Air distribution system

Operating the fan

⚠ CAUTION

Avoid possible hearing loss!
The machine operator must wear hearing protection.
Failure to comply could result in minor or moderate injury.

C0070A

1. Connect the fan hydraulic hoses to the tractor supply.

NOTICE: *The case drain line must be properly connected at all times. Damage to the hydraulic motor seal will occur within a few seconds if this line is not connected when the air cart hydraulics are operated. This line is a drain line only and must not be connected to any high pressure coupler.*

NOTE: *A tractor with a load sensing hydraulic system or a closed center hydraulic system with flow control for the fan control is recommended*

⚠ CAUTION

Flying objects!
Seed or fertilizer blowing out of the hose at high speeds can cause injury. Stay clear of air hose outlet when performing this procedure. Wear Personal Protective Equipment (PPE) including eye protection.
Failure to comply could result in minor or moderate injury.

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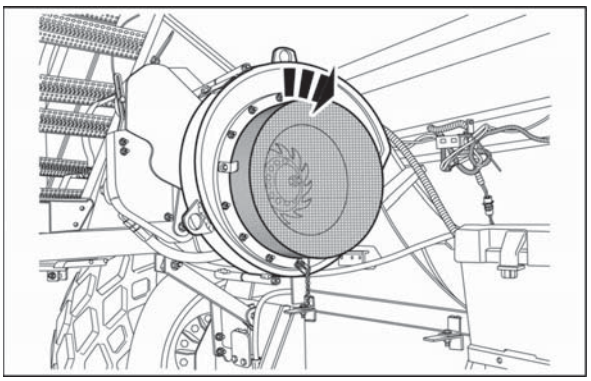


110152S 1

Prior to setting the fan speed, allow the tractor hydraulic oil to warm up to operating temperature.

2. Throttle back the tractor engine and engage the hydraulics to the fan.

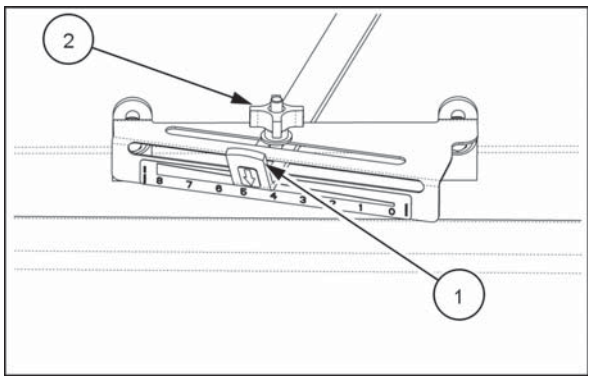
- The fan must turn in the direction shown.
- If the fan is not turning in the correct direction, switch the hydraulic lines at the tractor or reverse the hydraulic lever direction.
- Connect the hydraulics to the couplers on the tractor so that the control lever can be put into float position for powering down the fan pressure.
- Adjust the detent pressure for the tractor remote to hold the lever in operating position.

Setting the air dampers

Each tank has an air damper with an adjustment lever **(1)** on the side of the frame.

1. To adjust the air dampers, loosen the knob **(2)** and rotate the handle until the correct setting is attained.
2. Tighten the knob **(2)** once the adjustment is complete

The decal on the damper guide indicates how handle movement will affect the air flow at the meter box. Moving the handle to the left will increase the air flow and moving the handle to the right will decrease the air flow. The scale on the air dampers is for referencing only.



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NOTE: *Velocity sensors (if installed in the center manifold) have a delayed reaction time in registering air velocity changes. When making air damper adjustments, allow time for the velocity sensors to register the change.*

The air damper is not proportional in its air adjustments. As the damper opens more, the amount of handle movement influences the air flow less.

- This means that when the damper is almost completely open, a large amount of handle movement will have a small effect on the air.
- At the nearly closed position, a small amount of handle movement will have a large effect on the air.

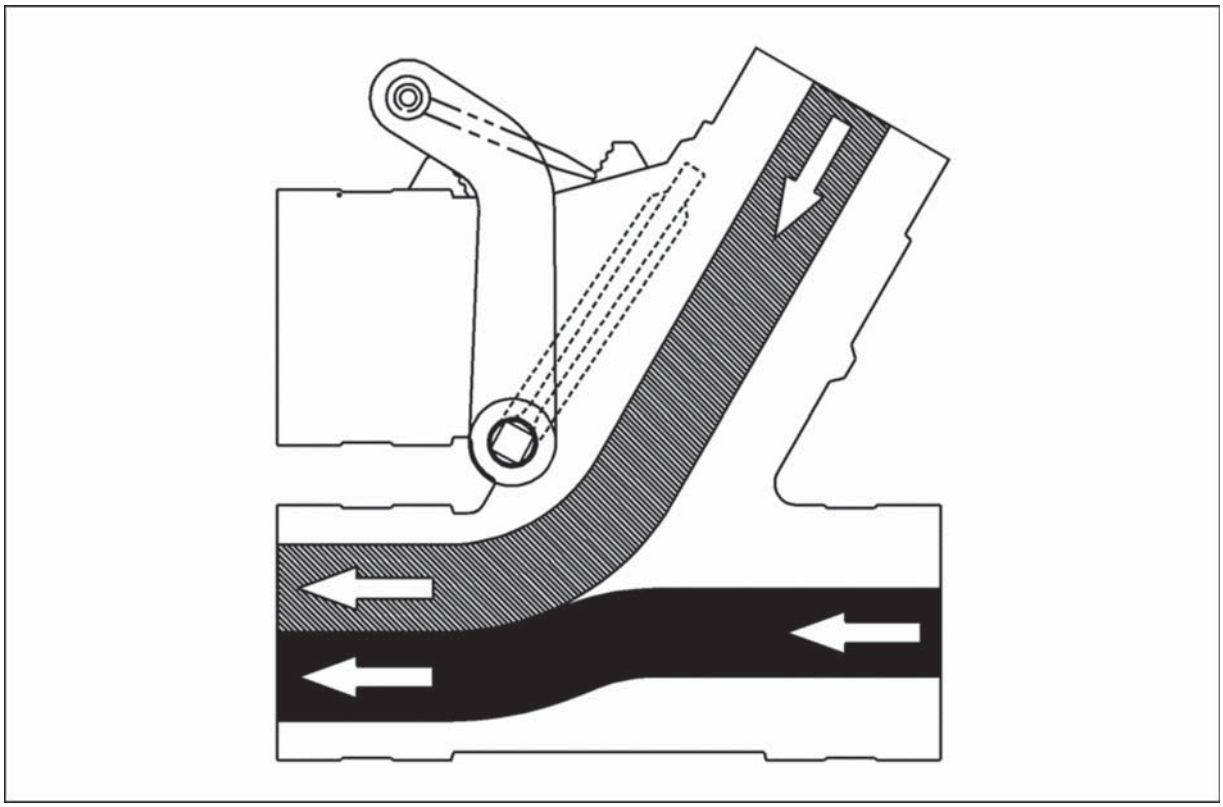
Tow behind air carts

When canola, herbicides, or similar light products are metered from the rear tank and other products requiring large volumes of air (i.e., fertilizer) are being metered from the front tank, divert some of the air to the front meter to avoid over-application of product from the rear meter.

