

Cars With 2-Stroke Engines.

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DEDICATION

This book is dedicated to Steven, who tragically died far too young, and for all my family.

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CHAPTER 1: Why Two-Stroke Cars?

My fourteen-year-old son came home from school one day and said that during his metal work class in school, the teacher was explaining the difference between two-stroke and four-stroke engines.

The teacher said that two-stroke engines were basically smaller in size and best suited to power chainsaws and similar equipment, rather than larger machinery. He also stated that, if a car was fitted with a two-stroke engine, it would only be good for up to sixty thousand miles as two-strokes didn't stand up to wear and would be underpowered, compared to four-stroke engines.

My son told him that I had a two-stroke engine car with over one hundred thousand miles on the clock. The teacher expressed surprise and possibly disbelief, to which my son said he'd bring in a photo of the car the next day. The car I owned then was a 1988 Wartburg 353 saloon with its 993cc engine.



Figure 1: My 1988 Wartburg 353W

Apart from the Wartburg Marque, which is a two-stroke car from the former Communist state of East Germany, the Trabant was another, better known car from the same region. I will often refer to East Germany in this book as the GDR.

In fact, although I have been a car enthusiast for many years, particularly classic cars, the Trabant was the only two-stroke car that I knew about for a while. But there were many other two-stroke cars made, mostly from Eastern Europe, but also from Japan, and what was formerly West Germany.

In fact, making small two-stroke vehicles enabled some Japanese manufacturers to get a head start, and a foothold in the car industry. Suzuki and Subaru would be the two best known of these.

DKW were always at the forefront of two-stroke technology for cars, and indeed their legacy as well as their inventive prowess can still be found in the remaining two-stroke cars today. Saab used a DKW engine in their cars for many years, which they rallied to great effect all over the world.

All the two stroke cars that originated from Eastern Europe used an engine which was essentially copied from DKW. This is true, at least in the beginning: after that, I believe that two-stroke car makers, such as Wartburg and Sachsenring in particular, bettered the original DKW technology and made significant improvements of their own.

DKW later amalgamated with other three German marques (Horch, Wanderer & Audi) to become Auto Union, and eventually abandoned their two-stroke technology for four-stroke engines.

Two-stroke cars were made up until 1990/1991 by some manufacturers.

I did a search on Amazon for any books, titled or related to two-stroke cars and my search yielded not a single result. There are many books on Trabant's but only a few are in English. Some books fleetingly refer to two-stroke cars, but I could find none that provided any depth of information on these unique and fast disappearing cars.

When I take my Wartburg to classic car shows, many people are amazed to discover that a two-stroke car of such size was ever made and was successful. Many people identify two-strokes as being confined to motorbikes and micro cars.

Now, there have been many micro-type cars made with two-stroke engines, but this book is not about them. Nor is it about motorcycles or scooters, who used two-stroke (of which some still do) power. It's about mainstream production cars that were big enough to carry at least a small family, and light commercial vehicles, pick-ups and van type derivatives will be covered to some degree. I have covered a few micro cars, which I think are significant.

Eastern Europe persevered with two-stroke engines, when the West had all but abandoned them as too smoky, too noisy, too unrefined or just plain old fashioned.

While the West wanted better performance from their cars, more valves, walnut dashes, and Wilton carpets, the East wanted cars that were simple, affordable, reliable and efficient. They couldn't have cared less whether they were considered noisy or unfashionable by the West.

The Eastern Bloc countries were hampered by a need to produce cars that were cheap to make, easy to maintain and most importantly were constructed of such simple mechanics, that many owners could maintain and fix them themselves. And many did just that!

Of course, money was the biggest reason that Eastern Bloc countries hung onto two-stroke engines. They didn't have the funds, or the desire to invest in technology. By sticking with the two-stroke engines, they improved them over time and when simple refinements such as electronic ignitions and electric fuel pumps were added, these cars were further improved. Many of these cars had production runs of over twenty years with only minor changes.

Modern cars are great, they're more reliable and better to drive than ever before. They're faster, have better fuel economy, better brakes and the advanced chassis design means they handle better too. They're also safer and have lower emissions. But, when something goes wrong with them, as will happen occasionally, since the perfect car that never breaks down hasn't yet been invented, what then? They've become and are still becoming ever more complex, both to diagnose and to rectify problems.

They have a warning light for just about everything, from airbag malfunction to blown light bulbs. Often, these lights can only be turned off at the main dealer. The electrics alone on modern cars are now frighteningly complex on many models. They've engine bays that are increasingly harder to work in without specialist tools, and to service modern cars it often requires the removal of swathes of covers and access is limited. They're becoming increasingly more complicated and the time will come when the most routine of maintenance can only be performed by the main dealers. Technology and the passing of time has made improvements in engine durability and reliability but it's my view that cars these days have too much electrical apparatus, and most of complex problems nowadays stem from this.

Cars have come a long way and as a means of getting from A to B, modern cars are invaluable to many. But in doing so, they've also become increasingly and blander and look like clones of each other, from one manufacturer to the next. Inside, all you see is masses of black plastic and padding. Much fuss is made by car manufacturers these days of their ever-increasing service intervals for the cars. Peugeot for example, are currently 20k miles between services and Renault 16k for petrol engines. Sixteen or twenty thousand miles on the same oil? I don't believe any oil will ever be made that can last this long and what can the quality of the oil be like when it's been working for twenty thousand miles? Oil is the lifeblood of any engine. Over time, oil loses its nutrients as it becomes dirtier. I wouldn't like to buy a car that had done nearly 20k miles and had never had an oil change, regardless of the Marque and quality of the oil. But, to get any work done these days is becoming prohibitively expensive, no matter what brand of modern car you drive.

