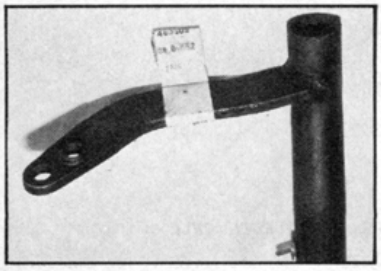
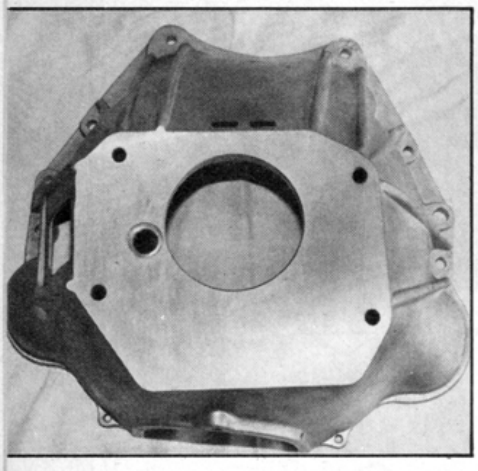
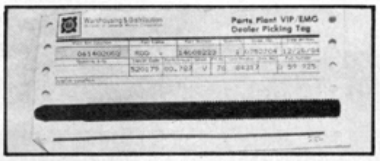
Installing A T-5 Five-Speed In A Late Model GM Intermediate

