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Chapter 1 : Hybrid and Alternative Fuel Vehicles (All Inclusive), 4th Edition

Hybrid and Alternative Fuel Vehicles, 4/e is the ideal text for a modern service technician's course on hybrid electric vehicles. It combines essential background information with up-to-date, vehicle-specific information on the latest makes.

Nuna team at a racecourse. A solar car is an electric vehicle powered by solar energy obtained from solar panels on the car. Solar panels cannot currently be used to directly supply a car with a suitable amount of power at this time, but they can be used to extend the range of electric vehicles. These events are often sponsored by Government agencies such as the United States Department of Energy keen to promote the development of alternative energy technology such as solar cells and electric vehicles. Such challenges are often entered by universities to develop their students engineering and technological skills as well as motor vehicle manufacturers such as GM and Honda. Teams from universities in the United States and Canada compete in a long distance test of endurance as well as efficiency, driving thousands of miles on regular highways. Nuna is the name of a series of manned solar powered vehicles that won the World solar challenge in Australia three times in a row, in Nuna 1 or just Nuna , Nuna 2 and Nuna 3. The Nunas are built by students of the Delft University of Technology. The race attracts teams from around the world, most of which are fielded by universities or corporations although some are fielded by high schools. Trev two-seater renewable energy vehicle was designed by the staff and students at the University of South Australia. Trev was first displayed at the World Solar Challenge as the concept of a low-mass, efficient commuter car. The simplicity of this short carbon chain compound leads during combustion to very low emissions of particulate matter, NOx, CO. DME is being developed as a synthetic second generation biofuel BioDME , which can be manufactured from lignocellulosic biomass. The X aircraft used ammonia as one component fuel of its rocket engine Ammonia is produced by combining gaseous hydrogen with nitrogen from the air. Large-scale ammonia production uses natural gas for the source of hydrogen. Ammonia was used during World War II to power buses in Belgium, and in engine and solar energy applications prior to Liquid ammonia also fuelled the Reaction Motors XLR99 rocket engine, that powered the X hypersonic research aircraft. Ammonia has been proposed as a practical alternative to fossil fuel for internal combustion engines. If produced from coal, the CO2 can be readily sequestered [44] [45] the combustion products are nitrogen and water. Ammonia engines or ammonia motors, using ammonia as a working fluid , have been proposed and occasionally used. Ammonia engines were used experimentally in the 19th century by Goldsworthy Gurney in the UK and in streetcars in New Orleans. In a Canadian company converted a Chevrolet Impala to operate using ammonia as fuel. On complete combustion it has no emissions other than nitrogen and water vapour. Biofuel Bioalcohol and ethanol[edit] See also: Alcohol fuel , Ethanol fuel , Methanol economy , Methanol fuel , Common ethanol fuel mixtures , Flexible-fuel vehicle , E85 , and Biobutanol The Ford Model T was the first commercial flex-fuel vehicle. The engine was capable of running on gasoline or ethanol , or a mix of both. The Ford Taurus was the first flexible-fuel vehicle produced with versions capable of running with either ethanol E85 or methanol M85 blended with gasoline. The VW Gol 1. The first commercial vehicle that used ethanol as a fuel was the Ford Model T , produced from through It was fitted with a carburetor with adjustable jetting, allowing use of gasoline or ethanol, or a combination of both. The use of alcohol as a fuel for internal combustion engines , either alone or in combination with other fuels, lapsed until the oil price shocks of the s. Furthermore, additional attention was gained because of its possible environmental and long-term economical advantages over fossil fuel. Both ethanol and methanol have been used as an automotive fuel. Since ethanol occurs in nature whenever yeast happens to find a sugar solution such as overripe fruit, most organisms have evolved some tolerance to ethanol , whereas methanol is toxic. Other experiments involve butanol , which can also be produced by fermentation of plants. Support for ethanol comes from the fact that it is a biomass fuel, which addresses climate change and greenhouse gas emissions, though these benefits are now highly debated, [54] [56] [57] [58] including the heated food vs fuel debate. For this reason, for pure or high ethanol blends to

