



Automobile Adaptations for Drivers with a different Mobility

Quality without compromise

*When you buy from KEMPF...
... expect the best!*



In 1954 Jean-Pierre KEMPF invented the accelerator-ring. Using a wheelchair himself due to polio at age of two, he started his company to adapt cars for drivers with a different mobility. At the time of his demise in 2002 he had adapted over 100 000 cars.

"The adaptation should not be like a prosthesis added to the car, but it should be integrated into the vehicle." Jean-Pierre KEMPF was saying.

He dedicated his life in designing the best technology to help drivers with disabilities control their vehicle with safety, comfort and elegance.

With KEMPF the pleasure of driving is back and mobility is redefined!



The Innovation goes on . . .

The KEMPF digital accelerator-ring remains a unique technical solution to this day. It is compatible with the airbag and it maintains all safety features required by the car manufacturers.

Driving with both hands on the wheel

The digital accelerator-ring and the main hand brake can be installed without the use of both legs can be installed on most cars with automatic transmissions. This adaptation is compatible with the driver's side airbag and with the airbag installed in the knee-area.

The original pedals remain functional.

The accelerator-ring is here in idle position. The ring is pushed towards the steering-wheel to accelerate; very little effort is required.

The distance from idle to full throttle is only about a 3/4 inch for ergonomic reasons.

The leather covered ring turns freely over its circular holder to enable precise acceleration even while exiting a curve.



Driving with both hands on the steering wheel

All integrated multi-functions as well as the original adjustment possibilities of the steering-wheel are maintained.

The accelerator-ring and the main hand brake fit well, esthetically as well as functionally in the car's interior. The ring and the brake's handle are covered with leather. There are 21 colors of leather available. (see selection online at : www.kempf-usa.com)



Driving without the use of both legs

The main hand brake consists of a lever coming out of the dashboard and pivoting around one horizontal and invisible axis. The brake-lever's handle moves downward.

The mechanical connection with the brake pedal is hidden behind the bottom cover of the dashboard. Therefore, in case of an accident, the driver's legs will have no chance of touching any mechanical element of the equipment : the car's passive safety is not compromised by the presence of the hand-controlled brake.

The airbag in the knee area remains functional. The force required to brake by hand is approximately one half of the one required by foot.



The main hand brake vertically activated respects the passive safety designed by the car manufacturers.



The main hand brake for each new car model requires research and development to maintain the original safety level designed by the car manufacturers.

In case of a failure in the original braking system the full braking range down to the floor is reachable with the main hand brake lever.



The main Hand Brake - Left or Right



Safety, Comfort and Elegance combined

Why choose the digital Accelerator Ring?



The Benefits and Technology of the Digital Accelerator Ring

Comfort :

- Both hands remain on the steering wheel.
- The distance from idle to full throttle is only 3/4 inch.
- The pressure on the ring is effortless.
- The ring turns freely over its holder to enable a precise acceleration while exiting a curve.
- The original multi functions and adjustments of the steering wheel are maintained.

Safety :

- The steering wheel airbag and the airbag in the knee area are maintained.
- The installation of two sensors inside the steering wheel guarantees two levels of safety.
- The digital signal is insensitive to electromagnetic noise.
- The original pedals as well as the cruise control remain functional.
- A solid mechanical connection (never a cable) activates the accelerator pedal.
- The hand-controlled main brake can on some cars have priority over the accelerator.
- The original horn function on the steering wheel is maintained on most steering wheels.
- A button installed on the dashboard turns on or off the accelerator-ring

Elegance :

- The ring fits well in the car's interior and the vision of the dashboard remains clear.
- The accelerator ring is only about 3/4 inch away from the steering wheel's rim.
- The ring and the brake handle are covered with leather.

How does it work ?

The movement of the accelerator-ring is captured by two sensors inside the steering wheel to be immune to electromagnetic noise.

An electronic circuit also installed inside the steering wheel analyzes the signals of both sensors and converts their values into one digital signal before transmitting it to the main controller under the dashboard.

It uses an existing wired connection (usually the original horn connection) to send the digital data twice 1000 times per second.

This main controller controls a servo-motor which mechanically activates the accelerator pedal.

This mechanical connection is secured by an electromagnet (main safety element).