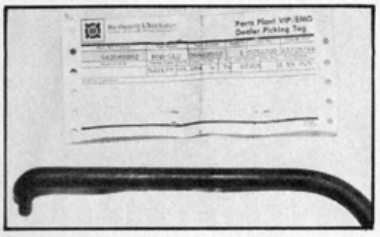




5 ON THE FLOOR

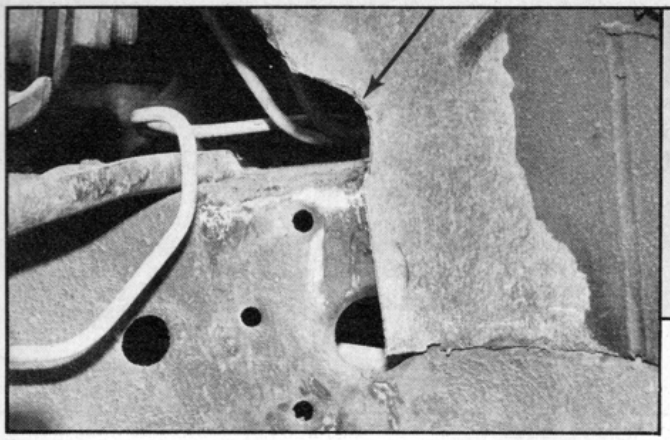
BY JIM LOSEE

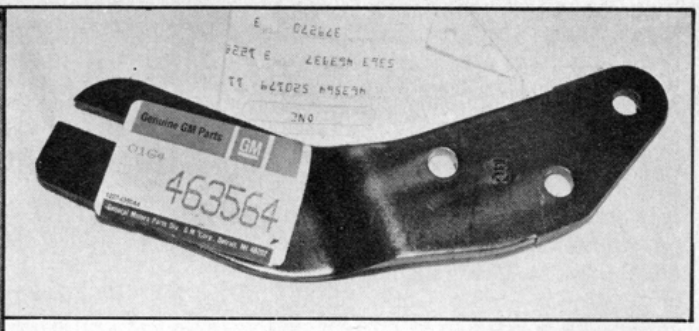




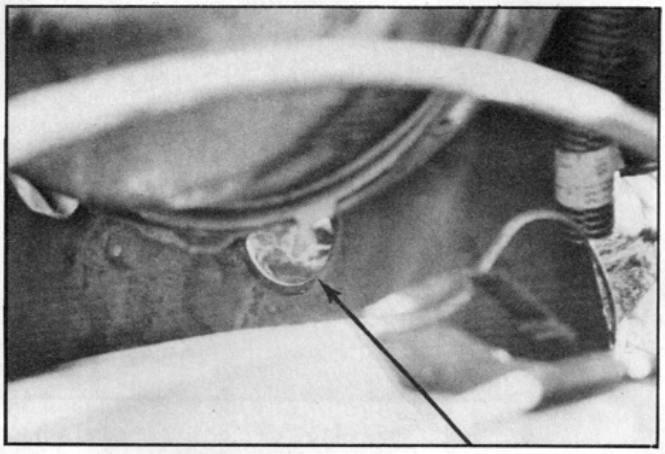
To get the maximum enjoyment from a good handling car, most performance enthusiasts would agree that a manual transmission is an essential part of the overall package. At the same time, some of the best handling mid-size cars have been coming from Detroit since 1978. The current fleet includes the Monte Carlo SS, the Regal T-type, the Pontiac Grand Am, and the Olds 4-4-2. Set up from the factory with large diameter swaybars and heavy duty springs, these cars handle extremely well and provide great driving pleasure, except for one thing, the automatic transmission. Whether it is a Turbo 350 or the infamous Turbo 200 or 700R transmission, it seems to us it would be a much more enjoyable car if you had control over gear selection. To this end we converted a 1984 Buick Regal T-type with a 700R automatic over to a T-5 five-speed utilizing factory GM parts.

When GM down-sized the then "intermediate" A-bodied cars to "intermediate" G-body, one of the options available was a manual transmission. Although not too many of these cars were ever sold with three- or four-speed transmissions, all the parts are available to convert any of the Malibus, LeMans, Regals, and Cutlass' from 1978 to the present. The one thing to remember is that GM stopped putting standard transmissions in the A/G-bodied cars in



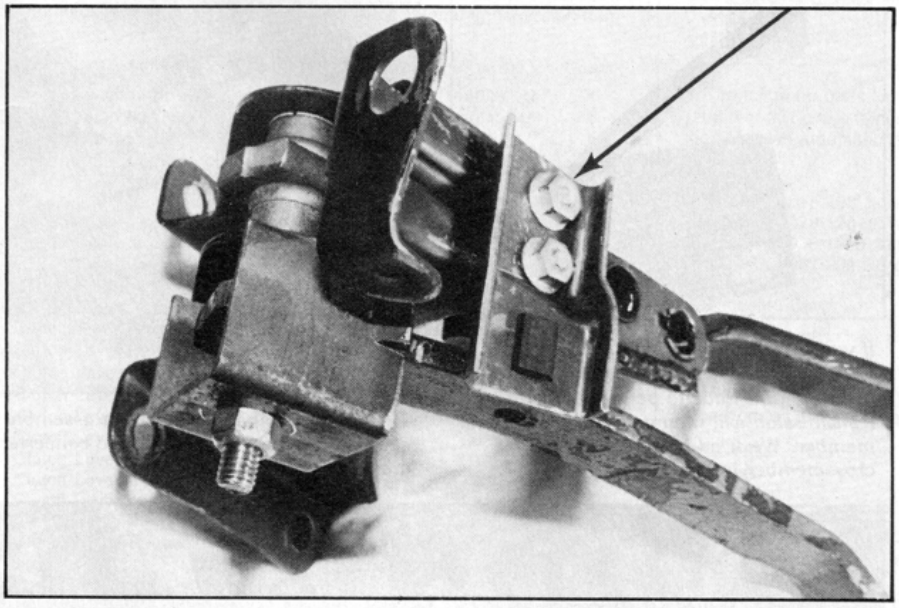


In order to mount the cross-shaft frame bracket, the outer edge of the fender skirt has to be trimmed. To mount the bracket requires using three self tapping sheetmetal screws and screwing them into the holes provided in the frame.



If your car is originally equipped with cruise control, you can use the hole the harness for the cruise control went through in the firewall for the upper clutch pedal pushrod. If there isn't any cruise control, you can locate the dimple for the pushrod hole by looking directly under the vacuum power booster.

