20 Driving your TVR

So you have bought your TVR and have just picked it up. The adrenaline is flowing and you are itching to experience all that power and acceleration. This is probably not the time that you want to hear about the very high number of single vehicle accidents TVRs experience or that none of your driving experience or techniques accumulated when learning to drive are really enough to enable you to drive the car and keep it under control. However, for most first time TVR owners, and for those that have not learned the techniques, this is exactly the case.

This chapter is not a replacement for additional tuition, which I would strongly recommend to anyone (especially first time TVR owners) but it will help you to understand why different techniques are needed and where they can be learnt safely through track days and even speed events. It also covers driving through floods and what to take when touring.

No engine braking, please!

Probably the most common fault shown by first time TVR drivers is that of engine braking, where the engine is used to provide braking by mismatching the engine revs so that it is turning over slower than that needed to match the road speed. This is normally done by changing down a gear or two and then engaging the clutch. This technique used to be taught as standard when brakes were not as efficient as they are today and engine braking was a generally accepted method of safely slowing down. If it was valid then, why is it not valid with a TVR today? The reasons are many but the one to remember is that it can cause the car to suddenly spin. This is probably the main cause of single vehicle accidents with these cars. The driver may claim that he was doing nothing wrong and the car suddenly spun out of control when in reality, the driver was engine braking (a normal technique used for years), the rear wheels locked up and the car did the equivalent of a handbrake turn.

The reason for the difference in technique is the difference in level of torque between a standard saloon car and a TVR. While the torque provides braking force, there is insufficient in a standard car to lock up the wheels — whereas with a TVR, and its 300+ lb/ft of torque, this is more than enough to lock the back wheel almost instantaneously!

Here is a more complete list of reasons why engine braking should not be used:

- The transmission was designed to accelerate the car, not stop it.
- When the car brakes, the weight is thrown forwards, reducing the grip on the rear tyres. Unfortunately, engine braking only works through the rear tyres, lowering the braking efficiency. This also contributes to the potential wheel lock up, as grip is constantly reducing during the braking phase. If you are anywhere near the limit of grip, or something unexpected happens, this may end in tears.
- The TVR has a big torque engine. Get the revs wrong even by a few revs and it will lock up the rear wheels (less grip etc.) and you will spin. Most novice spins on track days are achieved this way.
- Yes, you can sometimes get away with it — but if you start doing it automatically without thinking in wet conditions, this can lead to a spin and potentially another wrecked TVR.
- It is incredibly slow because each gear change can take a second or two which means other drivers have gone past, braked, slipped into the gear of their choice and left you while you

are thinking 'how did they do that'. It is also very jerky as each gear change causes weight transfer which unsettles the car. This means that the ability to go round the corner is also jeopardised. Not normally a problem but it reduces the safety margin if something expected happens.

- It increases transmission wear, especially on the clutch. New clutch £750. New brake pads £40. Garages love engine brakers as it enables them to buy their kids that extra present at Christmas.

There are several ways that owners like to use engine braking. Some people like to drop down the gears and use the clutch to spin the engine up and others are a little bit more gentle. Either way, the car will experience engine braking. The more brutal you are with the clutch, the worse it is — but, however gradually this is done, the effect is there. This is the worst thing you can do in a TVR. In a straight line in the dry, you might get away with it 99% of the time. However, that hundredth time when there's a diesel spill or a damp patch you didn't notice, you've put yourself into a situation that is almost impossible to recover from. As a result, I and many others would say just don't do it..... ever. It can be avoided by using the 'heel and toe' technique to match the revs on each down shift and so remove any engine braking. This is a technique that I think every TVR driver should be taught.

Engine braking should not be confused with slowing down through lifting the throttle.

Getting out of the habit

The easiest option is to drive an automatic! They have no engine braking, so you either use the brakes or you simply don't stop! Failing that, finding somewhere to practise the technique and going through it until it becomes second nature is really the only way. This doesn't mean driving fast and in fact driving normally (or a bit slower) will give you the time to think about what you are doing.

Using the brakes doesn't change anything at all on how to approach a corner or roundabout. Braking should be finished before you enter the corner. My own technique when approaching a roundabout is to start to apply the brakes and start slowing down while watching to see what the traffic is doing. I tend to adjust the braking so that if possible I don't have to stop and can safely blend into the traffic. As the roundabout approaches, I depress the clutch and change down to the gear I want (3rd or 2nd depending on conditions), blip the throttle, engage the clutch and apply power just as I am in the roundabout. This is hard to describe, as I use 'heel and toe' to overlap the braking and power phase. Essentially, as I come off the brakes, I'm onto feeding the power. The phrase 'heel and toe' is critical as this technique is essential in preventing engine braking.

The advantages of this approach are many. I am not doing all that work of going down through the box, double declutching etc. which sounds nice but is not very quick. I can concentrate on getting the car where I want it, on what is happening around me, and leave my gear selection until quite late — and thus have lots of options available.

Most engine brakers try to do so much that they either have to brake a lot earlier to give themselves time or they try to hurry things and that is when mistakes are made.

I spent some time with a Chimaera owner at Mallory trying to get him out of his engine braking habit and eventually he started to pick it up. He commented back in the paddock that he didn't realise how much easier it is to drive as a result and how much smoother the car felt. He also halved his braking distances.

The 'heel and toe' technique

This refers to the technique of using your right foot to apply pressure on the brake pedal while also using a part of the foot to control the accelerator. This sounds like a physical impossibility but mastering it is important. The idea is that while the braking is applied, the throttle can be blipped to allow the engine revs to match when the change down takes place. This matches the revs and prevents the engine braking. It also allows the accelerator to be pressed while the brake pressure is removed. This gives a very smooth transition between braking and acceleration and this smooth transfer allows power to be applied as soon as possible. The end result is a faster and smoother exit from the corner.

This technique is easier to describe than perform and requires a lot of practice. Many find it difficult because the term 'heel and toe' is taken as a literal definition of where the foot should be used and many cars do not have their pedals set up for its easy application.

The pedals need to have the height adjusted so that *when braking* the brake pedal and accelerator are approximately on the same level. If this is done when the pedals are not used, the brake pedal will go below the accelerator and make it virtually impossible to be able to control the accelerator.

The foot position can also vary and some drivers use the side of the foot to control the accelerator while others use the ball of the foot for braking and

the heel to control the accelerator. This means that the foot is at about 45° during braking and can pivot to a more upright position under full acceleration. It is worth spending some time sitting in the car while stationary experimenting with this. Also try changing shoes, as some shoes make it harder to achieve.

What are 'under-steer' and 'over-steer'?

Take any powerful, rear wheel drive car and the terms 'over-steer' and 'under-steer' will often be heard, especially when trying to explain what may have gone wrong. These terms refer to the car's tendency to not go in the direction that the driver wants. This may seem to be a car-related limitation until you go out with a competition driver.

When you go out with a competition driver, the first shock is how fast they can get the car round a corner and the fact that the techniques they use bear *no relation* to the techniques taught while learning to drive. So why do they do this and where do you start to learn these techniques? Let's start with the why first.

The terms 'under-steer', 'over-steer' and 'slip angle' are all related and knowledge of what they are, how they affect the car's steering and why they occur is vitally important.

The slip angle is essentially the difference in angle between the direction taken by the tyre tread, compared to the angle of turn of the wheel. You may think that when you turn the steering wheel, the wheel simply turns — but it does not. What actually happens is slightly different. The tread in contact with the road surface counteracts the wheel's turning because of the friction between the tread and the road. The tread is an elastic material, so it actually twists, with the top of the tread nearest the tyre carcass moving with the wheel and the lower level of tread touching the road, trying to resist this movement. The difference in the two angles is the slip angle. The steering input defines the top-level angle but it is the tread's resistance in contact with the road that defines the other and this angle is usually less than the steering input. In other words, the wheel will follow a direction that is less than the steering angle. Most people understand under-steer as being what happens when the car fails to turn into a corner and wants to go straight on. As this is the same as saying that the car's angle of turn-in is less than that of the wheel, it is natural to assume that both the front and rear wheels under-steer. While this is true, the effect of both front and rear wheels needs to be taken into account. The slip angle relationship between the front and rear tyres needs to be understood. The relationships are as follows:

Under-steer: Front Slip Angle > Rear Slip Angle

In this case the front slip angle is larger than the rear. The steering wheel is turned more than normal for the level of turn in. Effectively, the rear wheels are following the front.

