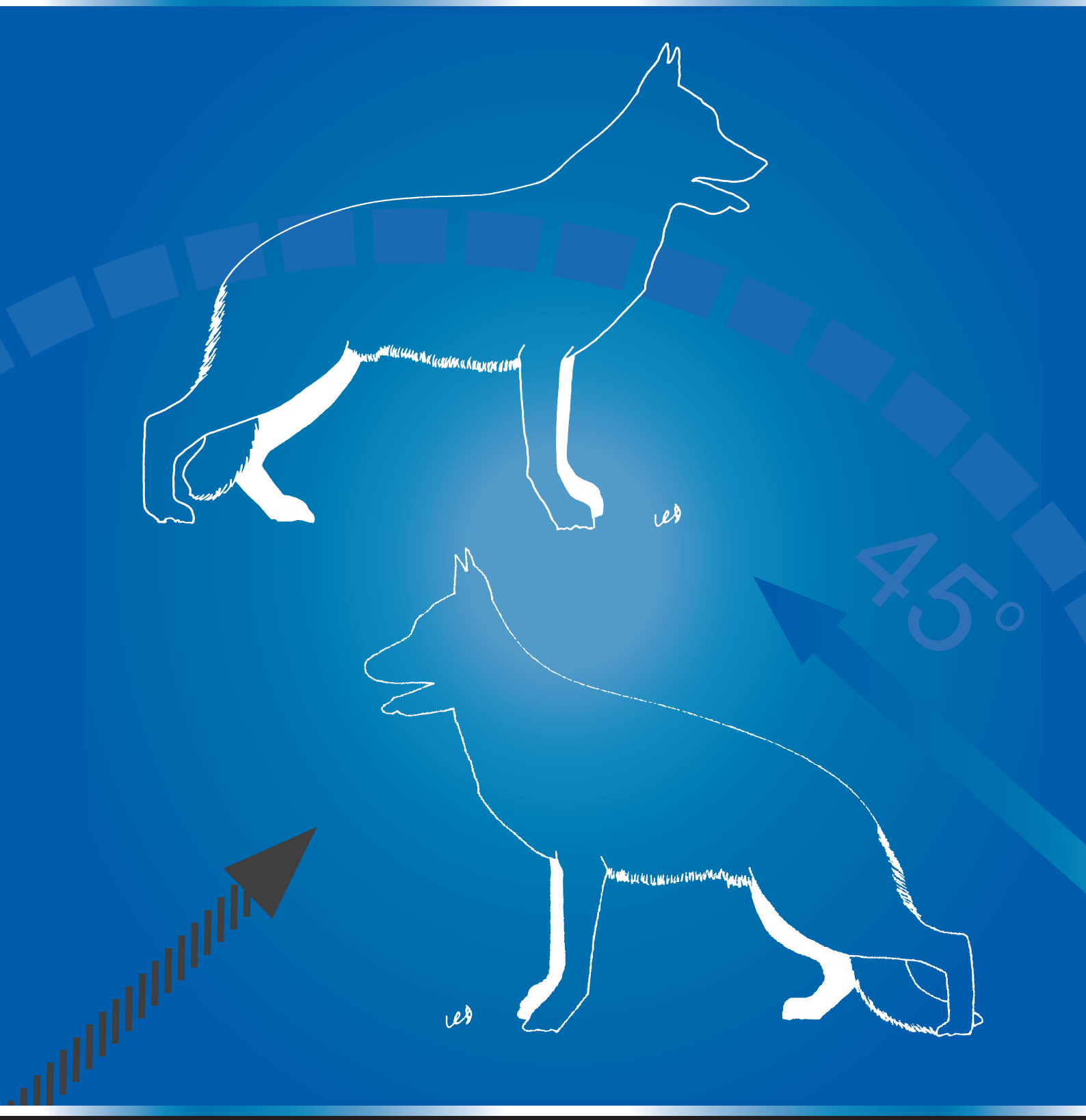
# A Discussion Paper on the Structure of the German Shepherd Dog




Louis C Donald

# Louis Donald

Louis has been involved in German Shepherd Dogs for 50 years and has had three primary mentors in his life and each has had a profound effect on him at both a dog sport and personal development level.

The first was Ian Stirton, Australia. Ian bred Louis' first dog and dedicated many years educating and mentoring Louis not just in regards to the German Shepherd Dog but all breeds of dogs. Ian instilled in Louis the fundamental principles of honesty and integrity above all other things.

The second was Madeleine Pickup, UK. Louis spent many years visiting Madeleine in the UK working in her kennels and travelled extensively with her in England and Europe. Madeleine instilled in Louis the importance that a dog's character and temperament comes before structure. Louis met his wife Gail through Madeleine, she was Madeleine's great niece.

The third was Dr Walter Gorrieri, Italy. Louis spent a considerable amount of time with Dr Gorrieri and he was, in Louis' opinion, the most knowledgeable person on the structure and movement of the German Shepherd Dog that he had ever met and this opinion still stands.

Louis started in the breed in 1962 at the age of 15 and by age 17 he was elected to his first official club position as Vice President of the Canberra Non-Sporting and Working Dog Club. At the age of 18, he was the club's Chief Training Instructor and President at the age of 20.

By 1980 his kennel 'Bratara' was the top winning German Shepherd Dog kennel in Australia having accounted for 160 Best Exhibit in Show awards. This included multi gold medal wins at Nationals where his kennel won the Breeders Group six times out of six times entered. His kennel had a number of major event Supreme Best Exhibit in Show wins where the entry was in excess of 5000 dogs. One of his German Shepherd Dogs 'Kurt' (Horand Prince Huzzar) won 56 Best Exhibit in show awards from 65 outings, this included Best Exhibit In Show at both the Melbourne and Adelaide Royals.

Louis became a fully licensed working dog judge in 1974, and in 1978 completed his exams in Germany to become Australia's first fully licensed SV German Shepherd Dog Judge, and at that time the youngest full list SV judge in the world. Louis is a licensed Breed Surveyor.

He was elected President of the German Shepherd Dog Council of Australia at age 26, a position he held unopposed for approximately 20 years. During this period, he either initiated or was the overseer of virtually all the major breed improvement schemes now in use by the German Shepherd Dog Council throughout Australia and for many years was the senior judge at the Council Main Breed Shows judging the Open Dogs.

His overseas appointments have included England where he judged the English National. He has judged in Italy, South Africa, Singapore, India, Philippines and many times in New Zealand, Taiwan, Thailand, Indonesia, Malaysia, and Hong Kong.

# A Discussion Paper on the Structure of the German Shepherd Dog

## Foreword

During my 20 odd years as President of the GSDCA I was a prolific writer of articles designed to educate, generate debate and make people think about where the breed stood at a point in time, where the breed was heading and where it should be heading.

The articles I wrote were supported by what I did when I judged the Open Dog Class at the Main Breed Shows and what I said at my post show Main Breed Show summations

In the time that I have been outside the Council I couldn't help but notice a lack of meaningful, factual, directional and cerebral reading material on this important topic and I feel that this has been to the Council and the breed's detriment.

In response to what I perceive as a need, I have written a paper that is in many ways an update of a primary paper I wrote some 15 years ago.

The discussion paper I refer to was based on the various faults and perceived future trends that I felt related to the breed at that time. The paper was supplemented by outline sketches using a master sketch as a template. This was presented to the annual meeting of the Breed Commission and was instrumental in providing clear breed direction and guidance to the Breed Commission and its Breed Surveyors.

The master outline and sketches were done by me from a more detailed sketch that was part of a series of copyright sketches that had been drawn by the late Dr Walter Gorrieri who, I am proud and eternally grateful to say, was a very close family friend and to this day remains as my most significant guide and mentor.

At the time, the Gorrieri sketches were considered by many leading authorities on the breed particularly in Germany, as an accurate depiction of the ideal German Shepherd Dog based on the written Standard at that time and as a matter of interest Dr Gorrieri's opinions and sketches were an important consideration in the SV review of the 1961 standard and had a significant impact on its subsequent 1976 amendments. Even today many people consider the Gorrieri sketches as accurately depicting the ideal German Shepherd Dog, but over time 'show trends' have changed some elements of his interpretation, but nothing new in that!

I say 'nothing new in that' because inevitably human beings will take a perfectly functional piece of equipment or an animal be it a dog, horse, cat, bird or whatever and fiddle with it and eventually their fiddling will result in primary elements or characteristics being emphasized through exaggeration. Often this exaggeration starts by an intentional but more often than not unintentional developmental exaggeration within the breeding kennel of someone of influence and the exaggerated characteristic eventually develops to the point of being an entrenched characteristic and hallmark of that kennel. An example of this might be using a dog to reduce size but introducing overangulation of the hindquarters! The kennel owner then sells the exaggeration as an improvement saying the exaggeration is 'better' and more often than not their better is not better but their influence as a breeder and or judge strikes fertile ground within their immediate entourage and within their field of influence. The entourage accept from their Guru that the change is better and they will convince themselves that the exaggeration is better functionally and as an added bonus more pleasing to the eye. If they and in turn their immediate entourage try hard enough, are persuasive enough and are influential enough this exaggeration eventually feeds its way down to judges and from there to exhibitors and eventually to breeders most of which feel they have no choice other than to follow the trend. Some breeders do not follow the trend and if the trend is strong enough they go from a kennel of significance and major importance to one of total obscurity. Dog history is littered with such events and such kennels.

When these events occur the exaggeration very often continues its trend line until it gets out of hand and inevitably in one way or another it does get out of hand and when this happens the pendulum swings back to the perfectly functional ideal or as is the case in the USA and the UK where the exaggeration becomes so endemic, so entrenched and unfortunately for the dog, so popular, the breed effectively splits into two separate breeds. One breed remains the German Shepherd Dog, a dog that is inherently anchored to the ideals of being a functional, trotting, enduring, sheep herding dog. The other, a dog that has been modified through exaggeration to appeal to a human being's perception of beauty is no longer anchored to the sheep herding ,working dog ideal and becomes nothing more than a 'show dog' and a dog of 'perceived beauty'.

*Champion Marquin's Xtra - Excellent Select graded and two times American Grand Victor*

*Champion Tarquin of Dawnway - considered by Alsationists in the UK to represent the ideal Alsatian and a type that still has a great influence on many All Breeds judges both within Australia and overseas*

I wish to convey to the reader that in putting this discussion paper together I am trying, as best I can, not to be judgemental about any dog, judge or breeder, nor am I saying that the SV or any Kennel Control should modify its direction nor that judges and breeders should modify or take a new direction.

To qualify my comment 'as best I can'. I say this because I understand that regardless of my intent the way in which I comment on and explain some matters will lead to me being accused by some individuals as being judgemental, but so be it!

What you will read here is based on my opinion and my endorsement of other people's opinions and most importantly, it is supported by my lengthy experience and involvement in the breed at virtually every level. I have written this paper in order that the reader, particularly the novice might see various structural issues through my eyes and via my comments and explanations, see issues of importance with better understanding and greater insight. Most importantly is for the reader to be able to do this using factual information as opposed to the usual mix of fact and fiction interspersed with anecdotal, biased and far too often opinion expressed by people who have been involved in the breed for five minutes and because they were fortunate enough to have a spin of good luck in breeding or the show ring, think they know it all.

I have been involved in the German Shepherd Dog breed for 50 years and in that time I have experienced a fair bit and learnt a great deal from people, many of whom were far more learned than me. From that experience I am putting forward my observations based on what some readers may consider are fundamental and already well understood aspects and developments within the breed. This may well be true and so that I might maintain the interest of those more learned people amongst us I have included more complex, technical, challenging and controversial matters and in this regard, God forbid, making comment on the 'elephant in the room'.

Be you a novice, an experienced exhibitor, an experienced breeder, a judge or a breed surveyor, I hope you find this discussion paper interesting, educational, insightful, thought provoking and challenging. Above all, I hope you find something in it that is beneficial and through you, this will in turn be of benefit to the German Shepherd Dog in Australia.

*Louis Donald*
*Past President GSDCA, ANKC Working Dog Judge,*
*SV German Shepherd Dog Judge, Breed Surveyor*

***Figure 1:***
*The ideal German Shepherd Dog in a typical show stance of the day*

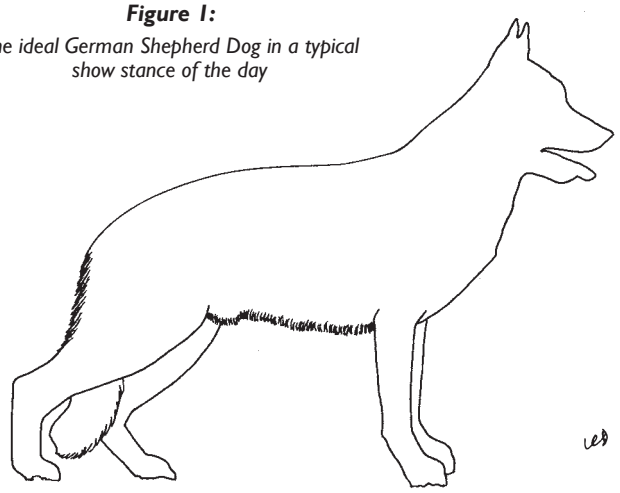
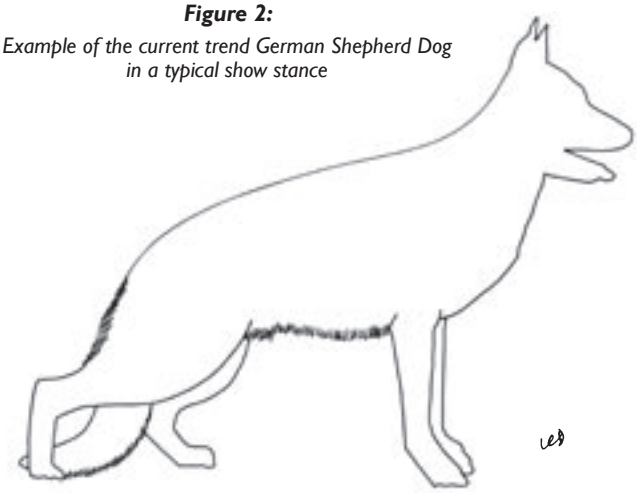


***Figure 2:***
*Example of the current trend German Shepherd Dog in a typical show stance*



This discussion paper commences with two outlines, Figure 1 and Figure 2 with both dogs drawn standing in what would be considered a 'typical show stance of the day'. The reason I have these two outlines is to depict what I consider to be the ideal outline of a male German Shepherd Dog - Figure 1; and to depict what I see as a typical outline of the 'developing trend' male German Shepherd Dog - Figure 2.

I am speaking here as a generalization and throughout this paper for practical purposes I am using as a reference point dogs sketched in outline or using their photo. If I make a comment on a photo that relates to a specific feature then the reader needs to appreciate the context in which the comment is made is based on what is seen on that dog in the photo and not what it may display in the flesh and particularly in movement.

Without wishing to state the obvious nor labour the point, I make the above comment because a dog in a photo can look 'very different' in the flesh and particularly in movement and many people including myself have purchased a dog from overseas to find this out to their great dismay and to their financial detriment.

Referring to these two outlines, and keeping in mind what I have just said, the facts are that in today's specialist ring, six to seven times out of ten the dog depicted in Figure 1 would be beaten by the dog depicted in Figure 2 and I predict in the forthcoming years the dog in Figure 1 will be beaten nine times out of ten if not ten times out of ten by the dog depicted in Figure 2. Yet by definition of the first paragraph of my introduction it should be the reverse!?

Before I comment on the reasons why I make these comments and predictions, let us have a quick run through some of the main points that you can see on these two dogs and then follow this up with a more detailed analysis and explanation.

The heads are basically the same and my only comment here is that in Australia we now have too many dogs and bitches that are refined in the head - they are not bad heads but they are not strong enough. Further refinement of the head,

especially the foreface, has a direct correlation to dropped incisors, the lower incisors 1+1 are pushed together and forced downward as the lower jaw narrows and in their worst situation end up pointing outwards. After this can come underdeveloped teeth, particularly the P1 and even the P2 where the P2 becomes the size of the P1 and is often wrongly critiqued in shows and breed survey as a double P1 with a missing P2. In the worst manifestation the P1's will actually disappear.

Many years ago I used to stay with very good family friends Danzio and Rina Gobbi of 'Dell Alta Quercia' kennels in Italy. They owned many very good dogs including multi VA and Italian Sieger Mutz v d Pelztierfarm.

I remember one day grooming Mutz and I had two thoughts. First, was that I should bag his hair and sometime in the future split it into little souvenir bags and sell them and second was that because I couldn't help but be taken by the size of Mutz's head and particularly the width of his skull, that I should measure the width of his skull to keep as a reference.

*VA Mutz v d Pelztierfarm SchHIII with Rina's daughter, Diletta*

The only measuring implement that I could think of that I knew I would always have with me was my hand. I stretched out my thumb and little finger as wide as I could and placed my open hand across the top of his skull. The outside tips of my fingers just covered the span of his skull. Try that next time you are standing next to an open dog!

One comment I would make on ears is that breeders need to be aware of a growing number of dogs here whose ears are a little large, a little open and somewhat thin in their leather.

It may appear to the reader that the depth of chest, length of foreleg and height to length proportions of these two dogs are different but in fact both dogs are the same. Doesn't look like it does it?

Both dogs have been drawn to a scale to represent a height to length of about 115% where the length is 15% longer than the dog is high.

The depth of chest and length of forelegs are the same based on a 55% length of foreleg to overall height percentage meaning the forelegs are longer than the chest is deep.

In regard to the height of the dogs, they are a little different. To demonstrate the trend change from 20 years ago to now, the dog in Figure 1 remains scaled as he was at a height of 64cm and the dog in Figure 2 is set at 65cm. Perhaps it should have been a little more?!

The withers on the dog in Figure 2 are long and sloping but because of the significant slope and 'slight curve' to the back they are not as defined as the withers on the dog in Figure 1. Whilst the shoulder blades are well positioned relative to the thoracic vertebrae, and therefore by definition the withers are high they are not quite as high as the withers on the dog in Figure 1, nor are they as long.

The back, which is defined here as being 'the section that goes from the end of the withers to the start of the croup' is straight and shows a slight slope on the dog in Figure 1 whilst in Figure 2 the back has a significant slope and there is a 'slight but discernable curve' over its entire length.

This, along with the hindquarters, is 'the elephant in the room', and more on that later.

Croups are the same length but where the dog in Figure 1 has a correctly angled croup, you can see that the croup on the dog in Figure 2 is more inclined, it is steeper.

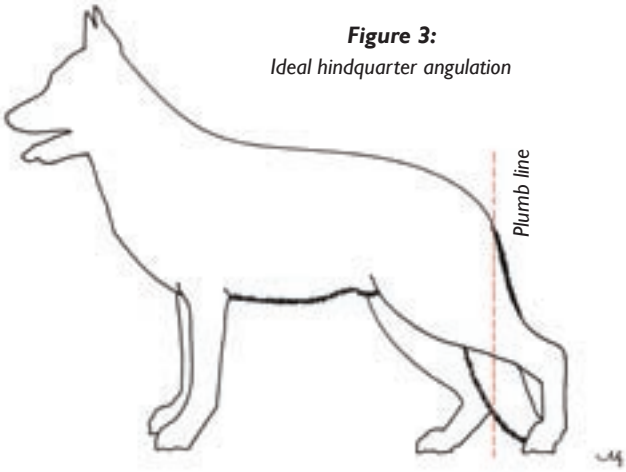
Both the upper thigh [femur] and the lower thigh [tibia] on the dog in Figure 1 are the correct length and angle whereas in Figure 2 they are considerably longer and the angles are not the same, more particularly the angle of the lower thigh, the tibia.

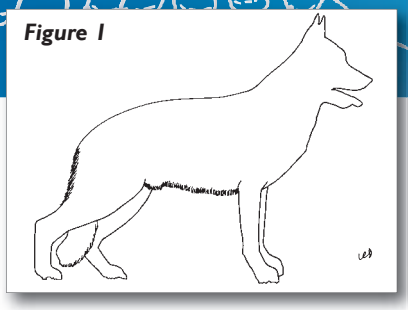
The dog in Figure 1 is posed with the rear-most hock in a basically plumb position and the front of the foot is positioned just behind an imaginary plumb line dropped from the rear of the pelvis whereas the hock on the dog in Figure 2 is angled slightly. More significantly, the rear-most hock and foot on the dog in Figure 2 is 'well behind' the rear of the pelvis and if you look at the further most hock, the one on the far side of the dog, you will see a difference there too in the angle of the hock relative to the ground. Like the foremost hock the far side hock is angled inward slightly as in mild cow hocks but you can't appreciate this in the sketch.

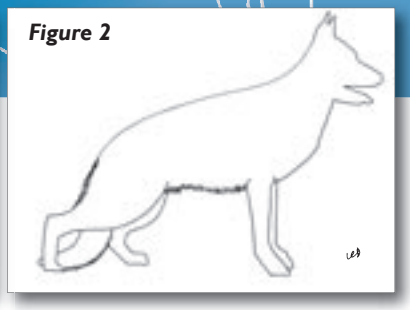
It is important that I make a comment here in regard to the fore-most hock position as its impact on making an assessment of a dog in stance is very important. In stance the fore-most hock has to be extended back and placed in a plumb/vertical position in order that an accurate assessment of the withers, the back, the angle and length of the croup, the rear angulation and the length to height proportions can be made.

If a German Shepherd Dog has the correct length of both the upper and lower thigh bones when the hind foot is positioned about 50mm just behind the rear of the pelvis i.e. just behind the rear-most point of the ischium and the hock at that position is vertical as seen in Figure 3. It confirms the hindquarter angulation is in all respects correct.

***Figure 3:***
*Ideal hindquarter angulation*






If you keep the foot in that fixed position just behind the ischium any deviation in the hocks vertical line either falling backward from the dog [over angulated] as seen in Figure 5, or forward [under angulated] as seen in Figure 4, is a deviation away from the ideal hindquarter, be it due to insufficient or excessive length of the femur and or tibia.

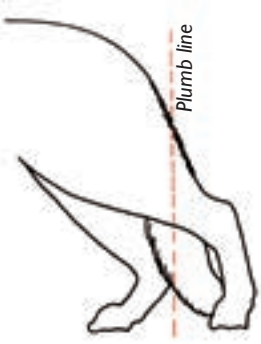



***Figure 4:***
*Under angulated hindquarters*

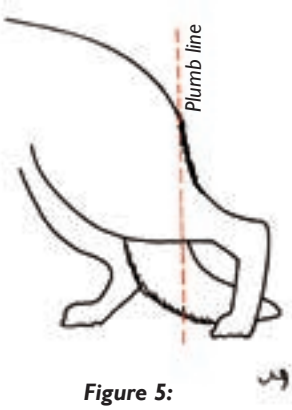



***Figure 5:***
*Over angulated hindquarters*

The dog in Figure 2, as tends to be the common practice today, is overstretched, all be it slight compared to what you normally see. As a consequence, the hock is not plumb and this combined with the overly deep hindquarters causes the backline to slope downward. As a consequence, particularly for the inexperienced, it becomes quite difficult whilst the dog is standing to assess all those features mentioned earlier.

Why and how have these changes as depicted in Figure 1 to Figure 2 happened?

Before we go into that, if the reader accepts what I have depicted and described in my comparisons, then the question should be asked, is this trend and development good for the breed and is it in the breed's best interest?

The question should also be asked is this the development of a 'classic human trend pattern' where we are exaggerating component parts because we believe more is better, but in doing so is it at the expense of the dogs inherent functionality and reason for being and to some degree is it to the detriment of the dog's health? Or is this an improvement, all part of the evolutionary development that Max Von Stephanitz envisaged for the breed and confirmed in his blueprint for it?

If a straight back is desirable because it's considered to be stronger than a weak back then just like the Sydney Harbour Bridge, isn't a curved back even better? If you are talking about a static, unyielding bridge the answer would be yes, but if you are talking about an agile, trotting and fluid working dog where upward and sideways flexing of the back is required then the answer is no!

