



Flex Header Service Manual





#: 95282



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2 - Torque Recommendations

Note: All torques are dry threads

		Recommended Torque											
Size	Grade	Grade 2		Grade 5		Grade 8		18-8 S/S		Bronze		Brass	
	Coarse	Fine	Coarse	Fine	Coarse	Fine	Coarse	Fine	Coarse	Fine	Coarse	Fine	
* #4	-	-	-	-	-	-	5.2	-	4.8	-	4.3	-	
* #6	-	-	-	-	-	-	9.6	-	8.9	-	7.9	-	
* #8	-	-	-	-	-	-	19.8	-	18.4	-	16.2	-	
*#10	-	-	-	-	-	-	22.8	31.7	21.2	29.3	18.6	25.9	
1/4	4	4.7	6.3	7.3	9	10	6.3	7.8	5.7	7.3	5.1	6.4	
5/16	8	9	13	14	18	20	11	11.8	10.3	10.9	8.9	9.7	
3/8	15	17	23	26	33	37	20	22	18	20	16	18	
7/16	24	27	37	41	52	58	31	33	29	31	26	27	
1/2	37	41	57	64	80	90	43	45	40	42	35	37	
9/16	53	59	82	91	115	129	57	63	53	58	47	51	
5/8	73	83	112	128	159	180	93	104	86	96	76	85	
3/4	125	138	200	223	282	315	128	124	104	102	118	115	
7/8	129	144	322	355	454	501	194	193	178	178	159	158	
** 1	188	210	483	541	682	764	287	289	265	240	235	212	

* Sizes from 4 to 10 are in *in.-lbs.* Sizes from 1/4 up are in *ft.-lbs.*

**Fine thread figures are for 1-14.

Grade 2, 5, and 8 values are for plated bolts.

Metric Bolts

	10-0	2		25	0	1 - 1 - 1 - 2	- 19						
Nominal Dia. (mm)	Pitch		4.6 CI	ass 4.6		B	8) c	lass 8.8		(10.9) Class 10.9			
		Clamp	Clamp Tightening Torque			Clamp	Te	ghtening Torq	ue	Clamp	Tightening Torque		
		Load (Ibs)	Lubricated (ft-lbs)	Zinc Plated (ft-lbs)	Plain&Dry (ft-lbs)	Load (lbs)	Lubricated (ft-lbs)	Zinc Plated (ft-lbs)	Plain&Dry (ft-lbs)	Load (lbs)	Lubricated (ft-lbs)	Zinc Plated (ft-lbs)	Plain&Dry (ft-lbs)
4	0.7	333	0.7	0.7	0.9	858	1.7	1.9	2.3	1228	2.4	2.7	3.2
5	0.8	538	1.3	1.5	1.8	1387	3.4	3.9	4.5	1985	4.9	5.5	6.5
6	1	763	2.3	2.6	3.0	1968	5.8	6.6	7.7	2816	8.3	9.4	11.1
7	1	1095	3.8	4.3	5.0	2822	9.7	11.0	13.0	4039	13.9	15.8	18.5
8	1.25	1389	5.5	6.2	7.3	3580	14.1	16.0	18.8	5123	20.2	22.9	26.9
10	1.5	2200	10.8	12.3	14.4	5671	27.9	31.6	37.2	8115	39.9	45.2	53.2
12	1.75	3197	18.9	21.4	25.2	8240	48.7	55.1	64.9	11792	69.6	78.9	92.8
14	2	4379	30.2	34.2	40.2	11289	77.8	88.1	103.7	16154	111.3	126.1	148.4
16	2	5943	47	53	62	15320	121	137	161	21924	173	196	230
18	2.5	7301	65	73	86	18822	167	189	222	26934	239	270	318
20	2.5	9286	91	104	122	23938	236	267	314	34256	337	382	449
22	2.5	11509	125	141	166	29669	321	364	428	42457	460	521	613
24	3	13372	158	179	211	34471	407	461	543	49329	582	660	777
27	3	17428	232	262	309	44924	597	676	796	64288	854	968	1139
30	3.5	21266	314	356	419	54819	809	917	1079	78448	1158	1312	1544
33	3.5	26310	427	484	570	67821	1101	1248	1468	97055	1576	1786	2101
36	4	30982	549	622	732	79866	1415	1603	1886	114291	2024	2294	269.9



3 - Safety Information

3.1 - Recognize Safety Information

This is a safety-alert symbol. When you see this symbol, be alert to the potential for personal injury. Follow recommended precautions and safe operating practices.



3.2 - Understand Signal Words

The following are safety terms used around the equipment and throughout this manual. Please read and understand their descriptions.

\land DANGER

Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

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. It may also be used to alert against unsafe practices.

ACAUTION

Indicates a potentially hazardous station that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

IMPORTANT

Warns of potential damage to the header if proper procedures are not followed.

Notifies you of important information to which you should pay attention.

3.3 - Read and Understand Instructions and Warnings

Please read and understand all warnings and safety information contained within this manual and the signs located on your equipment.

You may find additional safety information on after-market equipment not included in this manual.

Only allow trained individuals to operate the header.

Unauthorized equipment modifications can cause injury or equipment failure that is not covered under warranty.

3.4 - Protective Clothing

MARNING!

When working around running equipment, secure all loose items such as long hair, jewelry, or loose clothing are secured so they do not contact moving parts. Failure to do so will result in injury or death.

Wear hearing protection to protect against hearing damage.

Operating equipment safely requires your full attention, do not wear headphones while operating the header.

3.5 - In Case of Emergency

NOTE:

Keep a first aid kit and fire extinguisher with your header at all times. Keep phone numbers for emergency services near your telephone.

3.6 - Store the Header Safely

① WARNING!

Ensure your header and all attachments are secured when not in use. Keep bystanders away from equipment and storage area. Failure to comply can result in injury or death.



3.7 - Safety Around moving parts

1 DANGER!

Never attempt to service your equipment while in operation. Always shut off the combine and wait for all moving parts to come to a complete stop before approaching the header.

Keep guards and shields in place at all times. Ensure that they are serviceable and installed correctly.

Cutterbar, auger, reel, drive shafts, and drapers cannot be completely shielded due to their function. Stay clear of these moving elements during operation.

3.8 - High Pressure Hydraulics

🗥 DANGER!

High pressure hydraulic leaks can penetrate the skin causing serious injury. Always relieve pressure before disconnecting hydraulic lines and tighten all connections before applying pressure.

Hydraulic leaks can be extremely small and difficult to see. Search for leaks with a piece of cardboard. Protect hands and body from high-pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source.



3.9 - Transporting the Header

IMPORTANT!

When transporting the header, frequently check for traffic from the rear, especially in turns. Always use headlights, flashing warning lights, and turn signals (when turning) day and night. Follow local regulations for equipment lighting and marking. Keep lighting and marking visible, clean, and in good working order, replace if necessary.

Whenever possible avoid transporting the header on public roadways with header attached to the combine.

If combine must be transported with header attached, ensure all warning lights are operating, and reflective material is clean and visible.

Completely retract and lower the reel before transporting.

Use of a spotter or pilot vehicle is recommended on busy, narrow or hilly roads and when crossing bridges.

Drive at a speed safe for conditions.

Do not exceed 25 mph (40 kph) when transporting the header on the optional transport package.

3.10 - Using Correct Torque Values

IMPORTANT!

It is extremely important that you use the correct torque values when servicing your AirFLEX header. Failure to follow the torque recommendations on page 149 can result in equipment damage.

3.11 - Practice Safe Maintenance

🗥 WARNING!

Before attempting to service your equipment, ensure that you fully understand any procedure that you are about to attempt.

Ensure all equipment is secured against sudden drops.

Keep the work area clean and dry.

Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts. Remove buildup of grease, oil, or debris.

If welding on the header, first disconnect battery ground cable (-). before making adjustments to electrical systems or welding on the header.

The header must be lowered to the ground before servicing. If the work requires that the header or reel be lifted, provide secure support. If left in a raised position, hydraulically supported devices can settle or drop suddenly.

Do not support the header on cinder blocks, hollow tiles, or props that may crumble under continuous load. Do not work under a header that is supported only by a jack.

Do not attempt to clean drive belts or drapers with flammable cleaning solvents.

3.12 - Fire Safety

① WARNING!

Build up of chaff and crop debris near moving parts is a fire hazard. Check and clean these areas frequently. Before inspection or service, shut off engine, engage the parking break, remove the key and wait for all moving parts to come to a stop.

Keep a fire extinguisher with your equipment at all times and ensure the operator is educated in its operation.

3.13 - Keep Equipment Clean

IMPORTANT!

Inspect and clean your equipment before every use. Clear away all material buildup. Pay special attention to all moving parts such as drive belts, drive shafts, and bearings. Failure to keep the equipment clean can result in fire.



4. Safety Decal Locations

Please take a moment to walk around your equipment and familiarize yourself with the safety decals and features on your equipment. Refer to the figure below and the decal list on the following pages for assistance.

Please ensure that you fully understand all safety warnings and instruction before operating this equipment.

























- 1. Red/Orange reflector
- 2. Red Reflector
- 3. Yellow Reflector
- 4. Left end reel fore/aft indicator
- 5. Crush warning keep safe distance
- 6. Fall warning do not step here
- 7. Rotating shaft warning do not touch
- 8. Entanglement Warning do not touch
- 9. Reel drop Warning, lock reel arm when servicing



- 10. Turn Off equipment and read manual before servicing
- 11. Read manual before operating
- 12. Crash warning do not exceed 32km/h(20 mph)
- 13. Rotating part warning turn off equipment and read manual before servicing
- 14. Pinch warning keep away from moving parts
- 15. Grease every 10 hours
- 16. This is not a step
- 17. Ensure air system is fully pressurized before transporting
- 18. Grease every 50 hours
- 19. Do not pressure wash this area
- 20. High Pressure oil do not expose skin to oil
- 21. Operators manual location
- 22. Secure reel tines before operating
- 23. Basic Lubrication instructions
- 24. Basic belt tension instructions
- 25. Right-Hand reel fore/aft indicator
- 26. Left and Right end reel arm height adjustments instructions
- 27. Center reel height adjustment instructions
- 28. Draper tension instructions
- 29. Transport weight warning. Be aware of equipment weight and read operators manual before transporting.
- 30. Wash equipment before use.
- 31. Tip warning, ensure combine is properly ballasted prior to operating.



5 - Main frame and Header Height Control

5.1. Cutterbar Drive Paddle Replacement

The cutterbar is held in place by a paddle assemblies. There are three different paddles on each header.

- End Paddles
- Drive Paddle
- Common Paddle

5.1.1. Drive Paddle Replacement

WARNING!

Ensure your header and all attachments are secured when not in use. Keep bystanders away from equipment and storage area. Failure to comply can result in injury or death.

ACAUTION

Use Proper Lift Tools to Secure Parts As Moved

- 1. The drive paddle is held in place with two bolts in the rear and 10 carriage bolts in the front holding the paddle to the cutter bar.
- 2. Remove the air from the system allowing the cutterbar in the lowest position.
- 3. Place a suitable jack or lifting jack to the rear of the paddle.
- 4. Remove the feather plate over the knifedrive.
- 5. Attach a lifting device above the drive paddle and attach the drive paddle to the device.
- Support the cutterbar by using a ratchet straps around the reel tube. Just tighten the straps to support the cutterbar. Too much pressure could bend the reel tube.

 Remove the knife drive bearing assemblies. Save shims behind the bearing mounts as they will need to be re-installed during assembly. Keep track of their locations. Figure 1



Figure 1

- 8. Remove the carriage bolts retaining the front of the paddle to the cutterbar. The carriage bolts are not the same length so note the locations. Figure 1
- 9. Raise the front of the paddle up and remove the strap from the paddle. Figure 1
- 10. Remove the knife drive belt as described in **6.5 Knife Drive Belt Removal**
- 11. Remove the lines leading to the airbag. Remove the airbag by removing the bolts holding the airbag in place. Note: Make sure to mark the location of the airbag in the mounting holes.
- 12. Remove any header height attachments to the strut.
- 13. Remove the two large bolts and bushings at the rear of the paddle. Note: Make certain the paddle is secured to the jack at the rear.



Figure 2



- 14. The paddle can then be lowered from the strut using the two lifting devices. Make certain to be careful when lowering the paddle to prevent it from falling.
- 15. Any repairs can now be done on the drive paddle.
- 16. Assemble in the reverse steps. It is best to get the front of the paddle lifted first and then move the rear of the paddle in place.
- 17. Install the bushings and bolts in the rear pivot of the paddle. Use red Loctite on the threads and torque the bolts to 200 ft. lbs. (271Nm).
- 18. Install the carriage bolts in the front of the paddle and torque to 31 ft. lbs (42Nm)
- 19. Install the airbag and air-lines.
- 20. Install the knife drive bearings as outline 8.2
 Knife Drive Assembly Low Profile Guards
- 21. Install all Header height parts.

5.1.2. Common Paddle Replacement

- 1. The common paddle is held in place with pin in the rear and carriage bolts in the front holding the paddle to the cutter bar.
- 2. Remove the air from the system allowing the cutterbar in the lowest position.
- 3. Place a suitable jack or lifting jack to the rear of the paddle.
- 4. Remove the feather plate over the front of the common paddle.
- 5. Attach a lifting device above the paddle and attach the paddle to the device.
- 6. Support the cutterbar by using a ratchet straps around the reel tube. Just tighten the straps to support the cutterbar.
- Remove the bolts retaining the front of the paddle. Note: the carriage bolts are different lengths. Make locations for easier installation when assembling. Figure 3



Figure 3

- 8. Remove the strap holding the front of the paddle.
- 9. Remove the air line from the airbag at the rear of the paddle. Remove the airbag from the paddle. Note: Make sure to mark the location of the airbag in the mounting holes.



