



File Name: build manual transmission.pdf

Size: 2030 KB

Type: PDF, ePub, eBook

Category: Book

Uploaded: 4 May 2019, 17:10 PM

Rating: 4.6/5 from 614 votes.

Status: AVAILABLE

Last checked: 10 Minutes ago!

In order to read or download build manual transmission ebook, you need to create a FREE account.

[Download Now!](#)

eBook includes PDF, ePub and Kindle version

[Register a free 1 month Trial Account.](#)

[Download as many books as you like \(Personal use\)](#)

[Cancel the membership at any time if not satisfied.](#)

[Join Over 80000 Happy Readers](#)

Book Descriptions:

We have made it easy for you to find a PDF Ebooks without any digging. And by having access to our ebooks online or by storing it on your computer, you have convenient answers with build manual transmission . To get started finding build manual transmission , you are right to find our website which has a comprehensive collection of manuals listed.

Our library is the biggest of these that have literally hundreds of thousands of different products represented.



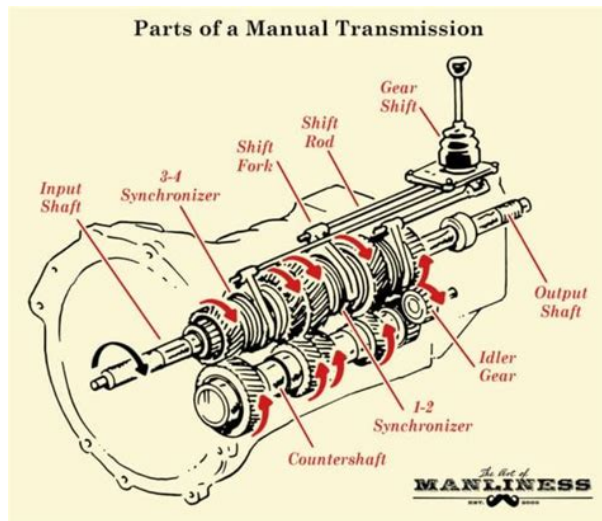
Book Descriptions:

build manual transmission



One answer is to design and build your own. Here's a man who did just that. To my knowledge this is the first time that a manual transmission has surpassed the input torque capacity of the strongest automatics in such applications. It soon became clear that Muncies—which came to be derided as “Munchies”—weren't up to my juvenile antics, as glasslike gears shattered left and right. The local towing service awarded my faithful business with halfprice discounts. The last straw was trashing a transmission in grand style, as in cleaning the teeth off second gear and splitting the case wide open. What were the options. Being a “real” seventies hot rodder, an automatic was out of the question. Some said Ford and Chrysler four speeds were stronger, but only marginally so. Alas, I didn't see any options—and thus, a seed was planted. That seed must still have been growing, however, because decades later I began to get the itch to create a bulletproof transmission. The aftermarket had been playing catchup, with Richmond street five speeds rated to handle 450 ft. lbs. Trouble was, a mild big block could easily exceed that. What about using twin cluster gears to double torque capacity. Big trucks have twin cluster gears, and Mack even has a triple. Liberty's in Detroit makes a strong twincluster transmission for NHRA Pro Stock drag racing. The lack of synchronizers and downshifting capability, as well as the incessant whine of spur gears, caused me to set about designing a more civilized twincluster transmission, based on a singlecluster Richmond five speed donor. Well, things got tricky fast when going from one cluster gear to two. For those intimately familiar with the workings of single and twincluster manual transmissions, what follows is old news. For the uninitiated, a primer is in order. Power flow is from the input gear to the cluster gear. <http://dioceseofniranam.org/userfiles/deere-320-skid-steer-manual.xml>

- **build your own manual transmission, build manual transmission, build manual transmission system, build manual transmission fluid, build manual transmission problems, build manual transmission parts, built manual transmission.**



