

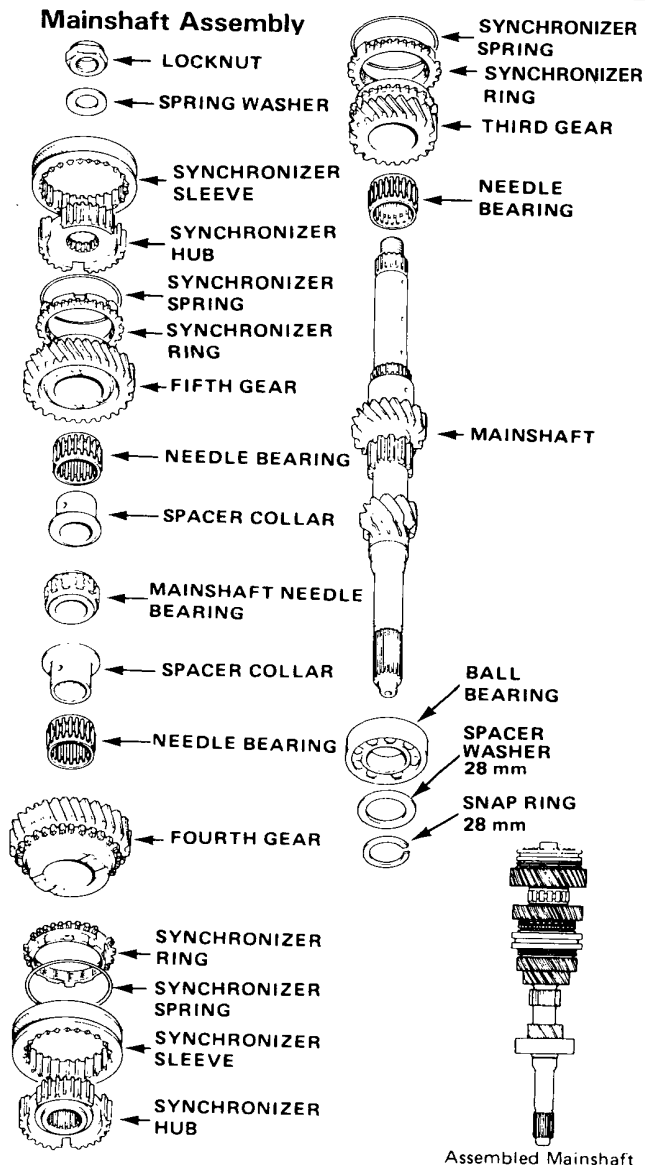
# Mainshaft/Countershaft

## Reassembly and Measurement

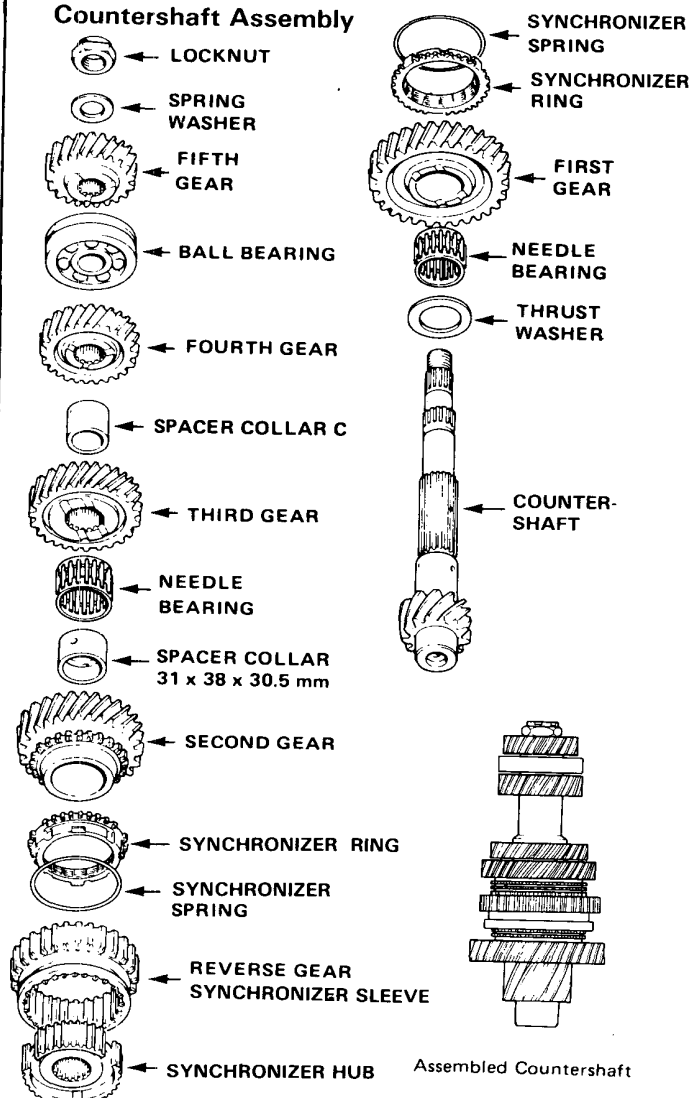
1. Remove both mainshaft and countershaft bearings from transmission housing.
2. Assemble mainshaft and countershaft including bearings and fifth gear components, as shown below. Lubricate all parts with oil before final reassembly.
3. Install mainshaft/countershaft assembly into clutch housing.
4. Install the mainshaft holder to prevent shafts from turning, and shift transmission into gear.
5. Torque the countershaft and mainshaft locknuts to 90 N·m (9.0 kg-m, 65 lb-ft) before checking clearances.
6. Remove transmission shafts from clutch housing and measure clearances as described on next two pages.

