

## **Shoulder Structure in Long Legged Terriers**

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Shoulder structure and its relationship to movement is one of the most confusing areas for breeders and exhibitors alike. The long legged terriers are known to have some variation from standard shoulder structure, but little information is available on what correct shoulders are in these dogs. In order to clarify this confusing issue, a study was initiated where about 50 dogs were radiographed (x-rayed) in standing show poses. Most of these dogs were AKC champions and approximately thirty were Airedales of a variety of bloodlines. Keep in mind, it is not possible to determine a correct dog with a measuring tape and a protractor and some x-rays. However, understanding what is really going on structurally is critical to evaluating the overall dog. This study was designed to help develop basic understanding of front structure.

As you review this information, remember that the front legs are attached to the body with only muscle, ligaments, and tendons. It is a flexible arrangement and there is no exact numerical angulation that a particular dog can be assigned. The angle can vary by positioning and the maturity of the dog. Consistency in the radiographs used in this study was carefully controlled.

Figure 2 shows terminology of the bones in the shoulder of a dog and the two angles of the shoulder conformation. The angle of the scapula is from the uppermost point of the scapula to the point of the shoulder compared to a vertical line. The angle of the humerus is from the point of the shoulder to the elbow compared to a vertical line.

Many exhibitors at dog shows talk about a 45 degree angle of the scapula. This is the traditional description of correct front angulation, but the description is incorrect. Rachel Page Elliot showed in her book, *Dogsteps*, that the correct actual angulation was approximately 30 degrees from vertical. Forty-five degree angulation does not exist, when measured from the point of the shoulder to the highest point on the scapula. The present study confirms Ms. Elliot's conclusion.

This study attempted to correlate the angle of the shoulder with the correctness of movement. In the 30 Airedales in the study, the range of angulation of the scapula was between 19 and 36 degrees from vertical. Dogs

with steep shoulders (smaller angles) typically move in a choppy fashion, without much extension. Most of the better moving dogs had angulation of the scapula around 30 degrees from vertical. There were some dogs in the study had shoulder (scapula) angulation around the correct 30 degrees that did not move well. This indicates the angle of the shoulder is important, but it is not the final determining factor for good movement. We looked for other factors to correlate with correct movement.

The next area of interest in evaluating front ends, is the degree the humerus (upper arm) goes back under the dog to support the weight of the chest. In most breeds outside the long-legged terriers, the forearm extends back under the chest to support the weight of the dog. Long legged terriers have a different conformation and are said to have straight fronts, sometimes called fish-hook fronts. This straight appearance (when viewed from the side of the dog) is shown by running a straight line upright from the feet to the fore-chest, continuing through the underside of the neck, to the base of the jaw. To achieve this appearance in long legged terriers, like Airedales, the humerus is more upright than standard dog conformation and does not go back under the chest like it does in other breeds like sporting breeds or hounds. This, in part, gives the long-legged terriers the straight appearance to their front conformations, since their front legs are positioned more forward in their normal stance than the stance of other breeds of dogs. This result is because of the smaller angle of the humerus compared to a vertical line. This upright characteristic of the humerus (upper arm) can be too extreme with too upright a humerus. When this occurs front movement is adversely affected, resulting in choppy movement with little extension. When a long legged terrier has a sloping humerus that goes under the chest, the dog does not have the desired straight appearance of the front end. Correct long legged terriers have a fine balance between too upright a humerus destroying movement and too much slope to the humerus, affecting type. A correct long legged terrier moves with extension and strength and without wasted movement, yet still has the visual appearance of a relatively straight front.

A short upper arm is said to cause dogs to throw their front legs high, sometimes in a hackney manner. As the study progressed, measurements were taken of the length of the scapula relative to the length of the humerus to study this claim. In our very small sample of dogs that move in this manner, we were not able to confirm this theory, but we have no data to refute the idea either. All of the dogs in the study that we were able to measure this ratio, had similar ratios of length of scapula to humerus (variation was one centimeter) regardless of their movement.

Another factor considered, was the slope and height of the withers, sometimes called fish hook or incorrectly laid back Airedales and other long legged terriers with prominent withers tend to have beautiful silhouettes. This feature tends to give the impression of a lot of angulation to the shoulder and very short backs. However, we did not correlate good angulation with the amount or slope of the withers. We did correlate that dogs with a lot of slope and height to the withers frequently move poorly. We examined the radiographs of the prominent withered dogs carefully. There did not seem to be a difference in the placement of the scapula relative to the thoracic vertebra or any other anatomical feature when compared to less extreme dogs. The primary difference was the length of the (upward extending) spinous processes of the thoracic vertebrae giving the height to the withers. In terms of basic anatomy, specific muscles attach to specific points on bones. Each prominence on a bone has a specific attachment for a particular muscle. The spinous processes are specific attachments for muscles that support the front limbs. Having particularly long spinous processes to these vertebra (high withers) results in a longer length for the associated muscle attachments to have to contract. This may play a role in the tendency for these dogs to lift their legs high as they move.

There was also the opportunity to radiograph one dog repeatedly as it matured. As this dog developed, the angulation changed dramatically. He appeared (no radiographs) to be very angulated as an eight week old pup. When he was radiographed as seven months of age, his shoulder angulation was only 22 degrees, meaning he was quite upright in his shoulder. When he was again radiographed as a fifteen month old dog, his angulation was 36 degrees. This is a lesson in selection. Dogs can change dramatically in appearance and angulation as they go through stages of maturity. A breeder needs to be familiar with the developmental stages of the bloodlines that they use in order to avoid culling a dog in an ugly phase of development.

So what makes dogs move differently in front? As the study progressed, and the issues were discussed with experienced breeders and judges, it became apparent that the most important indicator of front movement was the overall balance of the dog. If the dog has extreme characteristics, like an ultra short back, a very long neck, very high withers, extremely strong rear ends or weak rear ends, the dogs front movement suffered. Further, if the dog lacks balance, even correct angulation will not result in correct movement. This is consistent with the wording of many standards, including the Airedale standard which states Movement or action is the crucial test of conformation.

Many breeders select for a particular silhouette in the long legged terriers.

This visual picture often includes a long neck, clean, fish hook front, high withers, short backs, and powerful, well angulated rears. It makes for a beautiful picture standing still. However, when the beautiful silhouette moves, if the conformation is actually flawed, movement will clearly demonstrate the flawed conformation. Some defend the attractive, beautiful silhouetted dog with poor movement with an argument about type verses soundness. This argument is incorrect. A dog with correct type in athletic breeds like a long legged terriers, will move soundly. When breeders and judges select for the dogs with too extreme characteristics because they are beautiful in silhouette, they lose soundness, a fundamental characteristic of type! Characteristics like short backs, high withers, long necks, and clean fronts are ideal until they become so extreme that movement is lost.

The constant challenge for fanciers of purebred dogs is to select for desired type without loss of soundness. Most breeds started with fundamentally sound dogs. Fanciers then selected for characteristics they considered desirable as the breeds develop and evolve. As a particular characteristic is deemed desirable the tendency is to go for more of it. If a big head is good, a bigger head is better. Fanciers can go too far. Soon, too big a head results in loss of reproductive soundness, and c-sections are required to deliver pups. There are now a number of breeds that require c-sections for most deliveries. This is the rule of unintended consequences, where by selecting for one trait, you adversely affect another important characteristic. All breeders and judges should be constantly alert for fads and fashions that harm the fundamental soundness of their breeds. Movement is the test of conformational soundness. When selected characteristics have become too extreme or out of balance, movement is lost.

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