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 Drivetrain Loss Manual Transmission . To get started finding Drivetrain Loss 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:

Drivetrain Loss Manual Transmission

News Projects Home Automotive Engineering Drivetrain Transmissions Drivetrain losses efficiency Transmissions Drivetrain losses efficiency The drivetrain also called driveline is the sum of components which are delivering the engine power to the wheels. For example, on a rearwheel drive RWD vehicle, the drivetrain consists of clutch or torque converter, gearbox manual or automatic, propeller shaft, differential and drive shafts. The efficiency of the drivetrain has a significant impact on the overall efficiency of the vehicle. The higher the efficiency of the drivetrain, the lower the fuel consumption of the vehicle also lower CO 2 . Image Drivetrain architecture Audi A6 quattro and main components Credit Audi In the article What is efficiency.The current article is split in two main parts. Gear mesh efficiency A simple gear mechanism has an input gear and an output gear meshed together. The input torque and angular speed are converted through the gear ratio in output torque and angular speed. The friction is converting part of the energy into heat, which is dissipated in the surroundings environment, therefore lost. The overall efficiency of a gearbox depends mainly on the gear mesh and bearings efficiency. Image Sixspeed manual gearbox components Credit ZF Depending on the architecture, a gearbox has at least two shafts input and output and several simple gears. Each shaft is sustained in at least two ball bearings, one in each end. Therefore, when a gear is engaged, there are 4 bearings and at least 1 gear mesh as sources of power losses. The minimum efficiency is usually obtained at low temperature high oil viscosity and high shaft speed. The maximum efficiency is obtained at high temperature low oil viscosity and low shaft speed. Propeller shaft efficiency The propeller shaft is transmitting torque from the gearbox to the rear axle.http://kco.su/userfiles/craftsman-router-crafter-owners-manual.xml

- **drivetrain loss manual transmission, drivetrain loss manual transmission, drivetrain loss manual transmission problems, drivetrain loss manual transmission fluid, drivetrain loss manual transmission system, drivetrain loss manual transmission diagram, manual transmission drivetrain loss.**

Since the gearbox and rear axle have to move relative to each other while transmitting torque, the propeller shaft needs at least 2 universal “U” joints, one at each end. Image Propeller shaft components universal joints The efficiency of the propeller shaft depends on the number and efficiency of the Ujoints and holding bearings. If the propeller shaft is made up from two pieces, it needs at least one center bearing and four Ujoints. The lower the offset, the higher the efficiency. Differential efficiency The differential does the final gear reduction and the torque split between the right and left wheels. If the vehicle is driving on a straight line, only the final gear and bearings are adding power losses. There are 3 bearings one on the input pinion, one on the left output shaft and one on the right output shaft and 1 spiral bevel gear. Driveshaft efficiency The driveshaft is transmitting the torque from the differential to the wheel. Each wheel has it’s own driveshaft. At each end of the driveshaft there are constantvelocity joints CVJ, which are needed due to the relative motion between differential and wheel. The efficiency could be even lower for fourwheel drive 4WD vehicles which have a central differential. Also, the lower the drivetrain efficiency, the higher the engine fuel consumption. Frontwheel drive FWD vehicles usually have the highest drivetrain efficiency, mainly because they don’t contain a propeller shaft. At the opposite end are the allwheel drive AWD and fourwheel drive 4WD vehicles, with the lowest drivetrain efficiency due to higher number of components. You can also check your results using the calculator below. Prev Article Next Article 10 Comments Bill Hooghuis How do you calculate the losses due to diveline angles of the CV joints and UJoints. My buddy has a drag car and we changed the subframe to reduce the angles and were curious. Ben I am interested in losses based off of this scenario.http://riggi.ru/userfiles/craftsman-router-lathe-manual.xml