If the Standard states that the hindquarters must be strong, well-muscled, powerful and capable of carrying the body effortlessly forward then aren't longer bones in the hindquarter that will give longer muscles and therefore greater muscle mass and one assumes greater hind quarter thrust, better?

If you say yes, take my response with the consolation of knowing you are in the vast majority but the answer is no!

Some quite basic and fundamental facts may help to provide the reader with an understanding of my responses and at the same time provide something to contemplate. But having said this, if the reader is only interested in the German Shepherd Dog as a show dog and as a pleasing aesthetic, and does not believe in the concept and ideal that the German Shepherd Dog is fundamentally and inherently a sheep herding working dog, don't bother reading on!

See video of Brix vom Eichenluft HGH http://www.youtube.com/watch?v=b45WYL_2Xb8&feature=related

In the context of the German Shepherd Dog sport, I am a show judge not a working dog judge but I believe in the fundamental principle that in judging the German Shepherd Dog it should be judged on the basis of it being a trotting, endurance, working sheep herding dog.

What I am going to cover here is based on my own experience and observation and from what I have learnt about the breed from talking to and reading the work of many very knowledgeable people. A great number of them were acknowledged Internationally as leading authorities on the breed, some studied not just dogs but all sorts of animals and dare I say it here, quite a few had no direct involvement with German Shepherd Dogs but they were extremely knowledgeable about dogs in general and within their field of expertise highly respected throughout the World.

German Shepherd Dog enthusiasts tend to be very focused and very one eyed about the breed and so it was that my mentors who were not directly involved in the breed encouraged me to occasionally step away from the individual trees and see the forest, encouraged me to make objective comment, encouraged me to be factual in whatever I said and to the best of my ability guide the breed without the encumbrances of personal bias, ego, and fear of peer pressure.

With that in mind let's go into more detail on the previously covered general comments.

## Proportions

Long established observation, engineering principles and scientific tests have proven that the ideal proportions for a trotting dog where endurance is paramount is 8.5 or 9 to 10.

For the reader's interest, a ratio of 9 to 10 was preferred and referred to by Von Stephanitz in his writings where he quoted Stroeze who preferred the ratio of 9 to 10. Interestingly, Von Stephanitz noted that statistically, perhaps inherently, bitches where a little longer than males and put this down to bitches needing the extra room to bear puppies.

Out of curiosity the question could be asked, which of the two ratios are better?

All things being equal particularly in regard to foreleg length and speaking in the context of complete stepping cycles even though it may be minimal, over a short distance because of lesser body length, a dog with a ratio of 9 to 10 will require more stepping cycles than a dog with a ratio of 8.5 to 10.

Over a long distance the former will require more steps to cover the same ground and one would assume that as a consequence consume more energy and whilst I prefer a ratio somewhere between 8.5 and 9 given the above, the current preference toward 8.5 to 10 is understandable and has merit.

For those who are new to the dog sport and may not be aware, the length of a dog is measured from the tip of the prosternum, the fore chest [manubrium] to the end of the pelvis [tuberosity ischiatica] See Figure 6.

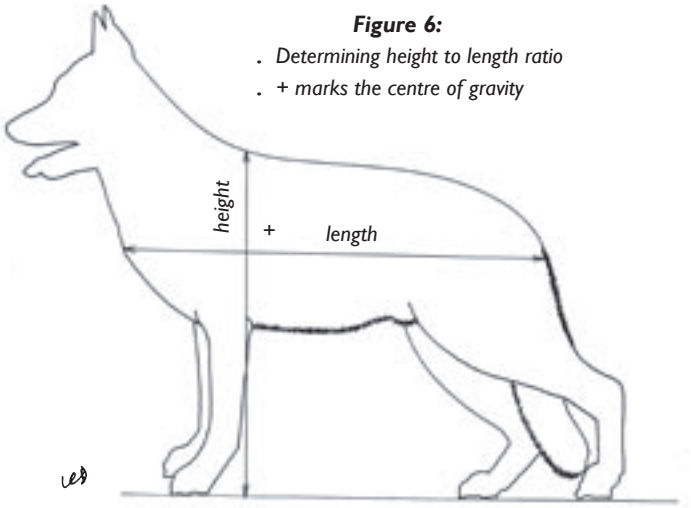



***Figure 6:***
*. Determining height to length ratio*
*. + marks the centre of gravity*

In our breed the length of the dog, unlike its height, tends to be an uncontroversial measurement mainly because variances in the length of the dog are not listed in quantifiable terms as 'disqualifying faults' whereas relatively small variances in height, just like the teeth are listed in quantifiable terms as 'disqualifying faults'.

Not all working dogs require these relatively stretched proportions and it is good to be aware of and understand this and why.

Once the ratio moves from 9 toward 9.5 giving a squarer dog, this assists a dog in its ability to gallop and for some breeds, such as the Old English Sheepdog which works sheep on hillsides, this is beneficial but it is at the expense of an expansive, ground covering enduring gait, generally carried out by the German Shepherd Dog over flat ground.

Just to confuse things a little but in a desire to broaden your understanding of movement it is worth mentioning here that there are breeds of working dogs such as the Samoyed where long distance enduring trotting is required but they are almost square in their proportions! In the case of the Samoyed, whilst it is a long distance endurance trotter, it is a sled dog with squarer proportions combined with shorter forelegs and lesser angulations that give greater pushing abilities than ground covering abilities which are the most effective in pulling a sled at a trot over a long distance. The message here is, proportions relate to function.

## Height

The height range was determined by Von Stephanitz as the ideal relative to a trotting, endurance, sheep guarding and sheep herding dog and for the benefit of the novice I will explain how the height is measured.

The height is measured from hard surfaced flat and level ground to the top of the withers where the determinant point at the withers are set by a plumb line that runs from the ground to the withers virtually parallel with the back of the foreleg when the foreleg is plumb and the dog is standing four square with the neck carried normally and not in a subdued or person handled depressed position. Other than the top of the approved measuring stick being gently pressed to ensure it is not sitting above the coat but on top of the shoulder blades. It should not be forced down.

Simple really, isn't it? It is simple, it should be simple, but it's not!

Before I decipher what I have just said it is very important for the reader to understand and accept that the taller the dog gets 'if it is to maintain correct proportions' the more mass it will accumulate and therefore more weight and as a result as German Shepherd Dogs get taller they take on a significant handicap in regard to energy consumption and endurance.

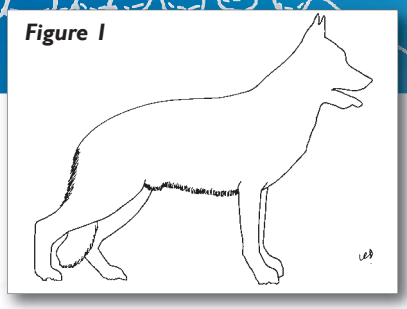
There is an extraordinary and understandable infatuation within the German Shepherd Dog fraternity for the dogs powerful, speedy, determined, and seemingly gravity-defying suspended in the air gait. This is one of the most unique and sought after characteristics of our breed.

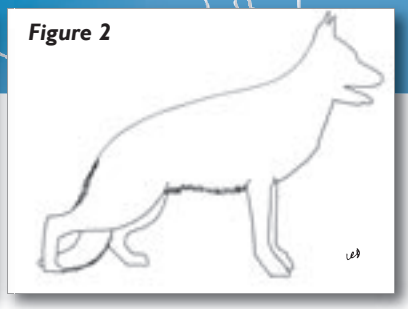

*Nicely balanced movement*

The irony here is that over size, and its associated companion extra mass and weight, is not conducive to such a characteristic 'particularly after an extended period of trotting'. However, in the context of the ideal dog's requirement for expansive, ground covering trotting with equally extraordinary endurance capacity, how often if ever does this factor get put to the test?

Practicality of course prohibits endurance being tested in a show environment and there are many who would say that the dogs exhibited in the show ring don't work sheep and therefore such an exercise would be totally irrelevant. I understand this argument of course, but all the pity, for such a test of endurance on many top winning dogs would be profound and show the problem of oversize for what it really is!

The problem of oversized dogs is exacerbated by the fact that if an oversized dog is fit and strong and is in proportion to its height then the mere fact that it has longer legs and a longer body allows it to cover more ground and effectively out gait its 60.0 cm to 65.0 cm competitor. Putting aside the reality that a bitch of 55cm and a dog of 60cm has absolutely no chance of winning, then correctly sized dogs are at a disadvantage. Yes I can hear you say that as a judge you take into account size but I won't even bother going there! What I have said is fact and that is why the oversized dogs remain in the breed and




too often beat dogs of equal construction and correct size. The problem is that in doing so, these dogs remain a perpetuating impediment to the breed at least in the context of the very basic and fundamental importance of abiding by the Standard and the dog having to possess outstanding long distance trotting and endurance capabilities. After all isn't it this characteristic of the German Shepherd Dog that determines not all, but a great deal of what is written in the Standard and isn't what Von Stephanitz wrote in the standard as a blueprint what we as the future caretakers of the breed committed ourselves to uphold and perpetuate? Isn't this our entry price and obligation?

All things in judging must be relative and I understand the concept of 'don't throw out the baby with the bathwater', but judges who don't have the concern or indeed the fortitude and self-confidence to penalize an oversized dog, particularly a dog that is well oversized say in the 67 cm plus range and falsify the height, do a great injustice to the Breed and to themselves. Particularly if this is done at a Breed Survey and more particularly at a German Breed Survey because such a dog, if it is sold to Australia, is measured here at a compulsory 'check survey'.

Some would and do call this GSDCA procedure an audacity, perhaps it is, but interestingly the last dog I measured at a Survey that was classified Class 1 in Germany and recorded on the survey certificate in Germany at 65cm, was measured by me at 68cm! This helps no one, especially the person who purchased the dog, presumably believing it was 65cm.

My experience is that very few Judges or Surveyors have a problem determining a dog's true height. The problem is what they then do with that measurement! This is the real core of the problem!

You can introduce all the rules, regulations, procedures and dictates you like but if Judges and Surveyors read a height and then reduce it, these counter measures amount to nothing. Too often when such judges or surveyors are cornered with irrefutable evidence of the dog being oversize, they simply deny the dog's true height or ignore what the Standard dictates and inevitably in a futile attempt to justify what they have done will tell you a story along the lines that the increase in size is a natural evolutionary development associated with better diet and as an analogy will tell you that even the Chinese are getting taller because they don't eat as much rice as they used to! The absurdity of it all is that an otherwise lovely dog with say a few misaligned incisors will be relegated to the middle of the class yet a horse of 68cm, and even 69cm, will win the class!

Given the endemic problem we have with size the current survey classification in Australia which allows a bitch of 62cm and a dog of 67cm to be classified is retrograde in its thinking and does nothing to keep size in check and simply allows further height creep.

Even though a Surveyor may give height advice the scheme allows a 62cm bitch to be mated to a 67cm dog. This isn't right! Breed Survey classification is the breeds control mechanism and at breed survey the maximum size for class 1 should be gradually reduced back to 60cm and 65cm – end of story! What occurs at a dog show is a slightly different matter as competition, relativity, and even the Country you are judging in become issues for consideration.

## Foreleg Length

As I said earlier, the forelegs are drawn the same length on both dogs in so far as the forelegs are drawn 5% longer than the dog's depth of chest. As a 'general rule' when determining the foreleg length as a proportion of overall height on dogs in general, it is measured by determining the depth of the chest not the length of the foreleg to the elbow and this is because various breeds have various ideals. For example, the Dachshund is required to have its elbows above the line of the underchest and Greyhounds below the line of the underchest.

The ideal proportion of leg to chest depth relates to the dogs function.

In the German Shepherd Dog the ideal proportion is mid-way between the above two examples for the reason this ratio is the one best suited to long distance trotting dogs. The German Shepherd Dog does not need the very long legs of Sight Hounds such as the Greyhound, where rapid speed and great ground cover over a short distance is required, nor does it need the stability and strength of the short forelegs of the Dachshund where the emphasis is on forelegs that are ideal for digging.

As an intermediate to these two extremes, the trotter performs at its optimum when it has its elbows located in line with the underside of the chest, and whilst the length of the foreleg should be determined by measuring the depth of the chest and dividing this into the overall height to get a ratio, the tendency is for German Shepherd Dog Judges, who do everything by sight, is to make an assessment by looking at the elbow and determining a percentage of leg length to body depth from that. This is often misleading just as it is to make an assessment of leg length or chest depth by looking at the underline and describing a well coated dog with full underchest feathering as too deep in chest or too short in foreleg.

In my opinion, the Breed Survey process should call for a calculation to be made on the measurement that is taken on chest depth and expressing it as a ratio to the overall height e.g. 1.1 to 1.0 where 1.1 is the foreleg. The reason why the legs are required to be relatively long and are a highly desirable characteristic to have in a German Shepherd Dog is explained in detail later in the article.

## Heads

The heads are the same in figure 1 and figure 2 and depicted as being close to the ideal but I do reiterate my earlier comment about the strength of heads and relationship to the teeth. The old adage that says 'show me a dog that has a refined head and throws refined heads and I will show you missing and underdeveloped teeth' stands true.

I have also observed quite a few dogs, generally males and interestingly nearly always associated with a distinctly masculine head, where the planes of the skull and foreface are out of alignment, out of parallel, creating a dish faced appearance – see photo. Given this, I have to say that I found it both curious and surprising that the Standard's requirement

for parallel planes of the skull and foreface has been deleted from the most current Standard - December 2010 SV / FCI /VDH.

*A beautiful male head spoilt by the planes of the top of the skull and foreface being out of parallel*

On a final point I mention that people should keep an eye on skulls that are too round, almost apple shaped. This can be seen not just when viewed from the front of the dog between it's ears but in side profile

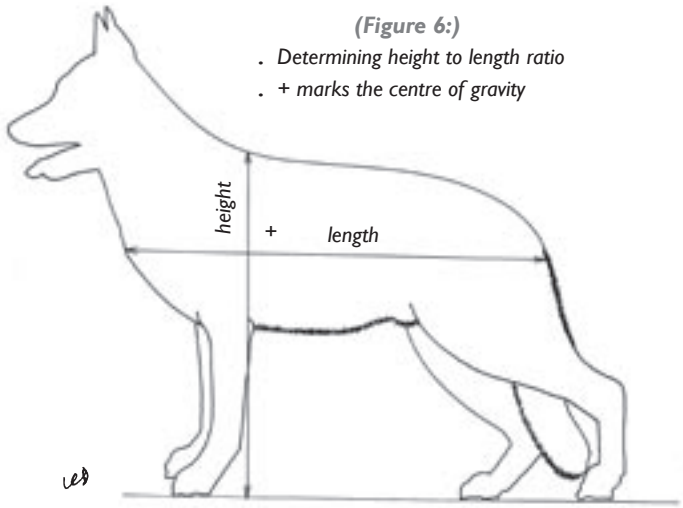
*A lovely strong masculine male head spoilt by a slightly domed skull together with the planes of the top of the skull and the top of the muzzle being out of parallel.*

## Neck

In both Figures the angle of the neck is set at 45 degrees to the horizontal plane and 90 degrees to the shoulder which in the latter is considered by many 'but certainly not all authorities' as the ideal angle of the shoulder blade for a trotting dog i.e. 45 degrees to the horizontal, but more on that later.

I have shown the neck length as being the same even though it could be said there are a number of dogs around that are short in neck but this isn't considered by me to be a point worth making on the diagrams as on the whole the strength and length of necks we see here are fine.

A comment I would make though in relation to short necks is that in movement dogs with short necks tend to lower their head. The reason this happens is because the neck has a function as a balancing mechanism during movement and the centre of gravity which is located just forward of the anticlinal vertebrae and shown in Figure 6 as a "+" is shifted toward the rear causing the dog to lower its head in an effort to bring the centre of balance forward and in doing so achieve easier lift to the forehand. This counter acting action reduces the effectiveness of the Brachiocephalicus and Omotransversarius muscles on the forehand and depending on the degree of the shortness of the neck will slightly reduce the fore reach.




***(Figure 6:)***

- *Determining height to length ratio*
- *+ marks the centre of gravity*

On the other hand if the neck is carried too high during movement, generally as a result of a long but steep upperarm accompanied with a very well laid shoulder blade, the foreleg will be pulled upward by the Brachiocephalicus muscle - see Figure 7 and as a consequence the dog will have a high stepping hackney pony like action and the degree of high stepping will be directly proportionate to the hindquarter drive.

The effect of this high neck carriage is that the dog will be forced to lift it's foreleg at its elbow and in its forward reaching arc the fore leg will stretch out further than is practicable and the foreleg and foot will be lifted too high from the ground. It should be kept in mind that as a general rule when a dog is

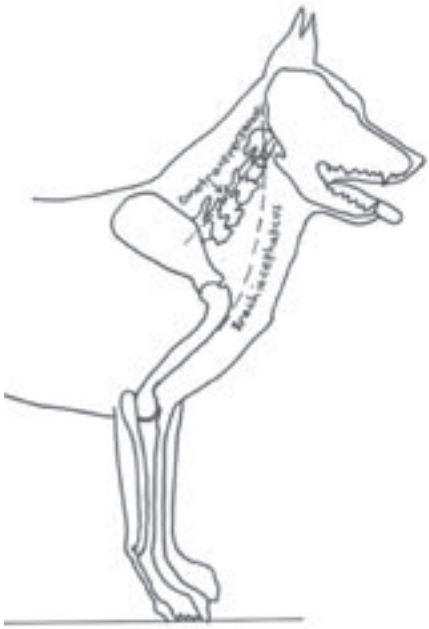
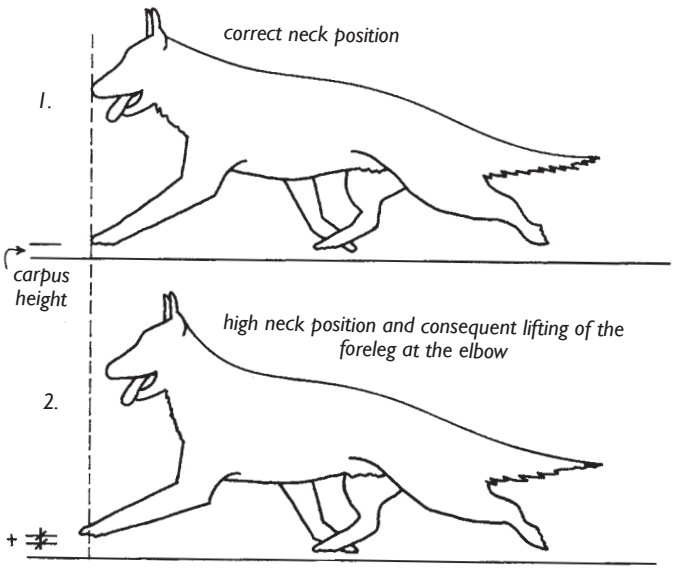


***Figure 7:***

*The neck's two primary muscles*

gaiting for optimum efficiency the front feet should not rise above the ground any higher than the height of the carpus. See Figure 8 and dotted line.

***Figure 8:***




1. *Correct neck position*
2. *High neck position and consequent lifting of the foreleg at the elbow*

If you look closely at a dog with this characteristic high stepping action toward the end of its forereach cycle, if there is a mismatch in the foot fall sequence between the hind feet and the fore feet, the fore foot and attached forehand will, just as the front foot approaches the ground, drop suddenly. It's a very small vertical drop and it isn't always there, sometimes it's obvious and sometimes it's barely perceptible, it all depends on the various elements that interact with each other during the movement cycle and foot fall sequence.

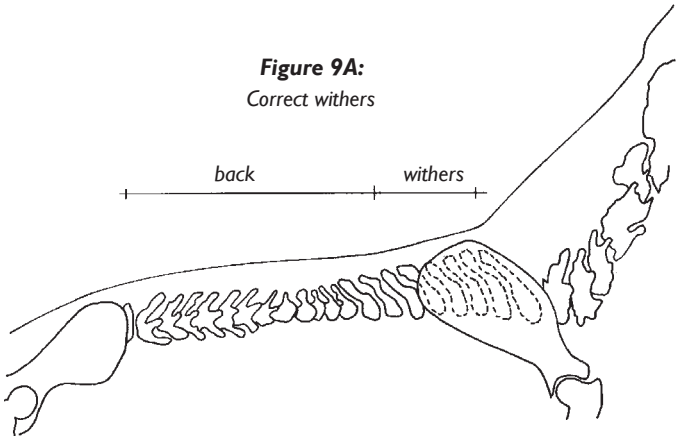
The degree of this energy sapping, non-enduring, high stepping fore action is determined directly by the hind quarter; specifically its degree of thrust and therefore the way some people try to disguise or at least reduce the high stepping is to tire the dog out before it goes into the ring. This works if you're doing two 'nice and easy as she goes' laps around a small ring behind a miniature poodle but not if you're in a large specialist ring where all the dogs are going like hell and the dog in question has been trained to do likewise.

The reality is that the best outcome in these high stepping cases is achieved when the dog is moderately angulated in the hindquarter and a touch lacking in drive thereby demonstrating the not uncommon but ironical situation where two faults are better than one!

## The Withers [and their relationship to the back]

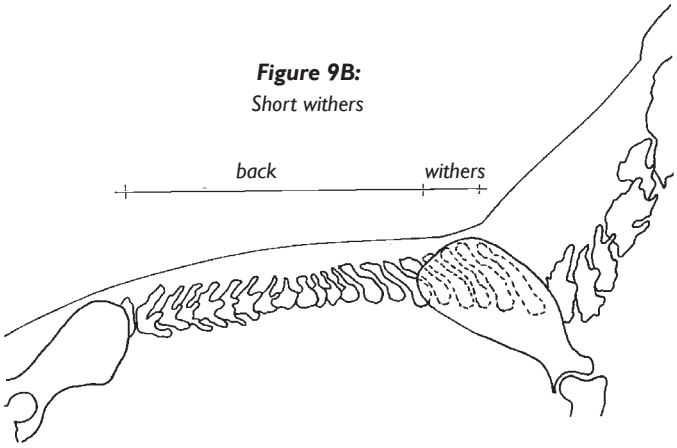
The withers are the section that commences at the base of the neck, immediately after the last cervical vertebrae and end at the start of the back. They span across the top of the shoulder blade and encompass around four of the thirteen thoracic vertebrae. This can be seen in Figure 9A and while looking at Figure 9A keep in mind this shows a dog with high withers therefore four of the thoracic vertebrae are lower than and therefore hidden behind the shoulder blade.