So, spare a thought for the simple beauty of uncomplicated machinery, where there are no timing belts, no valves, and where cars are equipped with the most rudimentary but effective electrical systems. Head gaskets can be changed in minutes, not hours. Many of these cars have no radiator and are cooled via air. They have no distributor and use a coil per cylinder. Oil changes are not necessary because there is no sump. Two-stroke cars with the oil mixed through the fuel perform the equivalent of their own oil changes every time they're refuelled and driven. A service often consists merely of new spark plugs and a set of points. The air filter doesn't even need changing in most cases, as it's a reusable steel type that just needs to be cleaned in petrol and can be reused time and time again.

Take my Wartburg 353 Tourist, which has been fitted with electronic ignition. A service for this car consists of new spark plugs, and a check and clean of the air-

filter, every twenty thousand miles. I can do this job myself in about ten minutes. That's it! Three spark plugs that cost about £2.00 each.

Why Buy A Two-Stroke Car?

As a classic car, these do have massive appeal, which many people in the classic car world do not realise or appreciate due to a lack of knowledge and/or ignorance. Although these cars are becoming rarer, and prices are rising, they remain remarkably cheap, compared to many other classics. Rare and unusual in the classic car world usually equates to expensive, so *some* two-stroke cars for the moment are both unusual and cheap to buy. Add simplicity to the just mentioned and I think two-stroke cars are a far better choice of classic and make more sense than many other higher maintenance cars in the marketplace today. Parts are also cheap for the most part and the cars are remarkably easy to maintain.

I will list websites and other sources where you can buy many of the cars featured in this book at the best prices and will also give tips as well as advice where I think useful. I have owned four two-stroke cars at the time of writing and I'm sure I will own many more in my lifetime. Before I got interested in two-strokes, I had a variety of other classic and modern classic cars.

What is a Two-Stroke Engine?



Figure 2: The Wartburg 353, 1.0 two-stroke engine

A two-stroke engine is an internal combustion engine that completes its cycle in two movements or strokes of each piston, as opposed to double that (four movements) in a four-stroke engine.

Stroke One, The Power Stroke:

In simple terms, what happens in each cylinder is - the spark plug fires, and the fuel and air in the cylinder compresses. The plug firing ignites this mixture, which creates an explosion that forces the piston downwards. As it moves down, it compresses the fuel and air in the crankcase. As the piston travels downward to the bottom of this stroke, the exhaust port opens, and the pressure in the cylinder drives out most of the spent gases and emissions out this port. When the piston finally gets to the bottom of the cylinder, the fuel intake port opens. The pistons movement creates sufficient pressure in the crankcase that it rushes into the cylinder, and forces out the remaining waste gases and emissions, and at the same time fills the cylinder with more fuel.

Stroke Two, The Compression Stroke:

Now, momentum built up within the crankcase during the power stroke, pushes the piston back up towards the spark plug for the next stroke, called the compression stroke. As the air and fuel mixture is again compressed, a vacuum is created within the crankcase. This vacuum opens a third port and sucks in air, fuel and oil from the carburettor. Once the piston has made it to the end of this stroke, the spark plug fires again and the cycle is repeated. The piston in a two-stroke engine has three different functions.

Let's divide the piston into two parts. Let's say one part is the combustion chamber, where the piston compresses the air/fuel mixture and captures the energy released by

the fuel igniting. The second part of the piston we'll call the crankcase. Here the piston creates a vacuum that sucks the air/fuel mix from the carburettor. It then uses the pressure created within the crankcase, so air and fuel are forced into the combustion chamber.

In a four-stroke engine, the crankcase is totally separate from the combustion chamber, which enables the crankcase to be filled with oil (also known as a sump). This oil is necessary to lubricate the bearings on the crankshaft, the bearings on the connecting rod that go to the piston and the wall of the cylinder. In a two-stroke engine, the crankcase is used to create pressure to force air and fuel into the combustion chamber, so it cannot hold oil as is the case of the separate crankcases (sumps) of four-stroke engines.

Therefore, two-strokes are lubricated by putting oil into the fuel. A lack of oil or insufficient lubrication will cause a two-stroke engine to wear prematurely and will seize if starved sufficiently, rendering it useless and beyond easy repair.

Some two-stroke engines have an oil pump, which will automatically administer the right amount of oil to the fuel from a separate chamber when it needs it. Otherwise, all other two-strokes need the oil mixed through the fuel before it reaches the fuel tank.

What's the main distinctions (in simple terms) between a two-stroke and a four-stroke engine?

The main difference between a two-stroke and a four-stroke is: in the two-stroke, it's the displacement of air caused by the descending piston that charges the cylinder for the next power stroke, rather than the need to suck in air through valves on the head, as in a four-stroke engine. This enables the two-stroke engine to do without cams, push rods, rockers and valves, which are all subject to wear and can all be problematic. The sides or walls of the piston act like valves as they cover and uncover the intake as well as exhaust ports that are drilled into the sides of the cylinder.

Most, if not all two-stroke engines fitted to cars have a freewheel system in place as a safety net. A freewheel is a device within the gearbox that ensures the driven shaft never goes faster than the driveshaft. In other words, it allows the wheels of the car (downhill for example) to travel faster than the engine speed, when the driver does not have his foot on the throttle (freewheeling). Otherwise, the wheels might drive the engine to dangerous levels of RPM, which could then starve the engine temporarily of fuel. This would mean a shortage of oil in the cylinders and could make the pistons seize within a very short time. Cars like the Wartburg had a lever under the dashboard that would activate or deactivate the freewheel, as the driver thought necessary. The freewheel in this instance worked in all forward gears. Others like the Sachsenring Trabant had a fixed, permanent freewheel that only came into use when in fourth gear and couldn't be deactivated. The freewheel would normally only be deactivated in extreme conditions, such as icy roads, prolonged uphill stretches and possibly when towing.