Over-steer: Front Slip Angle < Rear Slip Angle

In this case, the rear wheels have a higher slip angle and this will cause the car to turn more than expected from the position of the steering wheel. The net effect is that the car will try and turn even though there is no or little steering input. This is the dreaded over-steer situation that can be caused by the application of too much power.

Neutral: Front Slip Angle = Rear Slip Angle

In this case, the slip angles are balanced and the car turns in as expected. This is the normal situation.

So, is this all that causes a car to under-steer or over-steer? An easy question to ask, but tough to answer. The reasons why cars under-steer in some situations and over-steer in others are not that complex but there is so much going on that it could take a whole book to really define what is happening. To start with, it is normal for the car to under-steer in some situations and over-steer in others. The suspension settings can be tweaked to make the car more prone to under-steer or over-steer, which is why wrong geometry setup or a failure in a suspension component causes many a handling problem. The driver's input can make things worse or better, which is why this topic has become almost like a mystical art. Let's start with the basics.

Like most cars, TVRs are normally set up with a slight bias towards under-steer. This improves traction, makes the car less susceptible to external steering inputs, such as cross winds, and also reduces the tendency to over-steer under very heavy acceleration. So even with all that power and rear wheel drive, it isn't surprising that the car will under-steer in some situations and this can catch out an inexperienced driver who has been conditioned to expect the power induced over-steer.

Under-steer is normally experienced going through a very tight corner at a steady speed. This is probably the worst case and almost every rear wheel drive car will under-steer in this situation. This can mean that you end up running wide and the car just won't respond as you ask it to turn in. As you apply more steering lock, very little happens. If you accelerate gently it will under-steer more and more due to the dreaded 'push on' effect, where the forward

acceleration of the car overcomes the front wheels' efforts to try and deflect the car round the corner! While this description helps many to visualise what is going on, it is an oversimplification. The real reason for the push-on under-steer is that as the car accelerates, the weight is transferred to the rear wheels. This reduces the weight on the front wheels and thus the front grip and increases the rear grip. With reduced front grip, the car will under-steer.

Most people back off when they get in this situation and reduce the steering lock. This reduces the under-steer and lets you scrub off enough speed to get round the corner. But if you keep applying more and more power you can 'drive through' the under-steer and the car will become neutral. Add just a little more power and the car will start to over-steer. The danger here is that if you have lots of lock on and floor the accelerator to get through the under-steer, you need to be prepared for the car to move from under-steer into over-steer. When the transition to over-steer comes, it can happen very quickly and catch you out big time. If you've already under-steered yourself half way off the track, you've got even less room to recover!

This change from massive under-steer to massive over-steer can be a very frightening experience, partly because of the speed in which it can happen, and the amount of steering input needed to try and control it. This often requires going from lock to lock in an effort to apply massive amounts of opposite lock to catch the back and prevent that embarrassing spin.

The amount of acceleration necessary to get through the under-steer 'hump' depends on various things but mainly how close you are to the limit of grip and how tight the corner is. If you're cornering very close to the limit, the car will go round in a four-wheel drift and it only takes a tiny amount of power to get the back end out. If you are going slightly slower, you have more grip to spare but the 'hump' is bigger and it can take a very positive application of power in a low gear to get through the under-steer.

When you're comparing notes with experienced drivers and find they're going through corners in a gear higher than you, they get away with it because they're close enough to the limit to balance the car without needing loads of acceleration. The extra speed means the engine is revving slightly more and providing more torque. In other words, the car is closer to the edge because it is better balanced and does not need large acceleration to balance the large amounts of under-steer.

Try emulating them without carrying enough speed in and it won't work at all. To carry the speed in requires getting the car balanced, which comes with practice and experience. The secret of driving fast is smoothness and knowing how close to the edge the car is.

On fast sweeping corners, it is rare to get under-steer, as usually the car will be fairly neutral with a slight tendency to over-steer. This tendency increases as you pile on the power. On slower corners, where you have more lock on, it will tend to under-steer more and you will need more throttle to balance the car. This is all assuming the car is basically in a steady state. Of course in reality the car is continually pitching, rolling and yawing and the situation is more complex. Hopefully by now you have realised that every time you turn into a corner, you need to recognise what is happening and apply further driver input to balance the car and get it through the corner. However, what happens in practice is that this balance is slightly wrong and the car will either tend to under-steer or over-steer. In either case, the car will be going in a direction different from the one intended and this is frequently towards hard things that should be avoided. This transition into excessive under-steer or over-steer and the inability to cope is the reason for many accidents.

On public roads, the best option is to avoid the situation entirely by reducing your speed to the appropriate level and avoiding under-steer completely. However, in competition you need to get on the edge and this requires some pretty drastic techniques to retain control. Basically if you are in a corner and find the car is under-steering your choices are:

- Ease off the power and wait for the corner to open up (this is the safe option).
- Floor it and hope you are in a low enough gear to get over the under-steer hump (this is an act of faith, also be prepared to catch a **big** power slide the first few times until you learn how much power you need).
- Ease off the steering and then 'flick' the car abruptly into the corner. This will often unsettle the car enough to kill the under-steer.
- Abruptly lift off the power and then get straight back on it. This will unsettle the car big time! You have been warned!

Get any of these last three wrong and you will probably be in bigger trouble than you started with. It cannot be stressed enough that these techniques need to be learned in safe locations, with plenty of run off. Not on the public road! The quickest way is probably to enrol on one of the many driver performance handling courses available.

If you want to avoid getting into the under-steer in the first place, there are some additional techniques that can be applied and these are the same techniques that competition drivers use to corner faster. For slow corners, stay on the brakes until the turn in point. Then come off them suddenly and turn in and this will take advantage of the extra weight on the front wheels while the car is nose down. The extra weight will improve the grip and prevent the under-steer. This technique can be extended by continuing to brake as the car turns in and applying the power as you come off the brakes. This is the famous 'trail braking technique', so called because the braking phase trails into the turn in and acceleration phases of going through a corner. Get this wrong and the car will spin very, very quickly!

Turning in very positively rather than sweeping progressively into the corner can also help. For very slow hairpins, resorting to dropping down a gear without matching the revs right at the turn in point, will get the back out and once it's out you can hold it there on the throttle. This is very exhilarating when flawlessly executed — but very alarming if anything goes wrong as the car will spin very quickly.

It's worth pointing out that these techniques are *specifically* aimed at de-stabilising the car to kill under-steer, so you should be very cautious about when and where you try them. Also note that under-steer is rarely a problem. Most of the time you should be using the exact opposite techniques: accelerate, brake and steer progressively to avoid disturbing the car. It's fun to experiment with this kind of thing — but please bear in mind there is a very real risk that you will lose control of the car until you have got the hang of balancing it in a slide, this is definitely NOT something for public roads. However, in a sprint or a race, this is exactly what you need to do.

In summary, driving at the appropriate speed for the conditions and controlling the urge to plant the right foot to the floor will mean that severe under-steer and over-steer conditions will not be experienced and your fellow road users will appreciate your not being on their side of the road! On a track, where the envelope is pushed a little more, they can be common experiences. For any driver wanting to improve his track driving, it is important to learn how to recognise what is going on and be able to respond appropriately. So the next time you are on a track day, grab an instructor and start learning! For competition drivers, whether they sprint or race Tasmins or Tuscans, the successful application of these techniques is an essential ingredient to a fast lap.

