



HISTORY OF DIESEL ENGINES AND THEIR DIFFERENCES FROM OTHER ENGINES

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Abstract: Diesel engines modern transportation and in industry important place holds , especially freight, rural farm and construction in the field. Their high efficiency and strength because of world according to wide In Uzbekistan, for example, diesel motor vehicles (buses, trucks) public transport and logistics from 20% in the field more than to share has. This article reviews the history of the development of diesel engines, analyzing their differences from other engines (gasoline, electric, and hydrogen).

Key words: diesel engines, automobile, transportation, gasoline, electricity engines, hydrogen, combustion, village economy, society transportation.

Diesel engines appearance (late 19th century). Diesel engine basis German engineer Rudolf Diesel in 1892. He used heat energy mechanic to energy of conversion effective method working exit goal In 1897, the first working diesel engine from the test was held, its efficiency around 25% was, this that's it much faster than steam engines of the time (10-15%) high was. Diesel engines compressed in the air fuel by itself burning on principle is based on this sparkly to burn dependent gasoline from engines difference First use, initially industry stations and on ships used.

XX century first half expanding went. 1920s-1930s: Diesel engines car and iron road in transport application Mercedes-Benz first launched in 1924. diesel his car working released. Technological to the achievements fuel casting pumps improvement and squeeze level increase efficiency by 30% delivered. Soviet Union during In Uzbekistan diesel with engine locomotives and tractors (e.g. MTZ-50) for rural areas on the farm wide used.

XX century second in the middle modernization period started. 1950s -1980s: Turbocharging and Common Rail fuel casting systems current These systems power increase fuel spend by 20% reduced. Ecological to problems diesel engines waste gases (NOx, soot) problem intensified, this catalytic converters and soot filters (DPF) to release take came. In the 1980s, the Tashkent Tractor Plant diesel factory with engine techniques working released, but ecological standards still underdeveloped was.

XXI century: Ecological requirements and competition period. 2000s: Euro-5 and Euro-6 standards diesel to the engines hard emission requirements current SCR (Selective Catalytic Reduction) systems reduce NOx emissions by up to 80%. reduced. Electricity and hydrogen engines development diesel to the engines pressure However, freight transport and in industry diesel still the leader. In 2024 , UzAutoMotors diesel motor trucks working to release expanding, but ecological to standards compliance to do problem current.

Diesel engines in development turbocharging technology important place It is currently in use in the 1970s. done turbocharging to engines more air supply, power by 30% increased and fuel spend by 15% Common Rail system: Developed by Bosch in the 1990s working issued this system fuel high accurate at pressure (2000 bar) spray opportunity gave , this and burning efficiency by 40% delivered.

Diesel engines other from engines difference

Gasoline engines with comparison

- Performance Principle: Diesel engines fuel compressed in the air by itself burning through works, gasoline engines and sparkly to burn is based on.
- Efficiency: Diesel engines with 35-40% efficiency yes, gasoline engines and 20-30%. This diesel fuel thrift provides.
- Waste: Diesel engines NO_x and soot more emits, gasoline engines and CO₂ and CO more contribution Addictive.
- Application: Diesel trucks and on buses wide distributed, gasoline engines and light in cars preferably.

Electricity engines with comparison

- Performance Principle: Electric engines from the battery power take, mechanic energy harvest does, burning process It wo n't be possible.
- Efficiency: Electric engines reach 80-90% efficiency yes, diesel relatively much high.
- Waste: Electricity engines work during waste does not emit, but the battery working release and electricity working release processes CO₂ emissions take is coming.
- Limitations: Electrical engines charge to the stations related, in Uzbekistan and charge infrastructure limited (50 stations in Tashkent in 2024) there is).
- Application: Electrical engines light in cars expanding, diesel and heavy in transport column.

Hydrogen engines with comparison

- Performance Principle: Hydrogen fuel fuel cells produce hydrogen oxygen with to react enter, electricity energy harvest does. Burning in the process only water comes out.
- Efficiency: Hydrogen cells at 50-60% efficiency yes, from diesel high, but lower than electricity.
- Waste: Hydrogen engines ecological clean, diesel and NO_x and soot releases.
- Limitations: Hydrogen charge stations and working release infrastructure In Uzbekistan almost no, this his/her current to be completed makes it difficult.
- Application: Hydrogen engines test in phase, diesel and currently wide spread.

Bio- diesel with comparison: Bio - diesel (plant from oils working released) diesel in engines usage possible, which would reduce CO₂ emissions by 20% However, biodiesel in Uzbekistan working release infrastructure underdeveloped.

Gas engines (LPG/CNG): Natural to gas based engines NO_x emissions to diesel by 30% compared to reduces, but the power lower. In Uzbekistan gas motor vehicles 10 % share ha.

Capital Costs: Diesel engines working release and under repair gasoline to engines 15-20 % more expensive than fuel thriftiness because of far within the period more economical.

In Uzbekistan diesel engines mainly following in the fields applies to:

Logistics: In freight transportation KamAZ and like MAN diesel trucks wide spread.

Village Economy: Diesel tractors (e.g. Belarus MTZ) rural from 60% of the farm more than part provides.

Church transport: Tashkent and In Samarkand diesel buses public 30% of the transport organization does.

Diesel waste In Tashkent air by 25% of pollution close part organization Euro- 5 standards compliance to do limited. In Uzbekistan diesel fuel sulfur amount high, this engines efficiency reduces. Electricity and hydrogen technologies development diesel to the engines pressure is taking place.

Diesel from engines use expansion for following attention focus necessary. Ecological standards current to Euro-5 and Euro-6 standards by 2026 to pass mandatory to be done Catalytic converter systems Expansion: Diesel engines with SCR and DPF systems installation waste by 70% reduces. Alternative fuel tests: in Tashkent hydrogen or bio- diesel fuel from the test transfer.

Conclusion: Diesel engines his/ her own high efficiency and strength because of car industry and heavy in transport important place They are development history from the end of the 19th

century starting today on the day ecological requirements and competition because of new to the stage passed. Gasoline to engines relatively economical. electric and hydrogen to engines relatively and wide applicable diesel engines In Uzbekistan logistics and village on the farm important importance However, ecological problems and alternative of technologies development diesel engines modernization to do and ecological standards current to reach demand " Digital " "Uzbekistan - 2030 " strategy within this measures done if increased , diesel engines ecological to stability contribution add takes .

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