So, the freewheel was not only an engine saving device but also saved on fuel. When the freewheel is engaged, you lose the effect of the engine's capacity to slow the car down through the gears as there's no brake servo fitted to two stroke cars.

Advantages of Two-Stroke Engines

They do not have traditional valves, which makes them lightweight, simple to manufacture and cheap to produce. They start easier in adverse weather conditions than four-strokes. Two-stroke engines fire once every revolution, while four-stroke engines fire once every other revolution. This gives two-stroke engines a significant power boost because there are twice as many power strokes per revolution and because of this; they pack much more power than four-strokes within the same space. They have no bulky driveshaft running through the interior of the cabin, which creates more passenger room.

Let's look at the two-stroke Wartburg of 1000cc. In 1989, they switched this engine to a four-stroke Volkswagen unit of 1300 cc. Both cars, gave roughly the same performance which you could say means that the two-stroke engine of 1000cc is equal to a 1300cc four-stroke engine, at least in this case.

Two-stroke engines have very few moving parts. The Trabant for example, has only 5 moving parts; 2 pistons, 2 connecting rods and a crankcase. This means that two-stroke engines are far more recyclable than the vast majority of four-strokes. With lesser moving parts, there's less likelihood of mechanical failure as there's much less to go wrong. An engine rebuild for a two-stroke is thus very simple to do, compared to a four-stroke, and this simplicity ensures that a two-stroke engine is a very hard thing to kill. This higher power capability of the two-stroke engine is also a major reason that many such cars had tremendous rally successes in their classes. Saab, with their rally cars, powered by DKW engines won many major rallies. As did DKW themselves, along with Wartburg and Trabant from the GDR.

Two-stroke engines can work in practically any position, which gives them a huge advantage over four-strokes in many applications. If a chainsaw, for example, had a four-stroke engine, it would likely have oil flow problems unless it remained upright whilst in use and to use such a machine effectively would be impossible.

Perceived disadvantages of two-stroke engines

Two-stroke engines produce higher emissions as the oil in the combustion process produces excess smoke. This is the reason why many governments want to phase out two-strokes altogether, as they do not as readily fit the 'green' criteria as four-strokes.

Running two-strokes on fully synthetic oil greatly reduces the emissions and smoke, and they're only at their smokiest when cold. As an experiment for this book, I ran my Trabant for a time on a 50:1 mix with fully synthetic oil, and there was probably less smoke than most four-strokes I've ever owned (at least, in terms of visible smoke). The difference was like night and day.

I won't continue to run it on synthetic oil though, as they weren't designed to run on it, and I don't see the point unless the government brings in an emissions test (in UK and Ireland), which currently there is none for two-strokes. It was a useful experiment though, in showing how easily emissions and smoke could be reduced instantly by simply switching the oil, let alone making engine modifications, and adding things like catalytic converters. Germany has an emissions test for two-strokes, but I don't have any technical specifications for it and do not know whether they need to run on synthetic oil to pass it.

Update: Since May 2011, I own a Wartburg 311, which has always been run on fully synthetic oil by the previous owner, so I have continued this. The car will smoke a bit when cold, but when warmed to normal operating temperature there's no more visible smoke than any four-stroke car I've ever owned.

Two-Stroke Engines are dirty?

There is no question that two-stroke engines are dirtier than four-strokes. Reason being, every time a fresh batch of air and fuel is loaded into the combustion chamber, part of it will leak out through the exhaust. There are hydrocarbons in the fresh fuel and leaking oil that even in small quantities isn't going to win any 'green' awards.

But are they any dirtier, or as dirty as old generation diesels? I think that's a fair question. Every day I see old diesel cars spewing huge clouds of smoke and all the rest. They're not called 'oil burners' for nothing.

New generation diesels are brilliant. We all know that, and they have super low emissions thanks to billions spent on research and design, but the old ones appear to be excessively smoky and dirty.

Or can a two-stroke car engine (most are under 1000cc) create more pollution than a V8 sports car, or one of these monster jeeps we see on every school run? Point is, there are many ways to deal with and overcome emissions and pollution. All cars pollute, except maybe some hybrids, and how many people drive them?

If people want to save the planet, hug trees or advocate the drinking of their own urine that's their prerogative, but I feel that some governments are taking the whole 'Green' issue and concept to ridiculous extremes. Phasing out two-stroke engines, as many want to do, will not make any difference long term in the greater scheme of things. To ban two-stroke engines on evidence of pollution, what's next? If that happens, we might as well be banned from burning coal and oil to heat our homes.

Two-stroke oil is not that cheap nowadays and older two-stroke cars will use a higher percentage of oil to fuel. Most two-stroke cars in the early days, late thirties to early sixties, would have used a 25:1 mix (when British two-stroke motorcycles were using a 16:1 mix). This then changed, with many using a 33:1 mix. The last two-stroke engines made by Sachsenring and Wartburg used a 50:1 ratio, (50 parts petrol to 1 part two-stroke oil) which showed how they became better and more eco efficient over time.

The Wartburg's that were exported to Belgium, were fitted with an oleomatic oil pump that mixed the correct ratio of oil to the petrol when needed. Apparently, the Belgian Government had restrictions on two-strokes that made this necessary (at least in the 1980's).

In East Germany, such was their dependence on two-stroke motorbikes, cars and vans, garages sold petrol/oil ready-mixed at the pumps. In Britain, where two-stroke cars were always unusual, and in a minority, there are many tales of engines seizing due to someone forgetting to put two-stroke oil in with the petrol.

I'm not championing the use of two-stroke cars as everyday vehicles, although if someone wants to drive one, they should be able to without criticism or complaint. I am championing two-stroke cars as a viable and excellent choice of a classic car. Virtually all four-stroke cars, pre-1988, on the roads today will require a substitute lead additive added to the fuel. The cost and usage of this is no more a hardship than buying and adding two-stroke oil. Two-stroke car engines all run on unleaded fuel with no additives necessary, due to them having no valves.

