



BUCKEYE TRACTOR CO

Operation Manual

**Model 4531-D
BED SHAPER**

Version A14 • Serial No. 5230100 • Effective 1-1-15

Serial No: _____ Date Received: ___ / ___ / ___

Purchased From: _____

Order / Invoice No: _____



BUCKEYE TRACTOR CO

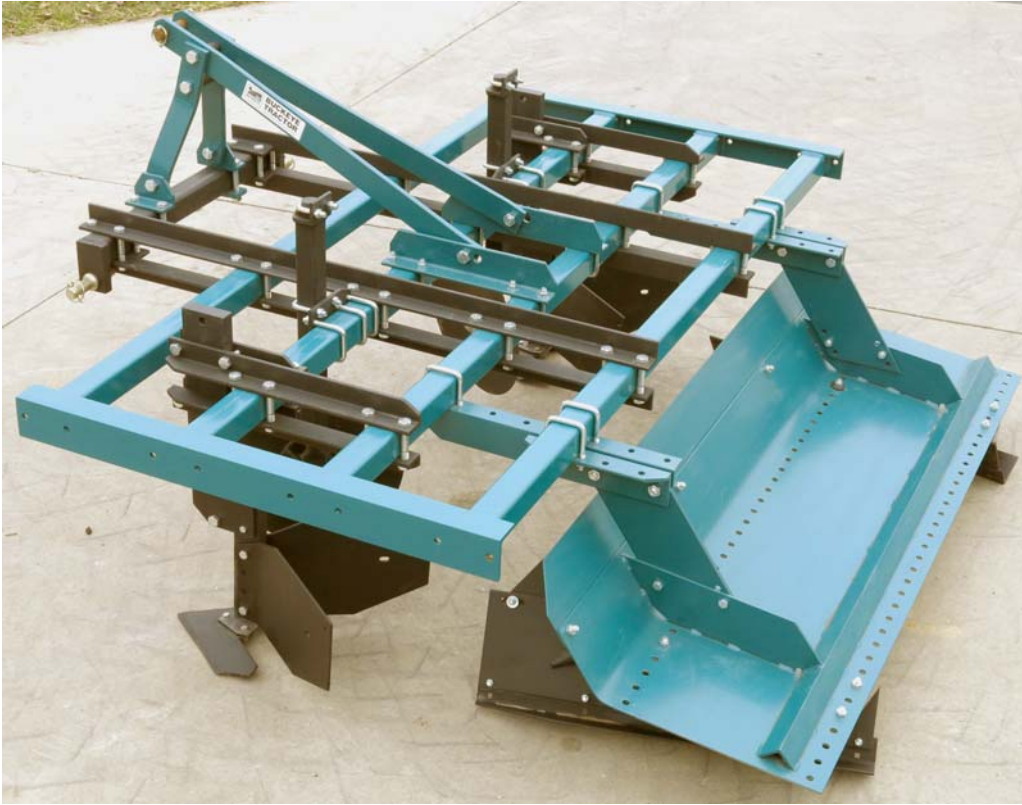
P.O.Box 97 • 11313 Slabtown Road • Columbus Grove, Ohio 45830 USA

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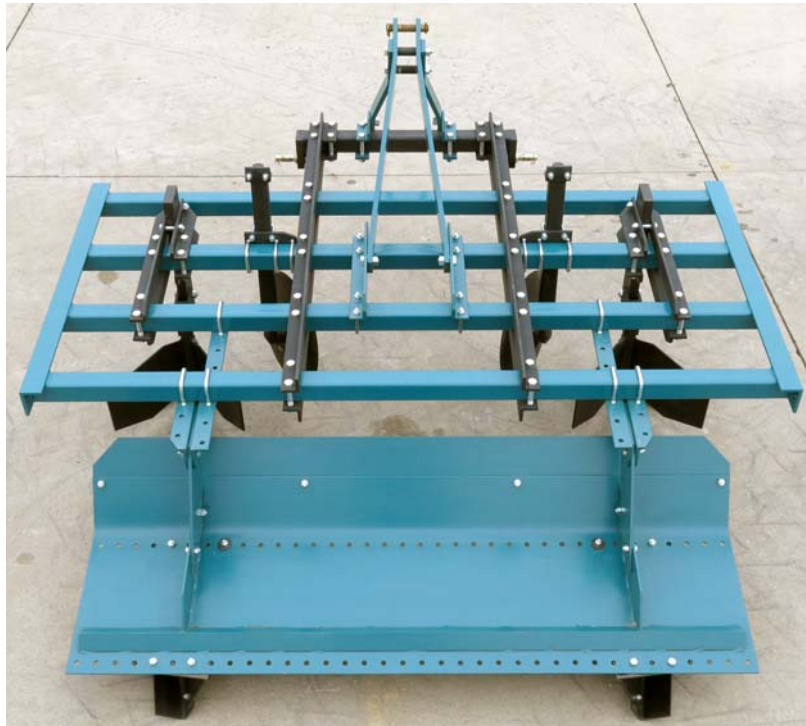
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GALLERY



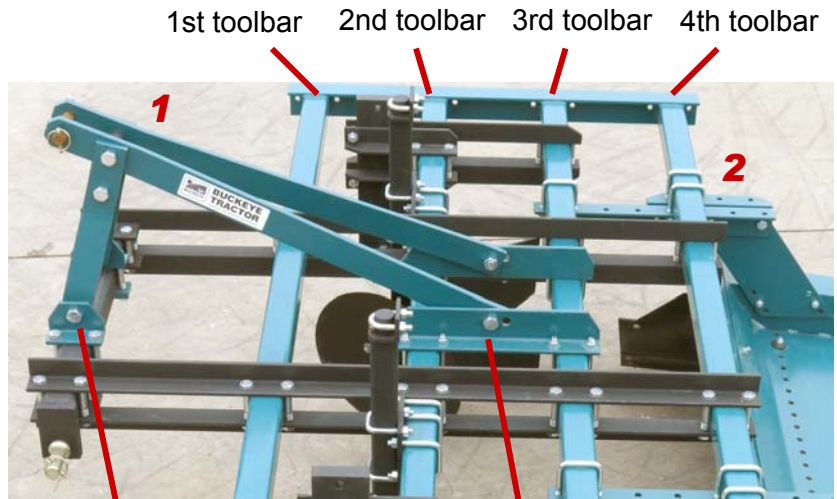
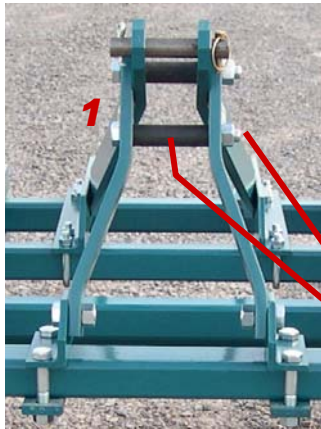
GALLERY



SET-UP

This equipment is "knocked down" for the best shipping rate by meeting any applicable NMFC density requirement for LTL trucking services. Shipping equipment "set-up" costs at least two or three times more. See PARTS LIST breakdowns if needed to visualize all parts in assembly. Contact Buckeye Service if you have any questions or comments about set-up.

