

*Grain Tank  
on the CFR 650*

**Operator's  
Manual**



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on the CFR 650*

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Manual**

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E11649V1

### **Highline Team Message**

*Congratulations on your purchase of the Grain Tank on the CFR 650 manufactured by Highline Manufacturing Ltd.*

*This operator's manual has been prepared to provide information necessary for safe and efficient operation. In the manual you will find safety procedures, maintenance routines and detailed operational instructions.*

*If you find that you require information not covered in this manual, please feel free to consult your local dealer. Your dealer is always able to contact Highline for this technical information.*

*Highline Manufacturing Ltd. thanks and congratulates you for selecting the Grain Tank on the CFR 650 as your machine of choice.*

*Highline Manufacturing Ltd.*

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## **GENERAL DESCRIPTION OF THE GRAIN TANK ON THE CFR 650**

The Grain Tank on the CFR 650 is an attachment to the CFR 650 Bale Processor. When the ground drive is engaged, the forward motion of the processor's wheel turns a drive system connected to an auger at the bottom of the grain tank. The auger is driven by the processor's ground wheel through an electric clutch and changeable chain sprockets. The auger discharges the metered feed directly into the tub of the CFR 650 Bale Processor.

When the addition of feed into the processed material is desired, the clutch is engaged and the auger is turned according to the chain sprocket ratios. The rate of feed mix is controlled by calibrating the auger discharge per revolution for a particular product and installing the chain sprockets that drive the auger to achieve the desired rate of feed intermix.

When the drive clutch is not turned on, the CFR 650 Bale Processor discharges material without any feed intermixed.

The operator of the Grain Tank on the CFR 650 is located in the tractor cab where they drive the tractor, control the speed of driving and engaging of the auger drive system.

## **INTENDED USE OF THE GRAIN TANK ON THE CFR 650**

The Grain Tank on the CFR 650 is designed to add animal feed materials into materials that have been initially processed by the CFR 650 Bale Processor.

The Grain Tank is intended for use in conjunction with the Bale Processor.

The Grain Tank is intended for use in farming applications.

The Grain Tank is intended for the mixing of animal feed in farming applications.

The Grain Tank is intended for off road use only.

Any uses of the Grain Tank on the CFR 650 other than the above stated Intended Uses shall be considered misuse of the Grain Tank . This misuse shall included (but not limited to):

- Using the Grain Tank in non-farming applications
- Using the Grain Tank on public roads
- Metering of feeds or grains for seeding purposes
- Metering materials other than animal feed materials
- Using the auger to move materials when the tank is not connected to the CFR 650 Bale Processor

Always use the Grain Tank on the CFR 650 according to the instructions contained in this Operator's Manual and the safety and instruction decals on the machine.

Perform regular maintenance and repair to ensure that the Grain Tank on the CFR 650 operates safely and efficiently.

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**SERIAL NUMBER**

Your serial number is found on the serial number plate attached to the tank.

It is important to record the serial number for proof of ownership and for any service or maintenance assistance.

**Serial Number** \_\_\_\_\_

**Owner** \_\_\_\_\_

**Model** \_\_\_\_\_

**Date of Purchase** \_\_\_\_\_



## SAFETY ALERT SYMBOL

The Safety Alert Symbol means:



**ATTENTION!  
BECOME ALERT!  
YOUR SAFETY IS INVOLVED!**

The Safety Alert Symbol combined with a Signal Word alert to the presence of a hazard and the degree of possible injury.



Indicates an imminently hazardous situation that, if not avoided, **WILL** result in **DEATH OR SERIOUS INJURY**. The color is Red with White lettering.



Indicates a potentially hazardous situation that, if not avoided, **COULD** result in **DEATH OR SERIOUS INJURY**, and includes hazards that are exposed when guards are removed or unsafe practices. The color is Orange with Black lettering.



Indicates a potentially hazardous situation that, if not avoided, **MAY** result in **MINOR INJURY**. The color is Yellow with Black lettering.

**GENERAL SAFETY**

1. Ensure that anyone who is going to operate, maintain or work near the machine is familiar with the recommended operating, maintenance procedures and safety information contained in this manual and follows all the safety precautions.
2. In addition to the design and configuration of the equipment, hazard control and accident prevention are dependant upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of this equipment.
3. The CFR650 Grain Tank shall not be operated without all the guards in place.

**SAFETY DECALS**

1. Keep the decals and signs clean and legible at all times.
2. Replace decals and signs that are damaged, missing or have become illegible.
3. Parts that have been replaced should display a current decal.
4. Decals are available from the Highline Parts Department.
5. Be familiar with the decals, the type of warning and the area or function(s) related to the area(s) that requires your awareness.

## Section 1 - Safety

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### DO NOT CONTACT THE ROTATING AUGER

Keep fingers and hand out of the auger tube and chamber. Never attempt to manually remove debris while the auger is rotating. Contact with the rotating auger will cause serious injury or death. Keep all auger guards in place.



### DO NOT ENTER THE TANK

The tank is a confined space not meant to be entered.



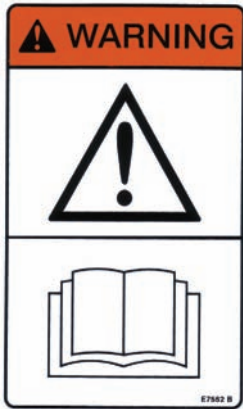
### DO NOT RIDE ON THE MACHINE

Riders may fall from the machine causing serious injury or death.



### DO NOT PLACE HAND IN THIS AREA WHEN RAISING OR LOWERING THE LID

Serious injury could result if hands are placed in this clamping area.



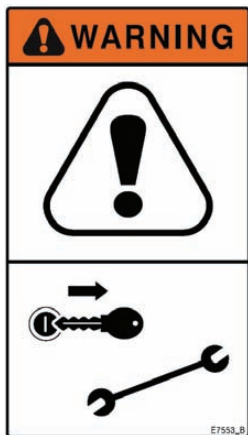
**READ, UNDERSTAND, AND FOLLOW SAFETY INSTRUCTIONS**

Read, understand and follow all instructions and safety messages included in this manual and on decals attached to the machine. These instructions and safety messages contain important information.

Allow only responsible, properly instructed individuals to operate and service the machine.

Failure to follow the instructions and safety messages in this manual and on the decals attached to the machine could result in serious injury or death.

Keep all safety and instruction decals in good condition. Replace any missing or damaged decals.



**SHUTDOWN THE TRACTOR BEFORE DISMOUNTING TRACTOR**

Shut down the tractor and remove the key before repairing, servicing or adjusting, lubricating or cleaning.

Set the park brake.

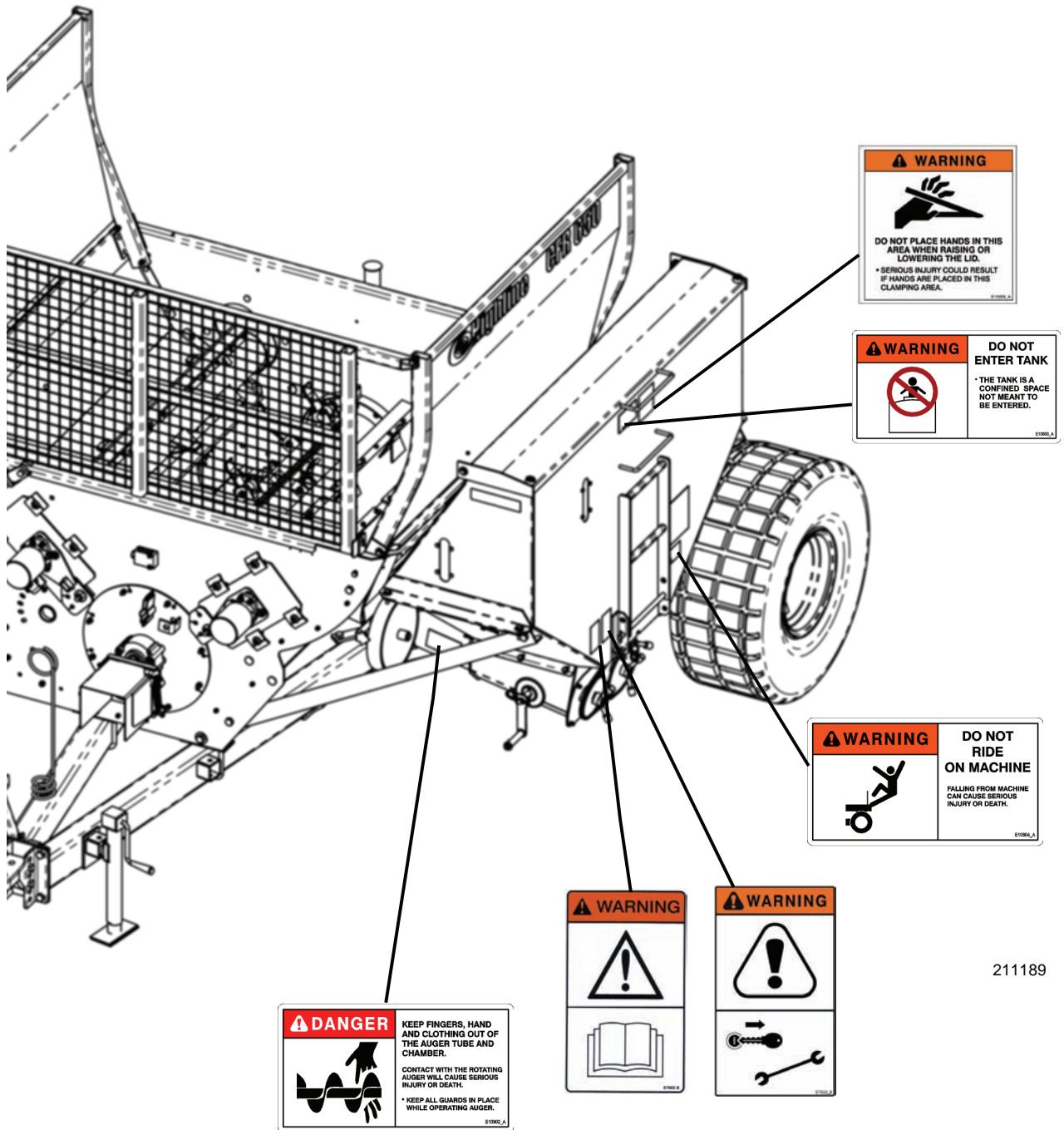
Disengage power take off.

