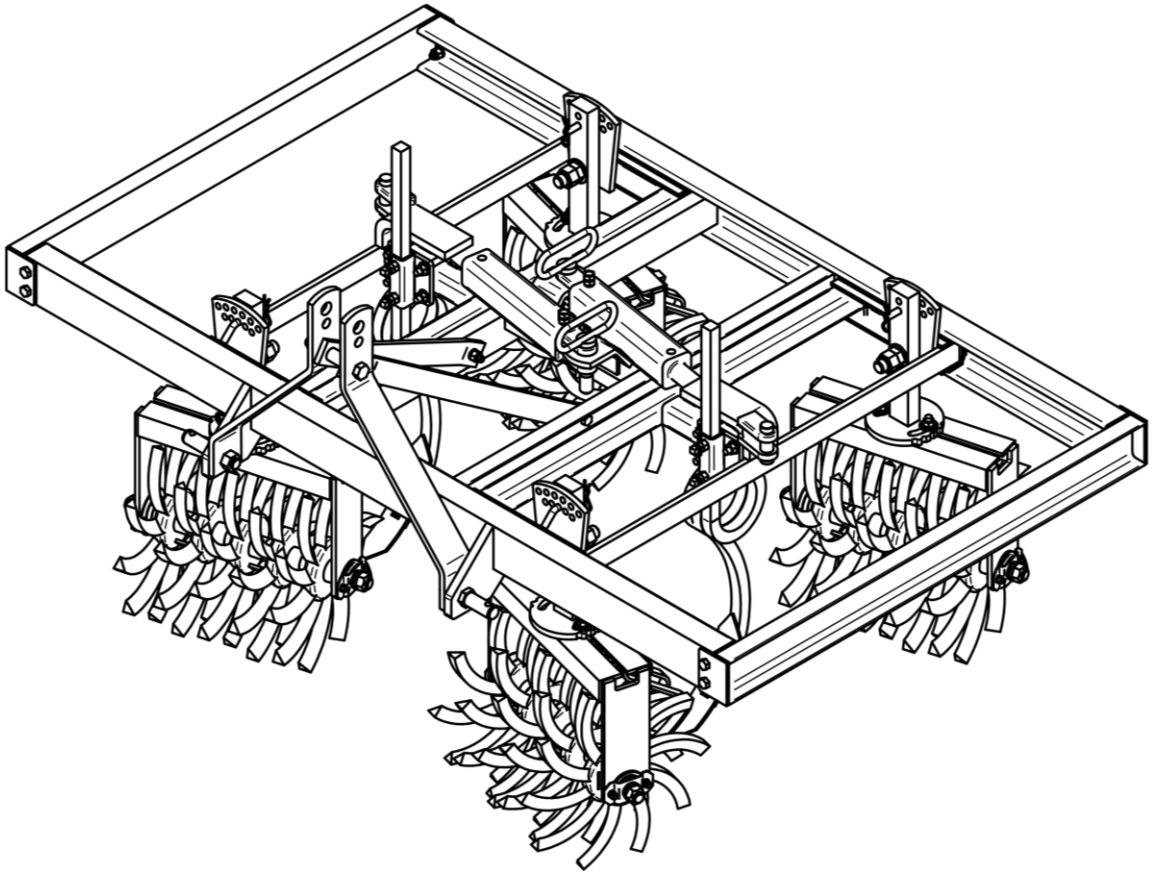
Hillside Cultivator Co. LLC
Operators Manual

Model CS



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Safety

Read the entire manual before unpacking or operating the cultivator.

- Always follow any requirements or recommendations in the tractor's operator manual to which the cultivator is attached.
- Keep all persons a safe distance from the cultivator when operating. Do not allow riders.
- Stop tractor and relieve any hydraulic pressure before working on cultivator.
- Regularly check the cultivator for damaged or excessively worn parts.

Warning: Be aware of areas where fingers, hands, and feet could be pinched, crushed or cut.

- Always wear appropriate gloves when making any adjustments or handling spider and disc gangs.
- When handling spider or disc gangs, keep fingers out of areas where they could be pinched against the yoke or scrapers.
- Make sure the cultivator is properly mounted to the tractor and safely supported before making any adjustments.
- Keep feet and all other body parts out from under the cultivator when the cultivator is off the ground.
- Never put arms or legs between the sliding sub-frame and the main frame if there is power to the hydraulic cylinders or any other potential for the sub-frame to move.
- Never put fingers in cylinder mounting holes when attaching cylinders or any other time.

Warning: Hydraulic fluid under pressure can be hazardous.

- Never touch leaks or test for leaks with hands.
- Relieve all pressure before loosening connections or performing maintenance.
- Regularly check hoses, fittings, and cylinders for damage. Replace any damaged parts.

Unpacking a Shipped Cultivator

If the cultivator has been shipped by truck, it will arrive with the spider gangs and/or disk gangs disconnected from their mounting plates and placed inside of the frame on a pallet. (Figure 1)

Figure 1

- Cut off any plastic wrap and banding securing the cultivator.
- Wearing gloves carefully remove the gangs from the pallet.
- Be attentive to keep fingers out of tight spaces where they could be pinched.
- Handle the gangs either by the ends of the axle or pick them up by the spider itself.
- Lift the frame from the pallet by attaching it to the three point hitch of the tractor.

Mounting Spider and Disc Gangs

- **Gangs should always be mounted with scrapers towards the back of the cultivator**.
- Gangs are numbered 1 or 2. The typical placement of gangs is shown on a sticker located on the back of the cultivator frame. For more details on gang placement see the **Configurations** section of the manual.
- Lift the cultivator off the ground using the three point hitch on the tractor.
- Loosen the angle adjustment nuts shown in Figure 3.
- Slide the appropriately numbered gang onto the mounting plate (Figure 2).
- Tighten angle adjustment nuts. (Note: A weld bead on the bottom of the pivot arm must be positioned in the slot of the gang or the gang will not mount tight to the pivot arm.)

