



The Toyota E53 Manual Transaxle

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Contributing Editor

With the world market for cars creating intense competition between manufacturers and many "foreign" car makers setting up factories in the U.S., the lines between import and domestic vehicles have faded. Honda, Toyota, BMW and Mercedes now are man-

ufacturing cars in the continental United States with the same high quality we have come to expect from these brands. It is now impossible to stay in business if you don't work on so-called "imports." Who would have thought that one day Toyotas and Hondas would be domestically produced and Ford's Crown Victoria would be an import (built in Canada)?

The Toyota Camry has been with us for quite a while and has been improved and updated continually. It is a big seller with good quality at a reasonable price.

In this article we will look at the E53 5-speed manual transaxle. The S51 manual transaxle, which is found behind the 5S-FE engine, has been a familiar repair for many shops. The E53, which comes on late Camrys equipped with the 3VZ-FE motor, is a beefier unit with some unique design changes that give us a picture of future trends in transaxle engineering.

The E53 is a 5-speed transaxle with all gears in constant mesh. All speed gears including reverse

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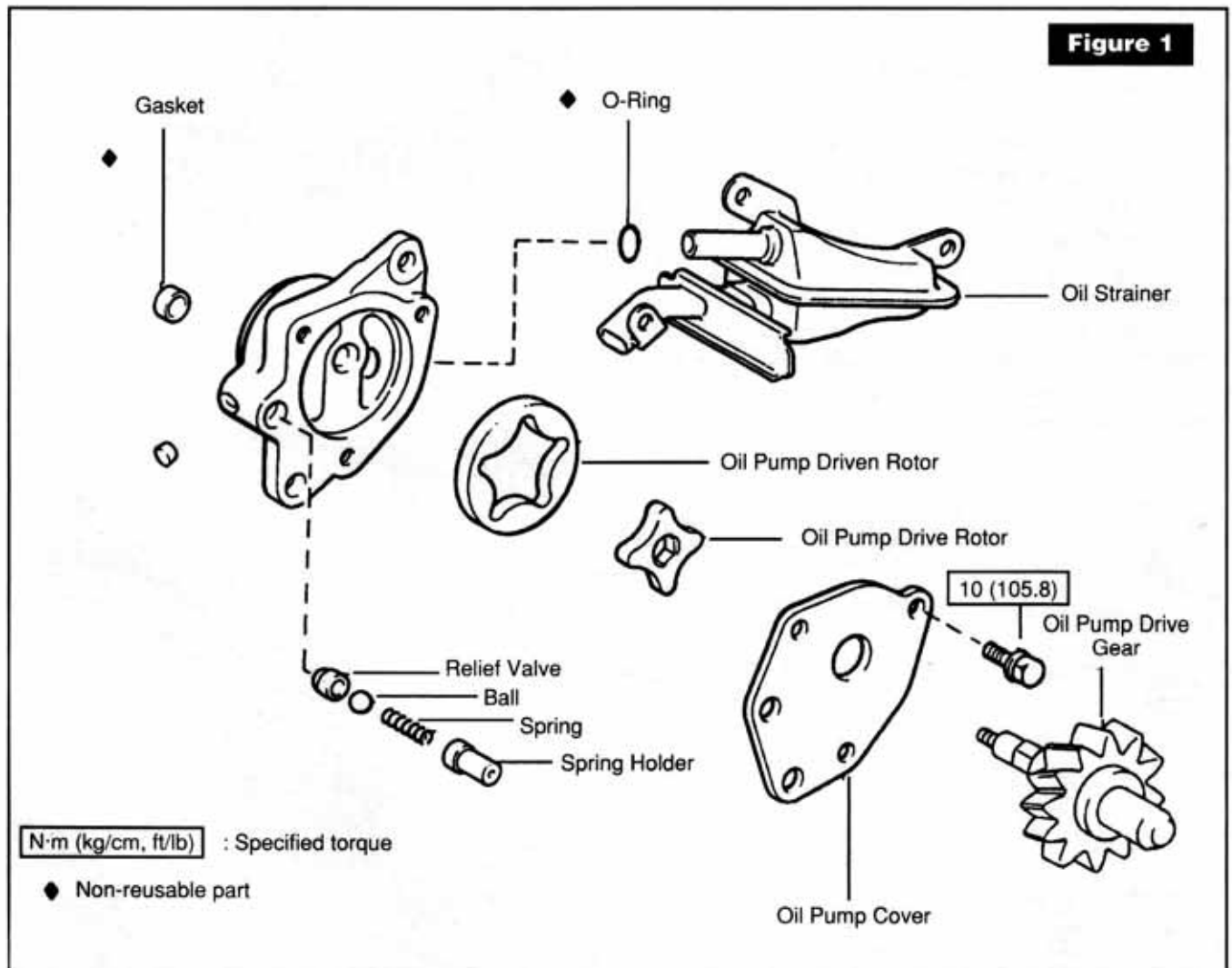