Figure 4

- 10. Remove any Header Height control parts that are attached to the paddle.
- 11. Remove the bolt holding the pin at the rear of the paddle, and remove the bolt and then slide out the pin. Figure 5



Figure 5

- 9. The paddle can then be lowered from the strut using the two lifting devices. Make certain to be careful when lowering the paddle to prevent it from falling.
- 10. Any repairs can now be done on the drive paddle.



- 11. Assemble in the reverse steps. It is best to get the front of the paddle lifted first and then move the rear of the paddle in place.
- 12. Install the pin at the rear pivot point. Install the carriage bolt and torque the nut to 31 ft. lbs (42 Nm)
- 13. Install the carriage bolts in the front of the paddle and torque to 31 ft. lbs (42Nm)
- 14. Install the airbag and airlines.
- 15. Install header height control parts

5.1.3. End Paddle Replacement

1. Remove the crop divider and the shield behind the crop divider to expose the front paddle attaching bolts.



Figure 6

- 2. Remove the shield covering the airbag. Figure 6
- 3. Remove the air from the system allowing the cutterbar in the lowest position.
- 4. Place a suitable jack or lifting jack to the rear of the paddle.
- 5. Remove the feather plate over the front of the end paddle.
- 6. Attach a lifting device above the paddle and attach the paddle to the device.
- 7. Support the cutterbar by using a ratchet straps around the reel tube. Just tighten the straps to support the cutterbar.
- 8. Remove the bolts retaining the front of the paddle. Note: the carriage bolts are different lengths. Make locations for easier installation when assembling.
- 9. Remove the strap holding the front of the paddle.

10. Remove the air line from the airbag at the rear of the paddle. Remove the airbag from the paddle. Note: Make sure to mark the location of the airbag in the mounting holes.





10. Remove any Header Height control parts that are attached to the paddle.

11.Remove the bolt holding the pin at the rear of the paddle, and remove the bolt and then slide out the pin. Figure 8



Figure 8

12. The paddle can then be lowered from the strut using the two lifting devices. Make certain to be careful when lowering the paddle to prevent it from falling.



- 14. Assemble in the reverse steps. It is best to get the front of the paddle lifted first and then move the rear of the paddle in place.
- 15. Install the pin at the rear pivot point. Install the carriage bolt and torque the nut to 31 ft. lbs(42 Nm)
- 16. Install the carriage bolts in the front of the paddle and torque to 31 ft. lbs (42Nm)
- 17. Install the airbag and airlines.
- 18. Install header height control parts
- 19. Replace all shields that were removed.

5.2 - Flex HHC

There is a Flex HHC (header height control) on the main frame.

This section of the manual covers the mechanical part of the system. See the electrical section for anything dealing with the wiring or troubleshooting the electrical section

The flex HHC system is split between the left and right side. All of the adjustments and repair are the same between the two sides.

The components of the system are:

- A. The activation tabs
- B. The strut sensing rollers.
- C. The HHC tube
- D. HHC sensors
- E. HHC mechanical link between the tube and the sensors



Figure 9

- 1. To remove the HHC flex tube, remove all of the activation tabs on the tube.
- 2. On the end of each tube is a lock collar on the inside of the outer strut. Loosen the inside lock collar. Leave the outside

collar tight to help in positioning the tube. Figure 10.

- 3. This will allow you to slide the tube out of the bushings in each strut.
- 4. Before assembly make certain that the bushings in the struts are clean and free of rust. The HHC tube should also be clean.



Figure 10





- Install the tube and all of the activation tabs. Leave the tabs loose but snug the tab that is attached to the sensor
- 6. The activation tabs for each paddle need to be set properly. This will make sure that the sensor reads the movement of the paddles. The outside tab should be set slightly tighter than the middle tabs. This will account for the "wind up" of the tube.
- The header must be on the combine and off the transport, lifted off the ground. The air system must have at least 100 psi.



 All Flex HHC components are installed and the activation tabs (other than middle activation tab where spring is attached to) are loose on the HHC tube.

Note: The following steps are for adjusting the tabs on a MY 2019 and below.

- Place a 1/8" piece of steel spacer (sickle section, etc.) between the middle paddle activation tab (paddle where the sensor is installed) and the roller. Figure 12
- 10. Set the outside tab so that it is in the center of the roller and against the tab.
- 11. Roll the activation tab forward until it touches the roller and tighten the U-bolt nuts (must have 3-4 U-bolt threads showing past the top of each C-lock nuts, Figure 12 Note: Make certain that all the tabs are set as close to the center of the roller as possible before the clamp nuts are tightened.
- 12. When the end paddle activation tabs are set into place, remove the 1/8" spacer from the middle paddle.
- 13. After the spacer is removed, you will notice that the middle paddle activation tab (the one the sensor linkage is attached to) should relax back close to the roller. There should be less than a 1/16" gap between the middle paddle activation tab and the roller.
- 14. If there is more than 1/16" of gap then redo the following steps with a thinner spacer (thinner than 1/8")
- 15. If there is less than 1/16" of a gap and the activation tab is pushing hard on the roller, then a thicker spacer is needed in the above steps.
- 16. The roller should spin underneath the middle paddle activation tab, the roller underneath the end paddle activation tab should not spin.
- 17. Set the remaining tabs on the tube to a gap of 1/16" between the tabs and the rollers. Note: The wider the head the more tabs are on the tubes to set.
- 18. If more movement is needed reduce each of the stop bolts on the end struts

so that there are only one thread showing on the stop bolts. Figure 14



Figure 12



Figure 13

Honey Bee



Figure 14

On Model Year 2020 and Above

The Flex sensors activation was changed. The spring for keeping pressure on the end paddles is moved to the end paddle. Figure 15



Figure 15

- 1. To adjust the activation tabs raise the header off the ground.
- 2. Inflate the air system to 100PSI
- 3. On the end paddle move the activation tab forward (with spring attached) until the activation tab touches the roller.
- 4. Tighten the cap screws on the activation tab collar. Figure 16



Figure 16

 When the end paddle activation tab is set adjust the sensor activation tab at the struts next to the center. Set the activation tab (with the sensor linkage installed) until the activation tab is just touching the roller on the arm. Figure 17



Figure 17

6. Set the remaining tabs until they just touch the roller. The number of tabs will depend on the size of the headers. Figure 18



Figure 18

5.3 - Terrace Kit

If equipped, the terrace kit is typically installed on headers used for harvesting soybeans and when operating on terraced fields.

This kit includes:

- UHMW guides along the bottom of the cutter bar which protect the transition plate from damage (these can be purchased separately from the skis).
- End paddle skis helps prevent dirt and crop from building at the ends of the head. Figure 19

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Figure 19

 Each of the UHMW guides are positioned in the middle of each cutter bar section. They are retained to the cutter bar with four 3/8"X1" carriage bolts and lock nuts. The holes for the guides are in the cutter bar on Model Year 18 and newer. On older units the holes for mounting the guides will need to be drilled. Figure 20



Figure 20

- The end shoes are mounted to each end strut. They are mounted with a ¹/₂" X 4 ¹/₂" cap screw washers and lock nut on the rear of the shoe. The front is retained with two 3/8" X 1" Carriage bolts and luck nuts. Figure 21
- On the bottom of each end shoe there is a UHMW plate. This plate is replaceable and is retained to the skid shoe with twenty-five 3/16" pop rivets and #10 washers. Figure 22





Figure 21



Figure 22

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Subframe Assembly

5.4 - Subframe Auger

🗥 WARNING!

Ensure your header and all attachments are secured when not in use. Keep bystanders away from equipment and storage area. Failure to comply can result in injury or death.

To remove the auger, install the header on the transport or on the ground. This will allow you to lay the subframe assembly back to expose the auger.

Note: On later model headers the auger will be 69" long instead of 80" long. Disassembly and assembly will be the same but there will be more room between the auger and the side-sheets.

- 1. Remove the driveshafts that are attached to the subframe on the left-hand side.
- 2. Remove the feeder-deck drive belt or chain drive.
- Attach a suitable lifting device to the subframe. Remove the bolts that retain the tilt cylinder and the safety strap to the subframe. Figure 23



Figure 23

 With the lifting device the subframe can be lowered to the rear. Note: Support the drum with a 4X4 piece of wood. The subframe will not go all the way to the ground so it must be supported. ON a CNH adapter watch that the safety latch does not get bent when the subframe is lowered.

5. On the left-hand side remove the bearing flangette, limit stop bracket. Remove the mounting plate by removing the rear attachment bolt. Figure 24



Use Proper Lift Tools to Secure Parts As Moved



Figure 24

6. On the right-hand side remove the Finger timing arm and the limit bracket. The mounting plate assembly can now be removed by removing the rear mounting bolt. Figure 25

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Figure 25

- 7. The auger can now be removed from the subframe by pushing the auger to the left and twisting it out of the subframe.
- On headers with an 80" auger the spider and drum need to be removed as an assembly.
- 9. On headers with a 69" auger the spider can be removed from the auger and then the auger removed without the spider.
- 10. The lifting straps can be installed though the access panels in the auger as shown in Figure 26.
- 11. After the auger is out of the subframe the auger can be disassembled as needed.
- The auger cross shaft can be removed. To gain access to the shaft remove all the covers on the auger tube. Figure 26



Figure 26

 Remove the fingers by removing the lower retaining bolts. This will allow the fingers and the clamps to be removed. Figure 27



Figure 27

- 14. With all the fingers and the clamps removed the cross shaft can be removed. This will allow the cross shaft to be removed from the spider end of the auger. Note: The fingers do not need to be removed if the cross shaft is not removed.
- 15. On the right-hand side of the auger remove the lock collar and bearing.
- 16. On the left end of the auger remove the shaft and spider assembly. Remove the lock collar on the bearing. Take the remaining two bolts out to the end disc pulling the disc out of the auger. This will allow the cross shaft to be pulled out of the auger. Figure 28 Note: 80-inch auger configuration shown.



Figure 28 80 inch auger assemblies

- 17. To reassemble install all the finger clamps, leaving the fingers out of the clamps, on the shaft. Install the bearing in the righthand side of the auger. Slide the shaft in from the left-hand end. Install the flanges and bearing on the disc. Slide the shaft in the auger and in the right-hand bearing. Bolt the disc in place.
- 18. Install each of the fingers in the clamps and through the bushings in the auger.

19. Install the lock collars but do not tighten. Align the cross shaft in the auger so all of the fingers align with the slides in the auger tube.

- 20. Install Left-hand spider on the auger. Use red Loctite on the mounting hardware and torque the bolts to 23 ft. lbs.
- 21. Tighten the set screws in the lock collars to 97 in. lbs.

69-inch Auger Assemblies

- 22. To reassemble install all the finger clamps, leaving the fingers out of the clamps, on the shaft.
- 23. Install the bearing in the right-hand side of the auger. Slide the shaft in from the left-hand end.
- 24. Support the left end of the shaft and adjust the shaft so that 7.9" (200.7mm) of the shaft extends through the bearing. Figure 29 Tighten the lock collar on the bearing



Figure 29

25. Install the end cap and shaft as shown in Figure 30



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Figure 30

- 26. Install bearing and shaft assembly. Tighten the lock collars.
- 27. Install each of the fingers in the clamps and through the bushings in the auger.

Installing the Auger in the Subframe Both Auger Lengths

 Place auger back in the subframe and install the right-hand bearing mount. Install the timing arm. Figure 31



Figure 31

29. Assemble the auger mounting bracket on the left side and tighten all hardware.





Figure 32

 Raise the subframe back into place and attached safety strap and tilt cylinder. Figure 33



Figure 33



5.5 - Tilt Cylinder Position

5.5.1 - Model Year 2019 and below

On all model year 2019 and above headers the position of the tilt cylinder has three different positions depending on the combine. SDX headers use a 7.5-Inch-long cylinder.

• Position One (Factory position): Top hole for the front of the cylinder and lower hole for the rear position. Figure 34



Figure 34

 Position Two: Bottom hole for the front of the cylinder and lower hole for the rear of the cylinder. This can be used in some crop conditions if the guards need to tilt forward or keep the guard's level to the ground. Figure 35



Figure 35



• Position 3:

Top hole on the front of the cylinder and top hole on the bottom of the cylinder. This can be used on combines with a steeper feeder house angle to lower the guard angle. Figure 36



Figure 36

5.5.2. MY 2020 Tilt Cylinder

1. The model year 2020 has a new style cylinder. This cylinder is larger to assist in moving the head. The cylinder also uses cast end caps and welded clevises at each mounting point Figure 37 A safety strap still retains the cylinder from over-extending. The positions for the cylinder are the same as MY2019 cylinder.



Figure 37

2. A manual turn buckle is available. This adjustable turnbuckle will still adjust the angle of the head but the combine must be shut off and the operator will need to get out of the cab to adjust the turnbuckle. Figure 38

3. The turnbuckle can be adjusted from 16.25"-19.25" (41.3cm-48.1cm)



Figure 38

4.

6 - Drives

Note: Adjust the tension when the belt is warm. If adjusted when the belt is cold can cause the belt to be to not be the proper tension when it is warmed up by operation. The belt tension should be checked after at least one hour of operation.

Note: Do not bend or fold the belts to less than a 4-inch diameter. If the belt is bent too small the cords could be damaged

Note: The pulleys for the drive on each brand of combine and Model Year of header are different sizes. See section 16.5

Note: On all drives without a spring-loaded idler the belts must be adjusted when at operating temperature.