***Figure 9A:***
*Correct withers*



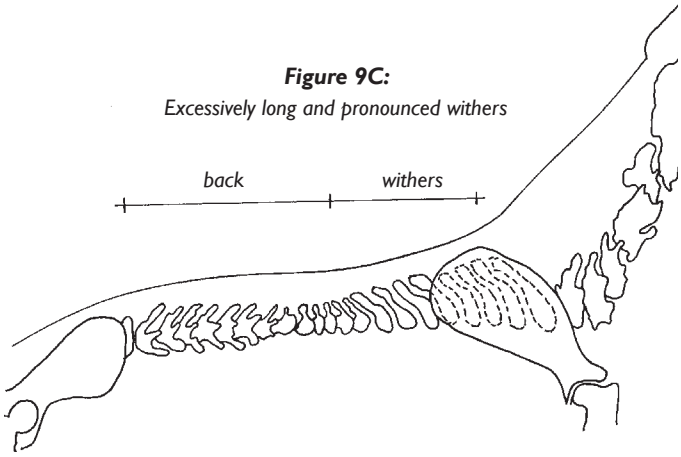

*Showing a straight back running into high, long, defined withers giving excellent attachment of the serratus ventralis muscle to the shoulder blade.*

***Figure 9B:***
*Short withers*



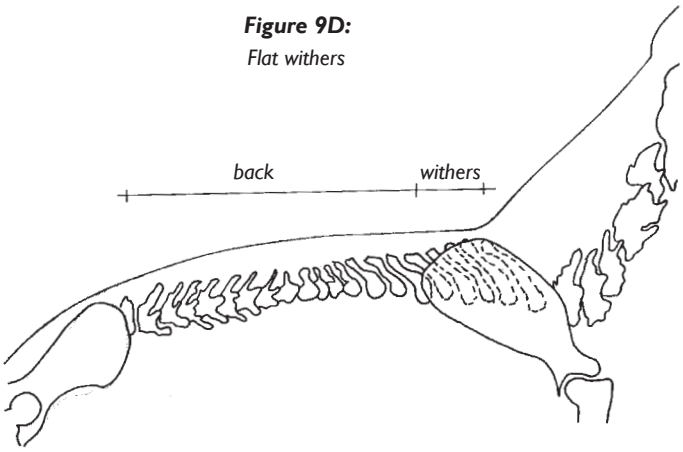

*Showing a slight curve to the back with consequent elevated thoracic vertebrae that run into the scapula at a higher point. This creates short withers and less secure attachment of the serratus ventralis to the shoulder blade.*

***Figure 9C:***
*Excessively long and pronounced withers*




*Showing a weak back which creates excessively long and very defined withers but still very good attachment of the serratus ventralis muscle to the shoulder blade.*

**Figure 9D:**
*Flat withers*



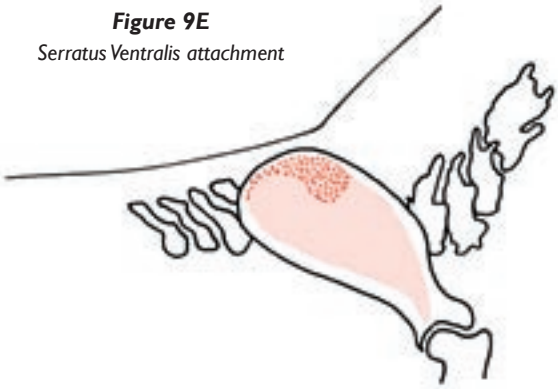

*Showing a curved back with consequent highly elevated thoracic vertebrae that run into the scapula at too high a point. This creates flat short undefined withers and consequent poor high attachment of the serratus ventralis muscle to the shoulder blade.*

The withers area contains substantial muscles which move and direct the shoulder blades. Three primary muscles attach the shoulder blade to the rib cage. The largest of these are muscles that fit between the inside of the shoulder blade and the rib cage and they are the serratus ventralis and lesser rhomboideus muscle. They allow the forehand to rise and fall during movement and for the shoulder blades to rotate during the dogs various movement cycles and absorb the enormous impact forces of the forehand when the dog is gaiting, galloping, jumping, turning and undertaking a whole myriad of agility manoeuvres.

The Rhomboid muscle is attached to the thoracic vertebrae and across to the top edge of the scapula. Whilst one of its functions is to hold the scapula onto the rib cage its primary function is to retract the scapula, to pull it inward toward the thoracic vertebrae. As the tops of the shoulder blades get higher in relation to the dorsal vertabrae they become closer and as a consequence the rhomboideus muscle spans a lesser distance. This creates firmer tighter withers during movement

The Serratus Ventralis which is a 20 mm thick fan shaped muscle originates on the first 8 to 9 ribs on the side of the chest and extends upwards into the lower part of the neck and is attached to the entire arterial length of the scapula. Critically, this muscle carries the thorax and therefore the forehand weight of the dog during the trotting cycle.

**Figure 9E**
*Serratus Ventralis attachment*



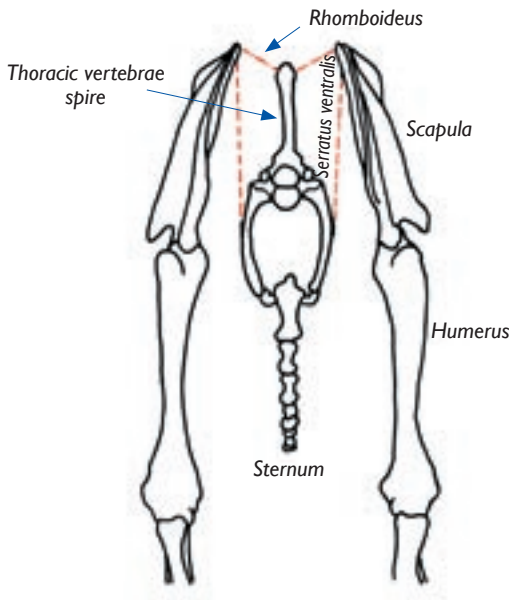
*Dark Red Dots showing the ideal attachment area for the serratus ventralis muscle. Lighter colour represents the spread of this muscle across the shoulder blade.*

The energy [drive] being generated from the hindquarters, transmitted through the dog's pelvis and on through its spine to the forehand is utilised and directed through the serratus ventralis. This muscle carries the weight of the forehand and is responsible for assisting forward motion, assisting with the shoulder blades rotation, keeping the top of the shoulder blades steady during movement, in conjunction with the higher located Rhomboid muscle keeping the shoulder blades apart and out from the ribs, and during movement directing the hindquarter drive to and through the front legs.

The most important thing for readers to understand is this; 'the serratus ventralis muscle is the main antigravity muscle of the shoulder blade during trotting' and 'the attachment point for this muscle from the thoracic vertebrae to the underside face of the shoulder blade is very important'. When the attachment point is too high not only is the muscle tautness affected but this will allow the shoulder blades to slide upward and lessen the muscle's antigravity capabilities. The net effect, be it minor or significant, will be manifested by the dog falling on the forehand thereby impeding its forward reach. See Figures 9 A, B, C & D.

As with everything you will have read so far in this paper there is an ideal 'sweet spot 'relative to angles, lengths, heights, relationship and proportions that determine optimum function. The ideal location for the attachment of the serratus ventralis that will give the ideal balance between weight support, effective rotation, function and stability of the shoulder blades and thereby optimum forward reach is when the top of the thoracic vertebrae spires are located just below the leading top edge of the shoulder blade. See Figure 9F.

**Figure 9F:**
*High withers*




*Cross section through the shoulder blades showing the muscle support system for the forehand. Note the top of the shoulder blades support the trunk (thorax).*

The withers are a critical aspect of the dog especially in its ability to function effectively during movement and whilst it

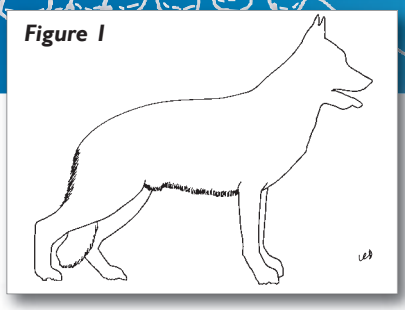


*Figure 1*

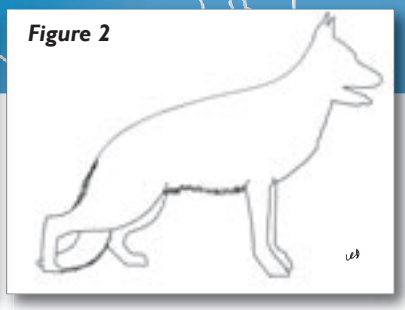


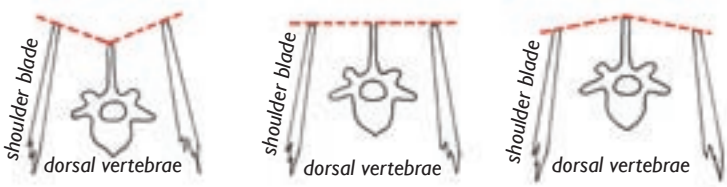
*Figure 2*

is an aspect of the dog that is appreciated I am not sure if it is generally fully understood. For example, rarely do I hear the width of the withers discussed but there needs to be a sufficient space between the shoulder blades to accommodate the two muscles I have mentioned and these muscles, particularly the serratus ventralis create the space between the shoulder blades. Width of withers is important not just because it allows accommodation of the muscles but because as the dog drops its head if there is insufficient width between the top of the shoulder blades at a standing position the dog will not be able to readily put its nose to the ground. This is because if there is insufficient space standing, as the dog drops its head the top of the shoulder blades will meet and when this occurs the dog will be unable to easily track or in the most extreme cases it will be unable to eat or drink without going down onto its knees. Once you get an understanding of what the desired width is between the shoulder blades an assessment of these muscles can and should be made.

A dog with the desired thickness of these muscles will have a wider space between the shoulder blades than the dog whose muscles are too thin and this can be seen not just in stance but more particularly during movement. I have found that the right space is about 25mm but this varies with the size of the dog.

Figure 10 shows a cross section through the withers and shows the various typical configurations that are found in the German Shepherd Dog. Their impact on movement is explained later in the paper. From these cross sections the reader will appreciate that 'wither height' is determined by the top of the shoulder blade and its relationship to the top of the thoracic spires.

***Figure 10***




***10A:*** *High withers* ***10B:*** *Level withers* ***10C:*** *Low withers*

The Standard states 'the withers must be high, long, sloping slightly from front to rear and defined against the back'. Definition of the withers against the back, no matter how slight their slope can only be defined if the back is straight and has no more than a slight slope. For interest, I did a calculation on the sketch by Dr Gorrieri, see Figure 11 and it shows a slope to the back of 5 degrees to the horizontal and clearly this was his quantitative definition of 'slightly sloping'.

If the back is sloping to the degree that it's sloping at the same angle as the withers and additionally the back has a slight curve over it, the wither definition will not be so obvious and in the latter case because the slight curve creates a relatively higher mid position of the back the back will come into the withers at a higher point than it would otherwise.

On the face of it this is a relatively small change, the curve and associated heightened elevation of the vertebrae is very slight, but it has a significantly marked effect. The withers are still high, still long, less sloping but because of the fill in effect that has taken place at the junction of the withers and back their definition against the back is markedly reduced. Visually the back and withers have become one line and as I said earlier, this is because you can't have a curve of the back, be it very slight or otherwise and still have long sloping defined withers. It's simply not possible!

## The Back [and its relationship to the withers and the croup – the topline]

The backs on the dogs depicted in Figures 1 and 2 are clearly different. The degree of difference will vary greatly from reader to reader and the words people will use to describe the backs will vary greatly.

I suggest German Shepherd Dog Specialist Judges will see less difference between the two than All Breeds Judges will and in this regard I suggest most, if not all, All Breeds Judges would prefer the back on the dog in Figure 1. I suggest too that if a questionnaire was sent out to all licenced Working Dog Judges throughout the World and a substantial number of the general public and asked one question 'what is the single most difficult aspect of the German Shepherd Dog for you to understand or for you to accept? ' the resounding answer would be 'the back, the topline'. For this reason alone this aspect of the dog is worthy of detailed discussion.

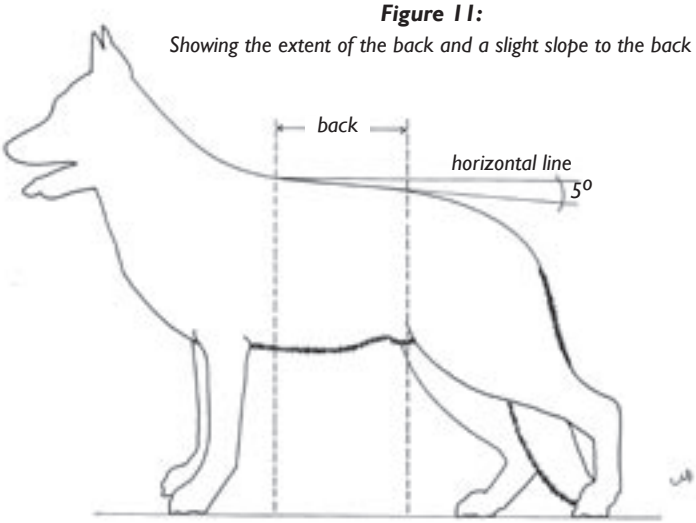
Whilst I describe the back on the dog depicted in Figure 2 as being 'slightly curved' most if not all All Breeds Judges would describe it as being 'roached' and for those of you that may not have thought about where the term originated from, it comes from the curved back of the cockroach.

With some fear of being presumptuous, I suggest these same All Breeds judges would also consider the withers on Figure 2 as not being sufficiently defined and even appearing to be somewhat flat and consider the croup to be excessively sloping. Whereas they would consider the dog in Figure 1 to have a high, long, defined and sloping withers flowing into a straight slightly sloping back that is flowing on to a long slightly angled croup, just as the standard states.

Regardless of what you might see here or how you might describe what you see here there are clear differences in the

***Figure 11:***

*Showing the extent of the back and a slight slope to the back*



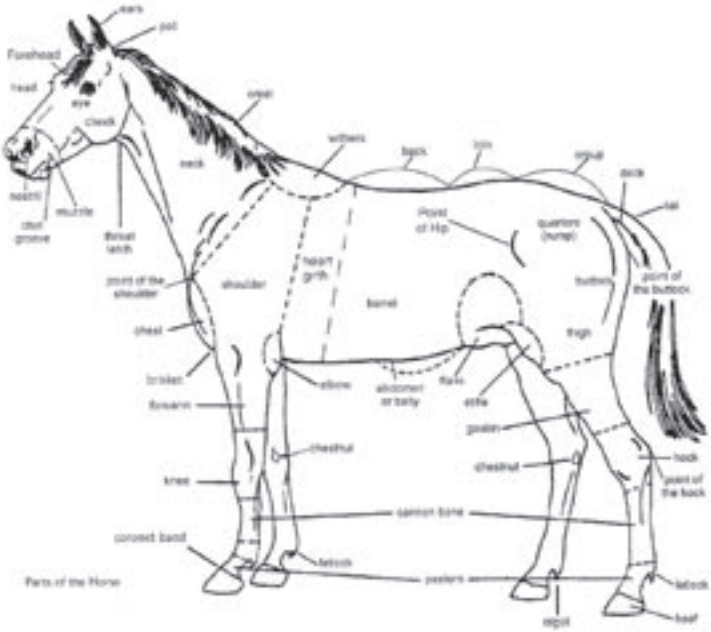

 

topline and a primary component of the topline is the back. Given this it is worth defining here where the back actually is as there are varied opinions on this.

Many dog Standards define the back as being the section that goes from the neck to the onset of the tail. This equates to the back of a human being, however, there are other standards where the back is defined as being a shorter area and these inevitably originate from horse terminology. The problem is that for many Standards no one actually knows what was intended by the author!

This variance in the definition of the back has created great confusion in dog circles when people are talking about and describing 'the back' and in particular when describing the back of the German Shepherd Dog.

In the horse there is very clear, practical and visual division between the withers, the back, the loin and the croup. In the




horse, the back is defined as the section that goes from the end of the withers to the last rib which is the start of the loin. This basically represents a relatively short span.

The creator of our breed, Captain Max von Stephanitz, in addition to having a broad array of impressive credentials and skills was a Cavalry Captain and thus a horseman and in his writings, as with most horse oriented people, referred to the back as being 'the section that is located between the withers and the loin'. Therefore if one was to seek his definition of the back he would say he was referring to the section that goes from the end of the withers to the start of the loin.

Notwithstanding the above and with full respect to Von Stephanitz, in my opinion, it seems far more logical that the back be defined on the dog as the section that goes from the end of the withers to the start of the croup.

As you can see from Figure 9A, this area effectively encompasses around eight of the thirteen thoracic vertebrae [the other five being part of the withers] plus the seven lumbar vertebrae. Just as a matter of interest, where the thoracic and lumbar vertebrae meet and the spires change direction you can see a slight recess, this is where the anticlinal vertebrae sits and this is where you will sometimes see a slight dip or nick in the dog's topline -see Figure 17.

This is potentially the strongest point of the back and the dip or nick behind the withers as it is often referred to is caused by a lack of muscle and ligament fill-in and is an aesthetic issue. It is not something that indicates a weakness in the back and has no detrimental effect on movement or the dog's ability to work but this, and a defined peak which at it's apex commences at and with the first elevated lumbar vertebrae, will often become more apparent as the muscles and ligaments forward of this vertebrae lose tension and mass as the dog gets older. Occasionally a slight peak will settle with age but not often.

The Standard states that the topline should be flowing but it makes it clear that the withers, back and croup should be discernable within that flow. The flow is created by the smooth and relatively seamless connection of the withers, back and croup, in other words, devoid of angles especially obvious angles. There is no argument that the Standard clearly states that the back should be straight but there are differing opinions as to whether in stance and in movement the back should be level, slightly sloping or sloping.

These varying opinions and beliefs are not helped by the fact that the description of the back is something that has varied through different editions of the SV and FCI Standard and through translations and interpretations of those various editions. I say translation and interpretation because the interpretation of the official SV Standard has varied from one country to another and this is also evident in the FCI and VDH translations. Some of this is akin to the Chinese whispers effect.

Variance in opinion has come about too because there are many people who have interpreted 'straight back' as meaning 'level back' even though straight does not mean level and then there are others whose interpretation of 'slightly sloping' is 'decidedly sloping'. The SV showed foresight in this regard when they describe the croup as 'slightly sloping' and quantified this description with a precise angle but in doing so they didn't appreciate that logically this then defined an angle of 23 degrees as a slight slope! To maintain relativity, any slope that is significantly less than 23 degrees should have been described as such i.e. very slight slope.

The following is a bit drawn out, and whilst it may surprise the reader to hear me say this, it took a lot of research with the assistance of Honey Gross Richardson and Frau Sabine Leib of the SV to unravel and compile the Standards in a readable sequential order. Honey and I persevered because we felt this matter warranted recording if for nothing more than to unravel what is a confusing series of publications, confusing interaction between publications, confusing translations and varied interpretations that are available in an array of publications of the Standard.

In chronological order the section in the official Standards that relate to the back and topline goes as follows:

The **SV Standard issued 1938** states 'back straight and strongly developed. Between withers and Ilium/sacral joint not too long. The length of the body should exceed the measure of the height at the shoulder. Dogs that are short in overall length, high legged or square, are to be deprecated. The German Shepherd Dog should not be a mad chaser, the agility required for herding is attained through the strength and the angulations of the hind quarter. Loins broad and strong, croup long and slightly sloping.'

**SV Standard issued 1948** states 'back straight and strongly developed. Between withers and Ilium/sacral joint, not too long .The length of the body should exceed the measure of

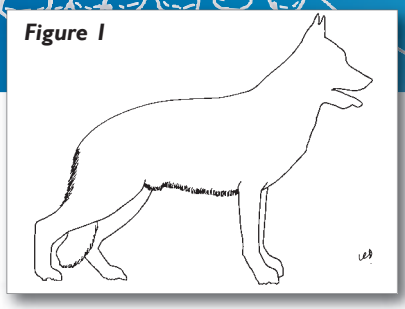


Figure 1

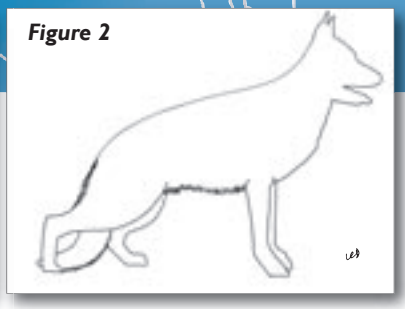


Figure 2

the height at the shoulder. Dogs that are short in overall length, high legged or square are to be deprecated. The German Shepherd Dog should not be a mad chaser, the agility required for herding is attained through the strength and the angulations of the hind quarter. Loins broad and strong, croup long and slightly sloping.'

The **SV Standard, issued 25/3/61** in the section that relates to the topline states 'back including loin straight and strongly developed, between withers and croup not too long. The length of the body should exceed the measurement of the height of the shoulder. Dogs that are short in overall length, high legged or square are to be deprecated. Loins should be broad and strong, croup long and not steeply sloping'.

The **SV Standard, issued 30/8/76** states 'back including the loin, straight and strongly developed. Not too long between withers and croup. The withers must be long and high enough, well indicated against the back into which it must gently flow without disrupting the backline, slightly sloping from the front to the rear, loins broad, strong and well-muscled. Croup long and slightly sloping [around 23 degrees]'.

The **SV Standard issued 1978** states 'back including the loin, straight and strongly developed. Between withers and croup not too long. The wither must be long and high enough, well defined towards the back, into which it must gently flow, without disrupting the back line, slightly sloping from front to back.'

The **SV Standard, issued 23/3/91** states 'the topline flows from the set on of neck, over the high long withers and over the straight back to the slightly sloping croup without a noticeable break. The back is moderately long, firm, strong and well-muscled. The loin is broad, short, strongly developed and well-muscled. The croup should be long and slightly sloping [approx. 23 degrees to the horizontal]'.

The **FCI Standard issued on the 30/8/91** states ' the upper line runs without any visible break, from the set on of the neck over the well-defined withers and over the back very slightly sloping to the horizontal line on to the gradually slanting croup. The back is firm, strong and well-muscled. The loin is broad, strongly developed and well-muscled. The croup should be long, sloping slightly [about 23 degrees to the horizontal]'.

The **ANKC Standard issued on the 1/1/94** that was translated from both the **SV Standard issued 23/3/91** and the **FCI Standard issued 30/8/91** states 'the topline flows from the set on of the neck, over the high long withers and over the straight back to the slightly sloping croup without a noticeable break. The back is moderately long, firm, strong and well-muscled. The loin is broad, short, strongly developed and well-muscled. The croup should be long and slightly sloping [approx. 23 degrees]'.

The **FCI Standard issued on the 7/8/96** states that it is a translation into English of the **SV Standard edition No 166 dated 23/3/91** states 'the topline runs without any visible break, from the set on of the neck over the well-defined withers and over the back very slightly sloping to the horizontal line, onto the gradually slanting croup. The back is firm, strong and well-muscled. The croup should be long, sloping slightly [about 23 degrees to the horizontal]'.

The **English KC Standard dated October 2009** states 'back between withers and croup, straight, strongly developed, not too long. The topline runs without any visible break from the set on of the neck, over the well-defined withers, falling away slightly in a straight line to the gently sloping croup. The back is firm, strong and well-muscled. Loin broad, strong, well-muscled, soft and roach backs undesirable and should be penalized heavily. Croup slightly sloping and without break in the topline, merges imperceptibly with the set on of tail'.

The current **FCI / SV Standard dated 23/12/2010** which replaced the **FCI Standard of 7/8/96** and **SV Standard of 23 /3 91** incorporated an **amendment to the coat made by the SV on the 1/6/2008** is the current Standard for both the FCI and the SV and it states 'the topline runs from the base of the neck via the high, long withers and via the straight back towards the slightly sloping croup, without visible interruption. The back is moderately long, firm, strong and well-muscled. The loin is broad, short, strongly developed and well-muscled. The croup should be long and slightly sloping [approx. 23 degrees to the horizontal]'.

As a matter of interest the current **American Standard** states 'the withers are higher than and sloping into the level back. The back is straight, very strongly developed without sag or roach and relatively short' and the **Canadian Standard** which is basically the same as the American Standard states 'the withers should be higher than and sloping into the level back to enable a proper attachment of the shoulder blades'.

I could go on and cite many other official Kennel Control Standards and many other quasi-official publications such as the Foto Urma book that that wrongly quotes this section of the SV Standard of 1961 but there is little point.

Many of these publications contribute to the confusion and the disparity but I think the point has been made and the reason I labour the point is this. If you reside outside Germany and outside the substantial support provided by the SV and you are new to the breed or perhaps you are an All Breeds Judge trying to get a picture of the back/topline of the German Shepherd Dog then you would study the written Standard to understand it and importantly, to get a picture of the back/topline and indeed the ideal German Shepherd Dog in your mind's eye and you do this, in part, by interpreting, connecting and comparing words in the Standard in your language to get relative meaning to the whole.

Von Stephanitz was clear on the matter of the back insofar as he considered nothing other than a straight level back to be ideal and given his view that balanced moderate rear angulation was the ideal and moderate to under angulated hind quarter was the norm of the day, a level back would be the associated outcome. Over time the SV has moved from describing the back as a 'level back' to a 'slightly sloping back', to dropping totally all reference to the backs relativity to the horizontal.