Before servicing or adjusting, wait for all parts to stop rotating.

Keep guards in place and in good condition.

Never transport unit on highway with product in tank.

SAFETY DECAL LOCATIONS



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## Section 2 - Sample Feeding Rations

The following are Sample Feeding Rations for feeding with the CFR650 and Grain Tank.

Adapted from [www.agriculture.gov.sk.ca/livestock](http://www.agriculture.gov.sk.ca/livestock)

**Note: Consult a Nutritionist for specific recommendations.**

**Note:** During periods of cold temperatures, increase feeding with additional grain at a rate of one (1) lb. per head per day for every -5° C that the temperature is below -20° C at midday.

For example, if the afternoon air temperature was -35° C, feed an additional three (3) lb. of grain per cow.

<b>Low Quality Forage</b>			
<b>Example Feeding Rations</b> (Consult a Nutritionist for specific recommendations.)			
Pounds per cow per day on an "as fed" basis			
	1,200 lb. Cow Mid-Pregnancy Early Winter Conditions No wind, -10° C Six months pregnant Calving mid March Calf birth weight 80 lbs	1,200 lb. Cow Late-Pregnancy Winter Conditions No wind, -20° C Eight months pregnant Calving mid March Calf birth weight 80 lbs	1,200 lb. Cow Lactating Early Spring Conditions No wind, -5° C First month lactaion Fourth lactation Calf birth weight 80 lbs
Cereal Straw + Oats or Barley	17 + 9	17 + 11	15 + 16
Pea or Lentil Straw + Oats or Barley	21 + 5	24 + 8	18 + 15
Slough Hay + Oats or Barley	26 + 3	29 + 3	21 + 12
<b>High Quality Forage</b>			
<b>Example Feeding Rations</b> (Consult a Nutritionist for specific recommendations.)			
Pounds per cow per day on an "as fed" basis			
	1,200 lb. Cow Lactating Early Spring Conditions No wind, -5° C First month lactaion, Fourth lactation Calf birth weight 80 lbs		
Alfalfa Grass Hay + Oats or Barley	31 + 3		
Canola Hay + Oats or Barley	31 + 9		
Canola Silage + Oats or Barley	60 + 9		
Cereal Greenfeed + Oats or Barley	31 + 3		
Cereal Silage + Oats or Barley	58 + 7		
Clover Silage + Oats or Barley	56 + 9		
Pea or Lentil Hay + Oats or Barley	27 + 7		

## Section 2 - Sample Feeding Ratios

Feed Name	Dry Matter %	DE Mcal/lb	TDN %	Protein %	Ca %	P %	Mg %	K %	S %	Salt %	Vit. A KIU/Kg	Cu mg/kg	Mn mg/kg	Zn mg/kg	Se mg/kg	I mg/kg
ALF-GRASS	87%	1.22	61.04	14.00%	1.2%	0.19%	0.26%	1.65%	0.17%	0.00%	0	6	40	23	0.23	0.00
CANOLA HAY	85%	1.13	56.62	13.20%	1.2%	0.32%	0.39%	1.90%	0.51%	0.00%	0	8	30	20	0.12	0.00
GRASS HAY	90%	1.24	62.26	10.70%	0.5%	0.17%	0.17%	1.32%	0.18%	0.00%	0	6	75	24	0.21	0.00
GREENFEED	86%	1.20	60.13	10.90%	0.5%	0.17%	0.17%	1.50%	0.14%	0.00%	6	45	20	0.13	0.00	0.00
LENTPEA HAY	86%	1.16	58.00	14.10%	1.3%	0.24%	0.36%	1.28%	0.14%	0.00%	0	7	46	29	0.15	0.00
SLOUGH HAY	88%	1.06	53.00	7.80%	0.4%	0.12%	0.14%	1.27%	0.19%	0.00%	0	5	33	20	0.11	0.00
CANOLA	35%	1.18	59.00	14.00%	1.1%	0.32%	0.21%	1.90%	0.51%	0.00%	0	5	33	27	0.12	0.00
CEREAL	37%	1.23	61.50	11.10%	0.5%	0.27%	0.27%	1.60%	0.22%	0.00%	0	5	33	27	0.08	0.00
CLOVER	37%	1.15	57.74	14.80%	1.4%	0.22%	0.27%	1.59%	0.19%	0.00%	0	8	27	27	0.11	0.00
CEREAL	89%	0.89	44.57	4.50%	0.1%	0.08%	0.13%	1.40%	0.12%	0.00%	0	3	3	16	0.13	0.00
LENTPEA	89%	0.96	48.00	7.20%	0.9%	0.08%	0.23%	1.30%	1.50%	0.00%	0	4	41	18	0.20	0.00
GRAIN	89%	1.59	79.59	11.90%	0.1%	0.36%	0.14%	0.54%	0.14%	0.00%	0	6	17	40	0.11	0.00
11% SCR PELL	90%	1.43	71.65	12.20%	0.2%	0.78%	0.17%	0.33%	0.14%	0.00%	0	6	17	40	0.11	0.00
14%VMR	89%	1.47	73.65	15.50%	0.9%	0.33%	0.22%	0.82%	0.13%	0.28%	22	39	89	172	0.33	3.30
32%PROT SUPP	90%	1.22	61.13	35.60%	5.9%	0.67%	0.33%	1.00%	0.33%	5.00%	100	222	378	1667	1.67	13.30
ALFA SUNCURE	90%	1.24	62.13	16.60%	1.7%	0.20%	0.29%	1.62%	0.21%	0.00%	0	5	37	21	0.21	0.00
CANOLA MEAL	92%	1.40	70.03	39.20%	0.8%	1.26%	0.62%	1.31%	1.16%	0.00%	0	9	58	97	0.60	0.00
18:18 MINERAL	99%	0.00	0.00	0.00%	18.2%	18.18	0.00%	0.00%	0.00%	0.00%	505	3182	5303	10227	30.30	90.90
19:9 MINERAL	99%	0.00	0.00	0.00%	19.2%	9.09%	0.00%	0.00%	0.00%	0.00%	202	505	1515	3030	10.10	90.90
LIMESTONE 1	99%	0.00	0.00	0.00%	38.4%	0.00%	0.00%	0.00%	0.00%	0.00%	0	0	0	0	0.00	0.00
TM SALT+SE	99%	0.00	0.00	0.00%	0.0%	0.00%	0.00%	0.00%	0.00%	97.47	0	2525	5050	7575	121.20	70.70
ADE 10 M	99%	0.00	0.00	0.00%	0.0%	0.00%	0.00%	0.00%	0.00%	0.00%	10101	5	20	20	0.01	0.00

Adapted from [www.agriculture.gov.sk.ca](http://www.agriculture.gov.sk.ca)

## OPERATING THE GRAIN TANK ON THE CFR 650

### Check the Auger Discharge in the Processor Tub

1. Ensure the Grain Tank auger discharge (1) inside the processor tank is clear of any material that would block commodity from entering the processor.
2. Clear any blockages.
3. Check that the auger can rotate.