There are two specifications

- A new belt (0-24 hours)
- A used belt (24+ hours)
- 1. The belts without a spring tension system will need to be adjusted to the correct HZ setting.
- 2. This is done by using an app on a smart phone.
- 3. Honey Bee recommends the following apps as they have been tested for accuracy. Take note of the app icon and developer name as there multiple apps with similar names.

NOTE:

Using an app to measure belt frequency requires a quiet location in order to take accurate measurements.

Please note this is a 3rd party application which is not published by Honey Bee. The software may be removed or changed without notice, this is beyond Honey Bee's control.

4. Apple Devices (IOS) App Name: Fine Tuner

> Developer Name: 9928189 Canada Inc. Link: <u>http://www.finetunerapp.</u> <u>Com</u>



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5. Android Devices



Figure 40

6.1 - Feed Auger Drive Removal

- Remove the drive shafts from the left-hand GT case. This is done by pressing the release on each end of the shaft. Remove the bolt retaining the clutch shaft to the GT case. Figure 41
- 2. Loosen the lock nuts at the front of the GT case and remove the adjusting bolt under the left-hand GT case. Figure 42
- 3. Loosen the tension bolt for the feed lefthand GT drive belt, remove the bolt retaining the idler and remove the belt.



- 4. Remove the left-hand draper drive belt.
- 5. Remove the auger drive belt by removing the adjusting bolt and the idler retaining bolt.
- 6. Remove the pulleys by removing the allenhead screws in the pulley and use one of the screws to push the hub off the shaft.
- All cogged pulleys on the Airflex use a tapered hub that tightens the pulley to its shaft.
- To remove a cogged pulley from its shaft, remove both of the set-screws that keep it tight. Figure 44
- 9. If threading this set screw into the central hole does not separate the hub from pulley, tap with a pipe or similar press tool and a hammer.
- 10. Remove the 4 bolts retaining the bearing housings to the GT Case. Figure 43



Figure 41



Figure 42



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Figure 44

 Replace the complete bearing housing assembly. (Note: In most cases if a bearing is out it is better to replace the complete assembly)

6.2 - Feed Auger Drive Installation

- 1. If any shims were found under the bearing housing replace the shims in the same positions.
- 2. Tighten mounting hardware on each housing replaced to 75 ft. lbs (101Nm).
- 3. Install the drive pulleys and hubs.
- 4. Torque the drive pulley hub set screws to the torque as described in Figure 45 and Figure 46.



- b. The 3/8" set-screws in the remaining pulleys are torqued to 24 ft. lbs.
- c. Note: Use Red Loctite on the setscrews.

Note: Some units may have metric screws vs. standard.

Figure 45



Figure 46

- Install Idlers and tighten idler mounting bolts on the left-hand and right-hand drives Figure 45 and Figure 46 to 150 ft. lbs.
- 2. Install the auger drive belt and tighten it to
 - a. 0-24 Hours of use 195-200HZ
 - b. 24+ of use 165-170HZ.
- 3. Install the draper drive belt and use the tension bolt on the underside of the gearbox assembly to tighten the belt.
 - a. Note: Pick up the end of the GT case and move around so that the GT case will "find home". Then Recheck the tension of the belt.
- 4. Retighten the lock nut and lock bolts when desired tension is achieved. Figure 47



Figure 47



6.3 - Right-Hand Knife Drive Bearing Removal

 Remove the right-hand drive shaft that connects the GT case to the combine. Remove the knife drive shaft by removing the 4 mounting bolts on each end of the shaft. Figure 48



Figure 48

3. Loosen the jam nuts and spring assembly holing the right-hand draper belt. Figure 49



Figure 49

- 4. Remove the right-hand draper drive cog-belt
- 5. Remove the bearing housing assembly

6.4. Installation Right Hand Drive

1. If any shims were found under the bearing housing replace the shims in the same positions.

- 2. Tighten mounting hardware on each housing replaced to 75 ft. lbs (101Nm).
- Install the right-hand GT drive cog-belt. Figure 50 Use the adjustment bolt to tighten the belt to
- 0-24 hours of use 180-190Hz
- 24+ hours of use 160-170Hz



Figure 50 2. Install the Right-hand draper drive cog-belt.

3. Adjust the cog-belt tension via the adjustment bolt. Note: Pick up the end of the GT case and move around so that the GT case will "find home". Then Recheck the tension of the belt.

- Retighten the lock bolts and lock nut when desired tension is reached. Figure 49
- 5. Install the knife drive shaft on the front bearing mount. Tighten the mounting bolts to 75 ft. lbs (101Nm)



6.5 - Knife Drive Belt Removal

 Remove the 4 bolts that retain the drive shaft to the bearing housing on the GT drive Figure 51



Figure 51

- 2. Remove the two bolts holding the tie rod arm. Figure 51
- 3. Loosen the lock nut and lock bolt but do not remove. Loosen the top bolt. Figure 52



Figure 52

- 1. Remove the belt.
- 2. Replace the belt and tighten the belt using the locking cam.
- Install the knife drive shaft on the front bearing mount. Tighten the mounting bolts to 75 ft. lbs (101Nm)
- 4. Correct tension is achieved when the belt vibrates at 60-70Hz when being tapped with a wrench.

- 5. The tension can also be set by using a torque on the adjustment bolt.
- Slightly loosen the lock bolt and two lock nuts shown below. DO NOT remove them. Figure 53
- While holding the lock bolt in place with one wrench, place a second wrench on the adjustment bolt and lift up with 180 ft/lb (244 Nm) of force. Ensure the lock bolt is tight. Figure 54
- 8. Tighten the lock nuts on the knife drive. Figure 55



Figure 53



Figure 54

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Figure 55

6.6 - Knife Drive Bearing

- 1. After removing the belt if the bearings need to be replaced remove the 4 bolts that retain the top pulley.
- 2. Remove the 4 bolts retaining the top bearing. Figure 56



Figure 56

- 3. This bearing can be replaced as a complete assembly.
- The lower knife drive bearing can be replaced by removing the connecting arms. Figure 57



Figure 57

- 5. Remove the four $\frac{1}{2}$ carriage bolts retaining the connecting rods to the pitman arms.
- 6. Note: The pitman arms can be removed with two long pry bars or with a gear puller. If using a gear puller be sure not to damage the threaded hole in the hub shaft. A 3/8" bolt should be threaded in the center hole and place the puller on the bolt when removing the pitman arms.
- 7. Remove the bolt through the center of the bearing and remove both flywheels.
- 8. Remove the hose, fittings and drain the oil from the bearing. Note on model year 2019 and newer the drain plug on the bottom of the bearing will need to be removed to drain the oil. Figure 58



Figure 58



- The bolts clamping the bearing to the drive paddle can be removed and the bearing can be slid out of the drive paddle. Note it may be necessary to drive a wedge in the clamp to loosen the clamps.
- 10. Install the new bearing assembly in the drive paddle. Tighten the clamp bolts enough to hold the bearing in place.
- 11. Install both flywheels. Make certain to line up the roll pins and cross-hatch on the flywheels and bearing housing. The bearing pin on the flywheels should be 180 degrees from each other. Retain the flywheels with the center bolt. Use Red Loctite and tighten the nut to 315 ft. lbs. Figure 59



12. Center the bearing assembly in the drive paddle making certain that the flywheels are the same distance from the paddle. Use red Loctite and tighten the bolts to 120 ft. lbs. Figure 60



Figure 60

- 13. Install the pitman arms on the flywheels and torque the bolts to 23 ft. lbs.
- 14. Note: When installing the pitman arm, make certain the snap ring points to the outside of the flywheels. The inner race of the connecting rod bearing must be flush with the stub on the flywheel. Figure 61





- 15. Install lower fitting and hose and fill the bearing housing with 75W-90 gear oil until it is halfway in the tube.
- 16. Install top fittings and hose.
- 17. Install the knife drive belt and tighten the belt to 60-70 Hz.
- 18. Install the tie rods to the pitman arms and torque the carriage bolts to 68 ft. lbs (92 Nm)

Note: Check timing after installation per section 8.3 - Knife Drive Timing

6.7 - Slip Clutch

6.7.1 - Assembly and Adjustment

The slip clutch is a friction type clutch. It has two friction discs to maintain the torque on the auger drive.

1. With the header on the combine open the left-hand shield to expose the clutch.

2. Remove the slip clutch from the header. Figure 62



Figure 62

3. Loosen the bolts retaining the clutch spring. Figure 63



Figure 63

- 4. Disassemble the clutch and replace the friction discs.
- 5. Tighten the clutch bolts up finger tight.
- 6. Replace the clutch on the drive shaft on the drive.
- 7. Install the other end of the shaft on the auger stub shaft.
- 8. Run the header for about 2-3 seconds with the clutch slipping. This will burnish the new friction discs.
- 9. When tightening the bolts use a crossing pattern. Figure 64



Figure 64

10. Once the clutch is burnished tighten the bolts in the same crossing pattern until the dimension of between the spring and plate is reached at each bolt location, Figure 64. Tighten the bolts 2 flats and then go to the next bolt.

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 The double spring was used on all clutches, Figure 66. On these clutches the distance between the spring and the top plate should be adjusted to 20.7mm + or – 0.2mm.



Figure 65




7 - Decks

The common (or center deck) is driven from a PTO shaft off the LH GT case. The drive goes through a belt or a chain, depending on Model Year, to a pulley on the drive roller of the draper drive.

7.1 - Center Deck Drive System

There are three different drive systems for the center deck. Model year 2018 and below a spring controls the tension on the drive belt. On the model year 2019 a solid link controls the tension. On model year 2020 and above the center deck is driven by a chain.

7.1.1 - On model year 2019 and Below

- Remove the tension rod by loosening the jam nuts and shorten the rod to remove the belt. Figure 67
- 2. The idler can be removed by removing the pin at the bottom of the idler mount.



Figure 67

- 3. The idler can be disassembled for repair by removing the pulley.
- 4. To remove the pulley, take out the set screws and pull off the tapered hub. One of the set screws can be threaded in the additional hole to pull the hub out of the pulley.



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Figure 68



- 6. Remove the set screws from the lock collars on the shaft.
- 7. Remove the bearing flangettes and the bearings off the shaft. Figure 69
- 8. Assemble the idler in the reverse order.
- 9. The bearings are held on with a split lock collar bearing, Figure 69. Torque the Torx screws in this lock collar to 97 in. lbs
- 10. The belt is tensioned with the nuts on the adjustment rod, Figure 67.
- The tension on this belt is measured in HZ. Tighten the bolt assembly until the following tension is reached.
 - 0-24 Hours use 90-95 Hz

• 24+ hours use 77-82 Hz

• Note: The belt should be checked at operating temperature.

IMPORTANT!

Re-check the center draper drive chain tension when the header is lifted off the ground by the combine and when the tilt cylinder is retracted as this may change the geometry of the center draper drive system.

7.1.2 - On Model Year 2020 and above.

- 1. Loosen the jam nut on the spring tension. Figure 70
- 2. Remove the connector link to allow the chain to be removed.
- 3. Once the chain is removed remove the bolt on the front of the tension system.
- 4. To remove the idler assembly, remove the bolt that secures the lower pivot pin in the idler assembly. Figure 70
- 5. Remove the pin and idler assembly. The idler can then be disassembled like the earlier Model years.



Figure 70



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- 6. The idler assembly is disassembled in same manner as the previous years.
- 7. Install in the reverse order.
- To adjust the chain, loosen the locknut (A) on the adjustment rod. Figure 71
- 9. Turn the adjustment nut (B) until the tension indicator is flush with the washer at the end of the spring.
- 10. Tighten the locknut against the adjustment nut to hold the spring in place.



Figure 72



Figure 73

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IMPORTANT!

Re-check the center draper drive chain tension when the header is lifted off the ground by the combine and when the tilt cylinder is retracted as this may change the geometry of the center draper drive system.

7.2 - Center Deck Draper Belt

The center deck has two rollers and a belt tension system. The following is disassembly of the deck.

- 1. Before the tension is off roll the draper belt around to expose the splice.
- To remove the draper belt, loosen the tension off the belt by loosening the spring tension off on both sides of the deck. Figure 74
- 3. Remove all the bolts in the splice and pull the belt off the center frame Figure 74



Figure 74

- 4. After the draper belt is removed the rollers can be removed from the frame.
- 5. On the right-hand side remove the bearing flange and bearing from the rear roller.
- 6. Remove the drive pulley on the left-hand side of the roller.
- Remove the tension system from the front roller. The bearing can now be removed from the front roller. Figure 75



Figure 75

- 7. Remove the front tension assembly and bearing.
- 8. The rollers can now be removed from the right-hand side of the frame.
- 9. Note: If the belt on the center deck is damaged the belt will need to be replaced as it can not be repaired.

Assembly

- 10. Before installing the new bearing, the size of the shaft must be checked,
- 11. A new shaft is 1.250" in diameter.
- 12. If the shaft diameter is worn where the bearing is on the shaft measures 1.249" nothing else is needed and the bearing can be installed.
- 13. If the shaft diameter is 1.247" to 1.249", clean the shaft and apply Loctite 648 to the shaft when installing the new bearing.
- 14. If the shaft diameter is below 1.247" a new roller must be installed.
- 15. Make certain that the V-guides on the rollers are aligned. If they are not aligned the belts will not track correctly.
- 16. Slide the collar on the bearing and tighten the set-screws on the collar to hold in place. Just tighten the screws enough to hold into place. DO NOT overtighten the set screws. Then tighten the Torx screw in the collar to 97 in.lbs. Figure 76





Figure 76

- 17. Install the drive pulley, belt or chain and sprocket depending on Model Year. Make certain that the belt is aligned with the idler pulley assembly on the subframe.
- 18. Make sure that the rock trap is in the open position prior to installing the draper belt on the deck. Place draper belt bundle on the top of deck runners, and unroll with the slats facing up. Be sure to align the v-guide with the notched side of the roller toward the rear end of the header. Wrap draper around one of the rollers and feed draper into the bottom runner of the deck. The bottom runners will support the draper, and prevent it from hanging down.
- 19. Pull draper through bottom runner, and wrap around the other roller. Pull the ends of the draper together.
- 20. Install a connector bar to close the joint. The curved sides of the connector bar are together. The heads of the screws for the connector bar should be installed pointing to the rear when the connector bar is on the top side of the feeder-deck. This helps prevent the crop being caught on the screws.

