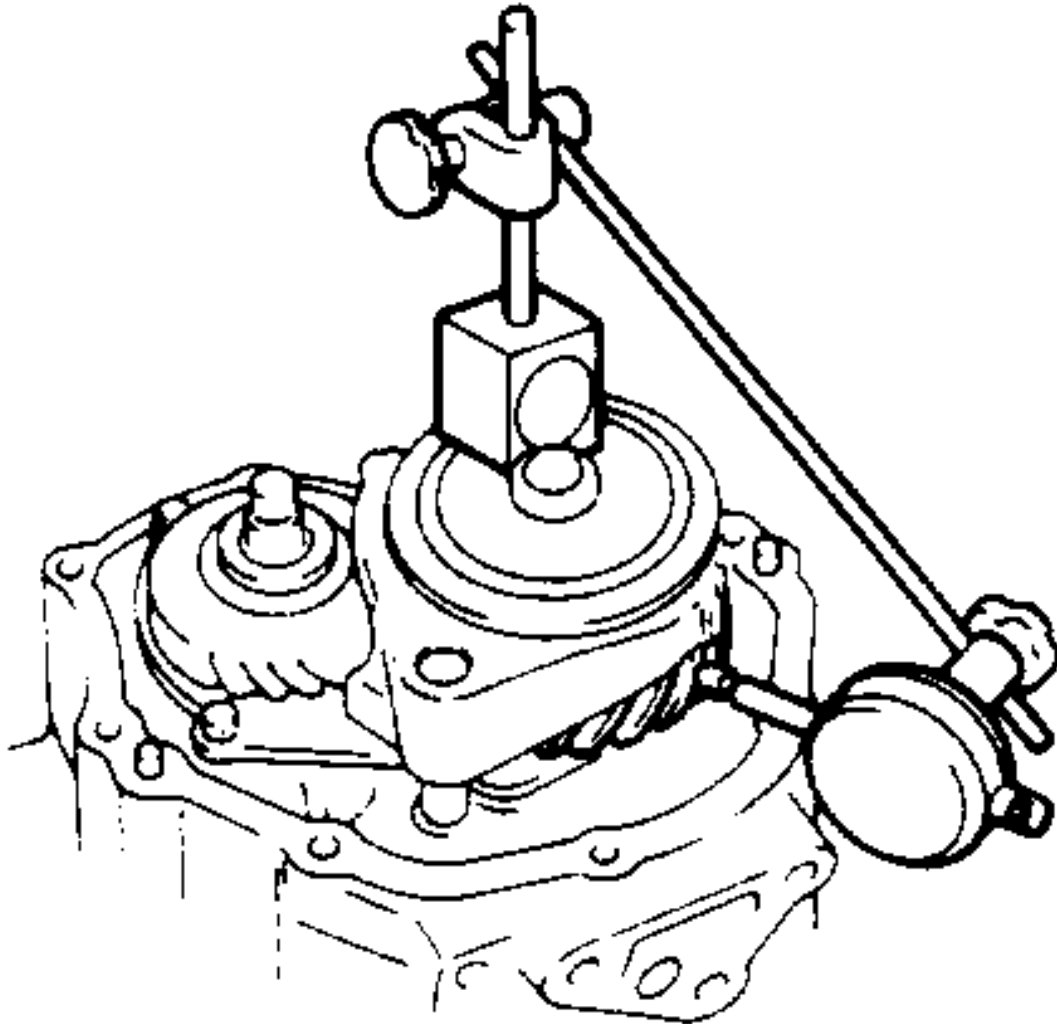


Fig. 4: Measuring 5th Gear Clearances (1 of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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Fig. 5: Measuring 5th Gear Clearances (2 of 2)

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COMPONENT DISASSEMBLY & REASSEMBLY 

INPUT SHAFT (MAINSHAFT)

Disassembly

1. For all clearance specifications, refer to INPUT SHAFT SPECIFICATIONS table. Using feeler gauge, measure 3rd gear and 4th gear thrust clearances. Secure input shaft in soft jaw vise. Using dial indicator, measure 3rd gear and 4th gear lateral movements (gear oil clearance). If clearance exceeds service limit, replace gear, needle bearing and/or shaft.
2. Remove input shaft snap ring. Using bearing splitter or blocks, press out ball bearing. Remove 4th gear, needle bearings, spacer and synchronizer ring from input shaft. Remove No. 2 hub sleeve snap ring. Support 3rd gear, and press No. 2 hub and sleeve, 3rd gear, synchronizer ring and needle bearings from input shaft. See [Fig. 6](#).

INPUT SHAFT SPECIFICATIONS

Application	Specification
3rd Gear Thrust Clearance	
Standard	.004-.014" (.10-.35 mm)
Service Limit	.016" (.40 mm)
4th Gear Thrust Clearance	
Standard	.004-.022" (.10-.55 mm)
Service Limit	.024" (.60 mm)
3rd & 4th Gear Lateral Movement	
Standard	.001-.002" (.02-.06 mm)
Service Limit	.003" (.07 mm)

Inspection

1. Inspect all parts for damage and wear. Replace if necessary. Clean all parts in new solvent, then dry and lubricate all parts. Ensure oil passages are free of contamination.
2. Measure input shaft at points "A", "B", "C" and "D". See [Fig. 6](#). Support input shaft on "V" blocks. Using dial indicator, measure runout while rotating input shaft 2 complete revolutions. Replace input shaft if runout or any part of shaft is not within specification. See [INPUT SHAFT BEARING SURFACE SPECIFICATIONS](#) table.

INPUT SHAFT BEARING SURFACE SPECIFICATIONS

Application ⁽¹⁾	Minimum Diameter: In. (mm)
"A" Ball Bearing Surface ⁽²⁾	.979 (24.87)
"B" Needle Bearing Surface	
C50 & C51	1.042 (26.47)
C140, C141 & C150	1.141 (28.97)
"C" Needle Bearing Surface	1.219 (30.97)
"D" Ball Bearing Surface	.983 (24.97)
Runout Limits	.002 (.05)
⁽¹⁾ "A", "B", "C" and "D" are measuring points. See Fig. 6 .	

