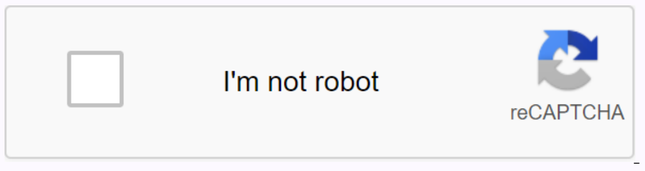

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Touareg manual transmission

If you drive a car with no stick, then you can have several questions floating in your head. How the funny H model I move this shift button through have to do with the gears inside the transmission? What moves inside the transmission when I move the shifter? Advertising When I screw up and hear this horrible grinding noise, what is actually grinding? What would happen if I accidentally reversed while speeding on the highway? Would the whole transmission explode? In this article, we will answer all these questions and even more as we explore the inside of a manual transmission. Cars need transmissions because of the physics of the gasoline engine. First of all, any engine has a red line — a maximum rev value above which the engine cannot go without exploding. Second, if you've read How Power Works, then you know that engines have narrow ranges of revs where power and torque are at their maximum. For example, an engine can produce its maximum power at 5,500 rpm. The transmission allows the gear ratio between the engine and the drive wheels to change as the car accelerates and slows down. You move the speeds so that the engine can stay below the red line and close to the rev strip of its best performance. Ideally, the transmission would be so flexible in its gears that the engine could still run at its unique value, better performance speed. This is the idea behind continuous variation transmission (CVT). Then we'll talk about it. Content A continuously variable transmission (CVT) has an almost infinite range of speed ratios. In the past, CVTs could not compete with four-speed and five-speed transmissions in terms of cost, size and reliability, so you wouldn't see them in production cars. Today, design improvements have made CVTs more common. The transmission is connected to the engine by the clutch. The transmission input shaft therefore rotates at the same speed as the engine, which improves both output power and fuel economy. CvTs has become common in hybrid cars because they are considerably more efficient than both manual and traditional automatic transmissions, and their popularity has skyrocketed from there as automakers competed for the best possible fuel economy ratings. At the end of 2016, one in four cars sold in the United States was equipped with a CVT. in particular, it can be slow to drive, as it is for efficiency rather than pleasure. However, as many drivers choose to move away from manual transmission, resulting in fewer manuals available, the CVT continues to increase its presence. The CVT also works best in small cars with small engines, which is why most trucks and large SUVs continue to use traditional automatics. You can read How CVTs work for even more information on how the continuous streaming variable Work. Now let's look at a simple transmission. To understand the basic idea behind a standard transmission, the diagram on the left shows a very simple two-speed transmission in neutral. Let's look at each part of this diagram to understand how they fit together: the green shaft comes from the engine through the clutch. The green tree and the green gear are connected as a single unit. (The clutch is a device that allows you to connect and disconnect the engine and transmission.) When you push into the clutch pedal, the engine and transmission are disconnected so that the engine can operate even if the car is stationary. When you release the clutch pedal, the engine and green shaft are directly connected to each other. The green shaft and gear rotate at the same speed as the engine. The red tree and gears are called the resting tree. These are also connected as a single piece, so that all gears on the laying shaft and the resting shaft itself rotate as a single unit. The green tree and the red tree are directly connected by their mesh gears so that if the green tree turns, then is the red tree. In this way, the laying shaft receives its power directly from the engine each time the clutch is engaged. The yellow tree is a beaked tree that connects directly to the drive shaft by the car's drive differential. If the wheels turn, the yellow shaft rotates. The blue gears roll on bearings, so that they rotate on the yellow shaft. If the engine is off, but the car is running, the yellow shaft can rotate inside the blue gears while the blue gears and the laying shaft are stationary. The purpose of the collar is to connect one of the two blue gears to the yellow drive shaft. The collar is connected, through the splines, directly to the yellow tree and rotates with the yellow tree. However, the collar can slide left or right along the yellow shaft to engage either of the blue gears. The teeth on the collar, called dog teeth, fit into the holes on the sides of the blue gears to engage them. Let's see what happens when you get to the first gear. Advertising The image on the left shows how, when moved in the first gear, the purple collar engages the blue equipment to its right. As the graph shows, the green shaft of the engine rotates the laying shaft, which turns the blue gear to its right. This gear transmits its energy through the collar to drive the yellow drive shaft. Meanwhile, the blue gear on the left rotates, but it is freewheeling on its bearing so it has no effect on the yellow shaft. When the necklace is found two speeds (as shown in the figure on the previous page), the transmission is neutral. The two blue gears freewheel on the yellow shaft at different rates controlled by their ratios to the laying shaft. Advertising From this discussion, you can answer several questions: When you make a mistake while a horrible squeaking sound, you don't hear the sound of mis-meshing speed teeth. As you can see in these diagrams, all speed teeth are all fully mesh at all times. Crushing is the sound of dog teeth trying unsuccessfully to engage holes in the side of a blue gear. The transmission presented here