Manifold valves

Two inlet valve

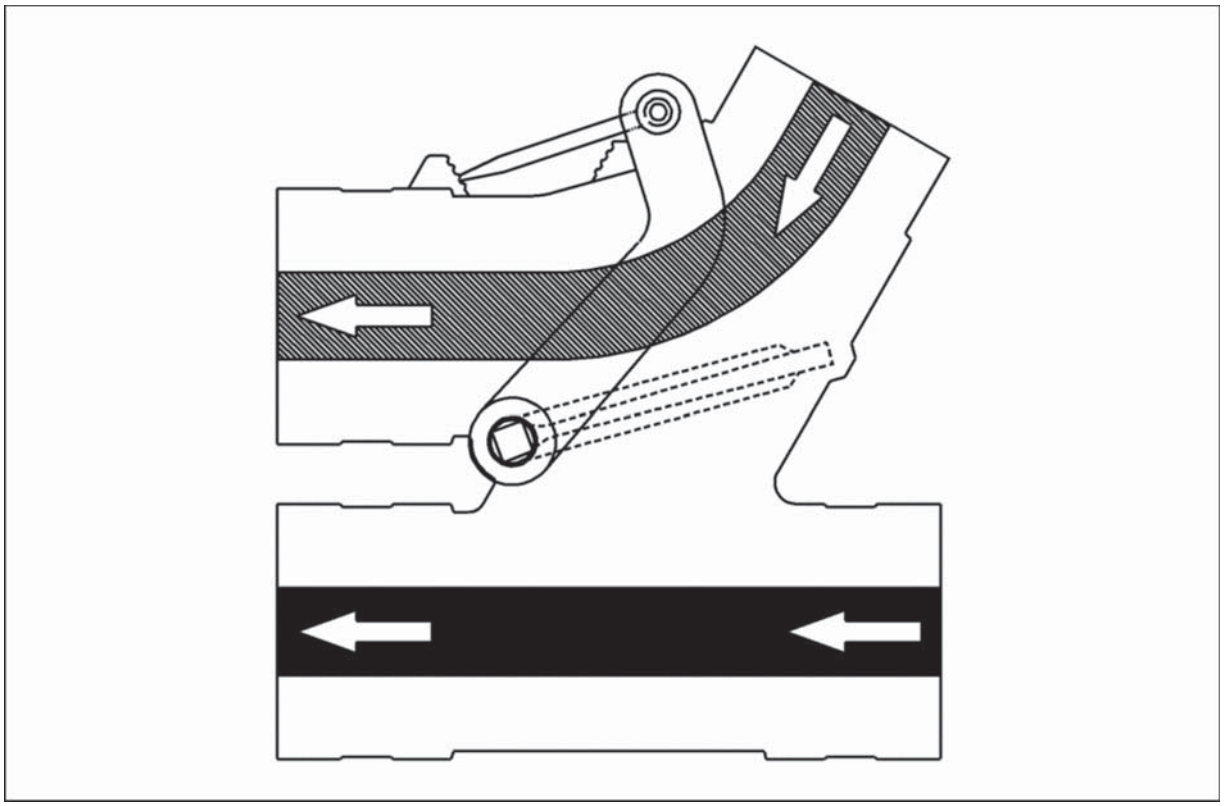
To combine the air/product of both tanks in the lower line, move the valve handle toward the discharge.



196207C 1

Combining product

To keep separate the air/product of each tank, move the valve handle toward the valve body.



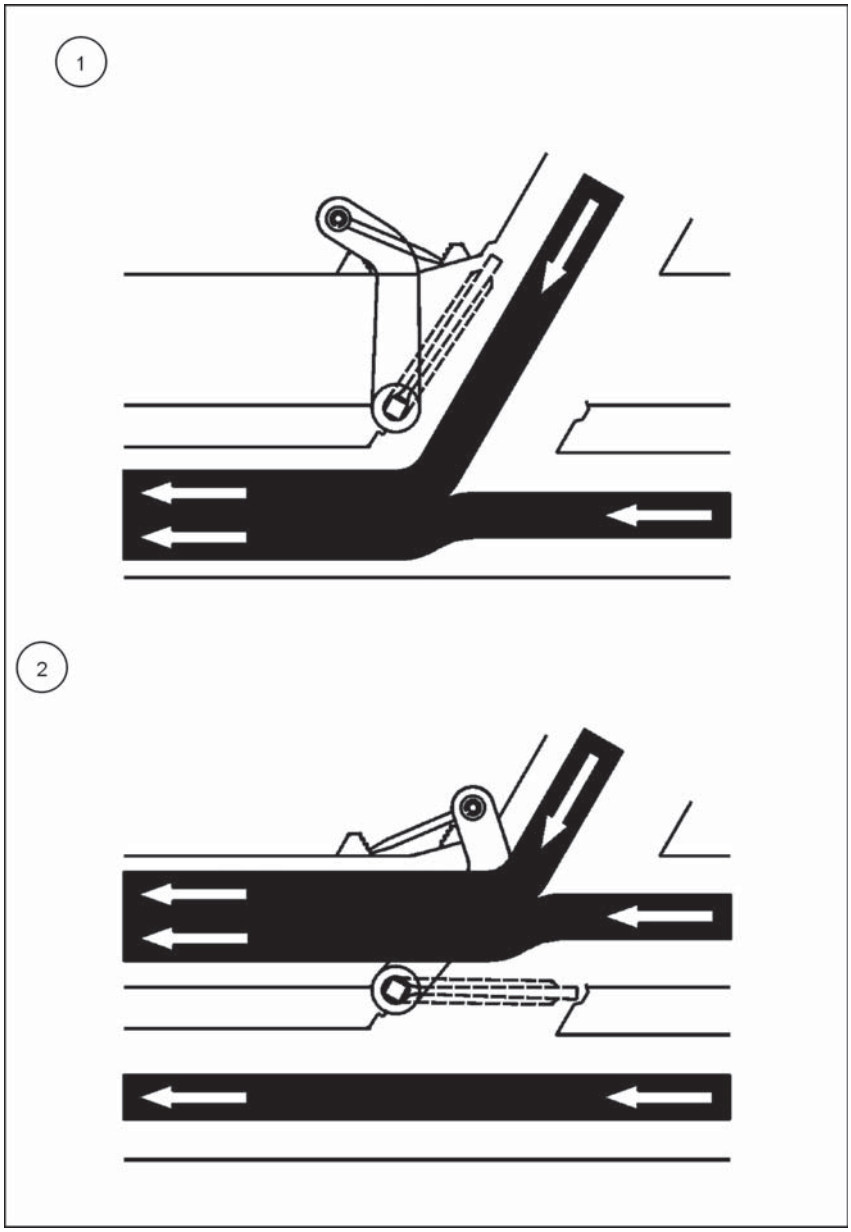
196206C 2

Product separate

Three inlet valve - three tank air carts only

The figure shows the three inlet valve's common handle and cam positions. The handles move internal flappers to direct the air to different outlets.
Decals representing this information are located on the manifold inlet for Tank 1; one on the right side, and one on the left. The single shoot **(1)** and double shoot **(2)** positions are shown.

NOTE: *Having a small amount of air flow aids in moving the internal flapper and cleans the valve out.*



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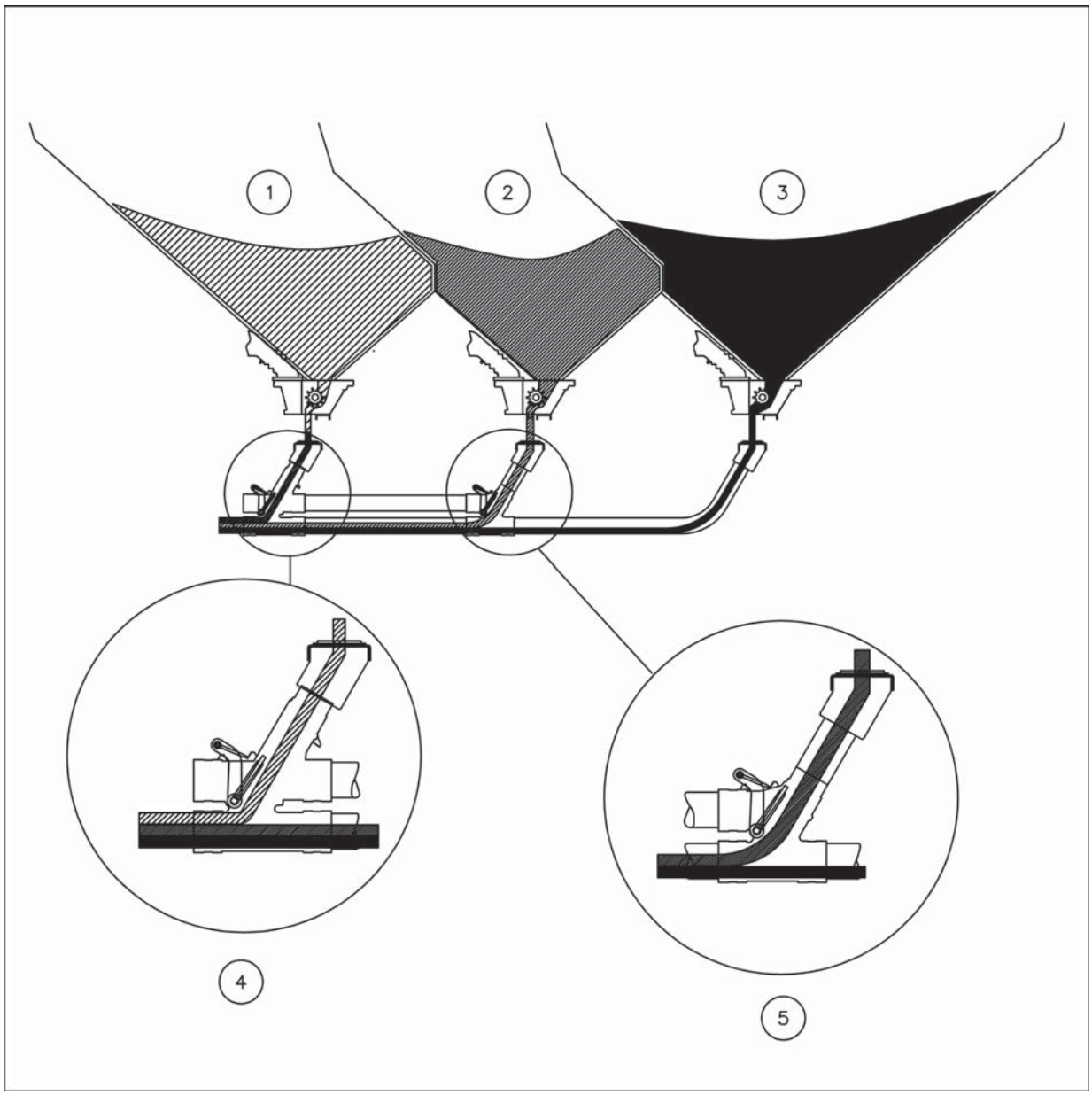
Tow behind configuration

