

Transcript - Subtitle for the Video

Time	Person	Description
00:06	Arun	See this auto rickshaw ...This auto rickshaw can run on petrol and also it can run on battery
00:12	Arun	This is having three people and climbing up on a bridge with full power
00:19	Arun	For 45000 electric auto ... That too Hybrid electric auto
00:27	Arun	To convert a petrol auto to hybrid auto like this is having government approval...?
00:33	Subramanyam	The government is likely to give a subsidy of around 25,000
	Arun	Then it is just 20,000 only
	Subramanyam	Monthly if you save Rs 10,000 from the petrol expenses, then you will get that investment back in just 2 months, with the subsidy
00:43	Arun	Hi everyone, Greetings to all E Wheeler subscribers... I how are you all..I am super good..
00:54	Arun	Hi all..today we are going to talk about a hybrid auto rickshaw... this is the auto rickshaw
		This auto can run on Petrol..and can run on battery also
		Very low price
		Just 45,000 only
		Electric hybrid auto for 45000
		Unbelievable
		A company in Chennai Velachery is doing this.. come let us go... and see the full details..
01:16	Arun	Namaskar Subramanyam ji
		How are you ..
	Subramanyam	Namaskar, I am good..
	Arun	Shall we wear the face mask..
01:26	Arun	Sir, You have made this hybrid auto for Rs 45,000..How did you get this idea..
	Subramanyam	We have been thinking about this for many years..
		Have written and published many articles in the past 10 - 15 years, on the need for finding alternatives for Petrol..
		When I was working on other projects , I used to carry out studies on this in the free time..
		So, after many years of planning and preparations, started developing it about 3 years back..and now just completed the working demonstration product..
01:48	Arun	Just 45,000 only..?
		It is unbelievable
		Because, in an electric vehicle, around 40 - 60% of the cost is battery only
		The battery alone may cost more than 45,000
		But you say 2 batteries each 30 KM range (total 60 KM) the Motor, Motor Controller, BMS, all other things as a full set for 45,000..
		Truly am not able to believe this..
		Till now am not believing this..
02:12	Subramanyam	ok ..see why this is costing so high today is because, almost no one is doing any developmental research in hybrids..
		Petrol price is going up and up and it will only keep going up further ...Petrol vehicle sales is going down and more people are buying only electric vehicles now.. but what you do with the millions of petrol vehicles which are already bought..?
		The best solution is to convert them all in to electric hybrid vehicles..
		and the solution needs to be cost effective..
		we developed the solution ground up .. calculating from the vehicle weight, gross load, tyre dia, frontal area, coefficient of drag, coefficient of friction .etc and developed the solution fully in house.. We designed the motor to fit the available space in the vehicle, yet deliver sufficient power, we designed the motor controller, communication controller, battery controller (BMS) all in house to meet the Indian climatic conditions, usages and road conditions and so on.. That is how we are able to give it at this price..
03:13	Arun	ok sir
		you have two batteries in this..one small and one big..
	Subramanyam	Yes.. The small one is 30 ah 60 volts.. It will give a milage of 30 Km. The big one will give a milage of 100 km.
	Arun	is this lithium-ion or lithium Ferro phosphate..?
	Subramanyam	This is lithium ion..
		It is 1 C battery..That is it will get fully charged in just one hour
		(This video was taken about 6 months back..presently we are using lithium ferro phosphate battery and also experimenting with 4 C cells. i.e full charge in less than 15 minutes)
03:40	Arun	This is hybrid. That means it has engine and battery.. Could you pl explain this..
	Subramanyam	ok..
		The left side is the engine as it is in any normal vehicle.. In the right side is the motor..and a mechanical gear assembly.
		The motor gear will be coupled to the engine gear..
		It will run on battery as long as there is charge..
		When the battery charge runs out you can switch to the petrol engine..
		When you switch to petrol no need to kick start the engine also..This motor itself will self start the engine..
		The battery state of charge can be seen in the mobile app.. The battery also has a charge indicator..
04:16	Arun	Ok..Shall we go for a trial..