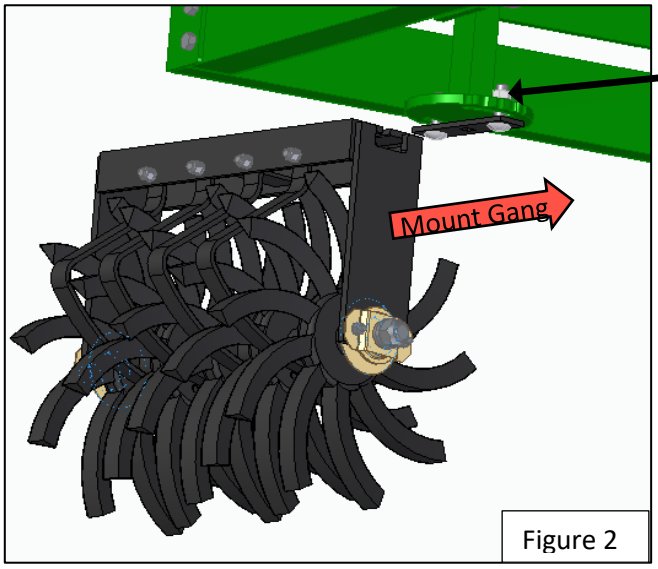


Figure 2

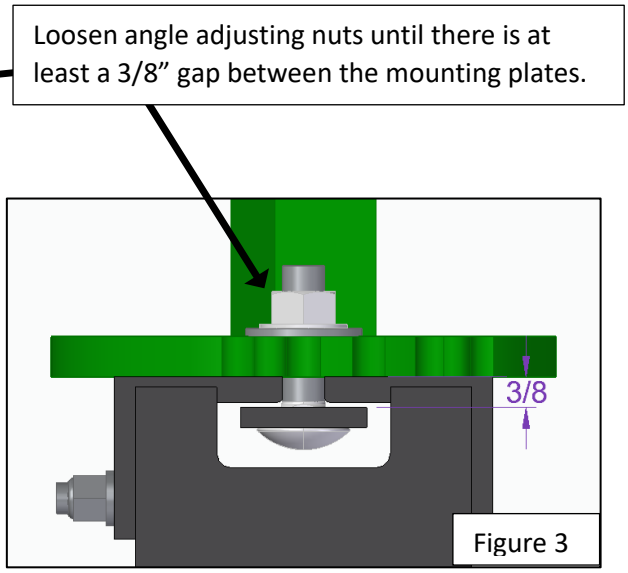


Figure 3

Mounting Coil Tines

- Slide the coil tines up into the clamps on the frame and tighten the set screws.
- If the tractor does not lift the cultivator high enough to insert the coil tines from below, use one of the following methods;
    - Remove the clamps from the frame, insert coil tine, and remount clamp.
    - Lift the cultivator up and park the tractor where the cultivator overhangs a ditch or location where the ground slopes away from the cultivator giving more clearance.
- The coil tine is best used to break up compacted soil in order for the spider gangs to engage the soil. The coil tines are especially important during strawberry renovation to break up compacted aisles.
- Some situations will only require the coil tines to be shallow in the soil or not used at all. Do not extend the coil tines farther than necessary for the job.
- A good starting point for using the coil tines to break up compacted soil is about 2” deeper than the spider gangs. This corresponds to approximately 9.5” of the coil tine shank extending above the clamp.

Cultivator Parts and Description

The Terminology used in the diagrams below will be used throughout the manual to identify parts and describe setup and andjustment.