The cluster gear is nothing more than a collection of two or more gears of different tooth counts mounted in series along a common shaft and rotating as a unit. The input gear meshes with the input cluster gear at one end of the cluster shaft. Power is transmitted along the cluster shaft to first cluster gear at the opposite end. The first cluster gear meshes with the first mainshaft gear. Since the transmission is in first gear, a circular array of small synchronizer teeth on first mainshaft gear engage matching teeth on a slider. The slider is splined to a hub, which in turn is splined to the mainshaft, thereby coupling first gear to the mainshaft. The layout is identical to the first illustration, only with a second cluster gear added. Power from the input gear is directed to both input cluster gears. Power is transmitted along both cluster shafts to both first cluster gears. Both first cluster gears drive first mainshaft gear. With everything working as it should, the twincluster geartrain in Figure 2 will handle twice the torque as the singlecluster geartrain in Figure 1, even though the gears are identically sized. That's an awfully big "if" since this is only possible if the cluster gears are exactly timed, and the shaft bores are machined in the case so that all shaft axes lie in exactly the same plane. Even a tiny deviation from these perfect conditions will cause either the driver side or passenger side first cluster gear to make initial drive contact with first mainshaft gear. When this happens, it's possible that only one cluster gear will be transmitting power, and the other will be along for the ride. The result, U.S. Patent 3,105,395, describes the world's first commercially successful twin cluster transmission. The design allows the mainshaft gears to radially float within narrow limits, captured only by the opposing cluster gears. <http://danchrisjewelry.com/userfiles/deere-345-service-manual.xml>



If a cluster gear were slightly advanced or retarded relative to its neighbor, the mainshaft gear would shift slightly offcenter so that the cluster gears equally transmitted power. You'll see this embodiment in Figure 3. Unlike figures 1 and 2, there is no bearing to support and center first mainshaft gear on the mainshaft. Indeed, the gear is radially supported only by the opposing cluster gears. However, the resulting gear-to-shaft offset created another problem. Conventional Synchromesh gear synchronizers require close alignment between the engaging members for smooth, quiet, low-effort shifts. This close alignment was lost by the very nature of Eaton's design. So, Synchromesh gear engagement was out of the question. Instead, relatively crude jawtooth gear engagement was substituted, with wide engagement "windows," which easily accommodated the radial misalignment see Figure 3. The tradeoff Doubleclutching, geargrinding, clunky shifts. Although modern twincluster big truck transmissions are smoothshifting, I wanted to create my own scaled-down, strong, smoothshifting twincluster manual transmission void of complex, expensive, computer-assisted shift mechanisms. In short, marrying ordinary Synchromesh gear synchronization with twin cluster gears. Back in the seventies Nash was developing a true clutchless drag racing transmission. Early experiments were conducted in famed racer Don Nicholson's car. The instantaneous shifts imparted huge shock loads, regularly breaking transmissions, drive shafts, and rear axles. I felt an instant kinship. Eventually, Doug fitted a torsion bar inside a tubular cluster shaft Figure 4 shows a simplified twospeed version. Power transfers from the input gear to the input cluster gear. However, unlike previous illustrations, the input cluster gear is not directly coupled to the cluster shaft—in fact, the input cluster gear is a clearance fit on the cluster shaft, allowing independent rotation.

Instead, the input cluster gear is splined to one end of the torsion bar. The torsion bar exits the other end of the cluster shaft, where a splined coupler connects the torsion bar to the cluster shaft. So the input cluster gear is coupled to the remainder of the cluster gear assembly only by the torsion bar. During high rpm launches and clutchless gear changes the high-strength torsion bar momentarily twists, substantially reducing shock loads. Doug said the torsion bar flat solved the driveline breakage problems for years to follow. As a bonus, quarter mile elapsed times slightly improved, because the drive wheels maintained better traction during "softer" launches and gear changes—yet another brilliant solution to a vexing engineering problem. This ensures synchronizer alignment during gear shifts, for smooth, quiet, low-effort shifts. Now, for example, if the transmission is in first gear, and the driver side first cluster gear is slightly advanced relative to the passenger side first cluster gear, the driver first cluster gear will make initial drive contact with first mainshaft gear. At that instant the driver torsion bar will begin twisting a small amount, allowing the passenger first cluster gear to advance until it also makes drive contact with first mainshaft gear.