You start with an AWD car, but then you decouple the transfer case in which it is now RWD, but still has all the components of the AWD. Now can you neglect the forward drive shaft, transfer case, forward axles and front differential. They are still on the car and are essentially still driven by the front wheels when they turn, but are not directly driven from the engine. Does this indeed transfer more power to the ground through only the rear diff or does the system as a whole still suffer the same losses as if everything were connected TIA. Anthony Stark If those components still rotate, the losses are still there. The only difference is that the power now comes through the road, via the rear wheels but still from the engine. You can eliminate those losses only if you disconnect them from the wheels. Compared with the AWD situation, now the rear axle has to compensate for the loss of traction of the front axle and also for the friction losses of the front axle. You might save something from the transfer case some components not rotating but pretty much, overall, you have same level of losses. So the rotation of the mass is no longer taking place and the only added inefficiency compared to a car with no FWD capability is the dead weight of the drivetrain components, that the RWD system simply carries around. But nothing is being driven in the front part of the car. Neither by the engine, nor by the front wheels turning.OR Is there any standard databook which shows the variation of gear mesh efficiencies for different types of gears like spur, helical, bevel, etc.Also the same for bearing efficiencies. Darin Selby At what point do you abandon one idea for another one, mathematically speaking. How would the friction losses of this be calculated. Kris When you are calculating your total loss, how would you correctly at least, roughly speaking account for the quantity of each element.

For instance on your rear drive example, you just multiplied everything together which would make enough sense if there was only one of each component, but in reality there is actually two driveshafts. Since both driveshaft have frictions, both have losses. In the example, the losses value is combined but you can split it in two. Hugo May I know where do the values of efficiencies involved in calculations of drivetrain loss come from. Any reference support. Anthony Stark Hi Hugo, The value of the efficiencies are correct in terms of order of value but not specific from a real component. The idea was to describe the method of calculation. If people know the baseline is 300 at the wheels, they know that 340 is a good bump. Its exactly why most manufacturers state crank hp. I cringe so hard when people on Instagram have shit like “330whp380 to the crank” in their bio. You just have to accept the rated hp from the manufacturer, which may be underrated, or in rare cases, overrated.Especially if you’re building an engine on a stand. They are nice because if you use an estimate for how much power you’ll lose to the wheels, you’ll know if you need to change anything else to get the power you want, while it’s out of the car, so it’s easier to work on. Like, what do they gain by blocking us. This is mostly applicable to cars up to the early 2000s. Transmissions and differentials are much more efficient nowadays, so those power losses are smaller. Also aided by the fact that bearings are getting better and better, too. Hell, greases as well.

https://labroclub.ru/blog/eah4870-manual

Edit But to give a broader explanation of why these power losses happen to those wondering, its essentially a battle of frictional losses. The transmission is full of shafts and gears. The shafts ride on bearings and a thin layer of oil in some cases, called liquid bearing. These bearings have small balls or tapered rollers inside, which experience direct friction metaltometal. Then youve got the gears, straight cut or in most cases helical. They mesh with each other and also experience metaltometal frictions. All this happens in the transmission, as well as differentials. So, naturally, the more of these components you have, the more losses there will be. Thus, an AWD system will always have the most amount of loss. In my case, Ive got about a 30% power loss from the crank to the wheels. Sucks, but its how it is.The EU updated legislation on data protection a few months ago. That means sites now have to say what the cookies they use do, and what companies they sell your data to. They dont care about your privacy, they simply are required to give you those to buttons by law. Sites that are mainly focused to a nonEU demographic would need to read up on a lot of legalese and make changes to their websites in order to make sure they comply with those regulations, otherwise risking being punished for not complying, so they took the easier step of blocking the site themselves. Because MR and RR is FF layout on the rear. All rights reserved Back to top. The purpose of this write up is to help explain the differences and the connection between crank and wheel figures. Crank numbers are the HP and Torque values as measured at the engine. To see these values, an engine must be connected to an engine dynamometer dyno for short. All engine powered accessories such as AC compressor, power steering, alternator, and sometimes even the water pump are removed from the engine for testing.