1 - Raise Hitch Mast. Conventional 19" mast height shown. See ADJUSTMENTS for 15" mast height for quick hitch. Toolbar sub-assembly can be mounted on tractor hitch and raised to ease further assembly.
ALWAYS USE SAFETY STANDS under implement for set-up, adjustments, maintenance, etc.



3/4 x 1-3/4 capscrews,
3/4 nuts (shipped on unit)

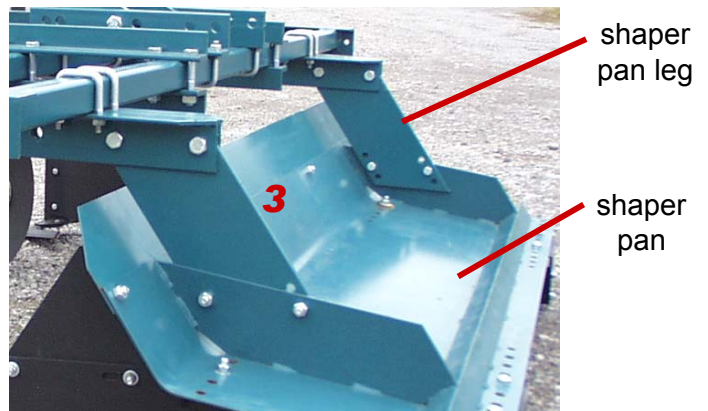
front hole position

3/4 x 6 capscrew, 3/4 nut (shipped on unit)
3-3/4 spacer (shipped on unit)

See note on next page.

2 - Re-install shaper pan assembly on 3rd and 4th toolbars.
OPTION: CROWNED SHAPER PAN is pre-installed.

3 - Re-install shaper pan leg to rear position. If shaper pan is disassembled more (by request), assemble as shown.

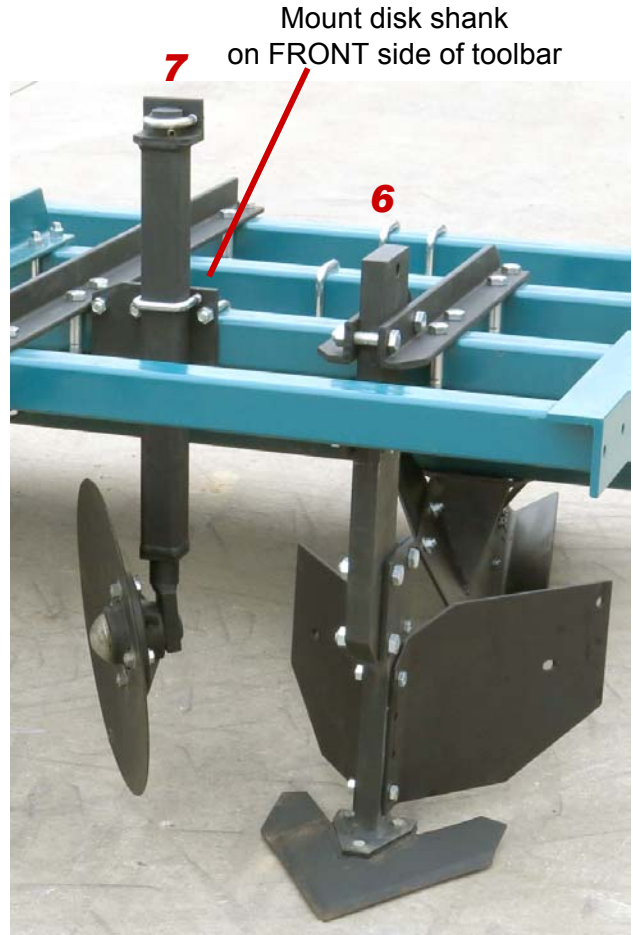


SET-UP

6 - Re-install furrow shanks to second toolbar

7 - Re-install shaping disks to second toolbar.

