



THE EFFECT OF DIFFERENT FUEL TYPES ON THE OPERATION OF AUTOMOBILE ENGINE CYLINDERS

G'. M. Bahodirov

Assistant, Andijan State Technical institute

J.B. Xodiyev

Student, Andijan State Technical institute

Sh.M.Tojimamatov

Student, Andijan State Technical institute

Abstract : Car engines cylinders is the " heart " of the car , their performance and used fuel type directly Depends. Fuel type of the engine efficiency, power, waste gases and to the endurance impact does. In Uzbekistan car industry, in particular UzAutoMotors, gasoline and diesel to fuels based although naturally gas, biofuel and hydrogen such as alternative fuels increasingly attention is gaining. This article various fuel types car engine cylinders to work the impact analysis does.

Key words: fuels, engine cylinders, gasoline, diesel, hydrogen, natural gas, biofuel, power, efficiency.

Car in engines following fuel types wide spread:

Gasoline: High octane fuel , spark plug burning in engines is used.

Diesel: High compressive in engines by itself lights up, efficiency hig .

Natural gas (LPG/CNG): Liquefied propane-butane (LPG) or compressed natural gas (CNG), low emission.

Biofue : Plant or animal from products working is produced (bioethanol , biodiesel).

Hydroge: Fuel in their cells used only water waste harvest does .

Every one fuel type engine cylinders to work to oneself typical impact shows , this below in detail seeing is released.

Fuel engine cylinders to work impact.

Gasoline.

Gasoline engines sparkly to burn is based on. Fuel -air mixture in the cylinder squeezed, spark using lights up. Efficiency gasoline engines to 20-30% efficiency has, because burning in the process heat disappearance high. High good at revs (5000-7000 rpm) power gives , easy in cars preferably. Cylinders high temperature because of piston and shaft systems faster It wears out. Waste gases CO₂ (4 billion tons per year globally), CO and releases hydrocarbons (CH).

In Uzbekistan UzAutoMotors by working issued 70% of cars gasoline to engines has . In Tashkent gasoline quality (A-92, A-95) engine to the efficiency impact does , because sulfur amount high to be possible.

Diesel.

Diesel fuel in the cylinder high compression (from 15:1 to 22 : 1) by itself burns without sparks. Efficiency 35-40 % , to gasoline relatively fuel economical Power i Provides high torque at low revs (2000-3000 rpm), trucks and buses ideal for. Durability High squeeze because of cylinders stronger from materials (steel, cast iron) iron) is made, but soot accumulation wear and tear The emissions include NO_x (60 million tonnes globally), soot (17 million tonnes) and CO₂ . SCR and DPF systems reduce waste by 70-80% reduces. Diesel motor vehicles Uzbekistan logistics (65% share) and village on the farm wide spread. But fuel quality (sulfur amount up to 500 ppm) of cylinders work the deadline shortens.

Natural gas (LPG/CNG).

Natural gas gasoline to the engines similar sparkly burning through works, but lower squeeze ratio (10:1) required does. Efficiency 25-30 %, gasoline close, but fuel price cheaper. Power For gasoline 10-15% lower than power, because energy density less. Endurance Cylinders low wear, because gas clean burns and soot harvest does not. Emissions are 30% lower in NO_x and 20% lower in CO₂, but methane (CH₄) emissions are higher. climate to change impact does. In Uzbekistan natural to gas based vehicles (10% share) Tashkent and Fergana such as in cities Gas is expanding. cylinders safety cylinders to the design additional requirements puts.

Biofuel (Bioethanol, Biodiesel).

Bioethanol gasoline in engines (E10, E85 blends), biodiesel and diesel in engines is used . Efficiency Bioethanol to gasoline 5-10% lower efficiency compared to yes, biodiesel and diesel with almost one different. Power Bioethanol high octane to divide, to power increases, but energy low density. Biodiesel diesel with in comparison one kind power gives. Durability Bioethanol cylinders corrosion strengthen possible , biodiesel and good beard giving , wear and tear reduces . Waste i Biofuels reduce CO₂ emissions by 20-30%. reduces, but NO_x emissions in biodiesel increase possible. In Uzbekistan biofuel working release still undeveloped , but cotton and other plant products biodiesel working release for to potential has.

Hydrogen.

Hydrogen fuel chemical in fuel cells reaction through electricity energy harvest does or internal burning in engines lights up. Efficiency Fuel cells at 50-60% efficiency has, internal in combustion and 30-35%. Power i Hydrogen engines stable power gives, but high in rotations to gasoline relatively lower. Durability Hydrogen clean fires, cylinders wear and tear reduces, but fuel cells for special materials demand Waste is Only water (H₂O) is formed does, the most ecological clean fuel. Hydrogen infrastructure In Uzbekistan no.

Fuel type cylinder walls, pistons and shaft systems to the endurance impact Bioethanol and high sulfurous gasoline/diesel cylinder on the walls chemical corrosion strengthens, this of the engine work extend the term by 10-15% shortens. Diesel fuel in the cylinder soot (PM) yield does this wear by 20% increases. Natural gas and hydrogen soot harvest does not, cylinders cleanliness Hydrogen high burning temperature cylinders for special alloys (e.g. nickel reasonable (requirement) does this working release costs by 30% increases.

Fuel type in the cylinder burning process physicochemical features Gasoline and hydrogen fast it burns, this high advantage in revolutions (5000-7000 rpm) Diesel and biodiesel slower It burns quickly, providing high torque at low revs (2000-3000 rpm). Diesel in engines squeeze ratio high (15:1-22:1), with a temperature of 600-800°C in the cylinder harvest Hydrogen burning and 2000° C to reach it is possible, this special to the heat resistant materials demand Low octane gasoline number (like A-80 in Uzbekistan) detonation strengthens, this cylinder and pistons Hydrogen high flammability and controllable burning demand does.

In Uzbekistan fuels impact and status .

Gasoline and diesel: in Uzbekistan 70% of cars gasoline, 20 % diesel to engines has. Fuel quality (sulfur) amount 200-500 ppm) of cylinders wear and tear strengthens, this and repair expenses increases.

Natural gas: CNG vehicles number to 150 thousand in 2023 enough, but gas quality and cylinder safety problems engine to work impact does.

Biofuel: Biodiesel working release initial in the stage, but cotton oil and other plant products potential source is considered.

Hydrogen: Currently In Uzbekistan hydrogen engines from the test not held , but the sun energy (3000 hours per year) sunny day) hydrogen working release for opportunity creates.

Fuel the impact soften according to to the proposals the following let's say will be. Fuel quality increase, Gasoline and diesel in fuel sulfur amount up to 50 ppm reduce , this cylinders Increases durability by 20% increases. Ecological systems current, Diesel engines with SCR and DPF systems mandatory installation, waste reduction by 70 % reduces. Biofuel working

release, Kashkadarya and In Surkhandarya biodiesel working release factories construction, cotton from oil use. Hydrogen tests, in Tashkent hydrogen fuel to the cells based buses from the test transfer .

Conclusion:

Various fuel types car engine cylinders efficiency, power, endurance and waste various impact does. Gasoline and diesel fuels In Uzbekistan wide widespread although, naturally gas , biofuel and hydrogen such as alternative fuels in the future ecological clean alternatives as important importance profession Fuel quality increase, ecological systems current to grow and alternative fuels from the test transfer In Uzbekistan engines performance improve and the environment protection to do service does.

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