

BULLET PROOF!



The Turbo Hydra-matic 200-4R and performance do mix. Level 10 Performance shows us how.



First, make sure your transmission is the proper Turbo unit. Unless you are the original owner, a substandard non-Turbo unit may have found its way under your car. Check the identification plate on the driver's side, right behind the shifter linkage; it should read "7BRF." This will tell you that you're starting out with the right one, as Turbo cars had different valve bodies and clutch assemblies than standard non-performance 200-4Rs.

By Vinnie Kung
Photography by John Hunkins

The days of seeing Turbo Buicks on the road as a new car are behind us, but the performance lives on. Unfortunately, if you have a Turbo Regal, Grand National or even a 1989 Turbo Trans Am, transmission problems always seem to come out-even at low mileage. Well, you can't blame the Buick guys in Flint, Mich., for the transmission itself, just their judgment for leaving it there as the 3.8 grew in horsepower over the years.

Let's look at how the 200 came into being. When GM was fascinated with downsizing cars, price and performance, the Metric 200 was born. It was a 3-speed tranny that was lightweight and

could safely handle the limp-wristed 4- and 6-cylinder engines of the '70s. As the early '80s came around, overdrive was the big news, so GM followed suit and instructed the Hydra-matic division to make an overdrive transmission. Hydra-matic then based a new overdrive 4-speed tranny on the 200 and called it a Turbo Hydra-matic 200-4R. It was not necessary for the tranny to be beefy because of its intended application (which included the 115-horse naturally aspirated, carbureted 3.8 V6.)

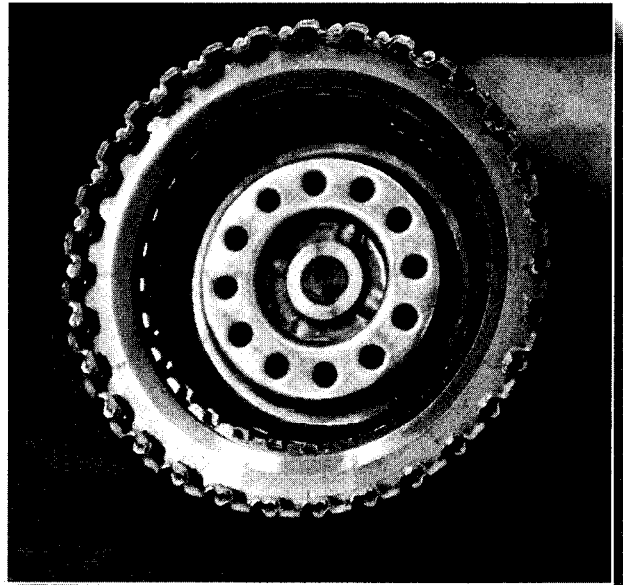
Although performance was coming around in the form of the 170-horse turbo-carbureted Regal (circa 1979), a few modifications were made to the 200-4R, and the Turbo-specific tranny was born. The early turbocharged versions



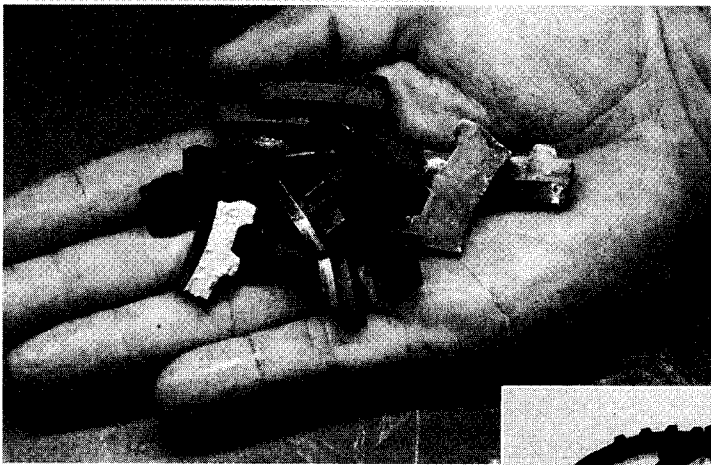
With the transmission completely disassembled, the bare case is laid on its back and the mating surface for the valve body is checked for straightness. A flat honing stone is used to remove any burrs or sharp edges from the surface. The case is then thoroughly cleaned in a washer. A clean transmission will be a happy transmission—the more you cleanse the parts and the work environment, the better the results.