This is the clutch pedal bumper bracket that bolts directly to the brake pedal assembly mount. Be sure to hook up the upper return spring to the clutch pedal also.

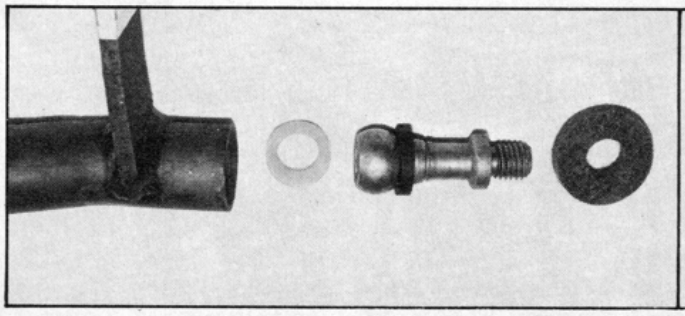


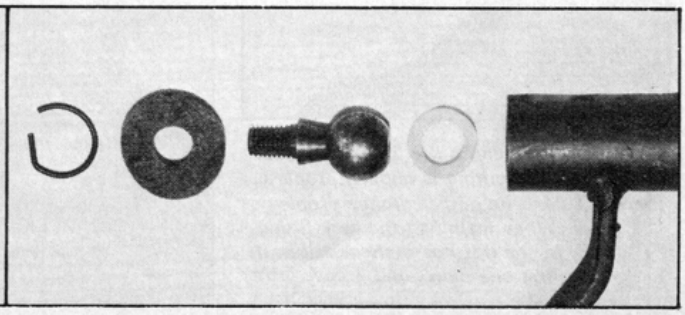
1982. When going to your respective dealer, tell them the parts you want come from a 1982 and earlier car. If you tell them anything later than 1982, there won't be a listing in their parts book for what you need. To make things easier when you go to your dealer, we are going to provide a part number list that will cover most everything you are likely to need in doing the conversion. Even if your car came equipped with a V-6, you will find the majority of parts are common between V-6 and V-8 cars. Remember that our guinea pig car is a turbo-equipped sequential fuel-injected 3.8-liter Buick V-6 with 300 net pounds/feet of torque.

For all those wondering about the emissions aspect, all we can tell you is that GM didn't produce any of the A/G bodied cars from 1982 to the present with any standard transmissions, so the combination isn't certified. But, if the conversion is done utilizing the factory GM parts, none of the emission controls are touched.

The first thing to do is to procure a transmission. The one we are using came from a 1983 Z/28 with the High-Output 305. Although a bit costly, the T-5 has a great gear spread for cars equipped with very high rear end gears. Or put another way, the ma-

The first photo shows the engine side ballstud components for the cross-shaft. The second photo shows the parts that go on the frame side bracket and cross-shaft. Make sure to get a zerk fitting for the cross-shaft and fill the shaft full of grease.



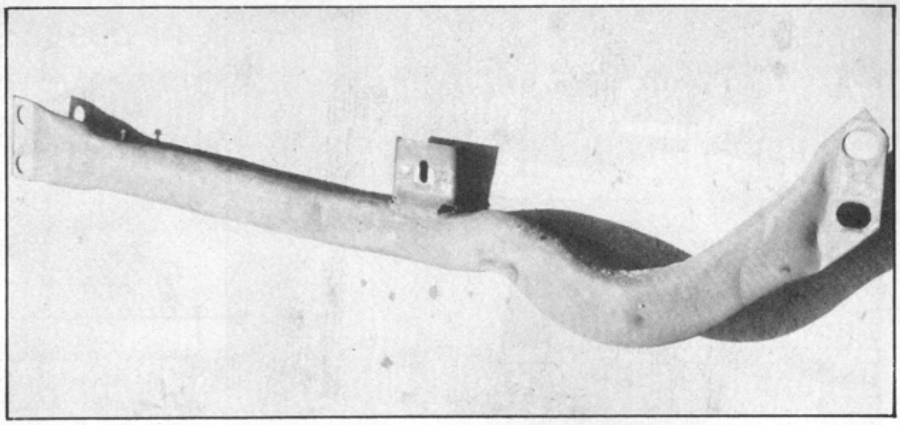


Nine times out of 10 the use of the stock crossmember will work fine. The exception is the 1982 to present Turbo Regal. When doing an installation in one of these cars use the earlier V6 crossmember.

