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## THE USE OF A SPRING INSERT IN PLAIN BEARINGS AND SHOCK ABSORBERS

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The analysis shows that bearings and shock absorbers are non-reversible elements, the wear of which occurs most often. Improving the sustainability and cost-efficiency of production is an important and urgent task. In cars, different groups of parts and assemblies are not equally reliable, some of which serve the entire repair cycle, others are part of it, and others work much less than the life of the car before a major repair. The functional setting is designed to ensure the reliability of different parts and assemblies that are provided differently during the design and manufacturing stages.

For transverse displacement, a sliding bearing design is proposed that meets the conditions for activating the working surface with plastic deformation and suppressing the oxidation process. [1, 2, 3, 4, 5]. For this purpose, the bearing is equipped with a movable additive in the form of a cylindrical spiral spring (intermediate element), which causes it to rotate only in one direction in vibration mode, and the spring tension necessary to achieve microplastic deformation is created for its preload. In vibration mode, elastic stress is created on the inner or outer surfaces, respectively, due to twisting and opening of the spring substrate and is forced to rotate in one direction (the effect of a crack mechanism). Elimination of the oxidation process in the proposed design is easily achieved by sealing the oil. Also by reducing the frictional adhesive component (friction at rest) and partial application of the idea: Well Zhukovsky for "frictionless motion" (rotation of the intermediate support) without the use of external energy sources. This operation (Fig.1) is as follows: 1) the drive shaft can be widely used instead of needle bearings, suspension silencers, steering rings and other loops operating in piston mode.

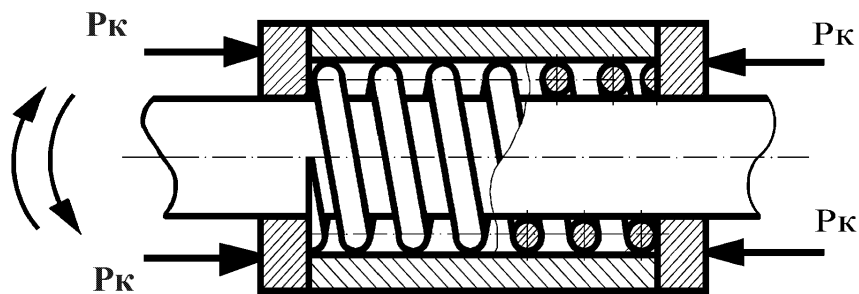


Figure 1. Scheme of a bearing with a movable spring insert

Examples of the implementation of some components of car units using a bearing of a new design are given below.

Needle roller bearings do not rotate, they only oscillate with a small amplitude (in the contact area) and, in fact, perform the function of connecting between shafts in a variable cacophony. Under the influence of the torque caused by the transmission due to the high contact voltage, a dent is formed on the working surface of the bearing, which is called the "false brinring", and the bearing clamp with the highest load. Standard needle roller bearings lack an inner ring and the surface of the pin serves as a stadium for the needle.

(Fig. 2) shows a photograph of the part of the pin on which the bearing needles worked, with pronounced dents (false brinelling) formed during operation in severe road conditions.



Figure 2. Sinks with traces of wear ("false brining")

The same applies to the cross-section of the gimbal joint, and the bearings of the pins. In the oscillatory motion of a small amplitude (Fig. 1).3), the RC ring with a needle hole and a crossbar is brought to the working surface and subjected to further impossibility of operation.

The literature [8, 9, 10] also describes sliding supports containing fixed intermediate elements (inserts) in the form of cylindrical spiral springs with rigidly fixed coils, which could be used instead of needle bearings.

The accuracy required for the manufacture of conventional materials requires the use of high-precision materials and expensive tools, and it is economically unprofitable to manufacture spring inserts and parts with it. Therefore, it was proposed to make the spring insert conical, making the remaining surfaces for fastening the cylindrical part..

Photos of worn parts of the bearing assembly of the crosspiece with traces of "false brining" are shown in (Fig. 3). The upgraded crosspiece of the VAZ Niva car is shown in (Fig. 4).



Figure 3. The appearance of worn parts ("false brining") of the bearing assembly of the crosspiece



Figure 4. The upgraded crosspiece of the VAZ "Niva" car

Elimination of oxidative processes in the proposed composition is easily achieved by oil seals. Positive effects are also achieved by reducing the adhesive component of friction (relaxing friction) and implementing the feedback component N. Zhukovsky's "in motion without friction" (central support circuit) without the use of an external power source. These bearings can be widely used instead of main shaft injection bearings, silent suspension blocks, steering hinges and other shafts operating in reverse mode.

In this work, the object of the study was the rear shock absorber of the VAZ 2108 car, (Fig. 5).

Changes were made to the design of the shock absorber piston concerning the piston ring, made according to the type of helical cylindrical spring with preloaded coils. The material of such a ring is a square-section wire made of 65G copper-plated steel.



Figure 5. The rear shock absorber:  
the design of a piston with a seal made of a square-section helical cylindrical spring  
with preloaded coils.

The proposed sliding bearings for reciprocating motion can be used in railway, automobile transport, suspension units, shock absorbers, steering, cardan gears, bearing units of aircraft, electrical contactors, sewing, mining, oil and gas production and processing industries and some others where traditional sliding and rolling bearings are used under heavy loads in the reciprocating-rotational mode [11].

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## ОӘК 629.1.01

### ЖЕҢІЛ АВТОМОБИЛЬДІҢ ОТЫН БАГЫН ЗЕРТТЕУ

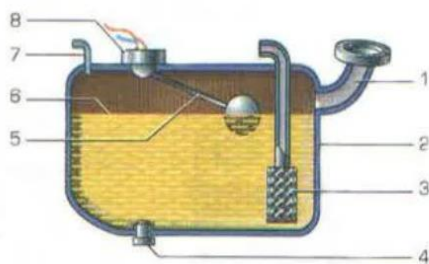
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Ғылыми жетекші – Алипбаев Ж.Р.

Жанармай бағының құрылымы.



#### Жеңіл автокөліктің жанармай бағы

- 1-Толтырғыш мойын
- 2-резервуардың қабырғалары
- 3-Сүзгісі бар отын алу түтігі
- 4-Пробка бар су төгетін тесік
- 5-жанармай көрсеткіші сенсорының қалқымасы
- 6-жанармай деңгейі
- 7-желдеткіш түтік
- 8-жанармай деңгейінің сенсоры

- Толтырғыш мойын-корпустың сыртына шығатын және жанармай құюға арналған. Көбінесе жүргізуші жағында орналасқан (дененің артқы қанатының үстінде). Көптеген көліктерде мойынның жанармайдың ағып кетуіне және шаңның түсуіне жол бермейтін арнайы тығыздалған бұрандалы жанармай бағының қақпағы бар. Дегенмен, кейбір заманауи көліктерде мұндай қақпақ жоқ. Ол easy Fuel жүйесімен ауыстырылды – газ бағын ашатын және құлыптайтын электр жетегі бар шағын Люк.

Корпус немесе қабырғалар (тікелей сыйымдылық).

- Отын алу құбыры-ластанудың алдын алу үшін сүзгімен жабдықталған. Қазіргі заманғы автомобильдерде бұл функцияны суасты жанармай сорғысының модулі орындайды. Ол қосымша алынбалы сүзгімен (тормен) жабдықталған.

1-сурет Бактың құрылымы.