Inspect the rear output shaft bushing and replace, if necessary. Level 10 uses a special type that offers better lubrication. Use of a proper installation tool is absolutely necessary, or damage will result.



Most transmissions, like the 200-4R, use a forward clutch to engage all the forward gears. This forward clutch assembly had a retaining plate that was damaged due to a low fluid condition (note cracks). The fatigued part was then removed from the clutch pack.

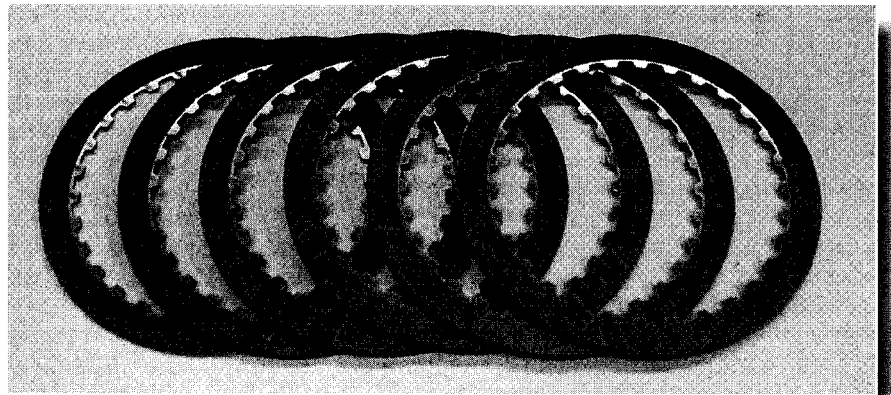
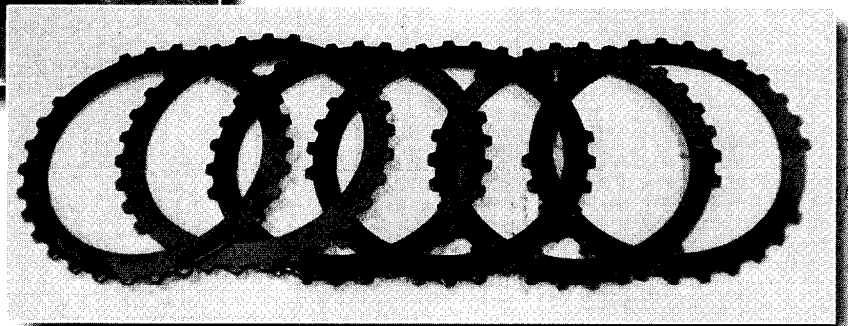


Here you can see the retaining plate that literally fell apart once its snap ring was removed. Considering it is made of cast iron, you can see how much stress is placed on some of these parts if there is insufficient fluid in the pan.

posed no serious threat to the little overdrive tranny. However, problems arose in 1984 when the 200-horse Turbo 3.8 came out and wreaked havoc on power-train engineers everywhere, particularly the Hydra-matic guys. Then came the '86 and '87, and the Turbo 200-4R was improved again. But the fact remained that its roots were very plebeian. Unfortunately, the evolution of the transmission never matched that of the engine.