jority of cars out there have on the average a 3.08 or numerically lower rear end ratio, so this will help them out tremendously on the initial take-off. For late-style cars such as the Turbo Regal or Monte Carlo SS that come with a 3.42 or 3.73 rear-end ratio, the overdrive fifth gear will help with mileage in a cruising situation. But the bottom line is overall improvement in driveability and fun per mile.

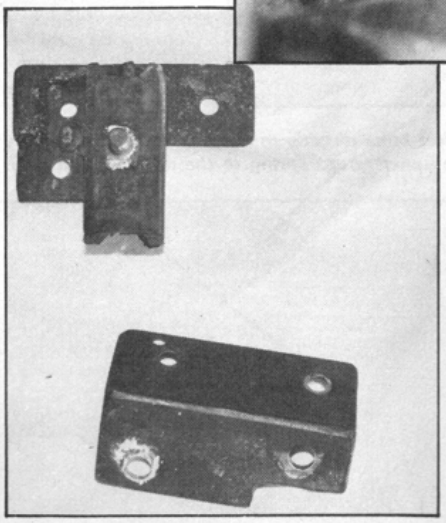
The next thing to do is go down to the dealer and order the parts. Make sure to tell them what kind of engine you have, since this may mean a difference as to what kind of stud and cross-shaft arrangement you will get. If you have a Chevy in an Olds, tell the parts man the car has a Chevy engine. Using the part numbers provided will get the conversion completed in 90-percent of all cases.

Because the Camaro T-5 sits at a 14-degree angle, all of the non-Chevy powered cars will have to do some fabrication in the area of the transmission crossmember. There are two different approaches to this problem. The first is to utilize the stock automatic crossmember (as we did) and fabricate the necessary mounting brackets that mount off the F-body torque arm mounting holes in the tail-

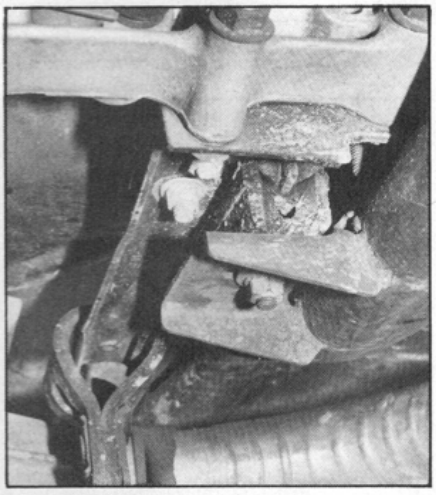


When mounting the upper clutch pushrod boot to the firewall, use the dimples provided to drill screw holes. Also use washers on the pushrods requiring cotter pins to retain them. This helps to evenly distribute the load on the cotter pin.

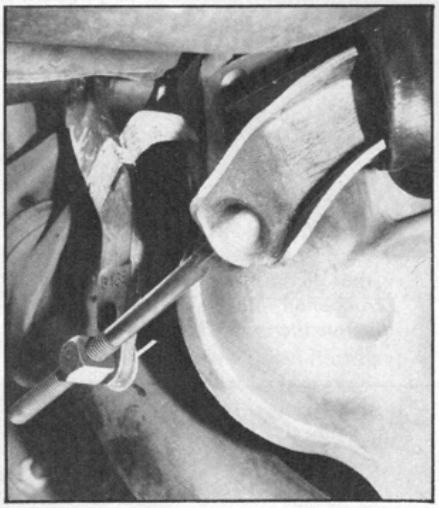
Here's how the lower clutch linkage should look when it's all assembled. Use a jam nut on the backside of the pushrod swivel so the clutch adjustment won't go away. Check for any interference too.



