



# The Ergonomics of Harness Fit

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Thank you to the ADS for asking me to speak on this subject. I've wanted to put together this presentation for a long time, as harness fit is *really* near and dear to my heart.

The Oxford Dictionary...

Relating to or designed for  
efficiency and comfort in the  
working environment.



Ergonomics of Harness Fit

My first introduction to Ergonomics was when I had a three-credit course in college which spawned my interest. (By the way, I did get an A in that class!) ☺ Even though I started in college, I am still learning from others and applying that knowledge to my carriage driving.

So what is Ergonomics? The Oxford Dictionary defines Ergonomic as....

## A Driving Horse's Working Environment



Ergonomics of Harness Fit

So what is a driving horse's working environment? Whatever his job, be it recreation, training, or competition, we want him to be comfortable to do his job more effectively and efficiently.

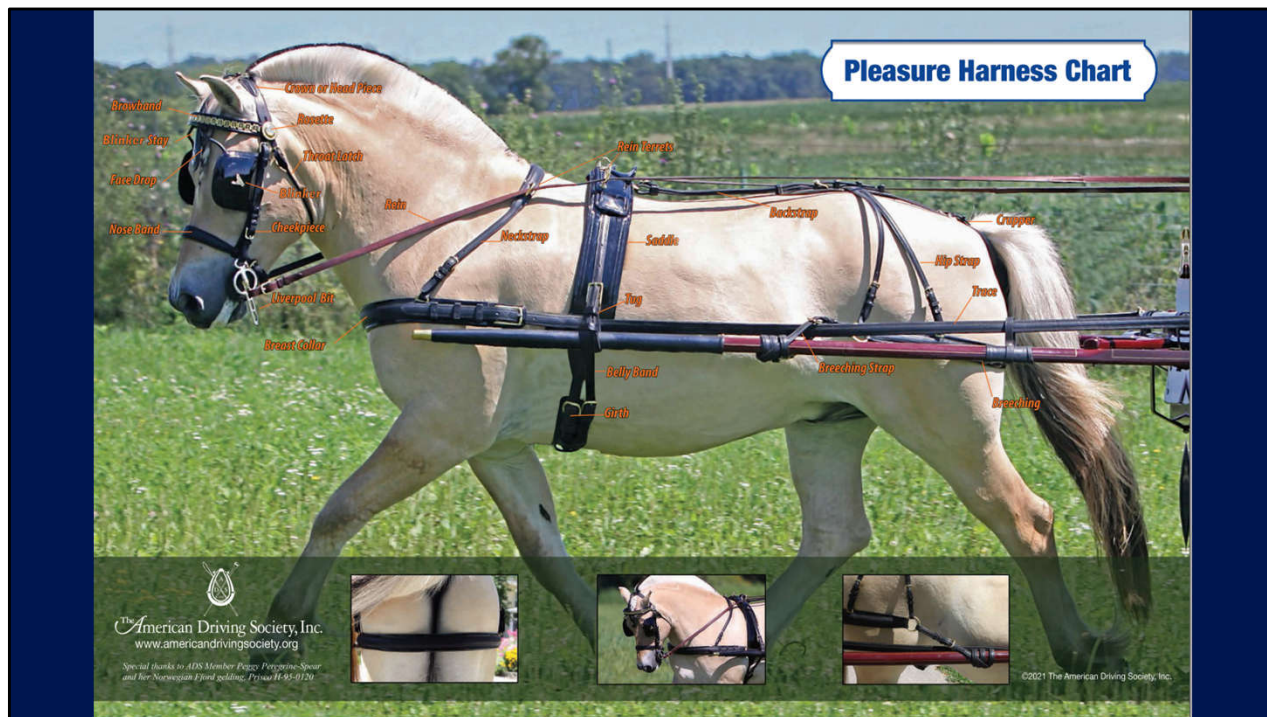
# Harness Fit is Paramount for Good Work!

- A quality, well-fitted harness should...
  - Not be too big or too small
  - Not rub or cause galling
  - Provide adequate clearance for the horse's spine and windpipe



Ergonomics of Harness Fit

Comfortable harness is safe harness, and the horse will perform better when he is comfortable. Training with an ill-fitting harness will likely sore the horse *mentally* to driving! I'll talk about that later in the presentation.



Before we get started, it is helpful to understand what parts we are discussing, so you need to be familiar with the parts of the harness. This chart is available on the ADS website, and is free for members.

We are going to talk about each part the harness...starting with the front of the horse and working our way back.

## “Middle” Hole



- The harness should have at least one hole adjustment both for tightening and loosening.
  - This is in case the harness breaks.



Ergonomics of Harness Fit

One more general comment...A well-fitting harness has the buckles adjusted into the middle holes, meaning not on the first or last hole on each end. This is one of those “unwritten rules”, but makes it so you can adjust the harness if necessary.



The exception to the “one hole rule” is the buckle above the blinker. You can see that here that there isn’t very much room between the browband and the buckle above the blinker, especially with smaller horses and ponies. The room there is going to be dictated by the size of the blinkers and the position of the ears on the head.



## Bridle Fit

- Browband below ears – not pinching
- Blinders (*blinker*) in center of eye
- Blinder stays adjusted to keep blinders off eyes and eye lashes
- Caveson (*noseband*) not too low or high



Ergonomics of Harness Fit

Let's start with the bridle. I once asked David Freedman what he thought the most important fitting part of a harness was, and without missing a beat, he said the bridle. We want the browband to be below the ears, the blinders in the center of the eyes, the blinder stays adjusted wide enough to keep the blinders off the eyes and eye lashes, and the caveson not too low or too high.

So let's talk more about how to get a good fit.