The torsion bars are sized so that the accommodated timing error is a very small percentage of the total available twist. Consequently, cluster gear loading is very nearly equalized. Instead, a vernier adjustment allows for indexing the input cluster gears to the remainder of the cluster assemblies. As the cluster assemblies are placed in the case, timing marks on the cluster gears align with corresponding marks on the mainshaft gears. The input cluster gears randomly engage the input gear. After the cluster gears are installed, one splined coupler is installed on the torsion bar splines. Then the coupler is rotated slightly to engage the cluster shaft splines.

GM 4L60E



RANGE	GEAR	SHIFT SOLENOID VALVES		2-4 BAND	REVERSE INPUT CLUTCH	OVERDRIVE CLUTCH	FORWARD CLUTCH	FORWARD SPRAG CL. ASSEMBLY	2-4 CLUTCH	LD ROLLER CLUTCH	LD/REV CLUTCH
		1-2	2-3								
PARK		ON	ON								APPLIED
REVERSE		ON	ON		APPLIED						APPLIED
NEUTRAL		ON	ON								
D	1st	ON	ON				APPLIED	HOLDING			HOLDING
	2nd	OFF	ON	APPLIED			APPLIED	HOLDING			
	3rd	OFF	OFF				APPLIED	HOLDING	APPLIED		
	4th	ON	OFF	APPLIED			APPLIED	HOLDING	APPLIED		
3	1st	ON	ON				APPLIED	HOLDING			HOLDING
	2nd	OFF	ON	APPLIED			APPLIED	HOLDING			
	3rd	OFF	OFF				APPLIED	HOLDING	APPLIED		
2	1st **	ON	ON		APPLIED	APPLIED	APPLIED	HOLDING			HOLDING
	2nd	OFF	ON	APPLIED	APPLIED	APPLIED	APPLIED	HOLDING			
1	1st	ON	ON		APPLIED	APPLIED	APPLIED	HOLDING			HOLDING
	2nd	OFF	ON	APPLIED	APPLIED	APPLIED	APPLIED	HOLDING			APPLIED

* 1-2 AND 2-3 SHIFT SOLENOID OPERATION AND THE SHIFT VALVE POSITIONING IN P, R, N RANGES ARE A FUNCTION OF THE INPUT TO THE SOLENOIDS FROM THE VSS. UNDER NORMAL OPERATING CONDITIONS THE SOLENOIDS ARE ON IN P, R, N.

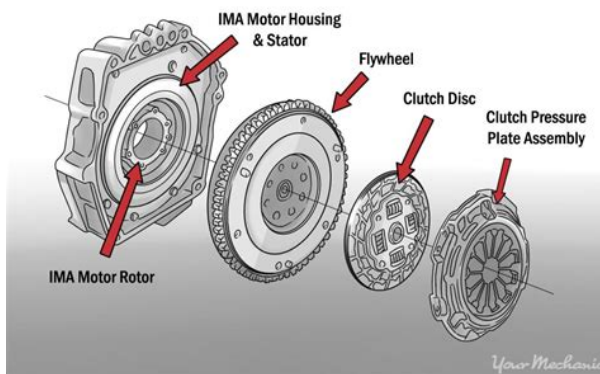
** A MANUAL SECOND - FIRST GEAR CONDITION IS ONLY AVAILABLE ON SOME MODELS. OTHERWISE, THIS CONDITION IS ELECTRONICALLY PREVENTED.

*** IN MANUAL SECOND AND MANUAL FIRST, SOLENOID OPERATION IS A RESULT OF PCM CALIBRATION. SOME CALIBRATIONS WILL ALLOW ALL THREE GEARS UNDER EXTREME CONDITIONS.