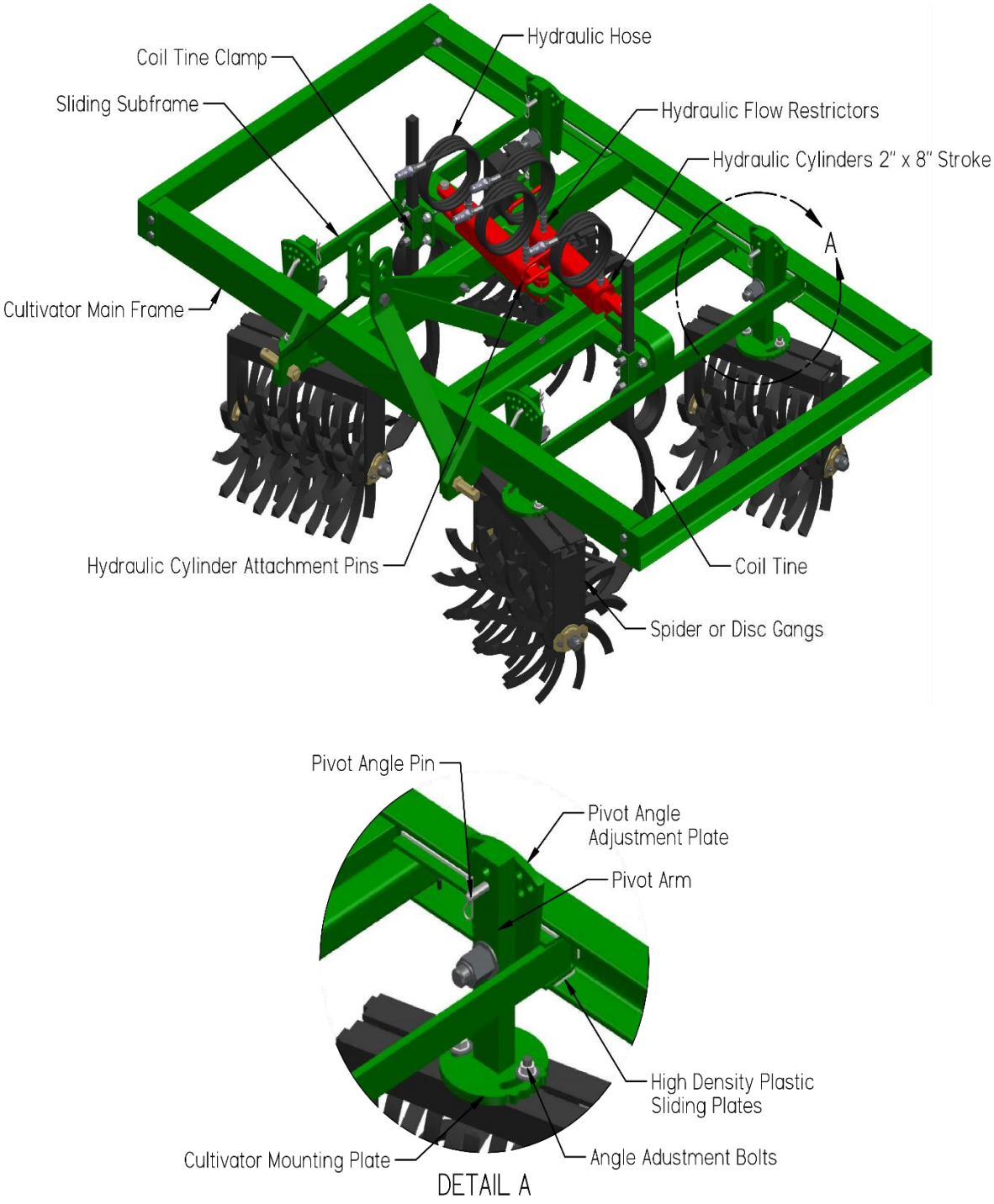


Figure 4

Using Rolling Spider Cultivators

- Rolling spider cultivators are ground driven.
- Cultivators move through the soil at an adjustable angle in relationship to the direction of travel.
- The spider gangs operate as a pair, consisting of a right and a left gang.
- Designated by a sticker on the yoke labeled either 1 or 2 the label identifies which direction a gang may be angled.
- Gangs are always oriented with the scrapers towards the rear.

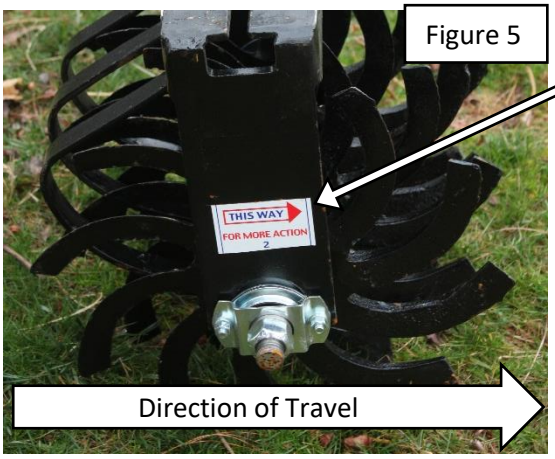


Figure 5

The number 2 label on the gang in Figure 5 illustrates that the near side of the yoke should be moved forward for more action.

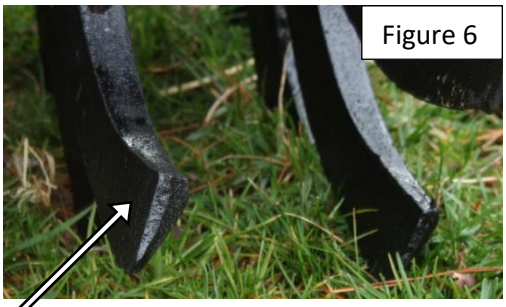


Figure 6

Figure 6 shows the profile of a single spider. The working face of the profile is the flat side shown by the arrow in the picture. The flat working face is analogous to the concave of a disc and should be leading into the soil.

Typical Setup

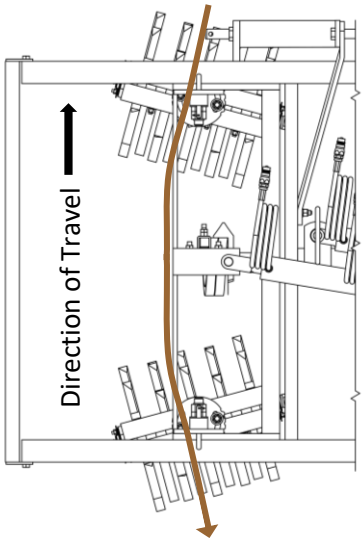


Figure 7

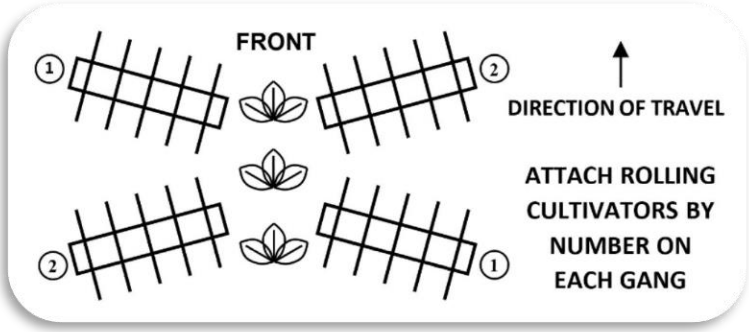
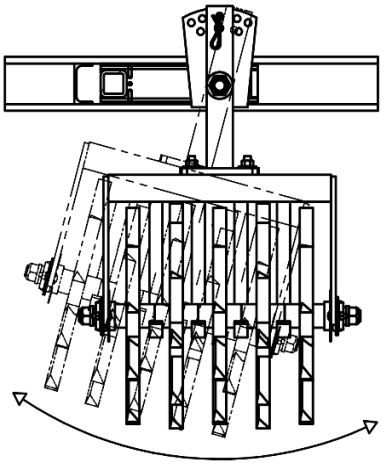


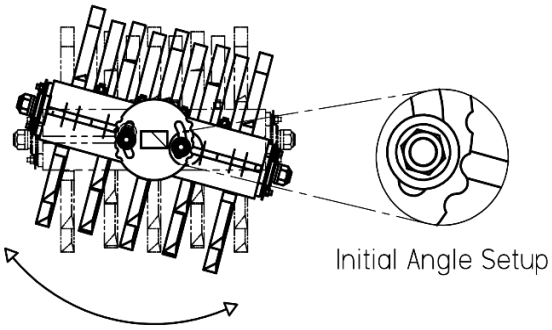
Figure 8

The typical setup for cultivating one row uses gangs in the front moving soil away from plants and gangs in the rear moving soil towards plants shown in Figure 7. The diagram in figure 8 identifies where to place No. 1 and No. 2 gangs for this setup. Figure 8 also appears as a sticker on the frame.