Putting aside the slope to the back, which I will cover shortly, the dog depicted in Figure 2 does not have a straight back and whilst there should be no need to define the word, I need to.

Let me start by saying the dog in Figure 1 has an ideal line of the back and whilst one would describe it in dog parlance as straight, in a literal sense it's not!

There is a barely visible slight rise over it and, as I mentioned before, this is because the spine in the centre of the back has a slight dip in it and this accommodates a layer of muscles and

ligaments that are critical to giving the dogs back strength and flexibility. When these muscles are well developed as with all well-developed muscles they create an outward rise or bulge. As the dog ages the line will straighten because there will be a natural degeneration of these muscles and that's why sometimes you can see a young dog with a straight clean back and as an aging adult develop a slight dip which sometimes can create a slight bump or rise at the start of the lumbar vertebrae.

The words very slight or slight lends itself to interpretation and as such the definition of slight as used in the Standard will vary from person to person. Depending on one's definition of the word 'slight', many people would say in regard to the dog depicted in Figure 2 that there is a slight but discernable curve not just over the back but over the entire topline seeming to start at the base of the neck and finishing at the very end of the croup. For some people, especially those not directly involved in the breed, it looks like the topline is one piece, one continuous downward sloping curve and that the clear definition of the withers, back and croup has all but disappeared!

Is this a well thought out, well managed, well contained, fine tuning, evolutionary, functional improvement or is this an impediment to the dog that should to some degree be penalized or just simply noted. Is it the start of a trend change in the back that when it attains it's most extreme manifestation will have a negative effect on the dog's ability to adequately function and at what stage does this happen? If you fall into the category of considering it to be of detriment or you are in the category of being unsure or concerned that it may be of detriment then a primary question that should be posed is, does this in any way impede the dog's ability to perform its inherent function as a working dog just as well and just as effectively as the dog in Figure 1?

The starting point has to be to understand exactly what has happened to create this slight curve sometimes associated with a sharp peak and subsequent heightened elevation of the back relative to the withers. In understanding what has happened, then perhaps it is possible to understand what, if any, impact this has on the dog at any level be it work, play or health and indeed to understand what happens as the curve ascends even higher than I have depicted.

For clarification I am talking here about the back at maturity and I say this because young animals can have a slight curve over their back that can often straighten out at maturity. I wrote about this in an article some years ago titled 'The Great Debate - A Question of Type' and I used photos of the 1982 German Siegerin Perle vom Wildsteigerland to demonstrate this.

See Rhosyn Kennels webpage to view the article and photos of Perle.

http://www.rhosyngsd.com/modules.php?name=Content&pa=showpage&pid=10

Sometimes we see a distinct curve over the loin area and putting aside illness, this is created by an upward rise in the lumbar vertebrae or as can be seen in some galloping breeds, an increase in the length of the spires to the lumbar vertebrae as they ascend from the sacrum. More often and more commonly we now see a slight rise and occasionally a peak in the approximate region of the centre of the back. The peak actually starts immediately after the anticlinal vertebrae on the first of the seven lumbar vertebrae as can be seen in the following two dogs.

*Two times National gold medal winner Unox vom Aducht*

*A top winning daughter of Unox, multi-excellent graded Andacht Super Fortress. This is an example of a topline shown in Diagram 6 on page 15 – to move to a higher peak as seen in Diagram 7 on page 15, the withers become lower than the back.*

Sometimes we can see a slight curve over the whole back seemingly running from the base of the neck all the way to the end of the croup.

*Photo of 1982 National gold medal winner Dina vom Reststrauch – this is an example of a topline shown in Diagram 4 on the next page.*

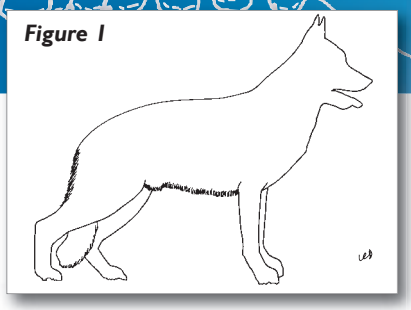


*Figure 1*

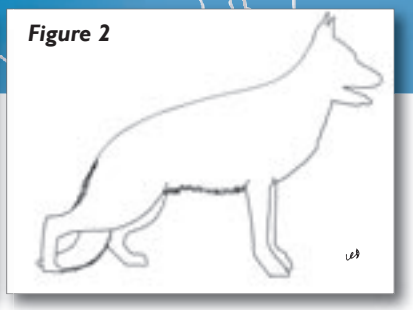


*Figure 2*

In Figure 2 we are talking about a lesser manifestation where the dog has a 'very slight curve' to the back [lumbar and dorsal vertebrae] that runs the full distance from withers to croup. I point out here that this is different to but directly related to the lesser manifestation where there is a 'very slight' elevated position of the little vertebrae in the short space between the withers and the back. This latter elevation has impact on the withers height nor the backs height but it removes the definition between them.

The following is a series of eight sketches starting with a correct topline and showing the above variations in a progressive developmental sequence and also showing the much less seen loin arch. The arch is something that becomes more apparent as the dog ages.

NOTE: On my sketches I have drawn a dotted line indicating the elevated position of the back and the spine. Where applicable the associated curvature of the top of the vertebrae spires is shown but for ease of drawing I have not shown the corresponding elevation or curvature of the underside of the vertebrae.

*Diagram 3:*

*First rise in both lumbar and thoracic vertebrae, withers becoming level*

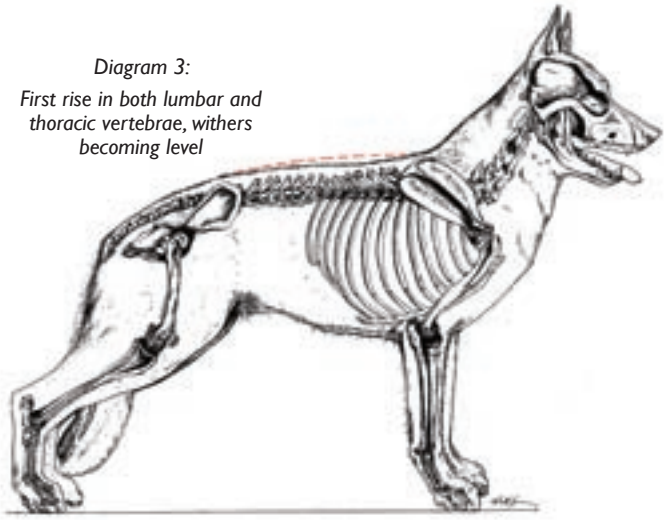


*Diagram 1:*

*Normal backline, defined withers, straight back*

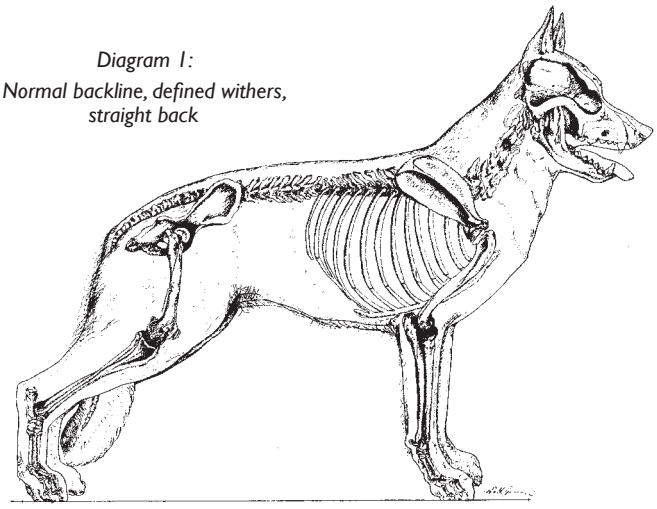


*Diagram 4:*

*Slight curve to back and just impacting slightly on the pelvis angle, withers now level*

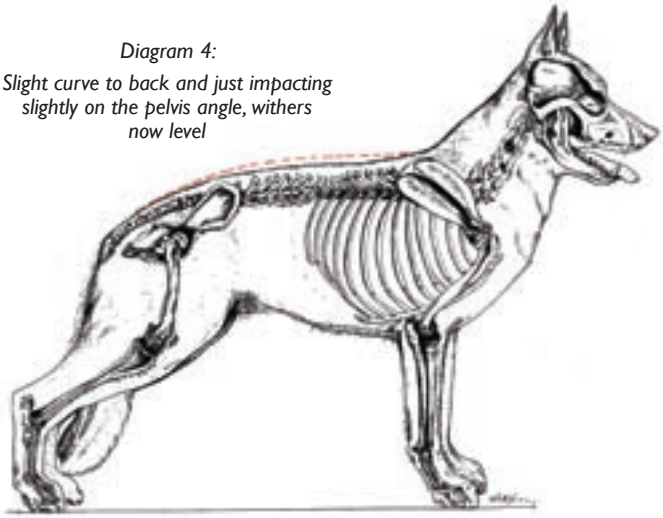


*Diagram 2:*

*First sign of rise in thoracic vertebrae, withers sloping but no longer defined against the back*

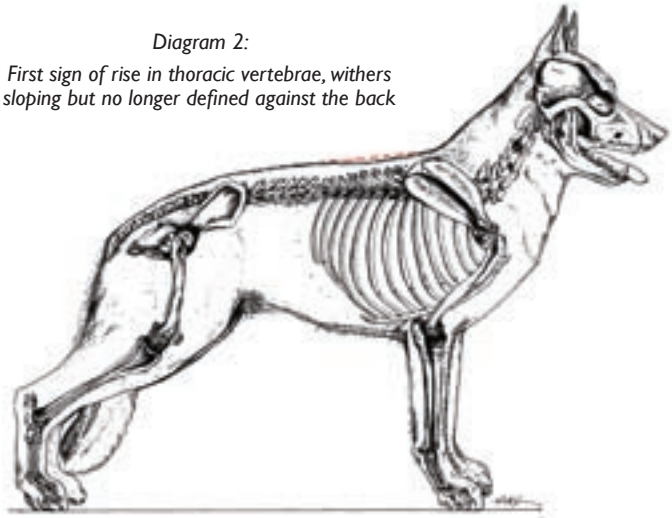


*Diagram 5:*

*Pronounced curve to the back and ensuing inclination to the pelvis and tibia, withers now low*

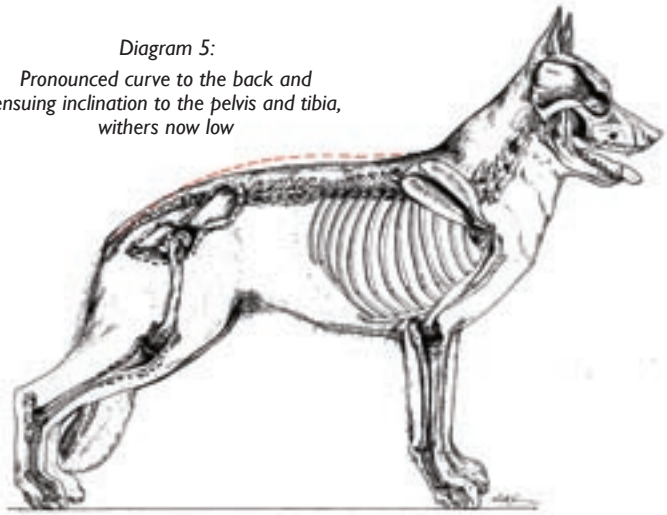


*Diagram 6:*
*Peak to back at first lumbar vertebrae, flattens off the curve to the croup area and inclines the pelvis and tibia, withers level*

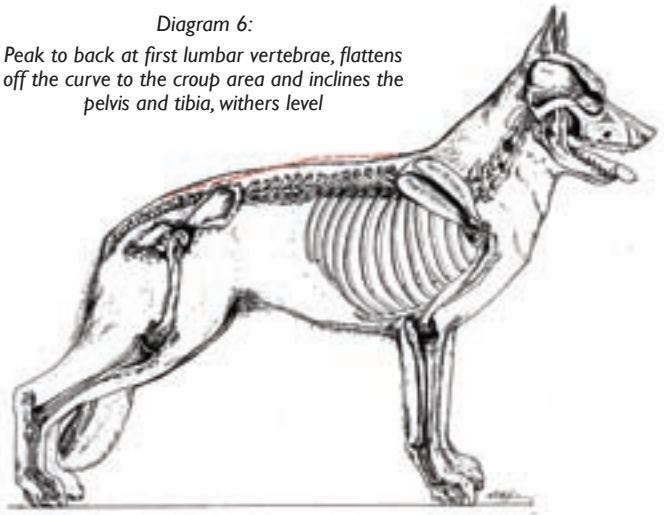


*Diagram 7:*
*Pronounced peak to back, croup inclined and withers are low*

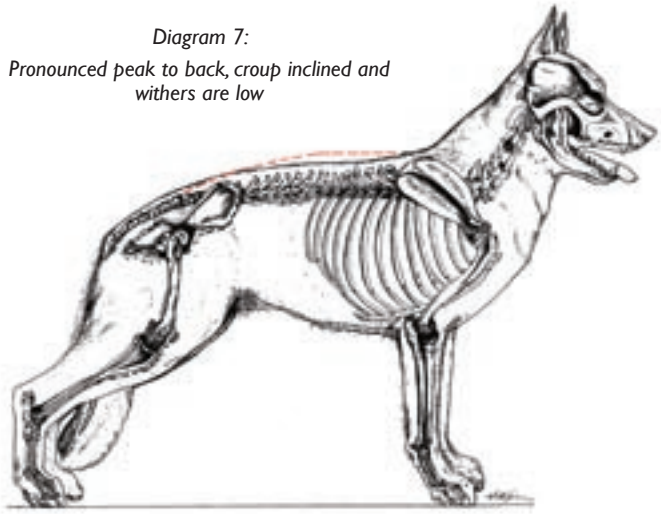
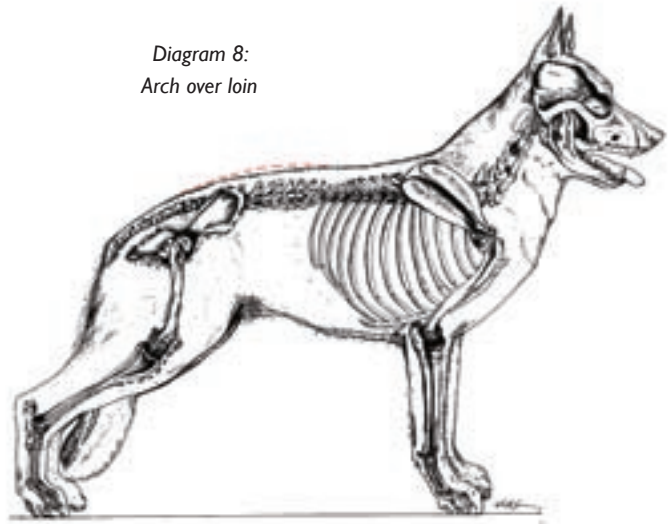


*Diagram 8:*
*Arch over loin*



Gaiting in the show ring as opposed to trotting over a great distance a dog with very slight curvature and less defined, shorter, but still high withers would not show any significant impediment during movement; especially at slower speed as say in the fast walk done typically on a tight lead. This needs to be taken into context as there is no question that at a fast trot and on a loose lead the dog depicted in Figure 1 would have freer lift of the forehand and over an extended distance less energy being dissipated than the dog in Figure 2.

It is important to keep in mind that the vertebrae whilst connected to one another do not consist of one single piece of rigid conduit but a series of interconnecting parts. The point I wish to make here is that, unlike the horse, the dog's back during the trot has a spine that needs to be firm, straight and tight but at the same time able to flex up and down with the rhythm of the foot fall sequences and cycles.

There is a fine line between the dog *just perceptively falling* on the forehand, and *falling slightly* on the forehand and a greater line between *falling* on the forehand and *falling heavily* on the forehand as explained on page 9. When the back, be it straight or curved to any degree, is level with or above the highest point of the the shoulder blades in movement the forehand suspension will be affected. The effect may be slight, sometimes barely perceptible, sometimes masked by other factors including the handler using the lead to pull against the dog creating artificial forehand uplift but it's going to be there, look hard and you will see it particularly when the dog is running on a loose lead or getting tired .

*Example of a dog falling heavily on the forehand*

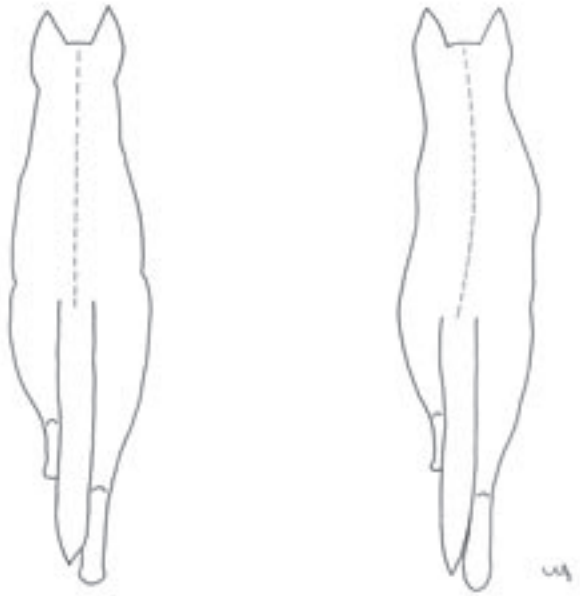
Given what I have just said, and taking a Devil's advocate position, putting aside that the Standard says the back must be straight and it says this because a straight back is considered to be the most functionally effective back for a trotting endurance dog, it could be argued that the amount that the dog falls on the forehand determines the degree of impediment of the curve. My point is if a dog had a 'very slight curve' to the spine and showed no sign of falling on the forehand '*at speed on a loose lead*' and I emphasize *loose lead* then it wouldn't be an impediment to movement nor a problem in relation to that dog and indeed there could be a reasonable argument to say this back was superior to a straight back! Wouldn't it?

One final point I am stating the obvious here, but the spine should not only be straight when viewed from the side but straight when viewed from above. That is, when viewed from

above, when the dog is walking or trotting there should be a straight line from the centre of the neck [centre of the cervical vertebrae] all the way through to the centre of the root of the tail [centre of the sacral vertebrae]. If there is a curve in the spine when viewed from above this will generally result in the dog crabbing.

The most energy efficient way for a dog to travel from point A to point B is in a straight line!

***Figure 12:***



*(a) Tracking straight* *(b) Crabbing*

## Hind angulation [and its relationship to the back and the topline]

What is causing the excessive slope to the back? It's over angulation of the hindquarter. See photos of male and female example.

Figure 13 shows the ideal length and angles of the femur and tibia whereas in Figure 14 the femur and tibia are much longer. Keeping in mind we are talking about making an assessment when the dog is standing with the hock in the vertical position, as the tibia gets longer, excessively so, its angle to the horizontal is reduced, bringing the patella [knee] down closer to the ground and whilst lengthening of the femur will play its part it is the excessive tibia lengthening that is the primary cause of the incline to the back and because it is attached to it, an incline to the croup.

As this happens as can be seen in Figure 9A and Figure 2 the withers, the back and the croup become less defined and the topline becomes a continuous line as the withers, back and croup definitions become somewhat lost, particularly so for a novice or someone who is not closely involved in the breed.

In relation to excessive slope, and as a point of retrospective amusement, think of the very common practice of handlers in Australia who used to lift the dogs second thigh up off the ground, then proceed to push the dogs croup down with their knee and as they lowered the second thigh slowly to the ground overstretched the hindquarter to create a distinct

*Cayos v d Noriswand Australia's most prolific contemporary sire*


*Orka v d Freiheit Westerholt, Siegerin in Luxemburg*

***Figure 13:***
*Ideal hind angulation*

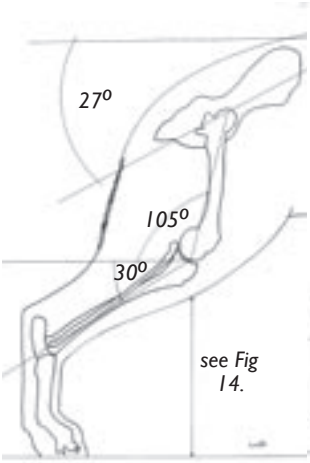
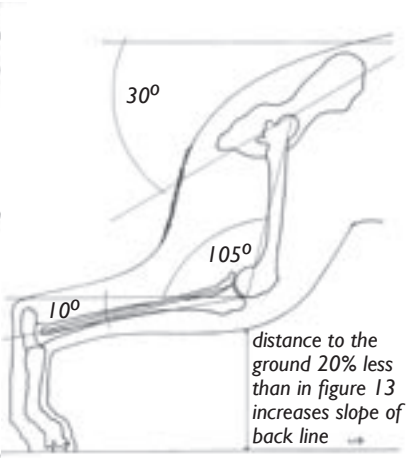
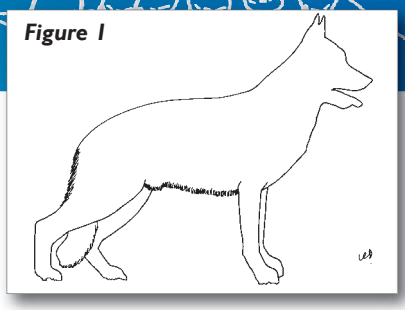
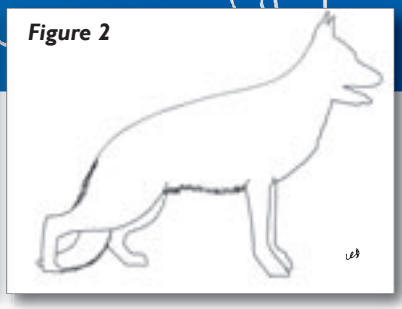



***Figure 14:***
*Overangulated hind quarters - over long femur and over long tibia*






slope to the topline. Absurd as it was they were in effect pushing the femur down, pushing the dogs knee closer to the ground and forcing the lower thigh parallel to the ground in an attempt to create what they saw in winning English dogs and later, astoundingly top of the tree winning German dogs.

You don't see this practice anymore do you? The reason you don't is because the over angulation and consequent sloping back is here and it doesn't have to be artificially created anymore.

Have a look at the vertical distance between the knee and the ground on the dog in Figure 1 and compare it to the distance to the ground on the dog in Figure 2. The difference is best seen and best understood when comparing Figure 13 to Figure 14. The difference in the distance is significant and not just visually on the hindquarter but as a direct consequence, on the topline and on the movement. The femur which should be just a little shorter than the tibia is set at the same angle on both dogs [105 degrees] but it is longer on the dog in Figure 2.

The upper thigh consists of an extraordinary array of overlaying, powerful and massive muscles, the primary one being the adductor muscle which is spread over most of the femur.

A person looking at a dog and its upper thigh and trying to visualize the femur, particularly the length and angle of it, will generally make an incorrect reading because they will tend to look at the end of the croup, see that as the upper end of the femur and then project that line down to about the middle of the sweep of the hindquarter and in doing so they are visualizing an angle and length of femur that doesn't exist.

If one wants to visualize the line of the femur when the dog is standing correctly as in Figure 1, in 'very broad terms ' it is best visualized as being a vertical line descending down a little forward of mid-thigh – this can be seen in Figure 13. As you can see, the femur is not straight and it is shaped this way to support the patella particularly when the lower thigh is extended. It connects to the pelvis socket which is the hip socket and this joint provides stability to the dog and particularly stability to its rear. Relative to the tibia, the femur is an extraordinarily strong bone and whilst I have no idea what weight it can carry in a dog I do know that in the upright human it can carry 30 times a human's weight! If you want to see an example of the importance of the femur to the dog's stability have a look at a dog during the walk when it has chronic hip dysplasia!

I stated earlier that both the femur and tibia in Figure 2 are longer than in Figure 1.

