



Retrofitted car for physically challenged

Transport

National Third

Biju Varghese

Mukkuttuthara, Kerala

Background

The story of Biju Varghese is one of inspired determination, courage and battle for self-reliance and compassion for others. By making the retrofit kit for cars rendering those disabled friendly, he has become an example for society that obstacles for physically challenged people are not merely challenges but stepping-stones for success.

Biju's family consists of his father, mother, younger brother and five sisters. All the sisters are married and settled. Thirty years back his family migrated to present place of Mukkuttuthara.

Being a hands-on person since childhood, with little interest in studies, he could only manage up to 10th standard in the local school and then joined his brother in law, an electrician engaged in repairing electrical and electronic goods, in his work.

Excelling in this profession, he prospered and had a busy life from morning to late evening till the fateful Friday.

Genesis

On that fateful day, life took a decisive turn, which sent him into a tailspin. He still remembers the 'unfortunate' incident that taught him bigger lessons in his life. On that black Friday in 1997, the happy 20 year old, sitting on the backside of his friend's bike was returning from Kottayam.

Hit by a speeding bus, thrown in the air and falling a few meters away in the main road, he ended up with a damaged spinal cord. He spent three days in coma and one frustrating year in the hospital with both legs totally paralysed. Fervent worship did not alter his condition and he came out in a wheelchair and became an object of sympathy for everyone. All this added to the frustration of a once energetic efficient technician.

Not to stay idle, he remained in the bed by spending time watching T.V. and radio. One day on National Geographic channel, he saw the huge sophisticated US President's plane being navigated by the pilot just by using his hand.

He observed that mere fingers controlled all the major operations.

An idea sprouted in his mind.

Why can't I use a similar mechanism in the car by which all operations can be controlled by hands?

He concluded that if he were to do so, he could move anywhere he pleased without any body's help.

Interacting with car mechanics and encountering much skepticism, he built a series of prototypes while improving on his basic idea, finally getting it right. It was quite a journey chasing utility and comfort using one hand to drive a car.

The initial attempt was not a great success. Clutch, brake, accelerator and gear were close and it was very difficult to move clutch with mere fingers. Next, he made changes in the clutch and more leverage was given to it. The application was transferred to upper thumb and fore hand.

He was filled with joy that it was working. Still it needed more improvement. He felt pain in the left

hand by using this system.

He then made five prototypes and spent more than fifty thousand rupees. Finally he succeeded. He traveled in his retrofitted car for the first time alone from Erumely to Mundakayam. This boosted his confidence.

Those who looked at him sympathetically then started to admire him.

He then brought a new 'Wagon -R' car and incorporated this system in the new car successfully. He mentions that this system can be installed in any car, which is using power brake.

Innovation

The innovation is a modification kit that can be fitted to cars for lower limb physically challenged. With the retrofitting brake, accelerator and clutch controls can be actuated with a single hand. This fitment can be retrofitted in any vehicle with a power brake. Specific illustrations are already there in art.¹

Physically challenged people who do not have one or both legs can use this car efficiency. The modifications made are in brakes, clutch, gear and accelerator. All these controls are modified in such a way that hands can operate them. Controls are transferred to hands by use of leverage and linkage mechanism while using the power transmission of existing system.

The modified brake is operated by the middle as well as adjoining finger by pushing the brake lever downwards, which is connected to the brake pedal of a car by the two-wheeler brake wire, as a con-

necting mechanism.

The clutch is operated with the palm. When clutch lever is pushed downwards, the clutch pedal is pushed and disengagement of clutch takes place. To engage the clutch, lever has to be released gradually. This action is also transferred by use of two-wheelers brake wire cable.