Application ⁽¹⁾	Minimum Diameter: In. (mm)
⁽²⁾ C50, C51, C52 and C150 transmissions only.	

Reassembly

1. Reassemble components in reverse order of disassembly. Support No. 2 hub assembly when pressing input shaft into 3rd gear and hub. Select snap ring that allows minimum axial movement. Snap rings are available in .06-mm increments. Snap rings range in thickness from .091" (2.30 mm) to .102" (2.60 mm). Snap rings are marked "A" through "F".
2. Recheck 3rd gear thrust clearance. See INPUT SHAFT SPECIFICATION table. Install remaining components. Use press to install ball bearing. Select snap ring that allows minimum axial movement. Recheck 4th gear thrust clearance.

OUTPUT SHAFT (COUNTERSHAFT)

Disassembly

1. For all clearance specifications, refer to OUTPUT SHAFT SPECIFICATIONS table. Using feeler gauge, measure 1st and 2nd gear thrust clearances. Secure input shaft in soft jaw vise. Using dial indicator, measure 1st and 2nd gear lateral movement (gear oil clearance). If clearance exceeds maximum, replace gear, needle bearing and/or shaft.

OUTPUT SHAFT SPECIFICATIONS

Application	Specification
1st Gear Thrust Clearance	
Standard	.004-.016" (.10-.40 mm)
Service Limit	.018" (.45 mm)
2nd Gear Thrust Clearance	
Standard	.004-.018" (.10-.45 mm)
Service Limit	.020" (.50 mm)
1st & 2nd Gear Lateral Movement	
Standard	.001-.002" (.02-.06 mm)
Service Limit	.003" (.07 mm)

2. Using bearing splitter or appropriate blocks, support 4th gear and press output shaft out of ball bearing and 4th driven gear. Remove spacer. Shift No. 1 hub sleeve into 1st gear. Support 2nd gear and press output shaft out of 3rd driven gear and 2nd gear. Remove needle bearing and synchronizer ring. Remove snap ring. See [Fig. 6](#).
3. Support 1st gear, and press output shaft out of No. 1 hub sleeve, 1st gear and synchronizer ring. Remove needle roller bearing, thrust washer and locking ball.

Inspection

1. Inspect all parts for damage and wear. Replace if necessary. Clean all parts in new solvent, then dry and lubricate all parts. Ensure oil passages are free of contamination.

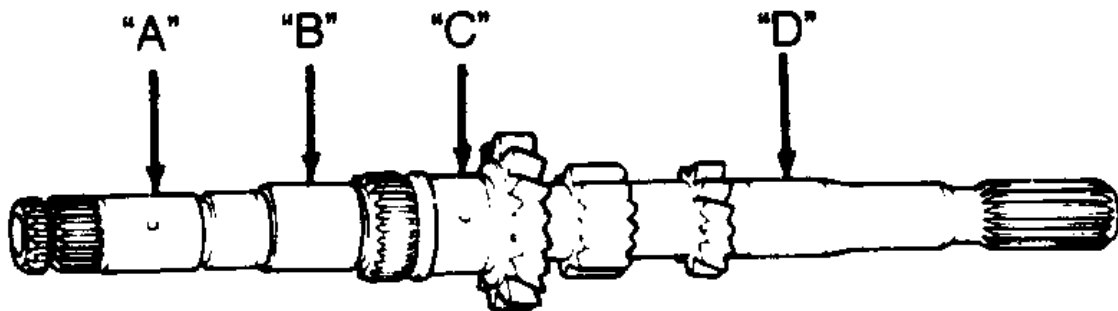
2. Measure output shaft at points "A", "B", and "C". See [Fig. 6](#) . Support output shaft on "V" blocks. Using dial indicator, measure runout while rotating output shaft 2 complete revolutions. Replace output shaft if runout or any part of shaft is not within specification. See [OUTPUT SHAFT BEARING SURFACE SPECIFICATIONS](#) table.

OUTPUT SHAFT BEARING SURFACE SPECIFICATIONS

Application ⁽¹⁾	Minimum Diameter: In. (mm)
"A" Ball Bearing Surface	1.298 (32.97)
"B" Needle Bearing Surface	1.495 (37.97)
"C" Needle Bearing Surface	1.259 (31.97)
Runout Limits	.002 (.05)
⁽¹⁾ "A", "B", and "C" are measuring points. See Fig. 6 .	