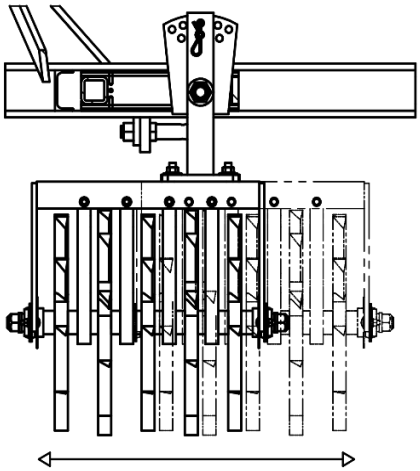
Adjustments



Adjusting Pitch of Gangs



Adjusting Angle of Gangs



Adjusting Gangs Laterally on Pivot Arm

Figure 9

Pitch

Pitch is changed by pulling the angle adjustment pin and reinserting into another hole.

This adjustment is used to match the side of an existing bed or ridge.

Pitch is also useful when using the cultivator to create a ridge.

Angle

Adjusting the angle of a gang affects how aggressively it cultivates and moves soil.

Loosen the angle adjustment nuts and rotate the gang to the desired angle.

Use the indexing cutouts on the cultivator attachment plate to match the angle of other gangs.

For a good starting point align the slot in the top of the gang with the first semicircle cutout (15 deg. off center).

Lateral

Adjust by loosening the angle adjustment nuts and sliding the gang right or left.

We recommend setting the rear gangs a couple inches closer than the front gangs.

Ideally gangs should be adjusted so that the desired row width is achieved with the hydraulic cylinders extended half way. This will give the best range of motion for the operator in the field.

Gangs will need moved in all the way to achieve the min. row width of 6”or moved out to achieve a maximum 60”.

Hydraulic Cylinder Attachment Positions

Each hydraulic cylinder on the Model CS has an 8” stroke giving a total of 16” of range in each position. In order to use the full range of adjustment provided by the frame, the inward attachment point of the cylinders is interchangeable.

Figure 10 shows the cylinder attachment position for row widths 6”-32”.

Figure 11 shows the cylinder position for row widths 32”-60”.

Figure 10

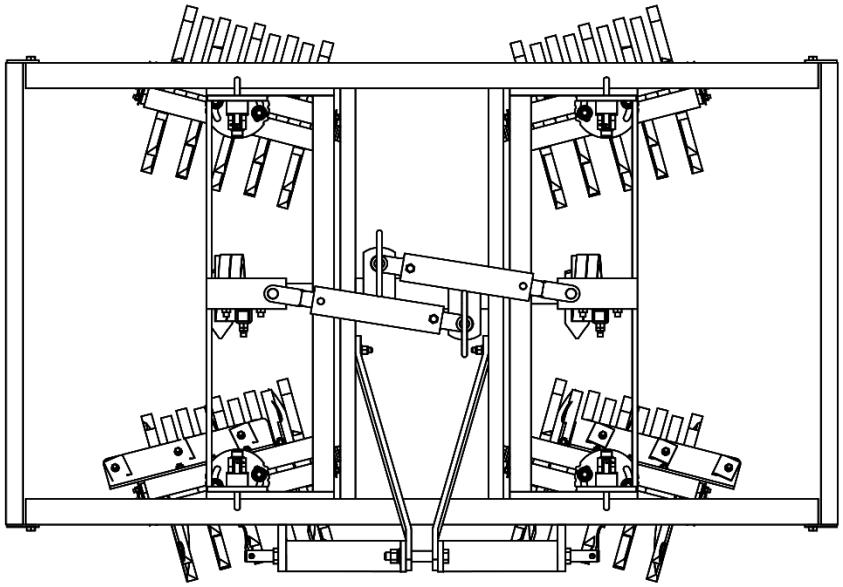
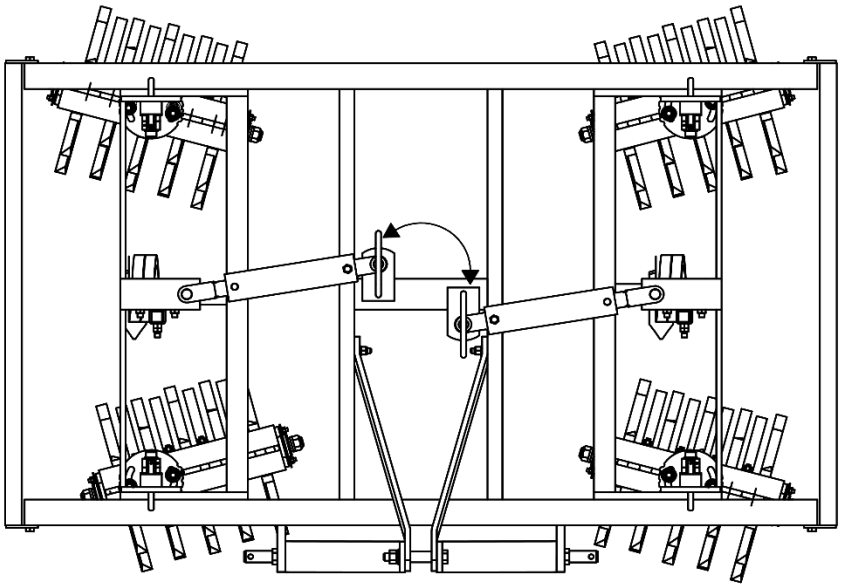