Engine dynos are usually housed in controlled environments to help limit variables that effect engine performance. The engine is brought up to operating temperature and run through the RPM range with the engine dyno applying resistive force to the turning of the crank. This force is called load and it simulates the engine accelerating the car in which it will be installed. The engine dyno, using load, acceleration rate, and a few other variables, measures the power output. Engine dynos are very useful tools in designing and testing OEM equipment and calibrations. Once the engine is installed in a vehicle, it can no longer be tested with an engine dyno. This is where the second set of numbers, wheel horsepower and torque, come from. Wheel, in the term “wheel horsepower and torque”, comes from the fact that they are values measured at the wheels of a vehicle. In the automotive aftermarket world, HP and Torque gains from tuning and upgrade parts are usually measured with chassis dyno testing. A chassis dyno test requires the entire vehicle to be strapped down on top of “rollers” so that the wheels spin the rollers as though the vehicle is driving. There are a few different types of chassis dynos. Dynojet dynos feature large and very heavy rollers while others such as Mustang and Dyno Dynamics are load based dynos that have small rollers. Dynapack, another common load type chassis dyno is unique in that, instead of rollers, the dyno modules are bolted directly to the wheel hubs. Load based dynos, on the other hand, function similarly to an engine dyno. Load is applied to small rollers to make it harder for the wheels to turn. Typically, these load values can be and are altered to match the specifications of the vehicle being tested so that the dyno can be a better simulation of on road driving. To have load control on a Dynojet dyno, Dynojet offers eddy current upgrades for their dynos.

Both types of dynos measure acceleration, time, engine rpm, atmospheric conditions, and roller speed to generate test results. Despite the similarities, results from different dynos quite frequently vary due to calculation methods and conditions which is why it is best to stick to using the same dyno and comparing before and after results on the same car instead of different cars on different dynos. The difference comes from what is called “drivetrain losses”. The engine power that is used to move all the components listed varies depending on transmission type automatic vs manual vs DCT vs MCT vs etc., drive type RWD, FWD, AWD and the general weight and dimensions of all the components. Many times, people try to put a simple percentage to drivetrain loss. Drivetrain losses are still present and largely unchanged from previous models. The reduced gap between crank numbers and wheel numbers on these vehicles is a result of a practice that is known as “underrating”. The practice goes back to the muscle car wars where manufacturers advertised lower numbers to help combat rising insurance rates for high powered vehicles. Drivetrain losses are a natural and unavoidable aspect of automobiles. For a long time, Dynojet has been the industry standard in measuring power at the wheels. Certain patterns became apparent with the Dynojet dynos which led to the common 15% 2WD and 25% AWD drivetrain loss rules. These rules are usually applied to manual transmission vehicles as automatic transmission vehicles are prone to more losses because of torque converters and more complex internal components. The rules, however, are not absolute or 100% accurate. Transmission type, wheel and tire size, driveshaft weight, brake rotors, etc.It is best to understand that the common rules are purely for estimates and that the best use of dyno testing is to measure before and after results on a specific vehicle on the same dyno.

Actual gains are dependent on the following Both have the same engine, however the C63 came with 451hp while the CLK63 came with 507hp. Naturally, the C63 will show more gains as it starts at a lower power level. The engines remain largely unaltered. As a result, final tuned output remains the same, while the gains are lower as the starting point is now higher. Top tier brand premium fuels should always be used to achieve the best results possible. Heat, high humidity, and thin air will all work towards reducing engine output as combustion engines react differently to different amounts of air density. Properly maintained engines will have better performance than abused or neglected engines. A dirty Air Filter or high millage original spark plugs quickly become weak links. It is a linked 4WD dyno with the load control eddy current module. The Linx option links the front and rear rollers with a massive industrial Vbelt. The eddy current module lets our calibration engineers apply load to better simulate road driving and develop tunes that offer great gains with OEM drivability. Dynojet is the most popular chassis dynamometer on the market and many people prefer to see numbers from a Dynojet as opposed to other dyno models. Other dynos are often recalibrated or otherwise adjusted to “read like a Dynojet” and thus end up reading entirely different than another dyno of the same make and model. Being an inertia based dyno, there are no simple ways to manipulate the results which helps to keep results consistent if comparisons must be made to a different Dynojet dyno’s results. The inertia variables can only be changed by Dynojet themselves, and it is not something they do for anyone. The Dynojet software offers a handful of correction factors SAE, DIN, JIS, EEC, and Uncorrected to compensate only for atmospheric conditions such as temperature, pressure and humidity. It may not display this or other websites correctly. You should upgrade or use an alternative browser.