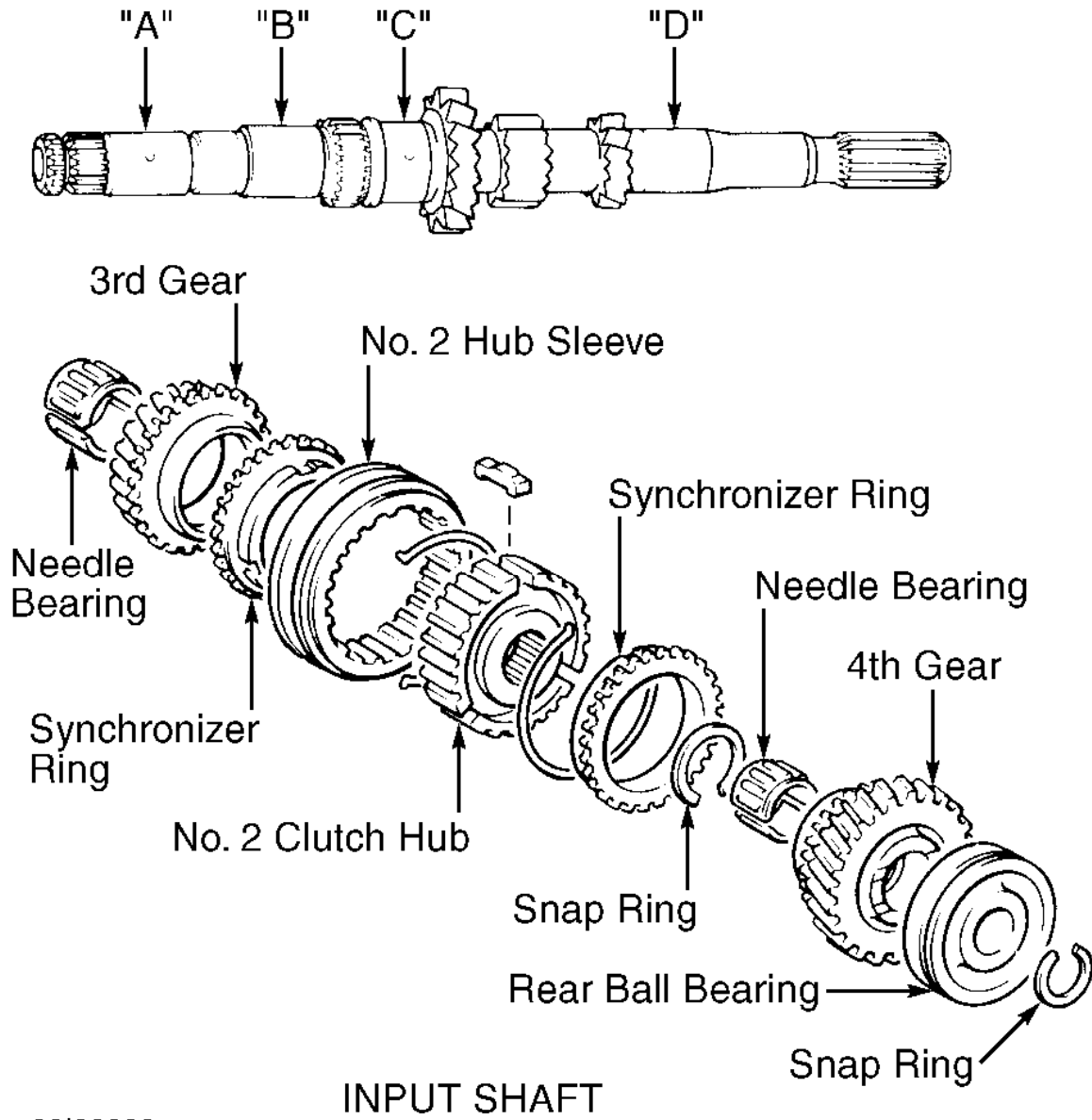
Reassembly

1. If output shaft was replaced, drive roll pin into new output shaft to a depth of .236" (6.0 mm). Apply gear oil to needle bearings. Assemble components in reverse order of disassembly. Support No. 1 hub and press output shaft into 1st gear and No. 1 hub sleeve onto output shaft. See [Fig. 6](#) . Ensure synchronizer ring tabs align properly with mating grooves in clutch hub.
2. Select snap ring that allows minimum axial movement. Snap rings are available in .06-mm increments. Snap rings range in thickness from .098" (2.50 mm) to .110" (2.80 mm). Snap rings are marked "A" through "F".
3. Recheck 1st gear thrust clearance. Refer to OUTPUT SHAFT SPECIFICATIONS table. Install 2nd gear. Press 3rd driven gear onto output shaft. Recheck 2nd gear thrust clearance. Install spacer. Press 4th driven gear and ball bearing onto output shaft. See [Fig. 6](#) .



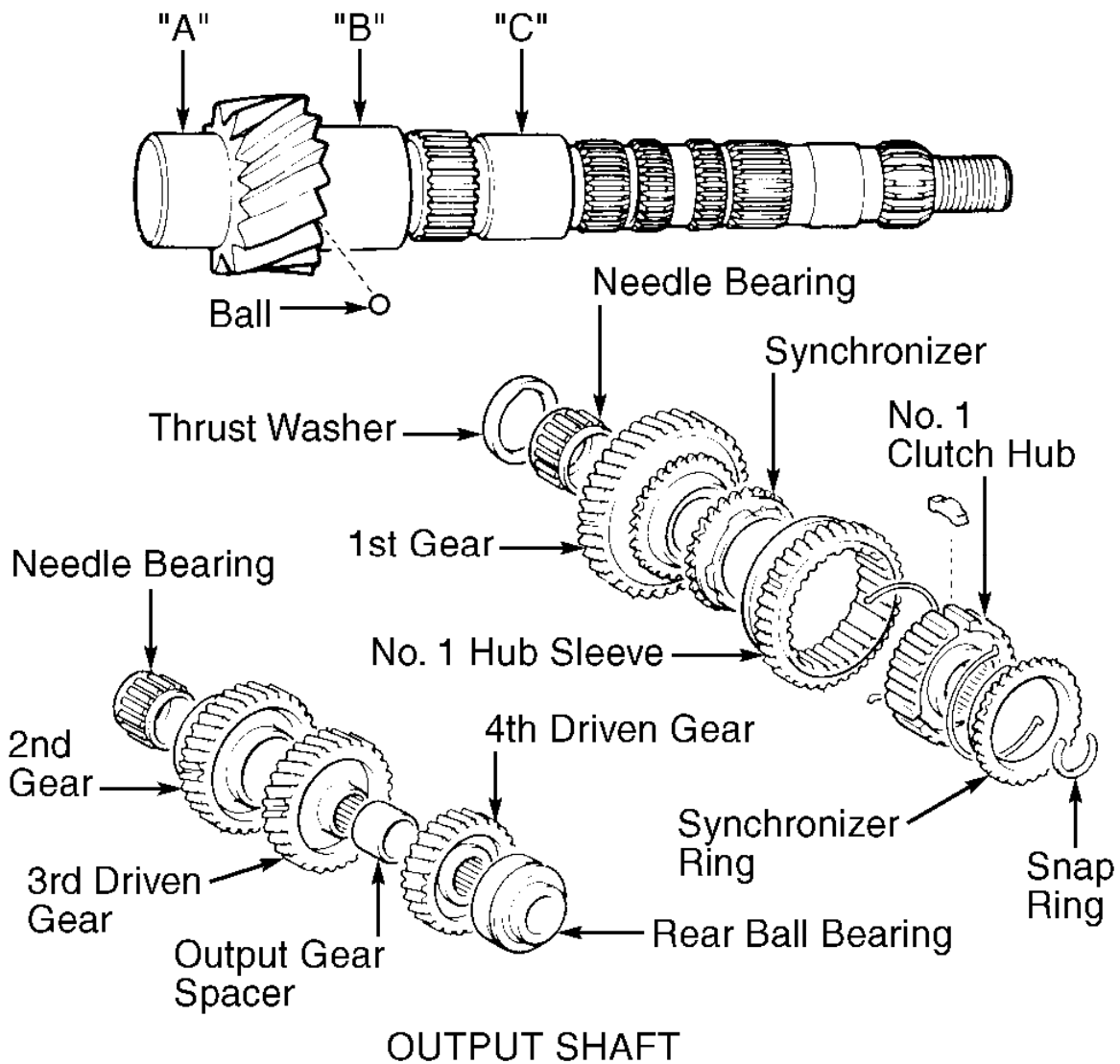
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[Fig. 6: Identifying Input & Output Components \(1 of 4\)](#)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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Fig. 7: Identifying Input & Output Components (2 of 4)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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Fig. 8: Identifying Input & Output Components (3 of 4)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

