

American Motors relies on a number of Borg-Warner automatic transmissions to back up their line of engines, and while these boxes are capable of functioning properly under normal usage, they are a far cry from what they should be if one is contemplating competition. The model shown here is known as the M-11 (other models are of similar design). It backs up the big 390-cubic-inch engine and is similar to a Ford-O-Matic transmission, according to B&M Automotive of Van Nuys, California. They claim it has been upgraded somewhat in design, but can stand some additional rework to make it suitable for drag racing.

The stock converter in the M-11 is a full 13 inches in diameter—a bit too large for obtaining a suitable stall speed. B&M has been replacing these units with a completely remanufactured 10-inch-diameter converter that was originally destined for a 6-cylinder Ford C-4 trans. About the best stall speed you can arrive at with the stock unit is 1400 rpm, while the new B&M converter will let you run the engine up to around 2800 to 3000 rpm and still maintain good efficiency at high revs.

In addition to being fully furnace-brazed for added dura-

bility the new converter features Torrington needle-bearing packages instead of bronze thrust washers normally used to absorb the internal thrust loads. Since loading increases as the stall speed rises, you can see the importance of this.

The pump drive tube on the front of the stock converter features two drive lugs that engage the inner rotor of the pump. Due to the tube's ability to turn in the instant before acceleration, and again at deceleration, the lugs tend to shear off. In an effort to reduce this more-than-liberal amount of lash, B&M utilizes a drive tube on their converter, which features two slots that now engage the two male driving lugs on the pump. With the excess lash done away with, the driving lugs last a far sight longer.

B&M employs a few other "performance tricks" in their converter but would rather not reveal them. Since modifying transmissions is their business, we'll excuse them this time. In case you want to boost your stall speed right now, and gain a more dependable converter in the process, they have your interest at heart. You can purchase a B&M torque converter by itself, and make additional modifications later.

Clutch band material in the M-11 is replaced with another

type that offers a higher coefficient of friction, thus giving less slippage and longer life. The grooving pattern is also reduced to allow more lining to contact the drum surface. The more lining you have grabbing that drum, the more you'll have working for you. Additional lining surface also means less heat build-up and more material to dissipate the heat that is created. The purpose of the grooves in the lining surface is to allow oil to pass off the drum when the band tightens on it. Late-model M-11 clutch discs are used because they offer a better groove pattern than the early types. These new grooves pass more oil over the clutch faces, thus dissipating much of the heat generated on application.

The main-line pressure regulator valve spring is replaced by a heavier spring; shorter, but with a larger diameter wire. This change works with valve body modifications to boost line pressure. The clutch hub contains a number of oil distribution holes which allow oil routed through the main shaft to lubricate the high gear clutches. B&M has found it necessary to open up these holes to 3/16-inch diameter.

Since the kickdown circuit in the valve body has been redesigned, the wire on the kickdown switch can be removed. The trans is affected in a minor way: It no longer possesses a passing gear. This loss is necessary in developing a valve body that can function under racing conditions. The M-11 trans in stock condition will automatically shift out of second gear at 5400 rpm, even though the shift lever is still in second gear.

Incorporating the few modifications just discussed into the M-11 transmission, along with the B&M valve body (more secret stuff), allows you to start out in first gear, and the trans won't upshift. Start out in second gear position, and the trans will operate in first; then go into second, where it will remain even under full throttle conditions. The trans will now be shifting at between 5200 and 5300 rpm. Start out in drive and it will go through the "gears" automatically, shifting at the points just mentioned when you're "on the wood." You can also manually shift the trans when you feel necessary, thus "over-controlling" it.

Quite a few guys are now running B&M Automotive's modified transmissions in their Javelins and AMX's with pretty good luck. One such racer, Dave Kempton, was only averaging between 7 and 15 runs on his Javelin (with the stock trans). He'd have to pull it down and change the clutches and band. After his unit was modified as illustrated, his problems seemed to vanish. At this writing, he has 58 runs on the trans, and it is still shifting hard. Don Spar at B&M mentioned that when the shifts begin to get soft, it's time for the clutches and band to be checked and, if necessary, replaced. Due to improvements in the trans itself, this occurrence won't happen as quickly as before. There should now be a gradual softening over a period of time as the lining wears down; it'll no longer happen all at once. It's gratifying to know that someone is making these boxes work harder and live longer, isn't it? ■