# Crown Fit



- Straight or shaped crown?
- Room for ear cartilage?
  - Need long enough browband



Ergonomics of Harness Fit

Let's start at the top of the bridle. Traditionally, crowns were just straight. More recently, harness makers have started to make shaped crowns. We'll talk more about that in a minute.

The browband should be long enough so that the crown isn't pulled into the ear cartilage. I actually like to see a little bit of room behind the ear cartilage if possible.

The browband needs to be long enough to go over the blinder stays appropriately. A shorter browband WILL NOT push the stiff blinder stays back before it pulls the crown into the ears.

## Shaped Crown Fit



- Will not “make room for” the ears
- Prominence of Atlas (C1) bone



Ergonomics of Harness Fit

Far from popular belief, a shaped crown will not make room for the ears, because it is still going to basically sit right behind the ears. However, the shaped crown definitely helped this horse. He has very prominent atlas bones behind his crown. You can see in the photo on the right how his bones stick out of his neck. A straight crown sat right over this horse's atlas wings, causing him to be irritable and avoid being bridled. The shaped crown fit right between the ear cartilage and the atlas bone. After this test drive, the leather shaped crown was added to this horse's synthetic bridle.

## Padded Crown

- Some horses may need a padded crown if they are overly sensitive about their ear cartilage.



Ergonomics of Harness Fit

If a horse is *really* fussy, they may benefit from a padded crown with soft, rolled padding under the harder material.

# Browband Issues

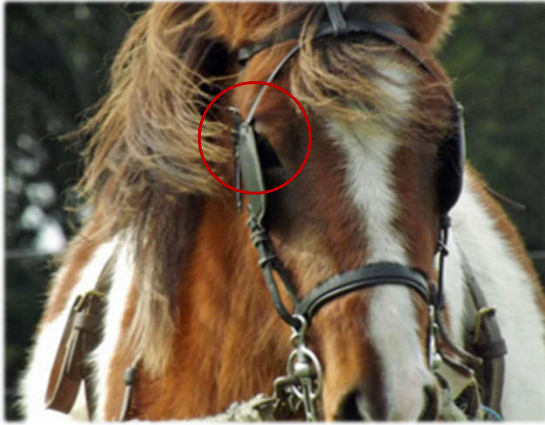
- Browband too small – pulling into ears (bay horse)
- Browband being pushed up by the stays (gray horse)



Ergonomics of Harness Fit

Back to more browband issues. On the bay horse, the browband is too short, pulling the crown forward. On the gray horse, the blinker stays are stiff synthetic which are formed incorrectly, thus pushing the browband up into the ears. These issues tend to be more common in poorly made harness with marginal materials.

## Blinder Adjustment?



- Blinders too low
- No structure in the stay material
- Could be adjusted too tightly at the blinder adjustment buckle at the poll.



Ergonomics of Harness Fit

Let's continue down the horse's bridle to the blinders. This horse has issues with his blinders. If the blinders are too low, the horse may actually be able to see over them just by raising his head. Having the blinders touch the eyes is like your glasses rubbing your eyelashes...it's irritating! That being said, these blinders may be adjusted too tightly at the poll buckle.

And yes, to answer a common question, you can use bridles without blinkers in ADS competitions, but they are there to keep the horse from seeing what is "chasing" him, and to not anticipate the whip cues, amongst other reasons.

# Noseband

- Technically, the noseband isn't to tie the horse's mouth shut.
  - Using a tight noseband is a "band-aid" approach, not addressing the problem.



Ergonomics of Harness Fit

Going down to the noseband, a lot of people don't know the true purpose of the noseband. It isn't to crank the horse's mouth shut.

Yes, the noseband can help the horse not evade the action of the bit. If he is *really* avoiding bit contact, using a tight noseband is a "band-aid" approach, not really addressing the problem, in my opinion. That is a whole other presentation.

Ultimate purpose  
of a driving bridle  
noseband is to  
help hold the  
blinkers in place..



The real purpose of the noseband on a driving bridle is to hold the blinkers in place. A correctly made driving bridle has a keeper on the cheek through which the noseband hangers go, which helps keep the blinkers from gaping. The green circle shows the keeper on the bridle that is connected to the noseband hangers.



## No Keepers on Noseband

- Blinders slide back on face without keepers to keep them close to the noseband.



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If there isn't a keeper on the cheek, the blinders can pull back or gape away from the horse's face. A keeper can be added to this bridle to put the cheeks and blinders in the correct position.





## Noseband Too High

- Pushes on cheekbone
- Two fingers below cheekbone for horses
- One finger for ponies/minis

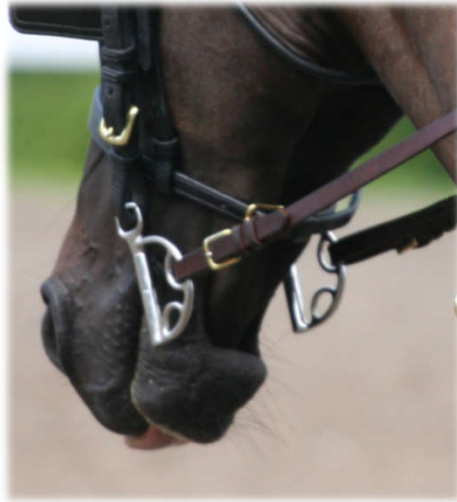


Ergonomics of Harness Fit

In this photo, the noseband is too high on this horse. It is pushing on the cheekbone. You want the noseband to be adjusted so that there are two fingers between the noseband and the cheekbone. For small ponies and minis, you need to scale everything down, so we use one finger's width with them.