be attractive for users, its price must be lower than gasoline to offset the lower fuel economy. Regional retail E85 prices vary widely across the US, with more favorable prices in the Midwest region, where most corn is grown and ethanol produced. In August the US average spread between the price of E85 and gasoline was Reacting to the high price of oil and its growing dependence on imports, in Brazil launched the Pro-alcool program , a huge government-subsidized effort to manufacture ethanol fuel from its sugar cane crop and ethanol-powered automobiles. These ethanol-only vehicles were very popular in the s, but became economically impractical when oil prices fell â€" and sugar prices rose â€" late in that decade. In May Volkswagen built for the first time a commercial ethanol flexible fuel car , the Gol 1. These vehicles were a commercial success and by early other nine Brazilian manufacturers are producing flexible fuel vehicles: Also, liquid fuels were preferred over gaseous fuels not only because they have a better volumetric energy density but also because they were the most compatible fuels with existing distribution systems and engines, thus avoiding a big departure from the existing technologies and taking advantage of the vehicle and the refueling infrastructure. Please help improve this article by adding citations to reliable sources. Unsourced material may be challenged and removed.

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Chapter 2 : Hybrid and Alternative Fuel Vehicles - James D. Halderman, Tony Martin - Google Books

Hybrid and Alternative Fuel Vehicles, 4/e is the ideal text for a modern service technician s course on hybrid electric vehicles. It combines essential background information with up-to-date, vehicle-specific information on the latest makes.

Compacts, luxury cars , and trucks all enjoy the ability to be ordered in alternative fuel models, which are defined as vehicles that use a power source other than gasoline as their primary source of motivation. Offered as a lease-only option in the state of California a price that includes both insurance and hydrogen fuel , this unique automobile produces absolutely no emissions as it generates power for its electric engine by way of breaking down the hydrogen locked in its fuel cell. The Honda FCX Clarity can also capture braking energy and store it in a lithium-ion battery, serving as a second source of power if needed. All told, the Clarity offers up horsepower and lb-ft of torque, giving the mid-size sedan respectable performance to go with its ultra-quiet operation. Additional versatility is provided by the fact that the Bi-fuel edition of the Chevrolet Silverado HD can move back and forth from propane to gasoline at the flick of a switch, which guarantees that drivers will never be left stranded without the ability to tank up. In addition to its full factory warranty and lower emissions, the Bi-Fuel Silverado offers horsepower and lb-ft of torque from its 6. Approximately miles of driving range are available with each full battery charge, and it takes about 6 hours to top up the RAV4 EV from a V outlet. The vehicle maintains the same generous interior space as its gas-only sibling, and it provides up to horsepower and lb-ft of torque from its electric motor. Even base editions of the Model S provide horsepower and lb-ft of torque, and all versions feature the same well-balanced chassis that gives the sedan above-average handling. The end result is a significant reduction in tailpipe emissions, making the Honda Civic GX one of the cleanest internal combustion automobiles in the country. A five-speed automatic transmission is paired with each and every Civic GX. Alternative Fuel Vehicles for - 06 - Ford Focus Electric Alternative Fuel Vehicles for - 06 - Ford Focus Electric The Ford Focus Electric greens up the popular hatchback edition of the recently redesigned compact car by way of an electric-only drivetrain that delivers horsepower and a top speed of mph. Most interesting to EV fans is the fact that the Ford Focus Electric only requires four hours of V charging in order to provide its full range of roughly 76 miles. This makes the Focus Electric a viable urban cruiser, as its range should cover the drive to work and any errands on the way home at the end of the day. Separating the subcompact Honda Fit EV from its Ford competitor is a recharge cycle that takes a full hour less than the Focus Electric, which is a boon to anyone worried about access to a charging facility away from home. The Fit EV offers up a range of 82 miles before it must be plugged back into the wall, and its electric motor generates roughly horsepower and a hefty lb-ft of torque. Drafted straight from the streets of Tokyo, where pedestrians are accustomed to seeing tiny city cars, and drivers are comfortable buying them , the Mitsubishi i-MiEV looks almost like a prop from a futuristic sci-fi flick. Inexpensive to purchase and even cheaper to operate, the i-MiEV is a subcompact hatchback that features a range of 62 miles and a seven hour charging window. Horsepower is low - 66 ponies - with torque measuring at lb-ft. Despite these seemingly feeble figures, the lightweight MiEV can hold its own in modern traffic, although highway driving will require careful planning of all passing maneuvers.