Tensioning the Center Draper Belt

- 1. Before tensioning the belt make certain that the idler roller is free to move and does not bind.
- Locate the two tensioners on each side of the center draper on the underside of the header. Figure 77
- Loosen the 1/2" UNC Jam Nut, hold the lock nut with a wrench to prevent it from moving and turn the adjuster bolt until the tension indicator is in line with the end of the spring. Retighten the jam nut.

4. Repeat the process for the adjuster bolt on the other side of the center draper.



Figure 77

- 5. Measure the distance between the center of each roller on the center deck. Figure 78
- 6. If the distance is not the same tighten the adjuster on the side with the shortest measurement.
- 7. This will ensure that the draper is running straight and the V-belt on the back of the draper will stay in the groove.



Figure 78

WARNING!

When working under platform always lower hydraulic cylinder safety stop onto cylinder rod to prevent platform from lowering.

NOTE:

For difficult crops, additional belt tension may be required. Increase belt tension only if necessary as belt life, tracking, and drive are affected.

7.3 - Lateral Deck Drive Rollers

The lateral deck is assembled in the same manner for all width headers.

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- 1. To remove the draper and rollers loosen the tension by flipping the over-center latch on the outside of the draper.
- 2. Move the splice to the end of the header and remove all the bolts in the splice. Figure 79



Figure 79

- Loosen the bolts on the bottom of the gearbox. Remove the tension bolt and remove the belt from the gearbox. Figure 80
- On the end of the deck, closest to the center deck, remove the shield, belt, and drive pulley. Figure 81



Figure 80

- 5. Remove the lock collars.
- Remove bearings assemblies on the drive side by removing the two retaining bolts. Figure 81



Figure 81

 On the front side remove the retaining bolt the holds the roller in place. Figure 82 That will allow you to remove the roller. This figure shows Model Year 2015 and above. Model Year 2014 and below is slightly different.



Figure 82

Idler Roller Removal

 Remove the shield and lock collar. Remove the bolts holding the bearing holder and remove the bearing and holder. Figure 83



Figure 83

2. Remove the bolt from opposite side of the roller. This will allow the roller to be removed from the deck.



7.4 - Roller Bearing Replacement

- 1. The bearings in the non drive end of the rollers can then be replaced. The roller bearings are pressed into the rollers with a friction fit and held in place with a retaining ring.
- 2. Remove seal that holds the bearing assembly in place. Be prepared to replace the seal with a new one upon replacement. Remove the snap ring that secures the bearing in place.
- Use a slide hammer to remove the stub shaft and bearing from the roller Figure 84



Figure 84

Assembly

 Assemble the bearing and the stub shaft. Install the snap rings to the stub shaft to hold it in place. Install the bearing assembly and the seal in the roller Figure 85



Figure 85

- 2. Install the rollers in the deck.
- Install the bearings. Install the slider onto the shaft and the deck frame. Slide the collar on the bearing and tighten the setscrews on the collar to hold in place. Just tighten the screws enough to hold into place. DO NOT overtighten the set screws. Then

tighten the Torx screw in the collar to 97 in.lbs. Figure 86



Figure 86

 Install the drive pulley. Make certain that it is aligned with the pulley on the drive gearbox.

7.5. Draper Belt Repair

The lateral draper belts can be repaired. A repair kit is available through parts.

- The draper, should be cut midway, between two slats to provide ample material for the new joint. With a measuring tape, measure, and mark a line six inches from a slat on a good portion of the draper to the side of the damaged section.
- 2. Ensure this line is straight and square. If this line is not straight and square, the draper will not track properly.
- 3. Measure 19 3/4" from the first line, ensuring the damaged section of the draper is included in this area and mark a second line, ensure this line is also straight and square. Figure 87



- 4. Place a board directly under the line you have marked, to support the section you will be cutting. With a utility knife and a straight edge cut the draper along the marks. This cut must be accurate, and square to assure that the draper will track properly. Repeat this step on the other side of the damaged area.
- To mark the location for the connector bar holes, measure 1" in from each edge to be joined, and mark a line parallel to the cut edges. Figure 88



Figure 88

- 6. On each of these lines, measure 1-1/8" from the front edge of the draper, and make a mark for the first hole.
- 7. Drill 3/16" holes through each mark.
- 8. Place the backs of the draper together, lining up these drilled holes.
- Place a connector bar on each side, line up the holes, and secure with a machine screw and nut.
- 10. Match up the edges of the draper and drill a hole at the opposite end on the 1" line, using the connector bar as a template. Insert a screw and secure in place.



Figure 89

11. Drill the remaining holes through the holes in the connector bar, insert screws and secure. 12. Repeat steps 10 through 13 for the other cut. The splice section should be fully secured at this point. Figure 90

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Figure 90

IMPORTANT

Ensure the screw heads are facing the direction the draper will be traveling.

13. A set of complete instructions are sent with each kit.

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7.6 - Lateral Draper Belt Installation

 After the rollers are installed the rollers use a square to make certain the roller is perpendicular to the frame. Figure 91 If the roller is not square, loosen the lock nut and reposition the drive roller via the adjustment nut. Figure 92



Figure 91



Figure 92

Make sure that the *quick release handle* is in the open position prior to installing the draper on the deck. Figure 93



Figure 93

Place draper bundle on the top of deck runners, and unroll with the slats facing up. Be sure to align the v-guide with the notched side of the roller toward the rear of the header. Figure 94



Figure 94

Wrap *draper* around one of the *rollers* and feed draper into the bottom runner of the deck. The bottom *runners* will support the *draper*, and prevent it from hanging down.

Pull draper through bottom runner, and wrap around the other roller. Pull the ends of the draper together on the top surface of the *deck*. Install a *connector bar kit* to close the joint. The heads of the screws for the connector bar should be installed pointing to the rear when the connector bar is on the top side of the feederdeck.

The head of the *screws* for the *connector bar kit* should be installed in the direction of travel. This helps prevent crop being caught on the *screws*. Figure 95



Figure 95

Once the draper is installed close the quick release lever to apply tension to the draper.

Turn the adjuster bolt until the indicator is aligned with the washer. Lock the handle and tighten the lock nut. Figure 96.

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Figure 96

7.7 - Draper Drive Gearbox Replacement

Each lateral deck has a 90-degree gearbox that drive the draper. This gearbox is driven from either the Right-hand GT case or the lefthand GT case. If there is an issue in the gearbox it is best to replace the gearbox.

Right-Hand Draper drive Belt

1. Loosen the two jam nuts and bolts that secure the drive housing. Loosen the jam nut and tensioner spring bolt on top of the case. This will loosen the drive belt to the input gear and the belt can be removed. Figure 97.



Figure 97

On the left-hand draper, loosen the two jam nuts on the GT case. Loosen the jam nut and bolt on the bottom of the case. This will loosen the drive belt to the input gear and the belt can be removed. Figure 98



Figure 98

Note: The rest of the procedure works on either the left-or-right hand side gearbox removal.

Remove the spring tension system off the gearbox assembly. Loosen the gearbox mounting bolts to relieve the tension so the gearbox can slide over. Remove the drive belt. Figure 99



Figure 99 The bolts on the bottom of the gearbox can now be removed. Figure 4



Figure 100

Note the locations of the pulleys on the gearbox shafts. Remove the pulleys from the gearbox by removing the set-screws in the tapered hub on the pulley and use one of the screws to "push" the hub out of the pulley. Figure 101



Figure 101

7.8. Draper Gearbox Seal Replacement

1. The input and output shaft seals are replaceable. Figure 102



Figure 102

- 2. To replace the output shaft-seal remove the four bolts retaining the shaft end cap.
- 3. Once the end cap is removed the seal can be pressed out of the housing
- 4. To replace the input shaft seal, the seal can be removed with a seal puller.
- 5. Use a seal puller to remove the seal from the neck of the gearbox. Figure 103
- 6. To install the seal use a pipe to press on the outside of the seal to push the seal in place.



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Figure 103

7.9. Bearing Replacement on Draper Gearbox

In addition to the seals the bearings can be replaced in the gearbox. There are four tapered roller bearings in the gearbox. There are two bearings on the output shaft and two bearings in the end cap of the input shaft. Figure 104 Note: If the shafts, gears, or housing is damaged the entire gearbox must be replaced.



Figure 104

7.9.1. Output Shaft Bearings

- To replace the bearings on the output-shaft remove the four bolts holding the cap. Figure 104
- 2. This will allow the output shaft and bearings to be removed from the gearbox.
- 3. Remove the cap from the shaft. A new seal can now be installed in the cap.

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- 4. Press the gear and bearing off the end of the shaft. Figure 105
- 5. The bearing on the other end of the shaft can now be pressed off.



Figure 105

- 6. Remove and replace the outer bearing races in each of the end caps.
- Clean the surfaces of the gearbox where the end cap mounts. Apply a thin layer of Loctite 515 or 518 or similar Anaerobic gasket maker to form the new gasket. Replace the solid end cap on the gearbox
- 8. Press the new bearing cone on the end of the shaft. Make certain that it is pressed against the shoulder of the shaft.
- Place the gear on the shaft and press the new bearing cone and gear on the shaft. Make certain the gear is seated against the shoulder on the shaft and the bearing is seated against the gear.
- 10. Use a thread sealer on the cap bolts and torque the bolts to 76 in. lbs.

7.9.2. Input shaft Bearings

- To replace the input-shaft bearings remove the four bolts retaining the input shaft end cap. Figure 104
- Remove the nut from the end of the shaft. Note: There are two different style of nuts. One is locked by stacking the nut in the keyway and the other has a keeper that locks the nut in place. Both styles are adjusted the same way. Figure 106



Figure 106

- 3. Press the input shaft out of the housing.
- 4. Remove the bearings from the shaft by pressing the bearings and gear off the shaft. Figure 107



- 5. Install new bearings and cups on the shaft.
- Make certain that the spacer is between the bearings. Press the bearings on the shaft until they are against the collar on the shaft. Figure 108





Figure 108

- 7. Install key and gear on the shaft and press the gear against the top bearing.
- 8. Install the nut on the end of the shaft

7.9.3. Gearbox Assembly and Adjustment

- 1. Install the seal in the input shaft housing.
- Install output shaft in the housing. Press the shaft until there is 1.78" (49.9mm) of the shaft past the end of the housing. Figure 109



Figure 109

- Install a paper gasket on the input housing and install the housing in the gearbox. Secure with the four bolts and torque to 76 in. lbs.
- 4. Check the backlash between the gears. The backlash should be between 0.016 and 0.025

- 5. If the backlash is too small install another paper shim under the input housing, 1, Figure 110
- If the backlash is too large install a shim between the gear on the input shaft bearing and gear, 2, Figure 110





7.10 - Installation of the Draper Deck Gearbox.

- Install the pulley on the gearbox before installing the gearbox on the mounting plate. Make certain there is clearance between the gear and the deck frame.
- 2. Set the pulley at the same location and tighten the set screws to 15 ft. lbs.
- 3. Install the gearbox on the plate and install the mounting bolts, leaving the bolts loose so the gearbox will slide.
- 4. Install the draper drive belt. Tighten the jam nuts on the tension system until the spring gauge is at the washer. Tighten the mounting bolts to 17 ft. Lbs. DO NOT USE LOCTITE. Recheck the spring gauge to make certain the tension did not change.
- Install the belt from the GT case to the gearbox. Tighten the adjusting bolt pushing the GT case out. Tighten the bolt until the spring gauge is even with the edge of the spring. Pull up on the end of the case and tighten the jam nuts. Figure 111





Figure 111

 Fill the gearbox with 5.8 oz. (171 ml) 80-90W oil. Remove the plug on the top of the gearcase and fill until oil comes out the side plug. Figure 112



Figure 112



8 - Knife Assemblies

8.1.1. Knife Removal

🗥 WARNING!

Knife sections are sharp!

Wear protective gloves when handling knives.

Raise platform completely and engage feeder house safety stop. Raise reel completely and engage reel lift cylinder safety stops. Shut OFF engine, set parking brake, remove key.

- 1. In order to replace either the left- or righthand knife, you must first remove the feather plate from above the knife head bearings.
- 2. Remove the grease zerk from the bearing. Figure 113
- 3. Remove 4 to 6 guards from around the righthand knife head. Figure 114



Figure 113



Figure 114

4. Remove the bearing housing from the righthand knife head. Figure 115

IMPORTANT!

There are a number of loose components within the knife head that you must take care to keep in place when reassembling. Take special precautions not to disturb the needle bearings within.

