

Tillers'

TechGuides

Britchen, Brakes, Head Yokes for restraining loads behind oxen

By Richard Roosenberg
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The Problem

Whenever animals are hitched to objects that can coast or slide of their own weight or momentum, some mechanism must be used to keep the load from overtaking the animals on downhill slopes or sudden stops. There are three principal options. First, brakes can be placed on the load. Second, a britchen system similar to that in horse harness can be added to the oxen. Or, third, the oxen can use head yokes.

Head yokes seem to have been favored over neck yokes in rugged mountain areas. Italy, Spain, and Switzerland are some of the areas where they were most popular. In flatter areas like England and the United States the neck yoke seems to have been more popular. While the neck yoke can be held back by a team of oxen with horns, the lack of its direct attachment to the animals means that a load can

gain a foot or so of momentum before being stopped by the horns of the oxen. By that time, there frequently is some shock to their heads as the animals break the increasing movement. With the direct attachment of the head yoke to the horns, there is no opportunity for a load to lurch forward before being caught. On the other hand, the head yoke is demanding to fit to the horns, and it severely limits the animals' freedom of movement.

Brakes on the cart or other load are most helpful in very steep descents. They must however, be attended, and they throw the balance of a loaded cart forward. Further increasing the tongue weight. This is especially true for cart designs with platforms, or boxes elevated above the axle. Moving up to a wagon with four wheels and brakes on the rear wheels can eliminate the load shifting problem at considerable cost. For heavy loads, if well arranged with low centers of gravity, brakes are probably the easiest on the animals of any of the restraint systems and perhaps the safest.

Adding a britchen is a simple adaptation with a neck yoke, especially if wide leather or nylon strapping is available. As compared to a horse, however, the ox moves its rear quarters much more against the britchen strap. And with the oxen's moister feces, the sawing of the strap risks frequent chaffing.

While none of these solutions are perfect, any of them is safer for driver, animals, and everyone living at the base of the hill than no precautions.

Acknowledgement of Reviewers

This is the first draft of this TechGuide and is being distributed to Dave Kramer, (MCC Uganda), Jack Shoemaker, Drew Conroy, Albert Payne, Dave Gullman (MCC Ethiopia), and others for technical comment. Future drafts will integrate suggestions, corrections, and improvements to illustrations. Please send Comments to: Tillers International, 5239 S. 24th Street, Kalamazoo, MI 49002 USA

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Ox Britchen

While the britchen idea is similar to horse harness, the rear quarters of oxen have a much less rounded shape. The horse britchen system is usually supported by four drop lines descending from a central point above the tail. These tend to slip off the back of the oxen. Albert Payne (of three Oaks, Michigan) discovered that old army mule harness had a britchen design which stayed on oxen much better. His mule harness had two pairs of opposing drops about 14- 16 inches apart. The back pair hung behind the hip bone, the fore pair in front of the hip bone. This design stabilizes the britchen nicely.

To fit a britchen system, determine the length of the britchen strap by measuring from the tail around beyond the drop points for about 12 extra inches (30 cm.) and double this length. Add "D" rings or other attachments for each of the drop lines and at the ends of the britchen straps. The drop lines should be adjustable in length. Hook ropes to the ends of the britchen strap and connect each to an "eye" bolt in the yoke. The "eyes" of these bolts should be at about the same level as the hitch point of the yoke. If their level is much different, the pushing of the yoke will twist the yoke excessively. Quick fasteners of the ropes to the "eye" bolts will facilitate use. Also, short sections of chain or some means of adjusting the length of the rope to the britchen is important since the britchen must be kept snug (but not tight) for effective operation. The "eye" bolts should be placed far enough from each of the oxen to minimize friction on the shoulders of the animals as they walk.

Brakes for carts

Brakes for ox carts with metal or wooden wheels are usually made of wood shoes attached to a cross beam behind the wheels. The beam is pulled forward to engage the brakes by lever or screw.

Putting brakes on pneumatic tires can be a greater problem. If the wheels are from an old rear axle, it may be possible to salvage the emergency brake cable and the original brakes. Sometimes wood brake shoes are used with pneumatic tires as well, but they are mounted inside the recess of the rim and are pulled out to create friction. There usually is not much surface for them to rub on however, and thus their effectiveness is in doubt.

With wooden or metal wheels, the brakes are usually placed behind the wheels of the cart and for wagons in front of the rear pair of wheels. The shoes are made of blocks of wood 6-9 inches in length with the grain in line with the movement of the wheel. Bolts anchor the pads to the cross beams. The bolts are recessed into the pads to avoid the heads rubbing on the wheels. The cross beam is suspended from the frame of the cart with flexible hangers. The cross beam draws the pads against the wheels as a screw or lever pulls it toward the axle. The forward movement of the wheels will lift the cross beam (if behind a cart axle) so the cross beam must rest firm against the frame of the cart.

Head Yoke

The head yoke is an effective means of using the weight of the oxen to break the momentum of the load. The oxen must have strong horns, which are firmly attached to their skulls. Getting a good fit is a demanding skill. Young animals with horns that are still growing need frequent refitting. Thus, animals are frequently not trained to head yokes until they are adults. Short strong necked animals are best suited to head yokes. And even then, care should be taken not to create too much tounge weight by overbalancing loads too far forward.

In fitting the horns, space must be left at the sensitive growth base. The grooves gouged in front of the yoke for the horns should be deep enough so the horn touches along the sides of the groove but not in its center.

A peg usually stands toward the center of each animal. It frequently has a slit in it and there is usually a slit in the end of the yoke beam. These slits serve to allow the directions of the strap that wraps the horns to be reversed. Two leather lines about 1 inch wide (2.5 cm.) or nylon belting of a similar width and about 10 feet long (3 m.) work well for fastening oxen into the yoke. They should have a loop at one end with which to start the fastening.

Conclusion

The choice among britchen, brakes, and head yoke is not straightforward. An across the board recommendation would be an over simplification. The choice needs to be made based on local circumstances, skills, traditions, and material resources.

Suggested Reading and References

Nolle, Jean

1986 *Machines Modernes a Traction Animale.*
Editions L'Harmattan, 5-7 rue de
l'Ecole Polytechnique, 75005 Paris

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Call **616/344-3233** Fax **616/344-3238**, or write
TILLERS International
5239 South 24th Street
Kalamazoo, MI 49002 USA

www.wmich.edu/tillers/ or tillersox@aol.com

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