Check the Auger Discharge

211180C

### Filling the Tank



Do not enter the tank.  
The tank is a confined space not meant to be entered.



1. Lower the tank access ladder.
  - Remove the hair pin and storage pin to lower the ladder.



Lower the Access Ladder

211164

### Section 3 - Operating the Grain Tank on the CFR 650

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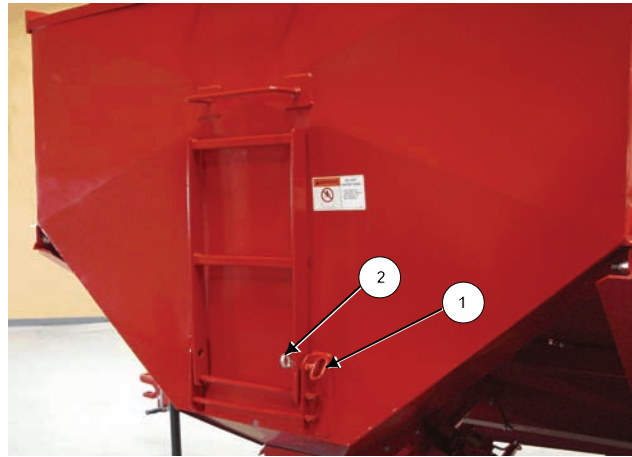
2. Lift the lid of the tank.
3. Fill the tank with the desired commodity.
  - The Grain Tank holds 30 bushels.
4. Close the lid.



Fill the Tank Through the Tank Lid

211163

5. Raise the ladder and lock into place with the storage pin (1).
  - Place the hair pin (2) into the storage pin to secure it.

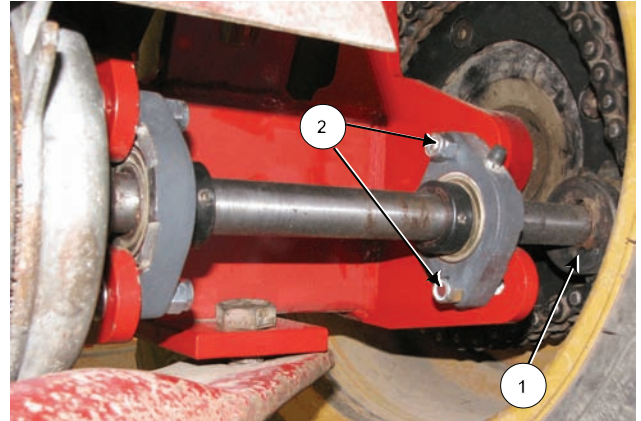


Raise and Lock the Ladder

211165C

### Ensure That The Wheel Drive Sprocket Is Engaged

1. The drive shaft sprocket (1) at the wheel needs to be fully engage the wheel drive chain.
2. To tighten onto the wheel drive chain:
  - Loosen the bolts (2) on the outer bearing mounts.
  - The bolts on the inner bearing do not have to be loosened as the bearing is self aligning.
  - Rotate the outer drive shaft bearing around the upper bolt.
  - Tighten the bearing bolts.

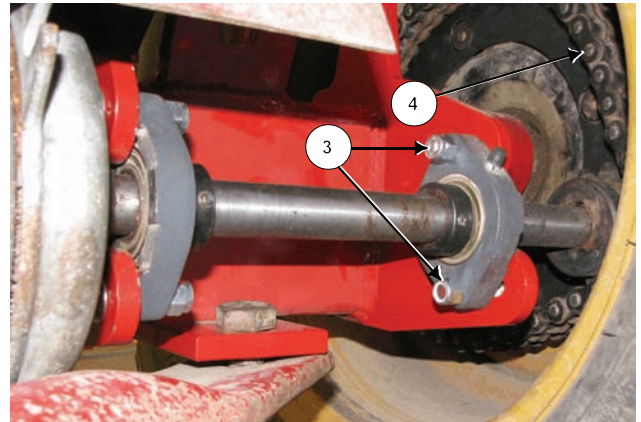


Adjusting the Wheel Drive Shaft Sprocket

211185C

### Transporting - (Only for Long Distance or High Speed Transport)

- Disengage the drive shaft sprocket
  - Loosen the bolts (3) on the outer bearing mounts.
  - Rotate the drive shaft and clutch to dis-engage the drive sprocket from the wheel drive chain.
  - Tighten the bearing bolts.
- Remove the double row chain connector.
- Remove the double row chain (4).

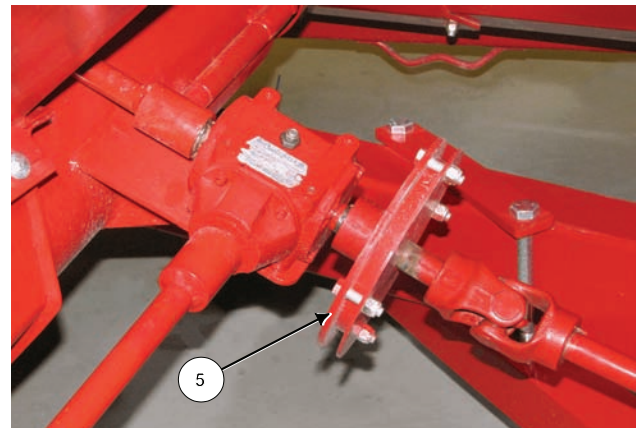


Transport - Remove Chain from Drive Wheel

211185C2

### Check the One Way Clutch

Check that the one way clutch (5) spins freely in one direction and engages in the other direction to drive the auger.



Check One Way Clutch

211183C2

## Section 3 - Operating the Grain Tank on the CFR 650

### Feeding With The Processor and The Grain Tank

Instructions:	A Feeding Example:
<p><b>Step 1</b> Determine the feed sources that are intended to be used.</p>	<p>- Alfalfa Hay Grass and Barley Grain</p>
<p><b>Step 2</b> Determine the required amount of feed sources per head. Some Sample Rations are included in Section 2 of the manual.  Note: Waste is not accounted for in the sample rations. Make adjustments to account for waste.</p>	<p>From the sample ration chart for Alfalfa Hay Grass + Barley Grain :</p> <ul style="list-style-type: none"> <li>- 1,200 lb. Cow</li> <li>- First month lactation</li> <li>- Early Spring Conditions, No wind, -5° C</li> <li>- Fourth lactation</li> <li>- Calf birth weight 80 lbs</li> </ul> <p>Use 31 lbs Hay + 3 lbs Barley</p>
<p><b>Step 3</b> Determine the weight of the bales being used.</p>	<p>Bale weight is 1200 lbs</p>
<p><b>Step 4</b> Determine the number of cattle intended to be fed.</p>	<p>Intend to feed 50 cows</p>
<p><b>Step 5</b> Determine how many bales are required.  Multiply number of cows by lbs/cow = lbs.  Divide lbs. by weight per bale = number of bales to feed number of cattle.</p>	<p>50 cows x 31 lbs / cow = 1550 lbs.  1550 lbs / 1200lb per bale = 1.3 bales</p>
<p><b>Step 6</b> Determine the travel distance for the number of cattle intended to be fed. Multiply number of cows by 5 ft/cow  Note: Travel distance will vary with bale type, processor guard rod aggression setting and feed roller speed. Adjust these settings to achieve the desired output and travel distance.  Divide the lbs/bale by the lbs/cow. Multiply by travel distance.</p>	<p>50 head x 5 ft / head = 250 feet  Travel how far with a single bale? A 1200 lb. single bale at 31 lbs/cow for a cow every 5 feet will go for 194 feet:  1200 lbs/bale / 31lbs/cow x 5ft/cow = 194 feet</p>

**Section 3 - Operating the Grain Tank on the CFR 650**

<p><b>Step 7</b>                  Select the Sprocket Set required for metering the desired grain output.</p> <p>Use the Sprocket Selection Chart:                  Use either:                  Method 1 - "Quick Reference Chart"                  OR                  Method 2 - "Commodity Calibration"</p>	<p>Use 3 lbs. Barley per cow.</p> <p>Method 1: Quick Reference Chart:</p> <ul style="list-style-type: none"> <li>- Grain Type: Barley</li> <li>- Intended rate: 3 lbs per head</li> <li>- Closest match: 2.5 lbs per head</li> <li>- Sprockets: 16 Driving, 56 Auger</li> </ul>
<p><b>Step 8</b>                  Determine the Number of Bales that can be processed with a full Grain Tank.</p> <ul style="list-style-type: none"> <li>- The Grain Tank holds 30 bushels.</li> </ul> <p>Multiply average bushel weight of commodity by 30 bushels = lbs. commodity (See Average Weight per Bushel chart below.)</p> <p>Divide lbs. of commodity in tank by closest match of grain output per head (from Sprocket Selection) = number of cows fed by grain tank</p> <p>Multiply number of cows fed by 5 feet = travel distance possible while feeding with grain output</p> <p>Number of bales to empty tank = travel distance/tank divided by travel distance/bale</p>	<p>Barley                  51 lbs/bushel x 30 bushels = 1,530 lbs.</p> <p>1,530 lbs. / 2.5 lbs/head = 612 cows</p> <p>612 cows x 5 ft/cow = 3,060 feet travel distance</p> <p><u>3,060 feet/tank</u> = 15.7 bales                  194ft/bale</p>

**Commodity Average Weight per Bushel -** It is recommended to test and adjust for the density of the commodity.

Commodity	
Barley	48 lbs / bushel
Oats	32 lbs / bushel
Peas	60 lbs / bushel
Wheat	60 lbs / bushel
Corn	56 lbs / bushel

## Section 3 - Operating the Grain Tank on the CFR 650

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### Procedures for Selecting the Sprocket Set for Metering

There are 2 methods for determining the sprocket set to be installed.