**CAUTION:** Incorrect gear clearances can be caused by overtightening the countershaft or mainshaft locknuts. Whenever locknuts are installed, use an accurately calibrated torque wrench.

### Mainshaft Assembly



### Countershaft Assembly





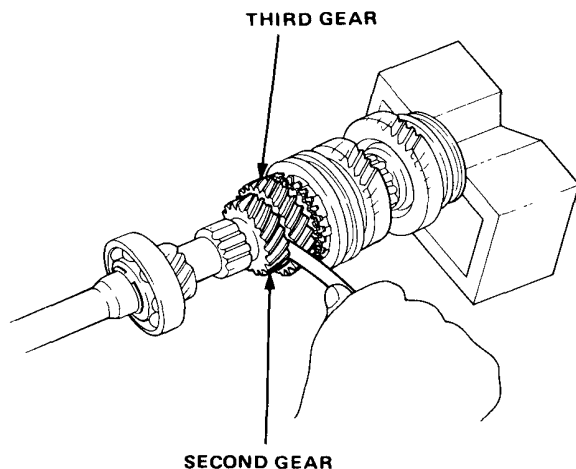
## Mainshaft Measurements

7. Measure clearance between shoulder on third gear and shoulder on second gear.

### THIRD GEAR CLEARANCE

Standard (New): 0.03–0.18 mm  
(0.0012–0.0071 in.)

Service Limit: 0.3 mm (0.012 in.)

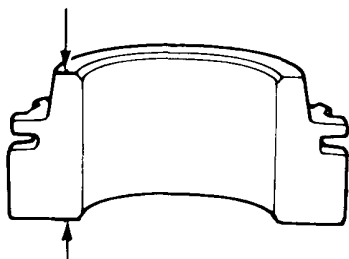


8. If out of tolerance, measure thickness of third gear.

### THIRD GEAR THICKNESS

Standard (New): 31.42–31.47 mm  
(1.237–1.239 in.)

Service Limit: 31.30 mm (1.232 in.)



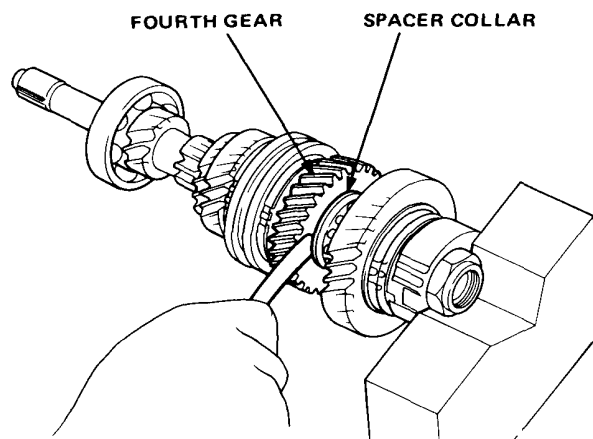
If third gear is OK, replace synchronizer hub if necessary after all other measurements are complete.

9. Measure clearance between spacer collar and shoulder on fourth gear.

### FOURTH GEAR CLEARANCE

Standard (New): 0.03–0.18 mm  
(0.0012–0.0071 in.)