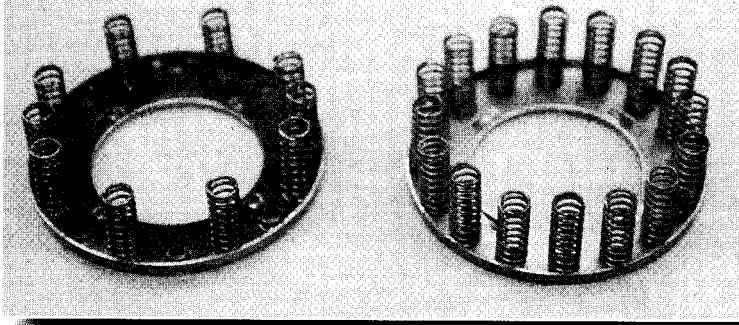
If you own a Turbo Buick or a Turbo Trans Am, sooner or later your Turbo 200 will have to come out for a rebuild. We've decided to show you what's involved, with one of the leaders in overdrive tranny technology, Level 10 in Hamburg, NJ., to help you make the right choices when buildup time comes. **GMHTP**

Here are the preferred steels used in the clutch packs. These steels are coated in Kolene, which increases the coefficient of friction, or, in layman's term's, "bite" on the friction material of the clutches. When a clutch pack engages, high-pressure transmission fluid is sent from the valve body to squeeze on a set of these Kolene steels. It then locks up with alternating clutch plates that have friction material on them-kind of like a clutch pack sandwich.



These Raybestos Blue Plate Special clutch plates replace the factory clutch discs. With the Kolene steels, more friction contributes to a clutch pack that can withstand up to three times more torque for a given amount of surface area. Level 10 uses them in all high-performance Turbo Buick direct clutch packs.

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These springs are located inside the direct clutch pack. Together, they release the application plate. More springs make for a quicker release, and fewer springs promote a slower release of third and fourth gears. Although there is no performance benefit, it can make for smoother downshifts. Since we're using a new accumulator for third, these added springs will balance out the requirement for the proper release timing of direct (third).

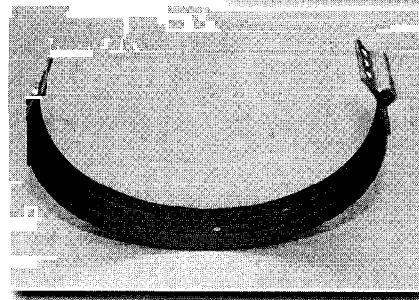


With the new return springs in place, we reassembled the direct clutch pack assembly, as well as the rest of the gears. With the application plate placed in first, insert (in alternating order) clutch discs and steels, starting with a clutch disc, and end with a clutch disc against the end plate. A snap ring then holds it all together:

With the case in its bench fixture, we inserted the output shaft and low/reverse sprag. The external splines of the sprag align with the low/reverse clutch assembly splines. Then the clutch engages it or releases it to the splines inside the case. Right below the sprag is the parking pawl ring which, when locked by the pawl that's mounted to the case in the rear, locks the output shaft to the case for park.

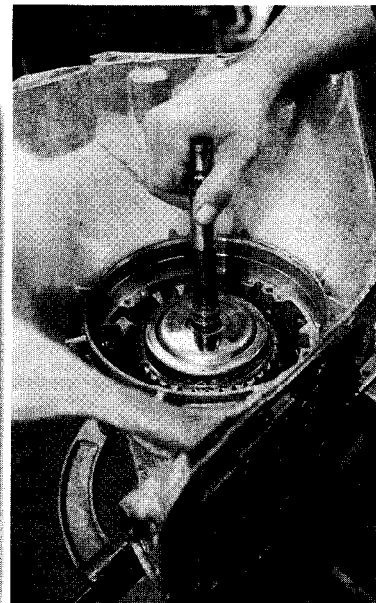


Next, we installed the low/reverse planetary gearset and its clutch assembly, which goes into the case. Seven steels and six clutches go down here, with a wave steel covering it all. Incidentally, a wave steel looks like a large wave washer and in this case, acts as a cushion to make sure the clutch assembly parts do not rattle in the case and are always ready for application with a pre-determined preload.



