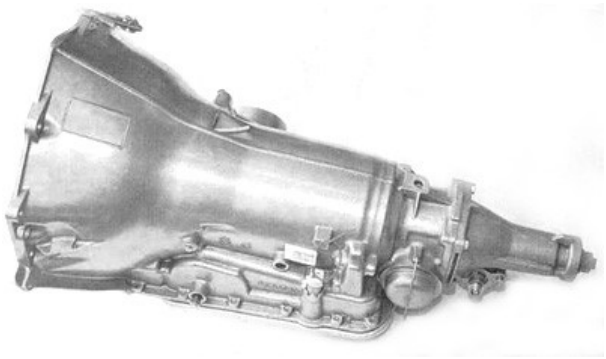
Classic Performance Products 378 E Orangethorpe Ave., Placentia CA 92870

Classic Performance Products Shifting Into Overdrive

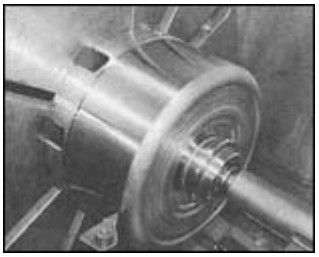
Installing The Right Transmission

By Jeremy Cook and Greg Ducato

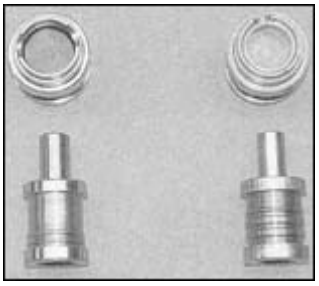


In keeping with the original plan, Project Old School has been on the road for a while now as I continue to make additions and improvements. And believe me, driving to all the shows and seeing all the attention the truck gets, thanks to you readers has been both rewarding and a total blast. Unfortunately, getting a truck on the road the quickest way possible (with regard to safety) means skipping over some of the creature comforts namely power steering, power brakes, and overdrive that make driving more fun (or at least a little easier). The next few installments will be dealing with just these items, beginning right here with the installation of a 700-R4 overdrive transmission from Phoenix Transmission Products. The obvious advantage of installing an overdrive trans in your classic truck is the final drive gear. Typically overdrive will reduce your rpms by around 30 percent. In addition to giving your engine a much-deserved break, it'll do wonders for your gas mileage. Usually you hear about the 700-R4 as being the transmission swap of choice. Lately, however, the world has discovered the plentiful 200-4R, and it is definitely a viable option. The compact overdrive was used from 1981-87 in everything from full-size Cadi1lacs to the Buick GNX. It has the same overall length and output spline as the short-tail Turbo 350 and comes in the Chevrolet and the Buick, Olds, and Pontiac (BOP) bolt patterns. This is an excellent trans for classic trucks with basically stock engines. Phoenix rates their top 200-4R kit at around 350 hp. Several people mentioned that it would be a good fit for Old School, until I mentioned that a warmed- over 396 would soon be replacing the original 283. The 700-R4 is still their most popular performance transmission. Phoenix has been modifying and improving this trans since it was first introduced in the early '80s. They offer seven versions for applications up to 575 horsepower. Since this trans has a low First-gear ratio of 3.06:1 and an overdrive ratio of .70:1- when built properly-translates into a stump-pulling low end while still givingyou the 30-percent reduction in cruise RPMs! Even their lowest-priced 700-R4HD offering features over 25 upgrades and modifications to improve durability and performance, and it comes with their heavy-duty lock-up torque converter with stall speed up to 1,800 ! RPMs. For our project, company CEO Greg Ducato specially built a transmission that falls somewhere between their RV and SS models. It's also worth mentioning that Phoenix tumble-polishes all of their cases prior to assembly, which gives them a new, semi-polished look that is similar to a new carb body. With the new trans on order, I quickly ordered up all the other parts to complete the installation. I began at Classic Performance Products. Not only did we perform the installation at the CPP facility but they supplied the new crossmember, cooler lines, dipstick, and miscellaneous hardware required for the job. A big thanks goes out to Jim, Alan, and the CPP crew on this one.