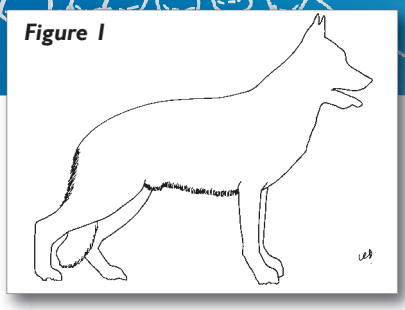
I have to say it is only occasionally that I see dogs with a short femur and correct length of tibia, at least to the point of the shortness being an impediment to the required length of the muscles in this area and especially the adductor muscle that is attached to it and to the rear of the ischium. On the other hand a slightly short femur and equally short tibia I have found is not uncommon and this creates under angulation and subsequent reduced drive. Something that is quite rare is an overlong femur associated with the correct length of tibia and like a flat croup creates increased thrust but over a long distance because of the imbalance it creates to the forehand it eventually fatigues the forehand and may well stress the hip joint too.

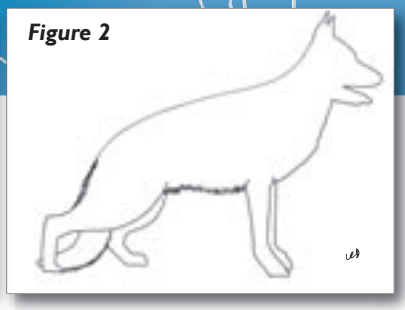
In stance and at a point in the movement cycle the effect of this comparative lengthening is to overly incline what would have been an otherwise correctly angled croup, brings the knee closer to the ground and reduces the angle of the tibia bringing it closer to the ground. As I said, from my observation it is quite rare but an example of an overly long upper thigh and normal length of lower thigh and subsequent inclination of the croup can be seen in the photo of Rikkor von Bad Boll.

*1998 and 1999 Sieger Rikkor von Bad Boll*

If you want to see how an overly long femur brings the knee closer to the ground look at the angle of the back and most importantly compare the distance from the ground to the knee on Rikkor to the slightly under angulated but outstanding mover Dingo vom Haus Gero, or the National Gold Medal winner Iturna Noble Knight whilst the femur and tibia are


*1983 German Sieger Dingo vom Haus Gero*




longer on Noble Knight than Dingo, both dogs have a correctly balanced length of femur and tibia.

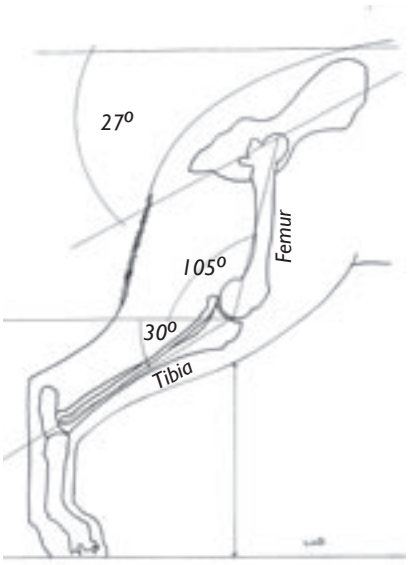

*2009 Australian National Gold Medal Winner – Iturna Noble Knight*

The tibia on the dog in Figure 2 is longer than the dog in Figure 1 by about 20%. Currently in Australia the norm in respect to over angulation would probably sit at a significantly lesser 10% but I can see this increasing to 20% if it is left unchecked.

The angle of the tibia in the dog in Figure 1 is set at the ideal angle of 30 degrees to the horizontal whilst on the dog in Figure 2 because of the longer femur it is set at 18 degrees. The tibia is a much thinner bone than the femur and is connected to the femur by a muscle that is attached to the Achilles tendon and unlike its corresponding counterpart the upper arm, it is not designed to carry a lot of weight and this is important to understand.

***(Figure 13:)***

*Ideal hind angulation*




The tibia's primary function through the attached tendons is to extend the hock and flex the knee and to be a conduit for the power being generated by the muscles attached to the femur. It is also designed to provide a stabilizing effect to the metatarsus or more precisely the hock joints [tarsus]. The longer the tibia the harder it is for it to maintain stability and perpendicular alignment of the hocks and potentially the more the chance for the possibility of consequent wearing within the hip joint – a sensitive and very topical issue not generally supported by the hierarchy in the show fraternity who support deep angulation.

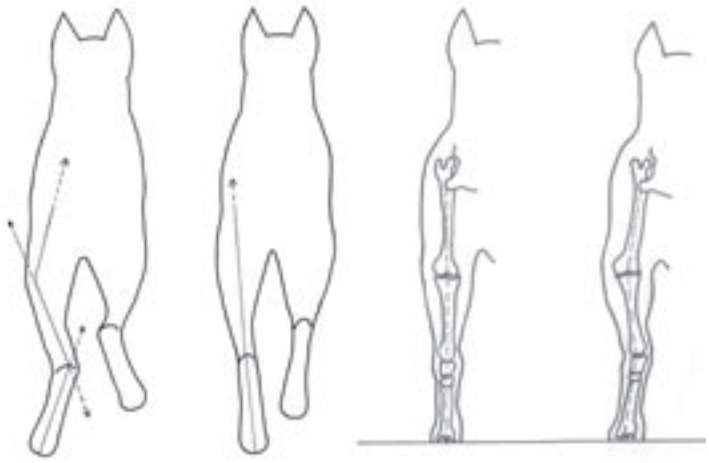
In relation to instability of the hocks, I would offer the analogy that it is like looking through a camera. Imagine the hand with which you are holding the camera body is the joint between the tibia and the femur and the end of the lens is the end of the tibia where it connects to the hock joint. When you look at an object through a camera's view finder with a short lens it is easy to keep the camera lens steady laterally but when you use a long telephoto lens it swings uncontrollably from side to side.

What this tells us is that a moderately long second thigh is the most stable and for long distance trotting the most enduring, but on the other hand if it's too short it reduces the rear and forward reach of the hind feet and consequently reduces groundcover. So it comes to having a length of second thigh (tibia) that is basically equal in length to the upper thigh (femur). Ideally the tibia should be about 10% longer than the femur. It is very important for balance in movement that these two bones have right balance and relativity to the shoulder blade and upper arm. A general rule of thumb that is often expressed in literature on dogs is that the bones in the forehand and hindquarter should be about the same length to ensure balance. This isn't a bad guide but for readers that may be interested in more specific relativities, they are as follows; measuring the lengths of the bones correctly as I have described in Figure 19 the femur should be about 20% longer than the shoulder blade and the tibia should be about 20% longer than the upper arm.

For the reason stated above the dog in Figure 2 will have less stable hindquarters than the dog in Figure 1 and this will be most noticeable in the hocks which when viewed from the rear, whilst the dog is standing the hocks will be closer together than normal and slightly cowhocked. In movement they will be somewhat loose and possibly, but not necessarily, stepping a little close and most likely stepping a little cow hocked.

Figure 15 shows the line of direction of the force being transmitted from the pad of the foot forward through to the body and in the overangulated dog you can see how the energy and thrust is deflected from a straight line through the various joints to one that continually changes direction and because of this deflection of energy it imposes forward and rearward side stress on those joints and the muscles and ligaments simply are not strong enough to withstand those forces and hold the leg steady through to the hock joint in a

***Figure 15:***



*15A: Dog in movement with cow hocks/loose hocks*

*15B: Dog in movement with correct hocks*

*15C: Dog in stance with correct hocks*

*15D: Dog in stance with cow hocks accentuated under pressure of movement (see 15A)*

straight line. This is what causes the hocks to be pushed in at the top [ tarsus ] creating cow hocks.

I also make this next observation. In this country virtually every dog that is walked away from a judge to allow assessment of the hocks is allowed by the judge to drive and pull so hard on the lead that the hocks inevitably assume a cow hocked and unstable configuration. This leads to dogs that are sound behind ending up with the same critique as dogs that are cow hocked and or have unstable hocks. Putting aside the cow hocks, most of the dogs that are pulling their heads off as they walk away will end up having a critique that inevitably reads 'slightly loose or loose hocks'. What else is the judge to say? He has just watched a dog that may well be sound in the hocks but going away it looks more like an eggbeater in action. He has to record what he sees! Handlers need to understand this and Judges should insist on dogs moving up and back on a loose lead.

In regard to the impediment to the dog in trotting and to a lesser degree endurance, 'very slight cow hocks or very slightly loose hocks' whilst not a pretty sight, contrary to popular opinion, are of minimal detriment to the dog's ability to trot and to endure. Distinctively loose cow hocks and distinctively loose hocks are another matter and having said what I have said the difference between the two needs to be understood. The latter are nearly always created when the tibia becomes excessively long and as I discussed earlier as a consequence, the deflection of forces through the joints being pushed and twisted – see Figure 15a - and with slackness in the Achilles tendon on the back reach they become infirm, at a more extreme level wobbly and at their most extreme level, uncontrollable.

With full regard to maintaining a balance in making an assessment of a dog and keeping in mind my opening comment 'distinctly loose hocks' need to be penalized quite heavily.

## Movement

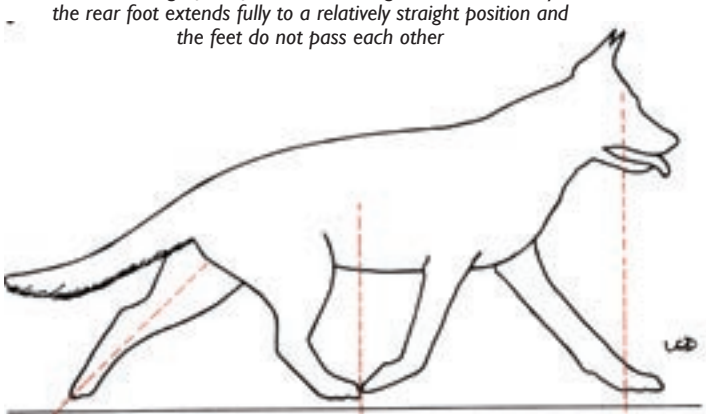
According to Dr Curtis Brown and based on pressure plate tests, during the trot excessive forward reach of either the front or rear paw at the moment the paw is set down causes an increase in energy consumption and a slowdown of speed.

This slowdown effect is an important fact to understand and be aware of.

Dr Curtis Brown and others have also shown conclusively that in movement the ideal set down position of the front paw 'for a trotting and endurance dog' is for the front paw to land on the ground directly under the dogs eye and any further distance, whilst being perhaps a more impressive aesthetic, only adds to the slowdown action and is therefore a waste of energy.

***Figure 16:***

*Showing the ideal foot fall sequence and steps for a trotting endurance dog - front foot touches the ground under the eye, the rear foot extends fully to a relatively straight position and the feet do not pass each other*

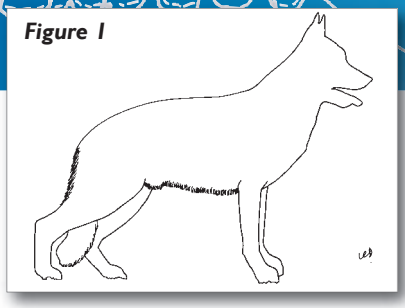


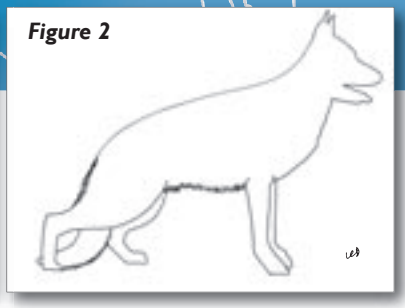
To test this theory of slow down action go for a run and as you are running, concentrate on what is happening to the underside of your feet as they connect with the ground. You will become aware that your foot on the backstroke exerts thrust and acceleration and your other foot, the fore stepping foot, as it hits the ground has a decelerating braking effect. This is the effect of gravity.

Because of the angulations and lengths of bones incorporated into the German Shepherd Dog Standard this creates over reaching both in the fore and hind hand and for the hock to fall a little short of straightening out to a trotting dog's optimum on its back reach. The most effective spot for the rear paw to set down in order to achieve the maximum thrust in a trotting endurance dog has been scientifically proven through tests using pressure plates to be one where the rear paw falls just slightly short of the middle of the dogs body on its fore swing and close to straightening out on its back swing, not straight but in broad descriptive terms getting close to that line. This is shown in Figure 16.

As can also be seen in Figure 16, in side gait and at a trot this foot fall span is not as spectacular a sight as a dog over reaching nor does it seem to contribute visually to the picture of a dog covering the maximum amount of ground possible with the least amount of effort in almost gravity defying suspension. For us in our breed, the movement of the dog in Figure 16 is showing somewhat restricted back and forereach but facts are it gives the maximum delivery point for rear thrust. It means too that the front and rear feet do not need to bypass each other thereby reducing fuel consumption and fuel consumption is all important for a dog that has to undertake extended ground covering trotting cycles.

Having said this let me make it absolutely clear. I am not saying over-reaching in the German Shepherd Dog is undesirable, not at all. As I said previously the anatomical construction




of the German Shepherd Dog, specifically the length and angles of the bones in the fore and hindquarter, as determined by the Standard creates over reaching and has made this a highly sought after gaiting characteristic that is a fundamentally unique characteristic of our

*2008 and 2009 German Sieger Vegas du Haut Mansard in movement*

breed. But as with all things it is a matter of functional balance and not one of exaggeration and excessive over-reaching.

An analogy of a breed's specific characteristics is the restricted reach and gait that is determined by the Standard for dogs such as the Fox Terrier.

In the Fox Terrier restricted fore reach is a unique and highly desirable characteristic and fundamental to it. I mention and explain this characteristic in order that the reader, particularly the novice, can have an understanding of basic movement fundamentals and much more to the point, for the reader, novice or not, to appreciate that 'contrary to popular contemporary opinion' for a trotting and endurance dog to best serve its prime function and probably it's wellbeing 'less angulation when it is balanced, is far better than over angulation' and should be treated as such in the show ring by judges.

This is so important for breeders and judges in Australia to understand that I will repeat it again 'less angulation when it is balanced, is far better than over angulation'.

"During movement the hind thrust commences immediately after the pad of the foot goes past the hip joint and continues so long as the pad of the dog's foot maintains contact with the ground and therefore the further back that contact point

*Ch Jimmy vom Baruther Land Sch III showing nicely balanced movement*

remains the better"– Dr Curtis Brown. This is something that needs to be understood.

In the dog in Figure 2 on the 'rear fore step' the hock will lie a little closer to the ground. In the more extreme cases of over angulation the back of the hock, not the pad of the foot, will make contact with the ground and the face of the hock, not the pad of the foot, will take the force of the ground and the hock is not designed to take such blows. It doesn't end there. On the back sweep instead of the hock attaining the ultimate position of 'almost straightening' as seen in Figure 16 it will stop short of this.

In the more extreme cases of over angulation during gaiting you will see the hock stop at the vertical and even short of the vertical – See Figure 4. This is referred to in all breeds circles as a 'sickle hock ' because of its likeness to a sickle. You will see too, hocks that are loose and wobbly and in side gait you will see feet that move too close to the ground. You will see a dog whose steps are no longer fleeting but heavy and in the more exaggerated cases you will see a noticeable shuffle as the dog literally drags his rear feet back and forth. In the worst cases which I have to say I have not yet seen in Australia but I have seen overseas, is a dragging action which wears the fur off the dog's hocks and cut into the quick on its nails.

*Example of an over angulated hindquarter, showing the consequential effect of the hock not straightening fully on the back sweep and lying flat on the ground on the forward sweep.*

If you want to see the best example I have seen of the desired optimum of straightening the hock on the back sweep and indeed excellent German Shepherd Dog movement, have a look at the video of Herman Martin's first Sieger - Dingo vom Haus Gero 'youtube.com Dingo vom Haus Gero' http://www.youtube.com/watch?v=hPJPE9oNN7A and while viewing the video have a good hard look at his hind angulation and also have a look in his photo.

The impact of the too long second thigh doesn't end there. It gives less stability to the dog when it is working, turning at speed, galloping and trotting, and it consumes extra energy as a result of the instability and the extra weight being placed on the rear. It also reduces thrust because the pad of the foot can't achieve the optimum distance of back stroke and for thrust the backstroke, particularly a long one, is where the desired power and thrust comes from.

The sire line trail of photos shown below is used to provide some guide as to where the slightly curved topline and deep hindquarter angulation came from. To do such a demonstration in photos that would be completely conclusive in its hereditary detail and trail would be practically impossible as there are animals that are in all likelihood significant contributors but no photo exists of them and there are animals both dogs and bitches who have made a contribution but it is not apparent

and or regardless of hypothesis their contribution is simply just not known.

After all of this, we add the fact that this is all opinion and conjecture by me and there will be plenty of people who consider they are far more authoritative than I who will disagree with what I have to say in part or in whole. This is the basis of healthy debate, this is the dog sport and this is the complexity and mystery of breeding dogs!

I have used the perpetuating German Sieger sire line because it is these dogs who wield the greatest influence on the breed. Not just because of their great use on the best bitches but because of the extraordinary influence these dogs have on German Shepherd Dog judges throughout the World and via them the most prominent breeders throughout the World

*1978 German Sieger Canto Arminius*

The reader will see that the trail starts with the Sieger of 1978 Canto Vom Arminius.

There were no Siegers from 1974 to 1977 but most, if not all of the select males during this period and all Siegers prior to this had a topline and hind angulation similar to Canto. The Sieger of 1973 Dick vom Adeloga is included to fill this gap and complete this picture, so to speak.

If you go back through time starting with the 1951 Sieger Rolf vom Osnabrucker Land, the dog that was a transitionary point in the breed's development in regard to type and the dog that effectively defined the breed's future as we know it today, you will see that from Rolf right up until Quando vom Arminius in 1986, a period of 35 years, the withers, back and croup were defined, the back itself was straight and level, and the hindquarters were moderately to under angulated.

The change in the straightness of the back appears to me to have taken place with Eiko and the change from a level back to a sloping back created by the deeper hind angulation took place with the 1993 Sieger Jeck vom Noricum. As from 1993 not all but most of the German Shepherd Dogs of influence in Germany and therefore the rest of the World carried the distinctive features of a sloping and slightly curved back and deep hind angulation.

The general view is that the topline, hindquarters, trunk length and indeed the type changed when Herman Martin [SV President 1982 – 1994] took over from Dr Rummell [SV President 1971 – 1982].

In regard to the length, there is no question in my mind that Dr Rummel perpetuated the inherent working dog ideals and type of Dr Funk and that he preferred the less elongated height to length ratio of 9 to 10. Whilst Herman and of course, the influential driving force, his brother Walter, had a preference to a more elongated, richly coloured and shapely dog. The elongation of the back and longer femur in the hindquarter was introduced by Walter when he used a relatively unsuccessful show dog called Hein vom Konigsbruch to produce the relatively short lived, controversial but extremely influential Canto v d Wienerau.

*Hein vom Konigsbruch*

*Canto von der Wienerau*

Whilst Canto had great direct influence on the breed, this elongation of the back was reinforced by Walter and Herman via Zamb v d Wienerau. Walter told me in confidence just a couple of weeks prior to Zamb becoming the 1992 Sieger that not only would Zamb be the 1992 Sieger but on doing so he would become the third pillar in the breed joining Quanto and Canto and that he would become Germany's most influential German Shepherd Dog.

*1992 German Sieger Zamb v d Wienerau*

Whenever I spoke with Walter about Zamb he told me he considered Zamb's daughter Vanta von der Wienerau to be a better bitch than Zamb was a dog and whilst she was in a number of respects quite different to him, he left me believing that he considered Zamb to be getting structurally close to the ultimate manifestation of Von Stephanitz's ideal German Shepherd Dog and when you look at the breed's divergent structural trend in regard to the back and hindquarter angulation after Zamb some people may consider Walter's opinion had merit. For me personally in type terms, and I never spoke with Walter about it, I saw Zamb's descendant the 2001 and 2002 Sieger Yasko vom Farbenspiel as being a nice rounding off and a distinct improvement on Zamb. Given Walter's opinion of Zamb I would like to think he would have agreed with me but then with Walter when it came to dogs you were never sure what he truly thought!

In the context of deep hind angulation my observation was that Herman was not an advocate of deep hind angulation. Dingo and later the under angulated 1986 and 1987 Sieger Quando is a demonstration of this.

In personal discussions I had with Walter he made it clear he did not see eye to eye at all with Dr Rummel. He actually

*1986 - 1987 German Sieger Quando vom Arminius*

disliked him and had strong disagreement with his ideas on type but when it came to discussing ideal hindquarter angulation Walter would inevitably tell me a story about his observation of the 1951 Sieger Rolf vom Osnabruckerland and Rolf's extraordinary endurance capabilities on the final day of the show.

*1951 German Sieger- Rolf vom Osnabruckerland*

Walter told me that when Rolf came into the ring under Dr Funk he was a very impressive, very masculine dog but was not a spectacular and powerful mover like some of his competitors. However, his energy and effective, balanced, sure footed but conservative drive was exactly the same at the start of the gaiting assessment as it was after three hours of continuous trotting. Walter said that unlike some of his more spectacular moving competitors Rolf completed the class as fresh as when he first entered the ring. He said this was the best example he could give me that was the result of a fit and balanced dog possessing moderate and not deep hindquarter angulation.

For a number of reasons Rolf was a bit like the dog depicted in Figure 15. This story had a profound influence on me in regard to the ideal hindquarter angulation being balanced and relatively moderate. In my judging life of all things related to my views on the German Shepherd Dog this one point would be considered by all who have exhibited under me or heard me talk as being my signature theme. I have to say my preference to moderate hind angulation is more often than not met with a pleasant benign smile and a look that makes it clear there is disagreement. That my view is quaint but out dated and certainly not conducive to winning in the ring.

On this last sentence, regrettably I have no argument!

There is no doubt that right from the beginning Herman was committed to a different type to Dr Rummel and with this came a different topline and in the mind of Herman a stronger and more functionally effective topline.

In looking back one of the first dogs that I saw that had a curved back was in late 1988 and that was Dax von der Wienerau.

I recall that when Herman took over with the awarding of his first Sieger in 1983 to Dingo vom Haus Gero for the next 5 years all his Siegers had a straight and level back however this changed in 1988, coincidentally the same year I saw Dax when he awarded the title of Sieger to Eiko vom Kirschental.

*Dax von der Wienerau*

This was the start of a subtle change in the line of the back and its relationship to the withers definition. Herman had no problem with a back that had gone from being straight to having a very slight but perceptive rise over it and from this came the new World view that just like a bridge with a 'slight curve' (and I try to drag out the word slight) must be stronger than a straight back and providing that the withers were high and during movement the withers position was above the highest point of the back, all be it minimal, this was an improvement to be perpetuated.

*1988 German Sieger Eiko vom Kirschental*

It seems to me that when Peter Messler took over from Herman, his Siegers were, in this regard, variable and oscillating from elevated fill-in behind the withers to straight back to slightly curved back but as with Dr Funk, Dr Rummel and Herman Martin, Messler maintained, best he could, the principle that a working dog should not be over angulated in the hindquarter.

What changed profoundly was when Messler was replaced as President. Show oriented judges took over from the accommodating but still die in the wool working dog principled Messler and the principle that only the President of the SV should judge the open dogs at the Sieger show came to an end. This was a profound shift in 100 years of SV practice and discipline and the beginning of a new era.

The first show under the new policy was judged by Eric Orschler who awarded the 2003 Sieger title to Bax vom Luisenstrasse

*2003 Sieger Bax vom Luisenstrasse*

This was the first Sieger that went from having a slightly elevated spine and consequent fill-in behind the withers to the combinations of a slightly curved back and deep hind angulation and because of this, a decidedly sloping topline.

This was followed by Eric in 2004 with the Sieger Larus vom Batu, a dog he bred himself and whilst the back on Larus was not curved, his hindquarters were overly deep and consequently his topline is decidedly sloping..

*2004 Sieger Larus vom Batu*

In 2005 Heinz Scheerer followed Eric and gave Larus the Sieger title and in 2006 he well and truly cemented in place the two characteristics of a slightly curved and decidedly sloping topline associated with deep hind angulation with Zamp vom Thermodos.