Figure 11



Configurations (Circled Numbers reflect the number on gang decals)

Typical one row

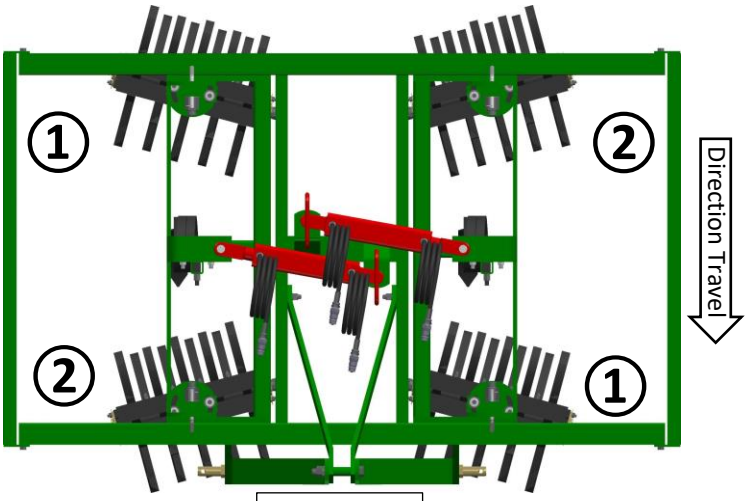


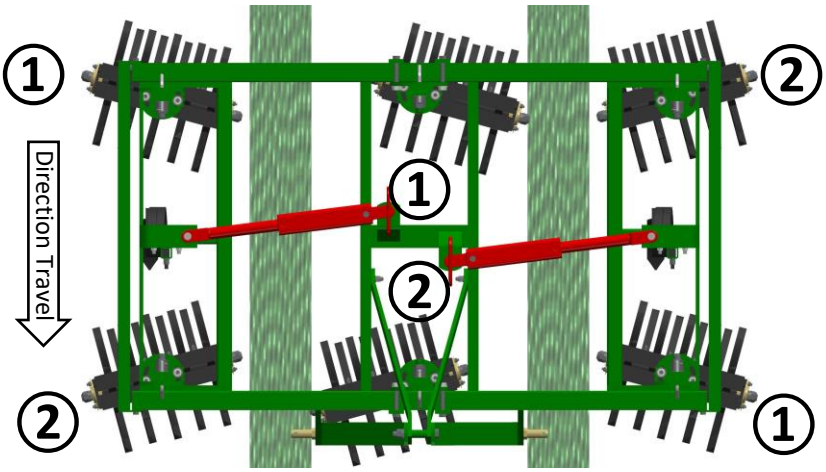
Figure 12

- The typical setup for cultivation of a single row uses a No. 1 and No. 2 gang in the front pulling soil away. A No. 1 and 2 gang in the rear pull soil towards the plants.

Possible two row configurations

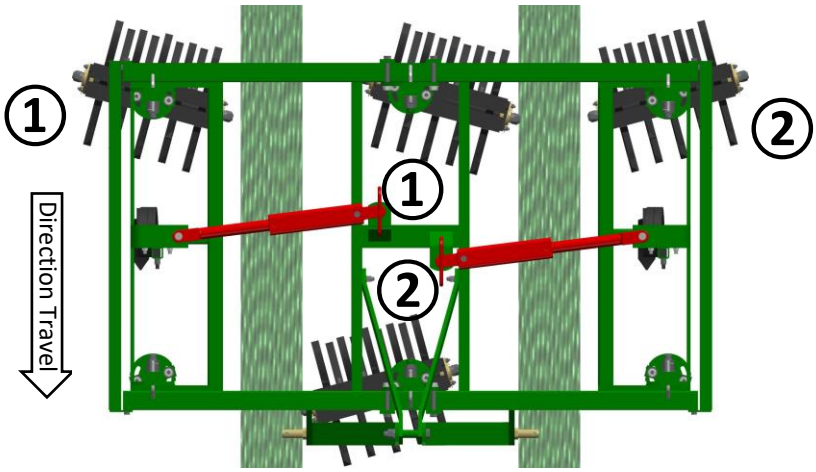
- Two rows can be cultivated using six spider gangs. The two gangs between the rows only move soil towards the rows.

Figure 13



- Two rows can be cultivated using four spider gangs. All the gangs move soil towards the rows.

Figure 14



Configuration for Creating Ridges

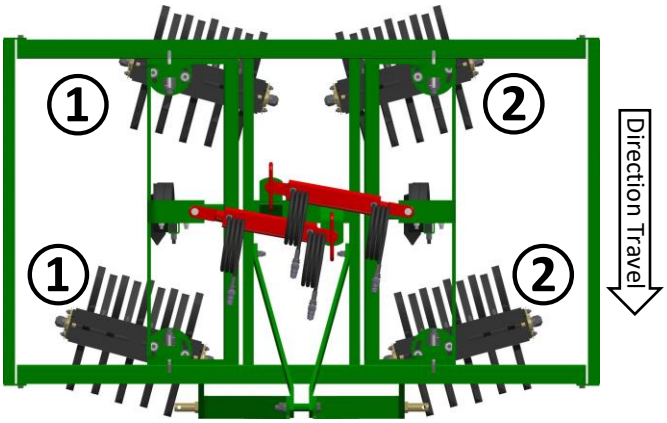


Figure 15

- If the cultivator is being used to create ridges the No 1 and No 2 gangs are on the same side.
- Moving the front gangs out and the back gangs in will collect soil from a wider area to create the ridge.