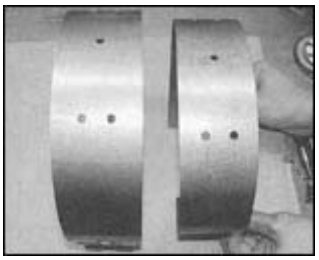
Gennie Shifter had just the shifter I was looking for. Their 23-inch Swan Neck provided the right look for the truck and was built specifically for the 700-R4. Bowtie Overdrives has a very nice cable system for the 700-R4, which you may remember from the article in our Mar. '03 issue. The kit is made specifically to match various aftermarket<et carbs so you can maintain the proper trans pressure-resulting in optimal shifting and downshifting. Having driven the truck nearly every day since the install I can honestly say that Old School feels like a completely different truck. With the Power- glide, the truck felt underpowered at takeoff and was taching out at 4,000 rpm when I tried to hit 80 mph on the freeway. Now I launch off the line, get second gear chirps if I'm really on the gas, and hit 80 mph at about 2,800 rpm Obviously, the larger benefit on installing this trans is going to be improving the GMC's dismal 11 mpg fuel economy. We have only had time to run one tank through it and although the mileage improved, we were doing other performance testing and the mileage suffered. Stay tuned to Film @ 11:00 for results after we put some miles on it so you can get a real picture of the improvements of the Phoenix Transmission Products 700-R4.



At Phoenix Transmission Products, every drum is machined across the band surface to ensure a perfectly flat and concentric surface for band application. If it's not flat, the band will only clamp on the high points causing slippage.



The TV boost valve and reverse boost valve were replaced with larger bore components as shown on the left. This increases internal trans pressure and clamping force across the board.



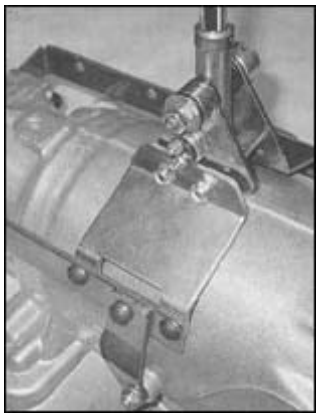
A stock band (right) is not as wide and does not cover the full drum surface. The Phoenix replacement band (left) is wider and covers the full area of the drum surface. This is important because with more band surface contacting the drum, less slippage occurs. It's like adding bigger brakes to a high-performance vehide. The band anchor area is both reinforced and hardened to prevent fluctuations in adjustment over time.

The splines on the factory stator shaft wear down over time, resulting in a converter that will not engage and multiply torque. At Phoenix, the shaft was replaced with a new shaft with a stronger spline area.

Phoenix manufactures a full line of custom torque converters right in their factory. Every converter is built to order to give you the best performance for that specific application and is fully computer welded and balanced. This one has an 1,800-rpm stall speed and was even labeled "Old School."

Once the truck was up in the air at the Classic Performance Products' R&D center, Alan and I got extremely dirty pulling the Powerglide. The factory crossmember had to be persuaded, but it eventually angled out of the framerails. Then hours of cleaning the underside of the cab began.

Ever since I saw the Jimmy Smith rendering that inspired this truck, I wanted a tall floor shiffer. The Gennie Shiffer 23-inch Swan Neck provided the nostalgic look that the truck needed.

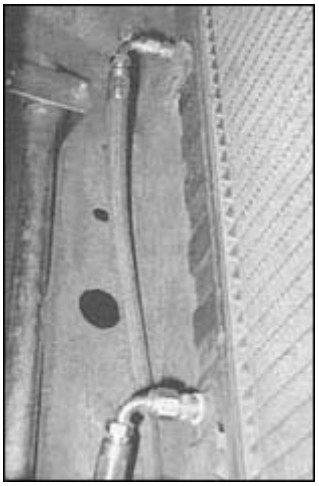


Before installing the 700-R4, the Gennie Shiffer base brackets were bolted into place on the trans.