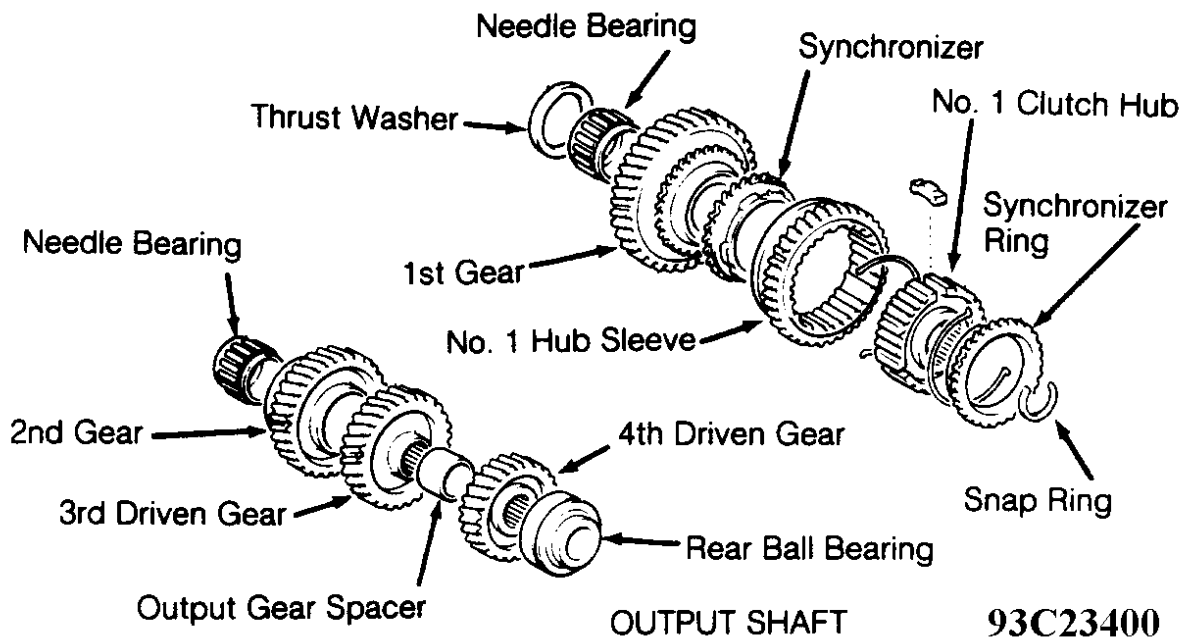


Fig. 9: Identifying Input & Output Components (4 of 4)

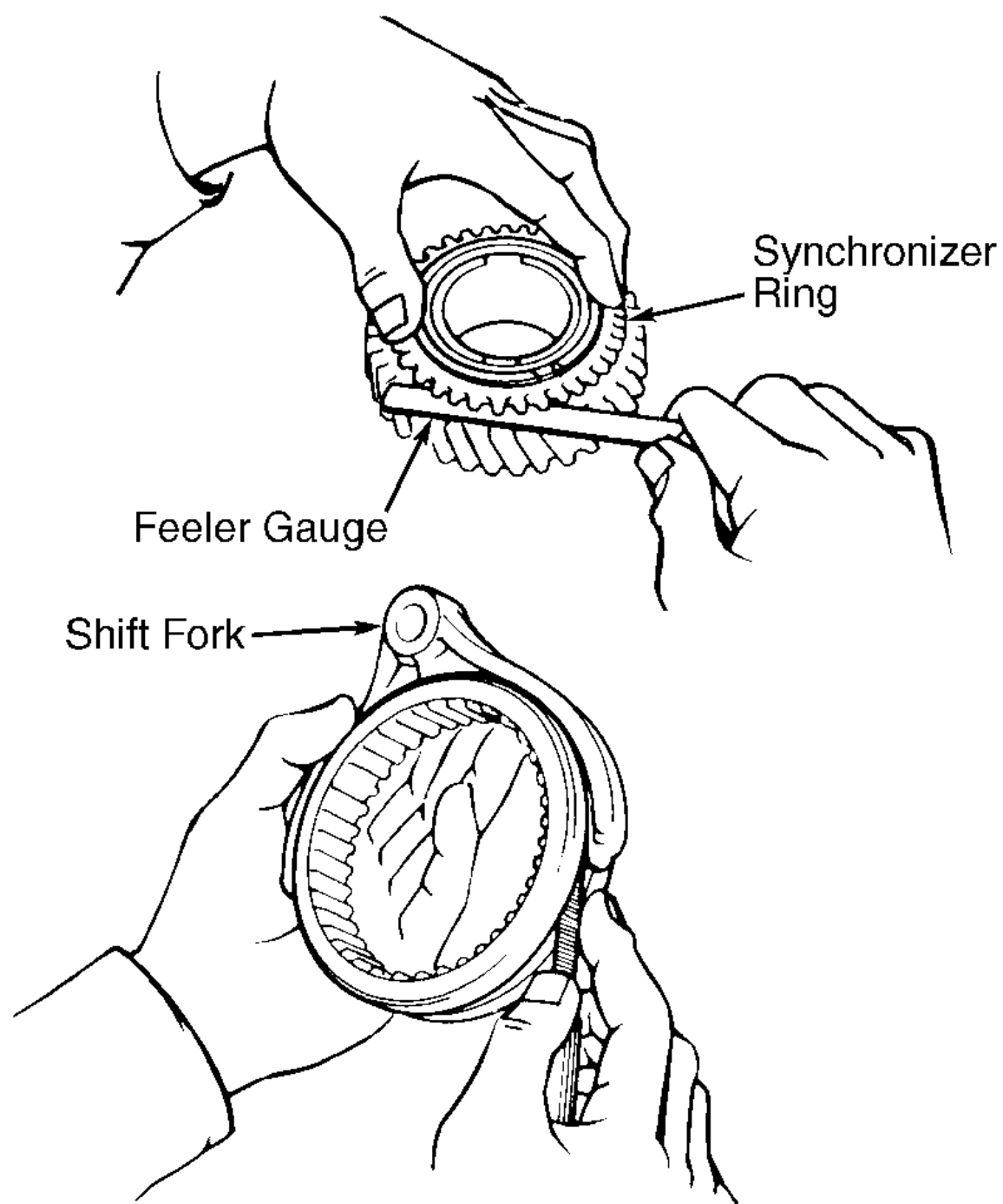
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