Setting the fan and air dampers to control the air velocity in each meter box

Air cart fan and damper setting - three tank air carts

1. Set the initial fan speed as suggested in setting charts. Refer to **5-30**.
2. Adjust the air damper for each meter box for sufficient carrying air velocity.
3. Confirm air velocity using one of two methods. Refer to **5-31**.
4. Adjust fan or air dampers as needed.

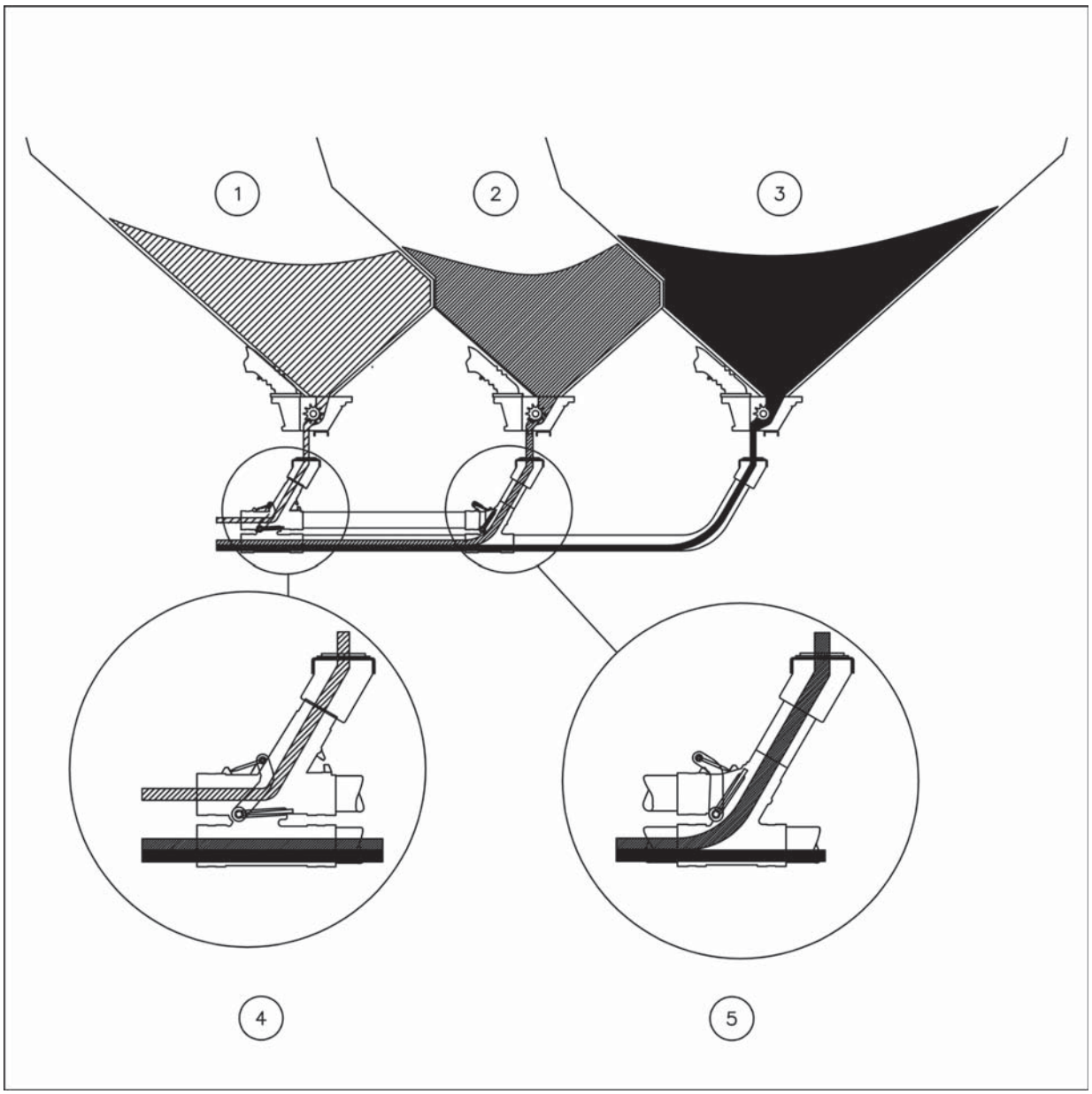


111095C 1

Setting the air dampers for single shooting
(Combining tank (1), tank (2), and tank (3) into the bottom line)

Tank **(1)** application rate is **6 kg/ha** (**7 lbs/ac**), tank **(2)** application rate is **50 kg/ha** (**56 lbs/ac**), and tank **(3)** application rate is **60 kg/ha** (**67 lbs/ac**).

- Tank **(1)** air damper is slightly open.
- Tank **(2)** air damper is slightly open.
- Tank **(3)** air damper is fully open.
- Valve **(4)** is in the single shoot position.
- Valve **(5)** is in the single shoot position.