Service Limit: 0.3 mm (0.012 in.)

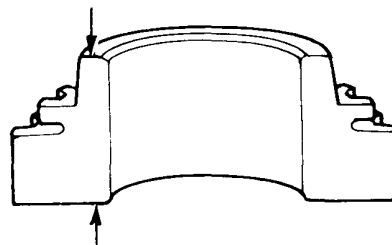


10. If out of tolerance, measure thickness of fourth gear.

### FOURTH GEAR THICKNESS

Standard (New): 31.42–31.47 mm  
(1.237–1.239 in.)

Service Limit: 31.30 mm (1.232 in.)



If fourth gear is OK, replace synchronizer hub if necessary after all other measurements are complete.

(cont'd)

# Mainshaft/Countershaft

## Reassembly and Measurement (cont'd)

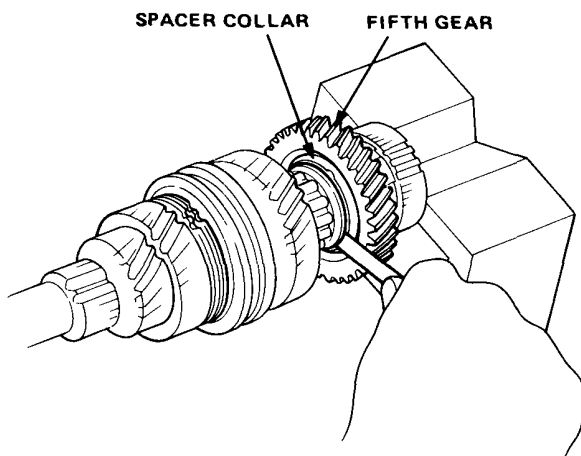
### Mainshaft Measurements

11. Measure clearance between spacer collar and shoulder on fifth gear.

#### FIFTH GEAR CLEARANCE

Standard (New): 0.03–0.13 mm  
(0.001–0.005 in.)

Service Limit: 0.25 mm (0.01 in.)

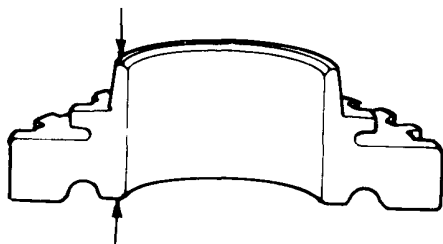


12. If out of tolerance, measure thickness of fifth gear.

#### FIFTH GEAR THICKNESS

Standard (New): 32.42–32.47 mm  
(1.276–1.278 in.)

Service Limit: 32.30 mm (1.272 in.)

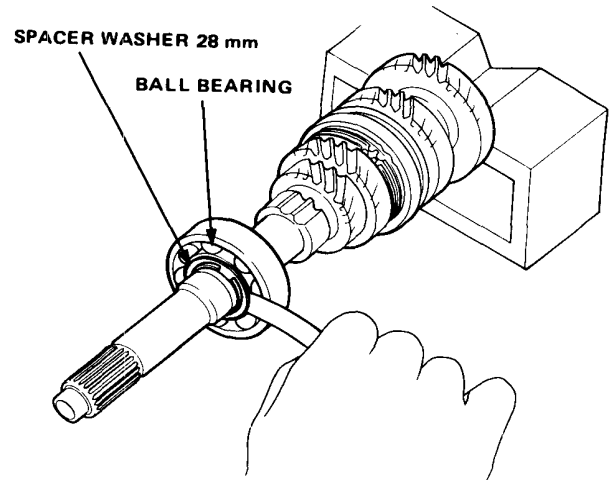


If out of limit, replace fifth gear.

13. Measure clearance between 28 mm spacer washer and ball bearing.

#### BALL BEARING CLEARANCE

Standard (New): 0–0.1 mm (0–0.004 in.)



If out of tolerance, change thickness of 28 mm spacer washer after measuring all other clearances.

#### Replacement Spacer Washers

IDENTIFI- CATION	THICKNESS
A	1.88–1.92 mm (0.074–0.075 in.)
B	1.94–1.98 mm (0.076–0.078 in.)
C	2.00–2.04 mm (0.079–0.080 in.)
D	2.06–2.10 mm (0.081–0.082 in.)
E	2.12–2.16 mm (0.083–0.085 in.)