## Jaw Strap

- Single buckle noseband
  - Buckle can end up on the jaw bones
- Double buckle noseband
  - Buckles on either side of the jaw bones



Ergonomics of Harness Fit

On a single buckle noseband, the buckle can push on the horse's jaw bones. Some horses can be sensitive on the jaw bones and a double buckle noseband can help with that, especially if the jaw strap is padded.

# Need a Gullet Strap!

Additional support  
to keep bridles  
on heads!



Ergonomics of Harness Fit

And on the underside of the horses's head, we can use a gullet strap. The gullet strap helps keep bridles on heads, and are *absolutely* necessary with a pair! If you notice the angle of the bay horse's head in the photo, he more than likely, rubbed the bridle off on the dark horse.

## What is a Gullet Strap?

- Attaches to throatlatch and noseband
- Can purchase as an aftermarket accessory

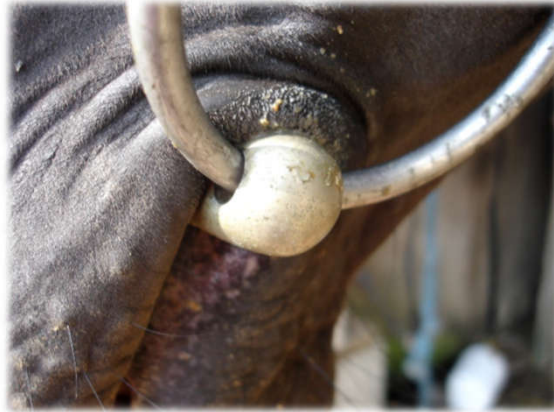


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So what is a gullet strap? It attaches to the throatlatch and the noseband, and makes it harder for a bridle to slip off the horse's head. If you don't have a gullet strap, you can purchase one quite easily nowadays. Our gullet straps come with a removable ring at the bottom which you can take off if you don't need it.

## Cheek (Bit) Fit

Wrinkles? –  
two-wrinkle rule is  
no longer hard and fast.



Ergonomics of Harness Fit

Finally at the bottom of the bridle is where the cheeks attach to the bit. We were taught way back when that your horse should have two wrinkles... well, you can throw those old ideas out. While there is such a thing as too low, the two-wrinkle rule is no longer hard and fast. We have one wrinkle horses and no wrinkle horses in our barn. It just depends on what the horse likes. Again, that is a whole other presentation.

## Check Rein?



Most people who use check reins do so because they don't understand their function.



Ergonomics of Harness Fit

One other bridle part on some driving harnesses is the check rein. It can be an overcheck like the one here, or a side check. We don't use check reins much in carriage driving, and for the most part aren't allowed in ADS shows. Most people who use check reins do so because they don't understand their function.

# Most Common Reasons



- My horse eats while driving
  - training issue
- They use them in the breed show ring
  - the “Black Beauty” effect
- My horse bucks
  - training issue
- It came with the harness!



Ergonomics of Harness Fit

Most common reasons I hear for using check reins are:

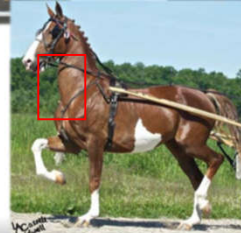
- My horse eats while driving (that’s a training issue)
- They use them in the breed show ring (the “Black Beauty” effect OR the people writing the show rules don’t know why, either)
- My horse bucks (again, that’s a training issue. You also want to check fit of your equipment)
- And the most common reason I hear?..... It came with the harness!

The check rein creates hollowness in the topline, makes it more difficult for the horse to use his back end to push, creates stiffness in the back, neck, and jaw. Can lead to major physical functionality issues (pain, soreness, bad attitude) in the horse.

## Consequences of a Tight Check Rein.



- Hollow in the back.
- Lack of "Tracking Up".
- Overdevelopment & bulging of muscles on underside of neck.



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Here we see some consequences of tight check reins. The check creates hollowness in the back, and therefore the horse won't track up and put his hind print into the print of the fore foot. A tell-tale sign of a horse that has been checked up is the bulging of the muscles on the underside of the neck. The horse will also learn to "lean on" the check rein to balance.

Making the check rein loose isn't a good idea, either, as that makes it considerably easier for the check to get under the shaft, making the bit really tight and encouraging the horse to rear. (Ask us how we know..)

If you decide to take it off a horse that has used one for a while, it may take a long time for a horse to relearn how to drive without a check.



# Breast Collar

- Fine line of adjustment



- Shaped collars for low-set neck horses



Ergonomics of Harness Fit

Moving down the horse, we find ourselves at the collar. The vast majority of drivers use a breast collar. Traditionally, breast collars were straight. Eventually, harness makers started putting “throat relief” into the collars, and more recently, we see harness makers producing shaped collars which we will talk about more in a minute.

There is a fine line of adjustment to a breast collar between the throat and the shoulder, especially on the smaller the horse where there just isn't a whole lot of room.



This is my gelding at one of his first shows. I was using a straight breast collar that came with the harness. The blue line shows where the throat is attached to his chest, and the top of the breast collar is the red line. The blue circle shows his point of shoulder. You can see that while the straight breast collar clears his shoulder, it is into his neck.



When I changed to the shaped collar, the dip in the collar is below his throat attachment. The first time I used this shaped breast collar, the judge noticed that I had changed the collar from his first class and agreed that it helped him move better. I haven't used a straight breast collar on this horse since.

## How Line of Draft Affects Breast Collars

- Singletree higher than breast collar.
- Pulls breast collar up
- Creates less than ideal angle for efficiency of pulling



Ergonomics of Harness Fit

Let's talk a little about how the vehicle design affects how the breast collar works. Remember that ergonomics is relating to efficiency in work. The traditional way of mounting the singletree is on top of the crossbar which is on top of the shafts. See the red circle. A Technical Delegate was looking at our miniature horse cart at one of our early shows and noticed that mounting the singletree on top of the cross bar raised the singletree significantly for the smaller horses. This creates a line of draft that goes uphill and less efficient for the horse from which to pull.