#### Method 1 - Quick Reference Chart

- This method can be used for the 5 commodities listed on the Sprocket Selection Chart.
- This method does not account for variables such as density of the commodity.

1. Refer to the Calibration Chart below and also located on the Grain Tank.
2. Find the column with the commodity that will be fed.

Note: If the commodity being metered is not listed in the chart, use "Method 2 - Commodity Calibration"

3. Look down the column to find the closest match to the intended feed rate in lbs/head.
4. Look across the row to find the size of the 2 sprockets required:
  - the driving sprocket
  - the auger sprocket

Note: A Metric Chart is available. Contact the Highline Service Dept.

lbs / head (5 feet per cow)

Barley	Oats	Peas	Wheat	Corn
2.5	2.3	3.2	3.3	3.4
4.0	3.7	5.0	5.1	5.4
4.5	4.1	5.6	5.8	6.0
5.1	4.7	6.4	6.6	6.9
5.7	5.2	7.1	7.4	7.7
7.9	7.3	9.9	10.2	10.7
10.0	9.2	12.5	13.0	13.6
13.9	12.7	17.3	17.9	18.8
15.6	14.3	19.5	20.2	21.1
17.8	16.3	22.3	23.0	24.1
20.1	18.4	25.1	25.9	27.2
31.2	28.6	39.0	40.3	42.3

Driving Sprocket	Auger Sprocket
16	56
16	36
16	32
32	56
36	56
32	36
36	32
56	36
56	32
32	16
36	16
56	16

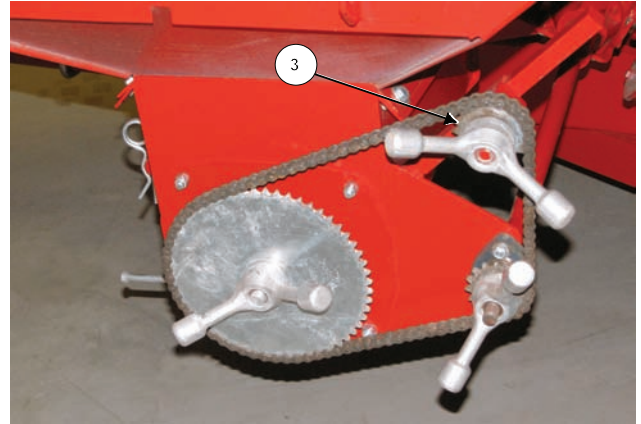
Calibration Ratio
0.53
0.83
0.93
1.06
1.19
1.65
2.09
2.89
3.25
3.71
4.18
6.50

## Section 3 - Operating the Grain Tank on the CFR 650

### Method 2 - Commodity Calibration

- Use this method if using commodities not listed in the Sprocket Selection chart.
- This method accounts for variables such as density of the commodity.

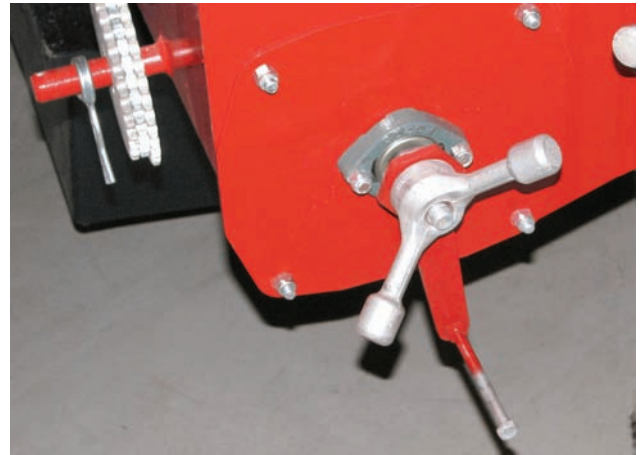
1. Remove the auger chain.
  - Loosen the chain tightener (3) and slide down.



Loosen the Chain

211166C2

2. Remove the auger sprocket and install the auger crank handle.
  - Tighten with the quick turn handle.

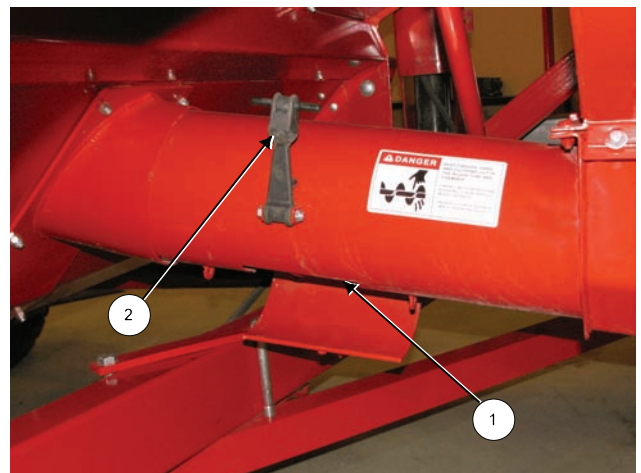


Install Auger Crank Handle

211168C

3. Ensure the Grain Tank is full of commodity.
4. Ensure the auger is full and primed with commodity.

5. Open the calibration hole (1) located at the bottom of the auger by removing the rubber keeper (2) and lowering the door.



Open the Calibration Hole

211169C

### Section 3 - Operating the Grain Tank on the CFR 650

6. Weigh and record the weight of the empty collection bucket.
7. Place the collection bucket under the calibration hole to collect the commodity.
8. Turn the crank counter-clockwise 4 times.



Place Collection Bucket Under Calibration Hole 211177

9. Use the supplied scale to weigh the bucket with the collected sample. Record the weight.
10. Subtract the empty bucket weight to get the weight of the collected sample.
11. Divide the weight of the sample by 4 to determine the discharge weight per revolution of the auger.



Weigh Sample, Subtract Empty Bucket Weight 211171

12. Replace the cover of the calibration hole.
13. Determine the target calibration ratio by dividing the intended rate (lbs/head) by the discharge weight per revolution of auger.

$$\text{Target Calibration Ratio} = \frac{\text{Intended Rate}}{\text{Weight/Revolution}}$$



Replace the Cover on Calibration Hole 211170

### Section 3 - Operating the Grain Tank on the CFR 650

14. Find the nearest calibration ratio from the Sprocket Selection chart.
15. Look across the row to find the Driving and Auger sprockets.

lbs / head (5 feet per cow)					Driving Sprocket	Auger Sprocket	Calibration Ratio
Barley	Oats	Peas	Wheat	Corn			
2.5	2.3	3.2	3.3	3.4	16	56	0.53
4.0	3.7	5.0	5.1	5.4	16	36	0.83
4.5	4.1	5.6	5.8	6.0	16	32	0.93
5.1	4.7	6.4	6.6	6.9	32	56	1.06
5.7	5.2	7.1	7.4	7.7	36	56	1.19
7.9	7.3	9.9	10.2	10.7	32	36	1.65
10.0	9.2	12.5	13.0	13.6	36	32	2.09
13.9	12.7	17.3	17.9	18.8	56	36	2.89
15.6	14.3	19.5	20.2	21.1	56	32	3.25
17.8	16.3	22.3	23.0	24.1	32	16	3.71
20.1	18.4	25.1	25.9	27.2	36	16	4.18
31.2	28.6	39.0	40.3	42.3	56	16	6.50