The electronic circuits :

The electronic circuits are designed and manufactured by KEMPF in Sunnyvale, California. They are tested to be in conformity with regulatory guidelines for electromagnetic compliance.

Their reliability is the result of more than 20 years of experience in the field of medical electronics.



"DUAL SELECT"

The digital accelerator ring "dual select"

enables the driver to choose between two driving styles:

Comfort or Sport



I. The comfort style selects an acceleration mode which gives the driver a sense of security and well being.

It enables him or her to get an excellent sensibility in acceleration, very smooth starts and an enjoyable and economical ride.

II. The sport style selects an acceleration mode which gives the driver a dynamic sensation.

It enables him or her to skillfully get a very precise acceleration, fast starts and a real pleasure in driving.

The digital Accelerator Ring "DUAL SELECT"

A few more reasons . . .

Keep your eyes level at all time.

Driving with the Digital Accelerator Ring enables you to keep your eyes level at all time, not having to bend forward like with standard manual hand controls.



Use the standard secondary functions.

Being able to drive with both hands on the steering wheel allows you to switch hands to accelerate. Push on the ring with one hand and use the other hand to control the secondary functions, like the turn signals, washer, wiper, switch between high beam and low beam, . . .

*Brake before the turn, then use both hands to turn.
Find again the pleasure of driving.*



... to use the digital Accelerator Ring



Easy access - No metal in front of your knees.

The digital accelerator ring and main hand brake leave your legroom free of any metal parts. It makes the transfer in and out of the driver's seat easier.

The absence of metal rod to the pedals gives an easy access to a driver using both feet. The flip of a switch on the dashboard turns on and off the accelerator ring.

The original pedals as well as the cruise control are always usable so drivers with residual leg functions are easily able to switch between driving modes.



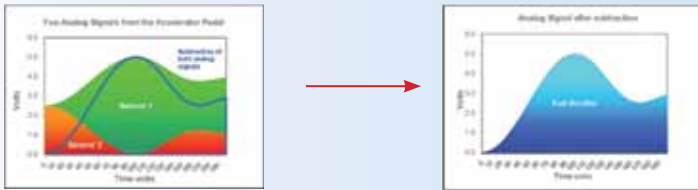
Why is the use of two Sensors so important?

The technology used by car manufacturers: They are all using two sensors

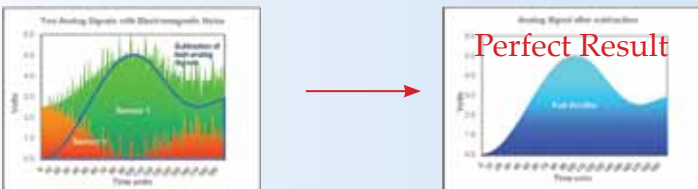
(The technical descriptions are simplified for a better understanding)

Most accelerator pedals built today are electronic. They have two sensors which transmit two separate signals to the main electronic controller of the car. These signals are ANALOG signals (see explanations below).

The car manufacturers all agree that two signals are required because they are sensitive to electromagnetic noise present in the automotive environment and they need to be subtracted to eliminate the errors due to this noise.



When the accelerator pedal is in idle position, both sensors have identical signals of 2.5 Volts. Their subtraction results in zero Volt. At full throttle, the sensor #1 (green) has a signal of 5 Volts and the sensor #2 (orange) has a signal of zero Volt, so their subtraction results in 5 Volts.



In the presence of electromagnetic noise, both signals are distorted by the same amount, so their subtraction eliminates all errors.

CONCLUSION: Car manufacturers are using **two sensors** in all electronic accelerator pedals to be immune to electromagnetic noise.

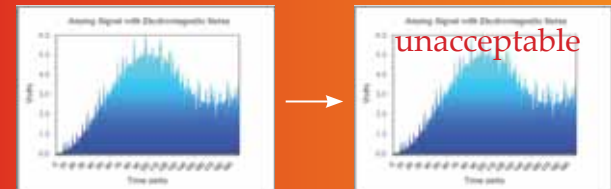
What would be the consequences of building an electronic accelerator with only one sensor ?

The price would be cheaper, but... the safety... could be compromised.



A hand controlled accelerator using only one sensor or transmitting only one analog signal from the steering wheel to its main electronic controller is sensitive to the effects of electromagnetic noise present in the automotive environment.

