



A FINITE ELEMENT FOR THE ANALYSIS OF DRIVING SHAFT

Vasilatxon Abdullaeva

Assistant, Ferghana Polytechnic Institute

Rustamov Mukhammadazim

Assistant, Ferghana Polytechnic Institute

Rasul Tadjibaev. PhD.

Ferghana Polytechnic Institute.

ABSTRACT

The paper presents methodology analyzing a drive shaft failure cause of a system using structural approach based on and other advanced methods. The procedure is useful, not only for the analysis, but also for identification, comparison, and evaluation of the failure cause. The method permits analysis, identification, and comparison a design as well as operating, functioning state of the system and provides the user directions for improvement of the system's reliability.

DISCUSSION

Therefore they must be strong enough to bear the stress, avoiding too much additional weight as that it would turn increasing their inertia. To allow for variations in the alignment and distance between the

driving and driven components, drive shafts frequently incorporate one or more universal joints, jaw couplings, or rag joints, and sometimes a splined joint or prismatic joint.



The above demonstrated drive shaft with universal joints at each end and a spline in the centre.

The term drive shaft first appeared during the mid 19th century. In Stover's 1861 patent reissue for a planning and matching machine, the term is used to refer to the belt-driven shaft by which the machine is driven. Driving shaft refers to the shaft transmitting

power from the machine's wheels to the gear train that works the cutting mechanism.

An automobile may use a longitudinal shaft to deliver power from an Automotive drive shaft. Engine transmission to the other end of the vehicle before it goes to the wheels. A pair of short drive shafts is



commonly used to send power from a central differential, transmission, or transaxle to the wheels.

Now, we are demonstrating a Truck with two propeller shaft



In our research we analysed, experimented, compared with other shafts.

Analyses demonstrated.(or transmission) mounted directly on the engine, with a drive shaft leading to a final drive in the rear axle. When the vehicle is stationary, the drive shaft does not rotate. Some vehicle(generally sports cars, most commonly Alfa Romeo or Porsche 924/944/928 models), seeking improved weight balance between front and rear, use a rear-mounted transaxle. In some non- Porsche models, this places the clutch and transmission at the *rear* of the car and the drive shaft between them and

The engine. In this case the drive shaft rotates continuously with the engine, even when the car is stationary and out of gear. However, the Porsche 924/944/928 models have the clutch mounted to the back of the engine in a bell housing and the drive shaft from the clutch output, located inside of a hollow protective torque tube, transfers power to the rear mounted transaxle (transmission + differential). Thus the Porsche driveshaft only rotates when the rear wheels are turning as the engine mounted clutch can decouple engine crankshaft rotation from the driveshaft. So for Porsche, when the driver is using the clutch while briskly shifting up or down (manual transmission), the engine can rev freely with the driver's accelerator pedal input, since with the clutch

Disengaged, the engine and flywheel inertia is relatively low and is not burdened with the added rotational inertia of the driveshaft. The Porsche torque tube is solidly fastened to both the engine's bell housing and to the transaxle case, fixing the length and alignment between the bell housing and the transaxle and greatly minimizing rear wheel drive reaction torque

from twisting the transaxle in any plane. A drive shaft connecting a rear differential to a rear wheel may be called a half-shaft. The name derives from the fact that two such shafts are required to form one rear axle. Early automobiles often used chain drive or belt drive mechanisms rather than a drive shaft. Modern automobiles use electrical generators and motors to transmit power to the wheels.

It is considered that these evolved from the front-engine rear wheel drive layout. A new form of transmission called the transfer case was placed between transmission and final drives in both axles. This split the driving shaft to the two axles and may also have included reduction gears, a dog clutch or differential. At least two drive shafts were used, one transferring case to each axle. In some larger vehicles, the transferring box was centrally mounted and was itself driven by a short driving shaft. In vehicles the size of a Land Rover, the drive shaft to the front axle is noticeably shorter and more steeply articulated than the rear shaft, making it a more difficult engineering problem to build a reliable drive shaft, and which may involve a more sophisticated form of universal joint.

It is noted that modern light cars with all-wheel drive may use a system that more closely resembles a front-wheel drive layout. The transmission and final drive for the front axle are combined into one housing alongside the engine, and a *single* drive shaft runs the length of the car to the rear axle. This is an effective design where the torque is biased to the front wheels to give car-like handling, or where producing both four-wheel drive and front-wheel drive cars with many shared components.



Here is a sample of Locomotive drive shafts.

Whenever a complex structures is to be analysed it is common practice to divide the whole structure into a member of components using a general method structure for predicting the results for the automobile in other words drive shafts are responsible for a large portion of the overall static and dynamic behavior of most structures a good deal of research has been directed towards a better understanding of the behavior of drive shafts.

Drive shaft is a mechanical component for transmitting torque and rotation, to connect other components of a drive train that cannot be connected (direct) because of distance or the need to allow for relative movement between them as torque carries drive shafts are subject to torsion and the load.

The discussion was based on the automotive industry also uses drive shafts at testing plants. At an engine test stand a drive shaft is used to transfer a certain speed or torque from the internal combustion engine to a dynamometer. A "shaft guard" is used at a shaft connection to protect against contact with the drive shaft and for detection of a shaft failure. At a transmission test stand a drive shaft connects the prime mover with the transmission.

Marine drive shafts

On a power-driven ship, the drive shaft, or propeller shaft, usually connects the propeller outside the vessel to the driving machinery inside, passing through at least one shaft seal or stuffing box where it intersects the hull. The thrust, the axial force generated by the propeller, is transmitted to the vessel by the thrust block or thrust bearing, which, in all but the smallest of boats, is incorporated in the main engine or gearbox. The portion of the drive train which connects directly to the propeller is known as the *tail shaft*. *The predicted results in this article are very productive. This problems associated with the transferability of driving shaft properties from laboratory test to large scale structures may be resolved.*

It should be mentioned that the critical characteristics is determined by analysis and testing plants. In my research I recommend to improve the weight of driving shaft. It should be redesigned.

USED LITERATURE

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