5. Wearing protective gloves, lift and pull knife head out from guards. Figure 116







Figure 116

8.2 - Knife Drive Assembly Low Profile Guards

 Install the guards and wear plates on the cutterbar. Between the cutterbar and the guards, spacers and wear plates are installed. These plates keep the guards at the proper spacing. The wear strips keep the cutterbar pushed forward. Figure 117

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Figure 117

- 2. The wear plates go under the guards on the outer side of the cutterbar. The spacers go on the center guards. Figure 118
- On Model year 2019 and older there are 6 spacers used in the center of the cutterbar. On Model Year 2020 and newer there are 10 spacers used.
- On Model Year 2022 and newer two types of wear plates are used. The standard plate and a plate with the wear strip, A, Figure 117, .100 thinner. There are a different number of these wear strips depending on the size of the header. Figure 119

25 ft.	8 per side
30 ft.	10 per side
36-45 ft.	12 per side
50-60 ft.	15 per side







Figure 119

 When installing the guards make certain that the guards and wear plates are adjusted properly. Use a pry bar to push the cutter bar to the rear. Tighten all the guard bolts. To 40 ft. Lbs. of torque on Model Year 2021 and below and 47 ft lbs on Model Year 2022 and above. Figure 120



- 6. Install the knife head bearings on the knife heads.
- 7. Once the seal is on inner race, push the knife head further onto the inner race by hand. DO NOT use a hammer or bench top vise to install knife head bearing onto knife head. At the same time, you are pushing down slightly rotate back and forth to get the rollers aligned onto the inner race. It may be necessary to remove the grease fitting or at least press the check ball in while installing the knife head on the knife head. Figure 121

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Figure 121

- Reinstall grease zerk (if removed) once knife head bearing is fully installed onto the knife head. Put Red Loctite (High Strength) on knife head mounting bolts and loosely connect knife head to bell crank.
- Re-install shims between the knife head and bell crank that were installed at the factory. Watch for clearance between the knife assembly (knife back on top) and guards. If adjustment is needed shims can be added or removed. The shims are 10 gauge and 16 gauge.
- 10. Clearance between the guard and the knife back should be 1-32" to 1/16" Figure 122



Figure 122

- 11. Make sure to optimize clearance with shims for both RH and LH knife.
- 12. Before the knife head bearing mount bolts are tightened, we need to make sure the knife head is bottomed onto the knife head and the knife is running along the bottom of the guard. Figure 123.



Figure 123

- Pry up on the knife head while tightening the knife head mounting bolts to 170 ft-lbs. This will keep the knife from running hard along the top or bottom of the guard sickle section opening.
- 14. Now with everything tightened, have someone stroke the knife by hand (pull on knife drive belt) and another person inspect the RH and LH knife for any tight spots.
- 15. Make sure the RH or LH knife is not interfering with the front/rear of the enter guards. If significant interference is present check out the shimming.
- 16. Ensure when the RH and LH knives come closest together that there is approximately 3/32" of clearance between the ends of the knives. If the clearance is less than this or more then 3/16" please recheck timing of pitman arms. Either one of these conditions tells us the timing of the pitman arms to the tie rod ends could be incorrect. Figure 124
- 17. Check timing per section 8.3 Knife Drive Timing ..



Figure 124

 The knife head installation process can be verified during the run-in stage by checking the guard temperatures and examining for any excessive vibration or interference.

19. It is critical to check the knife head/knife head bearing temperature after it has been fully assembled. Run the knife at full speed for at least 10 minutes to check for abnormal temperature in the knife head/knife head bearing. It can be checked by grabbing the knife head with your hand and if it is too hot to hold onto then the bearing should be checked. If you have a laser temperature gun, check the knife head temperature close to the bearing and if over 175F/80°C please check the bearing.

8.3 - Knife Drive Timing

- 1. Disconnect the drive shaft PTO from the knife drive system to allow you to move the knives freely while aligning.
- 2. Run a long bolt or rod through the alignment hole of the two flywheels to keep them aligned with each other. Figure 125
- 3. Remove the feather plate from above the two knife heads on the cutter bar.
- Remove the knife head bearings and use a straight edge to set the bell cranks parallel. This is the starting point for the timing. Figure 126
- 5. Loosen the large jam nuts on the ball joints.
- 6. Remove the bolts from the rear of the tie rods. Adjust the tie rods until the bell cranks are parallel. Figure 125

Note: Make certain that grease is put on the tie rod ends before the end is threaded in the tie rod. Do not use anti-seize on the threads as this will break-down the Loctite on the jam nuts. Figure 132



Figure 125

- Once bell cranks are parallel screw RH tie rod joint in (clockwise rotation looking at back of tie rod) 3 turns.
- Apply Loctite to jam nuts and tighten the jam nuts to 230 ft. lbs.
 Note: Make certain the tie rods stay straight

when tightening the jam nuts. Use a pry bar to hold the tie rods in place while tightening the jam nut. Figure 126



Figure 126

 Install the carriage bolts to secure the connecting rods on the flywheel. Use red Loctite on the nuts and torque to 68 ft. lbs.







8.4 - Knife/Bell Crank Drive

The Knife drive bell crank assemblies have changed over the past years. The assembly is about the same with some added items.

- To remove the bell crank assemblies, install a bolt in the rear bearing drive for timing. Figure 125 in timing section.
- 2. Remove the feather plates above the knife drive assembly.
- 3. Remove the knife head bearings by removing the bolts. Figure 128. Note the location of any shims behind the knife head bearings.



Figure 128

 Remove the clamp bolts on the tie rods. Note: the clamps must be used with the bell crank that it came off of as it is a matched set.

- 5. Remove the two nuts retaining the bell cranks to the drive paddle. Remove the stabilizer arm between the bell cranks.
- 6. The bell cranks can be removed and the bearings replaced.
- 7. Remove the snap ring and press the bearing from the bell crank. Note the bell crank can be replaced as a complete assembly. If a complete assembly is installed follow the instructions in the kit for the Model Year of header that you are working on.
- 8. If replacing just the bearing follow the instructions in the bearing kit. Make certain that you use the tool provided to press on the OD of the bearing. The letters on the bearing are up when pressing in the bearing. If the bearing is replaced with the non-greaseable bearing the grease fitting in the head of the bolt must be removed and replaced with a plug. Figure 129.



 Install the bell cranks on the drive paddle. Insert the bolts from under the cutter bar and install the stabilizer bar with an O-ring between the top of the bearing and stabilizer. Figure 130 Use grease to hold the O-ring in place. Put the nuts on the bolts finger tight to hold in place. Figure 131





Figure 130



Figure 131

10. Use Green 648 Loctite on the shaft of the tie rod end before installing the clamps. During assembly make certain the snap rings align with the grooves in the clamps. Figure 132



Figure 132

11. Install the clamps on the tie rods. Use new clamp bolts every time the clamp bolts are removed. If the bolts are reused too

much they can fail. Use red Loctite on the nuts for the clamp bolts. Tighten to clamp bolts to 100 ft. lbs. Figure 133



Figure 133

- 12. Note: Do not use Loctite on the bell crank nuts. Torque the nuts to 765 ft. lbs.
- 13. **On Model year 2019** and above a stabilizer with a 1 3/16" hole is being used. The stabilizer has a washer under the stabilizer between the stabilizer arm and inner race of the bearing. This washer goes between the stabilizer and the top of the bearing with the convex side down. Figure 134.



- Two O-rings used under the stabilizer. The O-rings are placed between the stabilizer and the bearing and over the seal of the bearing. Figure 135
- 15. The O-ring between the stabilizer and bearing is used on all units, item 1. The Oring around the bearing is used on Model Year 2019 and above, item 2.





Figure 135

15. Note: Do not use Loctite on the bell crank nuts. Torque the nuts to 765 ft. lbs. Figure 131

8.5 - Cutter bar Connector Kits

 The connector bar is used to repair a broken knife back. The break should be cut out and ground smooth. A cutting section should bridge the break and the connector bar should be installed on the top of the knife back. Figure 136 Note: This is for the standard cutting system.



Figure 136

Note: Knife sections must be installed on the bottom side of the knife back.



9 - Electrical

9.1. Troubleshooting SDX

Note: The full wiring diagram is in the rear pages of the service manual.

The Header height control goes from the header sensors directly to the combine.

The control box in the cab provides a voltmeter to monitor the HHC sensors and to control the functions. The box Figure 137 has a switch for the:

- Air Pressure increase or decrease
- The header mode (Flex or Rigid) Note: On the SDX only the Flex mode has HHC.
- Tilt/Reel function



Figure 137

The power for the display is provided by the combine except on CNH and some Gleaners. On those combines an extra power harness is needed to supply display power. This harness connects to the cigarette lighter in the combine and between the display extension harness

and the display harness. Figure 2



Figure 138

There are 3 relays mounted above the air tank. The relays control

- Air compressor Relay
- Air dump Relay
- Header Tilt valve

Figure 139 and Figure 140



Figure 139





Figure 140

9.1.1. Problem: Air Valve does not hold air in tank or does not regulate the air.

The air tank not filling on the SDX. There could be two issues

Issue 1: Air valve installed incorrectly. The air valve must have the arrow on the valve pointing down away from tank. If the valve is not installed correctly the air will continue to leak from the valve. The arrow on the valve must be turned pointing the ground. Figure 141



Figure 141

Issue 2: The solenoid is sticking or dirty.

1. Remove the diaphragm by removing the 4 screws on the back of the valve. Figure 142



Figure 142

3. Remove the diaphragm and clean the surface area off the valve. Figure 143



Figure 143

9.1.2. Relay Function

- 1. There are three relays on the SDX.
- 2. All three relays are the same and operate the same way. Figure 144



- 3. The power for the relays will come from two sources.
 - a. Air compressor and dump relay get the power from the power harness on the combine.
 - b. The tilt relay will get 12-volt power from the combine.

- 4. All the power goes through the multi-coupler harness.
- 5. The power for the air compressor and the dump relay will receive 12-volts to pin 30 on the relay from pin 8,16,18, on the round plug on the relay panel Figure 145 and Figure 145



Figure 145

- 6. When the relay is energized power goes through the relay to the solenoid at pin 87 on the relay.
- 7. The relay is grounded through pin 85.
- Pin 86 is also a ground that will engage the relay. When a switch is moved on the display, this terminal is grounded and energizes the relay sending power from pin 30 to pin 87.
- 9. The control ground comes from the display.
 - The air dump relay control ground goes through pin15 on the display harness to pin V on the main harness.
 - Air compressor add comes through pin 14 on the display harness to pin U on the main harness.
 - c. The tilt relay come from pin 5 on the display to pin J on the main harness.



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9.1.3. Diode Function in the Relay Circuit.

- 1. The diodes in the three relay circuits are just there to supress any electric surges when the relays are activated.
- 2. The diodes are located just below the relays and plug into the wire harness.



Figure 147

3. The diodes will only allow power in one direction and that is how they will stop the surges in the circuit. If there is an electrical surge when a relay fires it will dissipate the power through the relay ground circuit.



Figure 148

- 4. If the diode fails open the system will still function. With the diode open the system will not have protection against voltage spikes and this can cause failures of the relay or solenoid.
- 5. If the diode fails by shorting this will send voltage back to the relay base and could

damage the relay or melt the contacts in the relay base.

- 6. To test the diode by using a multi meter in the diode mode. Figure 149
- To test the diode, use a multimeter and black lead on one and the red lead on the other pin. The reading should be between 1 and 1000 Ohm. Figure 150
- 8. Reverse the leads and the multimeter should read OL.
- 9. If the multimeter has the same reading in both directions or reads OL, the diode is bad.



Figure 149



Figure 150

9.1.4. Problem: Air Compressor will not operate.

Turn the air compressor on by turning the switch on the display to add air. Does the compressor turn on?



Figure 151

1. Check for 12 volts at the air compressor connector. Figure 152



Figure 152

- 2. If there is 12 volts present replace the compressor. If no voltage or ground is present go to next step.
- Check for 12 volts at the Air compressor relay pin 87. Note: the relay can be removed for this step. Figure 154 and Figure 155 relay location and pin location. If voltage is present go to the next step. If voltage is not present, Check for power and ground at the compressor harness plug.



Figure 153

4. If there is no power or ground follow the circuit back to the combine power harness. If power and ground is present go to the next step.



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Figure 154



Nam	e: ADD-RLY	9017		
Cav	No.	Col.	Spec	Туре
30	C-PWR1	RED	10AWG	GXL
85	C-GND4	BLK	16AWG	GXL
86	C-ADD-AIR	BLK	16AWG	GXL
87	C-PWR3	RED	10AWG	GXL
87a	-	-	2	-

- 4. Check for power at pin 30 of the relay. If no power at pin 30 follow the power harness back to the battery.
- If there is power at pin 30 check for ground at 86. The ground is supplied by the display. If there is no ground follow the wire back through the display extension harness. If there is a ground replace the relay. The dump relay can be used for testing purpose.



9.1.5. Problem: Header Height Sensors not showing voltage

The header height sensors send a signal to the display and to the combine. The sensors have three wires leading to them. The sensors have a 5-volt reference voltage, a ground, and an output signal wire. If there is not a reading on the display for a sensor the three wires will need to be checked. If the display is set for flex only the flex sensors will have power. If the display is set for rigid only the rigid sensors will have power. Figure 156 Note: When testing the system, it maybe necessary to leave the plugs connected and check the voltage or ground from rear of the plug. This will also help to make sure there is connection at the plug.