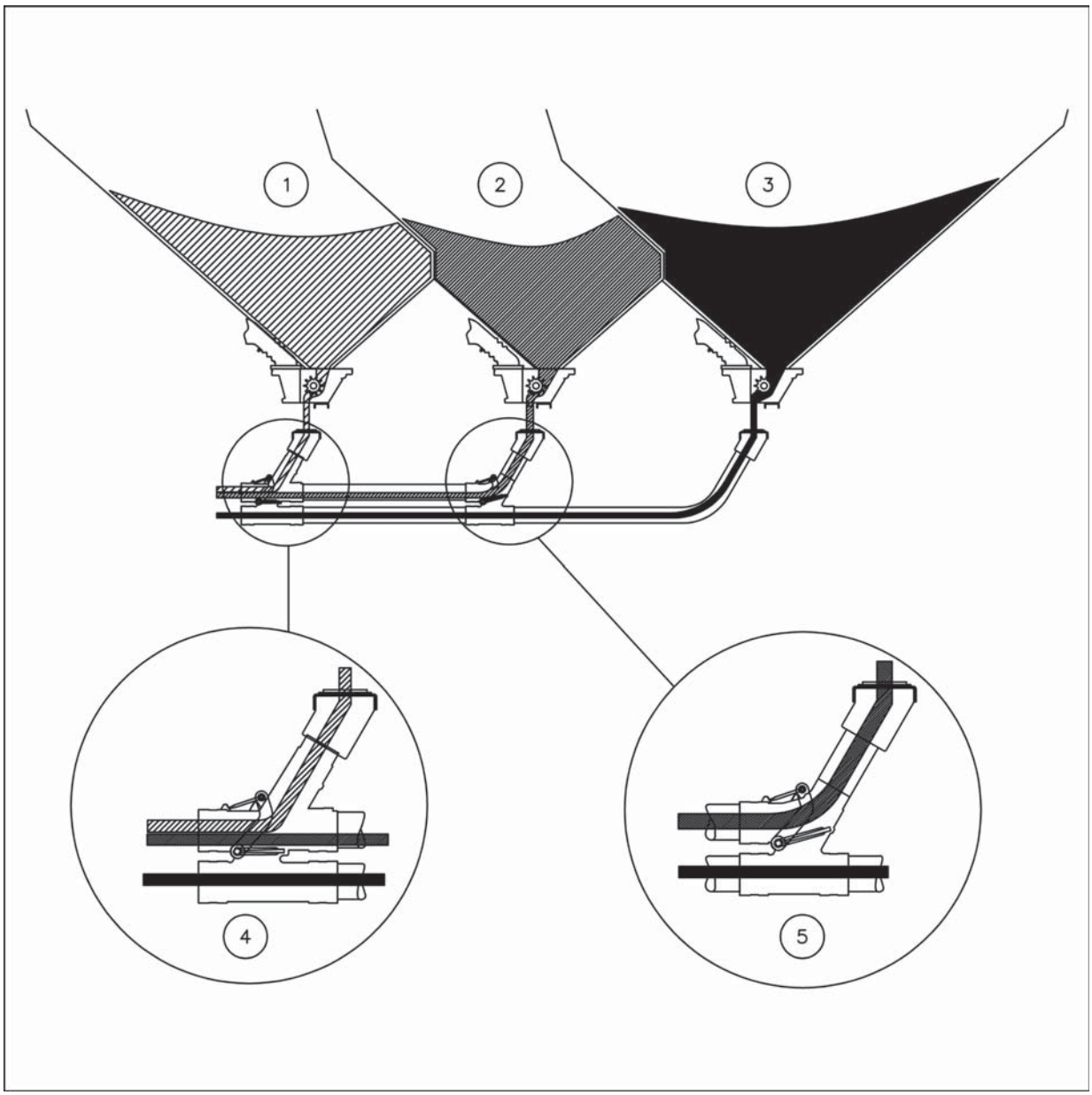


111096C 2

Setting the air dampers when double shooting
(Combining tank (2) and tank (3) into the bottom line and tank (1) into the top line)
The damper positions are for where the rate of product from Tank (1) is less than the rate of the product from the other two tanks combined.

Tank **(1)** application rate is **6 kg/ha** (**7 lbs/ac**), tank **(2)** application rate is **50 kg/ha** (**56 lbs/ac**), and tank **(3)** application rate is **60 kg/ha** (**67 lbs/ac**).

- Tank **(1)** air damper is adjusted for sufficient carrying velocity.
- Tank **(2)** air damper is slightly open.
- Tank **(3)** air damper is fully open.
- Valve **(4)** is in the double shoot position.
- Valve **(5)** is in the single shoot position.



111097C 3

Setting the air dampers when double shooting
(Combining tank (1) and tank (2) into the top line and tank (3) into the bottom line)
The damper positions are for where the rate of the product from tank (1) and tank (2) combined is less than the rate of the product from tank (3).

Tank **(1)** application rate is **6 kg/ha** (**7 lbs/ac**), Tank **(2)** application rate is **15 kg/ha** (**17 lbs/ac**), and tank **(3)** application rate is **60 kg/ha** (**67 lbs/ac**).

- Tank **(1)** air damper is slightly open.
- Tank **(2)** air damper is adjusted for sufficient carrying velocity.
- Tank **(3)** air damper is fully open.
- Valve **(4)** is in the double shoot position.
- Valve **(5)** is in the double shoot position.

Fan and air damper setting chart - three tank air carts

Set the fan RPM according to the table.
Maximum fan speed is **5500 RPM**. DO NOT exceed this RPM.

NOTE: *Use the following guide as a starting point for settings. Settings are approximate only. Do not set the fan speed excessively higher than the suggested fan speed settings, or higher than is required. Be sure to restrict air flow to easy flow, light rate products such as canola or herbicides to limit flow of air to these lines.*

NOTICE: *It is important to restrict the air flow for double shoot systems. If the air flow is not restricted, seed damage, increased wear, excessive air velocity, improper seed placement, and uneven metering may occur.*

Single Shoot Air Damper Positions and Fan Speed - Tow Behind Air Carts

Product, Rate and Tank						Suggested Single Shoot Damper Position			Suggested Initial Fan Speed
Fertilizer	**Fertilizer**	**Peas**	**Wheat**	**Canola**	**Light Granular**	**Tank 1**	**Tank 2**	**Tank 3**	**8 Run System @ 8 km/h(5 mph)**
225 Tanks 1 & 2	175 Tank 3					1	1	8	5000
50 Tank 3			90 Tanks 1 & 2			1	2	8	3500
50 Tank 1		180 Tanks 2 & 3				1	1	8	4500
50 Tanks 2 &3				5 Tank 1		1	1	8	3000
			90 Tanks 2 & 3		5 Tank 1	1	1	8	3200
50 Tank 2			90 Tank 3		5 Tank 1	1	1	8	3500

Double Shoot Air Damper Positions and Fan Speed - Tow Behind Air Carts

Product, Rate and Tank						Suggested Double Shoot Damper Position			Suggested Initial Fan Speed
Fertilizer	**Fertilizer**	**Peas**	**Wheat**	**Canola**	**Light Granular**	**Tank 1**	**Tank 2**	**Tank 3**	**16 Run System @ 8 km/h(5 mph)**
225 Tanks 1 & 2	175 Tank 3					1	8	6	4500
50 Tank 3			90 Tanks 1 & 2			1	8	2	3500
50 Tank 1		180 Tanks 2 & 3				4	1	8	4000
50 Tanks 2 &3				5 Tank 1		1	1	8	3000
			90 Tanks 2 & 3		5 tank 1	1	1	8	3200
*50 Tank 2			90 Tank 3		5 Tank 1	1	1	8	3500
**50 Tank 2			90 Tank 3		5 Tank 1	1	6	8	3500

NOTE: ** Tank 2 and Tank 3 combined*
*** Tank 1 and Tank 2 combined*

Methods of determining adequate carrying velocities

There are two methods of determining adequate carrying velocities:

- Open hose method
- Velocity chart method (requires optional velocity sensors.)

NOTE: *The appropriate method to be used depends on the configuration of the air cart.*

NOTE: *Using excessive air velocity will damage seed, increase wear on the system, blast seed out of the seed bed and require increased fan speed. Inadequate air velocity will result in plugged lines. To check if the fan speed and air damper settings are suitable for seeding, check product placement behind several openers and observe the seed planting depth.*

Open hose method

⚠ CAUTION

Flying objects!
Seed or fertilizer blowing out of the hose at high speeds can cause injury. Stay clear of air hose outlet when performing this procedure. Wear Personal Protective Equipment (PPE) including eye protection. Failure to comply could result in minor or moderate injury.