has no synchros (discussed later in the article), so if you used this transmission, you would have to double-clutch. Double-clutch was common in older cars and is still common in some modern racing cars. In a dual clutch, you first push the clutch pedal once to disengage the transmission engine. This removes the pressure on the dog's teeth so that you can move the collar to neutral. Then you release the clutch pedal and return the engine to the right speed. The right speed is the value of the speed at which the engine must operate in the next gear. The idea is to get the next blue gear equipment and the collar rotating at the same speed so that the dog teeth can engage. Then you push the clutch pedal again and lock the collar into the new train. With each gear change, you must press and release the clutch twice, hence the name double clutch. You can also see how a small linear motion in the gear change button allows you to change gears. The gear change button moves a rod connected to the fork. The fork slides the collar over the yellow shaft to engage one of the two gears. In the next section, let's take a look at a real transmission. Four-speed manual transmissions are largely obsolete, with five- and six-speed transmissions taking their place as the most common options. Some performance cars can offer even more speeds. However, they all work more or less the same, regardless of the number of gears. Internally, it looks like this: There are three forks controlled by three rods that are engaged by the shift lever. Looking at the top shift rods, they look like this upside down, first and second gear: Advertising Keep in mind that the shift lever has a rotation point in the middle. When you push the button forward to engage the first gear, you are actually pulling the rod and fork for the first gear back. You can see that when you move the shifter left and right, you engage different forks (and therefore different collars). Moving the button forward and backward moves the collar to engage one of the gears. The rear-end is handled by a idle gear (violet). At all times, the blue reverse in this diagram above rotates in an opposite direction to all other blue gears. Therefore, it would be impossible to throw the transmission in reverse while the car is moving; dog teeth would never engage. However, they will make a lot of noise. Synchronizers Manual transmissions in modern passenger cars use synchroizers, or synchros, to eliminate the need for dual clutches. The aim of a synchro is to collar and equipment to make frictional contact before the dog's teeth come into contact. This allows the collar and gear to synchronize their velocities before the teeth need to engage, like this: the cone on the blue gear fits into the cone-shaped area in the neck, and the friction between the cone and the collar synchronizes the collar and gear. The outer part of the collar then slides so that the dog's teeth can engage the gear. Each manufacturer implements transmissions and synchros in different ways, but that is the general idea. Automated manual transmission is perhaps better known and described more accurately as the dual-clutch automatic, and it is an increasingly popular option. Although dual-clutch automatic transmission has become popular on high performance cars, such as porsches and Audis, it is increasingly available on more mainstream models. The dual-clutch automatic works via two clutches, which are controlled by the car's computer network and require no input from the driver. As we discussed, when the clutch of a manual transmission is engaged, it disconnects the engine from the transmission to allow the shift. The dual-clutch automatic works two different speeds at a time, which completes the lag while bypassing the power disconnectation stage. This allows a dual-clutch transmission to complete the changes much faster, as there is no er while the engine and transmission try to match the back. Advertising The car is faster because there is no power interruption, the ride is more fluid because it is almost impossible to spot the time of the gear change, and the fuel economy is better because there is no lost power to inefficient changes. You can read more about dual-clutch transmissions here. It should be noted that some cars with dual-clutch automatics offer manual travel mode, usually via steering wheel-mounted gear levers, but the experience is not the same. Some performance enthusiasts may bemoan the loss of the row-it-yourself experience, since manual travel is a pleasant and perfect skill, but if speed is the ultimate goal, it's hard to argue with the results of an automated manual transmission. At the end of 2016, only 5 percent of new vehicles were sold with manual transmissions, according to U.S. News and World Report. This is down from the peak of about 25 per cent in 1987. Even if you're among From a rare car that prefers to drive a manual, you'll have a hard time finding one the next time you go to a dealership. Some manufacturers keep the manual around as an excuse to charge more for an automatic or CVT, but the flip side is that it's hard to get a well-equipped car with a manual transmission. If you want options such as engine upgrades or all-wheel drive, these features often come only on models or trim levels that do not offer manual transmissions. Sports cars, which To be surefire ways to get manual transmissions, also turn to faster and more efficient automatic options. Advertising Automakers say automatic transmissions are simply better in every way, especially the CVT and dual clutch options we've covered on previous pages. The real interest in owning a car with a manual transmission is on the decline, as well, especially as American drivers spend more time sitting in heavy traffic, where constantly feathers a clutch pedal can become tiring. As the U.S. News reported, As drivers encounter more of these excellent modern automatics, fewer are interested in learning how to drive a manual. Originally published: April 1, 2000, 2000