Configuration for cultivation alongside a crop that cannot be straddled

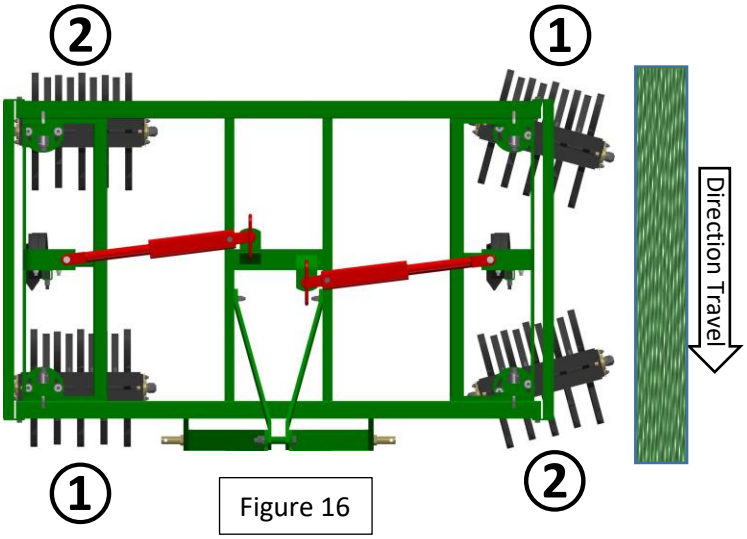
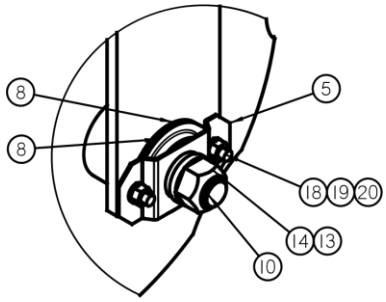


Figure 16

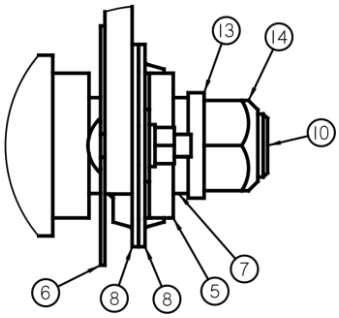
- The Hillside Cultivator Blueberry Model is preferable for cultivation alongside tall crops (bushes, brambles, trees); however the Model CS can accomplish a similar task with the gangs on one side fully extended.
- The gangs on the opposite side can be run straight to support the frame with minimal soil disturbance.

Disc Gang Replacement Parts

Item Number	Description	Quantity
1	Weld - Yoke 17"	1
2	Spacer - Disc Gang Long End	1
3	Spacer - Disc Gang Short End	1
4	Spacer – Disc Gang Middle	2
5	Outer Bearing Shield	2
6	Flat Bearing Shield	2
7	Fafnir Bearing 205PPB7	2
8	Single 52 MST Flange	4
9	Notched Disc 16" Dia. 3.5mm Tk	3
10	Axle 5-Spider Gang	1
11	Disc Gang Scraper 17"	1
12	Disc Scraper	3
13	Lock Washer 3/8"	2
14	Steel Lock Nut 7/8"	2
15	Carriage Bolt 3/8" x 1-1/4" Lg	5
16	Lock Washer 3/8"	5
17	Nylon Lock Nut 3/8"	5
18	Carriage Bolt 5/16" x 1-1/4" Lg	4
19	Lock Washer 5/16"	4
20	Hex Nut 5/16"	4

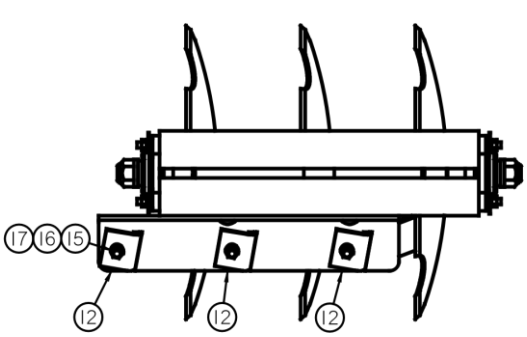


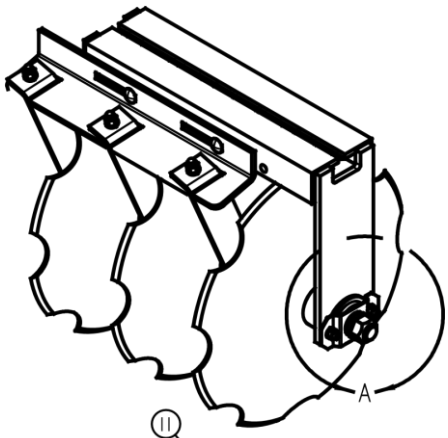
Detail A

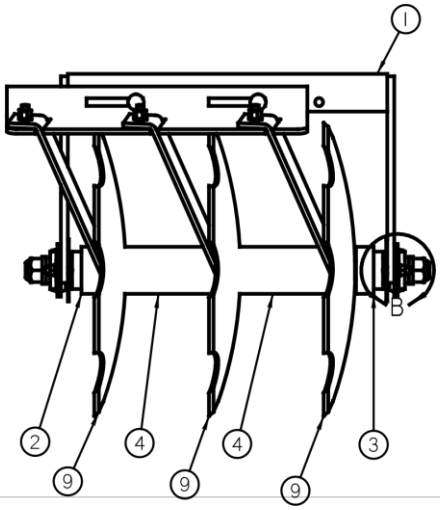


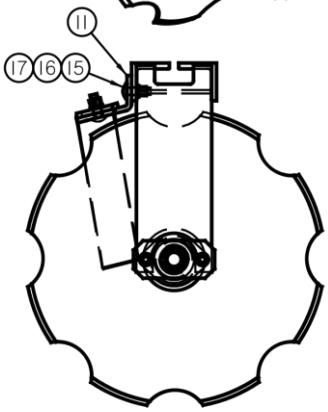
Detail B

Note: Spacers have concave and convex ends to fit disc curve.
Check Orientation when assembling.
Item 11: Disc Gang Scraper 17" is the only part different between a No.1 and No. 2 Gang.