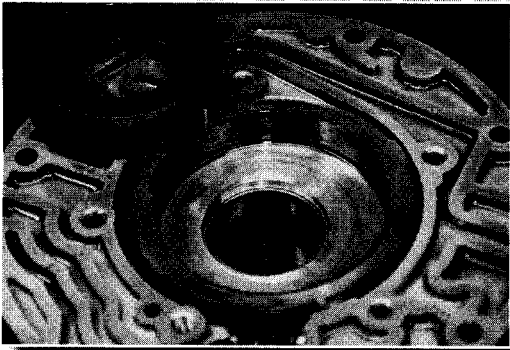
Although different transmissions use different methods to apply a selected gear, a band was used to wrap the direct clutch drum in the 200-4R to engage second. We installed this Raybestos band, making sure it was positioned properly in the case and aligned with the servo piston access hole.

It is often much easier to assemble a transmission with the proper tool for the specific unit. Sometimes it is a necessity, sometimes not, but either way, it is almost always easier. Here, our direct clutch assembly and drum is lowered into place with a holding tool. It locks to the inside of the assembly

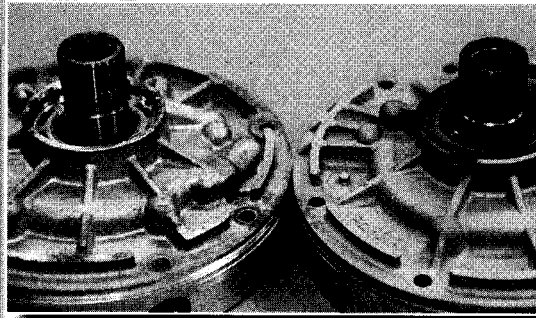


Finally, our 200-4R is starting to look like a full unit. The input shaft is connected to the overdrive assembly. Although the engine's torque reaches fourth gear first, overdrive is not operated until its band is applied. This causes the direct and forward assemblies to be driven first.

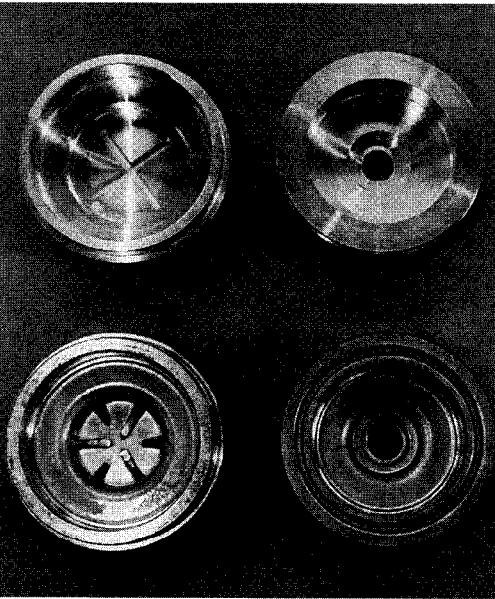
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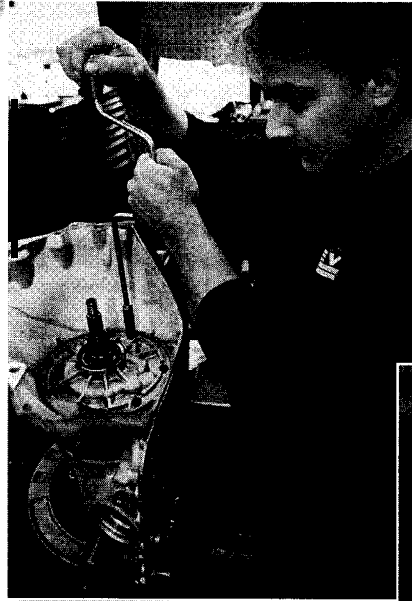
Before the front pump can be installed, it must be disassembled and checked on the bench. The pump's operation is critical for the durability of the tranny. This 7-vane positive displacement pump is also a variable displacement type. The outer ring that the pump vanes spin in moves to vary pump output. At low speeds such as idle and decel, the pump's output is decreased to improve fuel economy (less drag on engine to drive pump) and provide smooth operation. With the throttle mashed (sensed by the TV cable), the pump's output goes to max and provides high fluid volume and pressure to the rest of the transmission to give you tire-baking shifts and torque converter lockup. Make sure everything moves freely and all seven vane elements are in good shape.