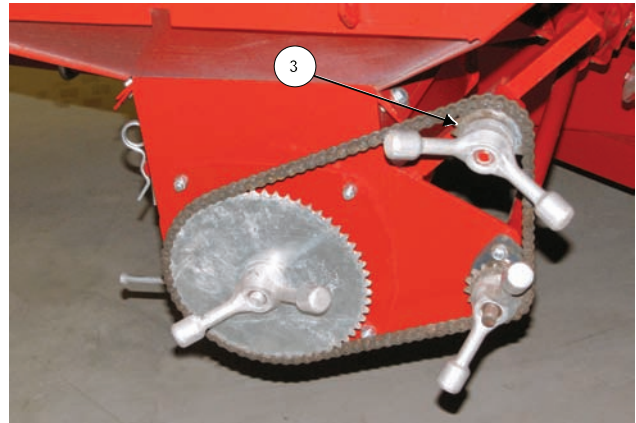
#### Example Using Method 2: Commodity Calibration

Grain Type:	Barley
Intended Rate:	6 lbs
Total weight of bucket + collected sample from 4 turns of auger	40 lbs
Subtract weight of collection bucket	2.5 lbs
Weight of commodity	40 lbs - 2.5 lbs = 38.5 lbs
Weight per turn of auger = Weight/4 turns	38.5 lbs/4 turns = 9.6 lbs
Calculate Target Calibration Rate = $\frac{\text{Intended Rate}}{\text{Weight per turn of auger}}$	$\frac{6 \text{ lbs}}{9.6 \text{ lbs}} = .625$
Nearest Calibration Ratio from Chart	0.53
Sprockets To Be Used	Driving Sprocket = 16 Auger Sprocket = 56

## Section 3 - Operating the Grain Tank on the CFR 650

### Install the Sprocket Set

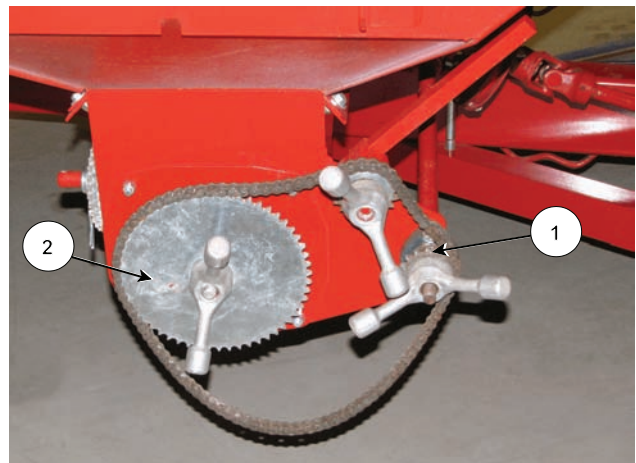
1. Loosen the chain tightener sprocket carrier (3) by turning the quick turn handle.
  - Slide the sprocket carrier down the slide.



Loosen the Chain

211166C2

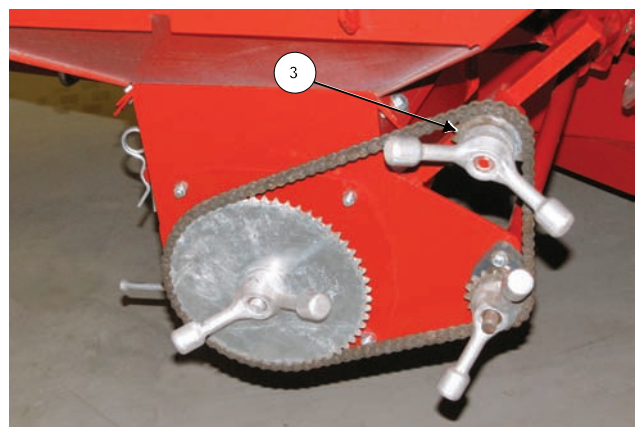
2. Install the (1) driving sprocket onto the shaft from the gearbox. Tighten with the quick turn handle.
3. Install the auger sprocket (2) onto the end of the auger shaft. Tighten with the quick turn handle.
4. Place the drive chain over the sprockets and the chain tightener.



Install the Driving and Auger Sprocket

211167C2

5. Slide the chain tightener (3) up the bar to tighten the chain. Tighten with the quick turn handle.



Tighten the Chain

211166C2

## Section 3 - Operating the Grain Tank on the CFR 650

### Using the Distance Indicator

The installed Distance Indicator shows the distance traveled in feet.

1. The Distance Indicator located at the front of the tank is to give a measurement of the distance traveled forward while feeding livestock.
  - The one way clutch prevents the auger and distance indicator from turning while backing up.
2. When the Grain Tank clutch is engaged, the Distance Indicator will record the distance traveled in feet.
3. The metering from the Grain Tank is done in lbs/head based on an approximate animal spacing of 5 feet.
4. Example of using the Distance Indicator:

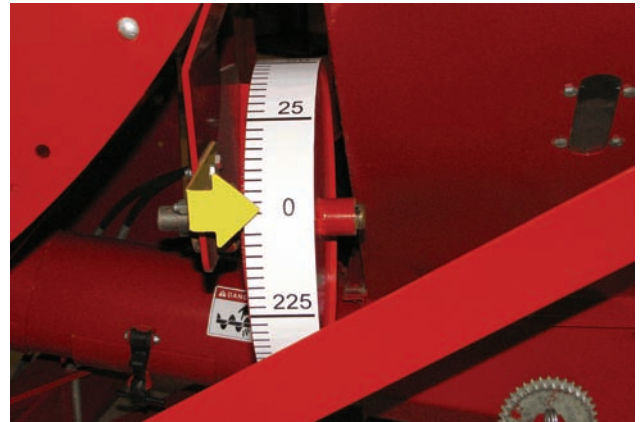
40 head x 5 ft/head = 200 feet of travel.

- For easy reference, there is a decal on the Grain Tank showing the Travel Distance in feet for the number of cows being feed.
5. Reset the Distance Indicator at the beginning of each feeding operation.
    - Turn the Distance Indicator by hand to zero.
  6. For distances greater than 250 feet, the Distance Indicator will go past the zero point.
    - Add the amount past zero to 250 for the total feet traveled.

Example:

- 1 full revolution (250ft) + 50 ft = 300 feet

Note: A metric distance indicator label is available. Contact the Highline Service Department.



Distance Indicator

211172

Travel Distance in Feet (5 ft/cow)				
Number of cows	Travel Distance		Number of cows	Travel Distance
20	100		60	300
25	125		80	400
30	150		100	500
35	175		120	600
40	200		140	700
45	225		160	800
50	250		180	900

## Section 3 - Operating the Grain Tank on the CFR 650

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### Metering With the Grain Tank

1. When at the feeding site-
  - Set the Distance Indicator to zero
  - Turn on the Grain Tank clutch with the switch located in the tractor cab.
2. Engage the drive to the CFR 650 flail drum to begin processing the bale.
3. Begin driving forward.



Clutch Switch Box

211174

4. As the CFR 650 moves forward the Grain Tank will meter out the commodity into the material from the processor.
  - The one way clutch prevents the auger and distance indicator from turning while backing up.
  - The rate of commodity metered will be according to the sprocket set installed.
  - The sprocket set is determined by the "Quick Reference Chart Method" or the "Commodity Calibration Method" (see above "Selecting the Sprocket Set for Metering").
5. When the bale is finished, turn off the Grain Tank clutch to prevent metering into the processor tub.



Metering

211175

## MAINTAINING THE GRAIN TANK



Shut down the tractor and remove the key before repairing, servicing, adjusting, lubricating or cleaning.

Wait for all parts to stop rotating.  
Disengage the PTO and driveline.



Do not enter the tank or allow anyone to enter the tank. The tank is a confined space not meant to be entered.



Do not contact the rotating auger. Keep fingers and hand out of the auger tube and chamber.



### Clear The Auger Discharge In The Tub

1. Ensure the Grain Tank auger discharge (1) inside the processor tank is clear of any material that would block commodity from entering the processor.
2. Clear any blockages.
3. Check that the auger can rotate.



Clear Auger Discharge Inside Tub

211180

## Clearing Blocked Auger Flighting



Keep fingers and hand out of the auger tube and chamber.

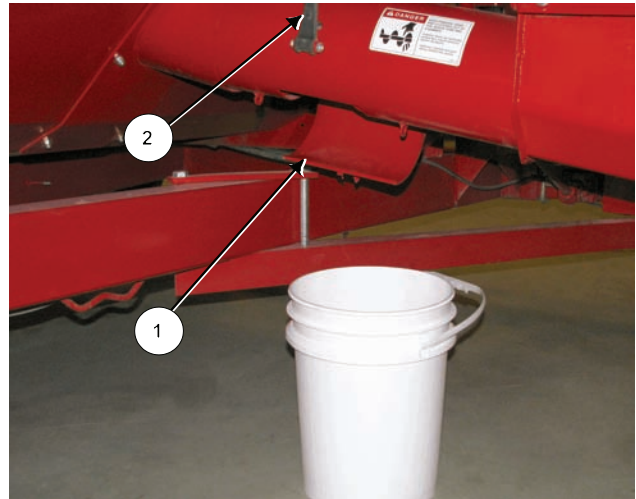
Contact with the rotating auger will cause serious injury or death.