Figure 2

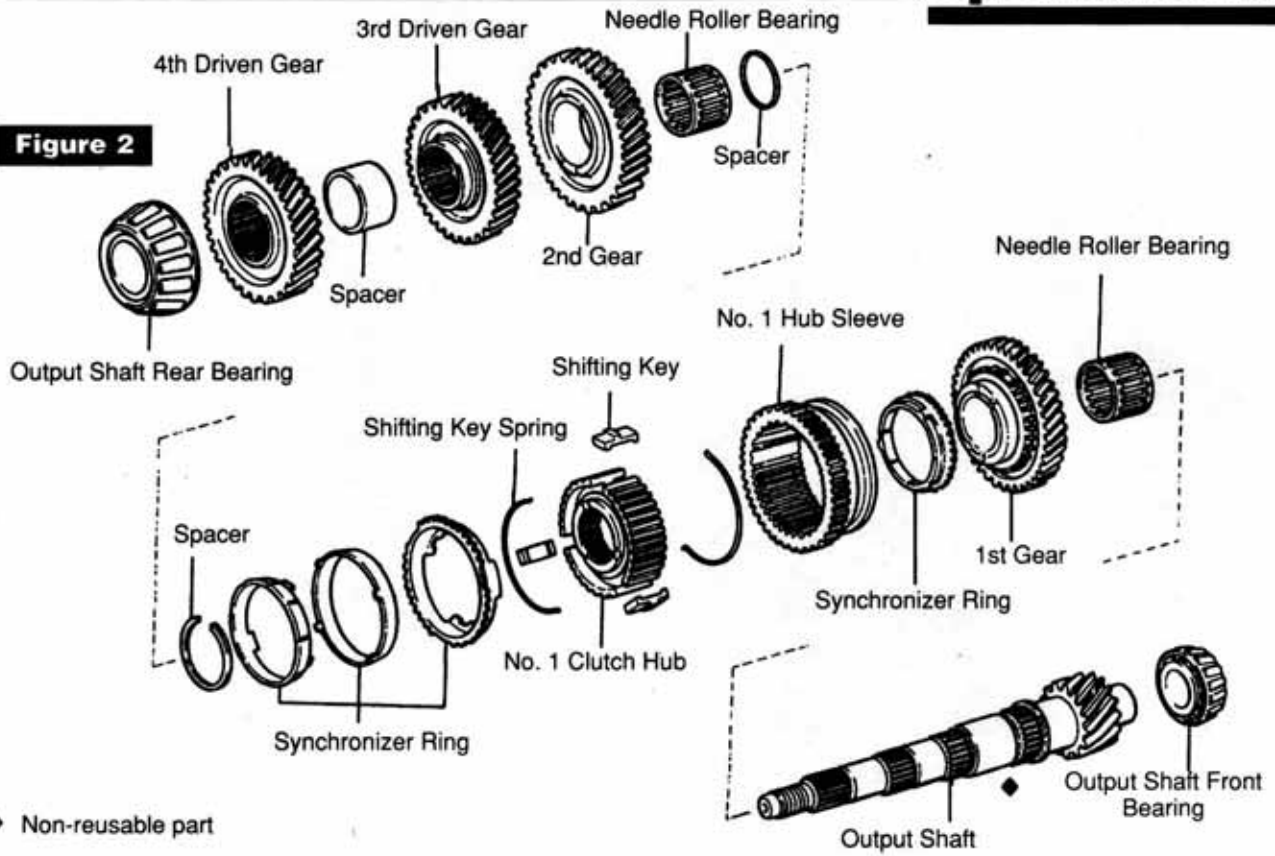


Figure 3