SHIFT FORK ASSEMBLY

Measure clearance between hub sleeve and shift fork. Maximum clearance is .039" (1.00 mm). If clearance exceeds specification, replace shift fork or hub sleeve. See [Fig. 10](#).

SYNCHRO RING & GEAR

Check synchronizer rings for wear or damage. Turn and push ring to check braking action. Measure clearance between synchronizer ring back and gear spline end. Minimum clearance is .024" (.60 mm). If clearance is less than specification, replace synchronizer ring. See [Fig. 10](#).



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Fig. 10: Measuring Shift Fork & Synchronizer Ring Clearances (1 of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

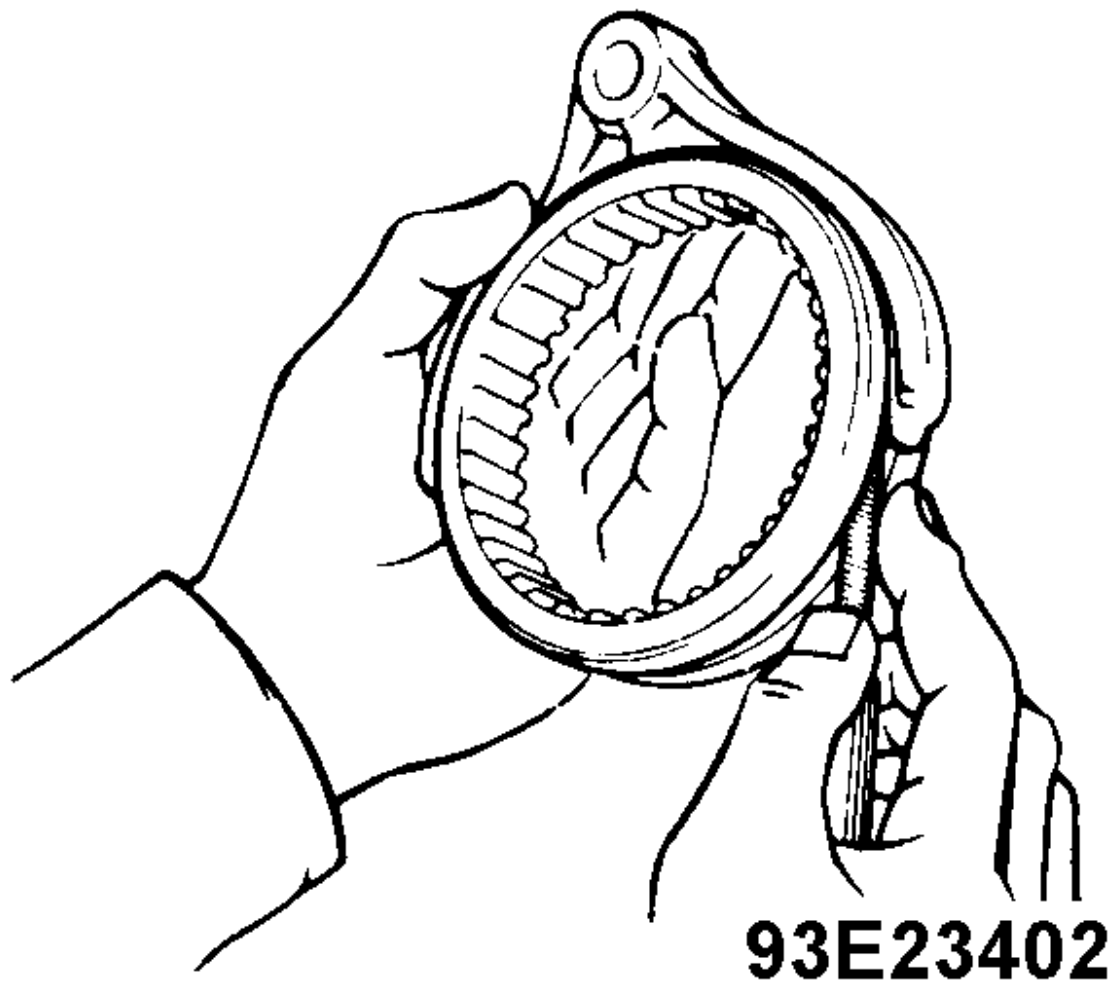


Fig. 11: Measuring Shift Fork & Synchronizer Ring Clearances (2 of 2)

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

SHIFT & SELECT LEVER

Disassembly

1. Remove "E" ring, No. 2 select spring seat and spring. Drive out roll pins from No. 2 shift inner lever. Remove No. 2 shift inner lever. Drive out roll pin from No. 1 shift lever and remove lever and shift interlock plate. See [Fig. 12](#) .

2. Drive out roll pin from select inner lever. Remove select inner lever, spring seat and compression spring. Remove snap ring from lever shaft. Remove control shaft cover. See [Fig. 12](#).

