DataSheet The Camping and Carayanning



Choosing a towcar – auto transmission?

Choosing your towcar's transmission

A car's engine will not give of its best unless it is mated to a suitable transmission system to get the power to the wheels. Towing, in particular, places different demands on the car, and a gearbox good for solo driving may be less suitable when pulling an extra tonne or so.



A manual gearbox is simple and reliable provided the gear ratios are suitable for towing, but many users prefer the freedom and flexibility of an automatic gearbox, which basically does all the thinking for you and can make for relaxed

driving. However, some types need modification for towing use if they are not to cause trouble. The latest semi-automatic systems are a hybrid between the two, can be used in a manual or automatic mode.

All-wheel-drive can be beneficial when trying to get off a muddy campsite, but it usually involves higher fuel consumption and adds another level of complexity. The right transmission system is always a compromise. Here we offer some advice to help you make the right choice.



Automatic gearboxes

Traditional automatic gearboxes (autos) include a hydraulic coupling in place of the clutch. A vehicle with one will use more fuel than an identical car with a manual gearbox because of inefficiences in the convertor and gearbox but you are spared the chore of using a clutch pedal and choosing the right gear and you won't be able to stall the engine on hill starts.

Towing with an auto is generally more relaxed than with a manual as the gears change automatically and driving in heavy traffic can be easier as a result. The disadvantages include heavier fuel consumption due to losses in the transmission, the need to keep the transmission fluid cool when towing by use of in-built or retro-fit oil coolers, and the higher costs of repair if something goes wrong. Some drivers also feel they are not in full control of what the gearbox is doing.

In recent years automatic gearboxes have improved significantly, particularly with full electronic management of the system that

improves fuel consumption, adds a degree of manual control and provides a choice of many more ratios than previously. Six- and even seven-speed auto boxes are now common, which means the right ratio for more conditions and fewer losses.

In most automatic cars there are extra driving modes such as 'sport' and 'winter'. These alter the change points from one gear to another. 'Sport' mode allows better performance by optimising the vehicle for performance and can be helpful if you're towing in hilly terrain There are some systems that provide a 'towing' mode, sometimes on the more expensive models by detecting the trailer connection. 'Winter' mode starts the car in a higher gear and can help when pulling away on slippery ground, avoiding wheel spin. In short, modern autos remove many of the earlier drawbacks associated with this transmission.

Hill starts can be made more easily with an auto car as all you need is to release the handbrake while pressing the accelerator.

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Towing limits

Whatever the car or its gearbox, the maximum towing limit set by the manufacturer is legally enforceable – if you are stopped at a check, the authorities can refuse to let you carry on with the journey.

Always try to stay within the 85 per cent of kerbweight recommendation whatever the maximum quoted for the car to allow for difficult conditions and to get the best stability.

Further information

- Federation of Automatic Transmission Engineers: list of automatic transmission repair specialists and information on cooling for automatics. fedauto.co.uk
- Vehicle Certification
 Agency (VCA):
 comparison of current
 VED costs.
 vcacarfueldata.org.uk/ved



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The vehicle will supply sufficient power to get you under way without stalling or burning out the clutch. There are also hill-hold systems that will prevent the vehicle rolling back until sufficient power to move away has been put down. Once you get used to all this, reverting to an ordinary manual can be a real shock.

There are still some disadvantages to autos though. They are more expensive to buy, have more complexity and any repairs are best left to a specialist. The way the official fuel consumption and emissions tests are carried out do somewhat disadvantage automatics. Autos generally have higher CO₂ figures, which can mean higher rates of car tax (VED). If the equivalent manual car is near the limit for its VED band for example, the choice of an auto box can push the car into the next higher tax band. It might not be that much compared with the price of the car, but you pay it every year.

One exception to letting the auto box do all the work is with downhill towing. In this case the engine will be at low revs as the gearbox senses that little power is needed. With an extra tonne behind, this can mean you will speed up faster as there is little engine braking to keep the speed in check. Downhill speed is one of the prime causes of instability in towed vehicles, and merely keeping the brakes on may result in the brakes fading on long downhill stretches. The solution is to manually select an appropriate gear (which all auto boxes will have) when descending, so that engine revs are kept up. If you are not sure about how to use this system, consult your handbook.

On the open road, automatics can largely be left to themselves in the D (or Drive) position. It can,

however, be useful to manually select a lower gear when ascending a long hill, especially one where the gradient varies. In this case an auto box in D may switch ratios rather too often for comfort as it tries to find the best compromise. Using the hold allows the gearbox to stay in the chosen gear until the hill is past, and most users find this of benefit to the smoothness of the drive. Remember that there is also normally a 'kick-down' facility, which is useful when you need an extra turn of speed or power. Increased pressure on the accelerator will engage a lower gear at most speeds.