Poor fuel efficiency?

My Wartburg 353 Tourist for example, has a 993cc engine and only does around 30 mpg, whereas I get over 50 from my Trabant of 595cc. But the Wartburg is twice as heavy and almost twice the size. When the Wartburg was conceived, few four-strokes of similar size were returning better than 30mpg. The Wartburg 353 Tourist is about the same size as a Ford Escort estate. I distinctly remember an old escort 1.1 of similar vintage, that belonged to a mate of mine and it returned only around 27 mpg and was seriously underpowered.

I think generally, that poor fuel efficiency attributed to two-strokes has more to do with the technology of the era their engine was designed in, than simply the fact they're not four-stroke. The DKW two-stroke technology, which most two-stroke cars were based on, dates from 1931, but their technology was far more fuel efficient than most of the competition.

When you consider how much money, technology and time has been invested in creating the economical four-stroke engines we enjoy today, how good and how different could two-stroke engines have become when you consider their technology dates to pre-World War II, and their technology was never invested in beyond the

1960's. Most two-stroke cars were at least as economical, if not more so than the four-stroke cars of the same era.

Two-strokes struggle to maintain progress on steep hills more than four-strokes. They do require a little more gear changing, but I feel the engaging nature and free revving appeal, and the sound from a two-stroke engine far outweighs any negatives.

Two-stroke engines are still used today, although increasingly less so and not in cars anymore. Some scooters and motorcycles still offer two-stroke options, particularly in the smaller engine sizes and dirt bike markets. Other applications include: small outboard engines, boats, jet skis, snow blowers, chainsaws, garden strimmer's and similar tools.

How my Interest Began

My interest in cars, classic cars to be exact, has always leaned towards the unusual, or even quirky. With curiosity and great interest, I spotted a Wartburg 353 on the front cover of the 'Classic Car Weekly' on 29th April 2009. In the cloudy, dusty shelves of my mind, I thought the name Wartburg sounded familiar, yet I couldn't ever remember seeing one before this article.

I had seen the 'Trabant', or rather a field full of them on TV a few years previous, when a local UK Council ordered the owner to move them and remember hearing they had a tiny two-stroke engine. I thought little of it at the time, but this was the first introduction to IFA vehicles for me, and maybe subconsciously the start of an interest that would become a passion.

The CCW article was positive reading for the most part and my curiosity was further piqued, when the article stated that the car's owner had three Wartburg's and wanted to sell one!



Figure 3: Front view of my 1988 Wartburg 353

My classic car ownership up to this point had been exclusively French. I'd owned a Citroen DS, 2 x CX's, a 2CV, Visa and a rare Peugeot 405 4x4 (with hydraulic rear suspension).

I will always have a soft spot for French cars and their idiosyncrasies, but problems with complex hydraulics of the CX and particularly the DS, made me yearn for something simpler that I could work at myself, without always having to consult expensive specialists. One of the things I've always admired about French Classics is that they invariably have soft suspensions that mask bad road surfaces probably better than anything else.

So, when Ian Seabrook who wrote the CCW article, commented on the fact that the Wartburg soaked up potholes and other road imperfections better than the modern BMW he was driving, I was very interested.

When I first saw the picture of the Wartburg 353, I immediately thought it might be a Peugeot, the styling clearly looked French to me. The paper provided an email address only for the vendor, and I sent off an email declaring my interest.

It was about a week or so later that I got a reply. The vendor had two Wartburg 353 saloons, a red 1984 one with column change, and the 1988 two toned grey and blue one that was in the paper. The third car he had was a 1986 red 353 Tourist estate model. He indicated that he might sell two out of the three cars. Unfortunately, I was told that someone had beaten me to it and had been given first refusal on either the Grey/blue saloon or the Tourist, one of which he seemed certain of purchasing.

It turned out he bought neither and after some protracted emailing with the vendor, I did a deal for the grey/blue saloon that I'd read about. Now here's the thing, the vendor lived in Derbyshire and I live in Ireland, so I couldn't just pop down the motorway on spec for a viewing. I bought the car unseen, mainly based on the CCW feature. I'd never bought a car this way before and almost backed out of it a couple of times, as I wasn't entirely satisfied with the email correspondence. Whilst email is a great tool at times, written text can be very ambiguous, and one can easily get the wrong impression, or a different impression than what is intended, which of course works both ways!

Anyway, I sent the vendor a holding deposit and my fears turned out to be unfounded as the car was as good as I'd hoped it would be. The vendor was decent enough to meet my thirteen-year-old son and I at East Midlands Airport and bring us back to his place in Loughborough, Derbyshire.



Figure 4: Don't the chrome hubcaps and whitewalls suit the car?

He picked us up in his 353 Tourist, which was a top of the range model with fitted sunroof as well as an automatic oil pump for automatic dispensing and mixing of petrol and two-stroke oil. The vendor explained that these oil pumps were only fitted to cars that were originally exported to Belgium. The upholstery in this car was also of a higher quality than that of the standard models.

I was very impressed with the Tourist, particularly its cavernous space, greater practicality, and plusher interior. When I saw my saloon back at the vendor's place, my initial feeling was that I preferred the Tourist and might have plumped for it if the owner hadn't just transferred his personal plates from the saloon I'd paid the deposit on, to the tourist (and did not have the V5 back yet).

We had to drive to Liverpool for the boat to Dublin later that evening, so we took the saloon we'd come for. The vendor told me that the car was the best driver out of the three cars he owned, and I also reckoned that he would surely have given Ian Seabrook the best car to test drive and to base his report on.

The car had been driven to Germany and Belgium in recent years, and I knew I was getting a good car. The car had been painted its two-tone colours about six years previously, from its original solid grey colour and it still looked very smart.