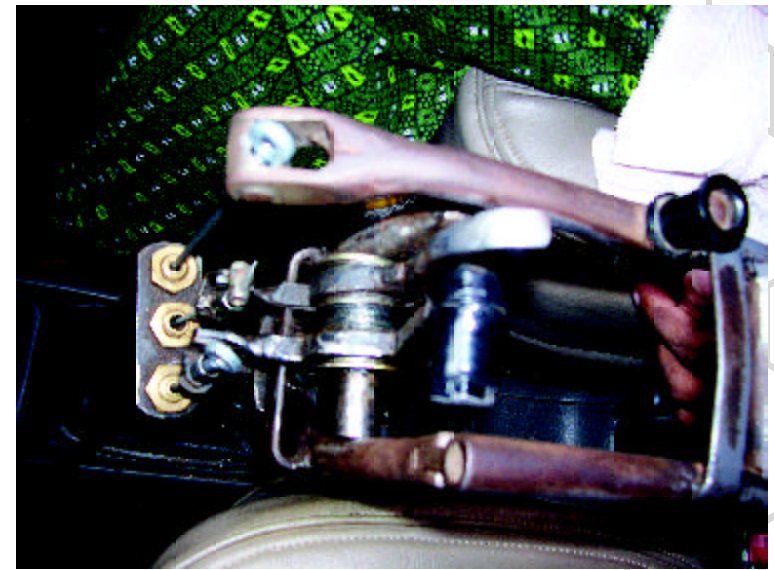
The accelerator is operated with forefinger by pressing the accelerator lever downward similar to hand operated brake level.

The system can be fitted into any model of car and the incorporation cost ranges between Rs 4000-4500/-. The repair kit for the system is quite easy and ergonomically also the system is comfortable.

Having perfected the unit satisfactorily and installed in his Wagon-R and driven over 50,000 kilometers using his left hand, he has become a role model in society and been transformed from an object of sympathy to an object of admiration.

Now he feels peaceful that he confidently "standing on his own legs". He is running his own shop selling and servicing electronic goods with lot of satisfied customers. He also repairs and assembles stabilizers, invertors and mobile phones. He is also well versed in plumbing. He himself acquired all his skills, without any formal training.

Social impact



He feels that depression is the major obstacle for handicapped people who cannot lead a normal life. To instill hope and self-confidence in them, he has made it his mission, to take out his car, driving himself and visiting them and showing them his achievements to convince them that many things are possible for handicapped persons and advising them to 'wake up'. He has already developed a big network of handicapped persons.

In many ways, he feels that accident has given him the power to expand and discover his own abilities.

He also acknowledges that the presence of close friends is his strength. He feels he owes his successes to the timely support of his friends. His friends help him to get into car and also for getting out every day. At the initial stages of development of this technology, his friends were the main supporters both morally and physically.



accelerator and clutch (<http://www.handicappedpeople.com/faq.htm#one>), manual hand operated brake, clutch and accelerator controls in the car for handicapped (Rajesh Sharma, Mujib Khan, Vaghaji bhai, Vinod bhai Panchal, Ninny - NIF Database), fully hand-operated manual transmission fitted with a vacuum-clutch (developed by Mr. Ferdie, Mumbai. www.indiacar.net). Brake and accelerator controls for handicapped (US Patent No. 5,103,946 - Apr.14, 1992), dash mounted throttle and brake control (US Patent No. 4,436,191 - Mar.13, 1984), engine throttle and brake control mechanism having a hand operated input lever (US Patent no. 4,627,522 - Dec.9, 1986), a hand controlled apparatus for the controlling of a brake pedal and accelerator pedal (US Patent No. 4,998,983 – March 12, 1991), device for manually operating the brake and accelerator pedals for a vehicle (US Patent No. 4,946,013 - Aug. 7, 1990), hand operation of throttle & brake pedals (US Patent No. 4,788,879 – Dec. 6, 1988).

He also feels some slight improvement in sensation in his paralyzed legs and feels this may be due to his increased confidence affecting body healing.

He considers the appreciation he received during the Shodh Yatra in December 2005, one of the most memorable recognitions he got. After this recognition, the broadcast media has given wide coverage for this innovation.

The local handicapped association in 2006 also honored him with the 'Vikalanga Sangam' Award with the award given away by the state minister CF Thomas.

There have been a lot of queries for his innovation

from all over Kerala and most of them were from disabled people.

These phone calls convinced him the widespread need of this device.

He is interested in licensing the technology to any entrepreneur or industry. He feels that he should license the technology, as with his physical condition, he will not be able to run an industry himself.

His advice to fellow innovators is not to lose confidence and to remember '*where there is a will, there will be a way*'.

'Automatic/manual transmission for hand operated brake,