1st toolbar 2nd toolbar 3rd toolbar

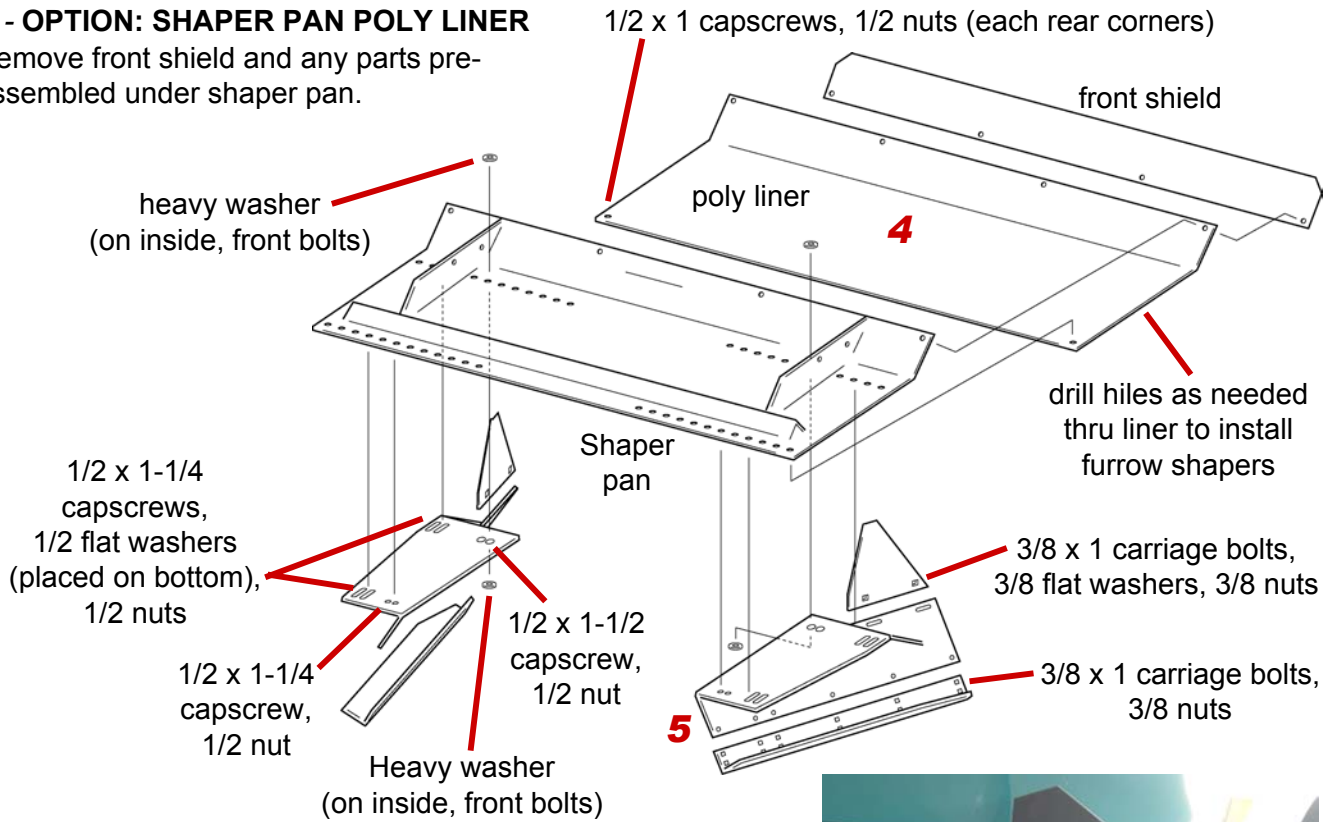


Note: With the furrow shanks and shaping disks mounted on the 2nd toolbar and the shaper pan mounted on the 3rd and 4th toolbars, the 1st toolbar is unused on this set-up. Other applications tend to utilize the 1st toolbar. Otherwise, the furrow shanks and shaping disks can remain on the 1st toolbar. The shaper pan can be set-up on the 2nd and 3rd toolbar, leaving the 4th toolbar unused.

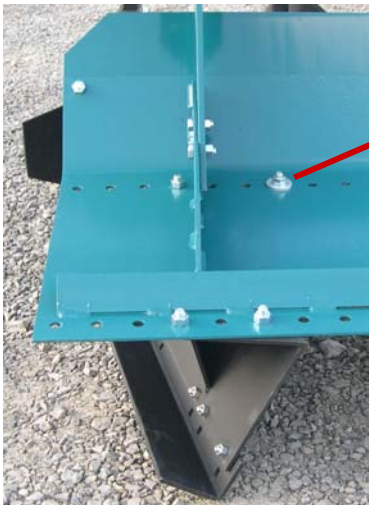
SET-UP

4 - OPTION: SHAPER PAN POLY LINER

Remove front shield and any parts pre-assembled under shaper pan.

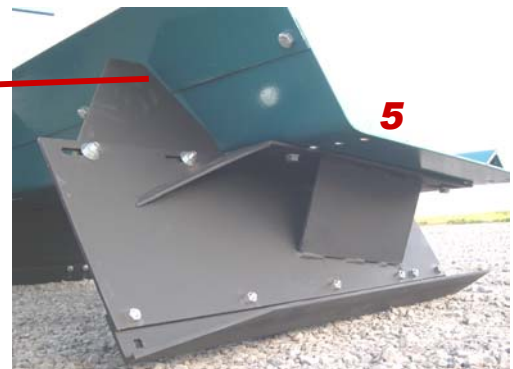


5 - Assemble furrow shapers. Parts for lower bed heights may be pre-installed. See ADJUSTMENTS to set-up for specific bed width.



Heavy washers (on inside, front bolts, top and bottom)

Position side shield near or against shaper pan

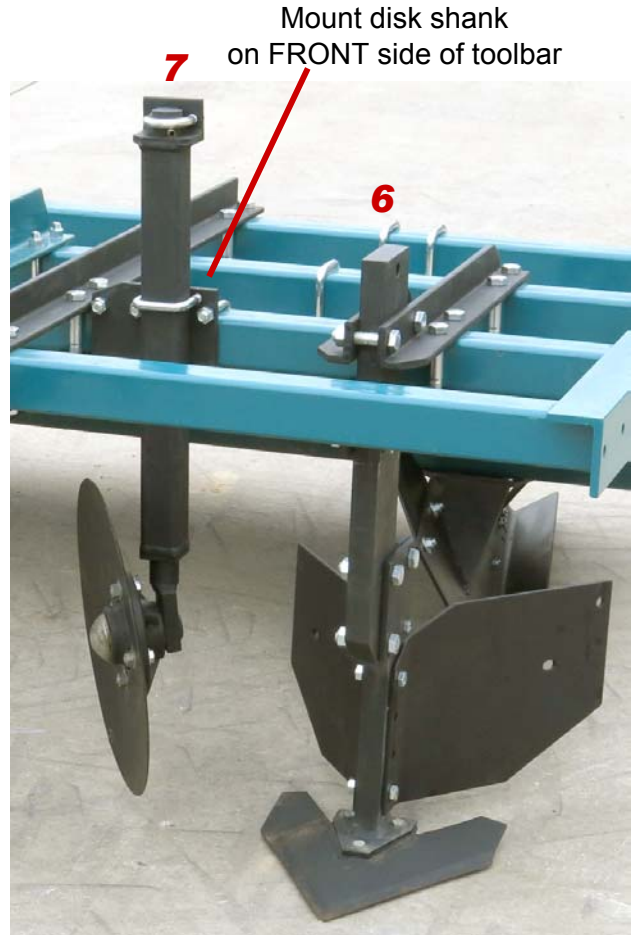


SET-UP

6 - Re-install furrow shanks to second toolbar

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1st toolbar 2nd toolbar 3rd toolbar



Note: With the furrow shanks and shaping disks mounted on the 2nd toolbar and the shaper pan mounted on the 3rd and 4th toolbars, the 1st toolbar is unused on this set-up. Other applications tend to utilize the 1st toolbar. Otherwise, the furrow shanks and shaping disks can remain on the 1st toolbar. The shaper pan can be set-up on the 2nd and 3rd toolbar, leaving the 4th toolbar unused.

