



DEVELOPING **LOW**  
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## Ashwoods Hybrid Drive

### Company Overview

Ashwoods is already one of the best known players in the field of low emission technology for commercial fleets. Over the last 2 years the company sold over 300 commercial vehicles to our private and fleet customers, all of these vehicles were converted to LPG at the company's installation centre near Bridgwater in Somerset. Our customers benefit from the fuel, tax and congestion savings associated with this greener fuel, not to mention the ongoing after sales service provided through our network of LPGA approved garages nationwide.

We focus on developing the latest CO2 saving technologies, making them more affordable and bringing them to market with our manufacturer partners. On that note we are pleased to introduce our latest development: the Ashwoods Hybrid Drive. We originally developed and emissions tested the system on the diesel Ford Transit and are currently working with several other manufacturers developing hybrid versions of their models. We are now taking orders with delivery in 6 to 8 weeks.

In this document we hope to give an explanation of the simplicity and effectiveness of the Hybrid Drive with the view of arranging live demonstrations.

### What is the Ashwoods Hybrid Drive?

The Ashwoods Hybrid Drive can be installed on both petrol and diesel vehicles.





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Ashwoods are pleased to announce that the Hybrid Drive won the Industry Innovation Award at The Green Fleet Awards held at Twickenham Rugby Stadium, 25<sup>th</sup> September 2008.

The basic concept of the Hybrid Drive is to capture energy that would normally be dissipated as heat during braking on vehicles and reuse it to assist the engine.

This assistance means that the engine doesn't have to work so hard and therefore uses less fuel and produces less CO<sub>2</sub>.

In this case, the kinetic energy that is normally converted to heat during braking is captured and stored in a battery. Using the latest C-LIFEPO 4 technology allows us to store the energy in a battery 1/3 of the weight of a conventional Lead Acid battery. The energy stored in the battery is then reused to assist the vehicle when the engine is at its least efficient. This is done by our bespoke vehicle interface system through an electric motor which is attached to the rear differential. The motor assists in turning the drive shaft and so the engine does not need to work as hard.

### **What effects does this have on CO<sub>2</sub> Emissions?**

Ashwoods are the first company to provide proven emissions data on a hybrid system. We have achieved 14.2% CO<sub>2</sub> reductions at approved testing facilities on the European Drive Cycle, this is coupled with significant NO<sub>x</sub> and Particulates reductions.

### **What makes the Ashwoods Hybrid Drive the best kit on the market?**

1. We have proven emissions testing on the European Drive cycle.
2. The technology provides significant CO<sub>2</sub> reductions on both petrol and diesel engines.
3. The system can easily be developed to fit different vehicle types
4. The system requires no modification to the vehicle
5. Our installation facilities are mobile and carried out at customer's place of business.
6. Installation can be completed in under 3 hours
7. All components are assembled on existing holes and fixings, the bonnet is unopened
8. The kit can be easily removed and reused on replacement vehicles



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9. The kit can be given '2<sup>nd</sup> life' at the end of the 3 year warranty period, at minimal cost.
10. Residual value of the vehicle will be unaffected
11. There are only 2 components to the kit
12. Servicing is cheap and easy
13. Faults are quickly and easily remedied without the need to return the vehicle to the place of installation
14. The user is removed from the equation. Other Hybrid technologies require the user to drive in a particular way.

### **What is the conversion kit made up of?**

We have worked hard to ensure that the kit has as few parts to it as possible and so does not interfere with the vehicle's components in any way:

1. Self contained Intelligent Power Pack Module (IPP Module) to house the batteries, controller and ECU
2. Electric Motor

### **How is the kit installed?**

Again we have worked hard to ensure that installation is as quick and straightforward as possible, so much so that our installers are mobile and can perform the installations at our customers place of business. The whole kit can be installed in under 3 hours and all components are assembled using existing holes and fixings. There is no need at any point to drill or cut into the vehicle, we do not even need to open the bonnet. The connection to the vehicle is made through the standard OBD socket.

1. The IPP module is attached under the vehicle using existing fixings. The casing has a port so that quick diagnostics can be carried out on the battery and the ECU. The casing is connected to the vehicle using the standard OBD socket.
2. The electric motor is attached to the rear differential and is connected by power cable to the IPP module.

One of the key elements of the Ashwoods Hybrid Drive system is that it can be recycled. If the customer changes their vehicle they can take the Hybrid Drive with them, to remove and reinstall would take less than 3 hours. Because the drilling or cutting is required, the old vehicle will not lose any residual value.



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### **What are the servicing requirements?**

The system will require an annual diagnostic check. This can be performed without even needing the keys for the vehicle because we can conduct the check through the diagnostic socket on the IPP module which is on the underside of the vehicle.

Each year we will replace the brushes in the motor. The total cost of servicing will be less than £80 plus VAT and can easily be done by main dealers once we have supplied the required software and training.

### **Proposed installation and after sales service from Ashwoods**

Ashwoods can either come out to the customer to make the installation on site and provide information directly to the customer, or we can take delivery of the vehicles and complete all installations at our facilities in Somerset and Wales then deliver to the customer. In the future, given the simplicity of installation, there is the option to train selected main dealers to install the Hybrid Drive if that is seen as necessary.

On the display unit there will be a dedicated after sales telephone number; this will enable the user to call with any questions or concerns they may have.

Ashwoods will train and provide diagnostic software to participating main dealers and large fleet customers. Users will also have access to the entire network of approved LPG converters who will be trained on the Ashwoods Hybrid Drive system. A booklet will be provided listing the locations of all dealers and installation garages.

In the case of a fault: the IPP module, which contains all the main components, can be removed in a matter of minutes and a replacement sent out and fitted. Because all the key components are contained within this sealed casing, there is no opportunity for it to be tampered with. This also means that there is no need for the vehicle to be returned to the place of installation in the case of a fault.



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Most importantly the vehicle will experience no down-time as the Hybrid system can simply be unplugged and the vehicle drive as normal until the replacement part arrives.

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