It therefore necessarily reduces the level of safety designed by the car manufacturer.



The absence of a second sensor eliminates the possibility to subtract the noise. The result allows involuntary accelerations.

An electronic accelerator ring using only one sensor reduces the level of safety designed by the car manufacturer.

An involuntary acceleration cannot be excluded.

What is the difference between analog and digital?

An ANALOG signal may have any infinite number of values. So it is very sensitive to electromagnetic noise, because its signals cannot be filtered out. The noise becomes a part of the analog signal which is then distorted.

A DIGITAL signal may only have two pre-defined values, which are insensitive to electromagnetic noise.

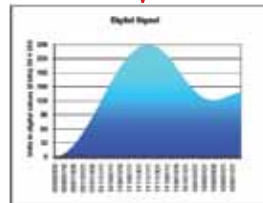
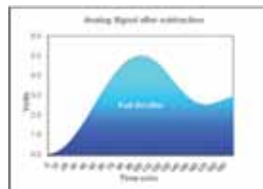
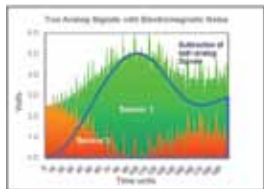
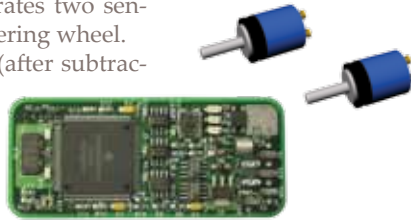
Let us recall the bases of digital electronics:

All informations or signals, calculated or stored by a computer are made

The Absence of involuntary Acceleration is guaranteed

The KEMPF digital accelerator ring uses two sensors and one digital signal (immune to electromagnetic noise)

The KEMPF digital accelerator-ring integrates two sensors and an electronic circuit inside the steering wheel. It converts both ANALOG sensor signals (after subtraction to eliminate electromagnetic noise) into one DIGITAL signal which is immune to electromagnetic noise.

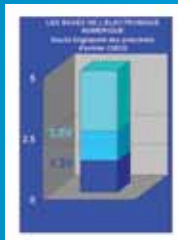


The DIGITAL signal inside the steering wheel reflects in real time the position of the accelerator-ring. Its digital data is sent twice, thousand times per second, to the main electronic controller which activates the accelerator pedal.

Inside the steering wheel the subtraction of both analog sensor signals and the conversion to one digital signal eliminates the negative effects of electromagnetic noise.

out of signals having two possible values : zero or OFF and 1 or ON. The advantage of this technology is that these two values 0 and 1 (also called logic states) are insensitive to electromagnetic noise, because by design all digital electronic circuits have well defined thresholds for these two values.

For example a CMOS electronic circuit requiring a 5 Volts supply will recognize all input signals with values between 0 and 1.3 Volts as a zero and all signals with values between 2.5 Volts and 5 Volts as a 1. So by design a digital signal is immune to electromagnetic noise.

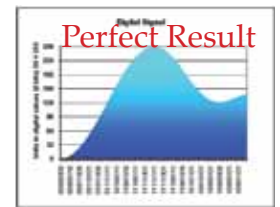
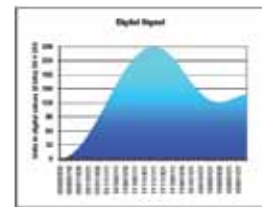


Two sensors are needed to guarantee the absence of involuntary acceleration!

The digital signals are transmitted through an existing wired connection (originally for the horn) from the steering wheel to the dashboard.

The horn function is maintained; its signal is integrated in the digital signals of the accelerator.

The digital signal



The digital signal is insensitive to electromagnetic noise (see explanation on previous page and below).

The digital signal is insensitive to electromagnetic noise encountered in the automotive environment.

No involuntary acceleration can occur.

CONCLUSION : The use of **DIGITAL** technology maintains the safety level required by all car manufacturers and gives the driver well appreciated comfort, ease of use and precision in acceleration.

The digital technology has already revolutionized :

- the musical recording with the CD
- the world of photography with digital cameras
- the movies with the DVD
- television with HDTV . . . and it will not stop here . . .