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Hybrid and Alternative Fuel Vehicles 4th Edition by James D. Halderman and Publisher Pearson. Save up to 80% by choosing the eTextbook option for ISBN: , The print version of this textbook is ISBN: ,

By Dana Flavelle Economy Fri. Sales of hybrid electric vehicles â€” which combine traditional gasoline engines with electric motors â€” have never really caught on with consumers and in recent years have been in decline. In fact, according to one industry report, hybrid sales in Canada have been in decline for years. The dramatic plunge in fuel prices since June has further narrowed the savings gap between conventional cars and their hybrid versions. Article Continued Below But there are compelling reasons hybrid electric vehicles are not going the way of the dodo any time soon. Automakers have scrambled to meet the U. Canada has adopted similar rules. By , that average must be 4. Having a hybrid in the fleet helps bring down that average in a fleet that still has numerous SUVs and trucks. Nearly 10 per cent of the vehicle models on the market feature alternative fuel engines, according to DesRosiers Automotive Consultants, a research firm based in Markham. Nor is Honda the first to axe a particular hybrid model while retaining and launching others. The Japanese automaker also said it continues to work on advancing electrified vehicles and hydrogen fuel-cell technology and has plans to launch an all-new battery electric model and plug-in hybrid model. Sales of hybrid electric vehicles in Canada, now in their 16th year, peaked in at about 25, units a year and are now in decline, according to the report. Sales of battery electric vehicles, now in their fourth year, are around 1, units per year. From plunging fuel prices to more efficient conventional gasoline engines, declining government incentives and an increased focus on full-fledged electric cars, hybrids are becoming less attractive, Schroeder said in an interview. Honda sold , Civics in the U. The lack of natural gas fuelling stations is also an obstacle. On top of that, some alternative fuel vehicles require consumers to make compromises on things like performance and luggage space in order to fit in the extra technology they require â€” like weighty battery packs. For example, Ford claims its Eco-Boost engine delivers the same power and torque with 20 per cent great fuel efficiency. Flexible Fuel Vehicles 1. It is sometimes blended with bio-diesel, made from vegetable oils, to reduce pollution. Hybrid Electric , 0. A plug-in hybrid electric vehicle, which contains a rechargeable battery, consumes 40 to 60 per cent less fuel than conventional gas engines. Battery Electric 4, -- Battery-powered electric vehicles EVs run on electricity using one or more electrical motors powered by battery packs. The vehicles are quieter and cleaner than gasoline engines but have limited driving range and can take hours to recharge. Desrosiers Automotive Consultants Inc.

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Chapter 4 : Alternative fuel vehicle - Wikipedia