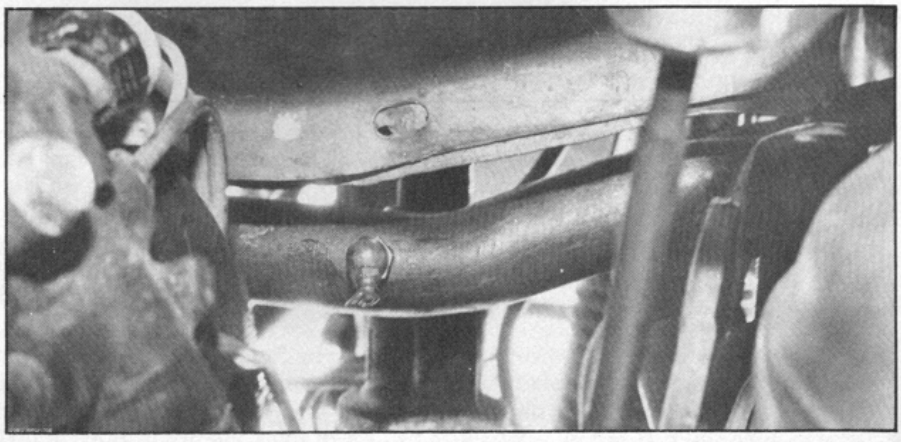
If you insist on using the Turbo Regal crossmember, these are the two mounting brackets that have to be made so the transmission will mount to the crossmember. We tried both and the earlier crossmember is the only way to go.

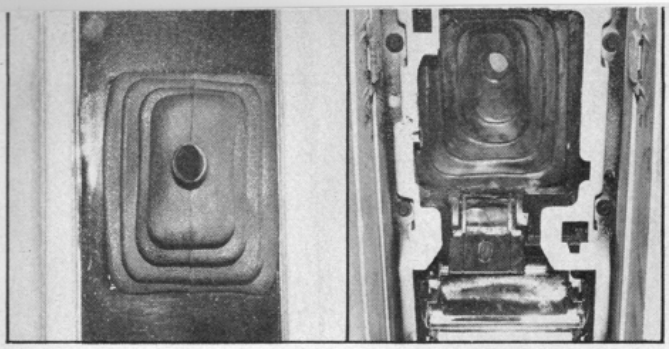


This is the completed mounting assembly even utilizing the stock catalytic converter mounting hardware.

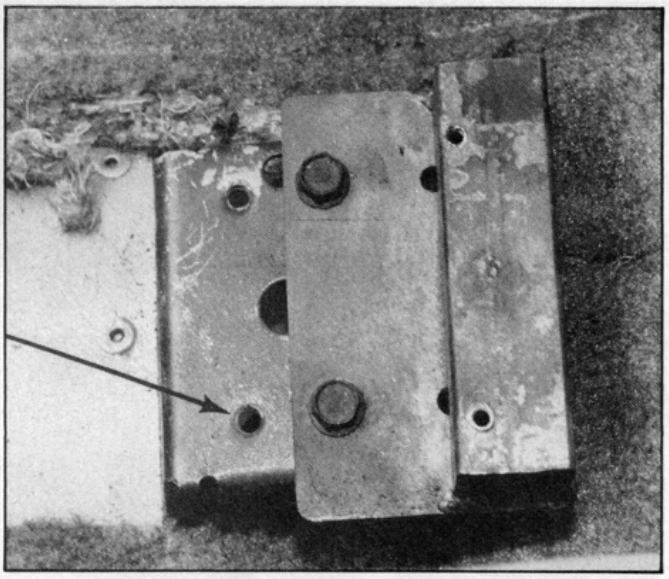


Cross-shaft follows the firewall contour closely. If everything is aligned properly, there shouldn't be any clearance problems at all. When installing the zerk fitting, check to see if it has a checkball in it. Our first one didn't and grease went everywhere.





