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Improving The Reliability Of Vehicles Using Automatic Engine Control Systems

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ABSTRACT

To ensure the performance of the main function of the car - the transportation of goods and passengers, it is necessary to increase the reliability of vehicles. On newly developed car models, they are additionally beginning to install completely non-traditional on-board automatic systems, which include: driver information system with microprocessor support; satellite navigation and search system; radar and ultrasonic systems for car protection from collisions and theft; systems for increasing the safety and comfort of people in the cabin; cruise control system; electronic card system; multiplex electrical wiring.

KEYWORDS

Engine, electronic control system, onboard, circuit, motor, gasoline, diesel, injection, sensor, microprocessor.

INTRODUCTION

A modern car consists of four main units: an internal combustion engine (ICE), a body, a chassis and a running gear. These units consist of various functional systems that provide the main function of the car - the transportation of goods and passengers.

More recently, microprocessor-based ignition systems, electronic hydraulic brake control

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systems, gasoline injection systems, on-Board self-diagnostics were considered the latest achievements in the field of automotive apparatus and instrumentation. Now they are classified as classic systems and are installed on almost every production car.

MATERIALS AND RESEARCH METHODS

On Newly Developed Car Models, They Are Additionally Beginning To Install Completely Non-Traditional On-Board Automatic Systems, Which Include: Driver Information System With Microprocessor Support; Satellite Navigation And Search System; Radar And Ultrasonic Systems For Car Protection From Collisions And Theft; Systems For Increasing The Safety And Comfort Of People In The Cabin; Cruise Control System; Electronic Card System; Multiplex Electrical Wiring[1]..

Trends In The Development Of Automotive Electronics:

- Improvement Of Automobile Gasoline Internal Combustion Engines To Create Environmentally Friendly Power Plants For Electric Vehicles.

- Intensive Research Is Being Conducted On The Possibility Of Using Electronically Controlled Solenoid Valves In The Gas Distribution Mechanism (Timing) Of A Piston Engine.

The Latest Systems Of Automotive On-Board Automation Are Radically Different From The Classic, Purely Electronic Systems. Depending On The Task Being Solved, The New System May Include Not Only Electrical And Electronic Components And Blocks, But Also Mechanical, Hydraulic, Light-Optical, Ultrasonic And Any Other Devices That Have A Non-Electrical Nature Of Operation. Their Role In The Implementation Of A Given Control Function Is The Main One, Although All Information Processes In The System Are Implemented At The Level Of Electronic Control Units(Ecus), And In The Latest Systems - In On-Board Microprocessors. Such Large Composite Control Systems Can Not Relate To Either Mechanical, Electrical, Electronic, Or Any Other "Clean" Systems By The Principle Of Operation. In This Regard, The Latest Systems Of Automotive On-Board Automation Have Received A New Name - **Auto Throne Systems.**

Auto Throne Systems.Are Large Composite Control Systems That Can Not Relate To Either Mechanical, Electrical, Electronic, Or Any Other "Clean" Systems By The Principle Of Operation.Name-Auto Throne Systems.

RESEARCH RESULT

The Autotronic System, Controlling Non-Electrical Processes Through The Non-Electrical Periphery At The Output, Is Itself Controlled By Signals Of A Non-Electrical Nature, Which Are Formed By The Non-Electrical Input Periphery.

For Example, On The Basis Of Electronic Automatic Engine Control Systems (Esau-D) And Brakes (Esau-T), A Gyroscopic Vdc System Has Been Developed And Is Already Being Used To Increase The Directional Stability Of A Car On The Road In Difficult Driving Conditions. The Vdc Car System, The Functional Relationship Of Which With The Driver And The Road, Uses As Input Information The Speed Of Movement, Body Tilt Angles, Wheel Speed Difference, Steering Angle, Atmospheric Conditions, And In Some Variants, Tire Pressure And Road Surface Condition.

[1]) Denton T. Automotive electronics. Published by Elsevler Ltd, 2006 / Дентон Т. Автомобильная электроника /пер. с англ. В.М.Александрова. – НТ Пресс, 2008. – с.33-36 .

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The Microprocessor Is The Central Control Organ (Brain) Of The Autotronic System. Its Main Function Is To Convert Electrical Information Signals About Vehicle Driving Conditions, Received From The Input Periphery, Into Electrical Control Signals That Carry Information About The Intensity And Sequence Of Non-Electrical Effects On Non-Electrical Controls. Such Information Is Generated In The Microprocessor In The Form Of Code Sequences Of Electrical Impulses, Which Are Not Suitable For Direct Control Of Non-Electrical Organs.

