

# BODY POSITION AND GAIT

## WHY DOES THAT HORSE DO WHAT HE DOES?

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### DEFINITIONS:

Symmetrical Gaits: All gaits of horses other than a canter or gallop.

Easy Gaits: Stepping or broken pace (sobreadando for Peruvian Pasos), fox trot, running walk, rack (aka singlefoot, tolt), and the paso gaits (corto, largo, llano) found in either Paso Finos or Peruvians.

### HOW DO HORSES MOVE?

What makes one horse choose a trot as his intermediate gait between the walk and canter, while another may prefer a running walk, and a third may do all of the easy gaits as well as a trot? Is it all just in the way his legs move or the timing of his hoof flight? And how does he decide how to move those legs, anyway? Basic structure and movement texts explain quite clearly that a horse does not just simply lift a front foot when he decides to move, the way an animated table might. For example, for a horse to move out of a square stop with one front leg he must first shift his weight away from that leg, raising his head and neck, raising his back, and lowering his hindquarters. He has then changed his balance by shifting his whole body, allowing himself to step forward without falling on his face. Think of all the brain cells, nerves, muscle groups, ligaments and joints involved in one simple step, then just imagine what must be required for a horse to move in any particular gait. It's not a simple process.

### COMPONENTS OF MOVEMENT

There are three basic elements that determine how a horse will move. They are:

1. The brain and nervous system;
2. The muscles (development, condition and basic fibre content);
3. Bony conformation.

Put as simply as possible, the brain (either voluntarily or involuntarily) sends impulses along the nerves which fire the muscles which move the bones resulting in a gait. Depending on which nerves are fired, the condition of the muscles, and the physical limitations of the skeleton, the horse will either trot or pace or do something in between. He will do these gaits, not just with his legs the way a moving table might, but with his whole body, the same way he moves out of a square stop.

### WHAT POSITION FOR WHICH GAIT?

There are three general body positions (or "frames" as our Dressage friends call them) used by horses in doing the symmetrical gaits. They are:

1. Round (Dorsiflexed or convex) Horse travels with raised, arched neck, nose vertical, rounded, raised back, hindquarters lowered by downward flexing at the lumbo-sacral junction and increased flexion at the joints of the hip, stifle and hock.

2. Hollow (Ventroflexed or concave) Horse travels with raised head, nose may be vertical or pointed out, neck shows a pronounced dip before the withers, back sags into a "swayed" position, some upward flexion at the sacrolumbar junction, little bending at the hip, stifle or hock, hind legs tend to trail behind the motion of the horse.

3. Neutral (Not flexed either direction) Horse travels with head and neck at somewhat lowered position, nose can be vertical or slightly pointed out, back is neither rounded nor sagging, no flexion up or down of the sacrolumbar junction, hind legs move with little energy, some bending at the joints but not as much as a rounded horse.

These are not absolute positions, since a horse may show degrees of roundness (the best example being a horse in a collected trot as compared to a horse in a passage and one in a piaffe -- all are round but the one in the piaffe is most round) or degrees of hollowness or different types of neutral position. However, these three frames give a good reference for seeing how a horse uses his body in the different symmetrical gaits. The following gaits and positions are easily observable with both gaited and non-gaited horses. The walk is not included since it can be done in any position.

HOLLOW	ROUND	NEUTRAL
pace	*trot	running walk
stepping pace	+fox trot	fox trot
rack	*trot	
paso gaits		
#running walk		
*trot		

\* The trot can be done in any of these body positions, depending on the flexibility of the horse, but is the only gait that lends itself to the extremely round position.

+The fox trot is the only easy gait that can be done in a rounded position, but is most often done in a neutral tending to round position.

#The natural running walk is most often done in a neutral position, but the "big lick" is nearly always done in a hollow one.