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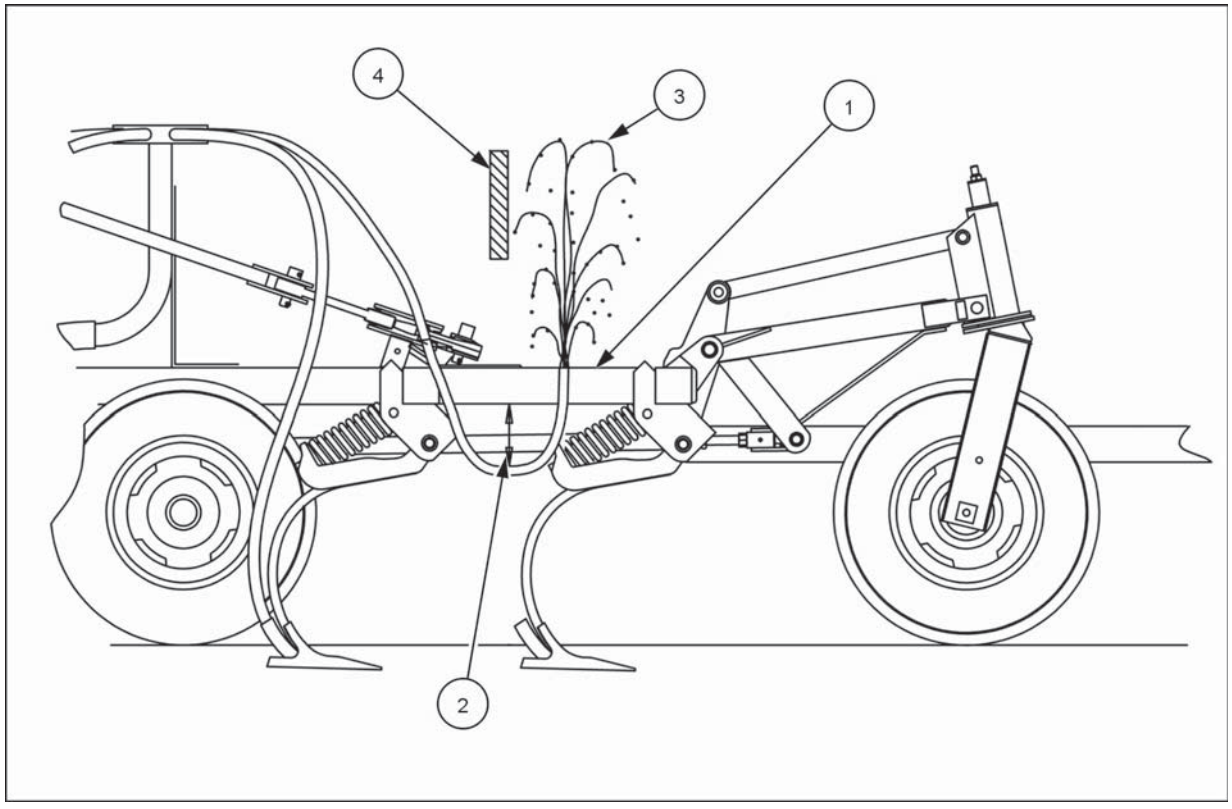
NOTE: *Refer to figure **1**.*

For single shoot systems:

1. Remove one secondary hose **(1)** from an outside opener for the highest rate tank.
2. Fasten the hose **(1)** to the frame of the seeding tool.
   - The hose should be no more than **30 cm** (**12 in**) below the bottom of the frame member, as shown **(2)**.
   - Ensure the end of the hose **(1)** is flush with the top of the frame member, the outlets face straight up and the hose is not kinked.
3. Begin seeding at normal operating speed.
4. From a safe distance, observe the product coming out of the hose end.
   - The product **(3)** should discharge about **31 - 61 cm** (**12 - 24 in**) above the hose **(4)**.
   - STOP the meters if the product is not **31 - 61 cm** (**12 - 24 in**) out of the tube.
   - Adjust either the fan speed or air damper setting to reach a product discharge of **31 - 61 cm** (**12 - 24 in**).

For double shoot systems:

1. Remove both the secondary hoses from an outside opener.
2. Fasten the hoses **(1)** to the frame of the seed tool.
   - The hoses should be no more than **31 cm** (**12 in**) below the bottom of the frame member as shown **(2)**.
   - Ensure the ends of the hoses **(1)** are flush with the top of the frame member, the outlets face straight up and the hose is not kinked.
3. Begin seeding at normal operating speed.
4. From a safe distance, observe the product coming out of the hose ends.
   - The product **(3)** should discharge about **31 - 61 cm** (**12 - 24 in**) above each hose **(4)**.
   - STOP the meters if the product is not **31 - 61 cm** (**12 - 24 in**) out of the tube.
   - Adjust either the fan speed or air damper setting to reach a product discharge of **31 - 61 cm** (**12 - 24 in**).



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Open hose method - single shoot shown

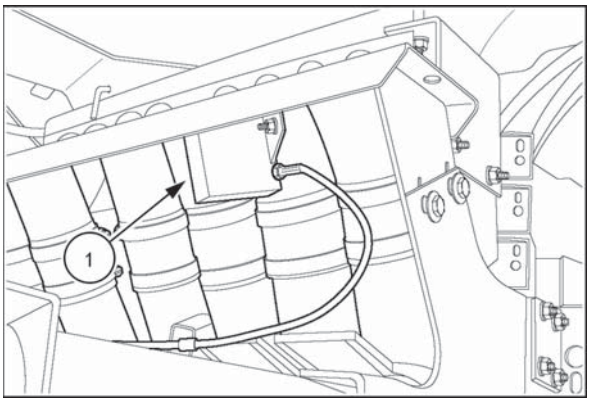
Velocity chart method

Velocity sensor location

- The velocity sensors **(1)** are mounted in transition tubes in the center manifold.

NOTE: *The velocity sensor must be located in an active run (one in which air is passing and product is metered).*

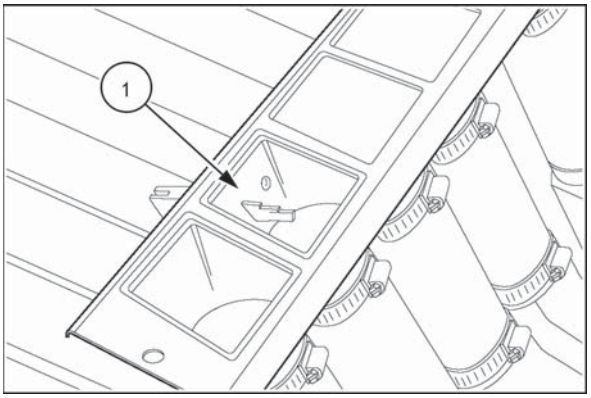
If the sensor is in an inactive run it must be moved.



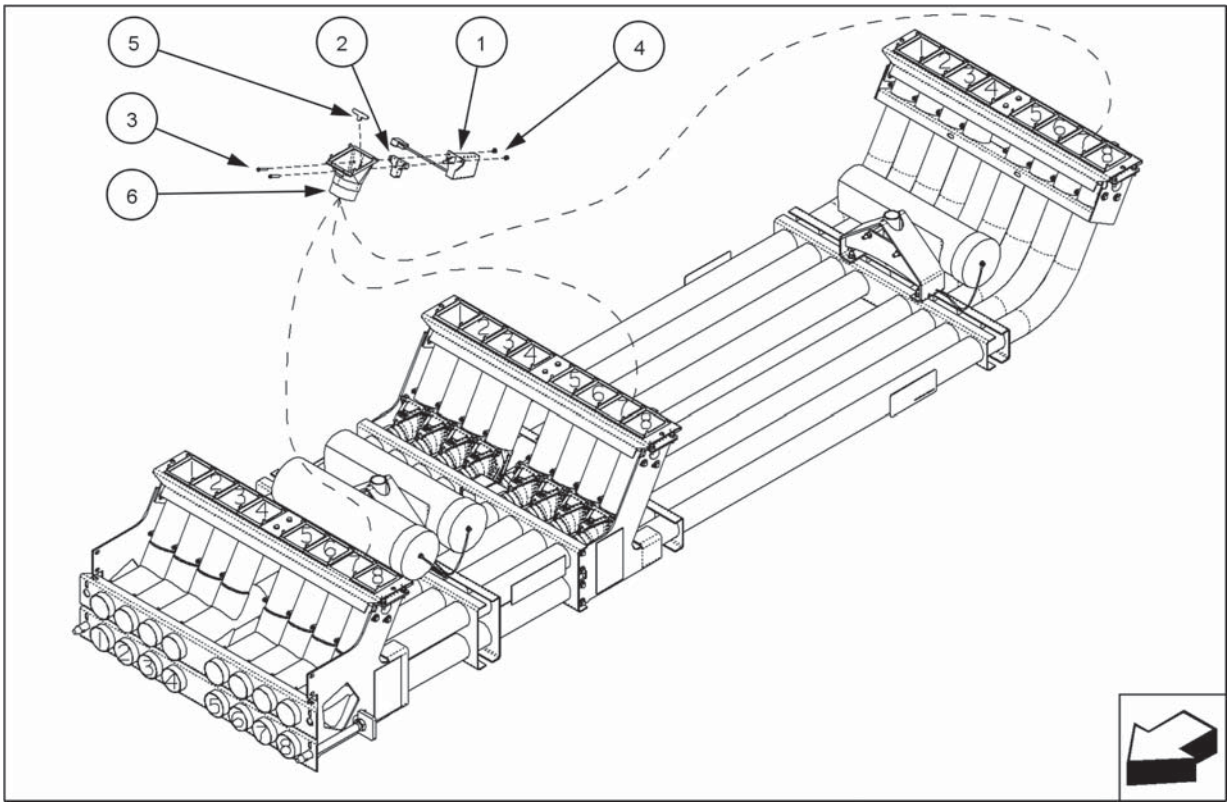
196135S 2

To move the sensor:

1. Remove the rubber plug **(5)** from the transition tube **(6)** of selected active run in the center manifold.
2. Move the velocity sensor **(1)** with the spacer **(2)** if required, from the inactive run to the selected active run.
3. Use two machine screws **(3)** and locknuts **(4)** to fasten the sensor to the transition tube.
4. Plug the holes in the inactive transition tube using the rubber plug **(5)** removed previously.



