

Improving the Reliability of Tractor Spline Shafts during Heat Treatment

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Abstract: When choosing a steel grade, they proceed from general operational, technological and economic requirements. The operational stability of the shafts is determined by fatigue strength, contact strength and corrosion resistance under torsion and fracture conditions. Steel grade 40x, Tractor spline shafts of various diameters during heat treatment with different cooling intensity, quenching is performed on the HDTV unit.

Keywords: Steel, element, austenite, alloy, perlite, ferrite, carbide, structure, temperature, eutectic, tractor, metal, hardness, core, shaft, technique, Rockwell, nano, martensite.

Introduction. We are talking about the fact that during the operation of steel parts of cars and tractors, the market iqdisoti dovrída improved their technological properties, improved durability, increased wear resistance. Micro and nanostructured sheet steels can be obtained by thermally machining them into structural Steels by using new shaper to increase heavy load tolerance, high tensile strength, fatigue tolerance. Increasing the reliability of extruded parts is an urgent task, which can only be solved by increasing the strength characteristics and maintaining the plasticity of the structural steels used.

Material and methods. In the thermal treatment of structural steels, it is possible to achieve a fine-grained structure as a result of phase changes when rapidly cooled in the glazing process. In order to increase high viscosity, fracture resistance, in the thermal processing of steel, it will be necessary to choose technological modes wisely so that the density of high dislocation is characteristic of the smallest carbides in the ham. The mechanical properties of steel depend on its structure and composition. Steels used for the manufacture of parts should not eat up to the high value of any property, but have high mechanical properties.



Figure 1. Tractor screw valve

One of the fast-edible parts is the shilets shafts, which harack working mechanisms constructed from improved structural Steels. The details are prepared forgone metal must be able to withstand high fatigue resistance, and the surfaces to be rubbed must be able to withstand eating resistance. When choosing a steel brand, they come from general operational, technological and economic requirements. The operational stability of shafts is determined by the fatigue strength, contact strength and resistance to ingestion in the conditions of twisting and ingestion. Quality steels have high tensile yega, low sensitivity, and a high tolerance limit with heavy load application, and a sufficient threshold of fragility. Such steels are usually subjected to thermal processing cooled in oil and high discharge is carried out. The release 6000s Steel has $\sigma_v=860$ MPa for 40X, $\delta_v=14\%$, $KSU = 1.47$ MDj/m², and Rockwell priborida resin HRC 26-28, and is used for medium load autotractor shafts.

Discussion. Steel brand 40x,T-28 with a diameter of 30mm, t-40 tractor slitting shafts are polished in a TVCH clamp in thermal processing with different cooling intensity. is done. In advance, the shafts were improved for increased fatigue strength. The refining Kharat was cooled at 850 ± 50 C oil and the upper discharge was done at 550-5600 c Kharat. Surface hardening was then achieved with induction hardening (quenching temperature 880-9000s) with a recovery depth of 1.5-2mm cooled in water. In this case, the water intake should be 10 ± 30 s, the cooling time is at a temperature of 5-7 second, the detail thickness is determined. End skirt slits shafts are discharged at low temperature 180-200 C.

Acknowledgement. The results of the study were carried out in samples sheared from the slits Val after sanding, the microstructure of the surface layers of the samples was increased by performing high and low discharges. The " MIM-8 " metallographic microscope saw surface layers and a groove (sample Center). In the study, the molten slug "Mira" was used in electron microscopy at high magnification resolution of the cell X5000 50,000 views. The rigidity was measured at the Tk14-250 Rockwell pribar.

In the initial state of steel 40X, ferrite-pearlite is absorbed into the micro structure, which does not provide the necessary mechanical and exploratory properties. The hardness of the surface layer after thermal treatment of the shafts was 56-58 HRC, and the core part ate to a hardness of 36-38 HRS, increasing by 35-40%, respectively, from the hardness values in the parts.

Polished steel 40X branded slotted shafts have a sorbit structure consisting of a partial trastite image 2 a), the surface of the Slite qsimi of the shaft is polished and the low-release structure is Figure 2 B), it has a mostly martensite structure, with the core part of the shaft dressing the sorbit microstructure, which provides the desired elasticity.

The results of the study showed that the results of a detailed examination of the microstructure of the surface part of the shaft with a thermal treatment of 40X brand steel increased accuracy show that the effect of the Dragonfly martensite on mechanical properties of the Dragonfly martensite with a size of 250-350 nm was observed when the structure was enlarged several times.

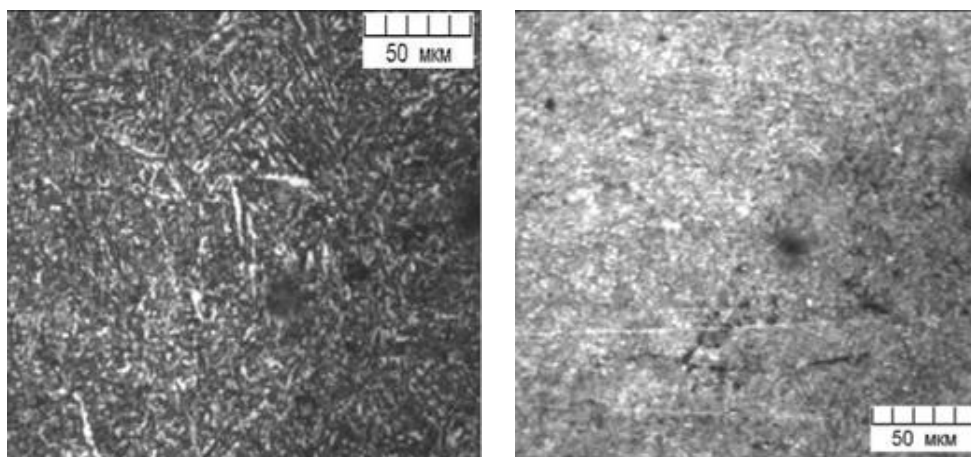


Figure 2. Microstructure of 40x steel:

a-refined is discharged at high level. Structure sorbit bleached areas of trostite;b-polished discharged in low level. Structure-martensite

Only with the electron microscope of martensite needles can x50000 be seen when enlarged. Studies have found that the martensitic needles are partially fragmented, the size of the blotches is in the range of 20 – 150 nm, with an average size of 40 – 50 nm. At the same time, the hardness and toughness of structural steel increased without reducing the elasticity and viscosity properties.

Conclusion.

1. The study of the characteristics of 40X steel depending on the processes of forming elements of the nanoscale structure and the thermal processing conditions allows their formation, taking into account the use in the techniques of Auto-Tractors..
2. Increasing the mechanical, technological and operational properties of parts is possible only after receiving nanodisperse structures as a result of traditional improvement and the development of new technological modes of thermal hardening.

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