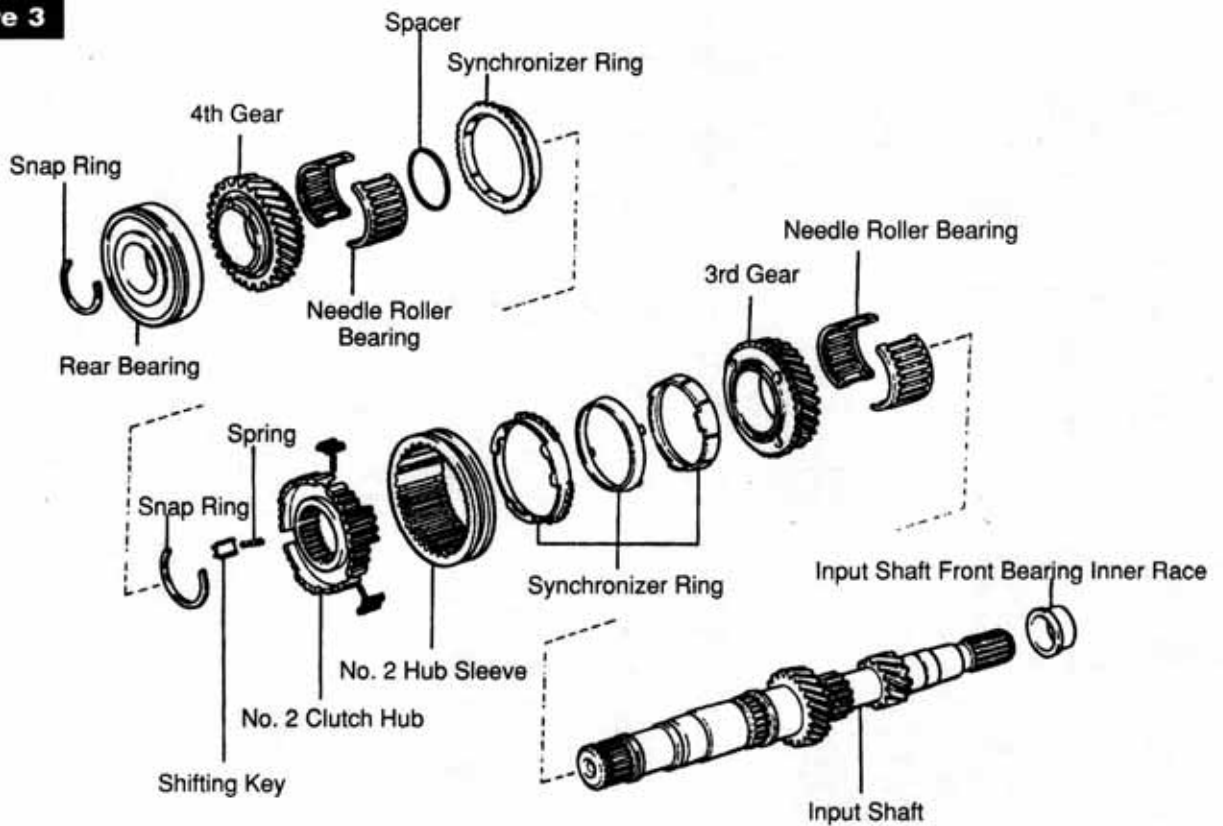


Figure 4