You really get a sense of how dull and grim life in the GDR could be when you see the bland choice of original colours from the seventies onwards. This is in complete contrast to the many beautiful two-tone schemes that prevailed in the fifties and sixties.

The car also had its original black bumpers changed for chrome ones, to give the car more of a sixties look and had been very well maintained. It had had all four wings replaced at some point and had a clutch replaced three years previously. The three original coils had been replaced in favour of a single coil, electronic ignition system and an electric fuel pump had also been fitted.

The vendor recommended a fuel mixture of 50:1 petrol - two-stroke oil, despite the fact it stated 40:1 in the user manual provided. I certainly had no experience of two-stroke cars before but had a bit of experience with two-stroke bikes and chainsaws, and always used a richer mix than specified.

I reckoned a little more oil was safer if you didn't overdo it. So, I ran the car on a mix of approximately 40:1, if not slightly richer and it always ran well for me, free of excess smoking or other over-oiling symptoms.

The car also came with several useful spares including front brake pads and a fan belt.

The only thing I didn't like about the car was that the original gear knob was missing and had been replaced with an awful shiny, silver, plastic aftermarket one that I thought was totally out of character with the car's interior.

Despite being a driver of considerable experience and a former taxi driver, I'd never driven a Wartburg before and found it difficult at first, particularly the gear change when making clutch-less changes. But these cars are hardy beasts and it forgave my crunching changes with no ill effects.

After a while, I sussed out that you needed to listen for the engine revs to drop, before changing up a gear, in order to effect a smooth change and maintain progress. Once I'd mastered this, I started to enjoy the drive to Liverpool.

Wartburg's really offer a classic driving experience that harks back to a much earlier era and give a lot of enjoyment. To get the most out of them, I think the best way to drive them is similar to the way one would drive a diesel, accelerate hard, drop off the throttle, change up and away again with a heavy right foot. These cars seem happier to slog at low speeds in fourth, than changing down a gear as one would in a modern car.

We arrived safely in Liverpool, with a few hours to spare for our ferry crossing. We were at a toll booth near Bootle when the car behind me honked the horn. I looked around and there was a Wartburg 1.3 saloon behind us. The occupants, a couple in their late twenties I'd say, were smiling profusely and motioned us to pull over to see the car. They were a very nice German couple, on a driving holiday across Europe and we chatted amiably for a few minutes, whilst admiring each other's cars. I had no camera, but they took a picture of all of us and the two cars together. It was a nice moment.

We arrived home the following morning, having driven over three hundred, trouble free miles since picking the car up and only had a week before taking it to a classic car show that I've been attending for years about an hour away from where we live. I come from Belfast, originally, but moved to Eire some years ago. The show is an outdoor affair and held in the grounds of Trim Castle, in County Meath, where much of Mel Gibson's 'Braveheart' was filmed. It really provides a gorgeous backdrop from which to display classic cars, and the show usually has around seven hundred cars

in attendance, displayed spaciouly within the grassy slopes of the castle grounds. So, with the help of my son, Iain, we washed and valeted the car thoroughly inside and out, and sorted some loose carpeting in the boot, and she was ready for the show!

Our Wartburg was the only one present, indeed it was the only IFA vehicle in attendance and it got a lot of attention, almost overwhelmingly positive. Quite a few people from Eastern Bloc countries, particularly Polish and Latvian people, stopped to talk about the car, and said that they'd grown up with Wartburg's and Trabant's in their countries, owned by their parents and knew many people who still drove them today. They all spoke with great affection for the cars they'd known. I met one elderly man who had been a Saab mechanic and was familiar with the older two-stroke, 841cc engine fitted to the Saab 92, from the mid-fifties to mid-sixties. This engine was made by DKW and was also the technology used by the IFA of which a wide range of vehicles were based (including my own), with many improvements and adjustments over the years. Other people, who had never seen or heard of Wartburg's before, were simply amazed that a two-stroke car of such a size existed or was even possible. I really enjoyed the show and in particular having a car to show, of which there weren't dozens of others in attendance, like the case of many other Marques at the show.

In the weeks afterwards, I sought to make a few small improvements to what I now knew was a very good and reliable car. With the two-tone colour scheme and chrome hubcaps, I knew whitewall tyres would make a fantastic addition to the car's overall appearance.

All four tyres were excellent, so I was able to purchase whitewall flaps that you simply insert between tyre and rim and is a much cheaper way of attaining the same effect. These, I picked up on Ebay for about forty pounds.

I located a Wartburg parts specialist in Germany, with the hope of obtaining a genuine replacement gear knob, but this proved to be unsuccessful. I then trawled Ebay for the same and couldn't get one there either, so I searched through dozens of web pages for a gear knob that would look authentic and more importantly, have the correct gear ratio inscribed on it. I ended up getting one made for a Volkswagen T25 transporter van that was the right colour, size and ratio, and wouldn't look out of place with the interior ambiance of the car. It was brand new and a good choice, and it only cost a fiver. Only downside was that the inner threading of the new one was much wider in diameter than the gear stick. I sorted this by managing to remove the inner threading core from the old aftermarket one and filing it down sufficiently, until it fitted snugly into the new one. It then screwed perfectly onto the gear stick, just like the aftermarket one had. I changed the front brake pads and overhauled the rear drums, then had the whole underneath of the car professionally sprayed with waxoyl.

Wartburg's are very easy to work on and some of this work wasn't necessary, but I enjoy working on cars as a hobby and I like my cars to be as good as they can be.

For me, classic car ownership is all about having something that is unusual and unique in some way. Wartburg's, Trabant's and all two-stroke vehicles possess these traits in spades. A two-stroke engine is a rare thing in a car nowadays. Sure, they're smoky and noisy, but that's part of the appeal and what makes them unique.