SET-UP

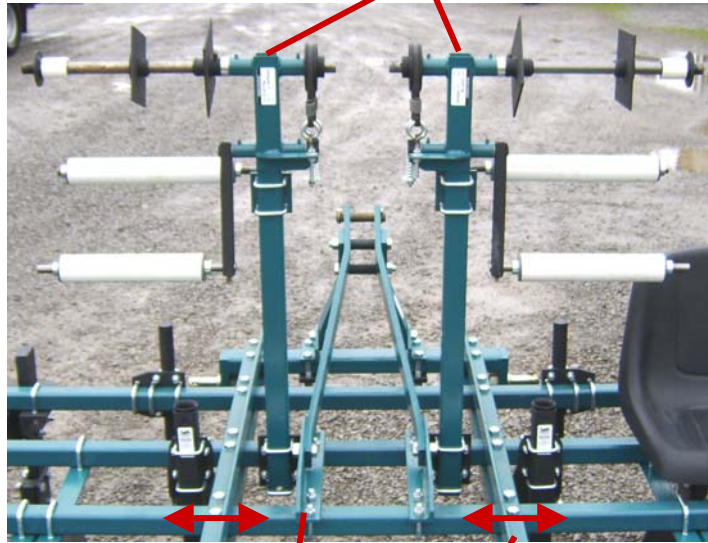
9 - OPTION: DRIP TAPE LAYERS

Typical installations shown. See TAPE LAYER MANUAL to set-up tape layer and install mounting hardware.

Right-hand tape layer installation with tape row in center



Right-hand and left-hand tape layer installation



hitch parts can be turned outward or inward

hitch parts can be moved laterally

Right-hand and left-hand tape layer installation with spool shafts pointing to the rear for close tape row spacing



ADJUSTMENT

HITCH MAST HEIGHT

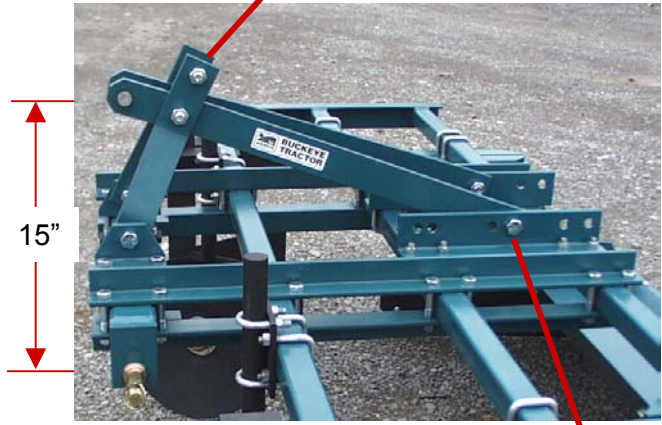
Standard ASAE Category-2 implement mast height is 19", which is shown in SET-UP. ASAE Category-2 implement mast height for Category-2 Quick Hitches is 15". Measure on a vertical plane, not on an angle. Set-up for each is shown.

Install long spacer on bottom



front hole location

Install long spacer on top

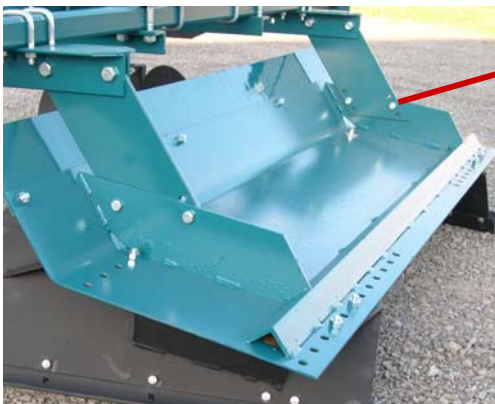


rear hole location

TOOLBAR HEIGHT

Toolbar height is not critical to function unless S-tines or possibly other tillage attachments are installed on the toolbar frame. This allows depth of these attachments to be adjusted in relation to shaper pan, which is the depth control. Adjusting the top link can provide minor depth adjustment. Toolbar should essentially be level during operation.

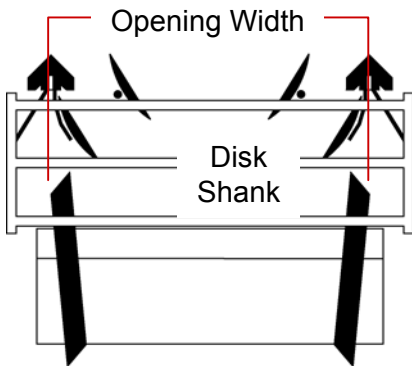
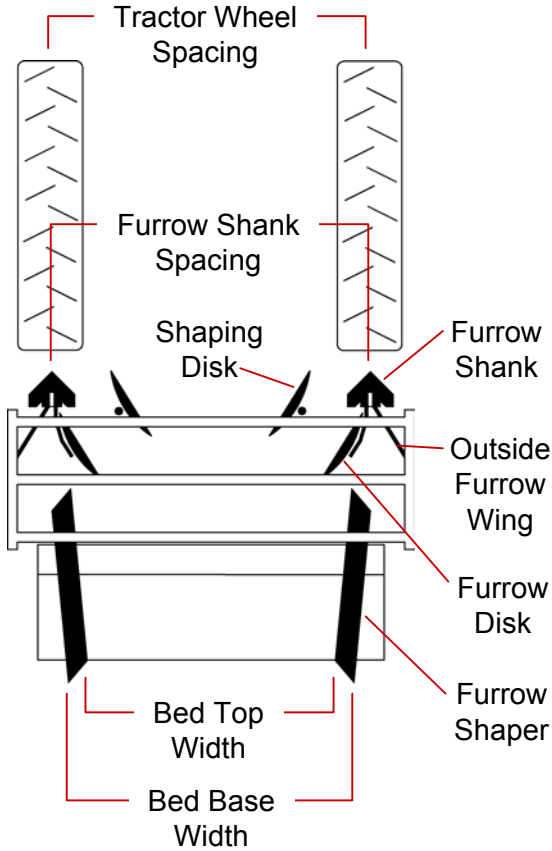
Toolbar height is relative to the bottom of the shaper pan and adjusted at the shaper pan. This is not necessarily an on-the-go adjustment, but should not need to be. On-the-go adjustment is possible for any or all components, which is priced accordingly.



Adjust toolbar height here. Set at the MIDDLE HOLE for 16" toolbar height, which is considered standard. Additional holes are provided for 15-in and 17-in toolbar height, which is currently only useful for more or less tillage depth for S-tines. There is no benefit to adjust this when using shaping disks.