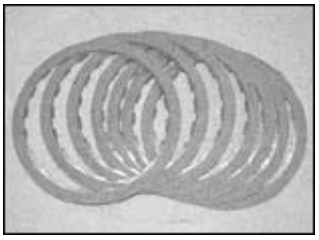
Alan measured and marked for the shifter hole by measuring from the back of the block and a seam in the floor. He then used a small hole saw to make the first cut. Slowly the hole was enlarged with a body saw and cut-off wheel until the shifter fit through the floor with no obstructions.

Inland Empire Driveline took just over 5 inches out of the driveshafl so we could reinstall it with the 700-R4. Check elsewhere in this issue for some driveshafl tips.

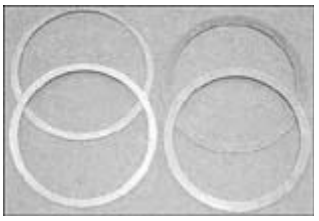
The speedo sensor from our Haneline gauge was installed onto the new trans, however, any stock cable will screw on just as easily. Then the switched power wire on the trans was run to the positive side of the coil.



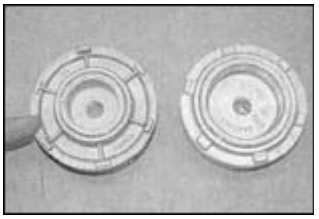
The transmission cooler lines were next. We chose to run cloth hoses



Seven high-energy friction plates are used in the Third- and Fourth-gear clutch pack. Unlike some aftermarket designs, these are full-thickness clutches and have proven to be highly durable under the demanding conditions of high- performance street use.

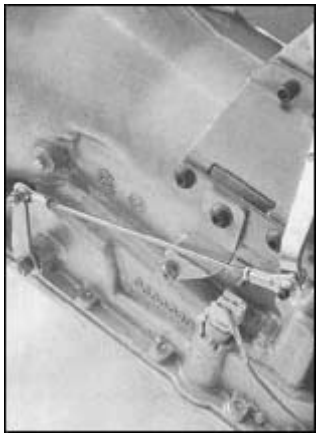


The stock cast pump rings (left) were replaced with hardened steel rings (right). This is critical in high-output pumps because higher rpms can cause the cast rings to fracture and disintegrate.

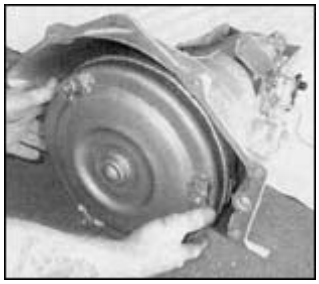


Phoenix uses the Corvette-style servo (left) to apply the band in Second gear on this trans. It has far greater clamping ability than the low-performance servo piston (right).

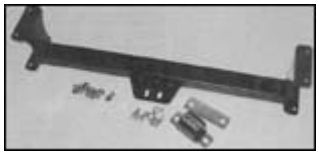
Phoenix will even match the speedometer gear for your application at no extra charge.



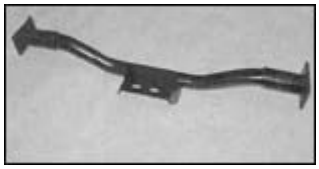
We also set-up the shift linkage at this time. It's recommended that you set it up with the trans and shifter in drive and then check the other gears.



We filled the converter with as much fluid as we could without it spilling out and installed it onto the input shaft.



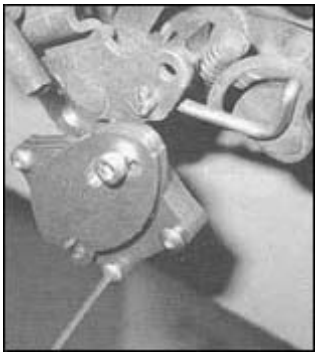
Originally, CPP and I planned to use their crossmember made specifically for the '63-72 trucks. Here it's shown with the new chrome Energy trans mount and hardware.