Grip

Grip is an interesting term and is usually used to describe the ability of a car to stay on the road, going in the direction that the driver wishes to go. For example, "the car has plenty of grip" translated means "despite me flooring the throttle in mod corner the car did not deposit me into the hedge when other lesser cars should have done". The opposite is also used as in "those tyres had no grip at all" which means "I had to slow down to warp factor 3 from the more usual 8 because the car was sliding about". In both these examples, the term grip is not correctly used as it does not describe how a car moves and responds but simply how much friction there is between the tyre and the road surface. The problem is that grip is a very dynamic thing and the amount or lack of it can vary because of many different factors. So why is this and how should a driver use grip?

The amount of grip or the 'grip budget' is initially dependent on the size of the tyre contact patch.

This photograph and those on the next page were taken at Curborough. Here, Pete Humphries shows how to hit the corner apex. Note how the car is pointing in the correct direction, allowing power to be applied.

Here is Steve Lyle at the same corner. Notice that he is further away from the corner apex and the car is now under-steering and not tucking into the corner the way Steve would like.

Steve now applies some power, goes through the hump and starts to experience massive over-steer which he corrects by applying some opposite lock. Note how fast this transition has occurred. The car has not moved very far between the two pictures.

Having corrected the over-steer, Steve is now rather concerned with keeping the car on the track, as it is now moving towards the outside edge. The weight is transferred to the front to give the front wheels extra grip to help them get the car round. This cornering style may look fantastic but it is slow as Steve has spent more time trying to stop the car going sideways rather than accelerate out of the corner.

Bigger tyres tend to give more grip (a bit of an approximation) because they have a bigger contact patch. The size is also controlled by the suspension geometry and the tyre pressures. If a tyre is under- or over-inflated, the side profile can change and with it, the contact patch. The whole idea of a grip budget is to make sure that the grip demands needed to move the car in the direction it is going do not exceed the grip budget available. So driving with the wrong tyre pressures or a badly set suspension can reduce or distort the contact area and reduce the grip budget. The tyre itself has a role to play. The softer and stickier the tyre the more grip. The less tread, the less grip which is why tyres should be changed well before the minimum tread level to maintain a reasonable amount of grip. The myth of bald tyres being like slicks and having maximum grip is just that, a myth. They don't and in fact they have a greatly reduced level of grip. Bridgestone addressed this problem with multi-compound tyres so that when their SO-2 tyre wears down, the tread gets softer to compensate.

Now let's look at the other side. The road surface is also a major influence. This is very obvious and yet many accidents are still caused by drivers failing to adapt to greatly reduced levels of grip. They end up with a grip deficit and wonder why the car spins and aquaplanes. However, it is interesting to note that the start of a grip budget deficit is frequently triggered by driving style and, despite claims to the contrary, it is this that makes the difference between staying in credit or going into debt and wondering how that happened — from a field or ditch.

The grip budget is affected by the driver's style in two ways: the first is control of the car's weight and the second is requests on the wheels itself. Let's look at the second topic first.

When the wheels are in a straight line, all the grip is used to either accelerate the car or stop it. If too much power is put through the rear wheels, the grip budget will be exceeded and wheel spin will result. If the braking is too hard the wheels will lock up because there is insufficient grip to keep them moving. When the car is turning however, some of the grip on the front wheels is used to cause the car to turn and to a smaller extent this is also true for the rear wheels. So this means that the available grip to accelerate or stop the car is reduced because some of the budget is allocated to turning the car. Wheels can lock up more easily or the rear wheels can spin.

The grip budget is also affected by the car's weight and the old trick in Hillman Imps of carrying a bag of sand in the front to give better grip relies on this. Notice I have used the term 'weight' and not 'mass'. For general use, the two terms are interchangeable: 1 kg mass weighs 1 kg. However, as **weight = mass x acceleration**, the car's weight can change as the car accelerates or brakes. This change is known as 'weight transfer' and is why you see cars dive or rear up. When a car brakes, weight is transferred to the front of the car and removed from

The author getting it slightly wrong at Lodge Corner, Oulton Park. (Stuart Norris)

the back. The grip budget at the front increases while the budget at the back decreases. This is why 70% of the braking force is at the front and that most cars including TVRs have a pressure reducer in the rear brake line to reduce the brake pressure. Without this, brake pressure that would not exceed the front grip budget might exceed that on the rear and cause the wheels to lock up. Note as well that this is dependent on the deceleration force so that the harder the car brakes, the higher the grip budget at the front, while the rear decreases.

This also raises the issue of engine braking, which is a definite no-no with TVRs and yet seems to be prevalent amongst many drivers. The transmission is a more expensive braking system to replace than a set of brake pads and it only works on the rear wheels. The same wheels that have a reduced grip budget because the weight is transferred to the front under braking. This means that you cannot brake as efficiently because there is not enough grip and secondly the threshold before you exceed the grip budget is a lot lower. TVR engines have a lot of torque and can lock the rear wheels in an instant as the clutch is engaged with the end result that the rear wheels lock up and the car spins out of control. Brakes are for stopping, gears are for accelerating.

Now let's look at the car accelerating. The same equations come into play, except that the transfer is in the opposite direction. Weight now comes off the front and is transferred to the back, where it increases the grip budget, so more power can be applied. This is exactly what you want with a rear wheel drive car. (It does cause a problem with front wheel drive cars but that doesn't bother us TVR drivers — unless there is something stirring in a dark corner in Bristol Avenue that has yet to see the light of day. If there is, I suspect it will be put down anyway.)

What's the problem, I hear you say? More grip at the rear under acceleration and more grip at the front under braking. Wonderful. Yes, it is — except there is a slight problem in that the weight transfer is not instantaneous. How long it takes is determined by the car's setup and the amount of body roll and movement involved. Competition cars try to minimise this transfer time by controlling the body's movement with stiffer suspension. If the throttle is applied immediately after heavy braking, there is a chance that the rear wheels will spin because the weight will not have transferred completely to the rear wheels. Similarly, the brakes can lock up as the weight transfers before the brakes are fully released. Now add to that the complication of turning and it is not too difficult to see why most spins happen at corners. Not only is there a dynamically changing weight distribution, which is altering the weight and therefore the grip front to rear, but also cornering (which is using part of the grip budget) and side to side weight transfer. The result is a car whose grip budgets are changing dramatically. And you thought you just turned the wheel...

To cope with all these changes, drivers are taught two simple techniques: Do one thing at a time. Always brake in a straight line, let the car settle before turning in and gently applying power. Secondly, drive well within the available grip budget, which usually means ensuring that the budget needs for each wheel are less than the minimum available. In simple terms, drive slowly and smoothly. It is also explains why many drivers can catch themselves out going into a corner too fast or trying or being forced to do too many different things at the same time.

So, how come competition drivers can drive through corners so much faster? The reason is very simple: they have a better awareness of the grip budget available and drive the car in such a way that they exploit all the available grip. They use the weight transfer to their advantage rather than fighting it, so they have very smooth transitions between braking and applying power which follow the weight transfer. They will use techniques like trail braking to help de-stabilise a car to help get the car to turn in. It is not simply driving quicker and going into a corner faster but using the right techniques.

What is a track day?

If you have a TVR, the only safe and legal way to really enjoy the car is to drive it on a racing track where you can enjoy the car's performance without the threat of blue lights. Like most things, few, if any, owners can simply get in a TVR, go on a track and drive it well unless they are experienced in the driving techniques necessary to handle very powerful rear wheel drive cars. As a result, most track days combine tuition with the thrill to help owners become better drivers when they leave the track.

A track day is where a racing circuit is hired for the day to allow owners to drive their TVRs without the normal speed and road use limits. It allows a car's performance to be enjoyed in a relatively safe environment and provides the opportunity to get professional instruction in driving the car. In short, if approached in a sensible and responsible way, it is not only great fun but also a valuable opportunity to improve your driving skills.