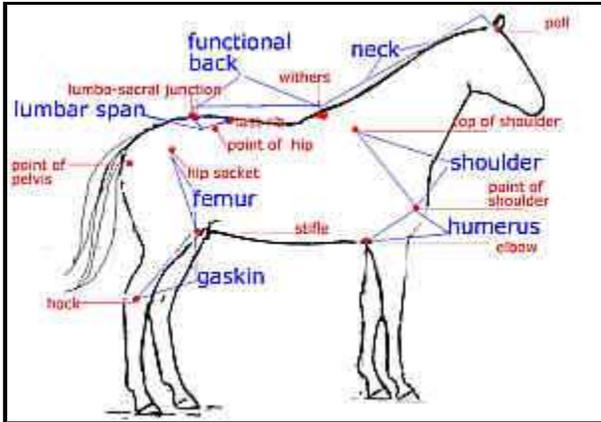
Most of the easy gaits are done in a hollow position, as is the least desirable of all riding gaits, the true pace. The shifts in body position between the pace and the others are very subtle, which is why many horses that do those easy gaits will also pace.

## WHAT DETERMINES BODY POSITION?

The same three things that combine to move a horse also determine what body position he will use. Of the three, bony conformation is the easiest to see, and the aspect of gait most studied. Skeletal structure is inherited from generation to generation ( for example, two horses with long backs will usually produce foals with long backs ) and has often been considered the most important determining factor in the type and quality of the gaits of horses. Although, as we will see in the second part of this series, muscle and brain action also affect the frame a horse uses, his basic skeletal structure often determines what will be his most natural body position and which gaits will come most easily to him.

Conformation of a Hollow horse: Any conformation traits that make it difficult for a horse to round his

body, lower his hindquarters, and flex downward at the lumbo-sacral junction will tend to make him hollow. Most obvious are:



1. Long functional back. If the back from the withers to the lumbo-sacral junction is more than 45% of the length of the total body of the horse, it will be difficult for him to round it, especially under the weight of a rider.

2. Long lumbar span. If the length of the lumbar vertebrae is more than 40% of the length of the total back, it will be difficult for the horse to prevent them from sagging under the weight of a rider, making him hollow in the back.

3. Horizontal pelvis. A horse with a horizontal pelvis will have trouble lowering his hindquarters to round his body, and will find it easier to let his legs trail out behind him.

4. Long hind leg. A horse with a long hind leg will have trouble flexing at the hip, stifle and hock to reach under himself while carrying his weight shifted towards the hindquarters in a rounded position.

5. Short femur/long gaskin. A horse with this sort of conformation in the hind legs will have trouble flexing well at the joints and will tend to have hind legs that trail behind him, making him hollow.

6. Short neck. A horse with a short neck will tend to have trouble flexing at the poll and arching it into a round position.

7. High set neck. A horse with a high set neck will also have trouble rounding and arching it.

8. Camped-out hind legs. A horse with hocks that fall considerably behind the plumb with his buttocks will have trouble flexing at the joints, stepping under his body, and attaining a round position.

Conformation of a round horse. Obviously, any conformation traits that enable a horse to shift his weight to his hindquarters and flex downward at the sacro-lumbar junction will help him travel in a rounded position.

1. Short functional back. (Less than 45% of body length)

2. Short lumbar span. (Less than 40% of back length) This is not only useful for a horse that rounds his body, it is also stronger for carrying weight.

3. Slanted pelvis. Neither too horizontal or too vertical, a good pelvis should be at about 45 degrees.

4. Femur/gaskin at a ratio of 1:1. This provides strength and flexibility in the hind leg.

5. Long, medium set neck. This is likely to be flexible and easy to round.

6. Well-angled hind leg. This will flex better at the joints and reach well under the horse.

Neutral conformation: There are no hard and fast rules for a horse that uses a neutral position. He

should have no more than a couple of the characteristics of the hollow horse along with several of those of a round horse.

### CONFORMATION AND DESTINY

If you look at a group of horses you may find that there are horses with hollow conformation doing "round" gaits, horses with neutral or round conformation doing "hollow" gaits, and horses with any sort of conformation doing "neutral" gaits. These individuals do these gaits which would not be predictable from their conformation either through innate talent, specific training, or artificial alterations in their natural way of going. They are examples of the effect of factors besides conformation on gait. Remember, the nervous system and the muscles are also part of the equation, and from the standpoint of a rider/trainer they are the most important. After all, there isn't much you can do about conformation, but you can train the brain and condition the muscles. As they once said in the newspaper horoscopes, bony conformation impels, it does not compel.

Next time we'll discuss the ways a rider can influence gait in any horse by working with the nervous system and the muscles of that horse.

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