Instructions here Click to expand. What formula can be used to determine wheel horsepower in BeamNG. Edit I just take a closer look at the screenshot. Flywheel power 450 PS, Wheel power 444 PS which means that the reduction is only about 1.36 percent. As far as I know, wheel power can be as high as 1015% reduction from flywheel horsepower.What formula can be used to determine wheel horsepower in BeamNG. Flywheel power 450 PS, Wheel power 444 PS which means that the reduction is only about 1.36 percent. As far as I know, wheel power can be as high as 1015% reduction from flywheel horsepower. Click to expand. Marking topic as solved, thank you!Drivetrain losses is a complicated topic, a rule of thumb like that doesnt reliably work for all conditions. But yes, the losses could use some tuning, we focused on the implementation first and the polishing will come.By continuing to use this site, you are consenting to our use of cookies. Join EngTips Forums! By joining you are opting in to receive email. Students Click Here EngTips Posting Policies Losses in diffs can be quite spectacularly large 10%, and again tend to be least at mid load. Cheers Greg Locock So for example, you have a car dyno at 150 horsepower at the wheels and the manufacture states that on an engine dyno the engine will produce 180 horsepower. This means the drivetrain causes approximatley a loss of 30 horsepower, or 16.7%. Now you turbocharge the same engine and the dyno registers 250 horsepower at the wheels. Is the drivetrain loss still approximatley 16.7% now 50 horsepower or is it closer to the original figure of 30 horsepower. I guess from Gregs answer it would be somewhere in between, right If its the first one, are diff coolers therefore useful for improving power even if not required for reliability Taken to be constant with speed, typically about 2% of power for spur gears and 3% for hypoid bevel. 2 The complex loss never found in textbooks due to oil fling and windage.

As it picks up speed it tends to fling the oil and carve a groove in the oil bath reducing drag by entraining air. As it flings oil the oil depth reduces, again reducing drag. It moves to a loss approx proportional to speed regime. I dont know what happens at very high speed when the oil level has been reduced as low as it can go or a larger gear on the same shaft is still flinging oil and a smaller gear runs clear of the oil bath. Auto boxes main loss is due to pumping loss in the oil pump and hydraulic system as the gears are not dipped in oil. Increased temperature will reduce viscosity and reduce drag. My LSD diff has an oil cooler, not for the benefit of the gears but to maintain the oil at the working temperature of the Viscous LS unit. It has a warning light to tell me when it is possibly an open diff. Transmission loss is a black art known only in the makers dyno house and consultants like Ricardo or SwRI, there is very little published information. Lots of people quote some % figure for loss but dont say what the power or speed was so the figure quoted is useless. Even assuming its for peak power and speed doesnt tell you what it will be at normal cruise. In lots of engineering texts I have only ever found one graph of transmission loss against speed, it was in a book on dynometer testing of engines, 1936 reprinted in 1969! It is no great secret. I agree, getting efficiencies for gearboxes is more difficult, but I have never needed to chase down public sources for them. Cheers Greg Locock Im not an engineer, so I dont know the usual sources. Thanks. If anyone knows of a refernce table or has a similar text I would be interested to see it, anyone I just need to know a real world figure to use, front wheel drive and rear wheel drive figures are required please. Cheers Greg Locock Please see FAQ731376 for tips on how to make the best use of EngTips. Keep in mind that power loss in general means loss being transmitted as heat fritional loss.