- 6. The signal wire sends the voltage to the display and the combine for the HHC control.
- 7. The wires can be traced through the main wire harness as shown in Figure 157
- Power for the Header Height sensors comes from the Flex/Rigid switch on the display. If 5 volts is not present at the sensor the red wire must be traced back to the display. Check before and after each connector including the connector at the display.
- 9. Note: To check the wires at the display connector it will be necessary to take the connector apart. Figure 161



- Check the C pin for 5-volt reference voltage. This voltage is from the combine through the display harness. If no voltage is present follow the wire back to the display harness
- 2. Check the ground at pin A. The sensor receives the ground through the back side of the multi-coupler harness on the relay panel.
- 3. Check the connector at Pin B. The voltage should vary as the sensor is moved. The wire goes to the combine as well as the display. Each sensor (Left and right) will go on a separate pin to the combine.
- 4. There are splices in the main harness and on the signal wire it is possible to have a signal going to the display and not to the combine. When testing make sure you test for signal at the combine and not just the display.
- 5. The 5 Volt power for the sensors come from the combine through the display harness.

Figure 157

Note: Follow the wire harness to check for splices as well as the proper diagram for the combine brand. A complete wire harness can be found in the rear of the manual.

- 10. Section B Figure 157 and Figure 158 show a closer view of the pins in the 31 pin connector that is attached to the combine harness at the Multi-Coupler
- 11. Section A Figure 159 and Figure 160 shows a closer view of the connector that attaches the display to the main harness at the Multi-Coupler.
- 12. The serial connection must be disassembled to probe the wires.
- To disassemble the connection, remove the three screws to remove the cap and the two nuts on the front of the connection. Figure 161

This will allow you to remove the wire connector and plug it back in to probe the wires. Figure 162

 The number are on the front and back of the plastic connector. Figure 162 and Figure 163







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Figure 161



Figure 162



- 16. If the wires in the harness are good then the wires of the display box and the switch must be checked. Go to 9.4.1 to find information on removing the printed circuit board and the wire harness from the board.
- 17. Check continuity on the wire harness from the printed circuit board connection to the serial port connection.
- Check continuity between pins 9 and 11. Note: The pins on the circuit board are arranged in a different pattern then the pins on the serial connection. Figure 164
- 19. If the wires have continuity then the switch must be checked. Continuity between pin A and pin B, When the switch is in the flex position and pin A and C when the switch is in the rigid position. Figure 165
- 20. See Pin out for display harness to circuit board 17.3.4 Display Harness To Circuit Board



- 21. If there is not continuity between pin A and B the switch must be replace. The switch is available but must be solder in the circuit board. If the switch can not be solder in they the circuit board must be replaced.
- 22. If there is continuity between the pins then the circuit board must be replaced. See 9.4.1 - section Wire Harness, Screen and Circuit board Replacement







Figure 165

9.1.6. Problem: An error code "no Recognition Module" or 'Recognition module shorted" appear on the combine screen.

Note: This issue will only occur on a CNH combine.

The CNH combine needs a device to tell the combine what header is on the combine. If the combine does not see this signal it will not set the combine to the correct header. The error can be bypassed and the header can be chosen through the screen. The error may occur anytime the key is turned on.

The multi-coupler harness has a recognition module wired in the system. The module has resistors wired in.

1. Remove the module, Figure 166, from the harness. The module is 16 inches back from the combine connector at the single point.



Figure 166

 Check the resistance across the terminals noted in Figure 138. If the readings are not correct the recognition module needs to be replaced.



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Figure 167

 If the recognition module is working then the wire harness needs to be checked. Check the wires between the plug on the harness and the plug that goes into the combine harness per the list in Figure 168.



Pin on Recognition plug	Pin on combine connector
1	12
2	27
4	13

Figure 168

4. If continuity is found on all the pins then the issue is with the combine and not the header.

9.1.7. Problem: The Display will not come on but the air compressor operates. (Agco, John Deere, and Lexion Combines)

If the air system operates but the display does not the issue is no power from the combine. The CNH and Gleaner combines need the power adapter covered in this manual.

Note: On the Lexion 6/7/8000 the combine must be running before power will be provided from the combine.

 Make certain on the multi-coupler harness the 12-volt combine connector, 2, is attached to the LED connector, 1. This provides power to the system. Figure 169

The cap, 3, is used on Model Year 2018 and below.



Figure 169

- 2. Use a voltmeter and check for power at the 12-volt combine plug. If no power ground the voltmeter to a good ground on the combine.
- 3. If there is 12 volts present the issue is the ground wire from the connector to the combine.
- 4. If there is still no power the issue on the red wire between the combine and the plug. The following figures show the pin locations. Figure 170

Nam Con	ne: Y201 n PN: HD34-2	4-31P	T-B019								
Cav	No.	Col.	Spec	Туре	Cavity Plug	Cav	No.	Col.	Spec	Туре	Cavity Plug
1	-	-	-	-	114017	17	HDR REC 2	PUR	18AWG	GXL	-
2	-	-	-	-	114017	18	-	-	-	-	114017
3	A/O 2-1	YLW	18AWG	GXL	-	19	-	-	-	-	114017
4	12V PWR	RED	16AWG	GXL	-	20	IGN-CMB	BLU	18AWG	GXL	-
5	-	-	-	-	114017	21	-	-	-	-	114017
6	-	-	-	-	114017	22	-	-	-	-	114017
7	A/O 1-2	YLW	18AWG	GXL	-	23	-	-	-	-	114017
8	F/O 1	YLW	16AWG	GXL	-	24	-	-	-	-	114017
9	A/O 3-2	YLW	18AWG	GXL	-	25	-	-	-	-	114017
10	GND SEN1	BLK	16AWG	GXL	-	26	-	-	-	-	114017
		-	-	-	114017	27	-	-	-	-	114017
12	GND-1	BLK	16AWG	GXL	-	28	-	-	-	-	114017
13	LT/HZRD	RED	16AWG	GXL	-	29	-	-	-	-	114017
14	RT/HZRD	RED	16AWG	GXL	-	30	REEL-HGT	YLW	18AWG	GXL	-
15	-	-	-	-	114017	31	REEL-FA	YLW	18AWG	GXL	-
18	HDB BEC 1	DUD	10 414/0	CVI.							

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John Deere



Agco



Lexion

- 5. If 12 volts is present at the combine side of the connector then check for power at the relay panel connector pin 3 plug and 11 for ground. Figure 171.
- 6. If no power is present then the issue between the connector at the relay plug and the 12-volt combine plug.





Figure 171

7. If power is present at the relay plug then check for power at pins 1 and 2. Ground is on pins 3 and 4 at the display plug. Figure 172.



 If power and ground is at the display plug then the issue is in the display or the harness on the display and the display will need to be replaced.

9.1.8. CNH and Gleaner Power Plug

On CNH and some Gleaner combines it is necessary to have an Aux 12-volt power supply as the combine does not have the provision to supply 12 volts to the display. An additional cable is supplied to provide the 12 volts from the cigarette lighter socket. Figure 173



Figure 173

The large connector is then placed between the display harness and the display harness extension. Figure 174



Figure 174



- If the display does not light up but the air compressor works make certain the cigarette lighter socket on the combine has 12 volts.
- 2. Check the fuse at the end of the power harness. The fuse can be accessed by taking the top off the cigarette light plug, 1, Figure 173.
- 3. If the fuse is good check for power at pin 1 of the connection to the power harness extension, at pin 1 Figure 175.



Figure 175

- 4. Check for a ground at pin 3 on the power harness. Figure 175
- 5. Check for 12-volts at the connector at the single point connection from the display harness at pin A. Figure 176
- 6. Check for a ground at pin H. Figure 176
- 7. If ground or power is not present the issue is with the display harness or connection.



Figure 176

- If power and ground are present Check for 12-volts at pin 3 on the main harness connection above the air tank.
- 9. If 12-volts is present check for a ground on pin 11 of the same connector

9.1.9. Transport Electrical System

The transport system has two electric brakes on the trailer. It also provides the electrical control for the road lights on the header.

The front trailer has a harness to the tow vehicle. The harness either has an RV plug, Ag Plug, or a plug for European vehicles.

- Figure 177 RV Plug
- Figure 178 Ag Plug
- Figure 179 European Plug



RV TRAILER PLUG

Cav	No.	Col.	Spec	Туре
(1) WHT	GND	WHT	12AWG	PVC
(2) BLU	E-BRAKES	BLU	14AWG	PVC
(3) GRN	TAIL1	YEL	14AWG	PVC
(3) GRN	TAJL2	GRN	14AWG	PVC
(4) BLK	-	-0	-1 -	-
(5) RED	LT-TRN	RED	14AWG	PVC
(6) BWN	RT-TRN	BWN	14AWG	PVC
(7) YEL	-	-	-	-

Figure 177



Front view



Name: A Conn PN	G TRAILER 82-2140	PLUG	•	
Cav	No.	Col.	Spec	Туре
1-(WHT)	GND	WHT	12AWG	PVC
2-(BLK)	-	•	•	÷. '
3-(YEL)	LT-TURN	YEL	14AWG	PVC
4-(RED)	STOP	RED	14AWG	GXL
5-(GRN)	RT-TURN	GRN	14AWG	PVC
6-(BWN)	TAIL	BWN	14AWG	PVC
7-(BLU)	18 m - 1	- 2	14	2

Figure 178



EUROPE TRAILER PLUG

Cav	NO.	Col.	Spec	Туре
(1) YEL	LT-TRN	YEL	14AWG	PVC
(2) BLU	-33	-	-	2
(3) WHT	GND	WHT	12AWG	PVC
(4) GRN	RT-TRN	GRN	14AWG	PVC
(5) BWN	R-TAIL	BWN	14AWG	PVC
(6) RED	STOP1	RED	14AWG	PVC
(6) RED	STOP2	BLU	14AWG	PVC
(7) BLK	L-TAIL	BLK	14AWG	PVC

Figure 179

On the RV plug a flasher is wired in the system to flash the yellow lights when the daytime running lights are on the tow vehicle. This flasher is wired in the system at the Rear of the adapter harness. Figure 180



Figure 180

The Europe and Ag plugs do not have a flasher wired in the system. Figure 181 shows pin connections.



Ag trailer connector

cav	No.	Col.	Spec	Type	Cavity Plug
	.s	S .,	3	-	114017
1	GND	WHT	12AWG	PVC	-
1	R-STOP	RED	14AWG	PVC	-
E.	L-STOP	BLK	14AWG	PVC	-
5	LT-TURN	YEL	14AWG	PVC	-
5	RT-TURN	GRN	14AWG	PVC	-
	•	-3	-	-	114017
	TAIL	BWN	14AWG	PVC	3 5

Europe Trailer connector

Cav	No.	Col.	Spec	Туре	Cavity Plug
1	-	-	28	-	114017
2	GND	WHT	12AWG	PVC	-5
3	STOP1	RED	14AWG	PVC	40)
4	STOP2	BLU	14AWG	PVC	
5	RT-TRN	GRN	14AWG	PVC	-
6	LT-TRN	YEL	14AWG	PVC	
7	-	-	•3 X	•	114017
8	TAIL	BWN	14AWG	GXL	-

Figure 181

The lights are on the right-hand shielding. There are two amber lights and two red taillights. The amber lights will flash anytime the tow vehicle has the lights on or if the tow vehicle is equipped with daytime running lights, when the RV plug is used. The red lights work as taillights and turn signals. Figure 182





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9.2. Wire Connector Repair Deutsch Connectors

 All wires and contacts are removed and installed from the rear of the connector. If you try to remove from the front or with out the correct removal tool the contact and connector will be damaged. The tool will release the barbs inside the connector. Figure 183.



Figure 183

- Put the handle of the removal tool over the wire. There are different tools for the different size of wires. While pulling the handle away from the wire carefully push the tip of the tools over the wire.
- Slide the tool straight into the connector along the wire, without twisting the tool. Push the too into the connector until it unlocks the contact and you feel resistance. If you force the tool into the connector the tool will break. Figure 184.



Figure 184 Figure 2

 Carefully slide the wire contact and removal tool straight out of the connector. Figure 185



Figure 185

- 1. If the wire has pulled out of the contact leaving the contact in the receptacle the contact can be removed in the following manner:
- 2. Fully insert the proper size removal too into the receptable.
- 3. Locate a solid wire the proper size and grind a point on one end. Then grind one side of the pointed end flat so that it has a slight flat surface on it
- 4. Carefully insert the pointed end of the wire into the receptable through the removal tool. Apply light pressure to the wire to force it into the contact.
- 5. Once the wire has seated into the contact carefully slide the wire, removal tool and contact out of the receptable. Figure 186




- 6. Choose the correct AWG for the contact being used.
- 7. Measure the end of the wire for the contact length
- 8. Use a wire stripping tool to remove the installation.
- Remove a small portion of the insulation. Figure 187



Figure 187

- 10. Check for broken or dented strands of wires.
- 11. If broken or dented strands of wire are found cut and strip the wire again. Figure 188



Figure 188

12. A special tool must be used to install a new contact on the wire end. The contact cannot simply be compressed with a pliers. Figure 189



- 14. Set the crimping tool for the proper size wire and contact.
- 15. Loosen the lock nut and turn the adjusting screw in until it stops Figure 190



Figure 190

- 16. Put the contact in the crimping tool with the opening for the wire out. Turn the adjusting screw out until the end of the contact is even with the indent cover. Tighten the lock nut and remove the wire.
- 17. Put the stripped end of the wire into the contact. Make sure that all the strands of wire are inside the contact. Make sure that you can see the strands of wire the hole in the side of the contact. Figure 191



Figure 191

Figure 189

13. The wire must be stripped correctly. There must not be any strands of the wire missing or any nicks in the wires.

- 18. Put the contact and wire in the crimping tool with the contact centered between the stops in the crimping tools while holding the wire in the contact push the handles together until the stops are together.
- 19. Release the handle and removed the crimped contact and wire. Figure 192



Figure 192

- 20. Make sure all of the wire strands are inside the crimped contact. Look through the hole in the side of the contact for the wire strands. Figure 191
- 21. To install the wire with the contact into the connector make certain that you are inserting the pin and the socket in the correct connector. The connector for the pins will have PIN and for the sockets SKT will be printed on the rear grommet (wire end) of the connector Figure 194



Figure 193



Figure 194

- 22. Hold the wire approximately 1 inch from the contact
- 23. Hold the connector with the rear grommet (wire end) toward you
- 24. Push the contact wire straight through the rear grommet and into the connector until movement is stopped. You will hear a snap as the locking tab fingers lock behind the contact. A small pull on the wire indicates that the contact is correctly locked in place. Figure 195



Figure 195

25. To remove the contacts on the smaller DT series connector, remove the wedge from the center of the connector using a needle nose pliers. Figure 196



Figure 196

26. To remove the contacts, gently pull the wire backwards while releasing the lock finger by pushing the contact to the center of the connector. Figure 197



Figure 197

- 27. Hold the seal in place and remove the wire and the contact.
- 28. The contact installation is the same as the larger connectors. Make certain that you set the tool for the correct size contact and wire.
- 29. To install the wire in the connector, hold the wire about 1 inch from the contact. Hold the connector with the rear grommet (wire end) facing you.
- 30. Push the contact into the grommet until a click is heard. Tug on the wire slightly to confirm that the contact is locked into place. Figure 198



Figure 198

31. Once all the contacts are in place insert the wedge in the front of the connector. On three terminal connectors make certain that the arrow is pointing to the exterior locking mechanism. On the other connectors the wedge will only insert one way. Figure 199



Figure 199



9.3. Downloading Software

 Go to the Honeybee website under the dealer portal and download PanelPilotACE Design Studio. This will put an icon on your home screen. Figure 200



Figure 200

Remove the mounting bracket from the back of the display.