196121S_NEW 3



110003C 4

Step 1: Calculate equivalent rate

NOTE: *The example shown calculates the equivalent rate for a three tank air cart.*

The application rates given in the velocity charts are based on a ground speed of **8 km/h** (**5 mph**) and each primary run covering **3 m** (**10 ft**). Use the following calculations to get the 'Equivalent rate' (Er). This rate should then be used as the application rate in the velocity charts.

NOTE: *'Equivalent Rate' is for determining velocities from the velocity charts provided and does not have anything to do with meter rate settings.*

Tank 1 = 11-51-0 fertilizer at **90 kg/ha** (**80 lbs/ac**)
Tank 2 = 11-51-0 fertilizer at **79 kg/ha** (**70 lbs/ac**)
Tank 3 = wheat at **100 kg/ha** (**90 lbs/ac**)
Ground speed = **9.5 km/h** (**6 mph**)
Seeding tool width = **13.7 m** (**45 ft**) seed tool
Number of primary runs = 6

1. Determine 'Total rate'

Single shoot - rate of product in front tank + rate of product in rear rank(s) .
Double shoot - rate of product in the particular tank. + combined rate of product in the remaining tanks.

Tank 1 = 11-51-0 fertilizer at **90 kg/ha** (**80 lbs/ac**)
Tank 2 = 11-51-0 fertilizer at **79 kg/ha** (**70 lbs/ac**)
Tank 3 = wheat at **100 kg/ha** (**90 lbs/ac**)
Total rate = **90 kg/ha** + **79 kg/ha** + **100 kg/ha** = **269 kg/ha**
(Total rate = **80 lbs/ac** + **70 lbs/ac** + **90 lbs/ac** = **240 lbs/ac**)

2. Calculate the 'Equivalent rate' (Er)

For kg/ha: Er = Total Rate x Ground Speed x Seeding Width / 27 x Number of Primary Runs
Where 27 = conversion factor.
For lbs/acre: Er = Total Rate x Ground Speed x Seeding Width / 50 x Number of Primary Runs
Where 50 = conversion factor

Er = 220 x 10 x 13.7 / 27 x 6 = **227 kg/ha**
(Er = 190 x 6 x 45 / 50 x 6 = **216 lbs/ac**)
(Er) for velocity charts = **227 kg/ha** (**216 lbs/ac**)

3. Approximate (estimate) velocity number from velocity charts using the equivalent rate.

Single Shoot - Calculate the combined product Er. Use the velocity chart for the product that requires the highest velocity.
Double Shoot - Calculate the combined product Er for the two combined tanks. Use the velocity chart for the product that requires the highest velocity. Then calculate the Er for the remaining tank. Use the velocity chart for the product in that tank.

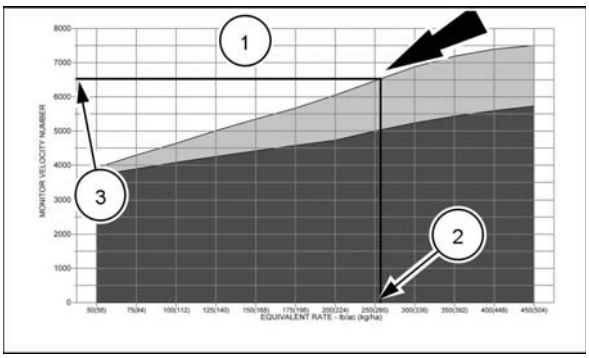
Fertilizer requires a higher velocity than wheat, so use the velocity chart for Fertilizer. At an equivalent rate of **227 kg/ha** (**216 lbs/ac**) the "Operating Range" velocity number is approximately between 4100 and 5600. The "Without Product Range" is approximately above 5600.

Step 2: Determine a suggested "without product" air velocity number for each meter before operating

The suggested initial monitor/controller velocity numbers on the following charts provide a beginning point for the required air velocity in the seeding system. They are an initial guide only. (For products not listed, use the chart of a similar product.)
Velocity charts are located further on in this section.

To use the velocity charts:

1. Locate your Equivalent application rate. See "Calculate equivalent rate" in Step 1
2. Read up from the equivalent rate to the "Without product range".
3. Read across to determine a monitor/controller velocity number.



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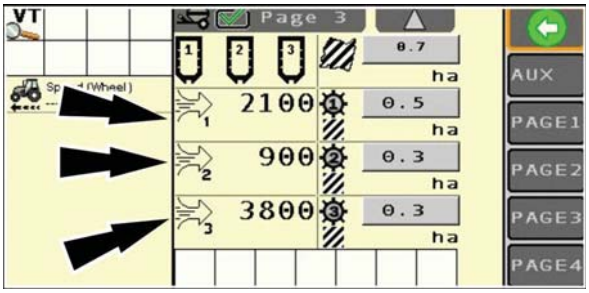
Example:

(1) Equivalent rate = **227 kg/ha** (**216 lbs/ac**)
(2) Without product range
(3) Display velocity number = above 6100

Step 3: Before metering product, adjust fan speed and air dampers until the display monitor displays a "without product" velocity for each meter.

Refer to earlier in this section for information regarding fan and damper setting.



108084S 6

Step 4: Observe the product flow in the hoses and make adjustments to the fan speed and air dampers as needed.

1. Begin seeding by operating for a short distance.
2. On the display watch the velocity number drop on the highest rate product.
   Stop metering if this number drops into the “Plugging” range on the air velocity charts.
3. Air velocity will drop more when:
   - operating a large system,
   - operating at high ground speeds,
   - seeding large diameter products,
   - seeding at high rates.
4. Adjust the fan speed to obtain a velocity number in the “Operating” range for the highest rate meter box.
5. Adjust the air dampers on the other meters to maintain the velocity numbers in the “Operating” range for that product.
6. Begin seeding again and watch the velocity number drop. Adjust the fan speed and air dampers as needed.

   NOTE: *Using excessive fan speed (rpm) will damage seed, increase wear on system and blast seed out of the seed bed. Inadequate air velocity will result in plugged lines.*

Step 5: Operate a short distance in the field, applying product in a normal manner.

Step 6: Stop ground travel but leave the fan operating.

Step 7: Inspect the hoses for clearing of product and signs of buildup.

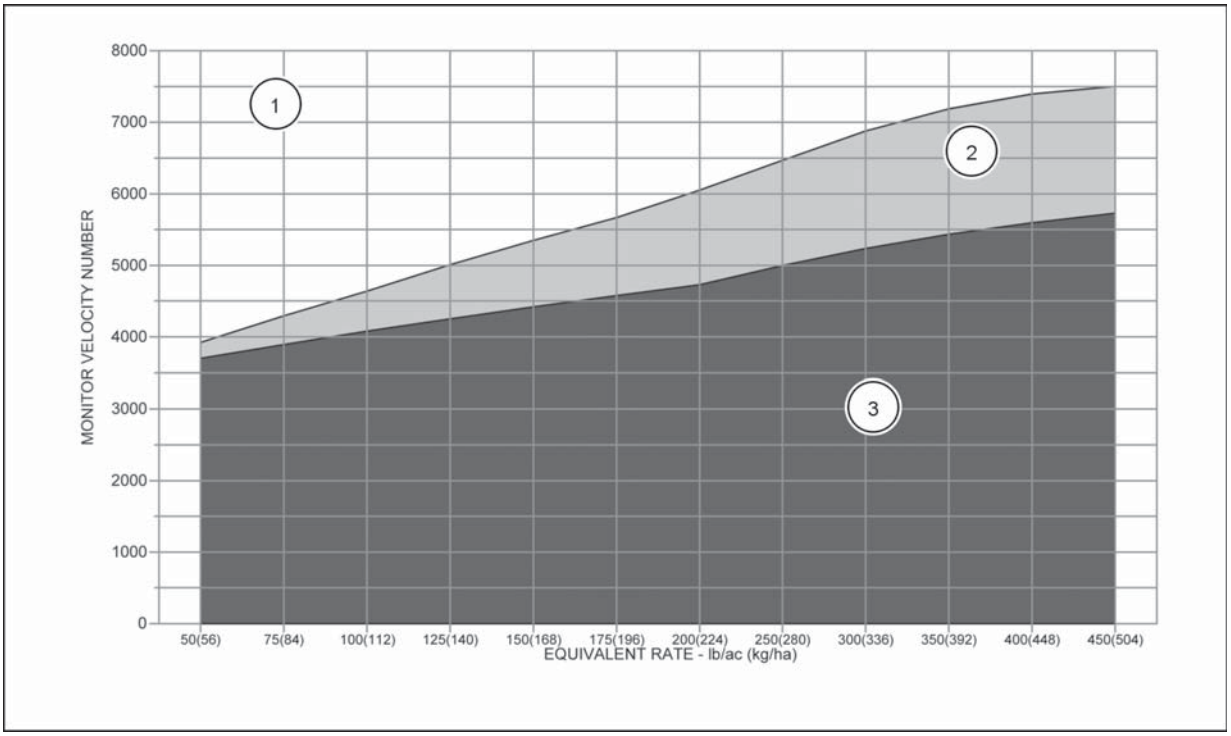
Listen for product clearing the lines.
Look for plugging in lines which is not clearing.
If buildup is happening, increase fan speed slightly to reduce the buildup of product during seeding.