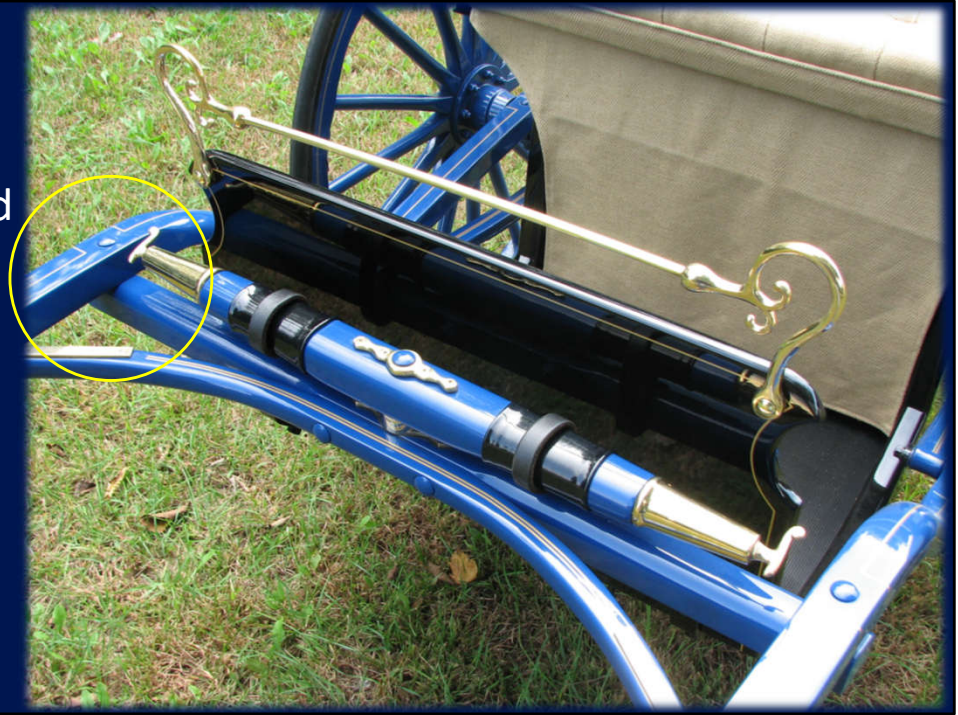
## How We Changed the Line of Draft



Ergonomics of Harness Fit

So later when we built our carts, we wanted to make a change in this design to make the draft from breast collar to singletree more even with the level of the horse's shoulders.

Undermounted  
cross bar to  
mount  
singletree  
between  
shafts.



Here is a close up of how we did that. The cross bar is undermounted, but the circle bar is actually upside down to be flatter on the bottom of the shafts. Then the singletree is mounted to the top of the crossbar in between the shafts.

## How We Changed the Line of Draft



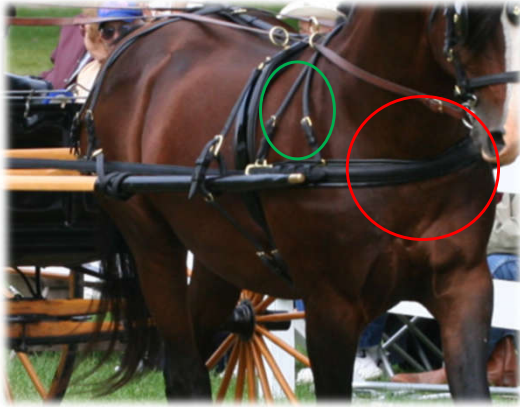
Ergonomics of Harness Fit



Making this change to the carts leveled the line of draft from breast collar to singletree making it more efficient for the horse to pull the cart. The trace is straight from breast collar to singletree without pulling the breast collar up. We have done this with all our smaller vehicles.



## High Breast Collars



- Straight breast collars with “high” singletrees
- Line of draft pulling breast collar up into neck



Ergonomics of Harness Fit

Here are some more singletrees that are mounted on top of the cross bar. These are standard size horses, but you can still see how the breast collar is raised by the line of draft pulling up the breast collar into the neck. (CLICK) You can see on the bay horse that the neck strap is actually loose enough that the high breast collar isn't being affected by that. The neck strap on the Haflinger might be a bit too short causing the breast collar to be too high.

## Shaped Breast Collar



- Wide bearing surface
- Clearing windpipe and point of shoulder
- Low line of draft

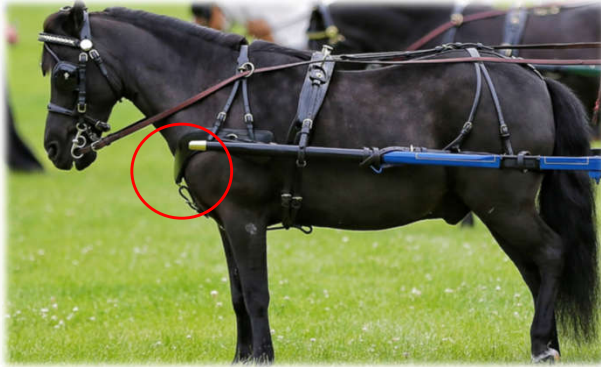


Ergonomics of Harness Fit

This shaped breast collar is clearing the windpipe and the point of the shoulder. It has a wide bearing surface from which the horse can pull, which makes the collar less likely to dig into the chest. This is a low draft on this marathon vehicle, which you might think could be holding the breast collar down based on the singletree in the previous photos pulling the straight breast collar up. However, I haven't found that to be the case with the shaped breast collars. It doesn't seem to matter where the point of draft is, they just tend to clear the windpipe better.