Like Rolf vom Osnabrucker Land, Zamp became in my mind the 'new type' and a dog that is now the model that virtually dictates what wins at German Shepherd specialty shows throughout the World. Even though his sire, Quantum, had a straight back and balanced hind angulation, the characteristic slightly curved back is well entrenched via a number of


*Photo 2006 Sieger Zamp vom Thermodos*

ancestors such as Jeck vom Noricum who as a young dog had a peak in his back, Odin vom Tannenmeisse and Shanto's Xano and the deep hind angulation can be seen to come from the mother line through Esko vom Danischen Hof who had a slight curve and peak in his back and from here the peak and overlong femur can be seen to go back to Wobo vom Larchenhain.

*1993 Sieger Jeck vom Noricum*

In 2007 Reinhardt Meyer gave the Sieger title to Pakros d' Ulmental, a Bax son, and this consolidated the legacy of Bax and Bax's curved back and excessively deep hind angulation.


*2007 Sieger Pakros d'Ulmental*

In 2008 and 2009 Reinhardt gave the Sieger title to the Pakros son, Vegas du Haut Mansard, and this locked in place the characteristics of a slightly curved and sloping topline with the now inherently dominant deep hindquarter angulation via Vegas's mother Rangoon du Haut Mansard.

The following photographs of the German Siegers from 1970 until 2009 may help to show the developmental trend line in regard to the backline and hind angulation.

*2008 and 2009 Sieger Vegas du Haut Mansard*

## Siegers of the German Sieger Show from 1970 to 2009

| Name | Year | Comment | Sieger |
|---|---|---|---|
| Vegas du Haut Mansard | 2009, 2008 | High sloping withers, slightly curved distinctly sloping topline with deep over angulated hindquarter consolidated and now endemic |  |
| Pakros d' Ulmental | 2007 | High sloping withers, slightly curved distinctly sloping topline with overangulated hindquarters |  |
| Zamp v Thermodos | 2006 | High sloping withers, slightly curved back, distinctly sloping topline with overangulated hindquarters |  |
| Larus v Batu | 2005, 2004 | High sloping withers, straight back, distinctly sloping topline, balanced but slightly deep hindquarter angulation |  |

| Name | Year | Comment | Sieger |
|---|---|---|---|
| Bax v d Luisenstrasse | 2003 | Withers not as defined, back slightly curved, over angulated hindquarters start here |  |
| Yasko v Farbenspiel | 2002, 2001 | High long sloping withers, sloping and straight back, balanced and effective hindquarter angulation |  |
| Ursus v Batu | 2000 | High long sloping withers with a straight sloping back, moderate and balanced hind angulation |  |
| Rikkor v Bad Boll | 1999, 1998 | Withers not as defined, slightly curved sloping back, overlong upper thigh, correct lower thigh |  |
| Lasso v Neuen Berg | 1997 | High long sloping withers, slight curve to the back, moderate and balanced hind angulation |  |
| Visum v Arminius | 1996 | High long sloping withers, back has a very slight curve, sloping back with steep croup, moderate and balanced hindquarter angulation |  |

| Name | Year | Comment | Sieger |
|---|---|---|---|
| Ulk v Arlett | 1995 | Long sloping withers but not as defined, the back has a slight curve over it, slightly too long femur relative to the length of the tibia |  |
| Kimon van Dan Alhedy's Hoeve | 1994 | Withers not defined and flat, slight curve to the back, balanced but slightly deep hind angulation |  |
| Jeck v Noricum | 1993 | High long not quite defined withers, slight peak to the back, nicely balanced hind angulation |  |
| Zamb v d Wienerau | 1992 | High long sloping withers, slightly sloping defined straight back, moderate and nicely balanced hind angulation |  |
| Fanto v Hirschel | 1991, 1990 | Long sloping not quite defined withers, back is showing a very slight curve, quite long femur |  |
| Iso v Bergmannshof | 1989 | Long but not quite defined withers, just very slightly curved slightly sloping back, nicely balanced hind angulation |  |
| Eiko v Kirschental | 1988 | Defined withers and just the first hint of a curve to the back with balanced and just slightly deep hind angulation |  |

| Name | Year | Comment | Sieger |
|---|---|---|---|
| Quando v Arminius | 1987, 1986 | High long defined withers, slight nick but straight slightly sloping back, balanced but under angulated hindquarters |  |
| Uran v Wildsteiger Land | 1985, 1984 | High long defined withers, slightly sloping straight back, nicely balanced hind angulation |  |
| Dingo v Haus Gero | 1983 | Defined withers, straight back, balanced and very moderate hind angulation |  |
| Natan v d Pelztierfarm | 1982, 1981 | High long defined withers, straight sloping back, very moderate and balanced hind angulation |  |
| Axel v d Hainsterbach | 1980 | High defined withers, straight just slightly sloping back, balanced hind angulation |  |
| Eros v d Malvenburg | 1979 | High long defined withers, straight sloping back, balanced hind angulation |  |

| Name | Year | Comment | Sieger |
|---|---|---|---|
| Canto v Arminius | 1978 | High long defined withers, straight back with slight slope, nicely balanced and effective hind angulation |  |
| No Sieger | 1974-1977 | All VA dogs continued to have defined withers, straight back and nicely balanced hind angulation | |
| Dick v Adeloga | 1973 | High defined withers, straight back with slight slope, nicely balanced and effective hind angulation |  |
| Marko v Cellerland | 1972 | High long defined withers, straight back, moderate and balanced hind angulation |  |

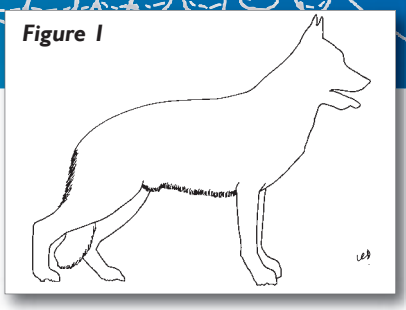
## Photos of immediate and therefore the most influential tail male sire line of Vegas du Haut Mansard

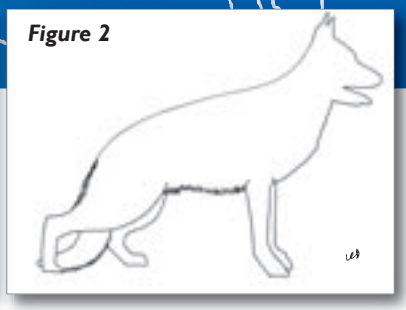
*Vegas du Haut Mansard*

*Pakros d' Ulmental – Sire of Vegas*

*Bax vom Luisenstrasse – Sire of Pakros*

*Odin vom Hirschel – Sire of Bax*




It is a great pity, perhaps even a tragedy, that the SV in 1961 removed from the 1938/1948 standard the words "the agility required for herding is attained through the strength and the angulations of the hindquarter".

## Croup

In regard to Figures 1 and 2, the croups on both dogs are basically the same and have been set at 27 degrees to the horizontal through the pelvis. The current SV Standard states the croup should be 'slightly sloping', the Australian Standard says 'slightly sloping ,'the English Standard says 'gently sloping', and the American Standard says 'gradually sloping'. The pelvis, besides anchoring the muscles to the hindquarter, satisfies one of its primary functions of determining the direction of the energy and thrust being transmitted through it to the body.

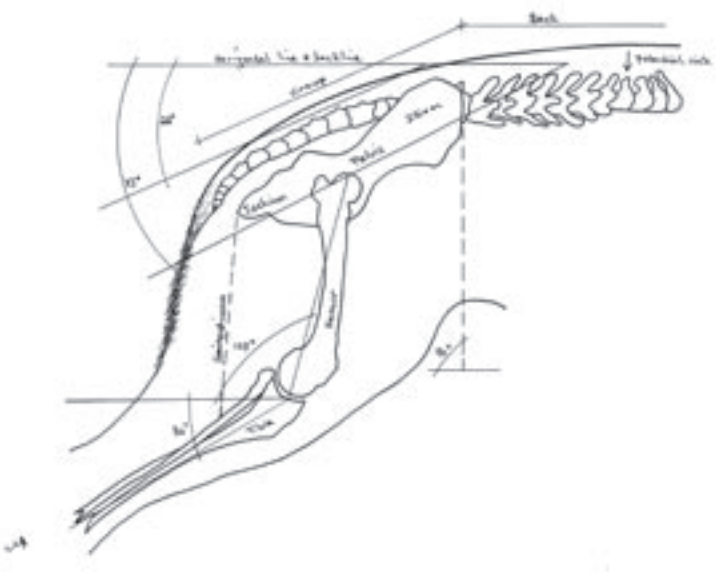
Before I move on, it may be worth explaining exactly what constitutes 'the croup'.

As with the back, I have found that there are various definitions of the croup and this often leads to confusion and misunderstanding in discussions and debate about not just the croup but often in All Breed circles misunderstanding about the whole topline.

The croup as can be seen in Figure 17 consists of the fused sacral vertebrae, the pelvis and the first six or so coccygeal [tail] vertebrae.

***Figure 17:***

*Showing how to deterine the croup, it's length and its relationship to the upper thigh*



The croups may not look the same on the dogs in Figure 1 and 2 and that's because of a number of factors.

These factors are as follows:

The dog in Figure 2 is deep in hind angulation and is stood overstretched and the combination of these two things causes the back to become decidedly sloped and as a consequence the difficulty in determining not just the angle of the croup but where it actually starts becomes difficult and this difficulty is further exacerbated by the slight curve in the back. In other words, because of the slope and slight curve to the back, the distinction between where the back ends and the croup starts is less obvious and this gives the illusion that the croup on the dog in Figure 2 is longer and steeper than the dog in Figure 1. And exhibitors wonder why critiques from various judges on the same dog vary so much?!

It would be fair to say we still have a large number of dogs with steep to slightly steep and slightly short croups.

Steep croups create an inclined [and sometimes interfering with the fore feet] over reaching rear fore step with an equally reduced rear back step. This reduced drive and energy is further dissipated when too much of it is directed upward at the expense of forward and in this process it can sometimes create a slight bouncing effect to the rear. As a flip side a steep croup is beneficial to dogs doing agility and hurdle work.

*A dog with over angulated hindquarters and long steep croup demonstrating their combined effect on the excessive slope of the back and topline*

In regard to the uplift and forward push function of the croup, think of a person lifting a wheel barrow. The person stands at the handles of the wheelbarrow, stands with his back and pelvis quite upright, bends his legs, gets hold of the handles and lifts the wheelbarrow and at the same time as he moves forward he inclines his back and pelvis and pushes the wheelbarrow forward. This action represents the function of finding a balance between upward and forward lift relative to the load and its centre of gravity. As an aside it also demonstrates how forward motion is initiated, that is by shifting weight forward or in the case of a human, literally falling forward.

If the wheelbarrow is empty the wheel barrow person will incline his back and pelvis to a flatter position than he would if the wheelbarrow was stacked high with bricks. If the wheelbarrow is stacked high with bricks as he moves forward he will do so with his back and pelvis in a far more upright position than if it is empty because this gives greater lift, but it's at the expense of forward push and motion.

In the dog the intermediate position that gives the pelvis the most effective balance between forward and upward thrust when ideal construction exists is 27 degrees through the centre line of the pelvis or because the sacral vertebrae, skin and coat add bulk, when viewed outwardly approximately 23

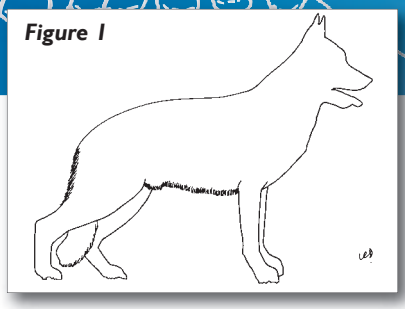


*Figure 1*

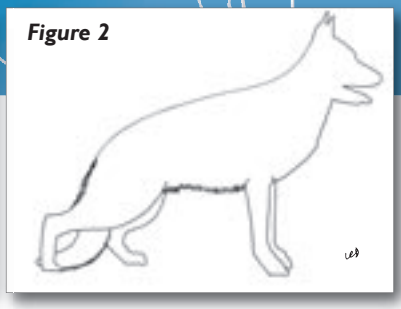


*Figure 2*

degrees. I say ideal construction because variations from the ideal will shift the centre of gravity slightly [see location of centre of gravity on the dog in Figure 6 and marked +] and thereby shift the distribution of weight and shift the ideal balance point for uplift versus forward push; like moving some of the bricks to the front or to the rear of the wheelbarrow. The amount of shift would be slight but the principle of what I am talking about is good for the novice to understand as it has application in other areas of the dog's construction.

As with all things the reverse applies in so far as the flat croup reduces the rear 'fore step' and whilst it increases the rear 'back step' and its thrusting power there is insufficient lift to the rear and too much forward thrust relative to the ability of the forehand to deal with and although the effect of this would not generally be seen in a typical show, over a long distance this eventually causes premature fatigue of the forehand. An example of a long but slightly flat croup can be seen in the photo of Prima Zorba on the next page.

For the reasons covered above the flat crouped dog requires more thought and greater insight from a judge when comparing it to a dog with a correct croup than when comparing it to a dog with an obviously less desirable steep or short croup as its effective on the drive over a relatively short period will be more forceful and more impressive than the correct croup.

The length of the croup has to be long and in proportion to the length of the dog so therefore the longer the dog the longer the croup needs to be. The length of the croup is best determined visually by looking at the width of the thigh because the croup length via the pelvis length determines the combined muscle mass which is there primarily to deliver power and thrust to the hindquarter. Simply put, short croup narrow muscles and reduced muscle mass, long croup wide muscles and greater muscle mass.

When the handler has stood the dog in an overstretched position it can be visually difficult to determine where the croup starts and to a lesser degree where it ends.

The Sartorius, which is the longest muscle in the dog, is a long thin muscle that has the function of assisting in flexion, adduction and lateral rotation of the hip and flexion of the dog's knee. It has its leading edge going from the base of the femur to the front of the pelvis creating the front line of the upper thigh. This allows you to literally see the start of the croup and is shown in Figure 17 as a dotted vertical line.

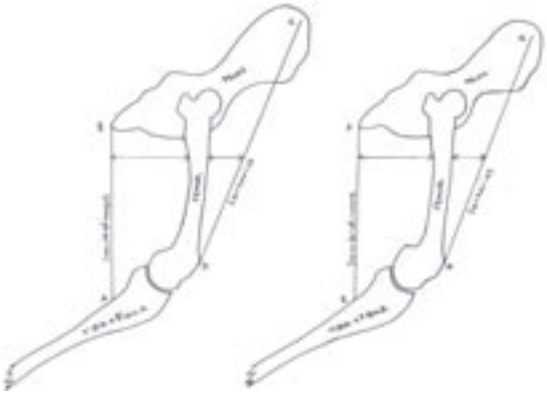
The Semitendinosus, which is a major muscle with an extraordinary long and powerful tendon, has the function of helping to extend, flex, bend and medially rotate the knee. The tendon of this muscle draws a line from the upper region of the tibia to the rearmost point of the ischium and this determines the outside edge of the thigh and this can also be seen in Figure 16 as a vertical dotted line.

In the context of the upper thigh muscle mass, when I look at a dog in stance I tend to see this area via the four interconnected dots of the connection points as can be seen in Figure 18D creating a 'sort of trapezoid' and the greater the total area of the trapezoid, the better. I make the comment 'as seen in stance' because whilst this is an indication of muscle mass it is not an indication of how well developed, firm or effective the muscles are and this needs to be determined on the day. What we can determine from this is the knowledge that a long and correctly angled croup creates a broad thigh and 'potentially' powerful drive whereas a short and or steep croup creates a narrow thigh and subject to the muscles development produces relatively reduced power and drive.

To help better understand the various aspects of the above within Figure 18, I have drawn 4 sketches.

One shows a long well laid croup, one shows a slightly short but well laid croup, one shows a slightly short and steep croup and the final sketch is an overlay of the three examples to show the muscle mass that is achieved in each example.

***Figure 18:***

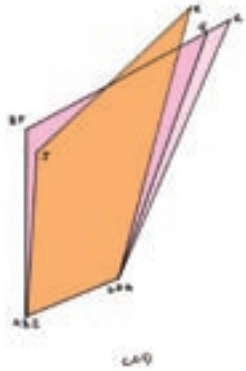


*18A: A long well laid pelvis*



*18B: A slightly short but well laid pelvis*

*18C: A slightly short but steep pelvis*



*18D: An overlay showing changes to the muscle mass relative to the three sketches of the pelvis*

The last thing you want in a dog with overangulation of the hindquarter is a short croup because of reduced muscle mass.

## Tail

Even though overstretching and overangulation brings the base of the tail closer to the ground, the tail on the dog in Figure 2 is much longer than the dog in Figure 1 and this reflects a classic human trend where 'perceived beauty' overrules functionality and a belief that bigger and longer

must be better and so the trend is for tails that, relative to the Standard, are too long and this is becoming endemic.

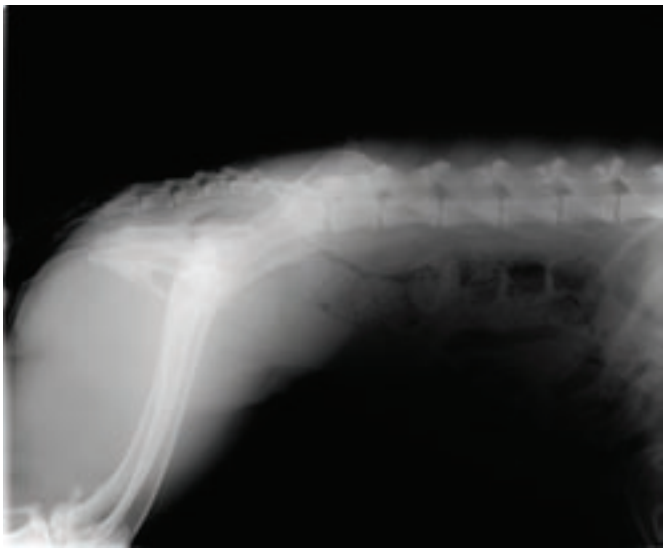
Putting aside aesthetics, the tail's function is to act as a communication tool and as a rudder during movement. The tail is an important tool for the dog when turning, particularly at speed; a balancing instrument a bit like the tight rope walkers balancing pole. Some people argue that dogs with docked tails have just as much manoeuvrability but I doubt it. A small example of this is something Walter Martin once said to me 'dogs out of coat with no hair on their tail can't run'. This is an exaggeration of course, but an interesting, and insightful comment.

I also like Von Stephanitz's description of the tail being the barometer of the dog's soul.

The tail is described in the Standard as 'not extending beyond the middle of the rear hock' as is depicted in Figure 1 and that it should 'hang in a gentle hanging curve'. The current 2010 Standard states 'the tail extends at least to the hock, but not beyond the middle of the hind pastern' [the metatarsus]. It also states under 'eliminating faults' that disfiguring tail defects are to be eliminated but it does not define 'disfiguring' and one example of a disfiguring fault in my mind is the quite rare, fusing together of the last few vertebrae.

The only thing that keeps this "beauty driven" trend in check is that long tails tend to lead to rings, twists, hooks and severe sideway casts as the dog endeavours to keep its tail off the ground and 'depending on its degree' can be classified as being anywhere between an aesthetic matter of little importance to a serious fault. Unfortunately though, as with double P1's, the way to hide anything perceived to be a disqualifying fault is 'to fix it' thereby hiding the fault even though this is illegal in the dog sport and 'if proven' results in total disqualification. The operative word here is 'if proven' and I am sure everyone who attends shows has seen an example of a 'fixed tail' and when they do it is generally discussed in whispered tones and referred to as a 'dead tail'.

My last comment on tails is in regard to high set tails. There is a difference between high set and low set and most of the incorrect tail sets that we have are high set. Neither have any real negative impact on function but just like the dip behind the withers it detracts from the standards requirement for a flowing clean topline. High set protruding tails are caused by a high set alignment of the sacral vertebrae and this can be seen in the following photo and x-ray.



*Example of a high tail set*

## Forehand (the shoulder blade and upperarm)

The desired angulations and length of bones in the fore [and hind hand] are sought because those angles and lengths will ensure the dog demonstrates in fast movement what is a highly sought after and unique characteristic of the German Shepherd Dog. In general dog parlance that unique characteristic is termed as a 'flying trot'. As I explained earlier this is attained by the dog having over a long distance a somewhat less than efficient energy to outcome result but an outcome that in the show ring demonstrates relative to every other breed of dog an extraordinarily long reaching ground covering stride that through basic engineering principles causes the front and rear paws to over reach, to pass each other.

The forehands are identical in so far as both dogs have a long shoulder blade [scapula] set at 45 degrees to the horizontal but this requires some discussion. The angle of 45 degrees or 90 degrees in total was first determined as the ideal by horse people and they determined this more on what they theorized and they were influenced too by the fact that the steeper the shoulder blade the rougher the ride and the more the lay back of the shoulder blade the better the ride.

*Prima Zorba - multi excellent select and 1989 & 1990 Australian Sieger - a dog the author made Sieger and promoted highly primarily because of his very good forehand and extraordinary ability to pass it on to his progeny*

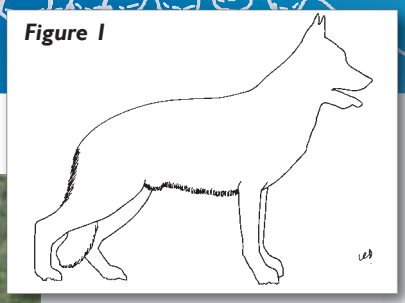


*Figure 1*

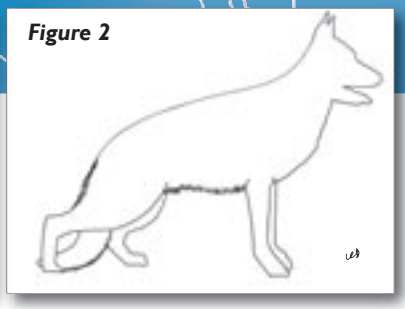


*Figure 2*

*Quincito Awol – multi excellent select and 1991 Sieger – a dog the author made Sieger and promoted highly because of his overall type and forehand angulation*

The function of the shoulder blade is somewhat akin to the pelvis. However unlike the pelvis which is basically fixed in its position during the walk and trot the shoulder blade isn't. The shoulder blade which has no attachment to the body other than by muscles and tendons oscillates back and forth as it directs energy from the hindquarters and the angle of the shoulder blade at it's given point of oscillation will determine the direction of the energy being passed through it hence a steep shoulder blade directs too much energy downward instead of forward. A point to also be aware of with the shoulder blades is that if they are set too wide apart because of too heavy muscling under them some energy instead of being directed forward toward the centre of gravity line will be directed outward and lost. The shoulder has the function too of carrying weight. The forehand has more weight than the hind quarters and this weight is relatively substantial. The shoulder blade also contributes toward propulsion, assists the front legs to lift and to swing back and forth, helps absorb forehand shock and contributes to or reduces fore reach via the upperarm and foreleg.

The Standard in relation to the desired angle of the shoulder blade was written over 100 years ago and like many other dog Standards that were written back then Von Stephanitz and the SV accepted the 45 degrees as fact and like most dog Standards it does not tell you 'exactly' how this angle is to be assessed. The belief that 45 degrees is the ultimate angle in dogs requiring great forereach goes back well before Von Stephanitz's time.

The latest scientific literature on movement states that the ideal angle of the shoulder blade for ideal fore reach in a trotting dog that requires endurance is 30 to 35 degrees off the vertical [that is approximately 55 to 60 degrees off the horizontal] and that it is virtually unknown for any dog including the German Shepherd Dog to have a shoulder blade that is laid back at 45 degrees!