You haved to loose the energy somewhere, and some losses mentioned above are just not possible. Id say the power is never fully generated Electric Traction Systems In principle, transmissions could be replaced by an allelectric drive system consisting of an enginedriven generator sending power to a motor or motors driving the wheels. Capable of developing maximum torque from a standing start, such motors would not necessarily need a changespeed transmission system. However, with the existing systems the loss of efficiency from the conversion into electrical energy and back again is seen as a disadvantage of a pure electric system. Renault has been looking at infinitely variable transmission made from planetary gears with motors and generators, not using the CVT arrangement of the Toyota Prius, but having an electrical path within the transmission rather than using the generators power downstream of the transmission. I believe they concluded that the most efficient ratios occured when power was transferred entirely mechanically, but that doesnt exclude the possibility that there would be a fuel saving at the intermediate ratios due to engine characteristics. The losses all end up as heat anyway, whatever the cause. I have never tried this myself, but the type and grade of oil you use may have a significant and measurable effect on transmission losses. A lot depends on what the gears are doing. In a high Rpm low torque situation, highway cruise most of the losses will be windage and pumping losses, so much thinner oil may possibly lower those losses. In a very high torque situation diff gears on the dyno most of the losses might be due to high pressure oil shear. A thicker high pressure lubricant may work better and show a lower temperature rise. Lowest possible transmission loss might require totally different oil in a mileage miser, to a high horsepower endurance race car. Even if the gearboxes and diffs are otherwise absolutely identical.

But I believe measured oil temperature rise is trying to tell you what the losses are. If different oil lowers the operating temperature in your application, that has to be a step in the right efficiency direction. Neat! Cheers Greg Locock Please see FAQ731376 for tips on how to make the best use of EngTips. All these things have an effect on output, so the results in a car could be very different than on an engine dyno. But not nearly as much as it would take without all that oil. Have a happy day. Pancholin Diesel locomotives with gearboxes and hydraulic couplings. The conclusion was that the geared transmissions were usually more efficient, but the electric transmissions had a place on the largest freight locomotives. But even if electric transmissions are less efficient which I dont concede, theyd likely be cheaper in cars. Are wheel motors then really the sticking point. If vibration is an issue, it seems rational to mount the hightorque motors near the centerline of the car, attached to the wheels with axles. Anyone have any or seen any Will that do Cheers Greg Locock Please see FAQ731376 for tips on how to make the best use of EngTips. Diesel locomotives with gearboxes and hydraulic couplings. Though not quite as reliable, the DieselHydraulic locomotives that many countries used for a while were also more efficient than DieselElectrics. Electric motors are efficient but they really only represent a little more than the short block of a gas engine. For the most part, they have no throttle means whatsoever and supplying proper current to them is a fairly monumental task. Efficient PWM control of a very high power electric traction motor is not as difficult as Fabrico suggests. Suburban trains in the electrified rail network have solved all the problems long ago, and they usually employ regenerative braking too. Very high voltage gate turb off thyristors easily operate at megawatt levels, with very high efficiency and precise control of power in both directions.