One of the reasons that two-stroke engines fell out of favour with other manufacturers, was their inability to make two-strokes that had the longevity and durability of four-stroke units. Perhaps the fact that the Communist regime doggedly resisted technological advances, this enabled the East German's to perfect the two-stroke engine to a new level, as they had no other option.

I know from some research into Wartburg's, that they wanted to abandon the two-stroke engine in 1978 in favour for a 1289cc four-stroke Renault engine. This car was the proposed Wartburg 1300, essentially the 353 with a new engine. This venture was vetoed by the government as were many progressive ideas proposed by the IFA over many years, for many models.

Best fact about Wartburg's and Trabant's (from a classic car perspective) is that they used old technology right up to 1989/1990, until four-stroke Volkswagen engines were used, so there are still many good examples to be found and enjoyed.

Wartburg's and Trabant's in the UK are thin on the ground as of late and the best choice of cars to buy lies in Germany and other parts of East Europe. Poland has many IFA vehicles available now at very low prices, but it's a long drive back to the UK and Ireland.

The four-stroke cars will also appeal to many as they're that bit more modern, but for me they're more like an ordinary car (and part Volkswagen), without the appeal of the two-stroke cars. So, you can buy a car only twenty or so years old that looks and drives like a classic of a much older vintage. Isn't that unique and worthwhile in itself? Also, they're usually very reasonably priced (although prices are rising), compared to other classics.

Modern cars are fine as everyday transport, but they all look the same nowadays and all you see is masses of black plastic inside. French cars, which used to be a little different from the mainstream, have succumbed to banality and look as well as drive like the competition.

Unfortunately, the recession hit my business hard last year and I had to close it. This prompted me to advertise my car for sale, which I did, and it sold quickly. I believe it went to Switzerland.

I missed the car and wished I hadn't sold it, but felt I had to at the time. Owning the car, I developed an interest in East German history and was intrigued by the Communist regime that existed there until the fall of the Berlin wall in 1989. In January of this year, I visited Berlin for a few days, never having visited Germany before. I did my research before I went and stayed in the Friedrichshain area, which appealed to me as it had been one of the most 'Eastern' districts of the former East

Berlin. This area is today one of the poorer parts of the city, but it still has masses of character, and is very different in personality and architecture to Western suburbs such as Charlottenburg. Friedrichshain had some lovely architecture and wide leafy boulevards everywhere you look. It was also practically free of Western franchises, like McDonalds and their ilk that are ubiquitous almost everywhere nowadays. In contrast, most of the restaurants in Friedrichshain were family owned, low key affairs with great food and service at low prices. Whilst there, I tried 'Currywurst' for the first time and found it delicious. It's basically a grilled Bratwurst sausage with the delicious sauce made from a mixture of curry powder and ketchup. Very tasty and handy as a snack or impromptu lunch as there are Currywurst stands and kiosks everywhere in Berlin, especially in the train stations, etc. At around 1.60 euro a pop, with a bread roll included, its good value. The traditionally Eastern parts of Berlin are much better value than the new Western parts and potential tourist traps like the 'new' Mitte, for everything food & drink, accommodation and shopping. One of the streets, adjacent to Frankfurter Allee, had a shop dedicated to the fast growing 'Ostalgie' trend which basically sells products and collectibles from the former East Germany. The shop called 'Mondo's Arts' sold everything from nostalgic t-shirts to model Trabants, food items and mock telephones of vintage design.

Visible in all areas of East Berlin is the quaint and distinctive 'Ampelmanchenn' green and red man symbols at pedestrian crossings. Berlin is a huge city and the transport system there is vast and brilliant, with typical German efficiency prevalent everywhere. There are overland and underground trains, buses and a great tram system, all of which traverse the city. No matter what hour of the day or night, you will get to where you need to go quickly and with no fuss. You can get a day pass which gives you unlimited travel on all transport services for only 6.50 euro, which is great value for seeing the city. The city in January was wrapped in a blanket of snow and whilst bitterly cold, gave the city a magical air. Despite the snow, footpaths and roads were always clear and life went on with no hiccups. A day's snow in Ireland and the country is in turmoil! In Friedrichshain lies the East Side Gallery which has the best and longest stretch left of the Berlin Wall. Many artists of international repute have painted some fantastic murals on what's left of the wall. It was within walking distance to where I was staying, and it was a very enjoyable walk which is adjacent to the Spree River. Whilst there, I visited the former 'Stasi Prison' Hohenschoenhausen and got the guided tour which was fascinating. The Stasi secret police, whose motto was 'To know everything', were probably worse than the Gestapo that preceded them for cruelty and their penchant for ruining people's lives. In Communist times, this prison was largely a secret and the people who lived in the area were almost exclusively Stasi employees. The prison and its surrounding streets did not feature on any map, and great lengths were taken to ensure its secrecy. There was no visitation here and prisoners would be moved to another prison to visit their families. When sentenced by a court, prisoners could be driven for hours around in circles, before making the short distance to the prison, so they thought they were being driven great distances. The prisoner transport vans were Barkas 1000 models and were disguised as delivery vans to all outward appearances, and of course the detainees were kept in darkness. The prison had one of these vans exhibited in stunning condition, which had six individual holding cells inside.



Figure 5: Immaculate Prisoner transport Barkas van

The Lichtenberg area where this prison is situated, is probably the most Eastern part of the city, where Soviet style concrete tower blocks of flats are everywhere. This area today is one of high unemployment and low rents. This, like many other parts of East Berlin, had graffiti everywhere you looked.

The film 'The lives of Others' released in 2007 and set in 1984 East Berlin, shows many scenes set in Hohenschonhausen Prison and is a great film, which shows how the Stasi operated, and has many IFA vehicles on show. These include Wartburg 353's, Trabants, Barkas Vans and a Robur split screen truck. HMV were selling this DVD recently for three pounds, worth buying if you haven't already seen it.

