LETTERS

Pantera International:

The following information should be helpful to anyone with ZF transaxle problems: This winter I repaired my ZF, which had developed the common 2nd gear syncro failure. I found that there is no need to send the unit off to be repaired, or trust your local mechanic to do the job if you have at least average mechanical skills, and a set of metric tools. I am not a professional mechanic and I have never worked on any kind of transmission before. The job took about 40 hours spread over 2 months. Out of this time, about 10-12 hours were required to remove and install the axle in the car. Some advice: Do not attempt to repair the unit without the following: ZF Manual from P.I. & P.I. technical Article #5 group 16, January 1977, "The short-cut, backyard Mechanic's Approach to ZF transaxle repair by T.R. Butke.

1) When removing the transaxle from the car, you must take the entire unit out including the bell housing. There are two hidden allen bolts inside the bell housing, so don't attempt to remove only the transaxle.

2) You don't need to loosen the engine mounts, just jack up the engine under the rear of the pan until the car begins to rise on the suspension.

3) You don't need a hoist to lift out the axle. Just put 8 or 10 layers of blankets and towels over the edge of the engine compartment, with one person standing inside the compartment and one person standing behind the car, lift the axle up and set it on the protected edge. (it only weighs about 130 lbs.)

4) Mr. Butke suggests the use of a soft hammer and hardwood block for disassembly of several internal parts. At one point (when the floor was full of wood splinters and the air full of four letter explicatives) I found it necessary to use a regular hammer and a cheap screwdriver to separate the parts. The internal parts are very strong and very hard (think about it), as long as you use soft metal for a "drift" I don't think there is any danger of hurting the axle.

5) The sliding sleeve (227) and syncro blocking ring (225) *must* be in excellent condition for the unit to work right. If you have any doubt about part #227 replace it.

6) 2nd gear itself (228) does not have to be in especially good condition for proper operation. If the sleeve and blocking ring do their job there is little or no relative motion involved at the time the sleeve (227) engages the gear (228). My 2nd gear works fine, while part #228 looks a little beat up after having destroyed the sleeve.

7) Be sure that the blocking rings all have good "friction" or "grab" on their respective gears. Before you take out the axle you may want to test all 5 gears by shifting them quickly at high RPM to check for syncro over-ride. This will help you decide later which parts to replace and which ones are ok.

8) Parts and service are available from R.A. Butfoy Transaxle Specialist, 131 Triton Lane, Suite 115, Huntington Beach, CA 92649 Tel. 714/897-6017 (Saturdays are a good time to call). Parts have actually come down in price since Butke wrote his article. I paid $48.00 each for syncro rings, and $65.00 for the sliding sleeve. My total cost came to a little over $200.00 including: 2nd syncro ring, 4th syncro ring, sliding sleeve, misc., small parts, metric wrenches, impact wrench rental.

9) As you slide parts off of the shaft, slide them onto a pool cue or broom handle. This will help you keep track of their relative position and make,re-assembly a much easier task.

10) Use top quality tools (especially the allen wrenches). The gearbox is not terribly complex or difficult to understand, but the parts do come apart hard. One of my allen bolts was so tight I rounded off the inside of it. I had to drill the head off and replace it with a new bolt.

Good luck to anyone who decides to repair his own axle. It is a long and difficult task but I think it's better to do it yourself than to ship it off (wondering if you will ever see it again) or trust your local mechanic.

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Editor's Note: Regarding item 4 of Dan's letter relating to use of the hardwood block. The internal parts are very hard, and, as a result, can be easily fractured when struck by the hardened surface of a hammer or screwdriver. An alternative to the hardwood block would be a piece of aluminum or brass. Oak usually takes quite a beating without splintering, however. The parts are quite difficult to separate at times, but I still strongly advise against hammers, screwdrivers, or punches to hurry things along. Glad the article #5 helped. Tom Butke, your Global Expounder.