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Clutch on an automatic transmission

À «You've ever driven a car with an automatic transmission, then you know that there are two large differences between an automatic transmission and a metadata transmission: there is no clutch pedal in a automatic transmission car. There is no change of change in an automatic machine transmission. Once the transmission in units is inserted, everything else is automatic.Both automatic transmission (plus its torque converter) and a manual transmission (with its clutch) realizes exactly the same thing, but they do it in totally different ways . It turns out that the way an automatic transmission is absolutely amazing! In this article, we will work through an automatic transmission. We will start with the key to the entire system: planetary gears. Then we will see how the transmission is put together, learn how the controls work and discuss some of the complexities involved in controlling a transmission. Drive like that of a manual transmission, the primary process of automatic transmission is to allow engine operation its narrow speed interval provides a wide range of output speeds. Without a transmission, the cars would be limited to a gear ratio, and this report should be selected to allow the car to travel to the desired maximum speed. If you want a maximum speed of 80 mph, the mapping report would be similar to the third gear in most manual transmission cars. You've probably never tried to drive a manual transmission car using only third march. If you did it, you will quickly find out that you didn't have any acceleration at startup, and at high speed, the engine would scream near the Red-line. A car like this would get very quickly and it would be almost improper. The transmission uses gears to make the use of the motor torque more effective and keep the operating motor at an appropriate speed. During the trailer or transport of heavy objects, the transmission of your vehicle can become hot enough to burn the transmission fluid. In order to protect the transmission from serious damage, drivers that the trailer must purchase vehicles equipped with transmission chillers. The key difference between a manual and an automatic transmission is that manual transmission crashes and unlocks different sets of gears to the output shaft to reach the various gear ratios, while in an automatic transmission, the same sets of gears all produces The different ratios of gears. The planetary magnet device is the device that makes this possible in an automatic transmission. Take a look at how the planetarium reducer works., When preparing and look inside an automatic transmission, find a huge assortment of parts in a fairly small space. Among other things, we see: an ingenome planetary gear band set to block parts of a set of equipment of three wet plates to lock other parts of the Watersetan incredibly odd system that controls clutches and gear pump large to move the fluid transmission around the center of attention is the planetary heater. About the size of a cantaloupe, this part creates all the different ratios of gears that the transmission can produce. Everything else in the transmission is there to help the planetary reducer do its thing. This fantastic piece of gears appeared on HowTuffWorks first. You can recognize it from the electric screwdriver article. An automatic transmission contains two complete planetary gears folded together in a single component. See how gear reports work for an introduction to Gearnets Planetary Gearset has three main components: the sun Gearle Gears Planet Gears and the manager of the planet Gearsthe Ring compensation of these three components can be the entrance. Choose which piece reproduces which role determines the ride ratio for updating the reducer. Let's take a look at a single planetary gear. The only planetary changes from our transmission has a ring with 72 teeth and a sun too! with 30 teeth. We can get a lot of Reports on this Gearset,also, blocking two of the three components together freezes the entire device at 1: 1 reducer. Note that the first transmission ratio listed above is a reduction - the output speed is lower than the input speed. The second is a overdrive - the output speed is faster than the entry speed. The last is the new reduction, but the exit direction is reversed. There are many other reports that can be obtained from this planetary group, but these are those that are relevant to our automatic transmission. You can try these in the following animation: Animation of the various transmission ratios are connected automatic transmissionClick on the buttons on the left in the Above.So table this group of gears can produce all these different transmission ratios without having to commit or unhook any other gears . With two of these gearsets in a row, we can get the four gears ahead and a reversing our transmission needs. You put the two sets of planets.let looks to some of the parts: the following figure shows the planets of the machinery. Notice as the planet on the right sits lower than the planet to the left. The planet on the right does not engage the toothed crown À € commit the other planet. Only the planet on engages left the ring gear.next You can see the interior of the planet vector. The shortest gears are only committed the small gear. The longer planets are engaged by the larger gear and smaller Planets.The animation below shows how all the components are connected in a transmission. Move the gear lever to see how power is transmitted through the first gear transmission.in, the Small gear is operated clockwise from the turbine in the torque converter. Trailing attempts to turn counterclockwise, but still holds from the unidirectional clutch (which only allows rotation clockwise) and the toothed crown transforms output. The small gear has 30 teeth and the toothed crown has 72, so the transmission ratio is: Report = -r / s = - 72/30 = -2.4: 1So The rotation is negative 2.4: 1, the which means that the exit direction would be opposed to the entrance direction. But the exit direction is really the same direction of entry - this is where the trick with the two series of planets enter the first set of planets engages the second set, and the second series turns the toothed crown, This combination reverses the direction. You can see that this could