I personally believe 55 degrees is closer to the mark and that leads us into the next topic which is where on the shoulder blade do you determine the line of angle? The angle of the shoulder blade is usually determined by 'visually drawing' a line through the centre of the shoulder blade

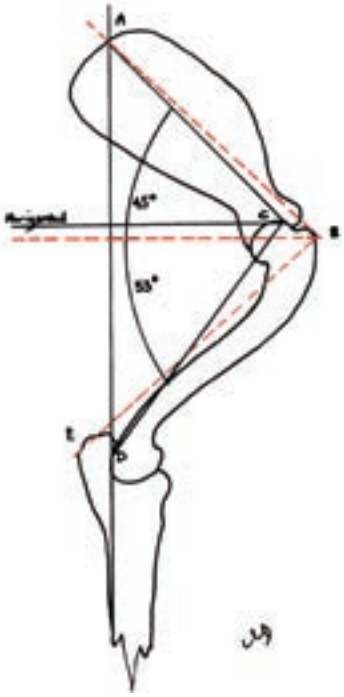
When judges and surveyors make an assessment of the angle of the shoulder blade they either visualize where the top and centre line of the scapula is and extend that line to where it connects to the upperarm or they bend down on their knees, put their hand on the top of the scapula and with the other hand feel for the point where it connects to the upperarm. From either process they determine the shoulder blades angle and length.

These upper and lower points of reference can be seen in Figure 19 and are shown as points A and B

***Figure 19:***

*Showing the various ways the length and angle of the shoulder blade and upper arm can be determined*

*The dotted line represents how most judges assess the shoulder blade and upper arm whilst the solid line represents how it should be determined*




The general response you would get from most people when asked how they actually determine by sight or feel the angle of the shoulder blade would be for them to say it's the line that runs through the centre of the scapula, solid line A C, but contrary to what they may think, this is not what they are actually determining the angle from!

What they are working on isn't a line through the centre of the scapula but a line that starts in the centre of the scapula at it's top, at the withers, but at the bottom where it joins the upperarm they have moved away from the scapula's centre line, its spine and they are now on a line that has been set by the outer point of the humerus dotted line A B. This is the point they actually see and or touch. This gives the illusion of more lay back of the shoulder blade than actually exists and is part of the problem when people both assess and talk about length and angles of bones in general.

Dr Gorrieri did believe that the shoulder blade should approximate 45 degrees but he did not accept the traditional view that is still generally expounded that the shoulder blade and the upperarm should both be 45 degrees to the horizontal and equal in length. If you assess the shoulder blade and the upperarm by sight as described earlier then they may appear to be at 45 degrees and 90 degrees to themselves and equal in length but if you measure them correctly, as a clinician would do as can be seen in Figure 19 in the solid lines they are not equal and the upperarm is not at 45 degrees but 53

degrees. It is necessary for the reader to accept that the way to measure and calculate degrees in the upperarm is as I have shown it in the solid line and as such comparison to the length of the shoulder blade should be done this way too.

There is also an important side issue to all of this

I have mentioned the importance of the dog maintaining its centre of gravity. This is in stance as well as in movement. To better understand this, to better understand Figure 19 and to feel this for yourself – stand up dead straight and in doing so you will find the most natural position for you to stand is when your two feet are together and your heels are in a vertical line with your legs, hips, spine, and head. This is because the central line of gravity is being transferred in a basically straight line down through the centre of your body and through the centre of your heels. As a result you feel totally balanced. If you tilt your upper body forward at the waist, you will feel the centre of gravity shift toward the balls of your feet. This has shifted the line of gravity and you feel less stable.

For the dog to have ideal transfer of gravity through the forehand when it is standing naturally, the centre of the shoulder blade needs to be vertically in line with the axis point where the upper arm meets the foreleg and this vertical line needs to continue on down through the fore leg to the pastern. This can be seen in part in Figure 19.

If the shoulder blade is set at 45 degrees through its spinal ridge and the upper arm is set at 45 degrees 'as you see it outwardly' if the upperarm was the same length as the shoulder blade the upper arm would be too short in so far as its ability to achieve the desired centre of gravity axis point and as such the transfer of the line of gravity would be shifted backward. Hence Gorrieri's calculation that the upperarm if it is set at 45 degrees outwardly which equates to 53 degrees through its axis points [which is how it should be calculated] needs to be approximately 10% longer than the shoulder blade. Given this logic of critical axis point, if the shoulder blade was steeper than 45 degrees, the length of the upperarm could be reduced and it may well be that it would be equal in length to the upper arm.

A slightly steep as opposed to steep upperarm [for a steep upperarm and for your interest a steep shoulder that is masked by a deep and overdeveloped fore chest see photo of the USA Grand Victor] is relatively common and an example of this can be seen in the following photo of a very successful Czech working dog - see video 'You Tube Policka 2009 Francesco Anrebri' http://www.youtube.com/watch?v=8e4UmCBC9l0

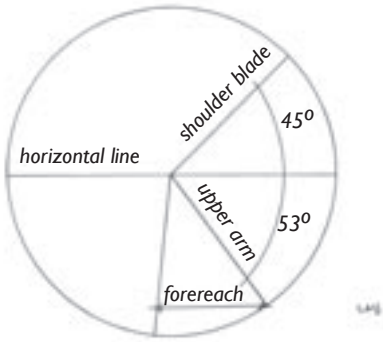
*Francesco Anrebri*

The angle of the upperarm on the two dogs in Figure 1 and 2 has been drawn at 53 degrees to the horizontal through their axis points and having said this the same issue as the shoulder blade comes up in relation to exactly how you assess the angle and this is also shown in Figure 19 as a firm line and a dotted line with points shown as B, D and E where B and D is the correct way to determine the angle of the upperarm and B and E is how it tends to be done.

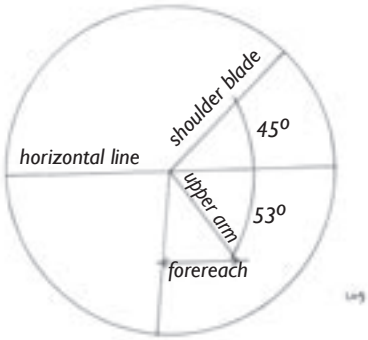
Confused? I can understand if you are but because the Standard doesn't explain exactly how you should assess measurements and angles of the fore hand and whilst it has been amended to accommodate the vagaries of what I have said, it is worth understanding this point to ensure clarity in discussion on the fore hand when you are talking to someone about it and to ensure you are both on the same page.

Figure 20 demonstrates the travel distance of the upperarm relative to its length and angle, specifically, the longer the upperarm and the greater its angle the greater the arc and forward reach of travel. In most, if not all breeds of dogs, during the extended gait the upper arm stops at the vertical and not beyond this point however my observation is that when a well-constructed German Shepherd Dog with well laid forehand angulation and effective drive gaits at full extension the upper arm stops anywhere from the vertical norm up to 3 to 5 degrees just forward of vertical.

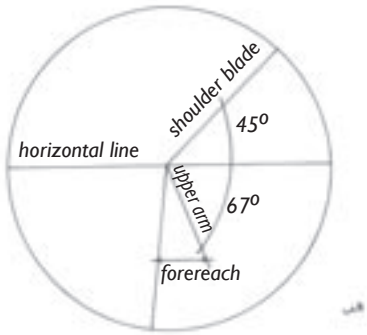
***Figure 20:***




*20A: Showing the maximum fore reach of the upper arm as a result of a long well angled upper arm - maximum fore reach*




*20B: Showing reduced fore reach as a result of a correctly angled but short upper arm - fore reach reduced by 25%*




*20C: Showing significantly reduced fore reach as a result of a short and steep upper arm - fore reach reduced by almost half of ideal*

In our breed the upper arm has the greatest influence on fore reach but having said this newcomers to the sport of dogs should be aware that the greatest single factor influencing fore reach on dogs and indeed most if not all animals is not the upperarm but the length of the foreleg and this is demonstrated in Figure 21. Let me explain this.

In broad terms the angle and length of the shoulder blade in most German Shepherd Dogs in Australia is pretty good. Very occasionally they are a bit steep but that's about as far as it goes however, the angle and length of the upperarms vary greatly and most are a bit short and a bit steep.

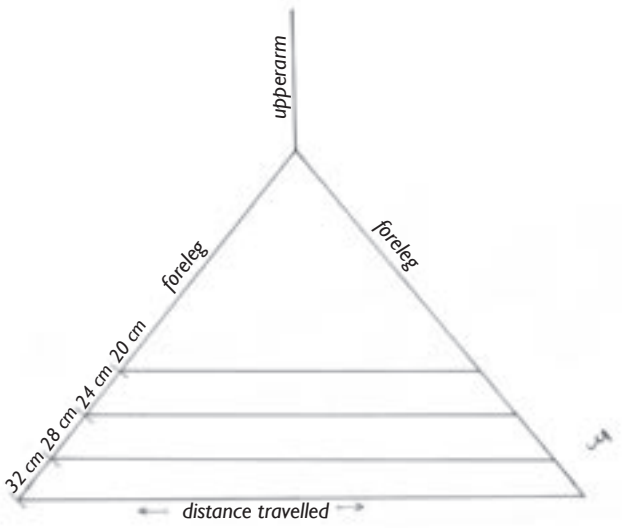
The foreleg lengths of our dogs are pretty good sitting between 50% and 55 % of overall height. Sometimes they are a bit short but rarely too long. In regard to foreleg length, something for the novice to be aware of is that the radius, which is effectively the foreleg from where it joins the upperarm [humerus] to where it joins the pastern at the wrist [carpus], should be about the same length as the upperarm.

What this tells us is that the most significant thing that impacts on fore reach in the German Shepherd Dog is the upperarm but 'in the context of all breeds of dogs' the most significant contributor to fore reach per se is the length of the foreleg and this is something I would like the novice reader to be aware of and understand as it will broaden your appreciation and understanding of dogs in general and particularly dog's movement. Believe me when I say to you that by having an understanding and appreciation of the construction of other breeds of dogs you will have a greater understanding of the German Shepherd Dog itself and as consequently you shall be a more credible dog person and a better caretaker of the breed.

***Figure 21:***

*Showing the fore reach attained by varying lengths of fore leg*

*The shorter the foreleg the less distance travelled*




Besides showing the length of the fore reach relative to the length of the foreleg, the above diagrams demonstrate that a dog with a just slightly short and just slightly steep upper arm, but with proportionately long forelegs, will out reach a dog that has the correct length and lay of the upperarm with decidedly short forelegs.

*Example of correct forehand angulation – long and well angled shoulder blade combined with a long and well angled upperam.*

## Elbows [and their relationship to the upperarm]

An observation that I have made is that dogs with short upper arms will have their elbows positioned slightly outward. This is undesirable because as the dog moves the energy is not being directed along central lines of gravity. This is because the elbow which is sitting higher on the rib cage than it would be in the case of a long upper arm is deflected outward by the rib cage and whilst I am talking about elbows I have to say that most of the dogs that I have judged in Australia, in stance, show a 'slight' open position of the elbows and in movement a slightly loose articulation and this generally is as a result of the short upperarm and loose ligaments.

Something to be aware of is that for a dog doing a lot of jumping, loose ligamentation in the elbows can lead to stretching and damage of tissue in that region and eventually this can lead to arthritis in the elbows.

A final note on elbows. My observation is that we have a few too many dogs that are slightly slab sided and this causes the elbows to be pinched in and the toes to turn out in the dog's attempt to attain their centre of gravity through the centre of the shoulder blade. Instead of the elbow lying close to the body when looking at the dog from the front you will see a clear gap between the body and the elbows that you can place the flat of your hand between.

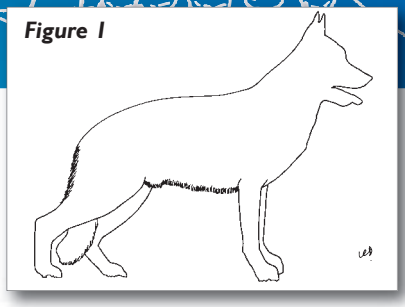
## Drive [hindquarter thrust]

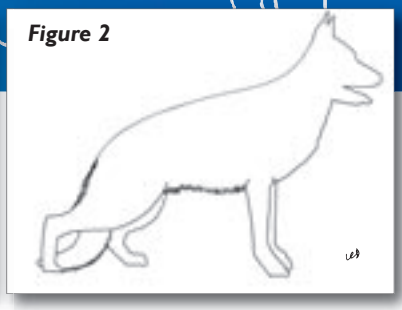
Much has been said and written about drive and most of the comments said and written tend to state that all the drive comes from the hindquarter and the forehand just does the steering.

This is incorrect.

Pressure plate tests have demonstrated that after the front paw passes behind the shoulder blade there is considerable forward thrust generated by the forehand and Dr Curtis Brown has suggested that the ratio of 'net effective thrust' produced rear to fore in a trotting dog is 60 to 40 with 40 being thrust generated from the fore hand .

An exaggerated example of this can be demonstrated by observing a sled dog. Under load, the sled dog driven forward by its inherent desire to work deliberately reduces its fore




reach [and hind fore reach] the fore reach steps are shortened to almost half of its normal trotting capabilities and the dog pushes with all its might once it's front paws are immediately behind the shoulder blade and its rear paws immediately behind the hip joint and the rear paws in particular are extended to the rear most distance possible before they begin their return.

Thrust only starts after the feet pass the hip joint and shoulder blade. If you can't find a sled dog pulling a sled and you want to see an example of short fore step and long rear step that is done by the dog to create the maximum possible forward thrust under load, no problem, just come along to any German Shepherd Dog show and you will see plenty of dogs pulling a substantial weight with all their might exactly as I have described!

## Underline

Both dogs are the same in this regard and show the correct depth and length of underchest and a moderate tuck up. We still have quite a lot of dogs in Australia that are short in the under chest and as a consequence show a distinct as opposed to moderate tuck up. See photo

*Example of a short underchest*

This is caused by a reduction in the length of the ascending ribs and except in extreme cases and contrary to popular belief is not associated with a rise in the vertebrae of the back. Excessive tuck up assists in the flexing of the back during the gallop. This is OK for a short distance fast sprinter but not a long distance trotter because it gives a reduced area for the lung and heart. It also shifts the centre of gravity forward. The impediment to the dog of a short underchest is something that can only be demonstrated after very lengthy gaiting like a long day's work in the field where long distance trotting and endurance is more important than short distance high speed galloping.

## Pasterns

The pasterns are drawn on the dog in Figure 1 and 2 at the desired angle of about 21 degrees. There is little point in me going into the detail of how the pasterns absorb shock as this quite well known but what I will comment on is that the reader should be aware that upright and or short pasterns are detriment to the dog because their elasticity is diminished and this impacts negatively on the dog's forward movement. This can be seen not just as a slight jarring in the forehand as one might expect but in a slightly reduced and less smooth lift to the forehand as the foreleg makes its rearward stroke.

I also make comment on the substantial number of dogs we have in Australia that have slightly to very weak pasterns and whilst this can be seen when the dog is standing but it is easier to see when the dog is walking or trotting. Weak pasterns are pasterns that are too inclined, the wrist [carpus] comes closer to the ground and the tendons in the pasterns start to bow.

The pasterns should be taught but at the same time flexible. They should be storing energy on the fore step and discharging it on the rear step but when they are weak they lose their taughtness and elasticity and have a flapping action as they are lifted off the ground on both the fore and rear step. A point worth mentioning is that when the pasterns are weak the lower angle will cause the front feet to become somewhat long and as this elongation occurs they will become a little flat and therefore a little open. Quite often I hear judges blaming the feet for this flapping action saying it's because the feet are flat. In a small way they are right but it isn't the feet that they should blame, it is the weak pasterns that are at fault and the feet are its by product

The flapping is somewhat akin to baby puppies consciously lifting their front feet from the elbow as they walk or run or visually like little children wearing socks that are too long flapping them as they walk.

A final point I would make is that dogs with this flapping/stepping fore action can be confused with dogs who exhibit a similar fore action which is caused by a long, steep upperarm, as covered earlier. This is because there are a number of actions occurring that whilst not exactly the same look similar and both may involve lifting at the elbow. The best way to determine which of the two problems is creating the stepping fore action is to look at the angle of the upper arm and the angle of the pastern and the angle of the neck during movement and this will give you the answer. It will be one or the other and very occasionally both.

Putting aside the shock that is being applied to the dog's forehand when it is running and jumping, the reason why weak pasterns are a particular problem for our breed is because it burns up a huge amount of energy and dogs with this problem at the extreme end of the scale get tired surprisingly quickly.

A very small point of interest for the novice to be aware of is that the front feet on dogs are larger than their back feet. There is a reason for this and if you have read the paper carefully the reason has been disclosed.

## Hocks

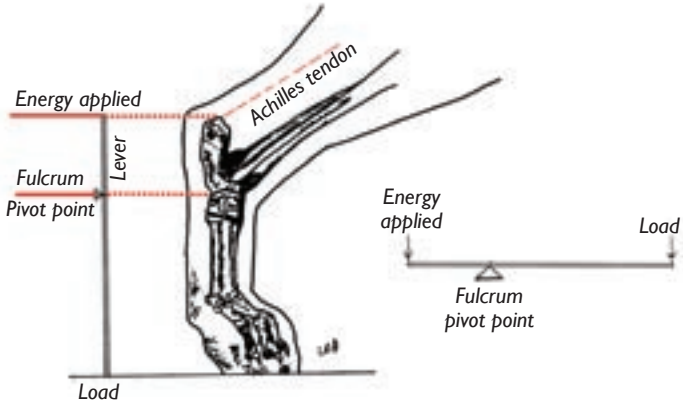
The function of the hocks in movement is often overlooked but considering rear movement starts with the hocks and their length and strength directly affect the thrust generated forward to the body, it needs to be understood.

The hocks are subject to the same physics as all levers and it is really just a matter of applying those laws to the hocks to understand their function and in turn understanding the ideal construction of the hocks for the German Shepherd Dog.

The basic fundamentals relating to the function of the hocks relate to the basic fundamentals of the lever system and the relativity is transposed in the following sketch.

***Figure 22:***

*When the distance between the fulcrum point and the load is lengthened this creates more thrust and speed, but it requires more effort and this causes earlier onset of fatigue.*




The optimum objective in the German Shepherd Dog is to have a situation where all opposing forces, being the toes of the metatarsus and the tip of the calcaneus divided by the point of the fulcrum, achieve a balance between the needs of thrust and speed best suited to a trotting, long distance, endurance dog.

The hocks are activated by the gastrocnemius muscle [calf muscle], a large muscle that is attached to the femur and runs down the back of the tibia. The end of this muscle is attached to the Achilles tendon, which in turn connects to the top of the calcaneus, which is the bone at the top of the hock. Keeping in mind that muscles and their attached tendons pull not push, the Achilles tendon and attached calf muscle, after being stretched, pull the hock forward after it reaches its required extension. The angle of the Achilles tendon is important in so far as the steeper the angle the greater the effort required to contract the hock.

For interest, using a basic mathematical formula, the amount of force required to push an adult male German Shepherd Dog who has the correct length of the hocks is approximately 170 kgs. The shorter the hocks the less the force required to move the same load but this generates less thrust and therefore less speed.

The goal in lever design is to have greater distance between the fulcrum and the effort than the fulcrum and the weight and as such the longer the section of the hock between the connection point of the Achilles tendon and the pivot point in the hock, the better. Archimedes Principle of the Lever - *'the longer the arm of the lever to which force is applied the less the force needs to be'*.

In the dog, the arm of the lever is the distance between the tip of the calcaneus and the pivot point on the hock. When you move the load [toes of the hock] further away from the fulcrum [connection point of tibia to the hock] the arc travel of the hocks is increased and whilst this has the benefit of creating much greater thrust and therefore increased speed, it is at the price of consuming more energy and inducing earlier fatigue.

Earlier in my article I gave the analogy of the Greyhound as a short distance sprinter versus the German Shepherd Dog which is a long distance trotter. The reason a Greyhound has long hocks is because it is required to travel forward covering the maximum amount of ground possible over a relatively short distance at great speed. No dog can cover this amount of ground with such rapid ground covering stepping cycles and not cause relatively early fatigue to the Achilles tendon and indeed the dog as a whole. A dog with short hocks will have less speed but the reduction in energy consumption and lack of stress on the Achilles tendon will guarantee it has superior endurance capabilities.

The German Shepherd Dog needs to cover a reasonable amount of ground and at a good speed but it must do this over a very long distance and as such a balance between a long hock and a short hock is ideal. A strong, medium size hock provides the right balance of energy consumption versus distance to be covered for a trotting endurance dog.

## Bone

Bone is shown in both dogs as being in proportion to the dog and therefore depicts very good bone strength. Shape of bone, straightness of bone when viewed from the front and correct density of bone, or dry bone as it is more often referred to, is important to understand but one outside my self-imposed brief.

Having said this one thing I would comment on is that in Australia we have too many dogs and bitches that are a little fine in bone. The shape of the bone, its density and even its functionality is not an issue; it is the bones lack of size relative to the size of the dog. It is the lack of proportional mass/ thickness which is described by judges and surveyors as bone strength. Unfortunately, we have a high number of stud dogs and breeding bitches that produce progeny that stand on the higher range of height and produce bone strength that is not in proportion to that height and this has can have a negative implication for the dog especially if it is a working dog and the bones are put under stress. Many people focus on the dogs rather than the bitches in this regard but they shouldn't as it is equally problematic in both sexes. I make this point because I often hear judges describe a dog as being under medium strength or fine in bone but when they describe a bitch who is equally fine in bone they will describe her as being 'very feminine'. Bottom line is that under medium strength to fine bone in a large dog is not a good combination and we have too many of them.

I have covered a number of aspects of the German Shepherd Dog here and thought it worthwhile drawing some sketches that show the effect of these various components on movement.

In Figure 23, I have placed them all together rather than spacing them throughout the paper as I felt it was better for the reader to be able to compare the dogs as a group as you might in the show ring. On that score, if you are up to a challenge, even for those readers who are experienced judges, try placing the dogs 1st to 12th and then compare your placings with your friends.

Before you do that you will see in Figure 23(k) a very good dog that is pacing and depicted as doing so at a 'fast pace'. In dogs the 'fast pace' is counter intuitive to a dog because the pace is a foot fall sequence that is designed for relatively slow speed as can be seen naturally in say the Old English Sheepdog but in show ring competition when our breed decides to pace inevitably it has to do so at a fast pace because it is caught up in the midst of dogs who are all gaiting at a medium to fast trot. This is akin to you being in the midst of a group of people who are all running and you are keeping up but doing so using a fully extended and therefore strenuous walking stride.

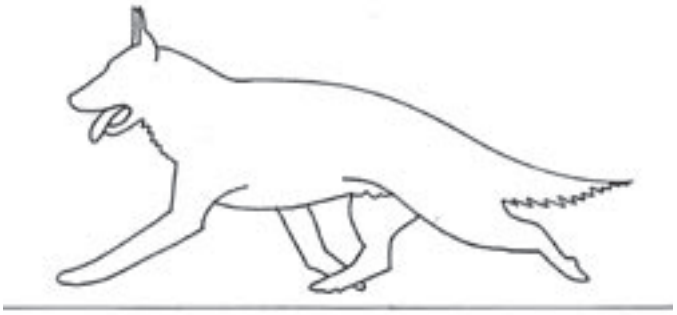
I am often asked why German Shepherd Dogs pace and the perplexing thing for most people is that they have seen some of the best constructed dogs in the World including German VA dogs pace. The reason why this form of gaiting is perplexing is because it is not a construction related matter it is a mental one that is caused by habit or deliberately introduced to the gait by the dog in its response to not feeling well, being physically fatigued or tired or intuitively selecting this as the foot fall sequence it considers to be the most appropriate to the task being undertaken or perceived.

The dog selects the pace because it is the most energy effective foot fall sequence for covering a reasonable amount of ground at medium to slow speed. It does this just as it selects the trot as the most suitable foot fall sequence for covering a lot of ground at a reasonably fast speed and selects the gallop as the most suitable sequence for covering the maximum amount of ground at rapid speed. The use of the pace can be likened to the dog's gearbox where the dog selects the most appropriate foot fall sequence relative to the required speed, the task at hand, the anticipated journey distance and above all, the minimum energy consumption requirement. For the dog this latter consideration is absolutely fundamental in its instinctive and inherent survival thought processes.