I just finished reading a book, 'Alone in Berlin' by Hans Fallada, which tells a story set in the war years 1940-1945. The Berlin depicted under Hitler's dictatorship mirrors very closely, that of East Berlin in the DDR, where suspicion and informants were everywhere. The similarities really are striking and profound.

I visited the excellent DDR museum, which is a short walk from Alexanderplatz train station and whilst small, it's very enjoyable. It's an interactive museum where you can see many aspects of how life was in the former DDR. In this museum, they have a cracking Trabant 601 Deluxe on show, with very good leather effect seats. You can sit in the car and turning the key starts a simulated drive through a typical DDR town, complete with all the sights and sounds created by a projector. You can see the 'Lipsi' dance in operation which was designed to be an alternative for the DDR's youth, to the capitalist evil which was Rock & Roll! When you see it in operation, it's no wonder the youth of the day wanted Western influences. You can watch the football match where East Germany beat West Germany 1-0, and find out about how nudist beaches were very popular in the DDR! There is also some interesting ex-Stasi surveillance equipment on display, which looks very crude and clunky compared to today's modern world of electronics. This museum publishes an excellent English book, GDR-Guide which deals with all aspects of how life was in Communist times. The book tells the whole history and more interestingly, how life really was for East Germans in an interesting and easy to read style. The book provides a chapter on the Trabant and this reveals some interesting statistics for 1988. In this year, there were 1.9 million

Trabants on East German roads, 600,000 Wartburgs, approximately 300,000 Lada's, and the same number of Skoda's. For most East German's, the Trabant was the only car that they could afford, which perhaps explains the iconic status that the humble Trabi has in Germany today.

The waiting list for a new Trabant could be as much as sixteen years, so when people attained one, they invariably looked after it, which goes some distance in explaining how the average lifespan of the Trabi at one time was twenty-eight years. If you could afford it, you drove a Wartburg or a car from another 'Socialist' Country. Lada's and Skoda's were popular choices.

The Volvo was seen by many East German's as the ultimate Western car to aspire to. I find it ironic that Communist countries always refer to themselves as Socialists, in spite of their restrictive and stifling regimes with which they governed their own people.

So, I've happily switched from French classics to East German ones. They're cheaper to buy, easier to work on, just as much fun and even more unusual. These cars have given my son and I something to look after together, and we enjoy taking them to shows for a day out. That's what Classic cars are all about.

At the time of writing, I have just purchased a 1985 Wartburg 353 Tourist in the worst shade of green I've ever seen! I bought the car on Ebay and have yet to receive it. It promises to be a good car though, has a full MOT, covered only 49K km and was repainted in its original colour two years ago. It was driven to the UK from Germany in 2008 by its German owner who came to work in England. It has a big history file and comes with a spare engine and a tea-chest full of brand new spares, including a full exhaust system still in original packaging.



Figure 6: My 1985 Wartburg 353 Tourist in 'Kermit the frog green'

I was looking for a Trabant and narrowly missed out on one that a fellow club member had for sale. No sooner had I bought the Wartburg, when the phone rang, and I was offered the Trabi, after the sale fell through on it! Unfortunately, I couldn't buy them both, without contemplating a quick divorce. Anyway, I'm over six feet tall and an ex-heavyweight boxer, so the extra room in the Warti will suit me better. Having bought the Wartburg on Ebay, I had the problem of getting it back from the UK. The car was in East Sussex, which is almost as difficult a place for me to get to, as could be. Bringing a car back to Ireland, you must use either Liverpool/Birkenhead or Holyhead.

There's also a crossing from Fleetwood, but it's not practical, for me anyway. Plus, I'd have to fly into London, get a train to East Sussex, then drive back the way I'd come past London again, and continue onto any of the above ports. No-matter which ferry port I'd have used, I'd have had a 400-500-mile drive to get there. The vendor told me that the car had been used very little in the past eighteen months, so I reckoned the only way for me to get the car home was to use a transporter. Again, I'd bought a car unseen, but a condition of sale for the car, was that the seller would put a fresh MOT on it at his cost. So, I reckoned with this fresh MOT and the fact that the car had a paint job done two years previously, and came with a spare engine, full exhaust system in packaging, new clutch and pressure plate, used carburettor and a big box of other bits and bobs, it couldn't be too much of a risk. I went onto a couple of websites for getting transport quotes. There's a number of these, and they let you put in your details and then the transporters quote you and bid for your custom. I ended up getting a quote of 350 quid sterling, which I thought was pretty good value. That was right to my door, so I did well on that one, became friendly with the transporter and developed a good contact for future use. So, I got the car back about a week later and as far as initial impressions go, my heart sank! For starters, it was absolutely filthy, with the type of ground in dirt that looked like it had been lying up for a very long time. There were leaf imprints all over the bodywork. I got it off the transporter and started it up. The engine sounded good, which was a minor respite to how I was feeling. The key in the ignition though, felt extremely tight, as if I turned it a fraction more than was necessary to engage the starter, it would break. My driveway is quite steep, and I drove the car up to the top of it, but it seemed very underpowered and I just about made it. After a few minutes idling, the engine developed a bad miss and began running very roughly. I turned it off for the moment, until I got the transporter sorted and away. I checked the car over and realised that the ignition key was a copy and wasn't right for the car. When you engaged the starter, it would often as not, fail to disengage after firing. This was purely down to the key being wrong for the car and sticking. On occasion, it was even possible to take the key out of the ignition, with the engine still running and the starter staying stuck! Furthermore:

- The wipers didn't work
- One of the headlamps was out
- The indicators didn't work
- The black Wartburg insignia was missing on the car
- There was a CD player in the car, minus the detachable cover, which was an eyesore and totally useless without it
- The Speedo was either disconnected or broken