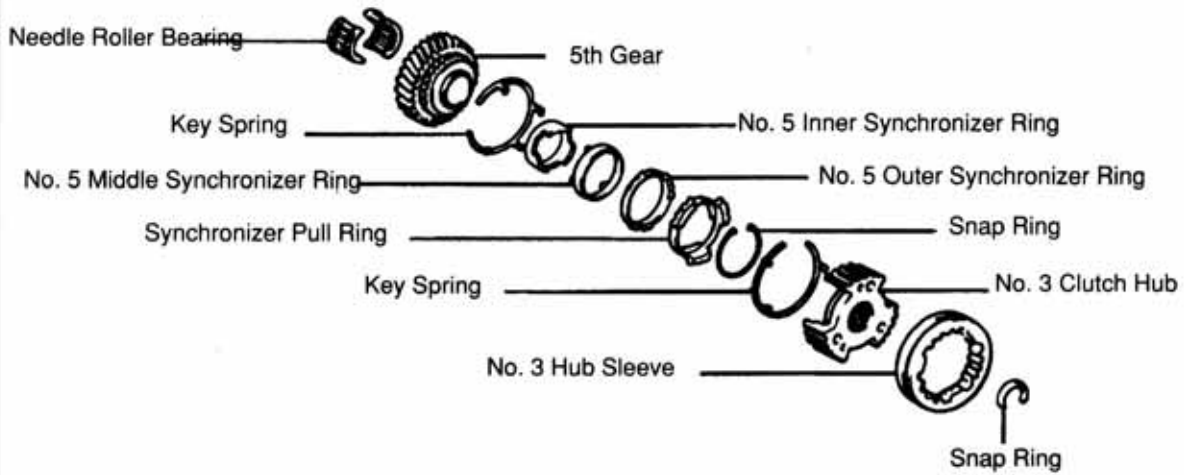
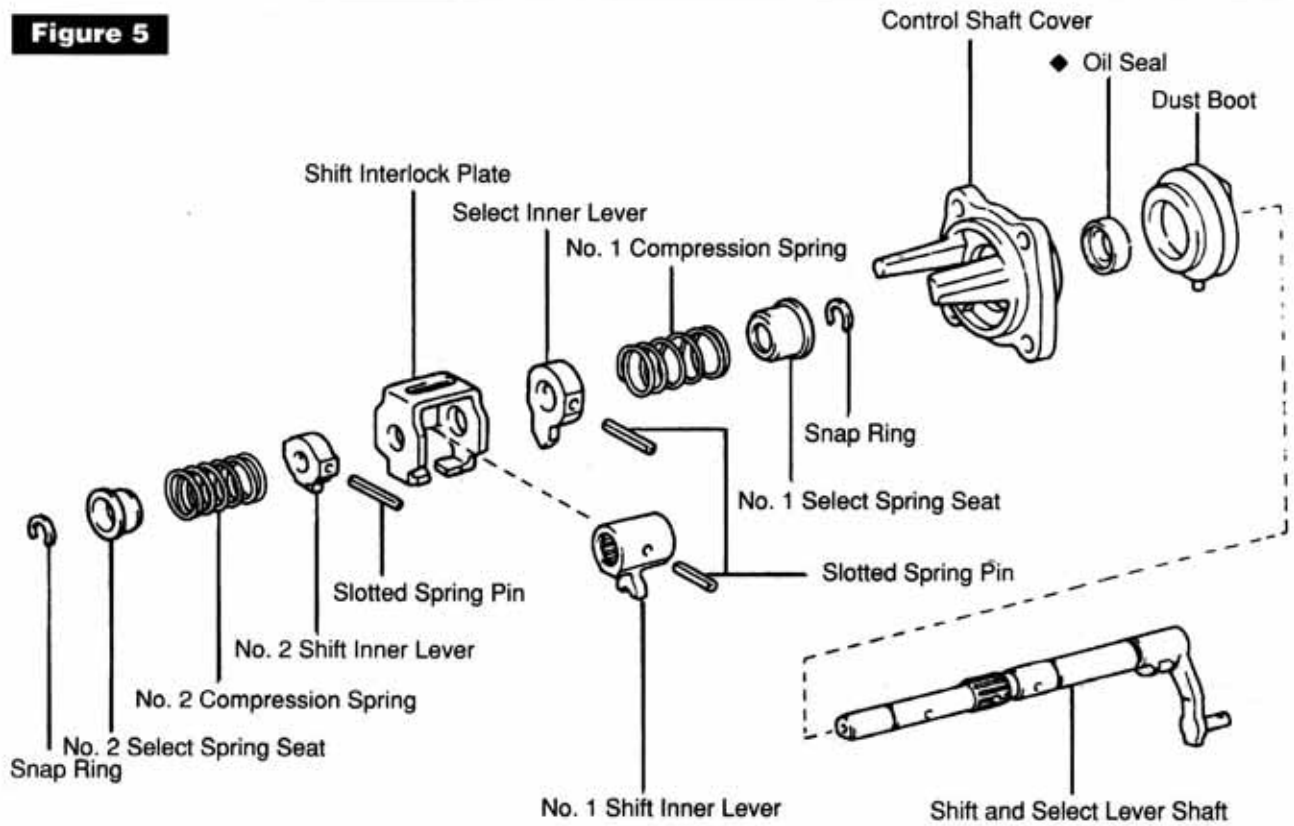
