



WORKSHEET 4-2

Transaxle—Shaft Removal and Inspection

Vehicle:	Year/Prod. Date:	Engine	Transmission:
----------	------------------	--------	---------------

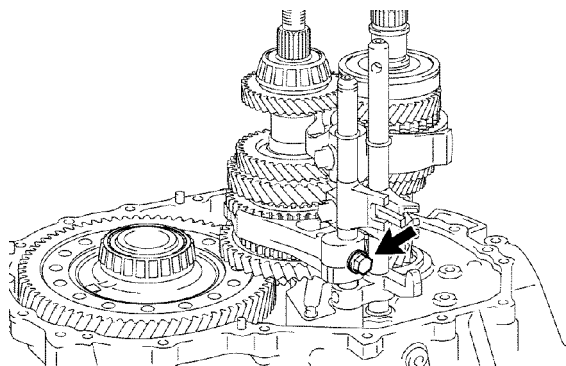
Worksheet Objectives

With this worksheet, you will follow the disassembly of a front-drive transmission shift mechanism and shafts using the required special tools, make measurements where appropriate, retrieve and apply the needed service information, retrieve and interpret service specification information from the repair manual.

Tools and Equipment

- Hand Tool Set
- Dial Indicator and Stand
- Micrometer, 0-1 in.
- Feeler Gauge
- Corolla RM (C Series Transaxle)
- Camry RM (E Series Transaxle)

Section 1: Remove Shift Mechanism



1. Remove the shift rail snap rings, screw plugs, locking balls and springs.
2. What function do the locking balls and springs serve in the shift mechanism?

3. Remove the shift shafts from the shift fork and slide the shift forks out of the synchronizer sleeves.
4. Remove the input and output shafts and differential assembly.

Section 2: Input Shaft Inspection

1. Inspect and measure the following thrust clearances:

Input Shaft 3rd Gear Measurement: _____ Specification: _____

Input Shaft 4th Gear Measurement: _____ Specification: _____

2. Inspect and measure the following radial (oil) clearances:

Input Shaft 3rd Gear Measurement: _____ Specification: _____

Input Shaft 4th Gear Measurement: _____ Specification: _____

3. If the radial (oil) clearance is greater than the maximum, how is it repaired?

Section 3: Output Shaft Inspection

4. Measure gear radial (oil) clearance using a dial indicator:

1st Gear Measurement: _____ Specification: _____

2nd Gear Measurement: _____ Specification: _____

5. Inspect and measure the following thrust clearances:

Output Shaft 1st Gear Measurement: _____ Specification: _____

Output Shaft 2nd Gear Measurement: _____ Specification: _____

Section 4: Clutch Fork Inspection

1. Measure shift fork to hub sleeve clearance:

1st/2nd Shift Fork: _____ Specification: _____

3rd/4th Shift Fork: _____ Specification: _____

5th Shift Fork: _____ Specification: _____

Transaxle—Shaft Removal and Inspection

Name: _____ Date: _____

Review this sheet as you are doing the Transaxle—Shaft Removal and Inspection worksheet. Check each category after viewing the instructor's presentation and completing the worksheet. Ask the instructor if you have questions regarding the topics provided below. Additional space is provided under Topic for you to list any other concerns that you would like your instructor to address. The comments section is provided for your personal comments, information, questions, etc.

I have questions

I know I can

Topic

Comment

Explain the function of the detent balls and springs on the shift fork shafts.			
Explain the function of the interlock pins on the shift fork shafts.			
Measure thrust clearances.			
Measure radial (oil) clearances.			
Explain the diagnosis process if radial clearance is excessive.			
Measure hub sleeve to shift fork clearances.			



Notes

**WORKSHEET 4-3*****Transaxle—Preload Check and Reassembly***

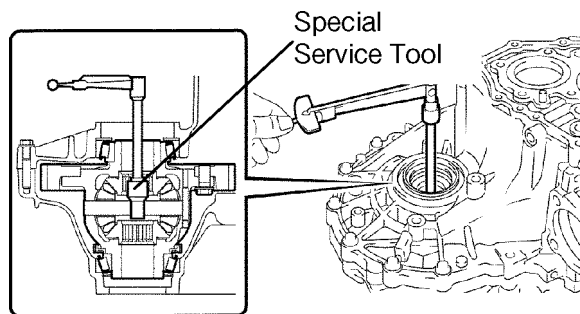
Vehicle:	Year/Prod. Date:	Engine	Transmission:
----------	------------------	--------	---------------

Worksheet Objectives

With this worksheet, you will follow the reassembly of a front-drive transmission using the required special tools, make measurements where appropriate, retrieve and apply the needed service information, retrieve and interpret service specification information from the repair manual.