## Deep V vs. Mid V Breast Collar

- Tipping of collar

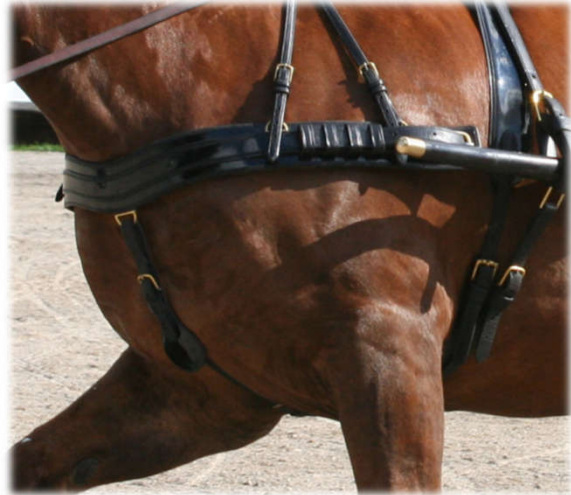


Ergonomics of Harness Fit

One interesting aspect I have noticed about the Mid V breast collar vs. the deeper V breast collars is that the deeper V's tend to tip out on the bottom, which makes the horse have less bearing surface from which to pull. I don't know why that is, but it doesn't seem to happen on the Mid V collar. The other thing I have noticed is that the shaped collars can be adjusted to the horse better once the horse is in draft. Many times, I will leave the neck strap a little longer and then adjust it once the breast collar settles into what I call the Sweet Spot on the chest. Again, I don't know why that is, but it is an interesting phenomenon.

## False Martingale

- Will not hold the breast collar down from getting into the neck.
- Will pull the girth forward first.
- Purely “decorative” on a single horse.
- Necessary on a pair.



Ergonomics of Harness Fit

Now before someone thinks that those high breast collars or the tipping on the deeper V breast collars are caused by the lack of a false martingale, please be assured that a false martingale will not hold a breast collar down. It will first pull the girth forward into the elbow before it ever affects the breast collar. This false martingale in the photo seems a bit too tight and is digging into the chest. In this instance, I would probably try to lower the breast collar first on the neck strap and see if it comes away from the neck, and then it would also loosen on the chest. The false martingale is very necessary for a pair of horses, as it contributes to the braking system.

# Full Collar



- Needs to fit very well!
- Easier for horse to pull
- Use with heavier, lower draft vehicle



Ergonomics of Harness Fit

The full collar needs its own presentation. A full collar is like using a Tupperware cover on Tupperware – if it fits well, it is the best thing to use. If it doesn't fit, it can create more problems than it solves. A breast collar is like Saran Wrap – it is effective and easy to fit, but not as good as the Tupperware cover that fits. The full collar can free the shoulder and utilizes more bearing surface from which the horse can pull in a low draft vehicle where the hames are perpendicular to the traces. Using a full collar with a higher draft vehicle is not going to give the horse the benefit of the full collar, as the horse is still only pulling from the bottom of the collar.

## Euro Collar

- Controversial
- Meant to be the best of both worlds between the full collar and the breast collar.
- Generally, known to trap a lot of heat next to the horse.



Ergonomics of Harness Fit

I just thought I would mention the Euro collar. They are fairly controversial in the industry. Drivers either love them or hate them. The Euro collar is meant to have the benefit of the full collar in terms of bearing surface while having the adjustability of the breast collar. Some drivers feel that they don't fit as well as they are supposed to, and they trap a lot of heat. I don't know of a lot of higher-level drivers who use them, and to me that says a lot. However, I will admit that I don't have any direct experience with them.

## Adaptable Draft

Will cause the pull of the draft to be moved forward, reducing amount of bearing surface of the collar.



Might give some neck relief.

Don't find it necessary with shaped collars.



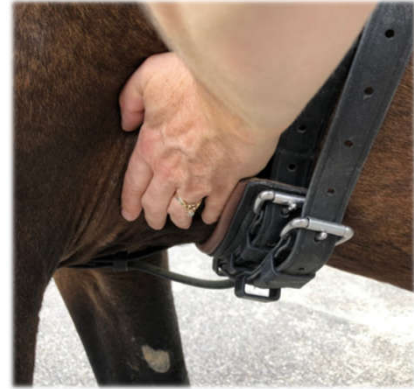
Ergonomics of Harness Fit

Another feature that some people like is the adaptable draft on a breast collar. This is the ring sewn onto the breast collar so that the traces can swivel. The theory is that it will relieve neck strap pressure from the breast collar being pulled down by the low trace attachment. However, I find that shaped breast collars tend to find that “sweet spot” on the chest, and then the neck strap really doesn't put that much pressure on the neck. Andy Marcoux produced an interesting video pointing out how the attachment of those rings are moved forward, resulting in the horse not having as much bearing surface from which to pull. I thought that was an interesting observation.

## Saddle Placement



- Saddle behind withers – should not touch withers
- Girth - one hand's width behind elbow



Ergonomics of Harness Fit

I think we have fully addressed the breast collar, so let's move back to the saddle. One of the biggest mistakes I see beginner drivers make is putting the saddle too far forward, especially if they come from the riding world. The saddle should definitely not touch the withers.