Inspection

If necessary, replace control shaft cover oil seal. Pry oil seal out of cover. Using socket or appropriate drive adapter and hammer, drive in new oil seal. Install to depth of .039-.079" (1.00-2.00 mm). Coat lip of oil seal with grease.

Reassembly

Apply grease to shaft. Install components in reverse order of disassembly.

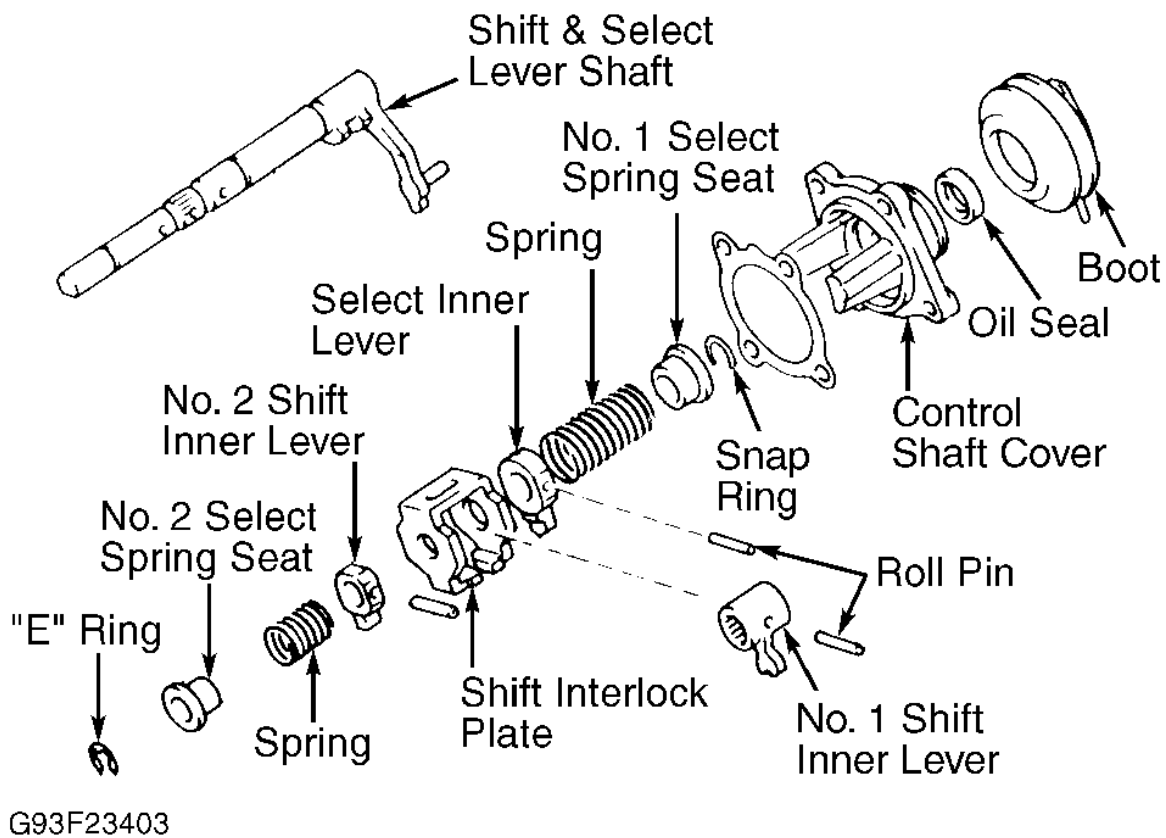


Fig. 12: Exploded View Of Shift & Select Lever Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