<http://www.drupalitalia.org/node/76046>

Now, to index the second coupler it's useful to know that the torsion bars have 31 splines and the cluster shaft has 32. This creates a vernier adjustment between the remaining torsion bar and cluster shaft, having 0.36 degree adjustment increments. The second coupler is installed on the torsion bar splines, then an attempt is made to engage the cluster shaft splines. If the coupler won't engage both sets of splines, the coupler is removed, rotated one spline, and reinstalled on the torsion bar. A second attempt is made to engage the cluster shaft splines. This sequence is repeated until the second coupler engages both sets of splines. The input cluster gears are now indexed to the remainder of the cluster gear assemblies. Owing to the twin cluster gears, the geartrain in the Richmond five speedbased prototype pictured can handle 900 ft. Certainly strong enough to handle anything I put in front of it. However, the design is not limited to Richmondbased transmissions. It's adaptable to a wide range of singlecluster transmission designs. If adapted to Tremec's T56 Magnum six speed, for example, torque capacity would increase from 700 ft. lbs. to 1,400. That's a far cry from the estimated 350 ft. lbs. rating of my old wideratio "Munchie." What's more, by incorporating Synchromesh gear synchronization into the design, the box shifts smoothly and quietly. Figure 7 Perhaps the strongest automatic of all time for car and light truck use is GM's 4L85E, rated at 850 ft. lbs. input torque. With the prototype's 900 ft. lbs. rating, and the promise of even higher numbers to come, that "automatic advantage" has officially evaporated. Figure 8 Through editorial contributions from industry experts, we explore elements of the gear production process, including raw materials, design, costs, heat treat, quality control, workflow, and more.

<https://fufolia.com/images/boss-bv7950-manual.pdf>



It uses a driveroperated clutch, usually engaged and disengaged by a foot pedal or hand lever, for regulating torque transfer from the engine to the transmission; and a gear selector that can be operated by hand. Higherend vehicles, such as sports cars and luxury cars are often usually equipped with a 6speed transmission for the base model. Automatic transmissions are commonly used instead of manual transmissions; common types of automatic transmissions are the hydraulic automatic transmission, automated manual transmission, dualclutch transmission and the continuously variable transmission CVT. The number of forward gear ratios is often expressed for automatic transmissions as well e.g., 9speed automatic. Most manual transmissions for cars allow the driver to select any gear ratio at any time, for example shifting from 2nd to 4th gear, or 5th to 3rd gear. However, sequential manual transmissions, which are commonly used in motorcycles and racing cars, only allow the driver to select the nexthigher or nextlower gear. A clutch sits between the flywheel and the transmission input shaft, controlling whether the transmission is connected to the engine clutch engaged the clutch pedal is not being pressed or not connected to the engine clutch disengaged the clutch pedal is being pressed down. When the engine is running and the clutch is engaged i.e., clutch pedal up, the flywheel spins the clutch plate and hence the transmission. This is a fundamental difference compared with a typical hydraulic automatic transmission, which uses an epicyclic planetary design. Some automatic transmissions are based on the mechanical build and internal design of a manual transmission, but have added components such as servocontrolled actuators and sensors which automatically control the gear shifts and clutch; this design is typically called an automated manual transmission or a clutchless manual transmission .

<http://fugentechnik-koepple.com/images/boss-bx-800-mixer-manual.pdf>



Operating such transmissions often uses the same pattern of shifter movement with a single or multiple switches to engage the next sequence of gears. The driver was therefore required to use careful timing and throttle manipulation when shifting, so the gears would be spinning at roughly the same speed when engaged; otherwise, the teeth would refuse to mesh. Fivespeed transmissions became widespread during the 1980s, as did the use of synchromesh on all forward gears. This allows for a narrower transmission since the length of each countershaft is halved compared with one that contains four gears and two shifters. For example, a fivespeed transmission might have the first to second selectors on the countershaft, but the third to fourth selector and the fifth selector on the main shaft. This means that when the vehicle is stopped and idling in neutral with the clutch engaged and the input shaft spinning, the third, fourth, and fifth gear pairs do not rotate. For reverse gear, an idler gear is used to reverse the direction in which the output shaft rotates. In many transmissions, the input and output shafts can be directly locked together bypassing the countershaft to create a 1:1 gear ratio which is referred to as direct drive. The assembly consisting of both the input and output shafts is referred to as the main shaft although sometimes this term refers to just the input shaft or output shaft. Independent rotation of the input and output shafts is made possible by one shaft being located inside the hollow bore of the other shaft, with a bearing located between the two shafts. The input shaft runs the whole length of the gearbox, and there is no separate input pinion. When the dog clutches for all gears are disengaged i.e. when the transmission is in neutral, all of the gears are able to spin freely around the output shaft.