## Saddle / Girth Placement Errors



Ergonomics of Harness Fit

On the left photo, the saddle is placed on top of the withers with the girth right behind the elbow. This is too far forward. The girth needs to be about one hand's width behind the elbows. The challenge becomes when you tighten the girth, it wants to migrate forward into the narrowest location. So how do you keep the saddle back? You loosen the girth! It does not need to be riding saddle tight. It only needs to be tight enough not to slip back over the ribs. Some people want to use a shaped girth, but I don't think they are necessary IF your saddle fits and your girth isn't so tight.

# Saddle Fit – should not touch spine!

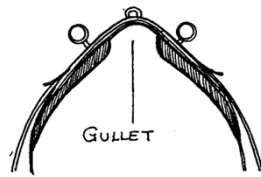


Figure 5A - Saddle with Gullet

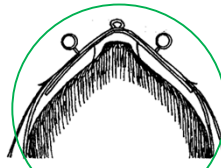


Figure 6A - Good Fit

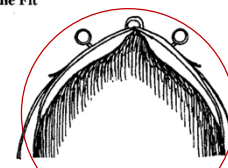


Figure 6B - No gullet - sits on spine

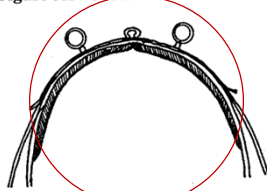


Figure 5B - Padded strap type saddle - no gullet

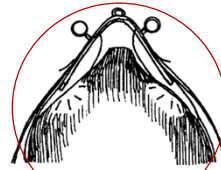


Figure 6C - Narrow tree pressure points

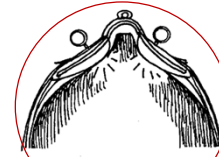


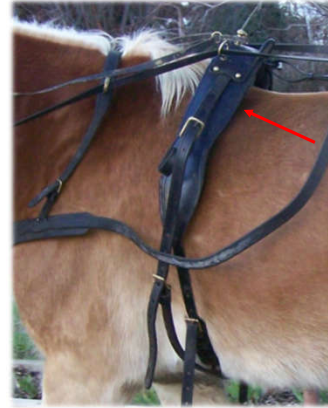
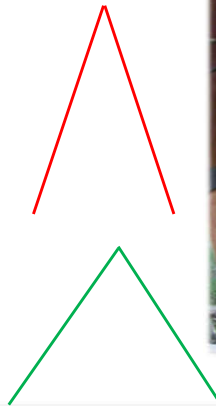
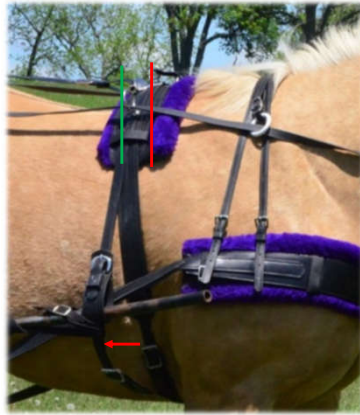
Figure 6D - Narrow gullet - pinches sides of back



Ergonomics of Harness Fit

So what does it mean to have a saddle that fits. First, it needs to have clearance in the gullet. This illustration was printed in *The Whip* many years ago, and I have gotten permission to use it in educational materials. It definitely shows what is required for a good fitting saddle.

## Saddle Fit Issues



Ergonomics of Harness Fit

On the left: This is a strap saddle with no gullet clearance. It is also too far forward. A tight girth is required to keep cheap saddles with no trees in place. This is where people want to use the shaped girths when their saddle doesn't have any structure. The girth has to be tight to keep it from slipping sideways, and therefore the girth pushes forward into the elbow. If the saddle has structure to fit the back, the girth can be looser.

On the right: Saddle perching and pinching. This saddle needs to be widened at the bottom.

## Strap (Jack) Saddles



Ergonomics of Harness Fit

The strap saddle, also known as the jack saddle, was originally designed for pair or team horses because they aren't carrying any weight on their backs. Unfortunately, they are less expensive saddles and have been used for single horses as well. They don't provide any gullet clearance and put pressure on the spine.



This saddle was owned by one of my students. Her horse kept wanting to lift his head and go hollow. I checked the gullet and found the end of the check hook poking through the bottom. This was pressing down on the spine of the horse because the padding was compressed, and the girth had to be tight to keep the saddle from slipping sideways. When I pointed this out, of course she felt terrible. She didn't know prior to me showing her.

# Harness Saddle Fixes



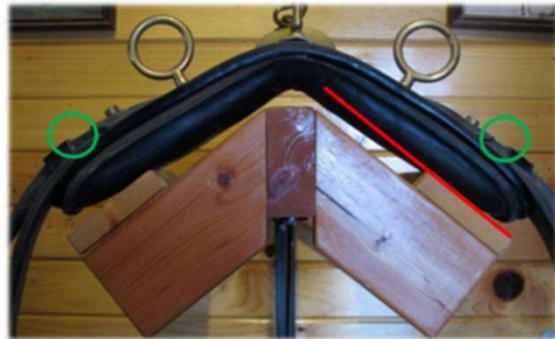
- Gullet Clearance Pad



We fixed the problem of my student's saddle with a Gullet Clearance Pad. We designed the pad to cushion the sides of the saddle to lift the middle off the spine. In most cases, it's an inexpensive, albeit not perfect solution. I recently tried to use one of these pads on a very narrow horse, but that didn't solve the problem because the horse didn't have enough muscle tone on the sides of the spine to hold up the pad. In that case, that owner is going to have to buy a new saddle to fix the problem with her horse.

## Harness Saddle Fixes

- Metal tree inside the saddle
- Narrow the saddle by squeezing the saddle at the green circles
- Widen the saddle by putting the saddle on a firm but protected surface and push down on the check hook.