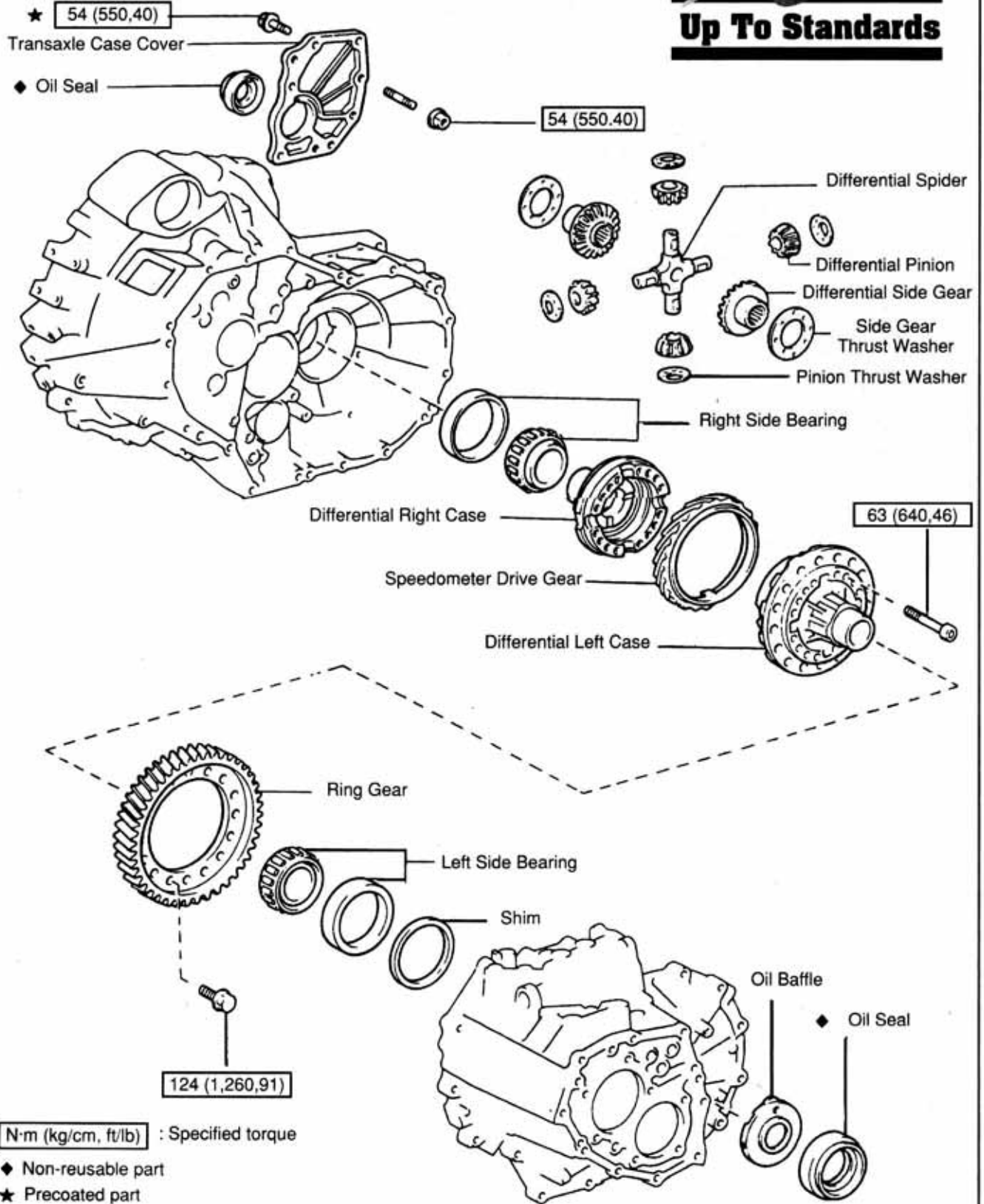