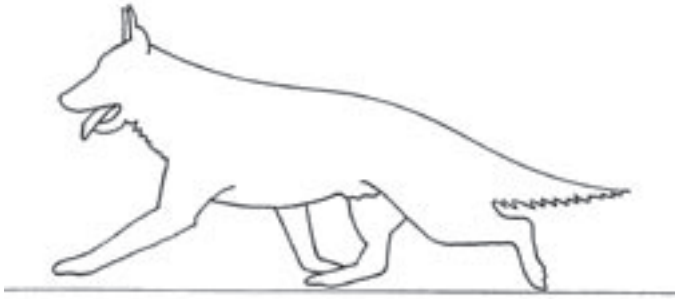
In the show ring the first dogs to pace, virtually right from the start, are the habitual pacers, often followed by the constitutionally less well dogs followed by the less fit dogs and if you wanted to extend this to infinity and kept the class going for hour on end inevitably most if not all the dogs in the class would start to pace as they worked out what the most energy efficient foot fall sequence was for what they now see as a never ending, energy consuming mind numbingly boring task where achieving distance has become primary to speed or clear goal. Habitual pacers can be likened to people who when walking long distances and start to tire begin to slouch their shoulders. Slouching of the shoulders even when you are not tired or fatigued can become a habit, just like pacing. That is, undisciplined people will slouch even when they are not tired or fatigued. They slouch just walking from the fridge to the television couch.

Because of this, habitual pacing can be corrected if you know how and you have the will and the determination to break the habit.

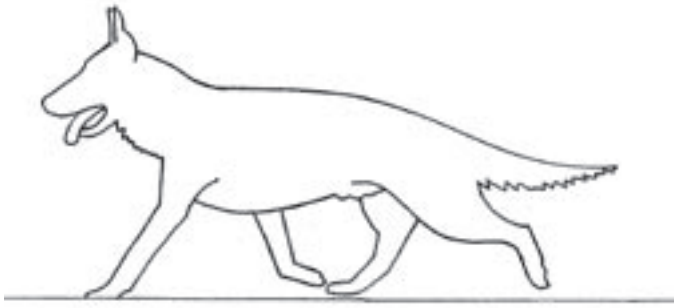
The following Figures show many of the faults previously discussed in relation to their effect on the movement of the dog in outline.



*23B: Roached/curved back*

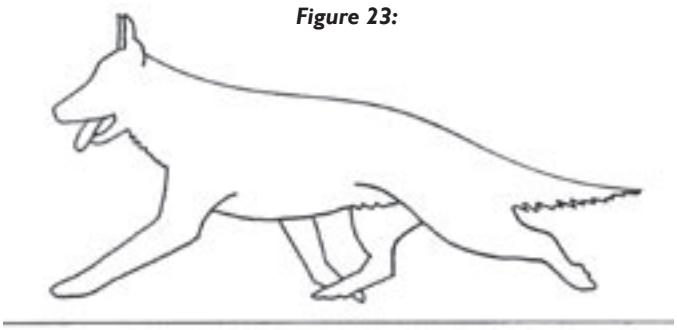


*23C: Overangulated hind quarters*

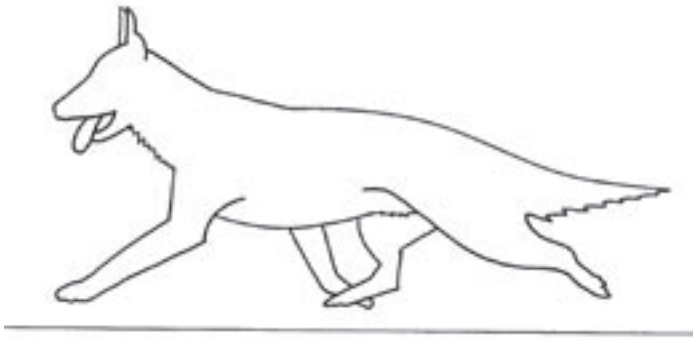


*23D: Flat withers*

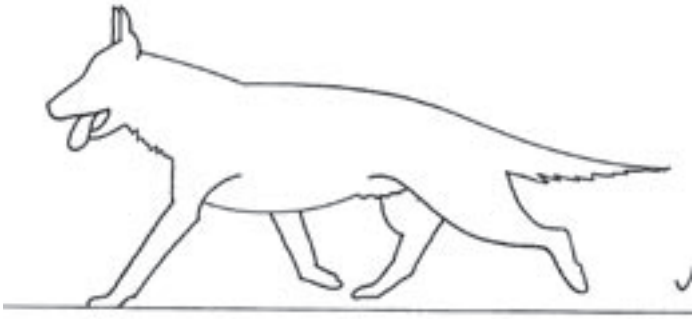
***Figure 23:***



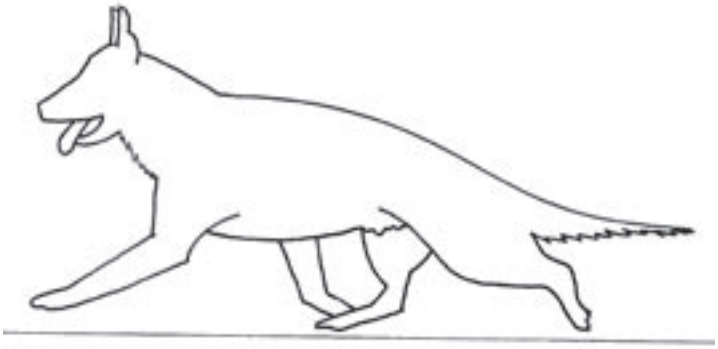
*23A: Correct construction*



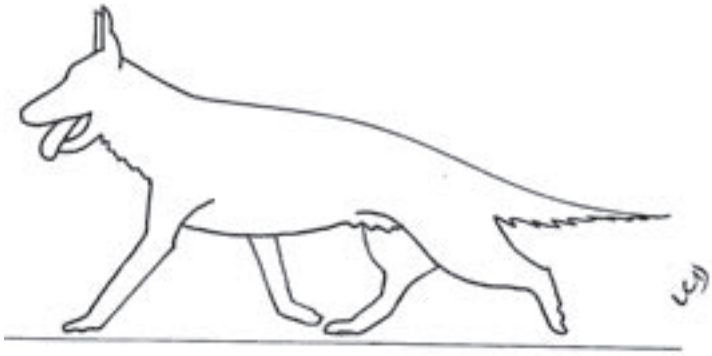
*23E: Weak back*



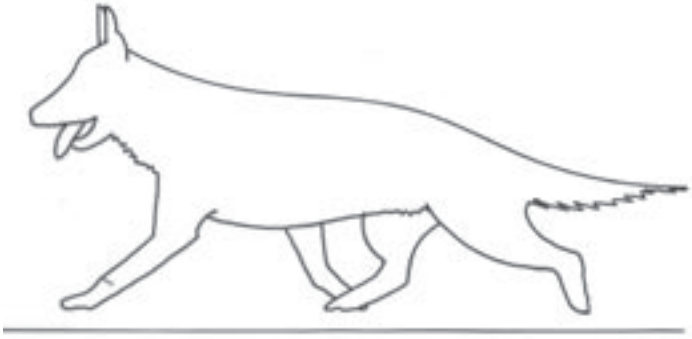
*23F: Low withers*



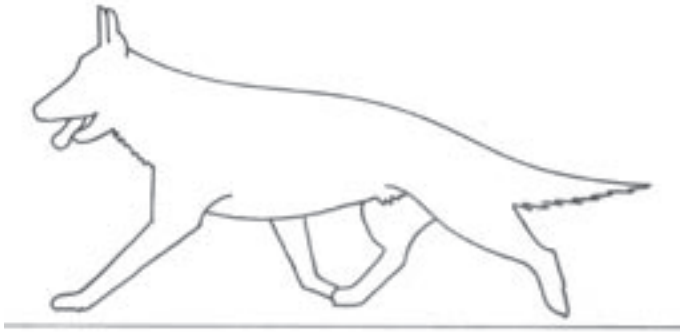
*23G: Overangulated hind quarters and roached/curved back*



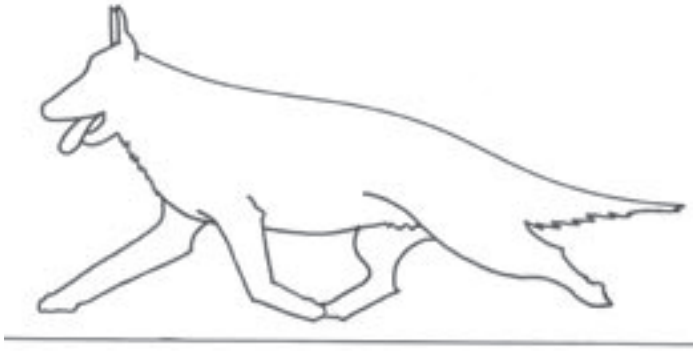
*23H: Short steep upper arm*



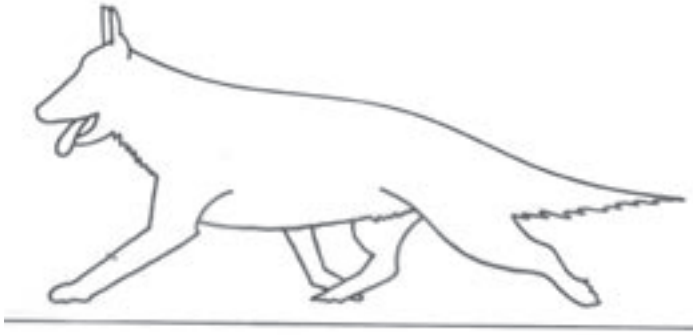
*23I: Slightly short and slightly steep upper arm and slightly short forelegs*



*23J: Slightly short and slightly steep upper arm and slightly short and slightly steep upper and lower thigh*



*23K: Fast pace*



*23L: Slightly short fore and hind legs*

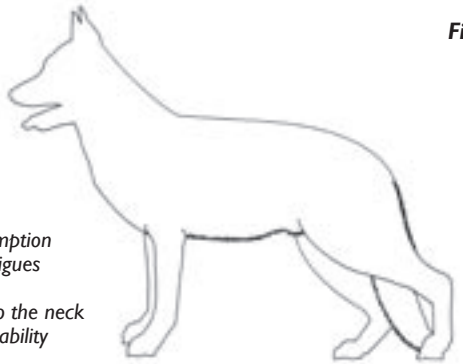
## Structure in stance

The following Figures represent the effect the various points that have been discussed in this paper have on the outline of the dog shown in Figure 1 in stance.

**Figure 24:**

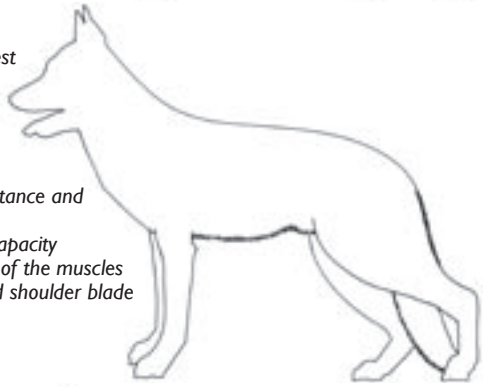
*24A: Level and low withers.*

- *Falls on the forehand*
- *Reduced forehand reach*
- *Increased energy consumption*
- *Over a long distance fatigues the forehand*
- *Reduced muscle mass to the neck*
- *Reduced endurance capability*



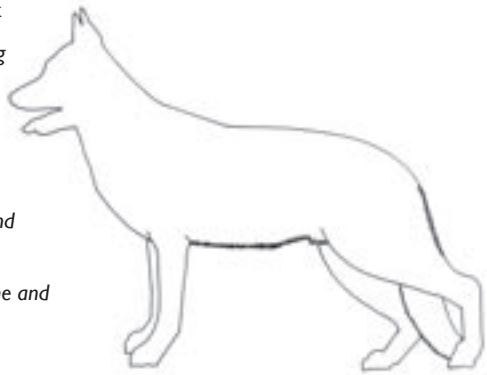
*24B: Shallow underchest and lacking forechest*

- *Elbows pulled inward*
- *Reduced area for the heart and lungs*
- *Loss of harmony, substance and proportions*
- *Reduced endurance capacity*
- *Reduced forward pull of the muscles to the upper arm and shoulder blade*



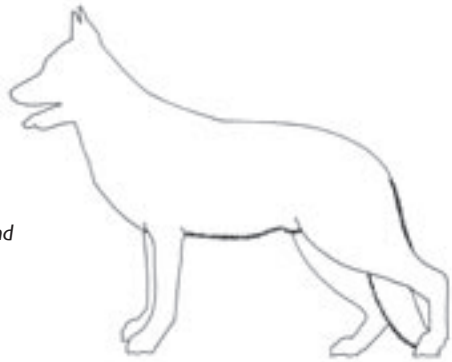
*24C: Long weak back*

- *Pronounced high long withers*
- *Loss of transmission through the back - energy dissipated*
- *Increase in energy consumption*
- *Reduced flexibility and agility at speed*
- *Reduced endurance*
- *Loss of flowing topline and harmony*



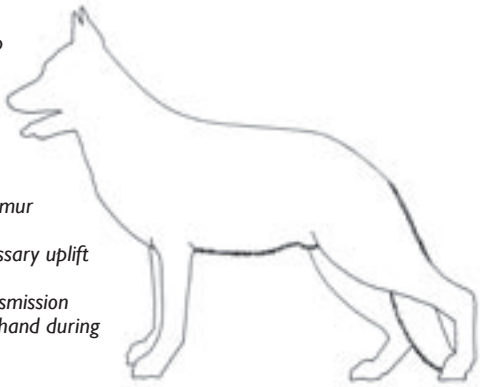
*24D: Weak back*

- *Loss of transmission through the back - energy dissipated*
- *Increase in energy consumption*
- *Reduced endurance*
- *Loss of flowing topline and harmony*



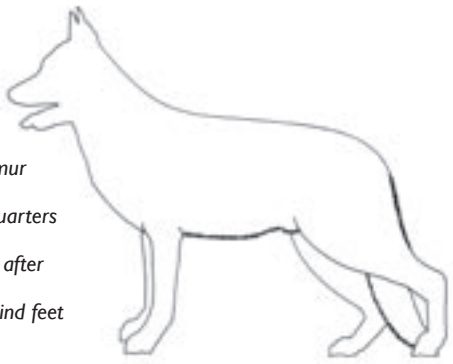
*24E: Short steep croup*

- *Reduced muscle mass/spread to the upper thigh*
- *Reduced muscle length from the rear of the pelvis to the femur*
- *Reduced thrust*
- *Increased but unnecessary uplift to the rear*
- *Reduced forward transmission*
- *Imbalance to the forehand during movement*



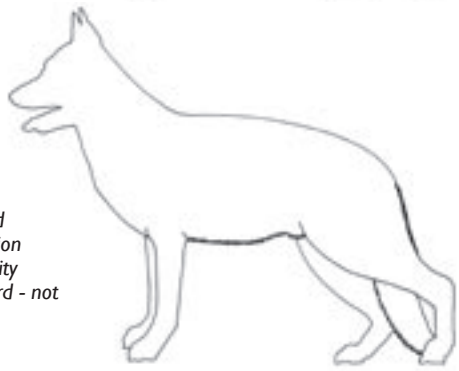
*24F: Long flat croup*

- *Shortened muscle from the front of the pelvis to the femur*
- *Increased back reach*
- *Insufficient lift to the hind quarters*
- *Too much forward drive*
- *Over taxing of the forehand after prolonged movement*
- *Reduced fore reach of the hind feet*



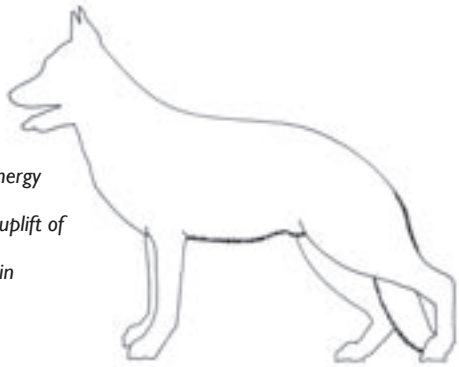
*24G: Roached/curved back*

- *Low and compromised withers during movement*
- *Falls on the forehand*
- *Energy transmission from the rear is not directed in a straight line to the forehand*
- *Increased energy consumption*
- *Reduced endurance capability*
- *Back not as per the standard - not straight and slightly sloping*



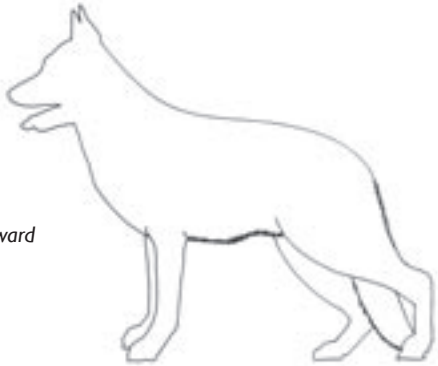
*24H: Long steep croup*

- *Reduced length of muscle from the rear of the pelvis to the femur*
- *Reduced back reach of the rear feet - reduced thrust*
- *Loss of optimum forward energy and drive*
- *Increased but unnecessary uplift of the rear*
- *Imbalance to the forehand in movement*



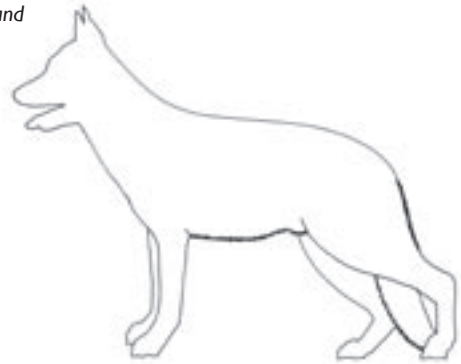
*24I: Short in back or loin*

- *Reduced ground cover during movement*
- *Rear feet have to bypass front feet in movement - occasionally crabbing*
- *Assists the dog when galloping*
- *Centre of gravity is shifted forward*



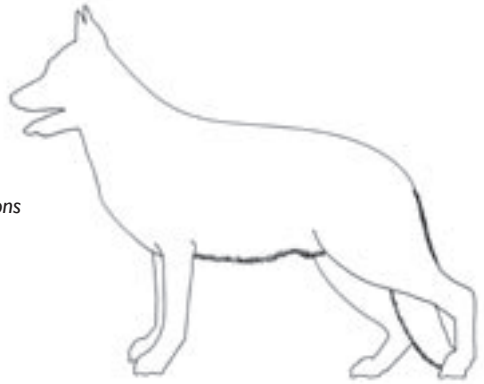
*24J: Short steep upperarm and lack of fore chest*

- *Reduced fore reach*
- *Can be some jarring in the forehand*
- *Shifts central support line through the foreleg to the shoulder blade too far forward*



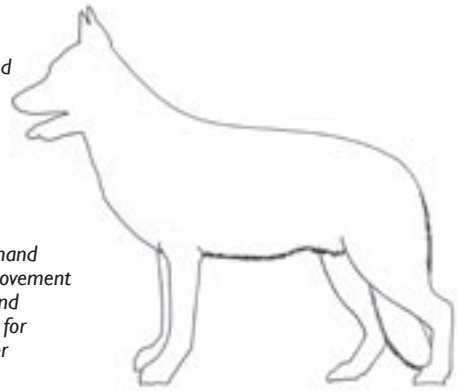
*24K: Too deep in under chest*

- *Additional weight*
- *Reduced athleticism*
- *Reduced fore reach*
- *Reduced endurance*
- *Less desirable proportions*



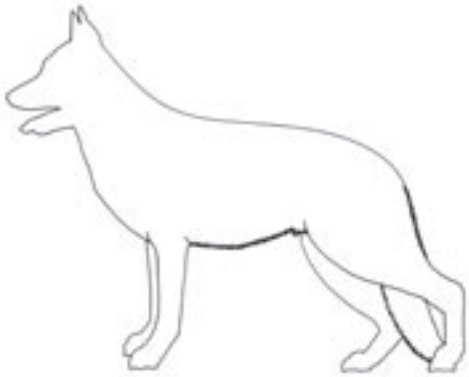
*24L: Under angulated hind quarters*

- *Short tibia and short femur*
- *Reduced fore hand reach and reduced rear hand fore reach*
- *Imbalance between forehand and rear hand during movement*
- *Very good for galloping and endurance but not good for trotting and ground cover*



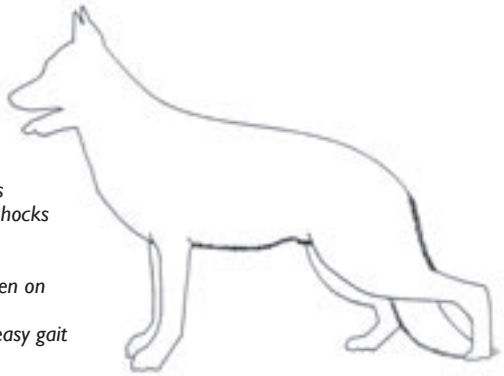
*24M: Short underchest*

- *Reduced area for heart and lungs*
- *Reduced endurance*



*23N: Overangulated hindquarter*

- *Slope to back line excessive*
- *Over long tibia*
- *Over long fibula*
- *Unsound hindquarters*
- *Loose hocks/unstable hocks*
- *Cow hocks*
- *Reduced endurance*
- *Hocks do not straighten on back stroke*
- *Lack of flowing, free, easy gait*



Well that's it!

The reader will appreciate that the paper is in no way exhaustive, I could write a paper as long as this one on temperament, character, protective and combative instincts, trainability, workability and intelligence and I could write one on the problem of UAP covering its clinical elements and impact on the dog through to naming the dogs and their antecedents who inflict this curse on the breed or perhaps I could write a lesser but equally current topic regarding missing teeth but hopefully you will have found that what I have covered here was worth the time you invested in reading it and somewhere in all of it you have learnt something, had to think hard about something or found something of value.

Balance is important in all things. I say this because it is very important that the reader, especially those new to our breed, appreciate that a criticism of a specific part of a dog's structure is exactly that, it is criticism of just one part of a myriad of components that make up the whole dog. The degree of criticism or if you are judging the dog, the degree of penalization applied, needs to be kept in that context. It needs to be kept in balance with the whole dog, always measured against the impact it would have on the dog's function as a trotting, enduring, working herding dog and not over reacted to or more precisely if you are judging or breeding, not overly negatively weighted.

No dog is perfect, a dog that you judge in the ring may well exhibit features that concern you or that you may consider to be less desirable than 'your interpretation of the ideal' but when it is compared to other dogs in the class, in relative terms it may still be the clear winner of that class and indeed it may be justifiably the winner of the whole show. It is very important that the reader take in what I have just said in the last two paragraphs and I say this because it would be too easy especially for the novice to over react to particular parts of the material that has been covered. In the context of showing or breeding it is critical that the reader appreciate what was said at the beginning of this paper and that was I have not attempted to be judgemental of any dog, breeder or judge I have merely put my thoughts and observations to paper in order that you might have a better understanding of the breed. How you assess its component parts and the breed as a whole can then be done by you from a more informed position.

There will be things that you have read in this paper that you will have disagreed with or have a different opinion on, the Standard that you use and the interpretation of that Standard, your personal experiences and personal preferences, your degree of self-interest or bias will guarantee this. That's what makes the dog sport so interesting and guarantees the same dogs don't win all the shows. For me personally the more disagreement and varied the opinion the more worthwhile writing this paper will have been.

## A Suitable Finish


He is your friend, your partner, your defender, your dog
You are his life, his love and his leader
He will be yours faithful and true to the last beat of his heart
You owe it to him to be worthy of such devotion
--- Unknown

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Images for the German Siegers kindly supplied by SV Archives (Source © SV Archive)

Appreciation and acknowledgement to the work of the late Dr Curtis Brown.

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