Long uphill stretches may also reveal another factor — the transmission fluid can get very hot. This is not normally a problem as the car will have (or you may be advised to fit) a special extra oil cooler.

On- and off-site manoeuvring is made very easy with an auto, as long as you have a gentle right foot, ready to switch between accelerator and brake pedal. You may find it far simpler to get to the right position than when slipping the clutch on a manual box.

You need to be aware that manufacturers' maximum towing limits can vary from the manual versions of a given car. You need to check this carefully before you buy, as some autos' limits are lower than the equivalent manual car. Some are the same and some can even be higher. If they are lower, the maker's engineers usually quote 'cooling requirements' as the reason. In any case, even if the maximum limit will suit your caravan it is wise not to tow right up to the car's limit. Give yourself a bit of reserve capacity.

Semi-automatics

Although automatic in use, these gearbox systems are best thought of as electronically-controlled manual gearboxes with an automatic clutch. You can drive them like a full automatic, letting the electronics do all the work, or there is a fine degree of manual control, using an up-down lever, or sometimes paddles on the steering wheel.

A good example is the DSG (Direct Shift Gearbox) available in many of the Volkswagen Group vehicles. Here, there are really two separate but integrated gearboxes and two clutches. First, third and fifth gear are on one shaft and second, fourth and fifth on another concentric shaft. Two clutches control which of the gear sets is selected, and the change time from one to the other is very fast (as short as 8ms is quoted for an up-shift).

Other versions based on similar principles are used by Citroën, Peugeot, Ford and Volvo, all with slightly different names such as PowerShift and Geartronic, and all offer manual or fully-automatic gear changes. There is a cost penalty in higher initial price and greater complexity of repairs and it needs specialist transmission fluids. A semi-automatic is also heavier than a conventional gearbox (typically by about 30kg) although this can be useful when choosing the best towing match.

The advantages of this system is that there are far fewer losses from the system, which can offer up to a 15 per cent fuel consumption improvement over conventional automatic transmissions — and can get very close to many manual gearbox figures. The changes are very smooth and extremely consistent, which makes for easy and relaxing driving. Manual control is a feature that can be engaged at driver choice, subject to the electronics' overriding control of an unsuitable selection. You can go up or down the gears at will with this, but you cannot 'skip shift' — it has to be sequential. The automatic mode, however, can skip gears on its way to the best choice of ratio.

Another kind of gearbox is the Continuously Variable Transmission (CVT). Most versions as used by Ford, Fiat, Honda and Nissan rely on variable diameter pullies for gear ratio variation and modern versions are much more robust and reliable than earlier attempts. All tend to sound a little different in use, which some may find disconcerting at first. There are other CVT systems in use in off-road applications that use different techniques, all aimed at seamless ratio changing and allowing the engine to be optimised either for economy or power.





All-wheel drive vehicles

Many caravanners tow with 4x4 all-wheel drive (AWD) towcars. Often this choice is driven by the significant kerbweight available, so you can tow a larger caravan. Most have high towing limits, some even way beyond the kerbweight, though again the Club would advise sticking to the 85 per cent recommendation.

The main advantage in use is in traction off a muddy field or in snow. Driving all-wheels means power is spread over both ends of the vehicle, and the latest controls apportion the drive as traction becomes available, though skill is needed for best results.

There are different types of AWD systems. Some vehicles have permanent four-wheel drive, some let the driver select two or four-wheel traction (this can save fuel as fewer parts are being driven) and some do the job automatically depending on conditions.

There are also many smaller AWD vehicles, such as mid-sized and compact vehicles like the BMW X3, Ford Kuga, Renault Koleos and Toyota RAV4 on the market. There are also 'crossover' vehicles from Nissan, Mitsubishi, Citroën and others, and the almost-conventional but four-wheel-drive cars from Subaru.

But do you really need that 4x4 grip and do you know how to use it? Few caravanners actually need AWD in normal touring, but when you really need it, it is invaluable. Consider how often you will use it compared with the extra cost you are paying — it's a £2,000 option compared with the two-wheel-drive Kuga for example. If you really need the weight and the traction, they are fine towcars that will be fit for arduous work. If you are to get the best results, an hour or two's training at an off-road course will pay dividends.

There are often controls for diff locks, which prevent one wheel getting all the power, inter axle locks and automatic or manual selection of four-wheel drive. Some vehicles will have a low ratio setting, which can be useful for pulling a caravan off a muddy field or starting on a very steep hill.

Remember also to check the noseweight limit of a 4x4 as not all will have a limit suitable for the very heavy caravan capability that would be suggested by its size. Many large caravans tow best with a noseweight up to the maximum permitted by the chassis manufacturer of 100kg if you are not to sacrifice some stability when the going gets rough. This noseweight is easily available from a Land Rover Discovery (150kg), but a 2011 Kia Sorento with an automatic gearbox offers a limit of only 80kg.