A track day is not a race. There are no prizes for the fastest around the track. The lap times are not even monitored. Whilst overtaking is allowed, aggressive driving and tactics will result in banning

from the track. Safety is paramount: if someone in front of you is going slower than you are, you must wait until the straight before overtaking. You don't have to be Damon Hill to participate and enjoy yourself.

TVRCC days

The TVR Car Club organises track days, which are open to all TVR models, throughout the year. Cars are allowed out onto the track in groups, based on car performance and drivers' experience. Instructors are usually available to offer help and guidance, if needed.

These days are a great social gathering and, unlike the Performance Technique days described later, you bring your own food and refreshments. If the weather is good, picnics and barbecues are common — with soft drinks for the drivers! Typical costs are about £70-£100 for the day. You have to be a member of the Club to participate, although a day membership can be arranged.

The timetable starts with the sign-on, where a disclaimer (stating that participation is at the driver's risk) is signed. This is followed by a circuit briefing, which includes safety procedures and so on. The car is then checked for any obvious mechanical faults and, if passed, the driver is given a coloured wristband and a coloured sticker for the car. The first time around the circuit is usually with an instructor, who shows where the braking and turning points are and provides general familiarisation with the circuit. The instructor also checks that the driver is proficient enough to be allowed onto the circuit unaccompanied. From then on, the group is allowed out onto the track at certain times. The track is fully marshalled and controlled. It is not a simple scramble to get out with a 'first come first served' policy.

Performance Technique days

TVR organises regular Performance Technique days, which usually coincide with Tuscan testing, from April to October. These cost about £300 per car and driver for the day, with additional drivers for the same car costing about £80 and spectators costing about £40. Lunch is normally provided.

During the sign-on and briefing, and during lunch, the Tuscans can be watched trying to destroy each other. During the rest of the time, 'normal' TVRs hurtle around the track. You do not have to be a member of the Club to attend one of these days and, if you buy a new TVR, you may get invited to participate in one, free of charge, by the dealer. Other racing teams also often turn up for some testing: seeing the Williams Formula One Grand Prix team unload and prepare for some engine testing was quite a sight at one session I attended.

The author's Griffith 500 and a Chimaera on a familiarisation lap at Oulton Park. This is driven at slow speed and helmets are not required. Note the two cones on the right indicating the braking and turning in points. (Stuart Norris)

Other differences between track and Performance Technique days

It is not uncommon for dealers to bring demonstrator cars to both track and Performance Technique days and take prospective owners around the circuit. A highlight of one track day at Silverstone was being driven around the circuit by Tuscan Challenge driver Matthew Kelly in a standard Chimaera!

In my experience, the main difference between the two types of day is in the level of instruction and catering provided. With Performance Technique days, you are continually assessed and tested at least three times during the day. This is normally organised so that you can pick up an instructor from the pit lane without waiting. The number of instructors increased in 1998 so that you effectively get a personal instructor for the day! This level of instruction can be extremely beneficial and worth the higher cost, compared to a TVRCC track day, and gives you the opportunity to learn the technique of driving these cars. For me personally, it was the first time since passing my test that I had professional instruction. Even though I now compete in sprints

and have a competition licence, I still attend track days because they are fun and because of the tuition provided.

After the first time round, do not be surprised that you are doing most things wrong and/or in the wrong order! The instructor will gradually work on improving your braking, positioning and gear changing techniques, plus a lot of other things. After several sessions, your driving is usually a lot smoother and you are often considerably faster around the track with less effort.

The track time is about the same and you can typically do about 45-50 laps of the track in the day. Add to this the lunch and stops to watch Tuscans go sideways and you have a very full day. You can also have a photograph taken of you driving around the circuit. (I have a photograph showing me on three wheels with daylight under the inside front kerbing the chicane and a VERY BIG GRIN!) With both events, you can bring spectators and guests.

The best thing about track days is not having to worry about blue lights and GATSOs, although taking a blind brow of a hill on the wrong side of the road with your foot to the floor is a little daunting at first.

There is one final advantage that I and many other participants find: participating in a these days actually makes you drive in a more tranquil manner on the roads. It is almost as if you no longer need to prove how quick the car is. This is probably also due to the fact that the whole experience of driving on a track is so much more fun and exhilarating than driving fast on a public road. All in all, I can thoroughly recommend track days. The trouble is that they can lead to wanting more competitive driving...

Speed events

Speed competitions are an ideal way to enjoy the performance of your road-going TVR in a safe environment. If you enjoy driving fast (what TVR driver doesn't?) then you should seriously consider having a go. It provides the next step from track days to motorsport in that unlike track days, where care is needed because of the other participants, speed competitions offer the chance to be timed with just you and no-one else on the track.

Many TVRs offer such huge performance that it would be highly irresponsible to use their full potential on the road. Track days offer a much safer environment and are an ideal way to learn the limits of the car – and your own limits as a driver. However, you have to remember that you are not alone on the track; track days are definitely not the place for competitive driving or hooligan behaviour. Having got to grips with the car at track days it is understandable that some drivers want to see just how fast they can go. What we all want is an opportunity to drive at ten tenths, hear the scream of tyres and the roar of exhaust, go for those huge opposite-lock power slides and not worry about what happens if it all goes horribly wrong. Well, we are not the only group of people in the country who feel this way, and someone has already come up with the answer: Speed Competitions.

Be prepared for any weather! This sudden downpour at Silverstone flooded the track in about 45 minutes and provided excellent facilities for trying out wet weather driving techniques. The key to driving in wet weather is to be smooth and to adapt to the prevailing conditions.

Accidents can happen on track days so make sure that the car is insured. This is TVRCC member Bruce Smith's Griffith after an argument with the tyre wall at Oulton Park. Most of the damage was superficial bodywork.

What are Speed Competitions?

Speed competitions are a friendly and low-cost form of motorsport organised by and for motoring enthusiasts. There are two types of speed event: sprints and hill climbs. At sprints you drive individually around a course of about a mile, against the clock. Courses vary from a lap of a racing circuit such as Goodwood, to a course marked out in cones at a disused airfield. Hill climbs have a similar format but take place on a special-purpose course up a hill instead of on level ground. Hill climbs are generally seen as more challenging but they can also be more rewarding. In the motorcycling world this sort of event is known as a Time Trial or TT event.

There are various prizes at each event, but the main reason to come along is that it gives you a chance to drive like a hooligan without any worry about traffic jams, speed limits, flashing blue lights or some other idiot pushing you off the road.

Is it dangerous?

Some events take place on race circuits, which are similar to the environment found at track days. These have some corners with nice big run-off areas where it is safe to be a complete hooligan, and some where a little more discretion is required. Other events take place on airfield circuits with huge run-off areas and nothing to hit other than the odd traffic cone – maximum hooligan mode is the norm here. Whatever the type of course, you are alone on the track so there is no danger of colliding with another car. Rescue crews and paramedics are present at all events but have a very boring job, you simply don't normally see people getting hurt. Above all, this is a low-cost, low-risk form of motorsport and none of us would be there if we thought there was a real risk of trashing our pride and joy.

Having said that, any time you drive your car there is the possibility of damage. Your normal road insurance will not cover you during competitions, but you can arrange specialist competition insurance from around £40 per day. You may want to consider taking out this insurance if you're planning to compete in something expensive. Many airfield circuits are so safe you might feel you can reasonably go without, but that's a decision you have to make for yourself.

Will it hurt the car?

Speed competitions involve a busy day with several runs of the course, but each run lasts only a minute or so. In that time the tyres and brakes have barely got warm. The wear and tear is minimal and should be no problem for the average TVR, no special preparation is required, other than the checks detailed later in this chapter.

Will I be fast enough to compete?