Step 8: Repeat step 5, 6 and 7 after traveling a greater distance.

Step 9: If possible, reduce the air velocity to obtain optimum product application.

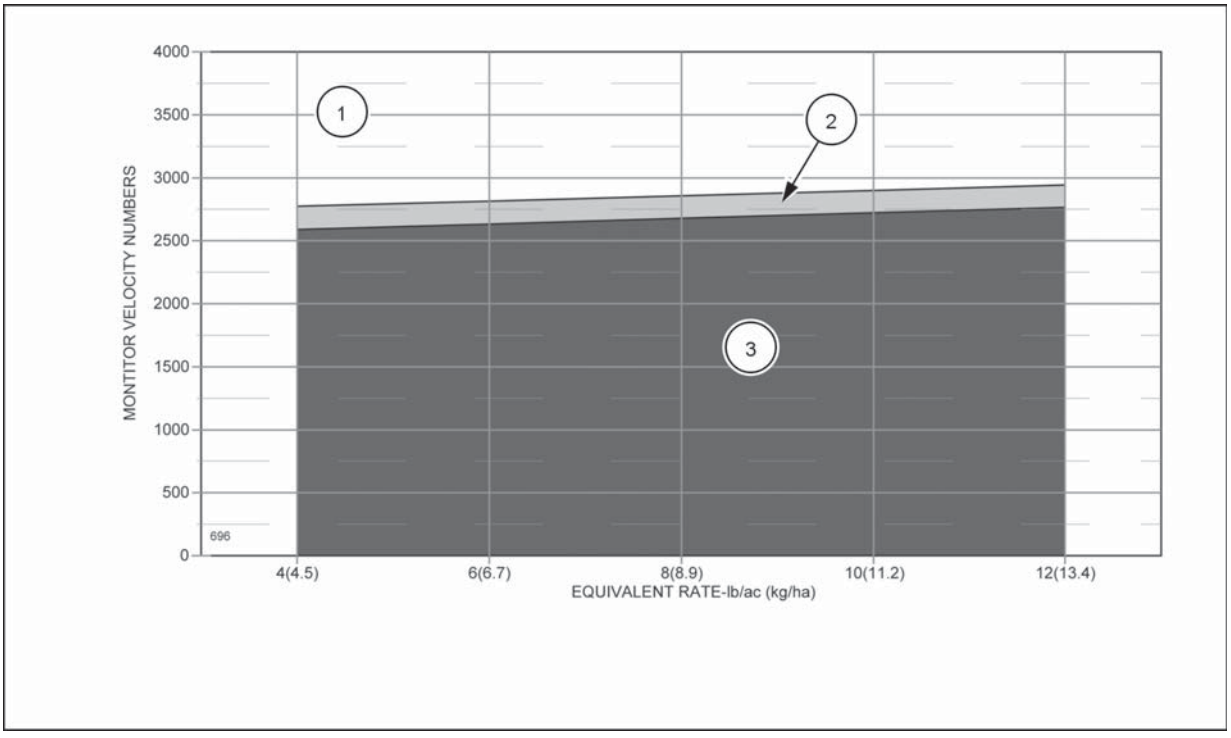
Velocity Chart Key

(1) Without Product Range
(2) Operating Range
(3) Plugging Range



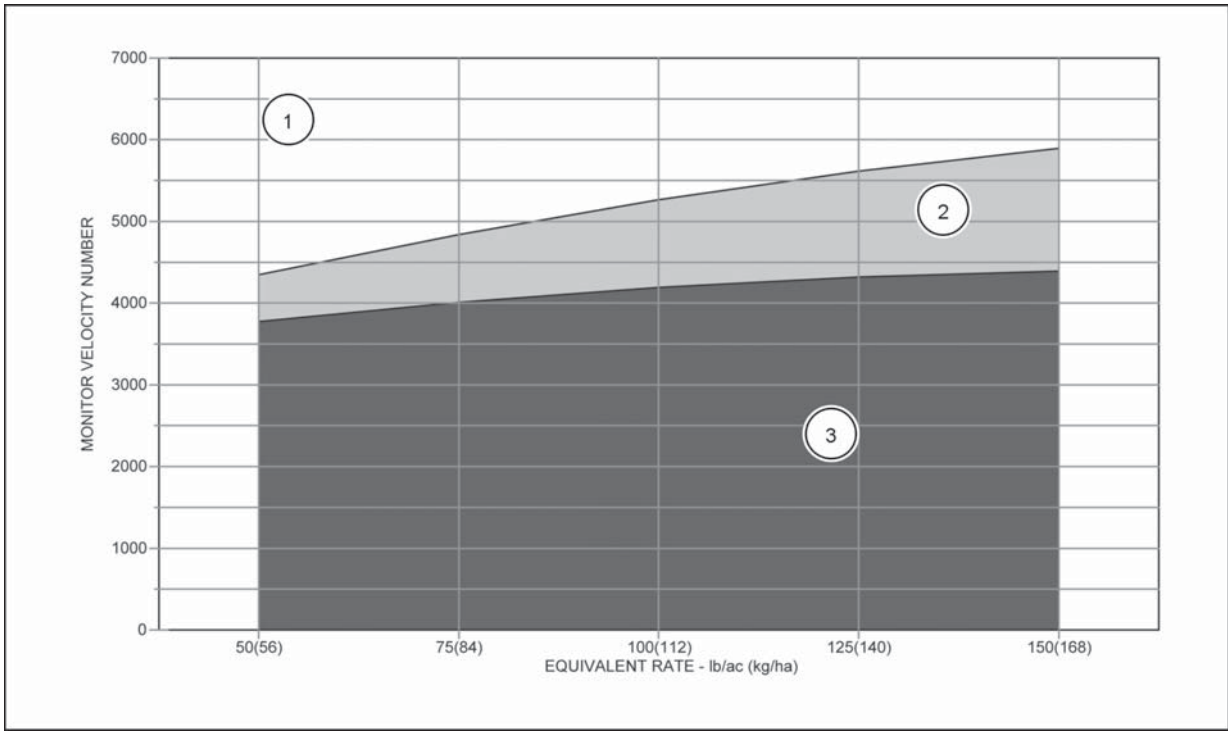
111130C 7

Suggested velocity numbers for fertilizer