Tests in Laboratories

The KEMPF products are designed and built with attention to details and sophisticated know-how. They are tested to be in compliance with regulatory guidelines as well as with the car manufacturers' quality and safety requirements.



Airbag deployment test performed in a certified laboratory.

Result : The accelerator-ring doesn't affect the deployment of the airbag

Each new car model requires research and development efforts to integrate the digital accelerator ring and the main hand brake while respecting the passive and active safety constraints designed by the car manufacturers.

The safety level of the vehicle is maintained (not reduced) by the installation of a KEMPF adaptation.

It is unacceptable to allow a reduction in the level of safety due to the installation of a driving adaptation for people with a different mobility.



Electromagnetic Compatibility Tests performed in an anechoic chamber.

The KEMPF electronic circuits are tested to be in conformity with the regulatory guidelines for electromagnetic compliance. They have even been successfully tested at higher voltage levels to comply with several car manufacturers more stringent requirements.



Research & Development

The KEMPF company substantially invests in research and development to allow its products to be in sync with the technological progress of the automotive industry.

Studying the multiplex circuits, measuring steering wheels in 3D, programming CNC drilling machines, designing mechanical parts with CAD systems are only a few examples of the activities taking place inside the company.

The KEMPF adaptations come with two years limited warranty.



The Steering knob with secondary Functions

Driving with one arm on the steering wheel

The Steering knob and its small controller are covered with leather and are solidly installed on the steering wheel's rim.

The buttons enable the control of the following functions:

- Turn signals
- Wipers (various speeds)
- Washer front
- Washer rear
- Horn
- Flash
- Low beam headlights
- High beam headlights
- Warning lights
- Driver's power window (optional)

The 6 buttons allow the driver to control up to 14 functions. Some of them are controlled by holding down the button for at least 2 seconds.

The two white buttons for the turn signals are translucent and lit in the dark.

One of them is slightly higher to serve as tactile reference

No markings are apposed for esthetic reasons. The functions of the black and white buttons (like a piano) are easily memorized.

The knob is removable. The light weight of the knob with its controller and the absence of battery avoids any negative effect on the power-steering.



Through the use of direct wiring no battery is needed on the steering wheel.



The electronic circuits:

The electronic circuits are designed and manufactured by KEMPF in California.

They are tested to be in conformity with regulatory guidelines for electromagnetic compliance.



Safe Driving

Using only one arm, the driver steers his or her car holding the steering-knob and activates the secondary functions using the buttons placed in reaching distance of the thumb.

The steering knob with secondary functions can be installed on most cars with automatic transmissions including cars with multiplex or CAN-bus systems.

The system is compatible with the airbag and all multi-functions integrated in the steering-wheel remain functional.

The original secondary functions remain functional.

The steering knob with secondary functions uses the existing wired connection for the horn to send its signals from the steering wheel to the dashboard and therefore it doesn't require the use of any battery; its reliability is guaranteed.



Driving after a Stroke - with Hemiplegia

A person having lost the use of his or her right arm and right leg will be able to drive with a steering knob with secondary functions (see previous pages) and an electronic left foot accelerator pedal.

This electronic left foot accelerator pedal can be installed in any car with automatic transmission and an original electronic accelerator pedal.

A second accelerator pedal identical to the original one is installed left from the brake pedal. A lighted push button placed on the dashboard enables the selection between both accelerator pedals only shortly after the start of the engine.



The selection is only allowed immediately after the start of the engine.



Original Configuration First:

An electronic circuit allows the selection of the left accelerator pedal only during 10 seconds after the start of the engine.

In the absence of selection the original accelerator pedal on the right is always functional. This prevents any confusion when the car is driven by a driver using both feet.

Driving without the use of the Right Leg

The electronic left foot accelerator pedal is designed for drivers without the use of their right leg.

It can be installed in any car with automatic transmission and an original electronic accelerator pedal (most cars since 2006).

An elegant Solution:

No handling of the pedals is necessary to switch between the left and the right accelerator pedal.

Both accelerator pedals are never active at the same time.

At the start of the engine the lighted green button flashes for 10 seconds. If the driver pushes it during that period of time, the button remains lighted and the left accelerator pedal is active until the next engine start.