1. Loosen the clamp on the auger calibration door (2).
2. Lower the door (1) from the auger chamber to allow the commodity to be caught in a pail.
3. Rotate the auger clockwise and counter-clockwise to move commodity out of the auger flighting.
  - Cleanout any commodity put into the tub by rotating the auger.
4. Use compressed air to blow out the auger.



Use appropriate personal safety equipment if using compressed air.

5. Raise the auger calibration door (1) and fasten in place with the clamp.
6. Fasten the clamp on the auger calibration door (2).



Auger Tube and Chamber Cleanout

211177C

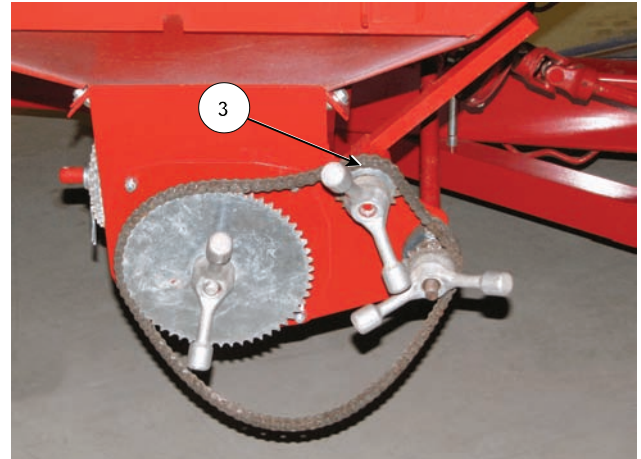
### Removing Commodity from the Tank

Commodity remaining in the tank can be removed through the auger end plate.



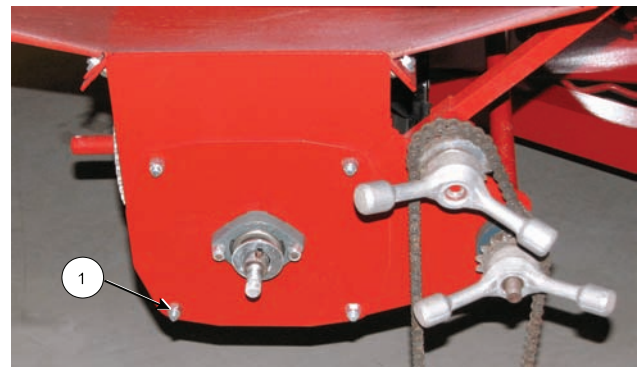
Do not enter the tank. The tank is a confined space not meant to be entered.

1. Loosen the chain tightener (3) by turning the quick turn handle.
2. Slide the tightener down the slide bar.
3. Remove the drive chain from the auger sprocket.
4. Place a collection bucket or hopper under the auger end plate to collect commodity.
5. Remove the auger sprocket by loosening the quick turn handle.
6. Remove the 4 nuts (1) holding the auger end plate.
7. Pull the auger flighting out of the auger tube to allow the commodity to empty into the collection bucket or hopper.



Loosen and Remove the Drive Chain

211167C



Remove Nuts From End Plate

211176C



Pull Out Auger To Drain Tank

211178

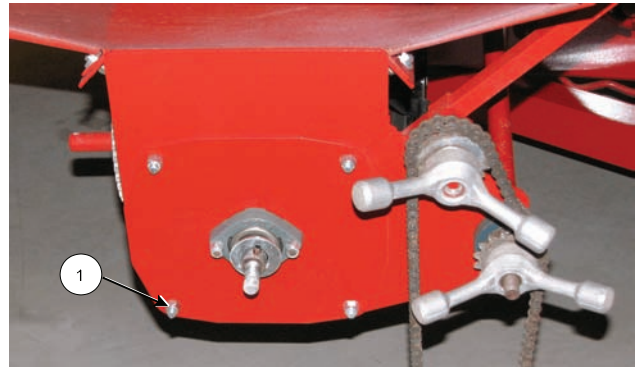
## Section 4 - Maintaining the Grain Tank 650

8. A compressed air supply can be used to blow out commodity from the cavities.



Use appropriate personal safety equipment if using compressed air.

9. Slide the auger into the auger tube.
10. Fasten the auger end plate to the auger chamber with the 4 nuts (1).



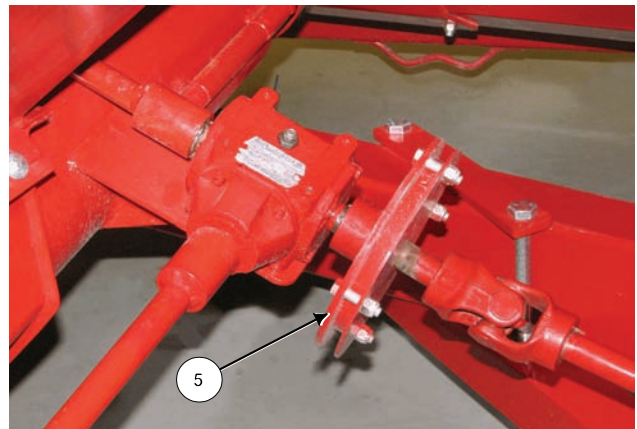
Fasten the Auger End Plate

211176C

### Check the One Way Clutch

Check that the one way clutch (5) spins freely in one direction and engages in the other direction to drive the auger.

If it does not spin freely in reverse direction, clean it but do not grease or oil it.



Check the One Way Clutch

211183C2

### Electric Clutch

Remove debris from the electric clutch.  
No other maintenance is required.  
If the friction disk wears out the clutch should be replaced.



Remove Debris from Electric Clutch

211188

**Lubrication - Oil**

**Every 10 Hours**

- **Lubricate the Wheel Drive Chain**

Lubricate the double row wheel drive chain every 10 hours. Use a quality chain oil.

Note: Remove the chain from the large sprocket for long distance transport or high speed transport.

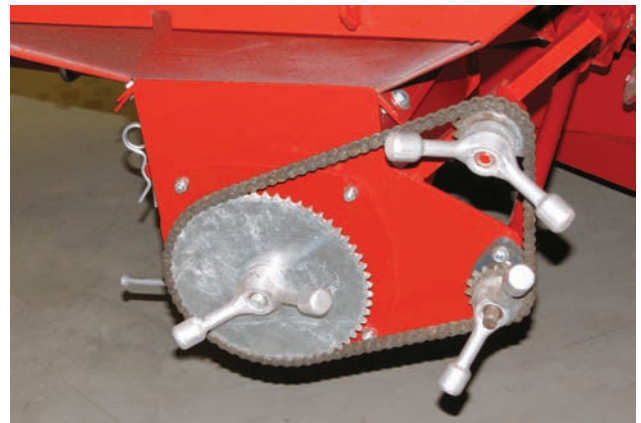


Lubricate The Wheel Drive Chain

211181

- **Lubricate the Auger Drive Chain**

Lubricate the auger drive chain every 10 hours. Use a quality chain oil.



Lubricate the Auger Drive Chain

211166

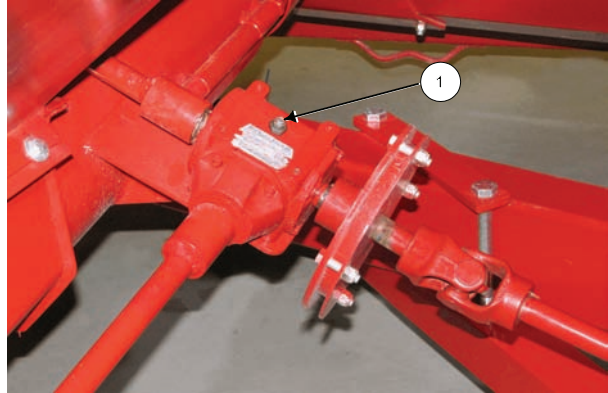
## Section 4 - Maintaining the Grain Tank 650

### Every 100 Hours

- **Change the oil in the upper and lower gearboxes.**

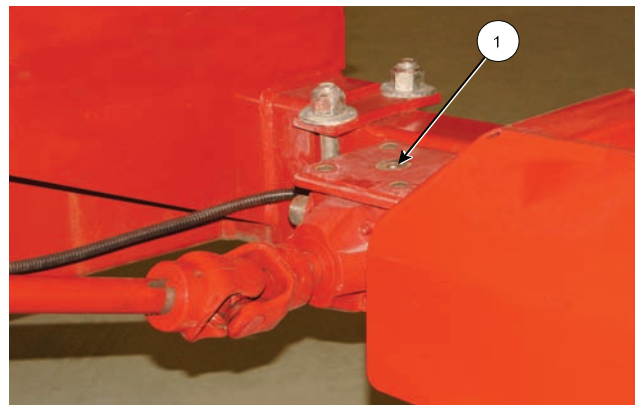
- Drain the oil by removing the bottom plug.
- Fill through the top plug (1).
- Use 80W90 gear oil.