Most sprint competitors are new to motorsport. Don't expect to simply turn up and win your first event, but before long you'll find you're keeping up with others in your class and even beating them from time to time. The truth is TVR don't make slow cars, so you can enter in virtually any TVR and be competitive. However, that isn't real the reason to enter — the whole point is that we're there to have fun! You will meet people of all ages and driving abilities, some of us tend to be rather 'diagonal'

on occasion but that doesn't stop us having a good time. If you take home a trophy once in a while that's a bonus.

How much does it cost?

Protective gear for the driver will cost between about £150 and £300. Annual fees and subscriptions will cost about another £50. Finally, entry fees for each event varies between about £50 and £100.

Where are the competitions?

The largest groups of TVR competitors are in the Midlands and South of England, however there are growing numbers of TVRs competing in Northern England, Wales and Scotland. Wherever you are, there's a fair chance you'll find TVRs competing nearby. The TVRCC run a speed championship based on a power to weight handicap every year and this is very popular amongst members. Selected regional events are used to create the championship and the fastest time from this events is used with a handicap factor to create a TVR Championship time which decides the points allocation. As a result, it is not the fastest car that wins and many of the smaller TVRs, such as the Vixen, have shown us bigger engined TVR owners how to do it. The championship is free to TVRCC members.

Hill climbing tuition

The Prescott Hillclimb Drivers' School has special days where it teaches performance driving techniques and general car control skills to both competitors and non-competitors. The difference here is that the course is on a hill climb rather than a circuit. Other locations such as Gurston Down and Curborough also provide these special tuition days.

The objective is to develop your existing driving skills and teach you new ones. Each ascent is recorded by video camera and receives individual comments from the instruction team. This means that you can follow your progress through the day, correct mistakes and experience the satisfaction that comes from applying correct car control. You will be under no pressure and you can look forward to an enjoyable day spent with a friendly group of motoring enthusiasts. Again, it is question of simply turning up in your TVR and participating. These events are very popular and pre-booking is often essential.

Track day preparation

As John Hayter said in his article in Sprint (April '95), the most safety critical item on a car is the nut that holds the steering wheel. Without a good one, anything can happen. The items described here give a set of guidelines which should enable you to ensure that your car is safe for the circuit. It will not stop you crashing or behaving irresponsibly on the circuit. Ultimately, you alone are responsible for your own safety.

This list is based on the ones published by the factory and the TVRCC prior to track days, plus some additional comments and tips I have picked up through attending these events.

Three weeks before the event

- **Get under the car and check the chassis is sound.**
- **Check the shock absorber and suspension mountings, including the engine and gearbox mounts.**
- **How old is the brake fluid?**

  I usually change the brake fluid before the track day, replacing it with DOT5.1 clutch and brake fluid. (I change the clutch fluid as well, just in case.) I have never had this problem but I know several drivers who have and they say it is terrifying. If it happens, there is no brake pedal resistance and absolutely no braking.

  Brake fluid normally stays liquid above the temperatures brakes experience in normal use. On a track day, this temperature can increase because of the heavier and more frequent braking. As the fluid ages, it absorbs water which reduces its boiling point, eventually to the point where it will boil under severe conditions e.g. on a track day. When driving around the circuit, there is often sufficient braking in a few laps to heat up the brakes and fluid beyond normal levels. If the fluid boils, vapour is introduced into the system and this compresses instead of the fluid. The end result is that all pressure and thus all braking is lost — without warning. Regular brake fluid changes are the way to avoid this.

  During the track day itself, you are advised to limit yourself to about four to five laps at a time, depending on the circuit, and to drive the car slowly on the last lap to cool down the brakes. When the car is left stationary after these laps, the handbrake should not be applied and the car should be left in gear. Do not rest your foot on the brake or apply the handbrake as there is a danger that the brakes may seize.

- **Check discs for scoring and pads for wear (beware asbestos).**

  Make sure that there is plenty of brake pad and tyre tread. Obvious really, but I was surprised how much tread I took off a pair of tyres in one day at Oulton Park (2mm) and the amount of brake dust that suddenly appeared. Very strange that one... was I really braking that hard? This was quite common, judging from the debris on a lot of the cars at the end of the day. It obviously depends on the track and the driving style but tyre wear can be surprisingly high, especially with 5 litre cars!

  Some owners remove the brake dust shields (if they have been retrofitted) to improve the air circulation and brake cooling.

- **Shake the wheels at 12 and 6 o'clock, and at 3 and 9 o'clock positions to check hubs/steering joints.**

- **Check the prop shaft and drive-shaft universal joints.**

- **Check oil levels in the gearbox and differential: if they need topping up, check a week later to see if there is a major leak.**

- **Check/change the engine oil, oil filter and air filter; check oil breathers/pipes for blockage.**

  The engine does get hammered on a track day.... Make sure that the oil is filled to the maximum dip stick mark. The centrifugal forces experienced while cornering can cause a temporary lack of oil pressure if only a minimum of oil is present.

- **Check the throttle return spring and consider fitting a second spring if one is not already fitted. Check that the accelerator cable is not frayed.**

  Adjust the accelerator pedal so that it is level with or even slightly higher than the brake. This makes 'heel and toe' easier and will be a big help when driving.

- **Check the exhaust, mountings and manifold sealing.**

  Some circuits have noise restrictions and will measure how much noise your car makes.

- **The car should be taxed, MOT'd and have road insurance; bring your documents with you.**

  Check your insurance. In most cases, you will have no cover but some companies will cover you with an increased excess, providing they are informed in writing that you will be participating in a track day.

On the Day

- **The car should be completely roadworthy with road legal exhaust and tyres. Tyre pressures should be 2-3 psi higher than for normal road use.**

  Do this just before you get to the track. Do not assume that an air line will be available. Do not forget to set them to normal again after you leave. A five pound foot pump is a good idea — you can hire it out to the other drivers who didn't adjust their tyre pressures!

- **Make sure that the cooling system is in A1 condition.**

  Check that the coolant level is topped up, the fan belt is tight and that there are no leaks. Make sure that the air vents are clear so that air can flow through the radiator. If they are blocked this can cause the car to overheat.

- **The car should be no more than 3/4 full of petrol and without leaks.**

  A full tank can cause petrol to slop out if the filler cap is not a good fit.

- **There should be no excessive oil or water leaks.**

  The last thing you or your fellow participants want is oil or water on the track.

- **The wheels and wheel nuts should be secure (including the spare).**

- **The battery should be secure.**

  Remember the additional battery straps!

- **There should be no loose items in the car or boot, not even tools and jack.**

  Wedge the roof panel in the boot with foam blocks. Take cassettes etc. out of the glove compartment — it's really fun when it flies open and the contents fly out, just when you are concentrating on doing a Schumacher out of the chicane!

- **Tape up the front and rear lights but do not obscure the indicators.**

  This prevents the lights from coming apart and depositing rims and lens on the track surface. Some circuits insist on this, others do not. Having seen a headlight rim come off a car going down the main straight at Silverstone, I personally think this is a good idea. It also makes the car look far more macho!

Personal Items

- **You will need an approved crash helmet.**

  It is sometimes possible to borrow these at the track on Performance Technique days but rarely at track days. If you are going to do several track days, it is worth investing in your own helmet. I got my first helmet in a sale reduced from £160 to £65 because it looked awful — black full face with 'dayglo' pink and green lightening bolts. As I can't see it when I'm wearing it, who cares!

  If the helmet is made from polycarbonate, it should be replaced after two years — or immediately, if it is dropped. Polycarbonate degrades with time or impact and manufacturers have started to date code helmets. Fibreglass helmets are longer lasting but more expensive.

  There are several standards to look for:

  BS 6658 – 85 A (Type B is not approved).
  BS 6658 Type A/FR
  SNELL SA95, SA2000
  SFI 31.1, 31.2

  This list is from the 2002 MSA motor sport regulations. The two British Standards are often found on motorcycle helmets and for occasional use. Many owners source a helmet to these standards from a local motorcycle shop. The SNELL and SFI standards are for motor sport and compliant helmets are available from motor sport suppliers. These are reckoned to be a higher standard than the BS ones but are not approved for motorcycle use.