When the driver selects a gear, the dog clutch for that gear is engaged via the gear selector rods, locking the transmission's output shaft to a particular gear set. It has teeth to fit into the splines on the shaft, forcing that shaft to rotate at the same speed as the gear hub. However, the clutch can move back and forth on the shaft, to either engage or disengage the splines. This movement is controlled by a selector fork that is linked to the gear lever. The fork does not rotate, so it is attached to a collar bearing on the selector. The selector is typically symmetric; it slides between two gears and has a synchromesh and teeth on each side in order to lock either gear to the shaft. Unlike some other types of clutches such as the foot-operated clutch of a manual transmission car, a dog clutch provides nonslip coupling and is not suited to intentional slipping. These devices automatically match the speed of the input shaft with that of the gear being selected, thus removing the need for

the driver to use techniques such as double clutching. Therefore, to speed up or slow down the input shaft as required, coneshaped brass synchronizer rings are attached to each gear. In a modern gearbox, the action of all of these components is so smooth and fast it is hardly noticed. Many transmissions do not include synchromesh on the reverse gear see Reverse gear section below. This is achieved through blocker rings also called baulk rings. The synchro ring rotates slightly because of the frictional torque from the cone clutch. In this position, the dog clutch is prevented from engaging. Once the speeds are synchronized, friction on the blocker ring is relieved and the blocker ring twists slightly, bringing into alignment certain grooves or notches that allow the dog clutch to fall into the engagement. The latter involves the stamping the piece out of a sheet metal strip and then machining to obtain the exact shape required.

<http://www.shipsupply.co.mz/wp-content/plugins/formcraft/file-upload/server/content/files/1626c646090c96---93-jeep-manual-transmission-fluid.pdf>

These rings and sleeves have to overcome the momentum of the entire input shaft and clutch disk during each gearshift and also the momentum and power of the engine, if the driver attempts a gearshift without fully disengaging the clutch. Larger differences in speed between the input shaft and the gear require higher friction forces from the synchromesh components, potentially increasing their wear rate. This means that moving the gearshift lever into reverse results in gears moving to mesh together. Another unique aspect of the reverse gear is that it consists of two gears— an idler gear on the countershaft and another gear on the output shaft— and both of these are directly fixed to the shaft i.e. they are always rotating at the same speed as the shaft. These gears are usually spur gears with straightcut teeth which— unlike the helical teeth used for forward gear— results in a whining sound as the vehicle moves in reverse. To avoid grinding as the gears begin to mesh, they need to be stationary. Since the input shaft is often still spinning due to momentum even after the car has stopped, a mechanism is needed to stop the input shaft, such as using the synchronizer rings for 5th gear. This can take the form of a collar underneath the gear knob which needs to be lifted or requiring extra force to push the gearshift lever into the plane of reverse gear. Without a clutch, the engine would stall any time the vehicle stopped and changing gears would be difficult. Deselecting a gear while the transmission requires the driver to adjust the throttle so that the transmission is not under load, and selecting a gear requires the engine RPM to be at the exact speed that matches the road speed for the gear being selected. In most automobiles, the gear stick is often located on the floor between the driver and front passenger, however, some cars have a gear stick that is mounted to the steering column or center console.

Gear selection is usually via the left foot pedal with a layout of 1 N 2 3 4 5 6. This was actuated either manually while in high gear by throwing a switch or pressing a button on the gearshift knob or on the steering column, or automatically by momentarily lifting the foot from the accelerator with the vehicle traveling above a certain road speed. When the crankshaft spins as a result of the energy generated by the rolling of the vehicle, the motor is cranked over. This simulates what the starter is intended for and operates in a similar way to crank handles on very old cars from the early 20th century, with the cranking motion being replaced by the pushing of the car. This was often due to the manual transmission having more gear ratios, and the lockup speed of the torque converters in automatic transmissions of the time. The operation of the gearstick— another function that is not required on automatic transmission cars— means that the driver must use one hand off the steering wheel while changing gears. Another challenge is that smooth driving requires coordinated timing of the clutch, accelerator, and gearshift inputs. Lastly, a car with an automatic transmission obviously does not require the driver to make any decisions about which gear to use at any given time. This means that the driver's right foot is not needed to operate the brake pedal, freeing it up to be used on the throttle pedal instead. Once the required engine RPM is obtained, the driver can release the clutch, also releasing the parking brake as the clutch engages. Please help improve it by