Connect the cord supplied with the display to the USB on the computer and then in the connection on the back of the display. Figure 201



New Software Installed

Figure 201

Open the PanelPilot Design Studio. In the upper right-hand corner of the screen the software should show the device is connected. Figure 202

Go to file and open project Flex-UI-Lite-7.ppproj. Figure 203 Note: The number may be different depending on the software revision.



Figure 202

Natific 9	Date modified	Туре	Size
🕌 Images	9/24/2018 08:32	File folder	
FLEX-UI-Lite-7.ppproj	9/22/2018 13:51	PanelPilot ACE De	232 K8

Figure 203

Go to file in the upper left-hand corner and select upload. Figure 204

The screen will ask if you want to up load and hit "YES". Figure 205

	Edit	Window	Settings	Help
N	ew Pro	ject		Ctrl+N
0	pen Pr	oject		Ctrl+O
R	ecent F nport 1	MY2016 from mo	and below F dule to traile	RH harness r connecto
Sa	ave			Ctrl+S
Sa	ave As.			
Sa	ave Cop	oy As		
Đ	(port a	s Template	ì	Ctrl+Sh
Vi	alidate			F4
PI	review	in Emulato	or	F5
U	pload			F6
E	(port p	roject runt	ime	Ctrl+Sh
P	orts Sc	hematic		
gure	204			

Figure 205

The program will begin to load. When it is done select close. Figure 206

This will upload the project to the device, the current project and any logged data will be lost, are you sure you want to proceed?

To make sure the program loaded go to settings on the display screen. Figure 207

The software version that you loaded will be in the lower left of the display Figure 208

Current File 6/31	Current File 31/31
Overall Progress	Overall Progress
Update Configuration	Update Configuration
Upturating	Close (1)

Figure 206





Figure 207



Figure 208

9.4 - Replacing Parts on the Display

9.4.1 - Wire Harness, Screen and Circuit board Replacement

- 1. The display needs to be disassembled to replace most of the parts on the display.
- 2. Remove the plate on the back that retains the suction cup/Ram Mount.
- 3. Loosen the 4 screws on the end cap opposite the wire harness.
- 4. Remove the 4 screws retaining the end cap with the harness. Figure 209



Figure 209

5. Slide the display, circuit board, and harness from the case. Figure 210



Figure 210

 Carefully separate the screen from the circuit board. Do not bend or twist the circuit board as that could damage the board. Figure 211



Figure 211

7. Once the screen is separated from the board, the harness can be removed by pushing the tab on the side of the connector and pulling the connector straight out of the circuit board. Figure 212



Figure 212

- 8. If the screen needs to be replaced the screen can be replaced without removing the harness.
- 9. The cover of the screen can be removed by pushing in the 4 clips on the side of the screen and pulling the front cover off the screen.
- 10. Replace the cover on the new screen and the screen assembly can be installed on the circuit board.

11. To replace the circuit board, remove all the parts leaving the circuit board.

9.4.2. Replacing the switches

- 1. As an alternative to replacing the switches the complete circuit board can be replaced.
- 2. The switches are soldered in the circuitboard. To replace the switch the switch must be de-soldered from the printed circuit board.
- 3. See Figure 213 for switch location
- 4. Flex/rigid switch, On-Off Item 1
- 5. Add/Dump Air switch, On-Off-Momentary Item 2
- 6. Tilt/Reel switch, On-Off Item 3
- 7. When removing the switch from the board make certain not to overheat the board as it can damage the circuit.
- Make certain the holes for the switches are clean of solder before installing the new switch
- 9. Install the new switch on the board and solder in place. Make certain that the area is clean of any flux.



Figure 213

 After the components are assembled slide the entire assembly into the case. Make certain that the front cover aligns with the top groove and the circuit board aligns with the bottom groove. Figure 214



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Figure 214

9.4.3. Switch Paddle Replacement

- 11. The switch paddle can be replaced without the disassembly of the display, however it is easier to replace the paddle with the assembly out of the case.
- 12. Remove any remnants of the paddle.
- 13. Make certain that switch toggle is in the center position. Figure 215
- Insert the paddle cap into the switch on the circuit board. Make certain the toggle of the switch is inserted in the paddle. Figure 216
- 15. Push the cap into the tabs until a click is heard. Do not push too hard to crack the circuit board.





Figure 216

9.4.4. Replacing the Battery in the Display

 On the side of the display remove the four screws holding the end cap on the box. Remove the bolts holding the back plate to the display. Note: Remove the side with the wire harness. Figure 217



Figure 217

- 2. With the end cap removed pull the display screen and circuit board out of the box as an assembly.
- 3. Remove the circuit board by firmly pulling up on the board. Make sure that you do not crack the board. Figure 218



Figure 218

4. Once the board is pulled off the display the battery can be replaced Figure 219



Figure 219

9.5 - Function of the Blue Light

The light indicates when there is power to the Air Compressor. Figure 220



Figure 220

 This light will come on with the center switch on the display is turned to the add air mode. Figure 221



Figure 221

- 2. Power is then sent back to the light from the Compressor on Relay.
- 3. The ground for the light is from the extension harness pin F and H.
- 4. Anytime the light is on the air compressor should be adding air to the system.



10 - Hydraulics

The hydraulic system is a simple system on both the AirFlex and SDX. Oil for any hydraulic function is supplied by the combine. The hydraulic diagram shows the oil flow for the headers

Figure 222. The manifold at the back of the header has all of the hydraulic connections.



The Manifold Figure 223 directs oil from the combine to the rest of the header.

- RL- To the cylinders for reel lift. This circuit on Model Year 2017 and above also provides oil for the header tilt cylinder. The oil goes through an electric over hydraulic valve that sends the oil to the desired system
- F- The reel fore side of the cylinder
- A- This goes to the side of the cylinder for moving the reel to the rear. On Model Year 2016 and below this circuit also sends the oil to the tilt valve and then to the tilt cylinder.
- P-Goes to the reel drive motor to provide hydraulic flow to the reel motor in the center of the header
- R-Is the return oil for the reel drive motor. This is also the return of the oil from the right hand lift cylinder.





10.1 - Tilt Valve

- 1. The tilt valve is controlled by the display box in the combine cab. On all SDX the power comes from the display box.
- The tilt valve has a solinoid that is activated by the display box. This valve has three ports. With no power to the valve oil flows from port 2 to port 1. When power to the solinoid is applied a spool shifts and send oil to port 3. Figure 224. The oil flows as follows:
- 3. RL port on hydraulic manifold to port 2 on valve.

- 4. No Power on solinoid oil flows from port 2 to port 1 LH reel lift cylinder.
- 5. Power to solinoid oil flows from port 2 to port 3 rod end of the tilt cylinder.



- On CNH combines the tilt can be controlled by the button on the back of the Hydrostatic handle. By pressing this button, power is sent from the combine through the number 20 pin in the combine connector. Disconnect the wire connection at the solenoid valve from the main harness and connect it to the cmb tilt vlv on the multi-coupler harness. Figure 225
- 7. This will allow the header tilt cylinder to operate with the for/aft reel button when the button in front of the multi-function handle is used. When the front button is not depressed the reel fore/aft will work. This will provide 12 volts to power the solenoid through Pin 20 on the combine harness.





Figure 225

- 8. On some combines the function for the button on the back of the handle will need to be turned on. Consult the combine manufacture for this process.
- Note: On some New Holland combines the hoses on the manifold will need to be changed for all functions to work properly. Refer to Knowledge Article 1104 Using New Holland Multi Function Handle For Tilt.

10.2 - Hydraulic Cylinders.

1 DANGER!

High pressure hydraulic leaks can penetrate the skin causing serious injury. Always relieve pressure before disconnecting hydraulic lines and tighten all connections before applying pressure.

Hydraulic leaks can be extremely small and difficult to see. Search for leaks with a piece of cardboard. Protect hands and body from high-pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source.

The reel lift cylinders are single acting cylinders. These cylinder are difficult to reseal. If a reel lift cylinder leaks the cylinder should be replaced

The Fore and aft cylinders are double acting cylinders and should also be replaced.

10.3 - Tilt Cylinder MY2020 and Above

A new style tilt cylinder is used on all units Model Year 2020 and above. The cylinder is a barrel style held together with 4 threaded bolts. Figure 226



Figure 226

- To disassemble the cylinder remove the four nuts at the head of the cylinder. Figure 227 This will allow the head of the cylinder to be removed and the seals replaced in the cylinder Figure 228.
- 2. If the piston nut was removed to install the seals, secure the piston with the nut and torque to 300-350 ft. lbs. (407-475Nm)

Note: Lubricate all seals and O-Rings before installation.



Figure 227





Figure 228

- 2. When reassembling the cylinder slide the cylinder rod and head into the barrel.
- 3. Attach the bottom end cylinder head to the barrel with the four threaded bolts.
- 4. Install the nuts on the threaded rods and tighten the nuts to 80 ft. lbs. Make certain there is at least one to two threads outside the nuts after tightening.

10.4 - Single Point Connector

- 1. The single point connector can be rebuilt if the couplings leak. To remove the couplings remove the valve assembly off the hoses.
- 2. Each cartridge can then be removed from the valve. Figure 229



Figure 229

- 3. To remove the cartridge unscrew the cartridge from the valve housing.
- 4. The cartidge can then be replaced as a complete assembly. When assembling the

coupler make sure the ring is setting in the valve body completely and flat against the valve body. Figure 230



10.5 - Reel Drive Motor and Assembly

The reel drive is powered by a hydrualic motor with oil from the combine. The hydrualic motor drives a set of gears in a gearbox. There is no lubrication in this gearbox.

The oil is supplied by the combine. If the reel does not turn use a flow meter to check the flow at the motor. If there is no flow at the motor check at the single point connection. If no oil flow is present then the issue is a combine problem. The flow should be up to 9GPM. See the combine brand for more information and how to test the flow rate from the combine.

1. If there is flow at the motor, remove the motor from the gearbox. This is done by removing the two bolts on that retain the motor to the gearbox. Figure 231



Figure 231

10.6 - Reel Drive Gearbox Repair

- 1. To remove the gearbox assembly support both reel assemblies.
- 2. Remove the coupler covers to remove the rubber couplings. Figure 231
- 3. Disconnect the hoses and the electrical connections. The bolts at the front of the reel arm can now be removed. This will allow the gearbox to be pulled from the reel arm. Figure 232



Figure 232

 To disassemble the gearbox remove all the bolts that hold the covers to the gearbox. Figure 233



Figure 233

- 5. Remove the lock collars from the driveshafts. Remove the covers and bearing assemblies.
- Replace the parts as needed. To assemble install the bearings in the RH case assembly. Figure 234

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Figure 234

7. Assemble the motor on the gearcase. Install the input drive gear on the motor shaft.

Figure 235



Figure 235

 Install the drive key in the shaft. Press the drive gear on the output shaft. Install the washers on each side of the gear. Figure 236



Figure 236

9. Install the output shaft in the gearcase. Figure 237



Figure 237

10. Assemble the LH side of the gearcase with the bearings and flanges. Figure 238



Figure 238

 Install the left hand gearcase on the input and output shafts. Install spacers on each bolt as the bolts a placed in the right hand gearcase. Make certain the gears are aligned and tighten the lock collars. Figure 239



Figure 239

12. Once the gearbox is assembled install it back on the center arm. Make certain that the bolt holding the gearbox to the arm is secured. Figure 240





Figure 240

 Install new flex couplers in the reel if the old couplers are damaged. Place the flex couplers on the reel shaft and wrap tape to hold them in place. Install the coupler covers in place and secrue the the mounting bolts. Figure 241



Figure 241

- 14. Install the hydraulic hoses to the reel drive motor.
- 15. Adjust the sensor to the gear in the gearbox to a .030 inch gap between the sensor and the gear. This is done by turning the sensor in by hand until it contacts the gear and then back it out by one turn. Figure 242 shows the sensor exposed but it is cover up on the header. Note: Some headers will not have a sensor as the combine can not read reel speed.