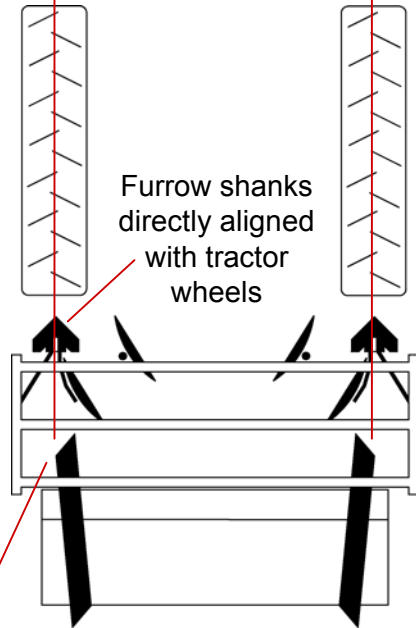
ADJUSTMENT

TRACTOR & BED ROW CONFIGURATIONS



Tractor & Bed Configuration #1
MOST COMMON & PRACTICAL
 This is for conventional beds with common-furrows. All soil in wheel track is turned into beds for a single furrow between bed tops. Tractors wheels drive in the furrow.

Bed row spacing is the same as tractor wheel spacing
 furrow shank spacing is the same as shaper pan opening width



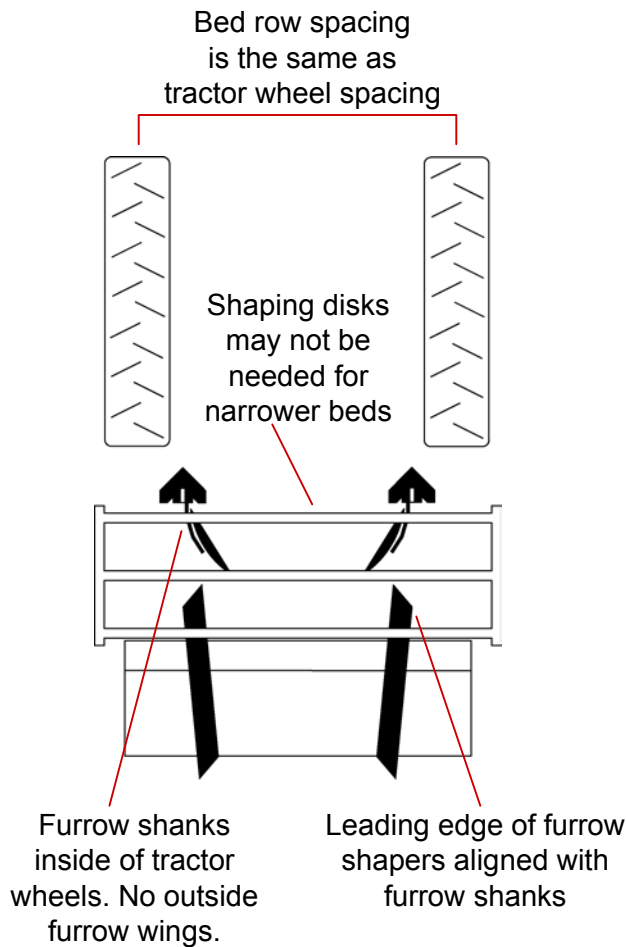
Leading edge of furrow shapers aligned with furrow shanks

ADJUSTMENT

TRACTOR & BED ROW CONFIGURATIONS

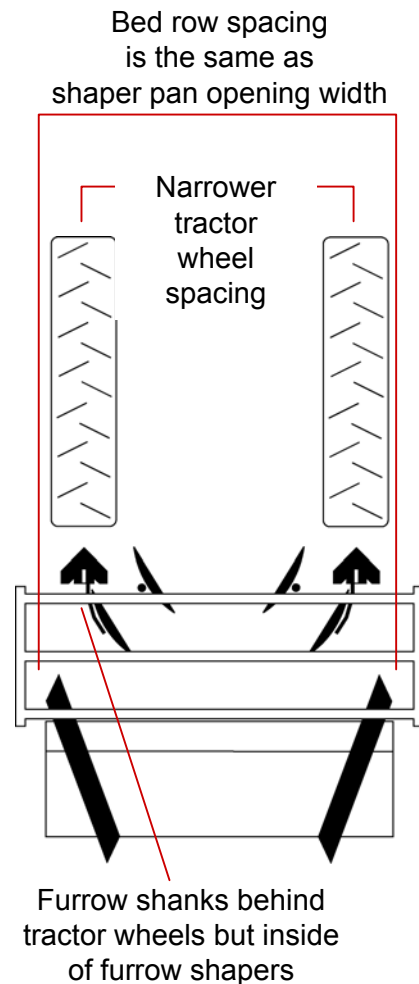
Tractor & Bed Configuration #2

Operators occasionally choose this, but for varied reasons that seem to prefer a narrow bed top. Bed furrows are inside of tractor wheels, leaving a drive space for tractor wheels. Soil in wheel track is not turned into beds.