rewriting it in an encyclopedic style. June 2020 Learn how and when to remove this template message Multicontrol transmissions are built in much higher power ratings but rarely use synchromesh. Usual types are The first through fourth gears are accessed when low range is selected.

To access the fifth through eighth gears, the range selector is moved to high range, and the gear lever again shifted through the first through fourth gear positions. In high range, the first gear position becomes fifth, the second gear position becomes sixth, and so on. This allows even more gear ratios. Both a range selector and a splitter selector are provided. In older trucks using floormounted levers, a bigger problem is common gear shifts require the drivers to move their hands between shift levers in a single shift, and without synchromesh, shifts must be carefully timed or the transmission will not engage. Also, each can be split using the thumbactuated underoverdrive lever on the left side of the knob while in high range. L cannot be split using the thumb lever in either the 13 or 18 speed. The 9 speed transmission is basically a 13 speed without the underoverdrive thumb lever. Transmissions may be in separate cases with a shaft in between; in separate cases bolted together; or all in one case, using the same lubricating oil. With a third transmission, gears are multiplied yet again, giving greater range or closer spacing. Some trucks thus have dozens of gear positions, although most are duplicates. Two speed differentials are always splitters. In newer transmissions, there may be two countershafts, so each main shaft gear can be driven from one or the other countershaft; this allows construction with short and robust countershafts, while still allowing many gear combinations inside a single gear case. One argument is synchromesh adds weight that could be payload, is one more thing to fail, and drivers spend thousands of hours driving so can take the time to learn to drive efficiently with a nonsynchromesh transmission. Since the clutch is not used, it is easy to mismatch speeds of gears, and the driver can quickly cause major and expensive damage to the gears and the transmission.

Since few heavyduty transmissions have synchromesh, automatic transmissions are commonly used instead, despite their increased weight, cost, and loss of efficiency. Diesel truck engines from the 1970s and earlier tend to have a narrow power band, so they need many closespaced gears. Starting with the 1968 Maxidyne, diesel truck engines have increasingly used turbochargers and electronic controls that widen the power band, allowing fewer and fewer gear ratios. A transmission with fewer ratios is lighter and may be more efficient because there are fewer transmissions in series. Fewer shifts also make the truck more drivable. Please help improve this article by adding citations to reliable sources. Unsourced material may be challenged and removed. June 2020 Learn how and when to remove this template message Gear oil has a characteristic aroma because it contains added sulfurbearing antiwear compounds. These compounds are used to reduce the high sliding friction by the helical gear cut of the teeth this cut eliminates the characteristic whine of straight cut spur gears . Retrieved 10 March 2020. By using this site, you agree to the Terms of Use and Privacy Policy. Used Good Laminated cover, good for a shop, cover has some wear, all exterior markings removed, interior clean and binding secure. Please try again. Please try again. Please try your request again later. Early in the 1950s, the major manufacturers figured they could broaden their audience and increase their sales by developing a transmission that would shift itself. While automatic transmissions became more and more popular among commuters into the 60s and beyond, manual transmissions remained required equipment among performance enthusiasts. Fast forward to today; only 5 percent of all vehicles come equipped with manual transmissions, and 99 percent of all parking valets dont know how to drive them.