Although the respray on the body had been well done, there were a couple of touch-ups on the car that had been done with the wrong shade of green, on the tailgate and front panel that houses the headlamps. The spare engine and box of parts had been put in the boot. The engine was pushed so tight against the tailgate, that I had great difficulty getting it open. How the engine didn't smash the rear windscreen on the journey to Ireland, I'll never understand. Apart from the disappointment I felt, the thought uppermost in my mind was, 'How did this car pass an MOT test four days previously?' Next day, I started the car and again it fired up with no problems and initially it ran well. Somewhat heartened by this, I took it out for a spin. I got about a quarter of a mile before the car started missing badly, making loud and horrible

cranking noises from under the bonnet. The power also had decreased at the same time, to the point where the car would start but would not drive. I had to park the car up and come back later to tow it home. All I could think of at this moment was, what a good job I didn't arrive in England to drive the car back!

I'm no mechanic but will do a bit of servicing and basic repairs. I realised that whatever was wrong with this car was beyond my capabilities and in the frame of mind I was in, the car seemed to be nothing but a disaster. I did feel that the loss of power was probably something to do with the fuel pump, but it could have been anything. The miss in the engine was very worrying, as well as the noises that accompanied it. I thought there was a big possibility that the spare engine I'd got with the car would be called into use. So, I towed the car to my mechanic, Noel and hoped for the best.



Figure 7: The rear door and front in ivory white looked okay, much better than I expected

The manual fuel pump in the car wasn't working or would work a little with the choke out. This explained why the car would drive a short distance, before losing power. As soon as the choke was disengaged, the car was being completely starved of fuel. He fitted a new electric fuel pump which worked a treat. The miss in the car was due in part to the carburettor, which ended up having to be rebuilt. This wasn't as costly as it might have been because the car came with a spare. Noel used the best parts of both carburettors to make one as good as possible. Although greatly improved, the car would still run rough and seemed to only run on two cylinders at times. Noel tested the 3 coils individually and they were fine, but he did find a broken earth wire under them when he had them out of the car, which was significant. The original carbon plug leads that were on the car were also faulty and once these were changed, the car ran as sweet as a Wartburg can. New NGK plugs were also installed. The speedometer as it turned out was merely disconnected. The wipers and indicators are powered by the same fuse, which just needed changing. A new fuse was needed for the lights as well. I got a new ignition switch from German Ebay with 2 keys for 25 euros delivered. I found a seller on Ebay UK who had original chrome 'Wartburg' insignia for sale and bought a set for about 20 euros and put them on the car. I got, also from German Ebay, a 'Konstant' radio from a Wartburg 311 and fitted it in place of the useless CD that was in the car.

Shortly after this work was done and the car had been used a few times, the alternator started playing up. There was no current going to the battery. I managed to find a brand new one (old stock) on German Ebay.

There were both new front brake pads and rear brake shoes in the box of parts, so I fitted these and changed the gear oil. The coolant system was then flushed and the coolant renewed, along with a number of hoses that had probably never been changed since the car was new.

I'm not mad on the bright green colour, so I had the tailgate and the front panel that houses the headlamps sprayed in Ivory white, which complements the green and also hides the touch-ups that were done in the wrong shade of green.

Figure 8: My Tourist with tailgate in ivory white.



I was far from happy with the people who sold me the car and told them as much. To cut a long story short, they agreed to refund me part of the purchase price, which went a little of the way to sort the car out.

When you focus on the negative aspects of any car, you are blind to the positives. The interior of the car is very good; seats and carpets came up great when thoroughly cleaned. The

bodywork is excellent, and the underneath is as solid as could be. The car has a massive history file and lots of receipts. The car came with an original GDR toolkit and first aid box which are very nice items. Likewise, the spare wheel has an original 'Pneumant' winter tyre on it. Now, the car has been sorted, it's an enjoyable drive and

I'd take it anywhere with confidence. This car feels faster and fresher than the one I had before. It's also quieter.

Figure 9: Dashboard of the Tourist. Note the fake wood veneer (sticky back plastic) on dashboard!



The car stands me a good few quid, but I'm now happy with it and I know I'd go a long way now to find a better one. For me, classic car ownership is as much about keeping cars on the road for as long as

possible, as driving the cars themselves. This car is as good as I can make it and should provide enjoyment for many years to come.



Figure 10: See the chrome insignia affixed

I took my fourteen-year-old son, Iain, to Berlin last week of June this year and we saw some cracking two stroke cars on our travels including a superb Wartburg 311. We stayed in Frankfurter Allee and enjoyed the break. Amongst other places, we visited Sachsenhausen concentration camp and explored East Berlin quite a bit, including seeing other, less known remaining parts of the Berlin wall.

For those interested in DDR history, there's a brilliant documentary made by independent film maker, Ian Hawkins, titled 'My DDR t-shirt'. In the film, he speaks to many former Berliners about what life was like in East Germany, and how their lives were affected in many ways, positively and negatively. The film is extremely well balanced and speaks to people from East and West. It's a very well-made film with lots of interesting DDR footage. He also visits a field full of Trabants in England.

This article about my Wartburg's appeared in 'Knight Rider' magazine, which is the Magazine of the UK IFA Wartburg/Trabant club. It appeared in the Summer/Autumn 2010 edition. I sold this car shortly afterwards and put the money towards buying my Wartburg 311.

This book will feature the two-stroke cars that I think are worthy of writing about. I have only included a small number of micro-cars, as there are so many of them and I don't have the same affinity for them as more practical cars and light commercials. I hope you enjoy this book and if you own a two-stroke car, feel free to contact me via email on bigmark7@gmail.com

I also write a blog, which you can find on www.wartburg353knight.blogspot.com and read many other articles about two-stroke cars.