



Selection of the most appropriate technology of reparatory hard facing of working parts on universal construction machinery

Abstract: The aim of this work is to analyse the possibility to increase the service life of working parts on construction machinery exposed to intensive wear, such as steel blades of the rotary device for roadside vegetation maintenance and grass cutting. A special attention is paid to characteristic working conditions and complex wear mechanisms. In order to select the most appropriate repair technology, both model and real investigations were conducted. The aim of the model investigations was to select the most appropriate procedure, filler materials and hard facing technology. Worn cutting edges of the blades were hard faced and sharpened by grinding to the shape and dimensions of new blades. Then, both new and repaired blades were alternately mounted on the rotor of the machine. Their wear was monitored under the same working and weather conditions. The repaired blades have proven more resistant to wear than the new ones, which is due to better properties of the hard faced layers.

Keywords: hard facing, construction machinery, wear, hardness, microstructure.

1. INTRODUCTION

Almost all working parts of construction machinery are exposed to complex tribological processes during operation. Sometimes, one type of wear is dominant, but in practice, combined wear is much more common. A typical example of combined wear is seen in blades of the device for roadside vegetation maintenance and grass cutting. These parts are exposed to abrasive, impact and fatigue wear as well as corrosion.

Working parts have relatively short service life, they increase machine downtime, it takes a long time to replace them, they decrease machine utilization rates, etc. However, reparatory hard facing can reduce or eliminate these problems. Hard facing also

offers an opportunity to determine wear resistance of different filler materials.

Our investigations [1-12] and investigations of other authors [13-15, 20-24] have shown that worn and new parts can be successfully hard faced. However, both reparatory and production hard facing can be performed only in specialized facilities with expert staff and adequate equipment.

2. MACHINE AND DEVICE DESCRIPTION

The device for cutting grass and other vegetation is mounted on a universal machine Unimag (Fig. 1). This is a multipurpose vehicle on which thirty-two different devices can be mounted and operated. In addition to grass and vegetation cutting, it can be applied for snow clearing, aggregates spreading, land clearing and levelling, preparing soil or aggregate substrate for concrete or asphalt laying, digging holes in the ground, cutting and removal of trees, load lifting, trench digging for utility installation, etc.

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