It is just about 99.4% efficient. If we had fitted more FETs it would have improved the efficiency. Cheers Greg Locock Please see FAQ731376 for tips on how to make the best use of EngTips. Suburban trains in the electrified rail network have solved all the problems long ago, and they usually employ regenerative braking too. Very high voltage gate turb off thyristors easily operate at megawatt levels, with very high efficiency and precise control of power in both directions. I have not kept pace with the latest advances in automotive electric drives. But, up until a short time ago, 3phase AC motors were considered among the most efficient direct drive motors in existence. But the controllers were bulky and extremely complex. Most needed water cooling. Trains have solved nothing for automobiles. Motor controllers have been just about as much a stumbling block as the batteries. The key to control system efficiency is using a sufficiently high operating voltage to reduce the current. The problem will always be the sheer size and weight of the batteries and motor, the power electronics to control it is simply not a problem. To get the high efficiency we used a bus voltage of around 200V.Speed control through electronic commutation. As far as efficiency, its claim to fame is during zero to moderate output. At high output it is about the same as a brush motor. I hope they turn out better than the brushless automotive generators. Dependable, but very bulky with low output. I have never seen any regeneration efficiency graphs. This is by no means computed but it is what I have seen between manufacture flywheel horsepower specs and the amount that is measured on a chassis dyno, I am sure there is a big variece on these numbers but they are a good guess to the midrange of drive train loss. in E.X. a 9601 Acura Integra LS is advertised as 140 fylwheel horsepower. Typical measurments from car to car for the manual transmission are 118121whp.

Also at the shop I used to work for we had a dyno day in which 10 or more Infiti G35s came in. I believe they are advertised at either 298 or 300 flywheel horsepower for the 06 6 speed, of which serveral attended. They varied by one or two horsepower but they were right at 238 horsepower. However the dynojet we had is also known to read lower than other local dynos, my guess is 58% low. Also automatic transmissions seem to read much much lower than manual transmissions None of this is fact and there are an increadible amount of variables involved including the dyno but it should shed some light on actual drivetrain loss for high speed fourth gear to redline on a 5speed manual wide open throttle. A RWD transmission will have to push the car along against the rolling resistance of the front tyres. Likewise a FWD car will need to drag those rear tyres around. Hysteresis in a pneumatic tyre can soak up a surprising amount of energy, and they are nowhere near as efficient as steel wheels running on steel rails for example. Another clue is the higher power reading obtained on a correctly calibrated hub dyno, against a correctly calibrated roller dyno. The point here is that the supposedly higher losses of 4WD transmission do not seem to manifest themselves as higher fuel consumption or serious loss of on road performance. Perhaps if the undriven wheels were externally powered, and that power subtracted from the power available at the driven wheels, 4WD may show up as having a very similar or possibly even lower overall loss than 2WD. I have never seen published figures on this, but my own experience of converting a FWD car to 4WD suggests that combined transmission and rolling losses may actually reduce with 4WD. Certainly tyre wear rates are much reduced, and that may be trying to tell us something as well. Bear in mind that the rolling resistance of a tire on a small roller, as used in a typical chassis dyno, is an order of magnitude greater than seen on the road.

Cheers Greg Locock Please see FAQ731376 for tips on how to make the best use of EngTips. Reasons such as offtopic, duplicates, flames, illegal, vulgar, or students posting their homework. The EngTips staff will check this out and take appropriate action. Already a Member Login However, it can be complicated and costly to unite engineering with the factory and supply chain. Download Now It focuses on the value measurement derived structure functions provide through interpretation of the heat flow path inside a package for use in thermal characterization, failure diagnosis, and improving simulation thermal model accuracy. Download Now Download Now Implementation of a requirements tracking solution requires attention to a variety of nuanced topics. When presented with the task of tracking the many concept relationships in a project of this type, the initial software solution of choice tends to be a twodimensional text systems. Download Now Unauthorized reproduction or linking forbidden without expressed written permission. Registration on or use of this site constitutes acceptance of our Privacy Policy. Its easy to join and its free. Several functions may not work. Please reenable javascript to access full functionality. How much ekstra gets losts due to the 4WD most have. Is there a big difference between a subarus longitudaly mounted engine vs the transverse mounting of the EVO How much ekstra gets losts due to the 4WD most have. Is there a big difference between a subarus longitudaly mounted engine vs the transverse mounting of the EVO. That is a very good question. The answer will, roughly, be a friction element, and a torque dependent element. Despite the existence of published test data for driveline losses, very few people seem to have an accurate idea of the numbers involved. Lots of people quote rules of thumb. Even more know even less.

http://www.liga.org.ua/content/eagletree-eagle-eyes-manual