If the car that's being converted has a console, these are the modifications that need to be done to retain it. Discard the automatic shifter parts and trim the underside of the console so the Hurst shifter from a Camaro or Firebird will clear. A boot plate will have to be fabricated also.



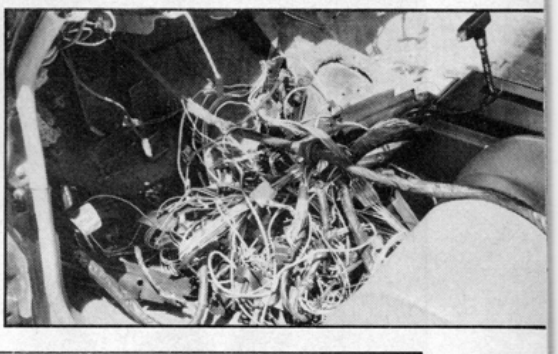
In order to get the console to clear, a bracket had to be made that moved the console back about an inch from the stock location. An extension had to be made to move the mounting height up an inch also.

shaft of the transmission. The second way is to get the four-speed crossmember and fabricate a spacer that will eliminate the 14-degree angle and allow the trans mount to sit parallel with the mounting tab on the stock four-speed crossmember. Either way seems to work and we have not experienced any trouble with mounting the brackets in the torque arm holes in over two thousand miles of driving.

The reason the Chevy-powered contingent doesn't have to worry is that the bellhousing on a Z/28 already has taken into consideration the 14-degree angle and thus makes the transmission sit properly in the chassis. With this combination, the four-speed crossmember will have to be used.

Now the bad side of having the Chevy engined chassis. Because of the angle of the transmission extension

Continued on page 86



If you have gone to this extent to mount the pedal bracket, trust us, you've gone way too far.

The following parts list has components common to all 1978-1985 GM intermediate cars on which a conversion to a manual transmission from an automatic is being done.

Description	Part No.	Quant.
Clutch Pushrod (lower)	14008223	1
Clutch Pushrod Swivel	3840845	1
Clutch Fork	14007356	1
Clutch Fork Stud (in bellhousing)	3729000	1
Clutch Fork Boot	14007355	1
Throw Out Bearing	908244	1
Clutch Pedal Bumper Bracket	461900	1
Clutch Pedal Bumper	467439	1
Clutch Pedal Pushrod (upper) Boot	463508	1
Clutch Pedal	461899	1
Clutch Pedal Bushing	14004821	2
Clutch Fork Spring	472105	1
Clutch Lever Ballstud Seal (engine side) Rubber	382658	1
Clutch Lever Ballstud Seal (frame side) Felt	3743360	1
Clutch Lever Ballstud Seat	3743349	2
Clutch Lever Ballstud Seat Retainer Spring	3750696	1
Clutch Lever Ballstud (engine)	3866568	1
Clutch Lever Ballstud (frame)	3935289	1
Clutch Lever and Shaft Bracket (frame)	463564	1
Clutch Lever and Shaft	463509	1
Clutch Pedal Pushrod (upper)	463507	1
Clutch Pedal Spacer (cut to length)	529323	1
Brake Pedal	1256195	1
Brake and Clutch Pedal Rubber Covers	1256202	2
Neutral Safety Switch	463496	1
Transmission Crossmember (all V8)	473721	1
Transmission Crossmember (all V6)	473725	1
Transmission Mount (rubber)	1257692	1
Transmission Crossmember Insulators	459092	4
Transmission Crossmember Insulator Retainers	375726	2

The following parts list has components peculiar only to the *Chevrolet V6 (200 and 229-cid) and V8 (305 and 350-cid)* engines on which a conversion to a manual transmission from an automatic is being done.