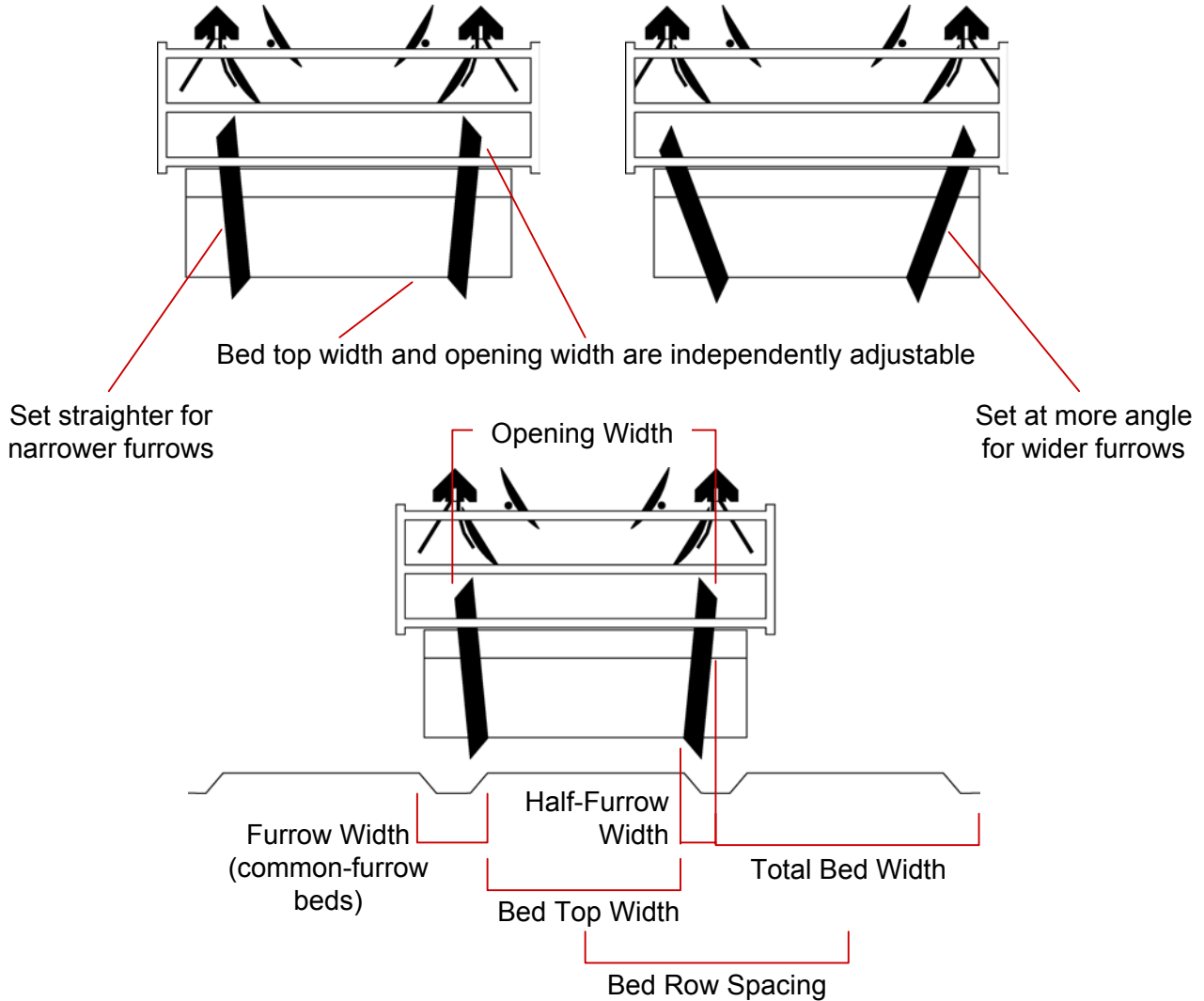
Tractor & Bed Configuration #3

This is a variation of Configuration #1. Tractor wheel spacing is narrower than shaper pan opening width for all tractor wheels to drive on flat land. This is often dismissed as too much hassle to adjust tractor wheels but illustrates one way to avoid peculiarities of one-pass bed shaping.



ADJUSTMENT

OPENING WIDTH -- BED TOP WIDTH -- FURROW WIDTH



Bed top width recommendations: This is actually beyond the purpose of this manual since the choices are endless. There are many pro and cons for narrower or wider furrows and narrower and wider bed tops. Connect with your agricultural community for direction, including Buckeye Service, if you don't already have an idea. This bed shaper meets most, if not all, expectations, which are usually reviewed at the time of sale. Frankly, if a desired bed size seems beyond the range of adjustment this model offers, it may be unusual or impractical to the point of warranting further analysis. Call Buckeye Service or participating dealer service any assistance.

ADJUSTMENT

OPENING WIDTH -- BED TOP WIDTH -- FURROW WIDTH

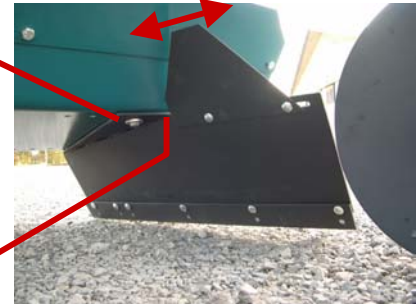
Two rows of adjustment holes

Be sure to install heavy washers on top and bottom



Be sure to install heavy washers on top and bottom

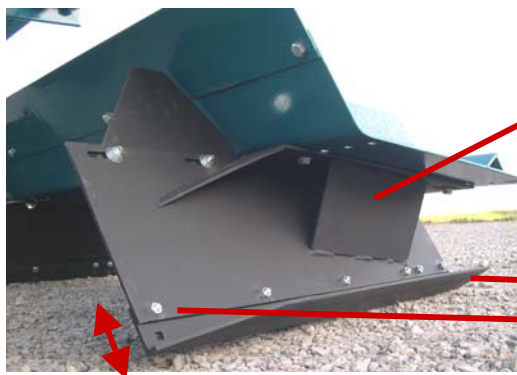
After setting furrow shaper angle, adjust side shields to minimize gap in front of pan



BED HEIGHT

A Bed Height Package is added to complete each Bed Shaper. Different Bed Height Packages allow the bed height to be changeable for a broad 3" to 10" range, however, each Bed Height Pkg is adjustable 1-inch. Fully adjustable furrow shapers have been designed, but these are complex and cost much more, so different furrow shapers for different bed heights are good, practical, and economical.

A Bed Height Package consists of (1) Left Furrow Shaper Bracket and (1) Right Furrow Shaper Bracket. Furrow shoes, side shields and fasteners are used with any Bed Height Pkg.



Left Furrow Shaper

Furrow Shoe

Adjust furrow shoe to change bed height by 1-inch. Install different furrow shapers for different bed heights

ADJUSTMENT

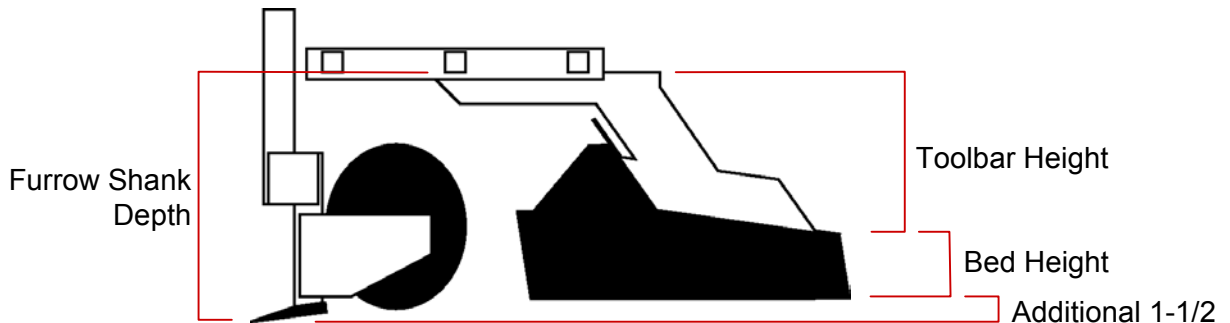
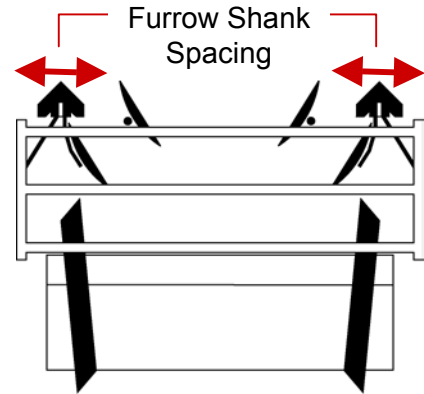
FURROW SHANKS