Note: To fill the lower gearbox, remove the pail holder to access the gearbox fill plug.



Upper Gearbox

211183C



Lower Gearbox (Pail Holder Removed)

211184C

## Section 4 - Maintaining the Grain Tank 650

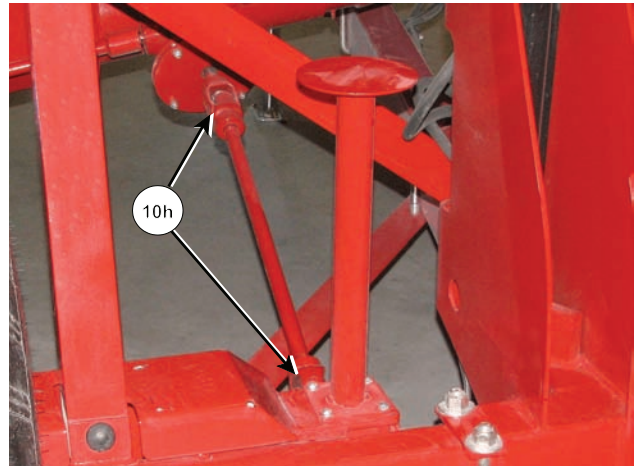
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### Lubrication - Grease

Grease all fittings with a quality lithium complex, extreme pressure NLGI Grade 2 grease.

### Every 10 Hours

- Grease the universal joints on the auger drive.



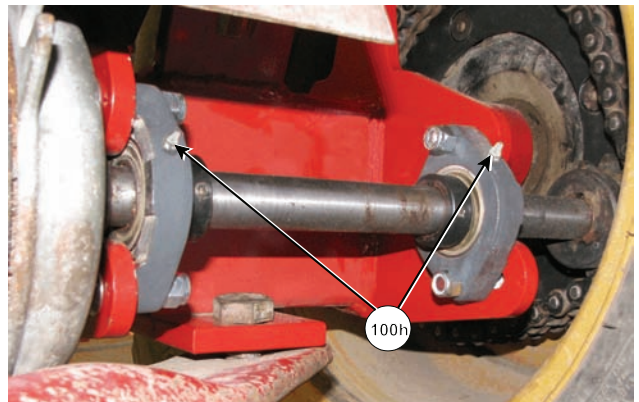
Grease Universal Joints

211182C

### Every 100 Hours

- Grease the Clutch Shaft Bearings

Grease both of the clutch driveshaft bearings every 100 hours.



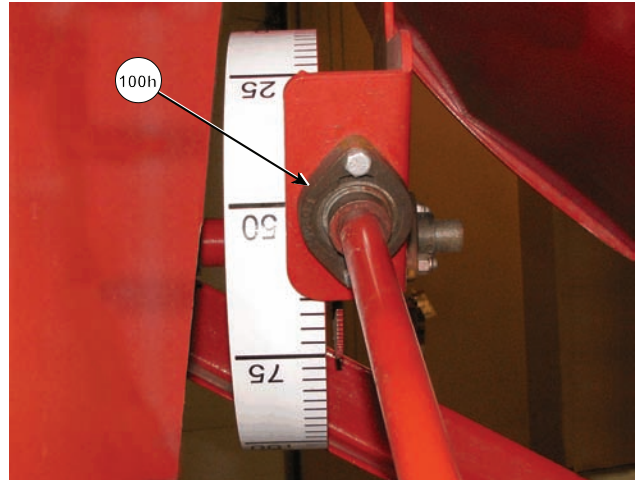
Grease Clutch Shaft Bearings

211185C3

## Section 4 - Maintaining the Grain Tank 650

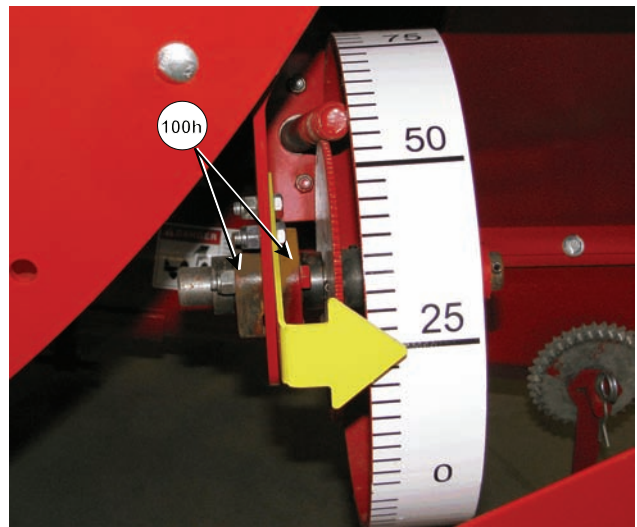
### Grease the Distance Indicator Bearings

- Grease the rear bearing of the distance indicator every 100 hours.



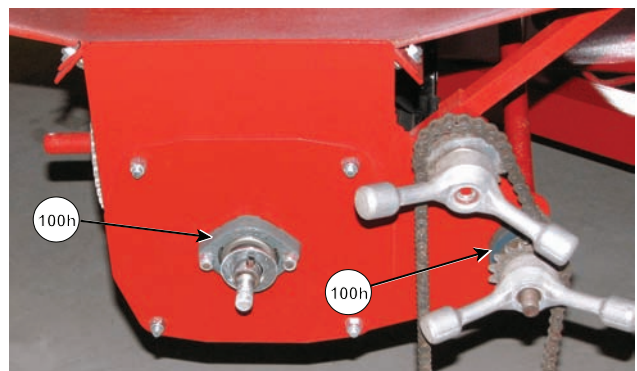
Grease the Rear Bearing - Distance Indicator <sup>211186C</sup>

- Grease the 2 side bearings of the distance indicator every 100 hours.



Grease the 2 Side Bearings - Distance Indicator <sup>211187C</sup>

- Grease the Auger Bearing and the Auger Drive Bearing



Grease Auger and Auger Drive Bearings <sup>211176C2</sup>

## Section 5 - Troubleshooting

### Troubleshooting

Symptom	Problem	Solution
Not Metering	Drive wheel sprocket not engaged in drive wheel chain	Rotate the clutch bearings to move the sprocket into the drive wheel chain
	Auger drive chain is loose or not engaging the sprockets	Tighten the auger chain. Move the auger chain tightener up and fasten.
	Electric clutch not turned on	Turn clutch on. Use switch in tractor cab.
	Electric clutch slipping	Replace the clutch
	Electric clutch not activating	Check electrical connections to the clutch
	Auger packed solid with commodity	Remove packed commodity from the tank and auger
	Auger discharge in tub is blocked	Clear the auger discharge
	One way clutch not engaging	Remove the clutch and clean. Do not oil or grease

Symptom	Problem	Solution
Auger chain falls off	Chain tightener not fastened securely to tensioner post	Slide the chain tensioner up the post and tighten with the quick turn handle
	Driving with electric clutch turned on but not processing a bale. Auger meters into the processing tub against a bale until the auger tube becomes packed and not able to turn.	Turn electric clutch off while driving but not processing  Clear auger tube and auger discharge in tub
	One way clutch operates auger when backing up	Remove one way clutch and clean. Do not oil or grease

**Section 5 - Troubleshooting**

<b>Symptom</b>	<b>Problem</b>	<b>Solution</b>
Distance indicator not rotating while grain is being metered	Distance indicator drive sprocket is not engaging worm gear on the drive shaft	Loosen the bearings on the distance indicator and rotate around the bearing top bolt to engage the sprocket into the drive shaft worm gear

<b>Symptom</b>	<b>Problem</b>	<b>Solution</b>
Commodity left over	Auger sprockets are incorrect for desired output	Check that the correct sprockets are mounted onto the auger and the auger drive
		Check the Sprocket Selection. Use Method 2 "Commodity Calibration" to verify commodity metering.
	Low metering rates	Refer to Section 3 - "Feeding With The Processor and The Grain Tank. Calculate Step 8 "Determine the Number of Bales that can be processed with a full Grain Tank."

## Section 5 - Troubleshooting

Symptom	Problem	Solution
Commodity runs out before expected	Auger sprockets are incorrect for desired output	Check that the correct sprockets are mounted onto the auger and the auger drive.
		Check the Sprocket Selection. Use Method 2 "Commodity Calibration" to verify commodity metering.
	High metering rates	Refer to Section 3 - "Feeding With The Processor and The Grain Tank." Calculate Step 8 "Determine the Number of Bales that can be processed with a full Grain Tank."