In the absence of any action from the driver the original accelerator pedal is immediately active and the button stops flashing after 10 seconds.

Installation by a Professional:

The electronic left foot accelerator pedal can be installed, for certain vehicles, by a mobility dealer (NMEDA member).



A button installed on the dashboard enables the driver to select between the right and the left accelerator pedal without touching the pedals.

For certain cars without electronic accelerator pedals a mechanical solution remains possible. In this case, depending on the model and year of the car, the left accelerator pedal and the original accelerator pedal can be removable or raisable. Please contact us for more information.

Read what our customers are saying?

Read what our customers are saying:

"After driving a large van for two years after my injury using 1950s push pull lever technology I felt there must be something better and was so pleased to find the Kempf digital driving controls.

As a result I purchased a high-performance automobile and now I can drive it with both hands on the wheel in full control.

No more suicide knob and a push pull lever that frequently destroyed my breaks and gave me limited control of the vehicle.

This new system gives me total control and great responsiveness, it's a real breakthrough!"

Don G. from Chicago, IL

"The system looks great and works super. I'm glad I held out for this system. Thanks again for a great job."

Rick T. from Jay, VT



"This new system gives me total control and great responsiveness, it's a real breakthrough!"



Test-drives available at many events

"After a bicycling accident in 1999 left my right leg partially paralyzed due to a hip fracture, I have used left gas pedals to drive.

However, I was never able to get comfortable, as my hip has a limited range of motion and the mechanical gas pedal designs require a block over the regular accelerator pedal.

Therefore, with the mechanical designs, my leg was bent more than was comfortable and my lower back was forced to curve in order to compensate for the reduced hip flexibility.

Also, the system had to be removed each time someone else drove the car.

With the Kempf design, I'm much more comfortable because I can stretch out my right leg.

The car drives as designed because the same gas pedal as is stock is used for the left pedal.

Even the switch on the dashboard to move between the right and left gas pedals is of high quality.

As an added bonus, since the system is simply a matching gas pedal installed to the left of the brake pedal, it looks very finished.

Finally, Kempf did a wonderful job installing the product."

Jeff B. from Boston, MA



KEMPf participates in many events.

For more information: www.kempf-usa.com

Company Background

The KEMPF company is a leading European manufacturer of car adaptations for drivers with a different mobility.

Its continuous efforts in developing the safest and most reliable systems available to drivers with disabilities makes it the most recommended company by the European car manufacturers.

Martine Kempf, the CEO of KEMPF is the daughter of Jean-Pierre Kempf, the inventor of the accelerator ring.

She has been the owner of an electronic design and manufacturing company in Silicon Valley, California for the past 23 years.

She invented in the mid 1980s a speech recognition control system, the Katalavox. Its first application was the control of secondary functions in cars for drivers without the use of both arms. It was worldwide the first car with voice-activated functions.

FREE TRANSPORT NATIONWIDE

KEMPF offers to transport the vehicle to be adapted nationwide free of charge to one of its facilities and back. This offer is valid for the installation of a digital accelerator ring or a steering knob with secondary functions.

Offer valid until 12/31/2010



KEMPF Inc. is a member of NMEDA

The Katalavox is used by micro surgeons in operating rooms to control surgical microscopes by voice-commands.

The same state of the art electronics with its proven reliability is integrated in the digital accelerator ring since 1999.

KEMPF is committed to remain on the cutting edge of technology by continually conducting research and development to provide safe and reliable solutions to drivers with a different mobility.



Mr. Andrew Kimble, a veteran from Jacksonville, FL is the first user of the digital accelerator ring in the USA.

**All KEMPF products are accepted by the VA (Department of Veterans Affairs).
If you are a veteran, please contact your prosthetics representative.**



Free Transport Nationwide

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"I really appreciate the attention to detail you took and you made this car an outstanding vehicle for a handicapped individual that enjoys driving. I certainly appreciate a minor amount of cutting you did to install the unit.

Thanks again for the great quality job."

Don G. Chicago, IL

"With the Kempf design, I'm much more comfortable . . . Kempf did a wonderful job installing the product."

Jeff B. Boston, MA

"The system looks great and works super.

Thanks again for a great job."

Rick T. Jay, VT



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Designer and Manufacturer of Automobile Adaptations
for Drivers with a different Mobility