also cause the biggest gear for rotation; But because clutch released, the larger gear is free of rotation in the opposite direction of the turbine (counterclockwise). Return the gear lever to see how power is transmitted through the transmission.this transmission does something really clean to see The report necessary for the second gear. It acts as two groups of planetary gears connected together with a common planet carrier.The first phase of the bearer uses larger gear as the toothed crown. So the first stage consists of sunshine (the small gear), bearing, and the ring (the larger solar). The entrance is small gear; The toothed wreath (large solar gear) is held by the band, and the exit is the yarn. For this phase, with the sun as input, make-ups as exit, and the fixed toothed crown, Formula is: 1 + R / s = 1 + 36/30 = 2.2: 1The model holder is 2.2 times for each rotation of the small planetary gear. In the second phase, the carrier acts as an entrance to the second planetary group, the larger solar (which is kept stationary) acts as the sun, and the toothed crown acts as exit, so that the transmission ratio is: 1 / (1 + s / r) = 1 / (1 (1 36/72) = 0.67: 1 To obtain the overall reduction for the second gear, multiply the first phase by the second, 2.2 x 0.67, to obtain a reduction of 1.47: 1. This may seem Extravagant, but if you look at the video you will have an idea of how it works. The greater the gear lever to see how the power is transmitted through the transmission. The most automatic transmissions have a 1: 1 ratio in third march. You will remember from the previous section that everything we have to do to get an output 1: 1 is blocked along with two of the three parts of the planetary march. With the arrangement in this rehesh is even simpler À € à, - "everything we have to do is engage clutches that block each of the gears of the sun at the turbine. If both gears of the sun run in the same direction, the planet Gears The block Because they can only run in opposite directions. This blocks the ring gear to the planets and causes all-ups as a unit, producing a ratio 1: 1. Move the gear lever to see how the power is transmitted through Transmission.by definition, an overdrive has a rapid exit speed than the speed entrance. It is an increase in speed À € à, - "the opposite of a reduction. In this transmission, involving the overdrive realizes two things simultaneously. If you read how torque converters work, you have learned block torque converters. In order to improve efficiency, some machines have a mechanism that blocks the torque converter so that the engine output goes directly to the transmission. In this transmission, when the overdrive is engaged, a shaft connected to the torque torque torque torque torque torque housing the converter (which is bolted to the motor flywheel) is connected by clutch to the planet. The small SnowWheels gears of the sun and the largest solar equipment is held by the overdrive band. Nothing is connected to the turbine; The only input comes from the converter housing. Let's go back to our chart, this time with the Planet Carrier for the entrance, the fixed sun reducer and the ring gear for output.atio = 1 / (1 + s / r) = 1 / (1 + 36 / 72) = 0.67: 1 If the output revolves once to two thirds of a motor rotation. If the engine turns to 2000 rotations per minute (RPM), the output speed is 3000 rpm. This allows cars to drive to the speed motorway speed speed while the engine speed remains beautiful and slow. Move the gear lever to see how the power is transmitted through the transmission.Reverse is very similar to the first gear except that instead of the small gear of the sun that is driven by the Turkish of the converter, the gear of the larger sun is guided and the small free wheel in the opposite direction. The planet vector is held by the reverse range to the housing. So according to our equations from the last page, we have: So the inverse ratio is a little less than the first gear in this transmission Gear Ratioisthis The transmission has four forward gears and a reverse. Let's summarize the gear reports, entrances and outputs: after reading these sections, you are probably wondering how the different inputs are connected and disconnected. This is made from a series of clutches and bands within the transmission. In the next section, we'll see how they work. In the last section, we discussed how each of the gear reports is created by the transmission. For example, when we discussed overdrive, we said: In this transmission, when the overdrive is engaged, a shaft connected to the torque converter housing (which is bolted to the motor flywheel) is connected by clutch to the planet vector. THE SNOWWHEELS Sun gears and the largest solar equipment is held by the overdrive band. Nothing is connected to the turbine; The only input comes from the converter housing. To obtain transmission in overdrive, many things must be connected and disconnected from clutches and bands. The planet vector is connected to the torque converter housing by a clutch. The small sun is disconnected from the turbine from a clutch so that it can free. The great march of the sun is held at the housing from a band so that it could not rotate. Each gear change activates a series of Like these, with different clutches and bands engaged and disengaged. Let's take a look at a band.Bandsin this broadcast there are two bands. The bands in a transmission are, literally, steel bands that envelop sections of the gear train and connect to the housing. They are driven by hydraulic cylinders within the transmission case. In the figure above, you can see one of the bands in the transmission housing. The gear train is removed. The metal rod is connected to the piston, which activates the band. Above you can see the two pistons that operate the bands. Hydraulic pressure, addressed in the cylinder from a set of valves, it sits that the pistons pushed the bands, blocking that part of the change train to the housing. The clutches in the transmission are a bit more complex. There are four clutches in this transmission. Each clutch is activated by the pressurized hydraulic fluid that enters a piston inside the clutch. Springs Make sure the clutch releases when the pressure is reduced. Below you can see the piston and the clutch drum. Note the à €

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