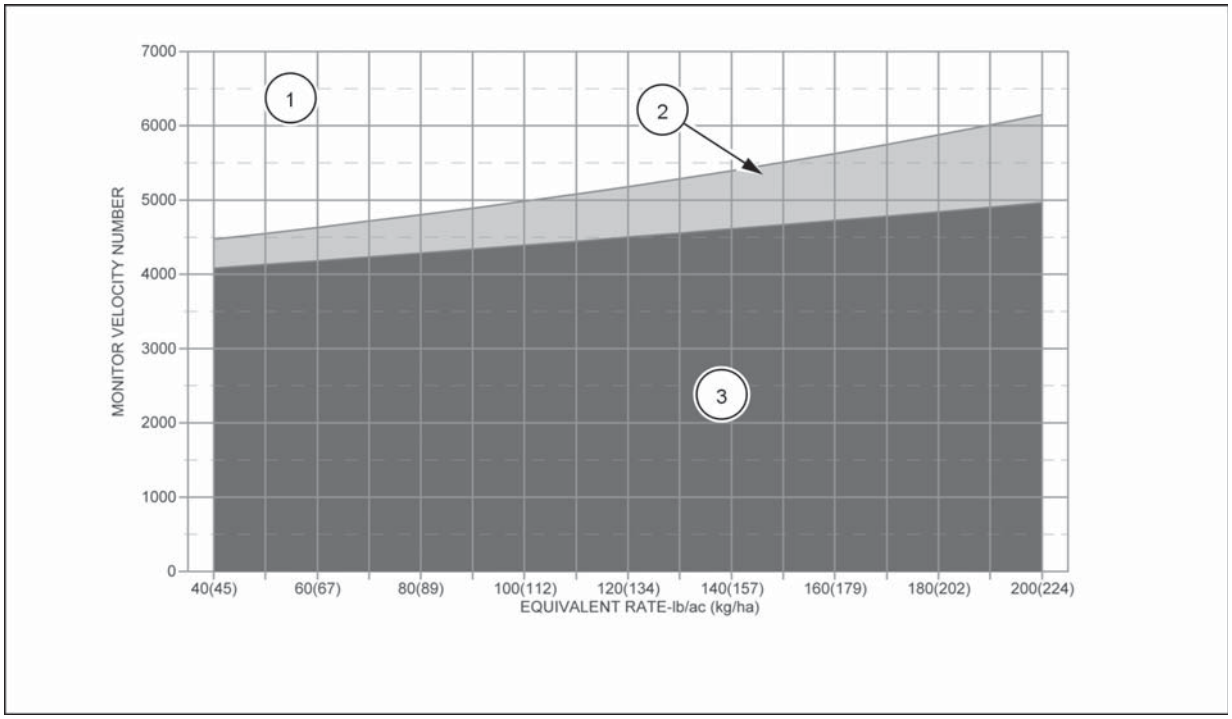
111131C 8

Suggested velocity numbers for canola



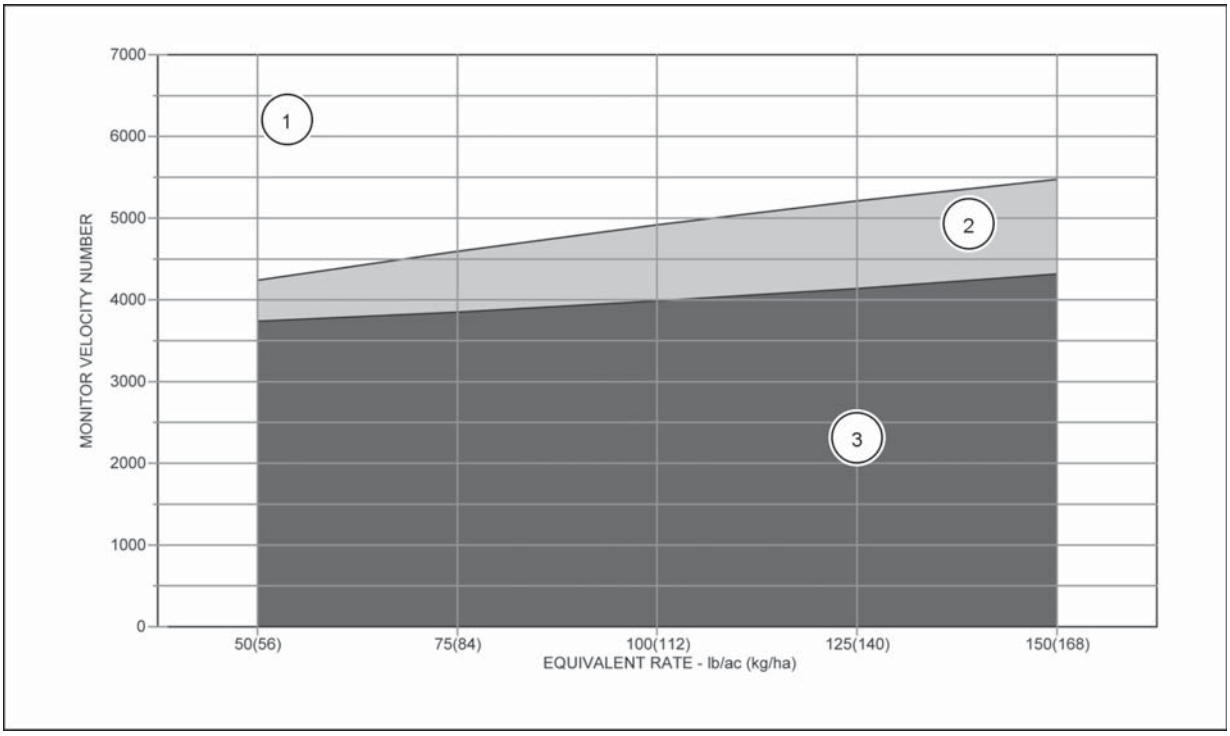
111132C 9

Suggested velocity numbers for lentils



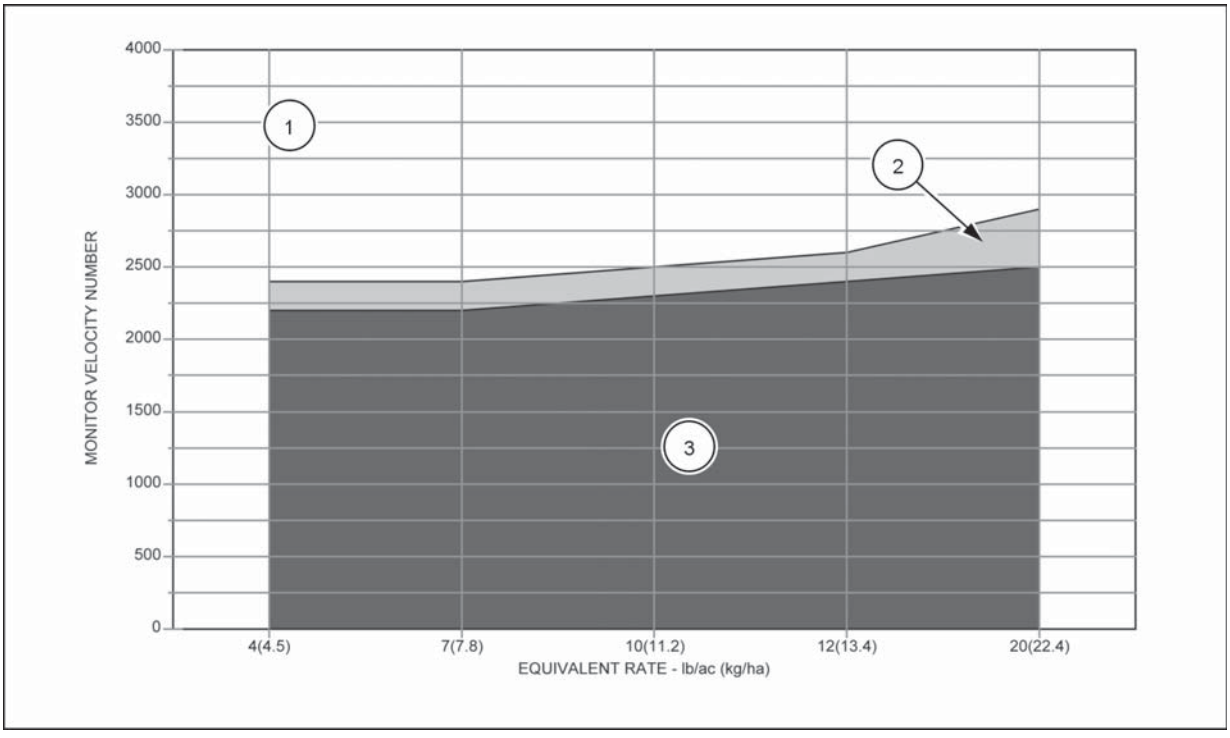
111133C 10

Suggested velocity numbers for peas



111134C 11

Suggested velocity numbers for wheat



111135C 12

Suggested velocity numbers for flax