The toolbar frame allows a maximum furrow shank spacing of 74". This is intended to adjust for row tractors with 5-ft to 6-ft wheel spacing. Narrower wheel spacing is certainly possible if tractors matched with this bed shaper model are capable. Wider wheel spacing simply requires a wider frame and possibly two more shaping disks. A wider frame is optional since most specialty crop growers consider consecutive bed row spacing greater than 6-ft to be wasteful.

Each furrow shank assembly is independently adjustable. Set-up according to the desired tractor and bed-row configuration. Set-up must be symmetrical.

Furrow shank depth can be critical for effective bed shaper performance. NEVER USE BED SHAPER WITHOUT FURROW SHANKS. These are intended to loosen wheel compaction for furrow shapers to form loose soil. These may loosen soil below the tillage layer, within reason. Furrow shanks are not rippers and not an excuse to shape beds in poorly prepared soil.

Furrow shank depth must be set slightly below the furrow shapers to sufficiently loosen wheel compaction. Otherwise, furrow shapers may ride on hard soil. Furrow shanks are generally positioned in front of furrow shapers. If not, the need for a second set of furrow shanks is possible if compacted soil is a problem, but this is rare.



Furrow Shank Depth	Toolbar Height	Bed Height	Additional
20-1/2"	16"	3"	1-1/2"
21-1/2"	16"	4"	1-1/2"
22-1/2"	16"	5"	1-1/2"
23-1/2"	16"	6"	1-1/2"
24-1/2"	16"	7"	1-1/2"
25-1/2"	16"	8"	1-1/2"
26-1/2"	16"	9"	1-1/2"
27-1/2"	16"	10"	1-1/2"

ADJUSTMENT

SHAPING DISKS

Shaping disks fill the bed center. Good bed shaper performance largely depends on shaping disk adjustment. Frankly, since there are a few things to NOT DO, this leaves what TO DO to be fairly simple.

Don't set the disks too far apart and expect them to do all the work. The furrow wings actually tend to move twice as much soil as the shaping disks.

Don't set the shaping disks too close. Soil bulldozing between the blades is evidence of this. Grooves on each side of the bed top are possible.

Don't set the shaping disks too deep. This also can be from the attempt to have the shaping disks do all the work. Too much soil may be heaped in front of pan and sides of bed may not fill out.

DO set inside shaping disks between furrow shanks to lead the furrow disks to hill soil in front of shaper pan. The inside shaping disks fill the center. The furrow disks fill the cuts from the inside shaping disks. This bed shaping design is intended to minimize soil roll-over and keep seedbed soil on top.

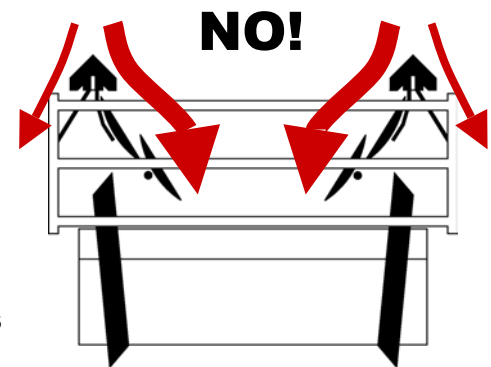
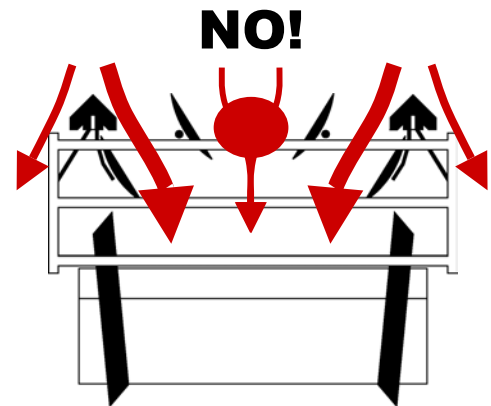
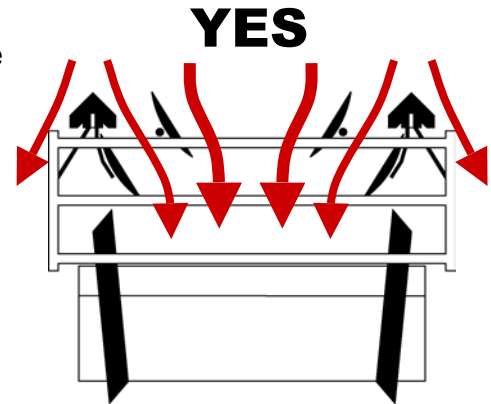
Even if disk depth is correct, these are not designed to cut into hard untilled soil. If soil is not tilled deep enough for the bed height, the furrow shanks may also be pulling hard or furrow shapers may also be riding on hard soil, causing an unfilled and unfirmed bed.

Frankly, it has been shown over and over that bent shanks and then blown bearings are because disks are set too deep or loose soil is not deep enough.

Are disks too light? No. Changing how disks are used changes the purpose of this bed shaper. Different shaper designs are available to work in hard ground, but such machines are usually not chosen for that purpose since hard soil does not make a good seedbed anyways.

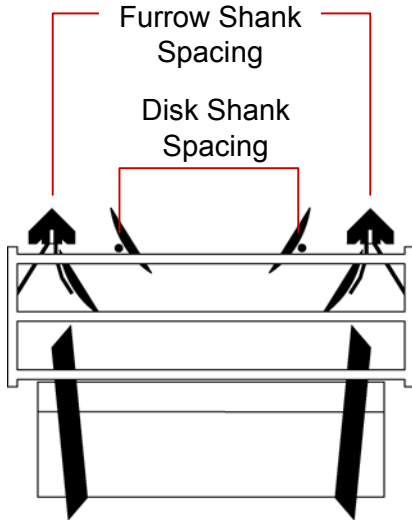
If circumstances are necessary and soil is workable, an option is available to equip this bed shaper with four furrow shanks to better work in untilled soil. But this is not an excuse to mismanage soil. Nearly all operators succeed with the bed shaper as it is.