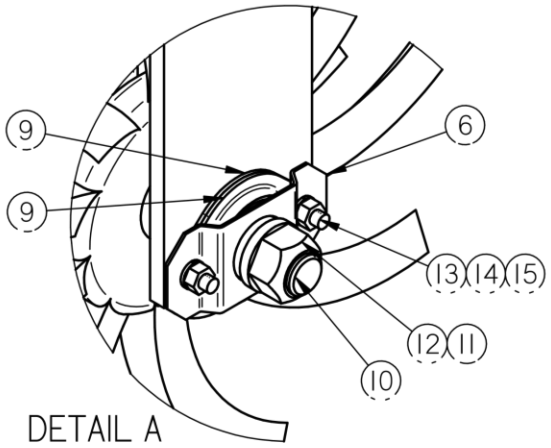


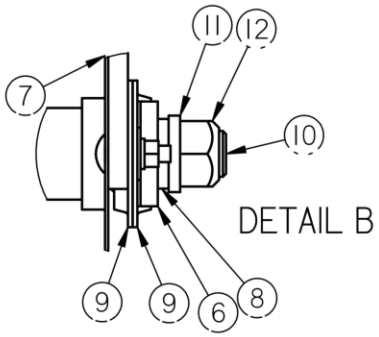




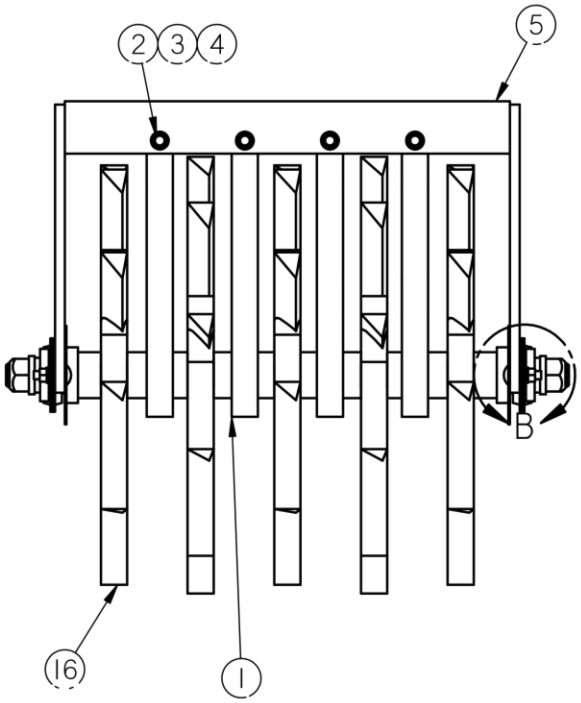
Spider Gang Replacement Parts

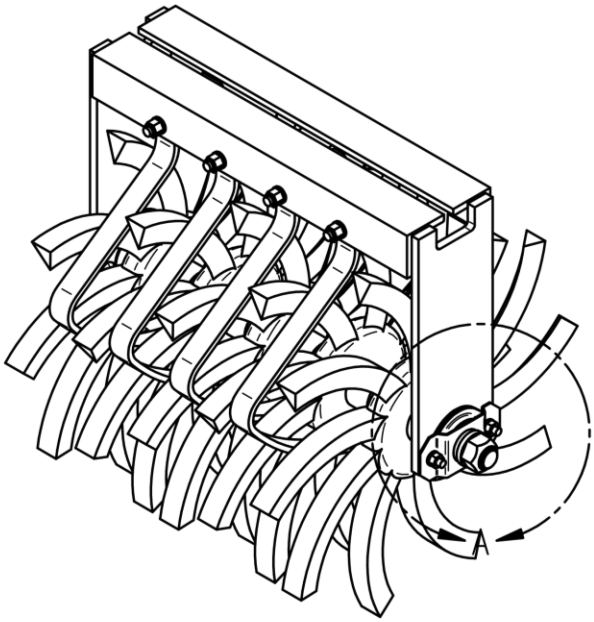
Item Number	Descrition	Quantity
1	Scraper Spider Gang	4
2	Carriage Bolt 3/8" x 1-1/4" Lg	4
3	Lock Washer 3/8"	4
4	Nylon Lock Nut 3/8"	4
5	Weld - Yoke 17"	1
6	Outer Bearing Shield	2
7	Cultivator Inner Brg Shield	2
8	Fafnir Bearing 205PPB7	2
9	Single 52 MST Flange	4
10	Axle 5-Spider Gang	1
11	Lock Washer 3/8"	2
12	Steel Lock Nut 7/8"	2
13	Carriage Bolt 5/16" x 1-1/4" Lg	4
14	Lock Washer 5/16"	4
15	Hex Nut 5/16"	4
16	Single Spider 16" No. 2	5





Item 16: Single Spider 16” can be ordered as a No. 1 or No. 2.





Disassembling a Spider Gang

1. Unbolt and remove scrapers.
2. Loosen Axle nuts but leave them on the axle. A piece of 2x4 can be placed between the yoke and spiders to prevent the gang from turning. (Fig. A)
3. Remove carriage bolts holding the bearing flanges to the yoke.
4. Lift the axle out of the yoke. Remove the axle nuts and replace parts.
5. When replacing spiders, make sure each spider wheel is placed on the shaft so that the tines are out of phase with the adjacent wheel. (Fig. C)
6. Pay close attention to the order of flanges at the bearings and then put on the axle nut loose. (Fig. B)
7. Make sure the axle is placed in the yoke such that the orientation of the spiders relative to the scrapers will be as shown in Fig. D. The bearing flanges mount to the outside of the yoke as seen in Fig B.
8. Reinstall the carriage bolts holding the bearings but tighten the axle nuts before making the carriage bolts tight.
9. Bolt on the scrapers. Scrapers can be adjusted with a prybar to where they do not rub the spiders.


