

WAYS TO IMPROVE THE DURABILITY OF VEHICLE PARTS

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Abstract: To improve vehicle part durability, use high-quality materials and advanced coatings, perform regular maintenance and inspections, choose efficient driving habits, store parts properly, and ensure proper lubrication. Applying surface treatments and using protective fluids also prevents wear and corrosion.

Keywords: Durable, machine, transport, maintained, inspection.

Introduction. There are lots of reasons to want smoother and more powerful performance out of your vehicle. You don't necessarily need a sports car or want to take your vehicle to the race track—nor do you necessarily need to be a mechanic to get the best performance out of your vehicle. Whether you want to get more enjoyment out of your daily commute or increase endurance and power while driving for pleasure, here are some ways to get a more powerful and enjoyable ride by enhancing your engine's performance. Oil lubricants work to ensure that your engine's components run smoothly and minimize component wear and overall friction. Motor oil comes in different varieties. But if you want something durable for all-temperature use, then you should choose a synthetic variety. Synthetic lubricants perform better and don't break down as quickly as conventional oil when the motor gets hot. As such, they are a better lubricant for high-performance and high mileage vehicles. In addition, you might also choose to use an oil additive to improve certain aspects of lubricants in your engine.

As wear and tear begin to affect the parts of your engine, your engine will lose compression pressure. This loss will lead to reduced performance and power for your vehicle. One way that you can help restore compression and repair the wear between engine components is to use an oil supplement meant for compression repair, which can help seal leaks and restore your engine parts to their original compression pressure. It can be difficult to tell whether your vehicle is losing compression pressure, but here are some possible signs.

- **Losing Oil:** If your oil level drops, this shows there could be a leak somewhere.
- **Lower Gas Mileage:** If your gas mileage has decreased but your driving habits have stayed the same, you need to take a look at the engine.
- **Blue Exhaust Smoke:** If your engine is not burning its fuel thoroughly, then there may be some loss in compression.
- **Strange Noises:** If you hear unusual noises in your engine, and it's accompanied by any of the above issues, then you may want to consider



improving your engine compression.

Using high-quality fluids, as well as additional treatment products, can go a long way in keeping your engine working smoothly at high performance. The kinds of fluids you put into your vehicle, including the quality of engine oil or gasoline, can make a big difference in how well your vehicle will run. Using specific treatment products can also help conventional fluids to function like high-quality products. You can also find other products to help remove deposits and improve engine parts to help older vehicles perform as well as ever.

Maintaining your vehicle is key to taking care of your engine so that it can perform at its best. Keep an eye on whether your engine parts are working properly. Be sure to change your oil regularly. Old oil gets dirty and can eventually lead to engine damage. Keep the engine filters clean and replace them regularly. If you don't, a clogged filter will reduce your vehicle's efficiency. Check your manual for maintenance intervals and stick to them. Remember that neglecting your vehicle's basic maintenance will lead to increased damage to your engine, and using the best additives or other products will not necessarily counteract the damage that you might avoid by doing basic maintenance. If you want your vehicle to run at its best, take care of it with simple maintenance and upkeep.

Durability is usually defined by the length of the failure free or maintenance free operational period. The basic assumption is that all failures are caused by mechanical / thermal stresses applied, and that there are no failures before the end of the failure free period (useful life) is reached. Durability allocation is an important part of durability design in mechanical system. Whether durability allocation is reasonable or not directly impacts the pertinence and validity of maintenance. When designing durability, lifetime data of components is necessary. The way to obtain lifetime is normally through test which takes so long and cost so much so that it cannot be adopted at initial stage. Tracked vehicles' moving system is taken as study target. Fatigue life of key parts that is necessary in durability distribution of mechanical system is predicted using virtual simulation [1]. Normally, the durability distribution of moving system is analyzed by the predicted life - which presents a scientific method of distributing durability in the design process. Durability analysis (DA): Determination of whether or not the mechanical strength of a product will remain adequate for its expected life. DA is used to determine cycles to failure or to determine wearout characteristics; it is especially important for mechanical products.

Methods of the research: There is an increasing need for improved methods of determining the reliability and predicting the lifetime of machines and production systems more accurately. The conceptions of 'robustness' and 'robust design' are still new to



the manufacturing industry. Moreover, their role and position in relation to conceptions like 'quality' and 'reliability' have yet to be established. Reliability, availability, maintainability and safety (RAMS) management of a product, its components and the production resources and processes employed, is a key activity which cannot be separated from other product performance control or programme management. RAMS management is to be considered as a whole, and it is a preponderant part of RAMS activities to coordinate the required trade-offs between the corresponding aptitudes for obtaining a product that is "robust" with respect to the specified undesirable events: reliability versus availability, dependability (RAM) versus safety, etc. As a didactical example, in Figure 1 is shown the influence of railway RAMS4 on quality of service.

Data collection and failure analysis are essential for several reasons:

- identify design deficiency for new product (or not new)
- improve RAMS criteria when they are not reached
- demonstrate these criteria during development or in service
- adjust logistic support
- contribute towards global cost management

Therefore it is used for development tests and in service. It is necessary to define an efficient process.

Conclusion. The management of products is increasingly moving towards the use of risk and durability/-reliability-based criteria. Durability is measured by life before wearout, whereas reliability is measured by operating life and the number of chance failures. Durability can use material properties that you define in the material data system software to evaluate strength and fatigue results. Tribological effects are today expressed on different geometrical scales, all the way from nanotribology even up to teratribology. Some examples for improving electronic and mechanical products durability are given.

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