But there was a time in the notsodistant past that if you had a performance car, you had a manual transmission, and if you were a driver worth your weight in salt, you knew how to use one. For all the performance junkies who have hung in there and insisted on doing your own shifting, this book is for you. *How to Build and Modify High Performance Manual Transmissions*, by author Paul Cangialosi, is a complete guide to all manual transmissions, including theory and design,

disassembly, inspection, rebuilding, tips and techniques, and performance modifications. Borg Warner T10s, ST10s, and T5s are covered, as well as Ford Top Loaders, and GM Muncies. Peripheral systems are covered as well, including clutches, speedometers, assemblies, shifters, and shifter modifications. Also included are tables, speedometer ratios for GM cars, torque specs, oil capacities, and ratio charts of all the popular transmissions. Then you can start reading Kindle books on your smartphone, tablet, or computer no Kindle device required. In order to navigate out of this carousel please use your heading shortcut key to navigate to the next or previous heading. Page 1 of 1 Start over Page 1 of 1 In order to navigate out of this carousel please use your heading shortcut key to navigate to the next or previous heading. Register a free business account Founded in 1981. His design work spans many industries, from bio medical to aerospace. His love for automotive manual transmission design spans over 30 years. He has been an innovator in developing new rebuilding techniques, rebuilding aids, service parts for General Motors as well as parts to anyone with a desire to build their own transmission.If you are a seller for this product, would you like to suggest updates through seller support To calculate the overall star rating and percentage breakdown by star, we don't use a simple average. Instead, our system considers things like how recent a review is and if the reviewer bought the item on Amazon.

It also analyzes reviews to verify trustworthiness. Please try again later. CHEVEN 4.0 out of 5 stars Paul knows what the heck hes doing and its clear he has the knowledge and experience needed to get the job done !! I wish I could afford to box up my transs and just have him build them !!! Paul has some Utube videos posted too that are a must see. The book wont have you building 4 speeds in your sleep but it does get your feet wet so you at least have some insight before you dig in !! Surprise! The book has absolutely nothing on working on this transmission. Those three whole pages include several useless pictures of castings, no teardown, and no howto text. It does have several paragraphs of useless fluff about the A833 history. For my main purpose, this book is misleading and worthless. P.S. March, 2010. The latest edition does cover the A833 transmission so those interested in it can now get their information. Ive changed the stars for my review of this first edition from 1 to 3 as this current manual appears to be a solidly helpful resource, and its shortfall is now remedied by the newer manual. Given the inexplicable absence of the A833 info in this first manual despite its advertising that that transmission was covered, I cant give a higher rating. To the chuckleheads who negatively rated my first review, just what kind of approval do you think should be given to a book that advertises on its covers an important section thats missing inside of it. Meanwhile, I have the newer manual for use with my Plymouth.I read it thouroughly and now I am convinced that I can do it. The photos are excellent and the content of the book is to the point. It was designed for the reader to realize what he is getting into, and to get the job done. The author is sincere in his desire to help you get a manual transmission apart, figure out what needs to be repaired or replaced, and then get it all back together again.

For the reader such as myself who wants to get a Muncie repaired, I would definitely recommend the video by the same author, as the book and the video go together very well. Both are worth the money. They will both save you money because you can do the job yourself.The photography and instruction are exceptionally clear especially for novices like myself. But the manual transmission is dying out. Just 41 out of the 327 new car models sold in the United States in 2020, or 13%, are offered with a manual transmission, according to data from Edmunds. That is a tremendous drop from less than a decade ago. In 2011, 37% percent came with manuals. Carmakers say the demand for manual transmissions has fallen off a cliff, adding that there may come a day when very few, if any, cars even offer a stick shift. Throughout much of automotive history, manual transmissions came standard in most cars. Automatics were a luxury feature, designed to relieve drivers of the skill and attention needed to shift gears. They can make it easier to drive a car on hilly terrain and in traffic. But automatics were also derided for their inability to shift as precisely as a good old stick shift. Now automatics have become far more precise, and carmakers have also developed systems

that can shift to a manual transmission if the driver chooses. Still, some drivers say they still prefer the sense of control and connection to a car they say can only be felt with a stick shift. Manuals are still found on less expensive cars — the transmissions themselves are cheap to build and easy to fix. There are also some performance car brands that stock at least some of their cars with manuals to please the purists. There are a few such cars that only come with a manual transmission, such as the Ford Mustang Shelby GT350. Manuals will probably not disappear completely from the market entirely in the near future. But every year, it seems another holdout gives way.

<http://www.drupalitalia.org/node/76047>