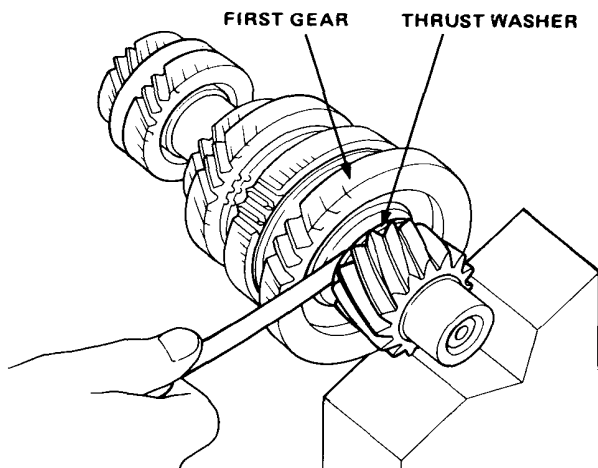


## Countershaft Measurements

14. Measure clearance between first gear thrust washer and shoulder on first gear.

### FIRST GEAR CLEARANCE

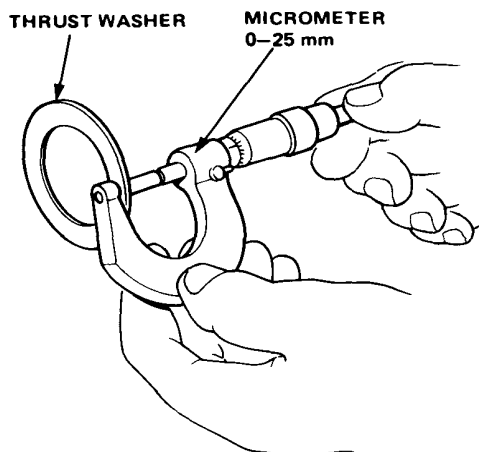
Standard (New): 0.03–0.08 mm  
(0.001–0.003 in.)



If out of tolerance, change thickness of first gear thrust washer after measuring all other clearances.

## Replacement Thrust Washers

IDENTIFICATION	THICKNESS
A	2.02–2.04 mm (0.080–0.081 in.)
B	2.00–2.02 mm (0.079–0.080 in.)
C	1.98–2.00 mm (0.078–0.079 in.)
D	1.96–1.98 mm (0.077–0.078 in.)

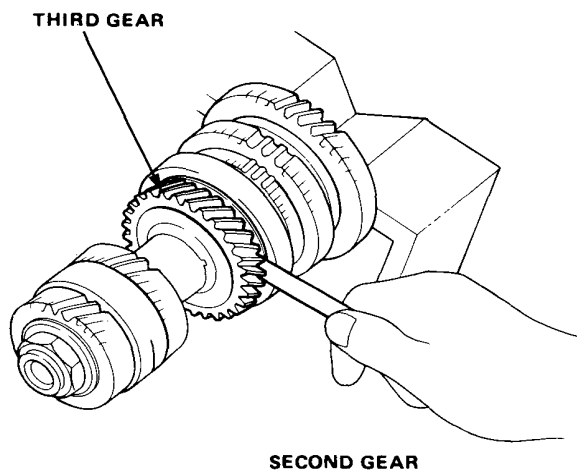


15. Measure clearance between shoulder on third gear and shoulder on second gear.

### SECOND GEAR CLEARANCE

Standard (New): 0.03–0.1 mm  
(0.0012–0.004 in.)

Service Limit: 0.18 mm (0.007 in.)

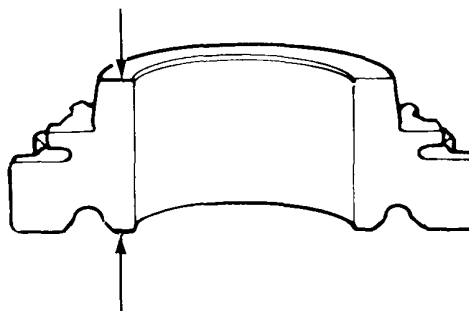


16. If out of tolerance, measure thickness of second gear.

### SECOND GEAR THICKNESS

Standard (New): 30.42–30.47 mm  
(1.198–1.200 in.)

Service Limit: 30.3 mm (1.192 in.)



If out of limit, replace second gear.

17. After all clearances have all been checked, and those out of limits corrected, reassemble transmission mainshaft and countershaft and recheck all clearances.

If they are correct, disassemble fifth gear components and reinstall bearings in transmission housing.