Creating a Thrust Surface in the Front Face of the Center Support

Normal operating conditions result in the forward clutch housing assembly thrusting rearward into the mainshaft (681). In high load applications this rearward thrust can push the mainshaft with enough force to result in damage to the # 22 thrust bearing assembly (686, 687, 688) and output shaft to case thrust and selective washers (695,696). By creating a thrust surface in the front face of the center support, this rearward thrust can be cancelled out at the center support without making it to the mainshaft. The origin of this rearward thrust begins in the torque converter. Pressurized converter charge oil in the torque converter creates a force that acts on the front face of the input shaft (601). The amount of this force (measured in pounds) is calculated by multiplying converter charge pressure by the surface area of the front face of the input shaft. Typically, "corrected"* converter charge pressure in a high load application will be @ 60 psi. The surface area of a production input shaft is .785". This combination results in 47.1 pounds of rearward force acting on the front face of the input shaft and forward clutch housing assembly. This force is then transmitted to the mainshaft at the interface between the forward clutch hub (616), and the mainshaft. This occurs because the front end of the mainshaft acts as a stop for the front end of the forward clutch hub. See Figure 6-88.

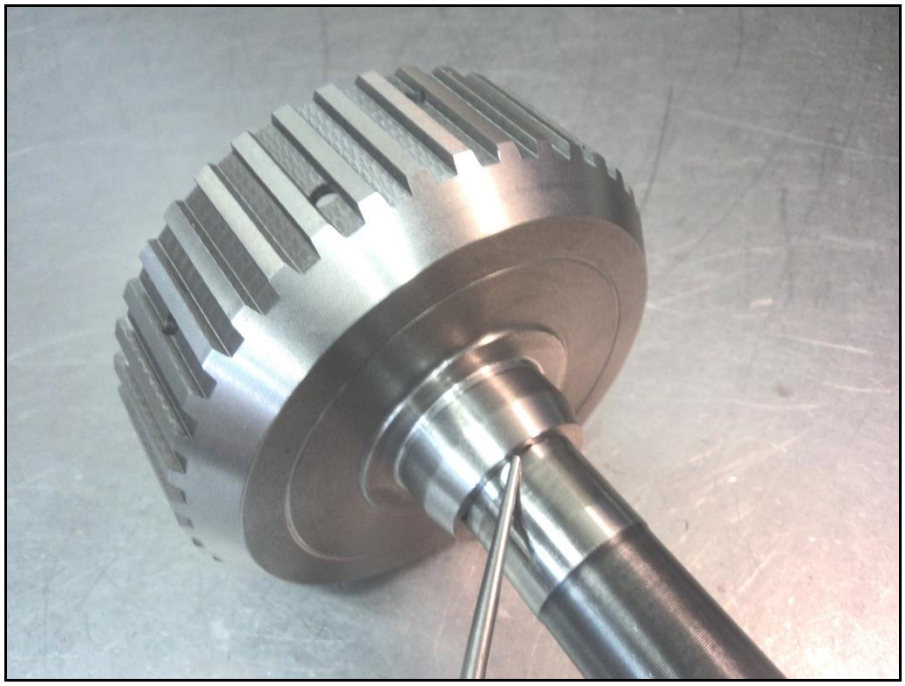

FIGURE 6-88

*** Please note that the term "corrected" used in the above paragraph is referring to a converter charge circuit that has been modified to reduce dangerously high converter charge pressures using the techniques in this manual. If left uncorrected, converter charge pressure and rearward thrust values can be as much as double that of the given example.**

From the mainshaft, the force is transmitted to the rear internal gear (685) and the #22 thrust bearing assembly (686,687,688), then to the output shaft (691) and on to the output shaft to case thrust and selective washers (695,696), where it is finally grounded out at the transmission case. See Figure 6-89. In heavy duty and high load applications this can result in complete failure of the #22 thrust bearing assembly and output shaft to case thrust and selective washers (695,696).