		ok..Now we are switching it on..
		We need to ensure that the gear is in neutral..That is important..
		Now just give the accelerator, the vehicle goes..That is all..
		So smooth a ride..No noise..Very nice..
04:49	Arun	Put this switch reverse, the vehicle goes reverse..
		So easy..
		Smooth ride..Went at about 30 Km speed..It is smooth..
05:02	Arun	Now we have 3 people in the auto plus the driver..And going to climb the velachery bridge .. in a heavy traffic road..
		done.. smooth
		now cognizant bridge..
		done.. smooth..
05:17	Arun	Now as we ride, we are switching to petrol mode ..
		done..It is now running in petrol..
05:25	Arun	Hi , what is your name
		Bharathi Raja
	Arun	What are you
	Bharathi Raja	Project Engineer
	Arun	all vehicles are making so much noise..
		Dur dur dur..
		When vehicles become electric, the roads will become very calm..
		and no need buy petrol..Huge savings..
		for 10 rupees it can runs for more than 40 km..
		huge savings..
06:02	Arun	Bharathi Raja, now you start and fully demonstrate the vehicle in both the modes..
		first in the battery mode..
	Bharathi Raja	First put this switch..The green light will glow..Indicating that it is in battery mode..
		Ensure the gear is in neutral.. Then just give the accelerator..The vehicle moves..
		The battery accelerator is in the foot..and the petrol accelerator is in the hand.If the customer wants we can give both the accelerators in the hand also..
07:02	Arun	Now switch to petrol mode and show it...
		ok..done
		now when the vehicle is running in Petrol can we switch to battery on the run
	Bharathi Raja	Yes..when you run out of petrol, just switch off the engine, change the gear to neutral , just switch on the battery and give the accelerator..it will keep running..
08:01	Arun	Most of the vehicles run on gas..Can this be fitted for gas Vehicles..
	Subramanyam	We just connect the engine gear with our motor gear..So whether the engine is powered by petrol , diesel ,lpg, CNG.is no issue.. all it will work
08:30	Arun	When the vehicle is running on petrol, will the motor also be running..?
	Subramanyam	The motor gear and the armature part of the motor will be freely rotating.. but it will not take any power and it is no issue..
08:48	Arun	Is this the set of all fittings..
	Subramanyam	This is the mechanical set..Plus motor controller, battery controller, motor, Battery are the set..
08:57	Arun	Is this the battery pack
	Subramanyam	Yes..This is 60 Volts 30 AH..The battery has a inbuilt indicator for the charge state.. It is showing 100%. That means it is in full charge..
		We give a home charger..Just take the battery from the vehicle and put it in the home charger..It will automatically start charging..
		The charger box has a controller circuit and battery has the BMS controller circuit..
09:52	Arun	Do you monitor and manage the temperature while charging and discharging...?
	Subramanyam	There are thermal sensors and the temperature is fully monitored and fully recovered. Will show you the reports.. Thermodynamics is fully analysed and managed meticulously by our algorithm..
		In case of any anomalies the circuit will go in to safe mode and will get switched off..
10:15	Arun	What is this..
	Subramanyam	This is the motor controller..Power board..We have developed all the boards ourselves in house..
10:40	Arun	The driver is outside and has run out of charge..He has to go back to his house to charge the battery.. Is there any other alternative way for him to charge his battery..
	Subramanyam	We have public charging station and battery swapping stations.. All are designed in house and very low cost..
		We give the app for the driver..He can see the nearest change / swap station in the app map and book a battery for swap..He goes to the station, put his battery, then a beep sound will come from the battery allotted to him..He can just pick up battery and move..The payment is also automated through a UPI wallet. It is fully automated..
		For every one kilometre we indent to have about 4 charge/ swap stations..In tea shops and other small shops..The shop owners also will get benefited by this..
12:01	Arun	what will be the cost for swapping the batteries..
	Subramanyam	It depends on the electricity cost.. say around Rs 30 for swap of a 30 Km battery..If he charges the battery in his house it will be Rs 5 only..For 30 km mileage..
		It is equivalent to 1.5 litres of petrol or lpg..It is huge cost saving..At an investment of just 20 % of the vehicle cost, you save 80 - 90 % of the fuel costs..It gives such a relief , Particularly at the troubled times of corona coupled with ever escalating petrol prices.

12:25	Arun	If a person comes with his vehicle and pays 45,000, how soon you can convert his vehicle and give to him..
	Subramanyam	We are currently in the process of identifying partners in all the regions and territories to convert the vehicles within in their locations..The partners will stock locally and train many mechanics in their area so that large scales can be handled..
		Partners for stocking , retrofitting, charge station, swap station partners..It is going to be a long haul and a herculean task ..But we are on it..Fully..
		This is a excellent opportunity those in the automobile business already..It is the future.It is highly scalable and very profitable business opportunity..
		Many customers who come ask for finance options.. EMI..So people already in the automotive business , will have the right associates to handle all these requirements..
14:14	Arun	To convert the vehicles in to hybrids like this is is permitted by the government rules..
	Subramanyam	We are working on to get the necessary certifications.. from agencies like ARAI , icat..
		once it is certified, it is ok to be fitted in all vehicles...
14:38	Arun	What is the warranty for this product..
	Subramanyam	Warranty is one year.. For those who want extra warranty, say for 3 years, can get it for a extra cost. Say 15-20 % additional cost..For motor we can give warranty for even up to 5 years..
		Battery life comes for easily 3 years..
		We are also working on a battery recycling plan..a few years down the line.. when the plan is operational, if you give the old battery, we will give a new battery for roughly half the price..
		In addition, there is a subsidy of around 10,000 for a kWh of battery..We working on getting FAME benefits..The subsidy will also greatly accelerate the conversion to electric vehicles..which is the main goal of the FAME initiative.
		If the subsidy is given, then the investment in this equipment will be extremely beneficial to the drivers.. The return on the investment can be as high as 600 %..
15:42	Arun	Very happy sir
		We request on behalf our youtube channel and our auto drivers that the Government to support these initiatives with subsidy and offer all other necessary supports, so that in the future the environment is protected and clean from pollution and huge economic benefit for everyone..wish you all the best
	Subramanyam	Thank you..