Description	Part No.	Quant.
Flywheel	366860	1
Bellhousing (1983 Camaro or Firebird—14° angle)	14060627	1
Bellhousing Cover	14060628	1

The following parts list has components peculiar only to the *Buick V6 (196 and 231-cid)* engines on which a conversion to a manual transmission from an automatic is being done.

Description	Part No.	Quant.
Flywheel—1978 196-cid engine	1261383	1
Flywheel—1979 196-cid engine	25501871	1
Flywheel—1978-1980 231-cid engines	25501872	1
Flywheel—1981 231-cid engine	25508657	1
Bellhousing	563441	1
Bellhousing Cover	1378868	1

The following parts list has components peculiar only to the *Oldsmobile V8 (260 and 307-cid)* engines on which a conversion to a manual transmission from an automatic is being done.

Description	Part No.	Quant.
Flywheel	398071	1
Bellhousing	563441	1
Bellhousing Cover	560696	1
Transmission Mount (rubber)	472143	1

The following parts list has components peculiar only to the *Pontiac V8 (301-cid)* engine on which a conversion to a manual transmission from an automatic is being done.

Description	Part No.	Quant.
Flywheel	526594	1
Bellhousing	563441	1
Bellhousing Cover	1378868	1
Bellhousing Shield	9794324	1

Thanks go to John Boimilla and Don Barton of the Gledhill Chevrolet Parts Department for their assistance in the compilation of the part number lists. Gledhill Chevrolet, 1500 West PCH, Wilmington, CA 90744; (213) 835-0281.

SERIOUS STREET 'STANG

be boosted in an unconventional manner, which is a story all to itself. Since the composition of brake pads is crucial to the stopping ability of any vehicle, we will be checking out the latest in pad science too.

What all these parts and pieces are for is a car that will go around corners as well as brake and accelerate well. And with the high cost involved with most types of racing today, we're going to try something that is a test of man and machine, autocrossing. Because most cars involved with this type of competition are driven to and from the autocross site, these cars are everyday drivers too. Another reason for competing in this area of motorsports is because the conditions that you compete in are similar in many ways to those encountered on the street every day.

Next month we'll look at the stripped car and what we will be doing to increase the strength of the uni-body. We'll also show how to prep the car for painting. There will be an update on the engine to correspond with the construction of the chassis. Stay tuned for the next installment of Project Serious Street 'Stang.

SLO-CAR BUSTERS

of the 55 mph speed limit and the reinstatement of import quotas.

"Along with a number of very fine high performance automobiles which are imported each year, are a veritable landslide of slugs which create untold problems for our members and the L.A. traffic flow in general," said Johnson. We would like to see a special lane for these cars called the 'slug lane' which would be reserved for cars of this type. Unfortunately, the California Senate is opposed to this idea since studies show a lane of this type would move so slowly that car owners would have to be charged property tax. A valid point, we are working on."

So the next time you're frustrated by the fast lane slug, whether it be on a superhighway or your local boulevard, that diesel spewing offspring of the "mpg era," who ya gonna call?

Slo-Car Busters!!!

Popular Hot Rodding wishes to thank Columbia Pictures for the use of the "Ectomobile" from the movie *Ghostbusters*. Without their help, "Slo-Car Busters" would not have been possible.

FIVE ON THE FLOOR

housing, which includes the shifter, the shift lever hole has to be cut over toward the driver's side of the tunnel. The same doesn't hold true for the non-Chevy-powered cars. With the 14-degree tilt of the transmission, it places the shift lever right in the middle of the tunnel for easy cutting and location.

If yours came equipped with a console, there is more work involved than with a car that didn't have one as original equipment. Most cars equipped with a console have the shifter located there too. To use the console, a new top plate will have to be made. Here again there are two ways to accomplish this. The first is to make a plate that will utilize the boot for the top of the console such as we have done. The second method is to leave the area occupied by the automatic shifter and plate open and fabricate an aluminum tunnel from the top of the console to the tunnel. Then the boot can be retained on the floor just like Chevy did with the 1968 and 1969 Camaros that came with a console and floor shifter. To keep drivetrain noise down to a minimum, try the first way.