DIFFERENTIAL

Disassembly

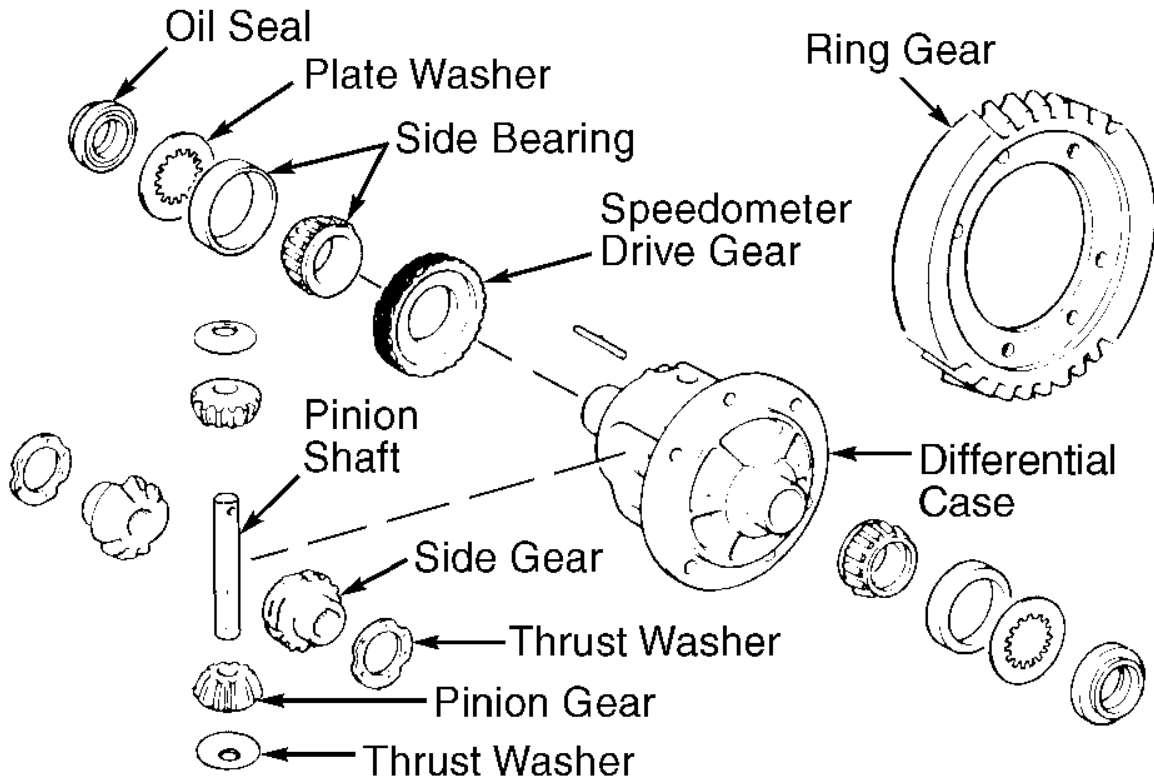


1. Fasten 2-jaw puller under bearing above cutouts on speedometer drive gear. Remove bearing from front differential case. Remove bearing from opposite side of differential case. Mark ring gear and case for reassembly reference. Remove bolts. Using a copper hammer, tap ring gear and remove from differential case.
2. Measure backlash of one side gear while holding one pinion toward case. See [Fig. 14](#) . Backlash should be .002-.008" (.05-.20 mm). If backlash is incorrect, drive out pinion shaft roll pin from ring gear side of case. Remove pinion shaft from case. Remove pinion gears, side gears and thrust washers from case. See [Fig. 13](#) .

Reassembly

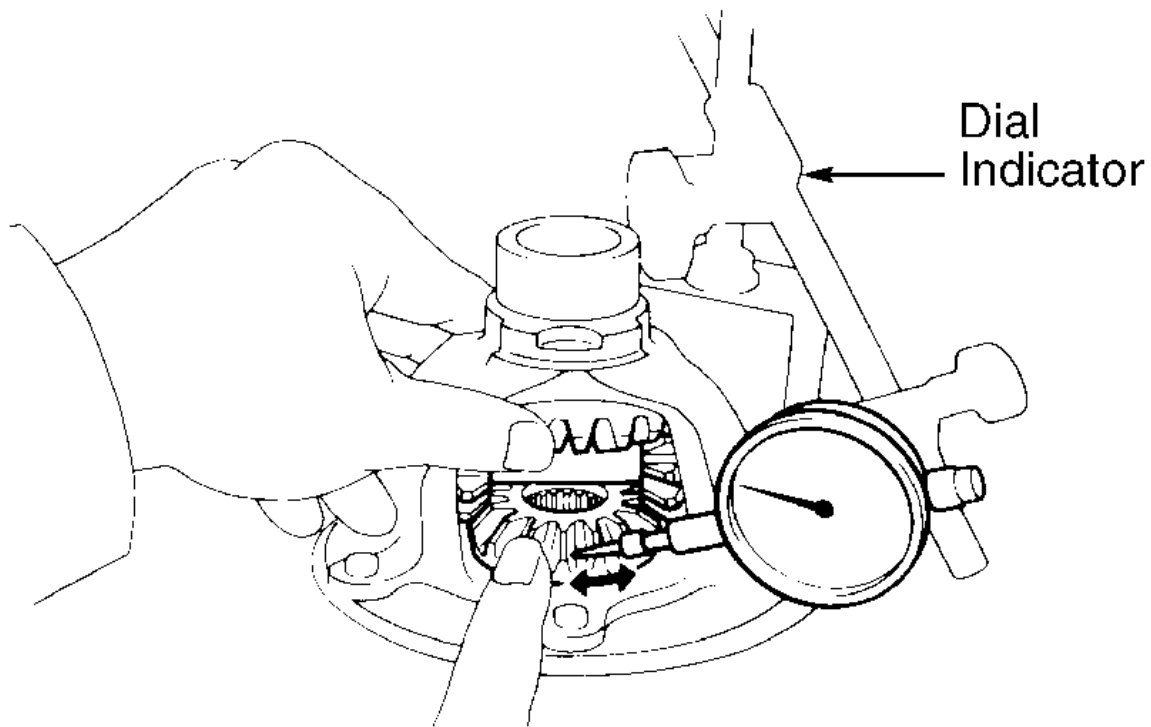


1. If backlash is incorrect, select thrust washer to correct backlash. Install thrust washers to side gears. Install side gear thrust washers, pinion thrust washers and pinion gears. Install pinion shaft. If backlash is correct, use thrust washer removed during disassembly.
2. Recheck side gear backlash while holding one pinion gear toward case. See [Fig. 14](#) . Backlash should be .002-.008" (.20-.50 mm). If backlash is incorrect, disassemble case and install new thrust washers. Install washer of equal size. Side gear thrust washers are available in .05-mm increments. For C140, C141 and C150, washers range in thickness from .059" (1.50 mm) to .689" (1.75 mm). For C50, C51 and C52, washers range in thickness from .95" (.037 mm) to 1.20" (.047 mm).
3. Drive lock pin through case and into pinion shaft. Stake differential case to hold pin in place. Clean ring gear contact surface of case. Heat ring gear to 212°F (100°C) in boiling water.
4. Clean contact surface of ring gear with cleaning solvent. Align ring gear with differential case and install. Install bolts. Tighten bolts to specifications. See [TORQUE SPECIFICATIONS](#) . Press new bearing on differential case.



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Fig. 13: Exploded View Of Differential Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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Fig. 14: Measuring Backlash

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

TRANSMISSION REASSEMBLY

Differential Bearing Preload

1. Install magnet. Install oil receiver. Install differential in transmission housing. Install clutch housing and tighten bolts to 21 ft. lbs. (29 N.m).
2. Using Differential Preload Adapter (09564-32011) and an INCH-lb. torque wrench, measure differential side bearing starting torque. See [Fig. 15](#). Starting torque should be 7-14 INCH lbs. (.8-1.6 N.m) for new bearing and 4-9 INCH lbs. (.5-1.0 N.m) for used bearing. If preload is incorrect, remove transmission case side bearing outer race, and select new adjusting shim. Preload will change about 3-4 INCH lbs. (.3-.4 N.m) with each shim thickness change. Shims are available in .05-mm increments. Shims range in thickness from .083" (2.10 mm) to .118" (3.0 mm). Shims are marked "A" through "U", depending on thickness.

Reassembly

1. Disassemble transmission case. Install input and output shafts with shift fork assemblies as a single unit.
2. Assemble reverse fork pivot and reverse shift arm. Install reverse shift arm bracket into transaxle case. Install and tighten bolts to 13 ft. lbs. (18 N.m). Install reverse idler gear, thrust washer and shaft. Align marking on reverse idler gear shaft with marking on case. Apply Three Bond (1281) sealant to transaxle case. Install transmission housing.