Ergonomics of Harness Fit

Here is a more traditional style harness saddle from a reputable company. Let's pretend that the harness rack is a horse. For this saddle to fit the "horse", we will have to narrow up the saddle. We do this by squeezing the saddle together at the green circles. If the saddle is too narrow, we set it up on a firm surface, with the skirts laid out, and push down on the check hook. However, this saddle didn't work on our high withered, well-sprung Part-Arab horse. If we widened the saddle, it sat on his spine. If we narrowed the saddle, it perched and pinched his back. Eventually, he got to the point that he didn't want to be harnessed.

## Gullet Spine Clearance



Ergonomics of Harness Fit

On the left is the Smucker Better Fit Saddle. This saddle worked to keep the pressure off his spine. It has plenty of space above the spine and distributes the weight of the cart down the sides.

Since we had issues with saddle fitting on that horse, we been very conscientious with our other horses, and made sure their saddles fit. We've won Turnout classes after the judge went down the line and checked the gullet clearance on each harness.



## Breeching Fit

- Breeching ring at the swirl
- Below the point of the buttocks
- Above the gaskin
- One perpendicular hand at rest
- One flat hand for smaller horses

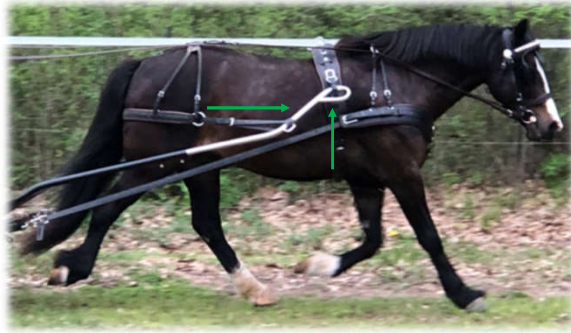


Ergonomics of Harness Fit

Continuing towards the back of the horse, we come to the breeching and hip strap. This is a correctly fitting breeching. The ring on the breeching is at the swirl of the flank. It does look too tight in the photo because the breeching is engaged, holding the vehicle back. At rest, we like one perpendicular hand between the horse and the breeching. We use one flat hand for smaller ponies and minis.

It is good if the footman loops on the shafts are mounted so that the breeching straps are fairly level and not pulling down on the hip strap. On the next slide, I will show why these are angled downwards.

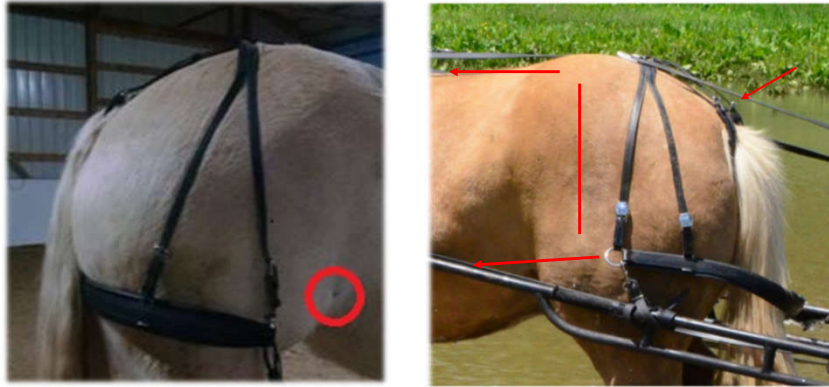
## Shaft Tug Height



Ergonomics of Harness Fit

This saddle came with tug bearing straps that were longer and the quick release tugs were all the way up. In the photo on the right, you can see that the tug bearing straps are shorter with a hole up higher, raising the tugs on the saddle. This puts the footman loop in the correct horizontal line for the breeching straps taking pressure off the hip strap.

## Breeching Fit



Ergonomics of Harness Fit

In the left photo, the breeching is just a little too short, and therefore the hip strap is pulling back, causing the hip strap not to lay flat. This is more common with synthetic material because it doesn't "bend" like leather can. This is a piece I'd rather be too long than too short for this reason.

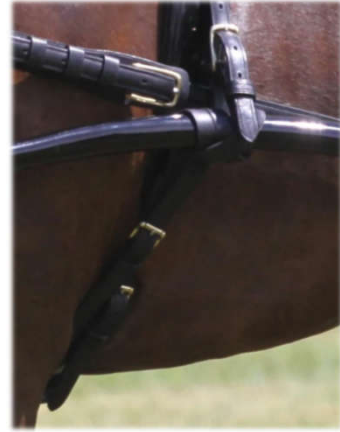
On the right is breeching that is adjusted totally incorrectly. The turnback (or backstrap) is too long and the crupper is hanging too low. The hip strap needs to be moved forward. The breeching straps and footman loops need to be attached on the cart forward of the breeching. In this adjustment, the breeching is doing no good to provide the animal with adequate braking ability.

## Open Tugs Require Breeching or Wrap Straps



Open Tug (Shaft Loop)  
with Overgirth

Open Tug with  
Wrap Strap Girth



Ergonomics of Harness Fit

Some beginners don't want to use breeching because it isn't used in some show rings. They just want to take it off their harness. If the harness has open tugs, breeching or wraps straps have to be used. The wrap straps on a girth become the braking system for a harness without breeching. If you take the breeching off a harness with an overgirth, there is no means of stopping the vehicle from slamming into the horse.

The overgirth or wrap straps are there to keep the vehicle from lifting up and going over backwards. If they are overly tight, it transfers the motion of the vehicle to the horse. If the wrap straps are used for the braking system, they have to be tight, but again, that is to the detriment of the horse.