Continued on page 88

FIVE ON THE FLOOR

With the shifter being part of the tailshaft assembly on the T-5 transmission, it is fairly easy to cut a hole in the floor for the shifter handle correctly the first time. Once the bellhousing, clutch and flywheel assembly have been bolted in place, put the transmission up and bolt it in. With the shifter assembly removed from the transmission and the resulting hole covered, jack the trans up until it just barely touches the tunnel. Then take a marker or a punch and put four dimples in the floor that correspond with the shifter mount holes on the transmission. After pulling the carpet back, locate the four dimples in the floor. Next, make a mark one-half inch outside each dimple, then draw the box outlined by the new marks. Drill holes at each corner and proceed to cut out the box with a jigsaw. The reason for the extra room is that the engine moves around when you are accelerating and the added half an inch will provide room for improvement.

The shifter we used was one of the Hurst models made for the late model GM F-bodied cars. We utilized the stock F-body shift lever and knob, but with the big assortment of handles and knobs available from Hurst, finding one to fit a particular car shouldn't be a problem. Make sure to use one of the Hurst boots for a sanitary finished product.

The factory clutch linkage for the A/G body cars is of the mechanical variety. In order to get the top clutch pushrod through the firewall, a hole will have to be drilled. The first thought was where do we drill the hole and how big should it be? The factory provided an answer in the form of punch marks on the firewall. The punch marks are there for the clutch pushrod boot also. The size of the hole should be approximately 1⅛ inches in diameter. In order to drill the hole, all the brake linkage and the pedal bracket will have to be removed from the car. To locate where the hole has to be drilled in the firewall from the inside of the car, there is usually a round cutout in the insulation on the firewall for the cruise control harness.

This brings us to another dilemma, to run or not to run cruise control. The reason for the dilemma is the hole in the firewall where the clutch pushrod goes through is the same hole the cruise control harness goes through. The solution is to drill an adjacent hole for the cruise harness. For us to remove and install the brake and clutch pedal bracket, the fuse box had to be unscrewed from the firewall so enough room could be had to maneuver the bracket around. Another thing to look for in the pedal area is interference from the insulation cover that bolts to the bottom of the dash. A slot will have to be cut so the clutch pedal will move freely and won't hang up. Also, remember to install the clutch return spring for ease of operation.

After the pedals have been installed is the time to put in the neutral safety switch. The wiring for the switch that came with the automatic transmission will have to be adapted, but will work just fine. Make sure the wiring is away from any movement of the pedal assembly too.

If the conversion is being done on a car which has a clutch converter, the wiring for the converter will have to be unplugged and tied off to the side. The plug should have the ends taped so no dirt or corrosion will get in. The wiring can be tied to the side of the frame along the brake or fuel line.

When installing the cross-shaft, put a Zerk fitting in and fill the shaft with wheelbearing grease. The rest of the linkage is very straighforward. Make sure to use flat washers where any cotter pins are used. The bracket holding the crosss-shaft to the frame requires the use of three 5/16 diameter self tapping bolts and the holes are already drilled in the frame.

When selecting a clutch, try and stick to a diaphram type for parts longevity and ease of use, unless there is going to be more than 350 horsepower in front of it. And even though the factory GM clutch and pressure plate assemblies are quite expensive, their reliability is a proven fact. The clutch fork pivot ball in the bellhousing should have just a bit of grease on it so there won't be any metal on metal contact.

Because the lengths of the automatics and the T-5 are the same, you should be able to use your stock driveshaft. To make sure, slip the yoke into the back of the transmission and put it up to the rear end. This should be no problem, but if it is, make sure that the driveshaft is shortened a little on the long side. It's a lot easier to shorten a driveshaft than it is to lengthen it.

After all the bolts have been checked for tightness and the transmission filled with fluid, push the clutch pedal in for a final check of any binding or other odd sounds. If everything checks out all right, you should be ready to enjoy the feel of "Five On The Floor."