The most common leak for a 200-4R is in the front seal. Pat Barret uses a seal that not only presses in, but has locking tabs around it to make sure it won't work its way loose. This would be a good time to change all the scarf seal... on the center support shaft and check for wear on the input shaft bushing. Here, we can view the stator support shaft on the left, which has damaged splines. The new assembly on the right is ready for use.

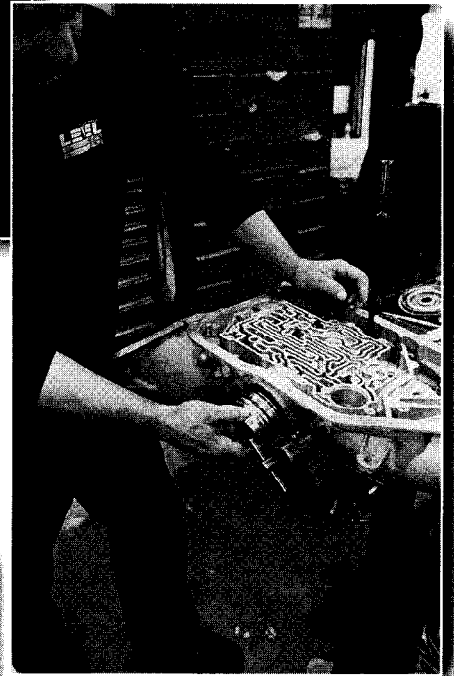


The intermediate band application servo is replaced with Level 10's new billet servo assembly (top). The advantages of a larger servo include a more positive first-to-second shift a cleaner second-to-third shift and a cleaner third-to-second kickdown. It makes second's application and release swifter and more accurate.

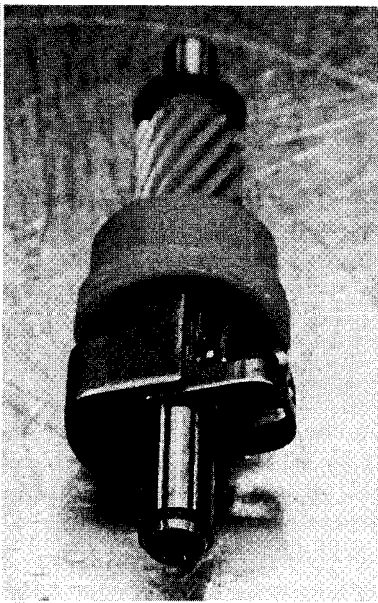


The front cover and pump assembly is slowly tightened to make sure the perimeter seal is seated properly and the hardware inside the case is installed correctly. If a hub assembly is not seated properly, the front cover will never bottom out against the case. We never had a problem with the Level 10 crew spinning the wrenches,

On the side of the case, we inserted the new billet servo and cover with its return spring and lock ring. New replacement-type seals were used as the piston rod was seated against the intermediate band. Check for alignment by looking down through the valve body, or by making sure the tranny still spins freely at the input and output shafts with the transmission in neutral.



This is the governor. It goes in before the valve body does and provides information to the valve body about the output shafts speed. It has a nylon gear that spins at a 90° angle to the output shaft. As it increases in speed, the whole assembly spins and sends centrifugal weights outward. In some cases, the ball valves in the governor can leak, causing an unwanted elevation in shift rpm. With a magnifying glass you can check the disassembled valve seat for wear to determine if leakage is a problem. If there is no leakage and you want to lower your shift points, a small amount of mass can be added to the smaller centrifugal weight (right side).



Sources

LEVEL 10 PERFORMANCE TRANSMISSIONS

188 Route 94
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201/827-1000
transmission rebuilding
and components