Tools and Equipment

- Hand Tool Set
- Dial Indicator Torque Wrench
- Preload Adapter SST (P/N 09564-32011)
- 5th Gear Replacer SST (P/N 09309-12020-01)
- 5th Gear Remover & Replacer SST (P/N 09310-17010-01)
- Corolla RM (C Series Transaxle)
- Camry RM (E Series Transaxle)

Section 1: E Series Transaxle Differential Preload Check and Adjustment

1. Install the output shaft alone into the lower case and install the upper case half.
2. Install the bearing race, adjusting shim and bearing retainer.
3. Secure the case bolts and retainer bolts, and record their torque specifications below.
 - a. Transmission case bolt torque:

- b. Bearing retainer bolt torque:

4. Using an inch pound torque (in-lbf) wrench with sweeping dial, measure the starting torque.

a. Starting torque:

b. Starting torque for used bearings specification:

5. Remove the bearing retainer and measure the shim thickness and determine the Mark designation from the repair manual chart.

Shim Thickness: _____

Mark Designation: _____

6. According to the chart in the repair manual, if starting torque required and additional 8 in-lbf of torque, what shim mark designation would be required?

7. Install the differential, output shaft and bearing retainer and torque the case and bearing retainer.

8. Using the same inch pound torque wrench used above, measure the starting preload of both the output shaft and differential.

9. If the starting torque of the output shaft was 8 in-lbf, in what torque range should the differential and output shaft fall in for new differential bearings?

Section 2: C Series Transaxle Differential Preload Check and Adjustment

1. Install the differential into the lower case.

2. Install the top case and torque the case bolts

3. Using an inch pound (in-lbf) torque wrench with sweeping dial, measure the starting torque.

c. Starting torque:

d. Starting torque for used bearings specification:

4. What special service tool is used to turn the differential?

5. Remove the outer side bearing race from the transmission case.

6. What special service tool is used to remove the bearing race?

7. Measure the preload shim thickness and determine the size designation using the repair manual chart. Shim thickness:
-

Section 3: Transaxle Reassembly

1. Install the input and output shafts together.
2. Install the shift forks and shift shafts and detent balls.
3. Install transaxle case half.
4. What type of sealant does the repair manual recommend?

5. Turn the shafts and check for binding.
6. Install 5th driven gear using 5th gear replacer. What is the SST number?

7. Install 5th drive gear and 5th synchronizer hub and shift fork.
8. What precaution is required when installing this assembly?

9. Using a dial indicator measure the 5th gear thrust clearance:

Measurement: _____ Specification: _____

10. Install the rear case cover.
11. Be sure that the shift shaft heads are aligned in neutral and install the shift and select assembly into the case
12. Shift the transaxle into all the gear positions while rotating the input shaft and feeling the differential rotation to ensure that all gear positions work and don't bind.

Instructor's Initials: _____



Notes

Transaxle—Preload Check and Reassembly

Name: _____ Date: _____

Review this sheet as you are doing the Transaxle—Preload Check and Reassembly worksheet. Check each category after viewing the instructor's presentation and completing the worksheet. Ask the instructor if you have questions regarding the topics provided below. Additional space is provided under Topic for you to list any other concerns that you would like your instructor to address. The comments section is provided for your personal comments, information, questions, etc.

I have questions

I know I can

Topic

Comment

Measure differential preload check and adjustment.			
Explain where the differential preload adjustment is made.			
Use the charts and specifications in the repair manual to determine shim thickness for preload adjustment.			
Properly install synchronizer key springs.			
Explain the importance of shaft rotation when installed in the case.			
Install the locking balls, detent pins shift forks and the shift shafts.			
Explain the application of FIPG sealants.			
Explain the importance of shifting through all the gears when the transmission case is assembled.			



Notes