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**Section 6 - Specifications**

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**Specifications**

<b>Total Width Mounted on CFR 650:</b>	123" (3.12 m)
<b>Maximum Capacity:</b>	30 bushels (1057 liters)

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# Highline New Agricultural Equipment Limited Warranty Policy

One (1) Year / 12 Months - Parts and Labour

Highline Mfg. Inc (hereinafter "Highline") warrants this new Agricultural product of Highline's manufacturer to be free from defects in material and workmanship, under normal use and service for one (1) full year after initial purchase/retail sale. Highline will warrant its product for one (1) year parts and labour, if performed by a qualified Dealer. This Limited Warranty shall apply only to complete machines of Highline's manufacture, parts are covered by a separate Limited Warranty.

**EQUIPMENT AND ACCESSORIES NOT OF HIGHLINE'S MANUFACTURE ARE WARRANTED ONLY TO THE EXTENT OF THE ORIGINAL MANUFACTURER'S WARRANTY AND SUBJECT TO THEIR ALLOWANCE TO HIGHLINE ONLY IF FOUND DEFECTIVE BY SUCH MANUFACTURER.**

During the Limited Warranty period specified above, any defect in material or workmanship in any warranted item of Highline Agricultural Equipment not excluded below shall be repaired or replaced at Highline's option without charge by any authorized independent Highline Dealer. An authorized Dealer must make the warranty repair or replacement. Labour in accordance with Highline's labour reimbursement policy. Highline reserves the right to supply remanufactured replacement parts as it deems appropriate.

## **RETAIL PURCHASER RESPONSIBILITY**

This Limited Warranty requires proper maintenance and periodic inspections of the Agricultural Equipment as indicated in the Operator's Manual furnished with each new Agricultural Equipment. The cost of routine or required maintenance and services is the responsibility of the retail purchaser. The retail purchaser is required to keep documented evidence that these services were performed. This Highline New Agricultural Equipment Limited Warranty may be subject to cancellation if the above requirements are not performed.

## **EXCLUSIONS AND LIMITATIONS**

The warranties contained herein shall NOT APPLY TO:

1. Any defect which was caused (in Highline's sole judgement) by other than normal use and service of the Agricultural Equipment, or by any of the following:
  - a. accident
  - b. misuse or negligence
  - c. overloading
  - d. of reasonable and proper maintenance
  - e. improper repair or installation
  - f. unsuitable storage
  - g. non-Highline approved alteration or modification
  - h. natural calamities
  - i. vandalism
  - j. parts or accessories installed on Agricultural Equipment which were not manufactured or installed by Highline authorized Dealers
  - k. the elements
  - l. collision or other accident.
2. Any Agricultural Equipment whose identification numbers or marks have been altered or removed.
3. Any Agricultural Equipment which any of the required or recommended periodic inspection or services have been performed using parts not manufactured or supplied by Highline or meeting Highline Specifications including, but without limitation, lubricants (oil, grease), belt lacings, and hydraulic fluids.
4. Equipment used for rental, custom work, industrial and construction or if equipment is used for any other purpose than the intended agricultural application.
5. Any Agricultural Equipment used in demonstrations not performed by a Highline Dealer. Warranty will be at the discretion of Highline for all other demonstration warranty.
6. New Agricultural Equipment delivered to the retail purchaser in which the warranty registration has not been completed and returned to Highline within ten (10) days from the date of purchase.
7. Any defect that was caused (in Highline's sole judgement) by operation of the Agricultural Equipment not abiding by standard operating procedures outlined in the Operator's Manual.
8. Tire Limited Warranties and support are the responsibility of the respective product's manufacturer.
9. Transportation costs, if any, of transporting to the Highline Dealer.
10. In no event shall Highline's liability exceed the purchase price of the product.
11. Highline shall not be liable to any person under any circumstances for any incidental or consequential damages (including but not limited to, loss of profits, out of service time and damage to equipment which this equipment may be attached) occurring for any reason at any time.

12. Diagnostic and overtime labour premiums are not covered under this Limited Warranty Policy.
13. Depreciation damage caused by normal wear, lack of reasonable and proper maintenance, failure to follow operating instructions, misuse, and/or lack of proper protection during storage.
14. Accessory systems and electronics not of Highline's manufacture are warranted only to the extent of such manufacturer's respective Limited Warranty if any.
15. Wear items which are listed by product group below:

**COMMON WEAR ITEMS**

Roller chain, sprockets, clutches, shear bolts, clutch components, chains, gearbox housings bolts/torqued parts, flails, feed roller belting, coupler chain, DRV couplers, bogie wheels, apron tines and hoses.

**PARTS WARRANTY**

Parts replaced in the warranty period will receive the balance of the one year New Agricultural Equipment Limited Warranty. Replacement parts after the original machine warranty are warranted to be free from defects of material for ninety (90) days or the part will be repaired or replaced, without labour coverage for removal and reinstallation.

**EXCLUSION OF WARRANTIES**

UNLESS OTHERWISE REQUIRED BY LAW, AND EXCEPT FOR THE WARRANTIES EXPRESSLY AND SPECIFICALLY MADE HEREIN, HIGHLINE MAKES NO OTHER WARRANTIES, AND ANY POSSIBLE LIABILITY OF HIGHLINE HEREIN UNDER IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, IMPLIED, OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF MERCHANT ABILITY OR FITNESS FOR A PARTICULAR PURPOSE. HIGHLINE RESERVES THE RIGHT TO MODIFY, ALTER AND IMPROVE ANY PRODUCT WITHOUT INCURRING ANY OBLIGATION TO REPLACE ANY PRODUCT PREVIOUSLY SOLD WITH SUCH MODIFICATION. NO PERSON IS AUTHORIZED TO GIVE ANY OTHER WARRANTY, OR TO ASSUME ANY ADDITIONAL OBLIGATION ON HIGHLINE'S BEHALF.

# HIGHLINE MFG. LTD.

P.O. Box 307, VONDA SK SOK 4N0 CANADA  
TEL.306-258-2233 FAX.306-258-2010  
TOLL FREE 1-800-665-2010

## DELIVERY AND WARRANTY REGISTRATION

DELIVERY DATE \_\_\_\_\_

MONTH

DAY

YR

WARRANTY COVERAGE IS EFFECTIVE ONLY WHEN THIS FORM HAS ALL APPLICABLE INFORMATION COMPLETED, IS SIGNED BY BOTH THE OWNER AND THE AUTHORIZED SELLER AT THE TIME OF DELIVERY, AND IS RETURNED TO **HIGHLINE MANUFACTURING LTD.** WITHIN 10 DAYS FROM THE DATE OF PURCHASE. WARRANTY SERVICE MAYBE DENIED IF THIS FORM CONTAINS FALSE INFORMATION OR IS INCOMPLETE.

HIGHLINE AUTHORIZED DEALER or

HIGHLINE SALES DEPARTMENT

CUSTOMER NAME

\_\_\_\_\_

\_\_\_\_\_

MAILING ADDRESS \_\_\_\_\_

MAILING ADDRESS \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

PHONE \_\_\_\_\_

PHONE \_\_\_\_\_

I HEREBY ACKNOWLEDGE THAT:

1. I have received and accepted delivery of equipment described.
2. The equipment was checked thoroughly for loose or missing parts and has been adjusted in accordance with the PRE-DELIVERY CHECKLIST.
3. I have been provided with and have carefully read the Operator's Manual.
4. I have read and understand thoroughly the SAFETY PRECAUTIONS found in the Safety Section of the Operator's Manual.
5. I have read and understand the nature and extent of the Warranty and understand clearly that there were and are no other representations or warranties, either express or implied, made by anyone.
6. I have been advised on proper operation, maintenance and lubrication procedures of this equipment.
7. I have been instructed and do understand the application, limitations and capacities that this equipment was designed and recommended for, all of which is described in the Operator's Manual and other literature published by Highline Mfg. Ltd.

PLEASE TYPE OR PRINT LEGIBLY

BASIC MACHINE MODEL NO. \_\_\_\_\_

SERIAL # \_\_\_\_\_

OPTIONAL EQUIPMENT

\_\_\_\_\_

\_\_\_\_\_

INSTRUCTIONS

1. Make sure registration is complete and signed.
2. White and yellow copies mail direct to HIGHLINE MFG. LTD.
3. Pink copy - Highline Authorized Dealer file.
4. Goldenrod copy - maintain in Operator Manual.

\_\_\_\_\_  
Authorized Sales Signature

\_\_\_\_\_  
Owner or Designated Representative Signature

NOTE: BOTH AUTHORIZED SELLER AND OWNER MUST SIGN TO VALIDATE THE WARRANTY