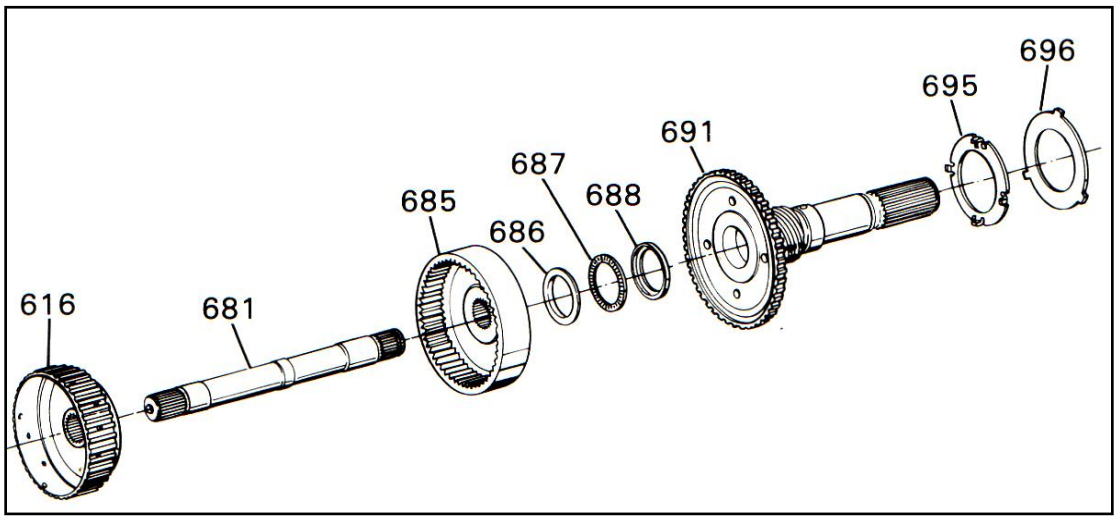

FIGURE 6-89 **GMC**

The solution is to remove rearward thrust from the forward clutch housing assembly to the mainshaft. This requires the creation of a thrust surface for the forward clutch housing assembly independent of the mainshaft. This is performed in two steps.

1. **A thrust bearing assembly is fit between the front face of the forward clutch hub (616) and the front thrust surface of the direct clutch housing (633). This modification is shown in Chapter Three. This will divert rearward thrust being applied to the mainshaft to the direct clutch housing. This force is now transmitted to the sun gear shaft (664) at the interface between the direct clutch housing and sun gear shaft. This occurs because the front end of the sun gear shaft acts as a stop for the rear end of the direct clutch housing. See Figure 6-90. The force is then transferred from the sun gear shaft to the sun gear (665), on to the # 21 thrust bearing assembly (682,683,684), followed by the rear internal gear (685), and returning back to the #22 thrust bearing assembly (686,687,688) and output shaft to case thrust and selective washers (695,696). See Figure 6-91. At this point we have done nothing more than reroute the rearward thrust we are trying to eliminate, back to the #22 thrust bearing assembly whose durability we are attempting to improve. However, because we have diverted rearward thrust into the direct clutch housing, the housing can now be grounded to the center support, diverting all rearward thrust into the support. Grounding the rear of the direct clutch housing to the center support removes all rearward thrust at the interface between the housing and the front of the sun gear shaft.**