  It is important that the helmet fits and cannot be pulled off the head when the chin strap is done up. I would strongly advise going to a shop and having a personal fitting to ensure a good fit. There is quite a variation in fit between manufacturers, so don't be scared to try several different makes.

- **Double-check your seat belt.**

  If you are serious about doing track days, consider fitting a full harness belt. These hold the driver far better than the standard diagonal lap belt and prevent sliding about in the seat when cornering. There is a lot of truth in the statement 'driving by the seat of your pants'. You do have a better feel for the car if you are securely strapped in. It is almost as if you become part of the car and can feel its balance.

- **Check your fire extinguisher (if you have one).**

- **Wear clothes made of wool or cotton (not nylon — it melts in a fire); cover your arms and legs fully.**

  Long sleeved cotton T-shirts or sweatshirts are good. A 100% cotton overall is also quite a good alternative. Cotton is also good at absorbing perspiration; as track driving can be hard work, it is easy to raise a sweat.

- **Bring a change of clean underwear (just in case).**

- **You should not have consumed alcohol before driving on the circuit — and that includes not having a 'heavy night' the night before.**

- **Be prepared for any type of weather.**

- **Don't forget a good supply of snacks — the adrenaline burns up energy and you get hungry very quickly!**

Coping with floods

To be absolutely honest, the best way of coping with floodwater, big puddles or fords is to stay clear. The reason is that water can enter the air intake and find its way inside the engine where it can hydraulic the engine.

It is probably a fair comment that water and TVRs do not go together. I am not talking about water leaks or cooling systems but the increasing chance that one day you may need to drive your TVR through a flooded road. Hot weather often puts the rains and floods out of our minds but they are likely to return. These can cause large bills for owners who thought they could get away with it but found, to their cost, that it only takes relatively shallow flood water to start putting the car and more importantly the engine at risk. The implications of such an attempt can be very bad indeed and may even involve a complete engine rebuild. The problem is not the immediate one of water causing electrical faults but of getting water into the air intake and hydraulically locking the engine. This is the engine equivalent of putting a rod through the spokes of a revolving wheel. Not only does the wheel stop pretty quickly but there is a risk of tremendous damage.

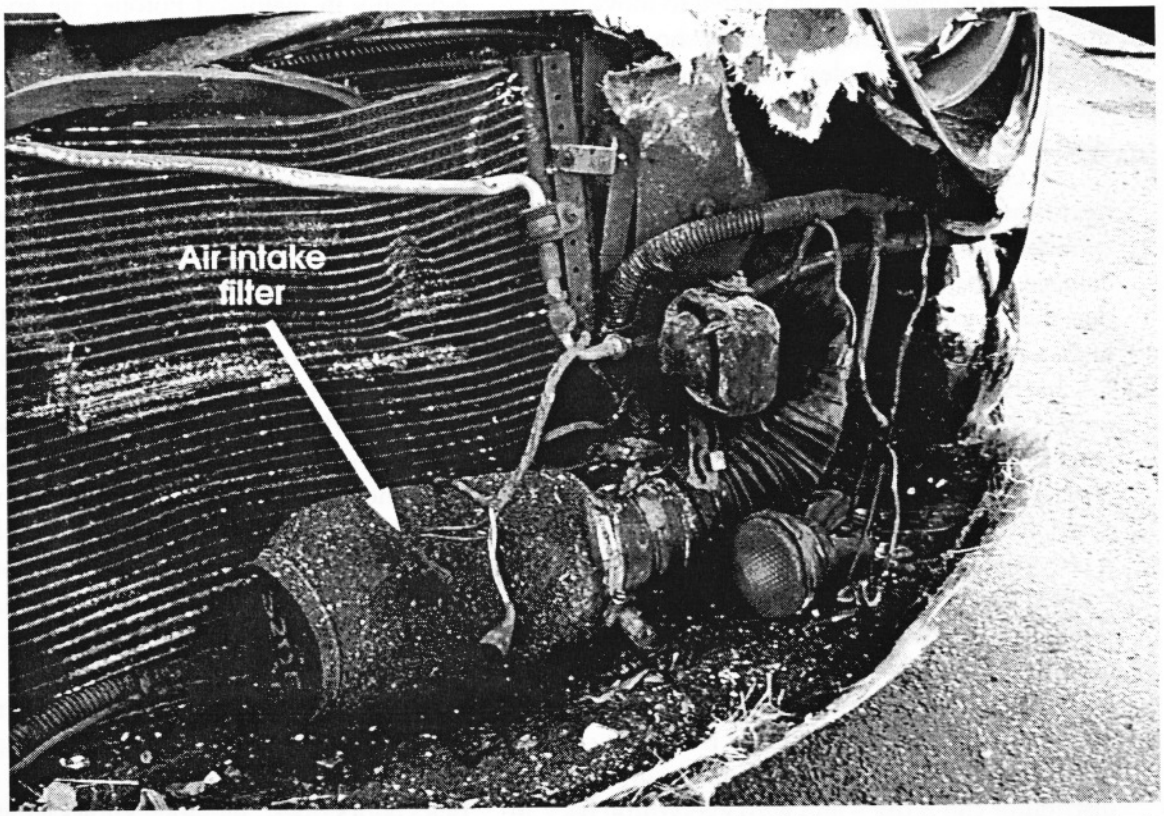
The problem is caused when the flood water reaches the air filter. Air is sucked into the engine under vacuum and it should be no surprise that water will be sucked in the same way. It will pass through the air flow meter, disturbing the hot wire readings and then through the plenum into the cylinder, when the inlet valves are opened. At this point, the pis-

tons are at the lowest point of their cycle. The valves shut and the pistons start to rise as the crank continues to turn. Normally the cylinder contains a compressible air/fuel mixture and the cycle will continue. If water has been sucked into the cylinder, it will also start to be put under pressure as the piston moves up. Unfortunately, water is virtually incompressible and when the piston has moved up so all the compression that can take place has occurred, the piston will stop. Unfortunately, the crank shaft and the rest of the engine hasn't and the resulting force can bend a con rod or worse. This condition is known as hydraulic locking (or hydraulicking for short). It is no surprise then that the engine has also stopped. Most people in this situation assume that the reason why the engine has stopped is due to water causing an electrical fault. While this may be true, it is also likely that the engine has hydraulically locked and effectively seized.

What can you do about it? It is a question of prevention rather than cure. The answer is really to avoid it at all costs, which means that anything more than a big puddle should be avoided like the plague. Even if the water is only a few inches deep, the car design is such that it can create a bow wave and water will flow into the front of the car where it meets the radiator. This acts like a stop and the water flowing in will have no where to go, so the water level rises. This can then reach the air filter and, hey presto, one hydraulically locked engine even though the water levels are low. Similar problems with water levels can occur inside the engine bay and this can also cause problems, especially as it can cover many of the electrical systems.

Given that you have miscalculated and the car is now stuck what is the next procedure? First turn off the ignition. Don't try and start the car as this may do more damage. If the starter refuses to turn the engine, the engine is probably locked and trying to start it will make matters worse. The first concern is getting the car out of the water. The chances are that the car is in the middle of the water and will need to be pushed or towed out. The tow hook is right under the front of the car and is effectively very difficult to get to, so in many cases it may be a case of getting wet feet... With the convertibles like the Griffith and Chimaera, it may be better to fold down the roof and clamber out of the car. Undignified, but better than a damaged interior.

Once the car has been recovered, the job of identifying how much damage has been done to the car can be started. This is probably best left to the professionals, as the amount of work needed depends on how much or how little damage has been done. This process can be time consuming and if water has got into the engine it may be scrap — but time is of the essence. If the car is left too long and there is water internally where it shouldn't be, it is possible



The front of a Chimaera. This shows the air filter and how low it is located. This makes it very susceptible to picking up flood water. Later cars and the Griffith have the filter mounted higher up which helps improve the situation but does not make it foolproof.

to start corrosion and this can make the damage far worse.