Integration Into The Car Network Of A Second Operating Voltage Of 42 Volts. This Is Due To The Need To Increase The Power Supply Voltage For The Latest Energy-Intensive Consumers, Such As Power Electromagnetic Hydraulic Valves, Electromagnetic Solenoids Of Power Actuators, Powerful Electric Motors, Power Electronic Switches, Multiplex Wiring, Etc. It Is Clear That When The Power Supply Voltage Rises, Currents Decrease Accordingly In Consumer Chains, Which Leads To More Reliable And Economical Operation. But It Is Currently Irrational To Immediately Transfer All Electrical Consumers To A New Voltage, As It Was Done When Switching From 6 To 12 Volts. The Reason For This Is The Production Of 12-Volt Consumers In Huge Series, The Technological Equipment Of Production And, Most Importantly, All Currently Operated Cars Are Equipped With 12-Volt Consumers (Electric Lamps, Electric Motors, Electronic And Microcomputer Equipment, Audio, Radio, Video Equipment, On-Board Self-Diagnostics, Etc. Etc.).
An Even More Striking Example Is Electric Cars[2]. Here The Main Traction Battery, The Control Controller And The Traction Motor Are Designed For A Voltage Of 120 ... 380 V And Are Interconnected By Separate Circuits. In This Case, The Network Remains 12-Volt.

- Creation And Implementation Of A Universal Electric Machine, The So-Called "Starter-Generator", Which Will Be Able To Perform Two Functions: Starting The Internal Combustion Engine And Supplying Electricity To The Network After Starting The Internal Combustion Engine.
- The Use Of Laser Spark Plugs That Work Directly From The Electronic Control Circuit Without An Intermediate Energy Storage. This Will Significantly Increase The Reliability And Efficiency Of The Ignition System, As Well As Save It From High-Frequency Electric Spark Interferences To Other Units And Blocks Of On-Board Electronic Automation.

In Conclusion, It Should Be Noted That Not All Known Developments Of Onboard Systems Have Left The Stage Of Experimental Research. They Are Used Primarily On Branded Sports And Concept Cars. But, As Before, Almost All Innovations Tested On Concept Cars Sooner Or Later Begin To Be Applied On Production Cars.

CONCLUSION

Modern Vehicles (Ts) Are High-Tech Systems, In The Design Of Which A Large Number Of Electronics Are Used, The Reliability Of Which Has Become Quite High, Often Exceeding The Reliability Of Mechanical Systems. For Example, The First Serial Anti-Lock Braking Systems (Abs) Manufactured By Bosch Had A Mass Of Up To 6.5 Kg, And The Number Of Electronic Elements Exceeded 140 Units. Modern Abs Systems Have A Mass Of About 1.5 Kg, And The Electronic Base Consists Of A Dozen Elements.

[2]) Denton T. Automotive electronics. Published by Elsevler Ltd, 2006 / Дентон Т. Автомобильная электроника /пер. с англ. В.М.Александрова. – НТ Пресс, 2008. – с.539-542.

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Electronic Systems Of Vehicles Today, Basically, Perform The Function Of "Closed" Systems, Receiving Information From Various Vehicle Sensors, Analyzing It With The Help Of Appropriate Programs And Generating The Corresponding Commands To The Actuators In The Electronic Control Unit (Ecu), With In Order To Increase Traffic Safety, Ease Of Management, Increase The Efficiency Of The Vehicle And Reduce The Load On The Environment. At The Same Time, Signals From Some Systems Can Be Used As "Open" - To Transmit Them To The External Environment: Information Centers, Road Transport Infrastructure And Other Traffic Participants. The Vehicle Can Not Only Transmit Information From Internal Systems, But Also Receive It From External Sources, As Well As Use It For Safer And More Efficient And Even Automatic Control.

REFERENCES

1. Goering C.E., Stone M.L., Smith D.W. And Turnquist P.K. Off-Road Vehicle Engineering Principle. Usa, Asabe, 2006 - 474 R.
2. Srivastava A. K., Goering C. E., Rohrbach R. P., Buckmaster D. R. Engineering Principles Of Agricultural Machines. Asabe, 2006 -559 R.
3. Denton T. Automotive Electronics. Published By Elsevler Ltd, 2006 / Denton T. Automotive Electronics / Per. From English. V.M. Alexandrov. - NT Press, 2008 .-- 576 p.
4. Bosch.Automotive Handbook. 5th Edition / Automotive Directory. Per. From English - 2nd Ed., Revised. And Add. - M .: ZAO "Kzhi Za Rulem", 2004.- 992 S.
5. Borshchenko Ya.A., Vasiliev V.I. Automotive Electronic And Microprocessor Systems: A Study Guide. - Kurgan: Publishing House of the Kurgan State. Un-Ta, 2007. - 207 p.
6. A. D. Abduazimov, A.A. Mukhitdinov A.A "Vehicle Automation" Study Guide.- Tashkent, TGTU.
7. N.A. Ikromov. Investigation of the Effect of a Magnetic Field on the Physicomechanical Properties of Composite Polymer Coatings. Russia. Bulletin of the Kurgan State University No. 3 2015, pp. 96-99