Bed shaping requires moving a lot of soil so soil management is inherent. This bed shaper is easily adaptable to many management practices.



ADJUSTMENT

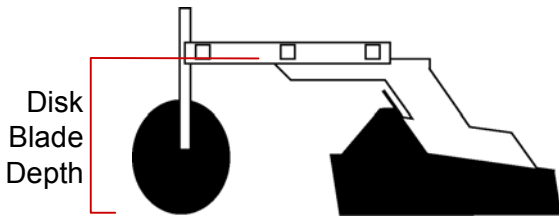
SHAPING DISKS



Furrow Shank Spacing	Disk Shank Spacing
60"	36"
62"	37"
64"	38"
66"	39"
68"	40"
70"	41"
72"	42"

Disk shank spacing is general in nature. The point is to proportionally space the disks with furrow shank spacing.

A range is given for disk blade depth. This is to illustrate that measurement does not have to be perfect. But NEVER adjust disks deeper than shown.



Disk Blade Depth	Bed Height
18 - 19"	3"
19 - 20"	4"
20 - 21"	5"
21 - 22"	6"
22 - 23"	7"
23 - 24"	8"
24 - 25"	9"
25 - 26"	10"

Operators tend to want to set disks deeper, thinking that more soil movement by the inside disks will solve a problem. As said in ADJUSTMENTS / FURROW SHANKS, the furrow wings and furrow disks typically move twice as much soil as the disks so more shaping with the two inside disks is folly, likely resulting in bent shanks and blown bearings, which is actually a good fail-safe from mis-using this machine.

Disk angle may be less (straighter) for faster tractor speed or more for slower tractor speed. Speed is usually not a factor to shape beds but avoid a very slow speed in first gear. Ground speed is typically 2 to 4 MPH. Some soils in some conditions may simply flow better at a faster tractor speed.

If there is any question about bed shaper adjustment, contact Buckeye Service or participating dealer service. Since bed shaping is cultural in nature, it is impossible to cover every point in a manual and expect it to be read. With a small learning curve and a little mechanical aptitude, this bed shaper is smart to meet your expectations.

If a problem seems unsolvable, call before adjusting other things that won't help or will make it worse and surely call before a bad attitude develops.

OPERATION

FURROW DISKS -- OUTSIDE FURROW WINGS

Furrow disks and shaping disks hill soil in front of shaper pan. There is no adjustment provided for the furrow disks but none should be needed. If any adjustment of furrow disks is believed to be needed, first contact Buckeye Service.

Outside furrow wings move soil into the next bed row for the cleanest furrow shape after shaping the next bed row. One row bed shaping requires forming a half-furrow with the first bed then finishing the furrow with the next bed. Outside furrow wings also effectively widens the half-furrow to accurately drive the tractor for exact bed row spacing. Without outside furrow wings, tractor wheels tend to drive too close to the previous bed and bed row spacing can be a couple inches less than the tractor wheel spacing. With good tractor driving, expect bed rows to be spaced perfectly. Your neighbors will think you are using 3-row equipment.

Outside furrow wings
move soil into the
next bed.



For expert one-pass bed shaping with narrow furrows, remove the outside furrow wing on ONE SIDE ONLY to avoid clipping the previous bed. This also requires shaping in a circular pattern from the center bed.



With common-furrow beds,
tractor wheels drive in furrow

OPERATION



Expect perfect beds with one-pass bedding practices. But does this soil look better than yours? One-pass bedding originated in easy-working soils. If you want to do one-pass bedding the same way, your field needs to be worked to sandbox condition - *like theirs*. To form bed tops level with one wheel in the furrow, one pass bedding works best starting with the center bed in the field and working out each way. As an alternative, first form every-other bed with the use of row markers then form in-between beds with both tractor wheels in furrows.

Many operators choose to form beds in two passes. The first pass roughs in furrows and moves most soil into the bed. First pass focus is also on bed spacing and straightness. The second pass focuses on finishing bed top. With both wheels then in furrows, beds can simply be formed from one side of the field to the other.

The first pass can also be done with a primary bedder. This bed shaper can be equipped with tillage attachments if light tillage is needed when finishing beds. Primary bedding after harvest for over-wintered beds greatly simplifies bed preparation before planting.



OPERATION



Photo is lightened to show typical soil build-up in front of pan

OPERATION

IMPLEMENT DRAFT & IMPLEMENT LIFT

Standards established by The American Society of Agricultural Engineers (ASAE) are intended to ensure that connecting points between tractor 3-point hitches and implement 3-point hitches are routinely compatible. However, ASAE standards do not necessarily standardize tractor hitch geometry for proper implement draft and lift. With the invention of the 3-point hitch system, Harry Ferguson established proper hitch geometry for implement draft, which generally also provides proper lift. Other design elements of hitch geometry can affect implement lift, which are largely at the discretion of the tractor manufacturers.

Poor hitch geometry affects implement draft and lift. Draft problems include implement side-sway or fish-tailing, inconsistent depth control between front and rear of implement or implement seeming to pull out of the ground or seemingly unwilling to penetrate the soil. Quick fixes like adding guide disks or more gauge wheels or adding weight may be considered when the true problem is poor tractor hitch geometry. Lift problems include limited lift height with heavier implements and long implements that won't raise on the back end. Quick fixes? Sorry.

Unfortunately, tractor manufacturers follow no hitch geometry standard except to not disappoint the customer, if anyone knows the difference. In retrospect, hitches on some brands of older tractors were nothing less than junk. Most newer tractors have been acceptable or worthy. Most problems originate on the tractor when the top link is anchored too high or the position of the lower arms, where pinned to the tractor, is too wide or too narrow.

Why not blame the implement? OK, but then it would be impossible to have any standards at all. However, implements are easier to modify if you don't mind using implements that can only be used the tractor with the bad hitch. Some implement manufacturers offer many top link pin holes, which is workable if it doesn't create more confusion. Adjusting the lower arm spread is also possible on many implements, but ease depends on design.

If there is any question on implement draft and lift, please contact Buckeye Service before making any modifications.