## Breeching (or not)



Quick Hitch  
Race Harness



Breed Ring  
Fine Harness  
with wrap straps



Ergonomics of Harness Fit

In my opinion (and that of most experienced carriage drivers), breeching is THE MOST effective method of non-mechanical braking. We will talk more about that in a minute. Other forms of non-mechanical braking are:

- Quick hitches that attach shafts directly to the saddle
- Wrap straps
- Thimbles (in the next slide)

These forms of braking are inadequate for hill work, and are designed for flat surface work, like a racetrack or a show ring.

# Results of Lack of Breeching

- In a slow or stop
  - Traces go slack
  - Thimbles or wraps straps engage
  - Saddle pushes and rotates into the horse's spine
    - especially if the saddle lacks gullet clearance.



Ergonomics of Harness Fit

So why should you use breeching? If you don't use breeching, the horse's middle (basically the bony withers, shoulders, and elbows) slows and stops the vehicle. Rotation of the saddle will also happen with wrap straps and quick hitches used as "brakes".

Story: We had a show mare who had been to Nationals. She was a well-trained older teenage horse and generally cooperative. One day, she quit backing. At first, I was mad and tried to make her back. And then I got smart and decided to analyze what the problem was. When we asked her to back, she would take one step and then the thimbles would engage. This caused the saddle to rotate and push down on her spine, at which she would stop attempting to back. We changed the saddle to one with a tree and added breeching, and voila! she backed again. Using the meaty haunches to slow and stop the vehicle is more comfortable than using the withers.

## Same Horse with Breeching

- Saddle can stay back off withers because the braking system isn't pushing it forward.



Ergonomics of Harness Fit

This is the same horse as in the previous photo. After we had the backing problems with his pasture mate, we always used breeching on our horses from then on. With this harness, the saddle is staying back off the withers because there are no wrap straps and thimbles pulling it forward. The girth is away from the elbows. You also notice this is another cart that we undermounted the cross bar, so the line of draft is level from the breast collar.

## Harness Fit Issues Can Cause Multiple Problems

This horse is not *physically* ready for his head to be in the position being asked of him.

Harness fit also causing hollowness.

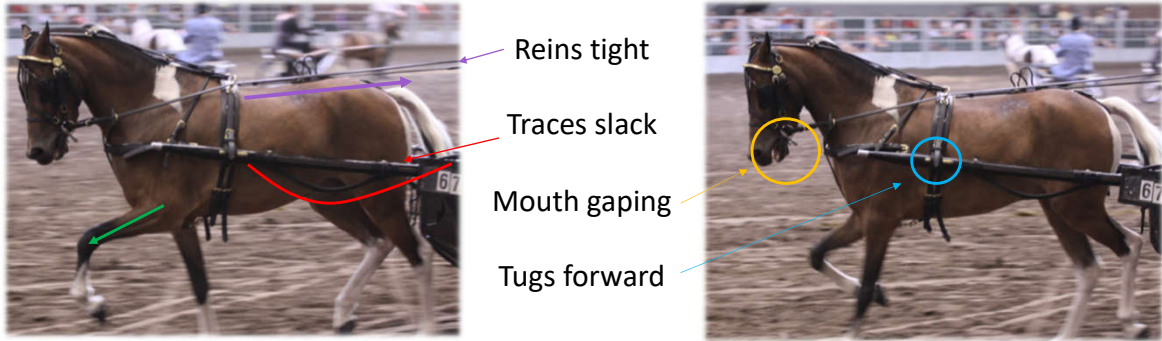


Ergonomics of Harness Fit

This is a photo that I took at a mini breed show. Basically, the driver is trying to get the horse's head into a position that he physically can't do. The tight check rein is holding his head up. It is also pulling the strap saddle into the withers. The saddle is pushing on spine. Tight martingale is trying to pull the head in. The breast collar is up into windpipe. The check rein has caused overdevelopment of neck muscles. This is how people use "yank and crank" to force a head set,...and they don't analyze their tack.



## Harness Trends Cause Problems, too.



There was a trend (and maybe there still is) in the mini breed ring to harness the horse so that the traces are slack. The cart is pulled forward, and the wrap straps are wrapped tightly so that the horse is supposed to pull with the saddle. The theory is that the breast collar won't be impeding the shoulder, and the horse can move better in the front end. However, IF this horse was actually pulling with the saddle, the tugs (where the blue circle is) would be back slightly from the saddle. You can see that these are straight down. So what is this horse pulling with? His gaping mouth. The lack of saddle gullet clearance is encouraging the horse to go hollow in the back. If the horse could go round and push with his hind, he would TRULY free up his shoulder.

Oh, for the want of good fitting tack and training!

# Harness Fit

“Use what you have until you get what you want.”



...but recognize that it may not be the best for the horse and its performance.



Ergonomics of Harness Fit

This is a “correctly fitted” single strap harness. It has a narrow breast collar being supported by a single neck strap. This is causing the breast collar to fall because it isn’t adequately supported. The strap saddle is not providing any clearance over the spine. The tight wrap straps are going to make the horse feel all the bumps of the cart on his girth. The tight blinders are pressing in on the eyes. While this harness is usable, it isn’t doing this pony any favors.

# Harness Should Fit Well!

*“Good harness should fit like a comfortable pair of shoes...”*

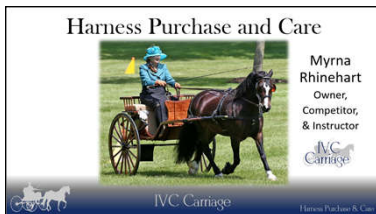


Ergonomics of Harness Fit

We want the horse to be as comfortable as possible in his work, just like you at your job. Take the time to analyze your harness and look for possible points of pressure that your horse might be trying to avoid. If the harness is not comfortable, you won't get the relaxation required for a good performance of the horse, no matter what the work asked of him.

Questions?

## Other Presentations Available...



*...and more!*



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