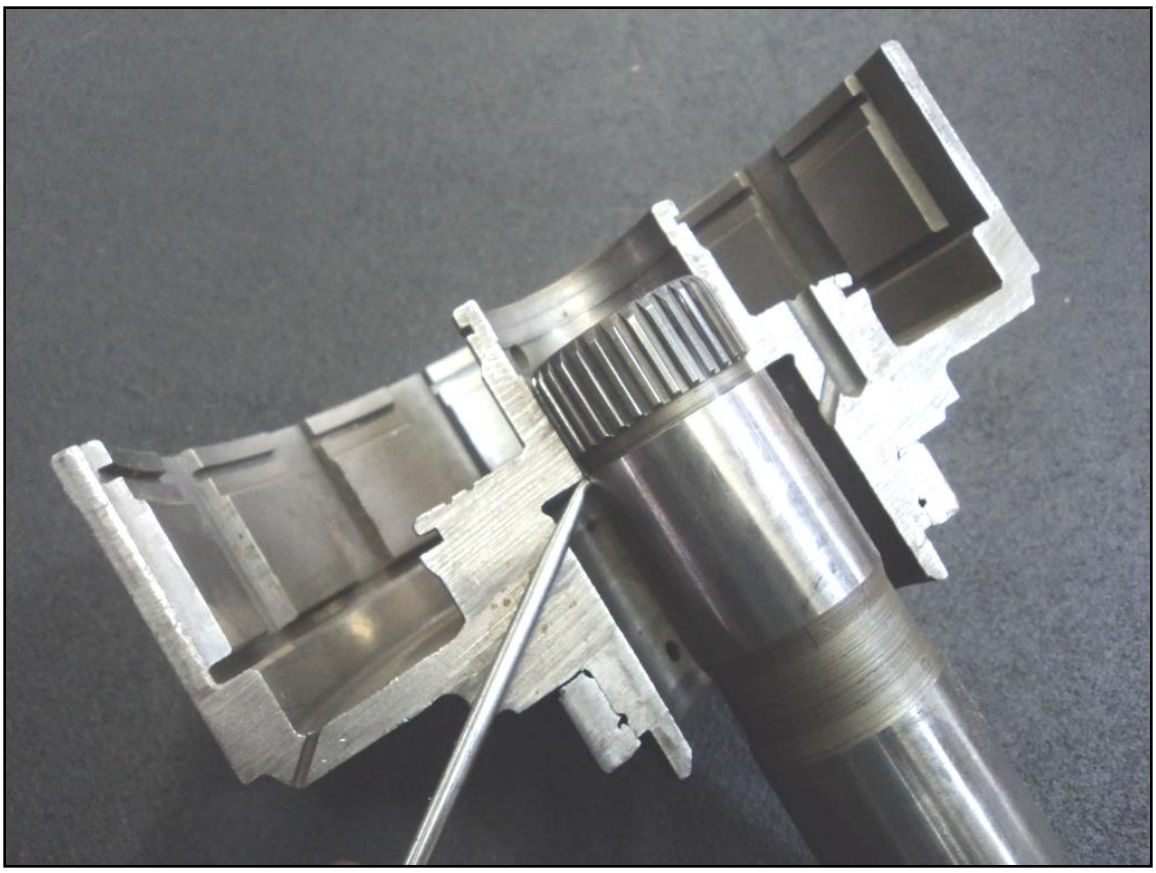

FIGURE 6-90

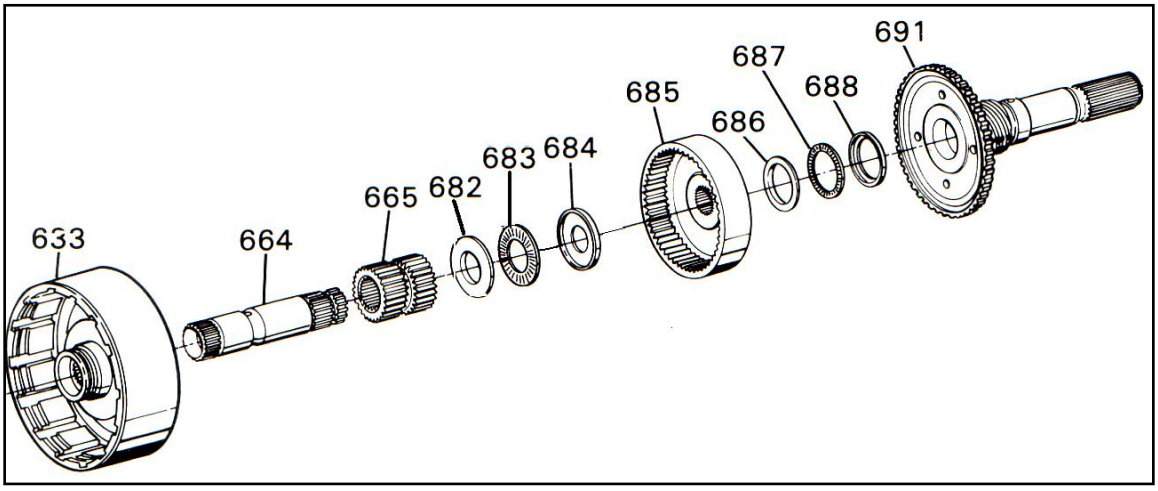

FIGURE 6-91 **GMC**

2. **A bearing pocket is machined at the bottom of the snap ring boss recess and fit with a thrust bearing, permitting the grounding of the direct clutch housing to the center support. See Figure 6-92. The pocket is machined to a depth of .375" measured from the front face of the boss and to an inside diameter of @ 2.125" and an outside diameter of @ 2.875".**

FIGURE 6-92

Selective shims installed between the thrust bearing and the bearing pocket "push" the direct clutch housing off the sun gear shaft stop permitting it to thrust against the center support. See Figures 6-93 and 6-94. Clearance adjustment is covered during final transmission assembly. The thrust bearing and shim kit is available under CK Performance part # 400CC/TBAWSP, and a machined center support with thrust bearing and shim kit under CK Performance part # 400CC/RCSA.

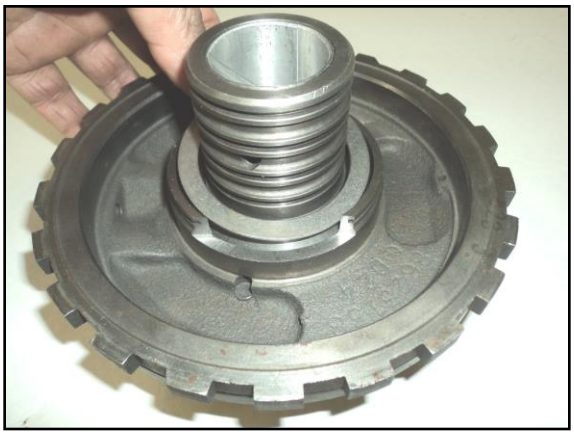

FIGURE 6-93

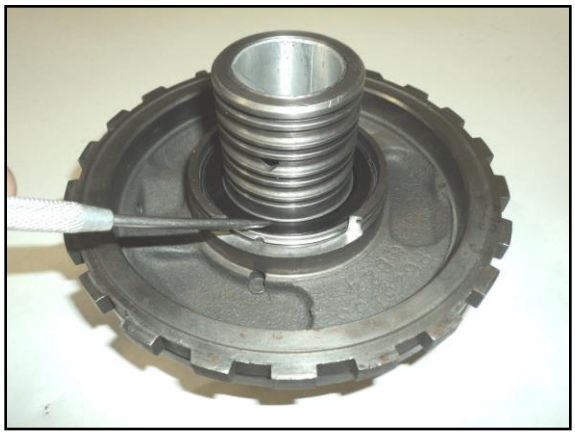

FIGURE 6-94