

Broken Brakes:

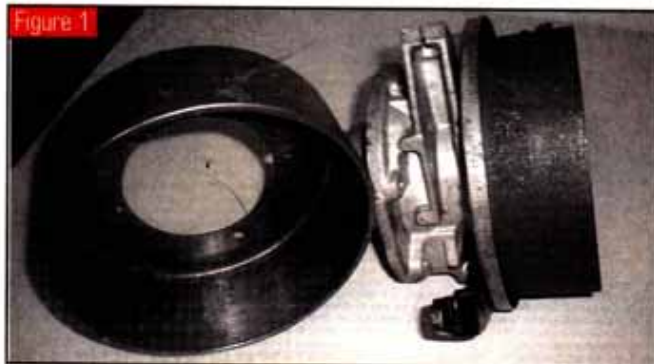
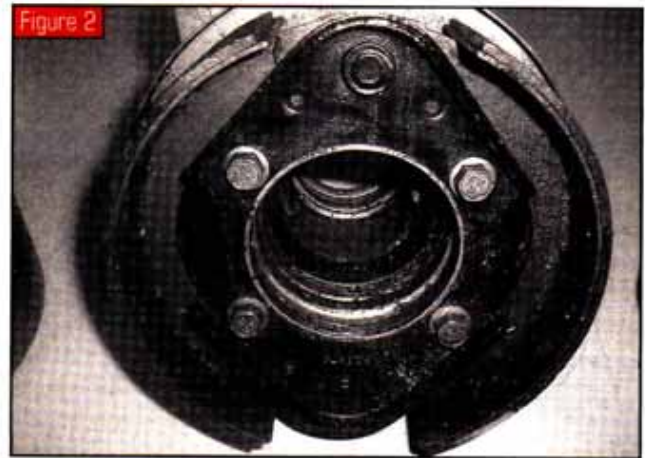
Answers to Some Parking-Brake Problems

Bolt-on parking-brake assembly on some ZF manual transmissions requires careful handling.

**By Mike Weinberg
Contributing Editor**

Ford light-duty trucks have been equipped with ZF five- and six-speed manual transmissions since 1987. The ZF S542, S547, S547M and S650 have been used behind gas and diesel engines and are manufactured in two- and four-wheel-drive versions.

The two-wheel-drive models use a bolt-on parking-brake assembly for added safety when the vehicle is parked or for operating the engine while the vehicle is stationary, such as using a power-take-off option to work pumps or winches. The parking-brake assembly is self-contained and is actually a drive yoke coupled to a drum containing a set of outward-expanding brake shoes and a yoke to connect the driveshaft to the transmission. When the emergency or hand brake is



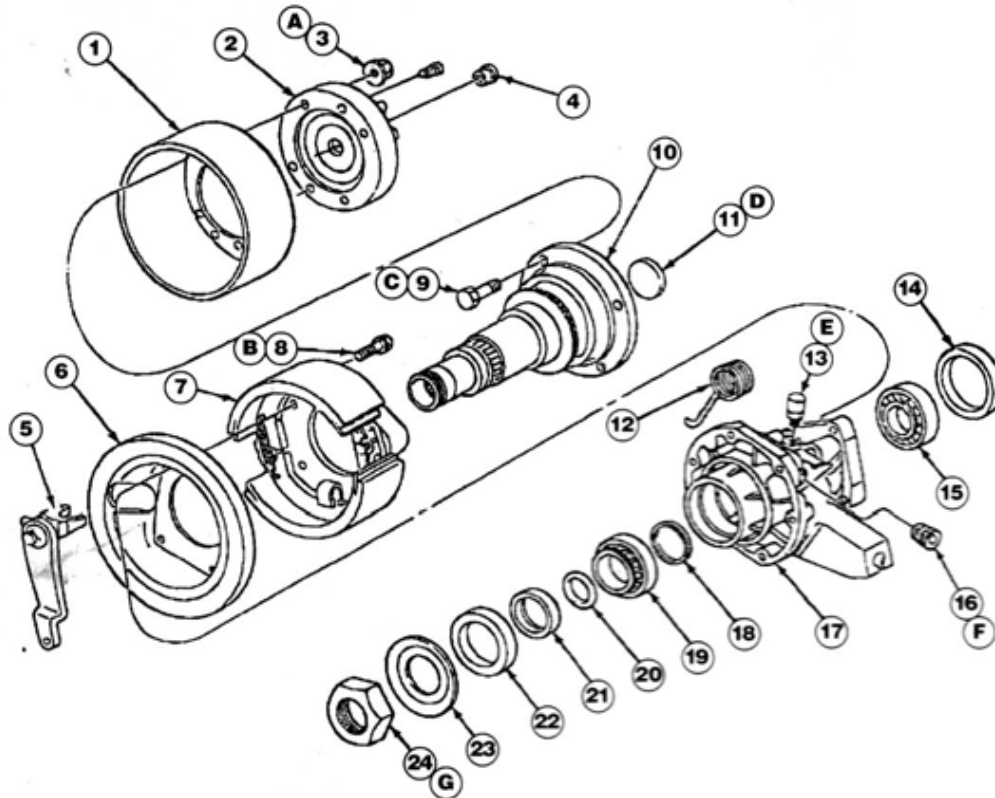
the transmission. No amount of pulling power will separate the brake assembly from the transmission output shaft, and only a torch or a plasma cutter will work to get it apart. This means that a new

brake assembly (at considerable expense) will be required and the transmission will need to be removed and disassembled for replacement of the output shaft. It is very common to have these units

shipped in for repairs with the brake assembly still attached because of this type of failure.