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Solar vehicle Public transportation vehicles are not usually included in the green vehicle category, but Personal rapid transit PRT vehicles probably should be. All vehicles that are powered from the track have the advantage of potentially being able to use any source of electric energy, including sustainable ones, rather than requiring liquid fuels. They can also switch regenerative braking energy between vehicles and the electric grid rather than requiring energy storage on the vehicles. Also, they can potentially use the entire track area for solar collectors, not just the vehicle surface. The potential PRT energy efficiency is much higher than that which traditional automobiles can attain. Solar vehicles are electric vehicles powered by solar energy obtained from solar panels on the surface generally, the roof of the vehicle. Solar vehicles are not practical day-to-day transportation devices at present, but are primarily demonstration vehicles and engineering exercises, often sponsored by government agencies. However, some cities have begun offering solar-powered buses , including the Tindo in Adelaide, Australia. Wind-powered electric vehicles primarily use wind-turbines installed at a strategic point of the vehicle, which are then converted into electric energy which causes the vehicle to propel. Animal powered vehicles[edit] Horse and carriage are just one type of animal propelled vehicle. Once a common form of transportation, they became far less common as cities grew and automobiles took their place. In dense cities, the waste produced by large numbers of transportation animals was a significant health problem. Oftentimes the food is produced for them using diesel powered tractors, and thus there is some environmental impact as a result of their use. Human powered vehicles[edit] See also: Bicycle sharing system Human powered transport includes walking, bicycles , velomobiles , row boats , and other environmentally friendly ways of getting around. In addition to the health benefits of the exercise provided, they are far more environmentally friendly than most other options. The only downside is the speed limitations, and how far one can travel before getting exhausted. Benefits of green vehicle use[edit] Environmental[edit] Vehicle emissions contribute to the increasing concentration of gases linked to climate change. The transport sector is the fastest growing source of greenhouse gases. A report estimated that up to 24, people die prematurely each year in the UK as a direct result of air pollution. The organization estimates that if pollution levels were returned to within EU limits, more than 5, of these lives could be saved each year. Monetary[edit] Hybrid taxi fleet operators in New York have also reported that reduced fuel consumption saves them thousands of dollars per year. When considering only CO2 emissions, it is noted that production of electric cars generate about twice as much emissions as that of internal combustion cars. For electric cars, emissions caused during operation depend on energy sources used to produce electricity and thus vary a lot geographically. Studies suggest that when taking into account both production and operation, electric cars would cause more emissions in economies where production of electricity is not clean, e. For this reason, some studies found that driving electric cars is less environmentally damaging in western US states than in eastern ones, where less electricity is produced using cleaner sources. Similarly, in countries like India, Australia or China, where large portion of electricity is produced by using coal, driving electric vehicles would cause larger environmental damage than driving petrol vehicles. When justifying use of electric cars over petrol cars, these kinds of studies do not provide sufficiently clear results. Environmental impact is calculated based on fuel mix used to produce electricity that powers electric cars. However, when a gas vehicle is replaced by an equivalent electric vehicle, additional power must be installed in electrical grid. This additional capacity would normally not be based on the same ratios of energy sources "clean" versus fossil fuels than the current capacity. Only when additional electricity production capacity installed to switch from petrol to electric vehicles would predominantly consist of clean sources, switch to electric vehicles could reduce environmental damage. Another common problem in methodology used in comparative studies is that it only focuses on specific kinds of environmental impact. While some studies focus only on emission of gas

pollutants over life cycle or only on greenhouse gas emissions such as CO 2 , comparison should also account for other environmental impacts such as pollutants released otherwise during production and operation or ingredients that can not be effectively recycled. A study that also looked at factors other than energy consumption and carbon emissions has suggested that there is no such thing as an environmentally friendly car. The Jevons paradox suggests that energy efficiency programs are often counter-productive, even increasing energy consumption in the long run.

Chapter 5 : ISBN - Hybrid and Alternative Fuel Vehicles 4th Edition Direct Textbook

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The Hybrid Vehicle and Alternative Fuel Report 1 We assume there is a delay at the Post Office because we haven't received any, yet. 2 This is not entirely a joke.

Chapter 7 : [USC07] 26 USC 30B: Alternative motor vehicle credit

Author: NFPAÂ® There are presently over 15 million alternative fuel vehicles on American roadways today. Be prepared to address potential hazards and know how to handle these Electric, Hybrid, Fuel Cell, and Gaseous Fuel Trucks, Buses, Commercial Fleet and Passenger Vehicle challenges safely and effectively with NFPA's Emergency Field Guide, Edition.*

Chapter 8 : New Toyota Hybrids for

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Chapter 9 : Sales of Alternative Fuel Vehicles on the Rise

The Hybrid Vehicle and Alternative Fuel Report Thomas L. R. Smith, Ph.D. Transportation Economist Washington State Transportation Commission.