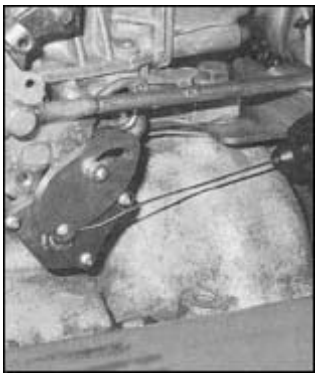
After a test-fit, however, CPP's universal tubular trans crossmember provided the height we needed for the perfect pinion angle in relation to the rear axle. The tube crossmember mounts through the side of the framerails unlike the stock crossmember which is secured on the top and bottom. Once the new location was marked, Alan drilled the four holes in each framerail.

instead of hard lines to make the installation a bit easier. They were tied along the frame and terminated at gO-degree fittings in the radiator.

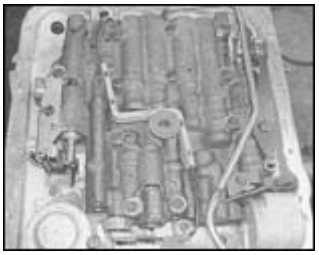
CPP offers this simple chrome dipstick a braided tube that attaches with one of the bellhousing bolts.



Last, but certainly not least, we installed the TV Made EZ system from Bowtie Overdrives. The key to their success is this cam mechanism that is made specifically to work with the linkage of all the popular carburetors. Combined with the carb base plate Bowtie Overdrives supplies, it eliminates much of the guesswork associated with TV cable adjustments.



The cable was secured at the trans, and the base plate bracket was installed under the carb. The cable was snapped into the bracket and linkage adapter, and then the cable length was set by depressing the lock on the cable and opening the throttle fully. Then the cam can be adjusted to fine-tune the timing and firmness of the shifts and downshifts.



The lock-up solenoid was wired off of a fourth pressure switch. When the trans shifts into overdrive, it will automatically engage the torque converter clutch without any external switches required. This is critical because the engine rpm at cruise may be substantially less than the stall speed of the converter, which is a recipe for disaster. By applying a lock-up converter clutch, you eliminate this slippage and heat source-allowing you to have the benefits of a performance-oriented stall speed, plus economy, efficiency, and lower-operating temperature.

When a transmission is completed, it undergoes a complete dyno testing to ensure performance and build accuracy before being crated and shipped.

The Energy mount was install and the crossmember was installed onto the mount. Finally, the crossmember was secured to the framerail. Look how good the underside of that cab looks!

With the underside of the cab looking good as new, Alan jacked the 700-R4 into place and installed the bellhousing and torque converter bolts. Phoenix supplies the new ground strap to help keep people from forgetting it.

The finishing touch before the test drive was dropping the shift boot over the shifter. Here it's awaiting the four screws that secure the bezel to the floor.

QUICK REFERENCE BOX

GM TRANSMISSION DIMENSIONS:

TRANS TYPE	OVERALL LENGTH	FACE-TO-MOUNT DISTANCE
Powerglide Short	25 23/64" or 27 9/16"	20 9/16"
TH-350 Short	27 5/8" or 30 5/8"	20 3/8"
TH-400 Short	28 1/4"	26 3/4"
200-4R	27 3/4"	26 3/4"
700-R4/4L60E	30 3/4"	22 1/4" or 27 5/8"
4L80E	32 3/16"	30 5/16"

GM TRANSMISSION GEAR RATIOS

TRANS TYPE	FIRST	SECOND	THIRD	FOURTH
Powerglide	1.76/1.82	1.00	n/a	n/a
TH-350	2.52	1.52	1.00	n/a
TH-400	2.48	1.48	1.00	n/a
200-4R	2.74	1.57	1.00	.67
700-R4/4L60E	3.06	1.62	1.00	.70
4L80E	2.48	1.48	1.00	.75