Figure 5



◆ Non-reusable part

Figure 6



N·m (kg/cm, ft/lb) : Specified torque

◆ Non-reusable part

★ Precoated part

are synchronized. This unit is designed to use GL4 or GL5 gear lube and is unique in that it uses an oil pump for pressurized lubrication. The pump is a gear-rotor design driven off the differential ring gear and has its own filter and plumbing to distribute force-fed lube to the required areas (See Figure 1, page 28).

Gear ratios are as follows:

- 1st - 3.583-1
- 2nd - 2.045-1
- 3rd - 1.333-1
- 4th - 1.028-1
- 5th - 0.820-1 (overdriven)
- reverse - 3.583-1
- Final drive ratio - 3.625-1

In order to improve shift quality, Toyota has added a triple-cone-type synchronizer for 2nd gear and a double-cone-design synchro for 3rd gear. Reverse is synchronized to smooth out engagement, and all speed gears are supported on the shafts with needle bearings (See Figures 2 & 3, page 30, and 4, page 32).

The internal shift selector and the interlock system are housed in one assembly under the control-shaft cover (See Figure 5, page 32) and are removed as an assembly. Each of the three shift rails has a detent ball, spring and seat that are housed in the trans case to provide the driver with positive shift feel.

The differential on this unit is a substantial piece, with a split diff case that contains a cross and the side and pinion gears. The side gear runs on selective thrust washers, and the diff carrier is supported by tapered bearings with selective case shims to set endplay and preload. It is important to match-mark the diff case before splitting it in order to re-assemble it in the same manner. Between the hex bolts that hold the carrier together and the bolts that retain the ring gear, your torque wrench will get a real

workout on this unit (See Figure 6).

This transaxle is sealed with RTV, and although it has some advanced technology and lots of parts, is not difficult to rebuild. Toyota, to its credit, produces some of the best service/repair manuals in the industry. They are well thought out, with excellent pictures (some of which are shown here) and have every spec and tolerance you will ever need.

If you want to guarantee your work won't come back to haunt you, make the effort to get your hands on these books. **TD**

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