The process is fairly straightforward. First the external components of the engine need to be dried and checked over. It is possible for water to remain trapped inside the air intake and removing the air filter pipe, air flow meter and plenum and drying these components off is not a bad idea. They can normally survive a flooding but bear in mind that the air flow meter contains some delicate electronics — so don't be surprised if it is damaged. The exhaust system should not be forgotten, so check that it is not full of water. Hot air guns are really invaluable during this process but be careful not to make the air so hot that some of the plastic components start to melt.

The next thing to check is whether water got into the oil supply. Look at the dip stick and look into the engine via the oil filler. In some cases, removing the rocker cover might be needed. If an oily mayonnaise-like mess is found, this is a sure sign that water has got in. Irrespective of this, the oil should be drained and replaced along with the oil filter. There are other checks to be made first, though. The next step is to remove the spark plugs and turn the engine over using the starter or with a socket on the pulley. It is advisable to disconnect the ECU and coil so that there is no danger of the engine starting or HT electricity being generated. With the plugs removed, the engine should be free to move and, if there is water inside the cylinders, it should be forced out of the spark plug holes. This is not a good sign. If the engine won't move and is seized, this is also not good news.

Once all the water has been pumped out, the next thing is to do a compression test on each of the cylinders. This will confirm if there has been any damage. A bent con rod will reduce the compression due the piston stroke being changed. It has been known for engines to survive so that once the water has been removed, the compression checks have proved to be OK and apart from an oil change and a good drying out, the engine is fine. If not, the engine is damaged internally and will need stripping down. If the engine is not to be stripped immediately, it is worth putting some oil into the cylinders to help prevent corrosion. They can be cleaned out when the engine is rebuilt so that there is no risk of damage to the catalytic converter.

If everything so far is fine, change the oil and oil filter. Then check that there is a spark – water can get into the distributor, so make sure that the distributor cap is dry – and with everything back in place including the ECU, try to start the engine. Hopefully, it will start and all that is needed is to give the engine a good check over and possibly replace any electrical components that may be damaged or look suspicious.

So are there any safe ways to go through flooded roads? In practice, no. If you go backwards, it may stop water entering the front of the car but it will certainly go up the exhaust pipes and the combination of water, hot steel and a hot catalytic converter is not a pleasant one. Blocking up the pipes will cause the car to stall very quickly and this will usually happen in the middle of the water. In reality, the safest option is not to go through and find another route. If it is imperative that you do and the water level is marginal (and more than 75mm is marginal) it might be worth disconnecting the air filter pipe from the air flow meter so that any water that does get through does not enter the engine. This is relatively easy to do on the V8 engined cars. Go slowly but keep the engine revs up so that the engine has a less of a chance of stalling. It may even be worth walking through the water to discover the shallowest path! If you do make it through, try the brakes on the other side as they will be wet and not as effective as they were. They will dry out but until this happens, make extra allowances.

Touring with your TVR

People like driving TVRs, so touring holidays, especially in mainland Europe, are another of the perks. The question is what should the TVR driver take?

This question periodically comes up in the summer, when the appeal of cheap wine (and Mobil 1) tempts many TVR owners to journey across to Europe for a holiday or an excuse to show off what a real sports car is. The question is, what do you take? Well... for some it may depend on how much space needs to be kept free for the wine and oil and for others it could depend on how paranoid they are. Many TVRs travel thousands of miles with nothing more than the spare wheel in the boot — but, in the UK, it is reasonably easy geographically to get specialist help or get the car taken to someone who can look after the car correctly. In mainland Europe, this is less likely to be the case. There is nothing worse than being stuck on the side of the road knowing that you have a replacement widget at home, and that it would take you 5 minutes to fit, and yet because you couldn't find room for it in the car, you are stuck at the side of the road waiting for a local recovery man, who has probably never seen one of Blackpool's finest, let alone knows what to do with one! Then there are the potential communication problems. Are your European language skills good

enough to explain that there is no door handle and that you press the wing mirror to open the car?

So while it probably not worth going to your local dealer and buying one of every spare he has, it is a good idea to pack a little more than a spare wheel and a credit card. This section suggests a minimum set of spares and items that are easy to take but do not take up too much room.

European breakdown cover

Essential. Make sure it includes recovery back to the UK just in case the unexpected happens.

Car documents

Do not leave this until the last minute as you may need more paperwork than you think. If the car is leased, you should get a letter of permission to allow you to remove the car from the country. This used to be a simple letter or fax but has been replaced with an official form known as a VE103 which is supplied (for a small fee) by the leasing company. It is essentially a legal requirement as without it, your taking the car to Europe could be construed as being theft.

I would also get details of the various TVR dealers in the countries you are visiting so you can call them in an emergency. These are available from the TVR website. Don't forget your green card (insurance cover) and driver's licence.

Warning triangle, fire extinguisher and first aid kit

Many countries require you to carry these by law and you can be fined if you don't have them. Check these requirements before you leave.

Beam deflectors

Some people don't bother but it is courteous to fit them and I have seen the French police check cars to see if they have been fitted. There are two types: those that block the light with black film and those that use a plastic fresnel lens to bend the beams. For TVRs with unfaired in lights, these are easy to use and simply follow the instructions. For the Griffith with its fairing, this is a little bit more of a problem. The headlamp beam benders are probably the best solution. Park the Griffith in front of a wall at night and switch on the dipped headlamps. Take the beam bender lens, hold it front of the headlamp and move it until the beam direction is changed. Once you have found this position, fix the lens in place.

GB sticker

While some owners already have the Euro style number plates with the GB on a blue background, and already have the sticker. If you don't have this style, a GB sticker is simple courtesy in some countries and a legal requirement in others. So while you might argue about this and how a GB sticker may ruin the artistic expression found in every TVR, the easiest thing is to simply stick a GB sticker on. To protect the bodywork, smear some petroleum jelly over the bodywork, wipe off the excess and then apply the sticker. It will then peel off with ease at the end of the holiday.

Bulbs

The bulb types are typically specified in the Owner's Handbook and can be bought either individually or as sets. The rear lights are easy to change and get access to but this is not necessarily true for the front lights. It is worth taking the appropriate tools to undo the access panels, remove the front grille, and so on, as described in the Owner's Handbook. Without them, you cannot change the headlamp bulb and it makes carrying spares a little pointless. However, if you do have them at least you might be able to get someone to do it locally.

Fuses

Take a selection and if you have one of the mid 1990s Griffith or Chimaera, get some 40 amp fuses for the cooling fans from your dealer before you go. These fuses are very hard to get because they are not commonly used. Apart from a TVR dealer, the only other source I know of is Demon Tweeks.

Relays

These come in various current ratings. It is worth getting a couple of 40 amp units just in case.

Fan belt

Essential. Do not rely on the fact that the TVR engines are based on Rovers and will thus be freely available in Europe. They won't! Many of the engines use different pulleys and ancillaries which means that the commonly used fan belts for these engines tend not to fit. Add to this that there are over 50 different fan belts associated with a Rover V8 engine and the task of being able to specify a fan belt simply by saying it is such and such is hard enough in the UK, let alone in a non-English speaking country.

For cars that have the V-belt, a trip to a dealer or motor factor and matching the belts is the best way forward. Belt part numbers, which include the width and length, are often printed on the belt, so these can be used to identify the belt size and track down a replacement.

For Rover V8 serpentine engines, then the best and quickest way of getting a spare is to go direct to a dealer as the belts are specially made for

TVR, despite them having a Land Rover logo. None of the Land Rover or Range Rover belts will fit.

Throttle cable

Again worth carrying as you cannot rely on being able to get a replacement locally. The AA and RAC use crimp-on nipples that can be used to fix a broken cable. Typically the cable will break either at the throttle or the accelerator pedal end. By slackening the cable a little, the wire can be pulled through and a new nipple crimped on. These come in repair kits that can be bought from the AA if you ask nicely. You can also use an electrical wiring block in a similar way: cut a single connector off the block, slide it onto the cable and tighten the two screws to effect an emergency repair.