If you are replacing a clutch in a vehicle equipped with this transmission and brake assembly, be

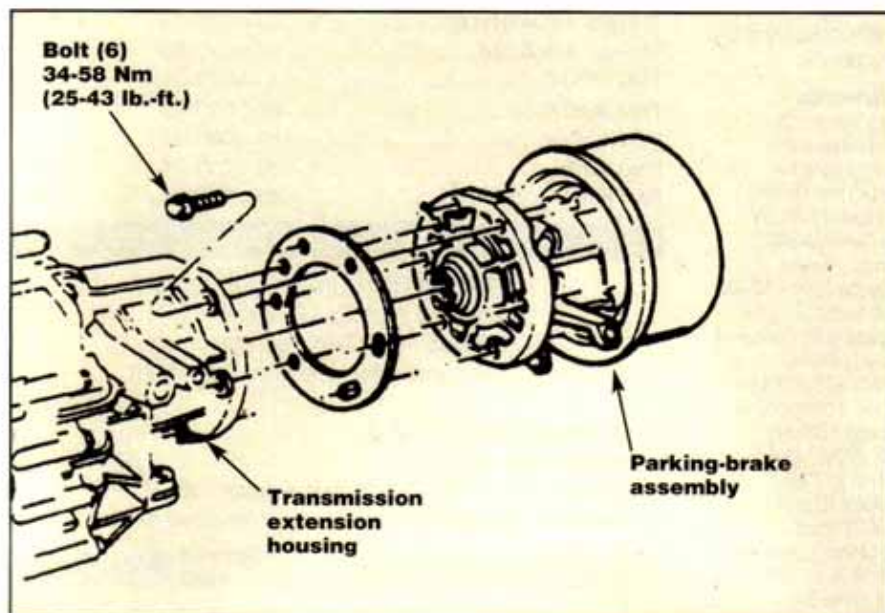
Transmission-Mounted Parking-Brake Assembly



| Item | Part Number | Description |
|------|-------------|-----------------------------------------------|
| 1 | - | Parking-brake drum (Part of 2C598) |
| 2 | - | Output flange (Part of 2C598) |
| 3 | 2L611 | Mainshaft-to-output-flange nut |
| 4 | 2L610 | Output-flange plug |
| 5 | 2A710 | Actuating lever |
| 6 | 2A703 | Splash shield |
| 7 | 2L598 | Parking-brake shoe and backing-plate assembly |
| 8 | 2L818 | Backing-plate-to-housing bolt |
| 9 | 2L617 | Mainshaft-to-output-flange bolt |
| 10 | - | Mainshaft (Part of 2C598) |
| 11 | - | Parking-brake seal disc (Part of 2C598) |
| 12 | 2M598 | Actuating-lever spring |
| 13 | 2L605 | Parking-brake vent |
| 14 | 2L606 | Parking-brake rear seal |
| 15 | 2L603 | Parking-brake rear bearing |

| Item | Part Number | Description |
|------|-------------|--------------------------------------------------------------|
| 16 | 2L608 | Parking-brake filler plug |
| 17 | 2K598 | Parking-brake housing |
| 18 | 2L613 | Mainshaft shim |
| 19 | 2L602 | Parking-brake front bearing |
| 20 | 7288 | O-ring |
| 21 | 2L601 | Mainshaft spacer |
| 22 | 2L607 | Parking-brake front seal |
| 23 | - | Lock-nut washer (part of 2598) |
| 24 | 2L616 | Lock nut |
| A | - | Tighten to 113-117 Nm (84-88 lb.-ft.) |
| B | - | Tighten to 118-123 Nm (87-90 lb.-ft.) |
| C | - | Unless damaged, leave bolt in mainshaft |
| D | - | Unless damaged, leave seal disc in mainshaft |
| E | - | Tighten to 11-16 Nm (8-12 lb.-ft.) |
| F | - | Tighten to 35-40 Nm (26-29 lb.-ft.) |
| G | - | Use new lock nut and tighten to 288-292 Nm (213-215 lb.-ft.) |

Up To Standards



sure to handle the unit with care so it will not fall over and lose the fluid. After doing the clutch job, make sure to check the fluid in the transmission and the parking-brake assembly once it is installed before test driving.

When separating a brake assembly from the transmission to repair the transmission, make sure to keep the brake assembly upright so as not to damage the brake shoes, and check the fluid again in the brake assembly after re-installing it on the transmission and putting the transmission back in the truck.

When a customer comes in for service and a fluid change, be sure to check the brake assembly for proper lubrication level as part of the service. The only way to handle one of these parking-brake assemblies safely is to install it on the transmission before you add fluid and make sure the complete assembly does not fall over while you're installing it into the vehicle.

Depending on the model of truck in which it is used, the brake assembly may have a speedometer drive cable. Whenever you check out one of these trucks, be

sure to check the fluid level in the brake assembly and make sure that the unit is not leaking. If the leak goes unnoticed or the customer declines to make the repairs needed, the outcome will be an extremely expensive repair. If the shop makes the error during the installation, it would have been better off never to have seen this job come in.

The exploded views of the parking-brake assembly and the parts legends included in this article should help you better understand the internal working of this simple but expensive part. **ID**

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