Fig. A

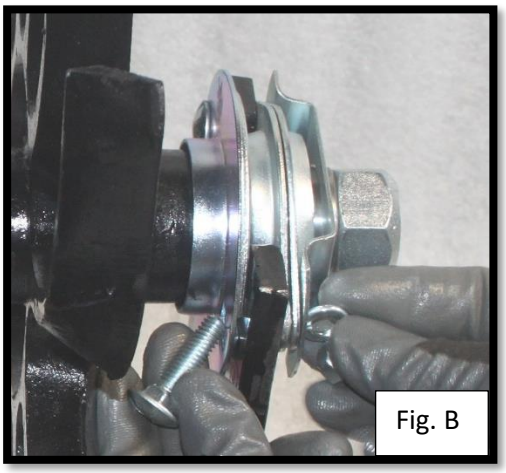


Fig. B


Fig. C

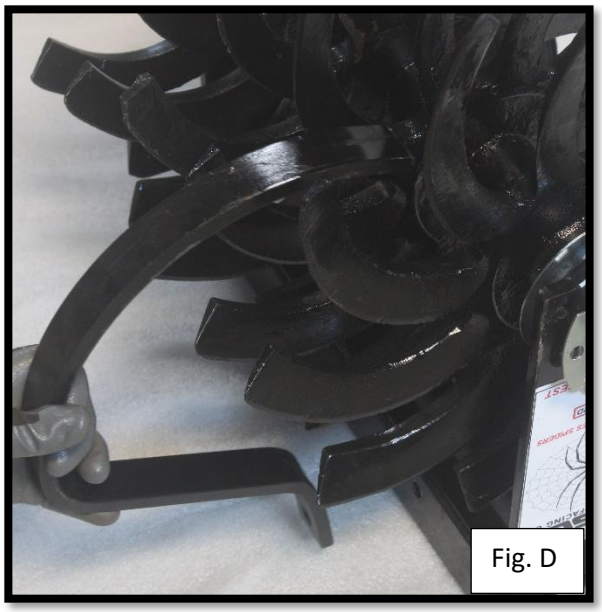
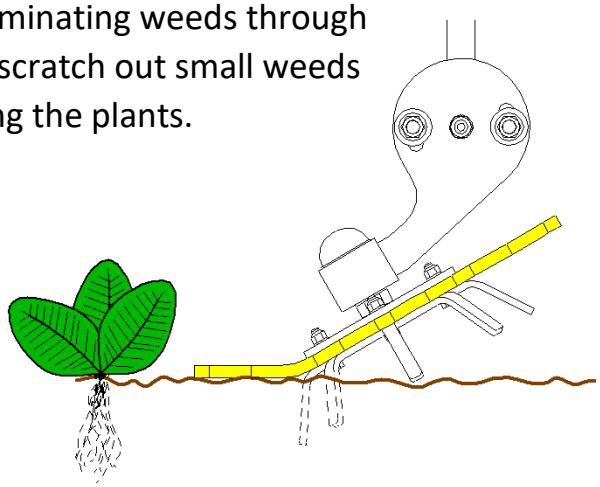


Fig. D

Using Finger Weeder Attachments

How Finger Weeders Work

Finger Weeders are designed to uproot germinating weeds through surface cultivation. The flexible fingers will scratch out small weeds very close to the crop row without damaging the plants.



Finger weeders **must be run at an angle** similar to that in the diagram. The metal drive disc spikes engage the soil and cause the fingers to rotate. The Flexible fingers flex upward to run on the surface of the soil.

The difference in rotational speed between the drive disc spikes and the larger diameter of the flexible fingers creates a scuffing effect on the soil surface which disturbs immerging weeds. The fingers will also push some soil into the row.

Finger Weeders can be run very close to plants; however, because our frames are three point mounted the precision is limited by the conditions of the field and the operators ability to drive straight

Set Up

- Remove Coil tines and insert finger weeders into coil tine clamps. Keep them raised up until depth is set in the field.
- Finger weeder wheels will have a few inches between them.
- Lower the cultivator and let it engage into the soil. Loosen the clamp and lower fingers to the ground until they rest on the ground with drive spikes engaged and fingers flexed.
- Tighten clamp. The spider wheels will act as gauge wheels to keep fingers running on the surface.

Setup Checklist

- □ Rolling cultivator gangs should always be mounted with scrapers towards the back of the cultivator.
- □ Check that no scrapers are rubbing on the spiders. Adjust as needed with a prybar. A rubbing scraper will make a screeching noise when running.
- □ Confirm gangs are located and angled correctly for their labels of #1 or #2.
  - #1 gangs should be angled to move soil from right to left viewed from the rear.
  - #2 gangs should be angled to move soil from left to right viewed from the rear.
- □ Gangs must be angled to achieve cultivating action. For a good starting point align the slot in the top of the gang with the first semicircle cutout 15 deg. off center. Increase angle as needed to uproot weeds or move soil.
- □ For most applications set the front gangs a couple inches farther from the row than the rear gangs. This is especially important when cultivating plastic beds.
- □ Adjust the tractor's top link so the rear gangs touch the ground first when the cultivator is lowered. Proper top link adjustment will prevent overloading and damaging the front cultivator gangs.
- □ Check coil tine depth. A good starting point for using the coil tines to break up compacted soil is about 2" deeper than the spider gangs. This corresponds to approximately 9.5" of the coil tine shank extending above the clamp.
- □ Hydraulic cylinders have two mounting positions. Cultivators are shipped in the inner position for single row cultivation. Move to outer position for bed cultivation, vine crops, or two row cultivation. See page 9 for diagram.
- □ If necessary, move the pitch adjustment pins in the array of holes to match the slope of bed shoulders or ridged rows.