Mechanics Transport Communications
Academic journal

ISSN 1312-3823
issue 2, 2007
article № 0088
http://www.mtc-aj.com

REPAIR OF ENGINES OF MOTOR TRANSPORT WITHOUT THEIR DISASSEMBLY

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Key words: *repair-operational preparations, nanotechnology, technical service of machines and mechanisms without their disassembly*
Abstract: *Some results of application of the repair-operational preparations, created from uses nanotechnology, are presented the concept of technical service of engines without their disassembly.*

1. INTRODUCTION

Result of long-term researches of scientists-tribologists, in a huge degree of the Russian scientific school, there was that fact, that friction now is represented not only as a destructive natural phenomenon. It in the certain conditions can be realized, as creative process that has allowed developing new, earlier not known methods of technical service of machines, including restoration of units and units of technics without their disassembly and during continuous operation.

Owing to works of the Russian scientists and experts has arisen and successfully the independent scientific and technical direction – "technical service of machines and mechanisms without their disassembly" which the complex of the technical and technological actions directed on carrying out of some operations of maintenance service and repair of units and mechanisms without carrying out of operations of their disassembly is meant develops. It can include operations green run, diagnostics, preventive maintenance, autochemical tuning, clearing and restoration both separate rubbing connections and units, and machines and mechanisms as a whole [1].

In conditions of lack of financial assets at the majority of the population, the certain deficiency of accessible lubricants the problem of maintenance in an efficient condition practically all domestic and second-hand import technics can be to some extent possible due to application of special repair-operational preparations and technologies not folding service, including on the basis of nanotechnology [2].

Nanotechnology has allowed to create such chemical structures which are programmed on removal of pollution and protection of rubbing surfaces, and also on their self-restoration [3].

Preparations differ on ways of application (introduction in rubbing connections). The majority of structures enter into oils, fuel or plastic greasings. Some of them submit through the power supply system (the inlet pipeline) in the form of aerosols and additives to fuel mixes (so-called "special treatment"). There are preparations which move directly in a zone of friction, for example, in cylinders of the engine, a nave of a wheel, etc.

In classical understanding process of restoration of a detail, connection or the machine as a whole means carrying out of the technical and technological actions directed on change or their geometrical sizes up to nominal either repair, or restoration of working capacity up to normative parameters. However to spend repair work it is meaningful even in the event that the problem of only partial performance of these requirements is put.

2. EXPERIMENTAL

Application of repair-operational preparations is defined by a technical condition of the car. Thus necessity of this or that influence is estimated on the basis of results of technical diagnostics. By results of diagnosing are appointed or preventive preparations of "soft" action, or the preparations providing more intensive influence on rubbing connections and units of the car.

It is necessary to note, that sometimes necessity of application repair-operational is caused also by a number of others compelled, for example, participation in competitions, run or any other supernumerary tests.

With use of repair-operational preparations and technologies of restoration without disassembly there is an opportunity of practically full elimination of parametrical refusals, and also a plenty obvious.

The expediency and efficiency of restoration without disassembly is shown in figure.

Figure. Between-repairs cycle of operation of technics in conditions of application of repair-operational technologies: WB – parameters of object after restoration without disassembly; TB – (point) of carrying out of restoration; TP – a between-repairs resource of object in usual conditions of operation; TPB – increase of a between-repairs resource of object due to application of technologies of restoration

3. RESULTS

More often it is direct after treatment high-speed characteristics (dispersal, etc.) at once appear better on 10…25 (table). At the further operation restoration of the worn out surfaces of friction and other technical and economic characteristics of the unit proceeds. Technical and economic parameters increase before run 1,5…5 thousand in km, remain almost constant before run nearby 15 thousand in km, and then start to decrease gradually, being partially kept up to 30…50 thousand in km, according to some information - up to 80 thousand in km of run.

4. CONCLUSION

Application of technologies of service of automobile technics without its disassembly allow to raise considerably wear resistance of rubbing connections, it is essential to lower economic expenses at its operation and repair. Operation of automobile technics in real conditions of the motor transportation enterprises of the country, and also responses of many private motorists specify, that their application is reduced considerably with the general expenses for maintenance of technics in an efficient condition.

In connection with last achievements of a science and practice in this area time has come to make change and in definition of concept "Tribology". Most full a modern level of studying and development of the given question following definition would be reflecting. Tribology – a science about contact interaction of the mobile connections, covering a complex of questions of their friction, wear process, greasing and itself the organization (restoration).

Table. Results of restoration of working capacity of engines of cars without their disassembly

Mark of the car	Run, km.	Compression, MPa		Effect
		Before (K_b) treatment	After (K_a) treatment	$[(K_b - K_a)/K_b] \cdot 100$ %
VAZ – 2102	216 000	0,59	0,64	8,5
ZIL – 130	93 000	0,78	0,85	8,9
VAZ – 21081	117 000	0,87	0,95	9,2
VAZ – 2104	162 000	0,83	0,91	9,6
VAZ – 21093	100 000	0,96	1,10	11,5
VAZ – 21073	126 000	0,96	1,10	14,6
GAZ – 31029	190 000	0,65	0,81	15,8
GAZ – 24	156 000	0,69	0,84	21,4
VAZ – 21063	120 000	0,76	0,99	30,3
ZIL – 131	153 000	0,50	0,75	50,0

Note: K_b – an average compression in cylinders before application of a preparation; K_a – an average compression in cylinders after application of a preparation

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