# Toughening AM's Automatic

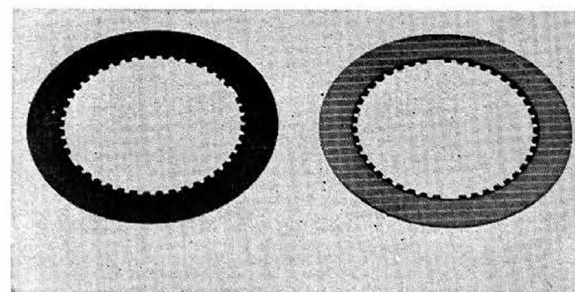
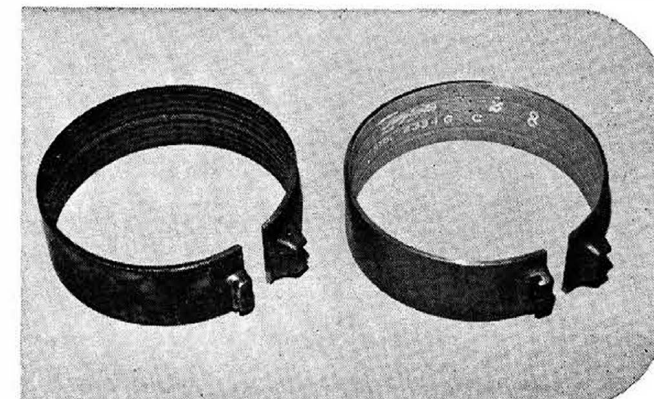
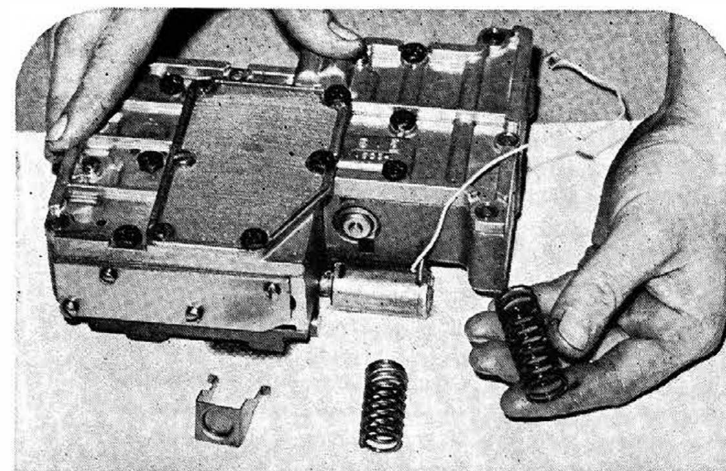
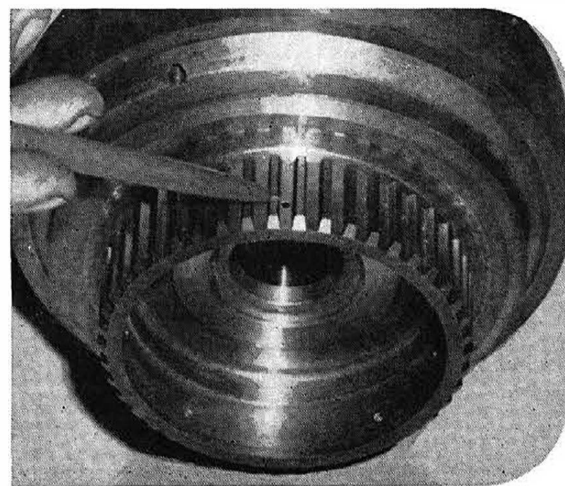
Text and photos by Bud Lang

**B&M beefs the American Motors trans to stop slippage, wear, and losing races. Here's how it's done**



The drive tube on a new B&M converter comes with two slots rather than two lugs. They engage with the stock pump lugs perfectly. Getting the lowdown on what goes into a B&M modified trans is

HRM's Bud Lang, above, left) with Larry Frash of B&M Automotive. They have been pretty active in developing the American Motors automatic boxes into something livable. The series of oil distribution holes in the clutch hub have been drilled out to 3/16-inch to allow better lubrication of the high gear clutches, important in a high-performance transmission.



The main-line pressure regulator valve spring is being removed for replacement by another to help boost line pressure. Wire on kickdown switch can be removed completely, as the valve body has been redesigned to make other uses of this circuit. The new clutch band employed by B&M, upper right, has fewer grooves, a higher coefficient of friction. If you run an early B-W automatic, then consider the late-model M-11 clutch discs. This disc is on the right, in photo at left. Their groove pattern allows more oil to pass over the clutch faces, thus dissipating more heat than normal. It's easy to see the difference between the stock 13-inch converter and the 10-inch unit remanufactured by B&M. The new one offers a higher stall speed, greater dependability. At right is a stock converter's drive tube with twin lugs. Due to lash, lugs generally break.