Tool kit

This is always difficult. The rule of thumb I use is to carry a basic set of tools that I know will allow me to fit the spares I have with me. There is no point having a spare fan belt and not the tools to fit it. Well... there is, as the fan belt is hard to find — but you still have to wait for assistance to fit it. However, with the right tools, you could be on your way in 20-30 minutes.

Tape

I would take insulating tape for general electrical repairs, self-amalgamating tape for making weatherproof repairs and gaffa tape for everything else. Every competition car owner carries rolls of this stuff as it can be used for all sorts of things. Holding bits of bodywork onto the car, covering and protecting scraped GRP so that water can't get into the fibres, mending holes in roofs and plastic windows and holding headlight rims in place are just a few of the ways I have used this stuff. It's indispensable.

Cable ties

Another small and lightweight essential for tying things out of the way and keeping things generally shipshape. You can often buy big drums of these from hardware stores for a few pounds. It is worth taking a handful of each size with you. Don't forget that they can be joined together to create bigger ones.

Emergency otter switch bypass

If you don't have a cooling fan override switch, think about fitting one. (See the chapter on cooling for details.) If you haven't got time to do this, take a paper clip (not one covered in plastic) which can be used to bridge between the two spade connectors that clip onto the otter switch. This will turn the fans on permanently but allow you to continue without overheating, should the otter switch fail.

You can use a spare fuse as an alternative to the paper clip. The current rating is not important as the switch does not turn on the relay directly. Either way, use some tape to insulate the connectors and clip to make sure it does not short anything else out.

Torch

Don't forget the batteries and a spare bulb. It might be worth considering a 12 volt lamp that plugs into the cigarette lighter. Many electric air pumps have these built in.

Multimeter

This is another very worthwhile addition. Use it to check connections, fuses, relays and other electrical equipment. If you have an electrical problem you can check the obvious things, such as making sure that there is a voltage where there should be and that switches work when needed.

Plastic sheet

These are inexpensive but again have a multitude of uses. They provide protection whilst working on the car on a dirty or muddy road, something to cover and protect the contents of the boot if you need to unload at the roadside, a makeshift tent/shelter from the rain while working on the car, or something to sit on and have a picnic. The uses are endless.

Jump leads

Another essential aid to recovery. When choosing leads, make sure they are long enough to connect. With the battery located in the footwell on the Griffiths and Chimaeras, many of the shorter leads simply will not reach. It may be worth getting a Leven Technology plug-in set from the TVR Car Club and fitting this before you go. It uses a remote plug under the bonnet to save removing the footwell panel, ECU and other bits to get to the battery. The jumper leads then simply plug in.

Water

Worth carrying. Just take an extra large bottle of water. If you drink it, keep the bottle so it can be used to fetch water.

Radiator sealant

Just in case there is a leak. I would also include some emergency radiator repair putty and hose bandage. The putty is epoxy-based and can be used to seal holes in radiators that the radiator sealant can't cope with. The hose bandage will cope with holes in the rubber hoses and will enable a temporary repair to be made. The main problems with us-

ing these are getting the surfaces clean and providing some mechanical support to enable the seal to be effective. A small piece of 150 grade wet and dry paper enables the surfaces to be cleaned. Some copper wire to wrap around the bandage or a couple of jubilee clips placed over the top and tightened are invaluable additions. The jubilee clips can be joined together to create bigger ones and are invaluable for use with the exhaust system as well as providing spares for the hoses. Make sure that you include a suitable screwdriver and/or socket to do them up with. It is worth checking before you go that all the jubilee clips are orientated to make access easy. If they are difficult to get to, the time to find out is before you go and not on holiday!

TyreWeld

Ditch the space saver spare and carry a couple of cans of TyreWeld in case you get a puncture. Apart from freeing up some valuable boot space, it also means you will not have to suffer driving on a space saver wheel which, by all accounts, is quite unpleasant. TVR have followed this advice and no longer provide space savers. Instead, a can of TyreWeld is hidden in one of the cubby holes in the boot. It is worth getting an extra can and taking a small air pump to inflate the tyre, just in case the TyreWeld seals the puncture but does not restore the pressure. Small electric ones that are powered off the cigarette lighter are more convenient and take up less space than a foot pump. It is worth taking a separate tyre pressure gauge as the ones that are fitted to the pumps are often inaccurate.

Liquid gasket/sealant

A tube of liquid gasket and/or silicone sealant can help cure sudden water leaks and allow you to reseal the inspection hatch if you have to change the front headlamp bulbs using this method.

Mobil 1 oil

Essential as TVRs need to have their oil levels regularly checked (daily is not a bad practice to get into) and topped up as appropriate. Mobil 1 is currently about half the price in France — so it may pay to get a can when you go across and several more when you return! The slightly thicker 10W version is still freely available in France and is definitely a good buy. If you see someone with a trolley in a hypermarket full of Mobil 1, they may well have a TVR.

Octane boost

While super unleaded fuel is generally reasonably available, there will undoubtedly be times where you need fuel but only plain unleaded is available. While you may not have any choice but to use it and risk the engine pinking, all that is needed is to add some octane boost to create your own super unleaded and prevent the problem. So find space for some, just in case.

Antifreeze

This may be worth taking if the weather will be cold so you can maintain protection when topping up the coolant. Alternatively, get some locally.

Rain-X

This product is a modern miracle. If you suffer a problem with a wiper blade or a broken wiper arm and the wipers do not work, then apply this stuff to the windscreen and you may wonder why we have bothered with wipers for all these years. You will be able to carry on in the wet to somewhere where you can the wiper repaired. Without it, you will have to stop because the visibility will be so bad. (This happened to me with my Wedge when the wiper rack and wheel box seized. Someone lent me some Rain-X and it allowed me to safely get the car to a garage where the wiper could be repaired.)

Don't forget that if the problem is with a blade or an arm that you can use the passenger one on the driver's side. It may not be ideal but it will provide the best vision for the driver. Rain-X can then be used to help with the passenger side.

Owner's Handbook and this book!

These go without saying. Here is your opportunity to finally read them both from cover to cover!

Summary

While this may seem a lot, it doesn't take that much room and could help prevent a breakdown from ruining a holiday. There is an alternative that means you can leave all this stuff at home and know that you will always be able to get a spare with no real problem. So where can you go? How about the golden sands of... Blackpool!

Driving in bad conditions

To complete this chapter, here are a few tips on driving in bad i.e. slippery conditions. TVRs have a reputation of being almost uncontrollable in the wet, with stories of the cars spinning with the least provocation. If you have read the earlier sections in this chapter, you may have a better understanding that most of these problems are caused or made worse by inexperienced driving and the application of incompatible driving techniques such as engine braking.

The most obvious tip is that if the conditions are slippery, the levels of grip that are available are less and the result is that driving the car needs to be done almost in slow motion. Everything should be smooth and no sudden transitions. This means anticipating more and gently squeezing the brake rather than just stamping on it. The same is true with the accelerator and it should be treated as if there is an egg under your foot. Breathing on the throttle rather than stamping on it is what is needed. I find that using a higher gear and keeping the revs down is a big help in that the car's response is a bit slower and this smooths out the application of power. Remember the grip budget and reduce your demands on it by not accelerating so hard and not asking the car to change direction and brake or accelerate at the same time. Brake in a straight line and gently accelerate in a straight line. Consider changing up earlier to get into a higher gear quicker and thus help control (reduce) the amount of torque that is needed.

The secret is to drive smoothly and anticipate. This is also the secret of fast driving as well so learning to drive safely and smoothly in the wet or in cold icy conditions is not a waste of time but invaluable in learning how to drive these cars quickly but safely.

It is not all about driving fast! Even mundane chores such as washing the car can be fun with a TVR.