NOTE: This transmission uses no gasket between major housings; use Three Bond (1281) sealant. Assemble housing within 20 minutes after applying liquid gasket. Allow 30 minutes curing time before filling with oil.

3. Insert balls, springs and seats into holes. Apply Three Bond (1344) sealant to plugs and lock ball assembly threads. On C140 and C141, using Socket (09313-30021), install 3 plugs and straight screw plug. On all other models, using socket, install 3 plugs and lock ball assembly. See [Fig. 1](#).
4. On all models, install reverse idler gear shaft. Install bearing snap rings. Install snap ring on No. 2 fork shaft. Install rear bearing retainer. Using Installer (09309-12020), install 5th driven gear onto shaft. Install spacer. Apply gear oil to needle roller bearings. Install 5th gear, needle roller bearing and synchronizer ring.
5. Install No. 3 clutch hub and shifting keys to No. 3 hub sleeve. Install shifting key springs under shifting keys. Ensure key spring end gaps are not in line. Support tip of input shaft with spacer to raise transaxle assembly. Using Installer (09612-22011), drive in No. 3 hub sleeve with shift fork. Align synchronizer ring slots with shifting keys.
6. Measure 5th gear thrust clearance. Standard clearance should be .004-.022" (.10-.57 mm). Select 5th gear snap ring that will allow minimum axial play, and install snap ring. Snap rings are available in .06-mm increments. Snap rings range in thickness from .089" (2.25 mm) to .103" (2.61 mm).
7. Engage 2 gears to lock transmission. On C140 and C141, install spacer. On all models, install and tighten lock nut to 87 ft. lbs. (118 N.m). Disengage gears. Stake lock nut. On C50, C51, C52 and C150, install shift fork bolt. Install shift and select lever shaft assembly with new gasket. Install shift and select lever lock bolt.
8. On all models, apply Three Bond Sealant (1281) to transmission case cover. Install transmission case cover. Using Socket (09817-16010), install back-up light switch. Install speedometer driven gear.

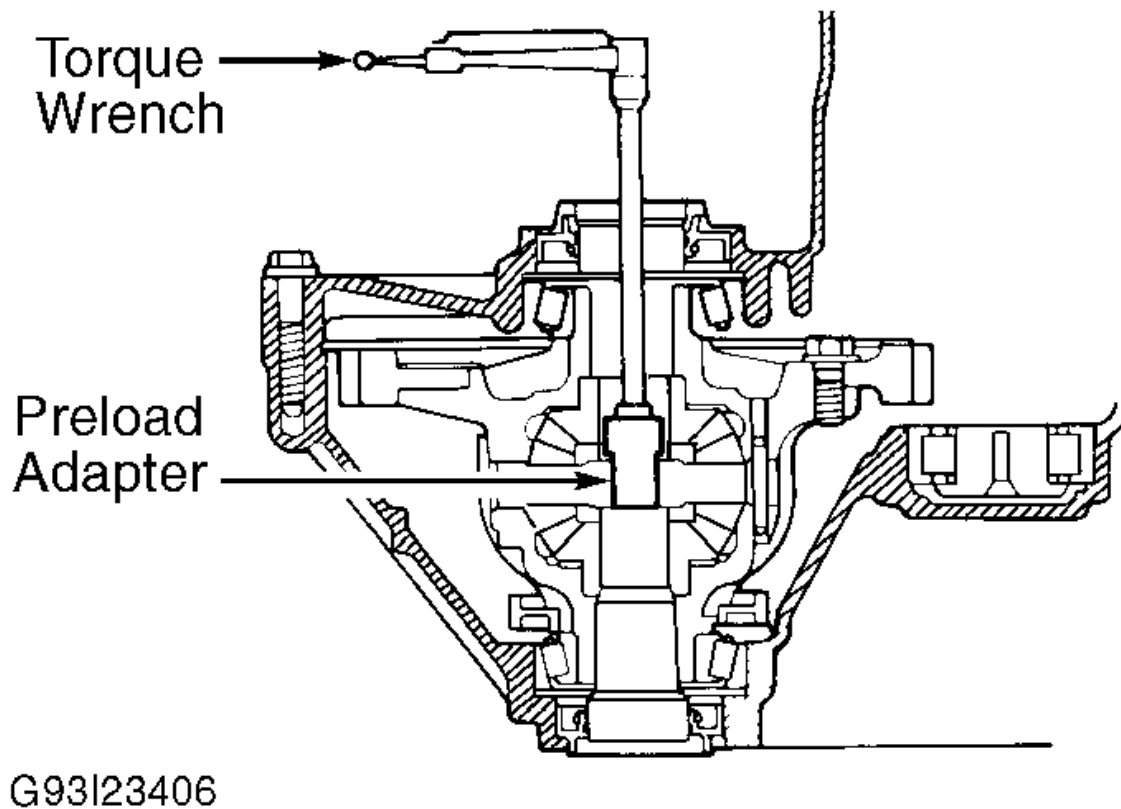


Fig. 15: Measuring Bearing Preload

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

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Back-Up Light Switch	30 (40)
Differential Ring Gear Bolt	91 (124)
Drain & Filler Plugs	29 (39)
Lock Ball Assembly Bolt	29 (39)
Rear Bearing Retainer Bolt	14 (19)
Reverse Idler Shaft Lock Bolt	17 (23)
Reverse Restrict Pin Straight Screw Plug	14 (19)
Reverse Shift Arm Bracket Bolt	13 (18)
Shift Fork Shaft Straight Screw Plug	18 (25)

Application	Ft. Lbs. (N.m)
Shift Fork-To-Shift Fork Shaft Bolt	13 (17)
Shift Interlock Plate Lock Bolt	21 (29)
Shift & Select Lever Assembly Bolt	14 (19)
Transaxle Case-To-Transmission Case Bolt	22 (29)
Transmission Case Cover Bolt	13 (18)
5th Driven Gear Lock Nut	87 (118)
	INCH Lbs. (N.m)
Output Shaft Front Bearing Lock Plate Bolt	97 (11)

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