- On 2016 and newer John Deere combines a line lock must be installed on the header to keep the reel from drifting fore and Aft. In 2016 John Deere took the check valve out of the combine hydrualic system.
- The line lock is a valve that is bolted on to the hydraulic manifold and provides the check valve needed on those combines. Figure 243.
- Hydraulic oil is supplied from the manifold, "F" and "A" ports, through the valve then to the cylinders on the header.



- 4. The lock valve has a spool inside that valve that will shift as oil is supplied to the reel
- 5. As oil is applied to one port the spool will shift to release the oil and allow the oil to flow through the valve.. When



the oil flow is stopped the spool shifts and blocks the oil. Figure 244



Figure 244

6. If the cylinders drift, remove the spool and make certain that it moves freely in the valve body.

11 - Reel

11.1 - Reel Bats

The Honeybee reel has 6 bats and Plastic teeth.

 To remove a tooth on the reel remove the spacer between the teeth. This can be done by using a needlenose vise-grips and pulling the spacer out Figure 245



Figure 245

2. Once the spacer is removed the finger can be turned 90 degrees by a wrench and pulled out of the bat. Figure 246



Figure 246

 If more than one tooth needs to be replaced simply slide the spacers down to replace the teeth.

4. Replacing a Reel Bat

 The reel bat can be replaced by removing the mounting bolt on each reel spider. This will allow the entire reel bat to be removed. Figure 247



Figure 247

 After the reel is removed the spider clamp can be removed by removing the clamp bolts. Figure 248



Figure 248

7. When installing the spider clamps on the reel tube the spacing should be checked. This will aid in assembling the reel bat back on the spiders. Make certain the diamensions for the clamps on the cam end of the reel are as shown in. Figure 249 for the standard Reel and Figure 250 Cam Reel. The only difference between the Standard reel and the Cam reel is the dimension for the control knuckle clamp.



Figure 249 Standard Reel



Figure 250 Cam Reel

8. On the inner end of the reel the outside clamp should be positioned to 8" from the end of the reel tube. Figure 251.



Figure 251

 The center clamps are installed depending on the size of the header. On the 25 foot headers the clamps are installed 65 1/8" from the inside clamps. On the 30-50 foot headers the center clamps are placed 125 1/8" from the inside clamps. Figure 252



Figure 252

11.2 - Replacing and Adjusting the Reel Cam

Note: There are standard and Cam reels.

- The cam adjustment on each side of the reel controls the pitch of the teeth on the reel. The reel support and the cam can be removed from the reel.
- 2. Support the reel with a lifting device on the reel tube.
- 3. Remove the bolt attaching the reel to the reel arm.Remove cylinder pin. Figure 253



- 4. This will allow you to move the reel forward past the divider. Remove the reel end shields. The snap ring on the end of the tube can now be removed.
- 5. Remove the bolts that attach the spider to each bat. This will allow you to remove the

cam assembly. Figure 254



Figure 254

5. Check the bushings in the mount assembly. If there is wear on the bushings replace the bushings. There should be a grease fitting on the mounting tube. This grease fitting will lubricate both bushings. If a plug is present and not a fitting replace the plug with a 45 degree fitting. Figure 255





 Remove the spider arms from the cam. The cam can now be removed by removing the bolts that hold the rollers on the cam. Figure 256



Figure 256

- Replace worn parts. Note if the cam assembly is disassembled the rollers on the cam should be replaced if they have been used.
- Install the bearings on the center ring. Leave the mounting bolts loose at this time. Install the center plate into the ring. Figure 14
- 9. Note: Make certain that the arrow on the center ring is pointing in the direction of rotation for the reel. Figure 257



- 10. Install the spiders on the center ring. Slide the assembly on the shaft, bolt the spiders to the reel bats.
- Slide the mounting plate on the shaft and secure the assembly with a washer and snap-ring. Slide the assembly back on the

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reel arm and secure. The end shields can be installed on the outside spiders. Figure 258



Figure 258

 The link from the cam to the reel bat control arm Figure 259 must be installed properly. If the hardware is not install properly control arm link wear is possible.



Figure 259

13. In order to retain the control, arm the 5/16" bolt should be torqued to 22 ft. lbs. (30 Nm) The head and nut of the bolt should be secured on the spacer that goes through the bushing. Figure 260. This will make sure that the arm turns on the bushing and not the nut or head of the bolt.

┍╤╺╤╵┛╹╹

Figure 260 11.2.1. Cam Reel System

 The cam reel on the headers have two separate cams that control the pitch of the teeth. The cam reel has the same bats but the spiders and the cams are different then the standard reel. The bats are controlled by the set of rollers on each side of the cam. Figure 261



Figure 261

- 2. To remove the spider arms retaining the reel bats, remove the end shields, A, from the reel.
- 3. Remove the bolt and spacer that retains the spider to the reel bat.





Figure 262



12 - Air System

The air system is made up of a

- Electric Air Pump
- Air Tank
- Air Manifold
- Air Lines
- Air Bags

12.1 - Air Compressor

Note: The electrical part of the system is described in Section 9.

1. The air compressor is mounted to the frame behind the shield on the left-hand side of the header. Figure 264



Figure 264

- 2. The compressor is powered through the power harness on the combine. (see electrical section for details)
- 3. The compressor keeps the tank filled with air so that the air bags maintain a constant pressure.
- In the line leading to the tank is a check valve that keeps the air from escaping out the tank through the compressor Figure 265.



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Figure 265

Model Year 2020 and below

Install the check valve in the air tank. using a 6point socket to tighten the valve in the air tank. Using an open-end wrench or over-tightening the valve will cause the plunger in the valve to stick and cause a leak. Use a thread sealant on the end of the valve. DO NOT USE TEFLON TAPE. Torque the check valve to 12-15 ft. lbs (16-20 Nm). Figure 266



Figure 266

Note: A new check valve kit is available through service parts.

Model Year 2021 and above

On Model Year 2021 and above a check valve is still used at the base of the tank.

This check valve is a different design and is larger than older model years. A rubber hose connects the compressor to the tank. Figure 267

Note: Older headers can be upgraded to the Model Year 2021 check valve.



Figure 267

The check valve must be installed properly so the tank will hold air.



Figure 268

The hose should be installed on the inlet side of the valve. Tighten the fitting ton the hose to 10 ft. lbs. Make certain the arrow is pointing away from the hose. Figure 268

Note: This is a two-piece valve. The wrench must be placed on the end of the valve that is being tightened to hold it in place.

The pump has two filters in the head that should be changed once a year.

Remove the cap on the pump and replace the filter cartridge. Figure 269



Figure 269

At the bottom of the tank is a dump valve. This dump valve will keep the pressure in the system. This valve is controlled by the electrical system when the air pressure needs to be changed. Figure 270





12.2 - Air Lines and Air bags

From the air compressor tank, the air goes through a manifold. This manifold directs the air to the different air bags on the header. In the valve is a relief valve that keeps the pressure in the tank below 125PSI. If the pressure goes above 125PSI the valve will relief the pressure in the tank. The air pressure is consistent through out the system. Figure 271

1. On Model Year 2021 and above the relief valve setting has changed to



150PSI. The higher relief valve can be installed in older headers.



Figure 271

2. Through a series of lines, the air is directed to the air bags on the unit. There is an airbag on each of the cutter bar struts to support the cutter bar assembly. Figure 272



Figure 272

3. Each strut has a supply line and air bag that is retained by 4 bolts. Figure 273



Figure 273

12.3. Checking for leaks

 If the air system does not maintain pressure, there may be an air leak. To check for leaks: Fill a spray bottle with soapy water and spray the all the lines and the fittings to the air bags while watching for air bubbles. Figure 274 and Figure 275



Figure 274



Figure 275

- 2. Re-seal all leaking fittings. Check the fittings on the air tank and air manifold located just to the left of the feeder house.
- Remove the hose to the compressor and spray water on the check valve to see if it is leaking. Figure 276
- 4. Note: The figure shows the new style check valve.





13. Skid shoes

Skid shoes can be added for extra header protection. The shoes are adjustable from 2-4". The skid shoes are either factory installed or can be installed at a later date. The shoes are bolted to each strut at the front of the strut. Note: the number of skid shoes depends on the size of the header. Figure 277 shows a 30-36foot header.

NOTE:

Please add an additional 10 PSI if skid shoes are installed on the cutter bar. Accessories attached to the cutter bar require additional pressure to counteract their weight.

Recommended Air Pressures

Flex

- Lower than 32 PSI for terraces.
- 32-35 PSI for firm/fast ground conditions.
- 36-39 PSI for normal ground conditions.
- **40-50 PSI** for soft/sticky/wet/slow ground conditions.
- Higher than 50 PSI in severe rocky conditions.

Rigid

25 ft - 90 psi	40 ft – 95 psi
30 ft – 95 psi	45 ft – 105 psi
36 ft – 102 psi	50 ft – 115 psi



Figure 277

Best header/feeder will fall rapidly if hydraulic lift system should fall. Rest header/feeder on ground or engage lift cylinder lockouts when working around raised header/feeder. Fallure to comply will result in death or serious injury.

- 1. To install the skid shoes the common and transport shoes are installed.
- 2. The two skidshoes next to the subframe will need to be removed when the header is place on the transport trailer. Figure 277
- 3. Hook the two brackets over the lip on the paddle,
- Then secure the skid shoe on the rear using a ½"X5.5" bolt. Use a spacer between the skid shoe and the drive paddle to fill the gap between the mounting brackets and the strut. *Figure 278*
- 4. Secure with a ½" lock nut and torque the nut to 75 ft. lbs.



 On the knife drive paddle strut the front of the skid shoe is slid on the front of the paddle and the rear is secured by a ½' X7" bolt and lock nut. Torque the nut to 75 ft. lbs. *Figure* 279





Figure 279

- 6. The end skid shoe is installed by sliding the rear of the shoe over the inside plate on the strut.
- 7. Place a spacer between the sides of the strut.
- 8. The skid shoe is secure on the front outside by a 5/16" X 1bolt, washer and lock nut.
- 9. The skid shoe is secured in the rear by a 1/2" X 4.5" bolt and lock nut. Torque the nut to 75 ft.lbs. Figure 280



Figure 280

13.1. Skid Shoe Model Year 2022 and above

On Model Year 2022 and above the skid shoes have been changed. The range of these shoes is 3"-8". The shoes still attach to each of the struts under the header. These shoes are



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Figure 281

- 1. The shoe to the outside of the paddle strut will need to be removed to lace the header on the transport.
- 2. This is done by removing the rear adjustment bolt.
- 3. The front retaining bolts are then removed to allow the skid shoe to be removed. Figure 281
- 4. If the skid shoe on the drive paddle needs to be removed it can be done in a similar manner. The only difference is the skid shoe is wider. Figure 282



Figure 282

5. The end skid shoes are mounted with a bolt on the side of the strut and one on

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the inside of the strut. A bolt retains the rear of the shoe and allows the height adjustment. Figure 283



Figure 283

- 6. The adjustment of the skid shoe is accomplished by moving the rear of the skid shoe down.
- 7. The position of the header tilt will affect the cutting height.
- 8. The lowest is approximately 3" with header tilt in the forward position.
- 9. The highest cut height is approximately 8" the header tilted to the rear.
- 10. The following figures show the different height positions. Note: the end shoe is shown but the other skid shoes are adjusted in the same configurations.



Figure 284



Figure 285



Figure 286



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14. Cross Auger

The cross auger is optional and can be installed on all SDX headers. The cross auger is mounted on the rear beam of the header. It is supported by jack assemblies to allow the height to be changed. It is driven on the left side by a hydraulic motor with oil supplied by the combine reel circiut.Figure 288



Figure 288

14.1. Cross Auger Removal

- To remove the motor, remove the shield on the auger. Support the end of the auger with a suitable lifting device.
- The bolt retaining the drive joint can be removed. The hoses can be removed from the motor. Note: Cover the fittings and port on the motor after the hoses are removed to avoid getting dirt in the motor. Figure 289
- Remove the bolts holding the motor. The motor can now be removed from the auger. A wedge may need to be driven in the drive joint to loosen the joint off the motor shaft.



Figure 289

- 4. To remove the cross auger completely once the motor is removed, support the left hand end of the center auger and the entire left end of the auger.
- 5. Remove the shield covering the joint at the left and center auger.
- 6. With the cover removed and the augers supported the pin that retains the left-hand auger to the center auger can be removed. Figure 290
- The bearing mount can now be removed by removing the nuts securing the bearing mount. The same process can be used to remove the right -hand bearing mount. This will allow the center auger to be removed.
- 8. The right-hand auger can be removed by removing the 3 bolts holding the bearing mount to the retaining tab. Figure 291







Figure 291

- 9. To install the auger, install the bearings and mounts on the auger. Support the center auger and secure each bearing with the bolts and nuts. Figure 292
- 10. Make certain that the auger is centered between the supports and lock the shaft in place with the lock collars. With the center auger on the header, install the yoke on the right-hand auger. Install the bearing mount on the end of the shaft and secure the bearing mount to the tab on the frame. Do not tighten any hardware at this time. Figure 293

P 000 3

Figure 292



Figure 293

- Install the left-hand auger to the center auger with the yoke and bolt. Do not tighten any hardware at this time. Install the yoke and motor on the left hand end of the shaft.
- 12. Tighten the motor mounting bolts. Center both the left and right augers between the tabs and tighten all hardware. Figure 294





14.2. Hydraulic Testing

- This flow control valve allows the reel to reverse (if the combine brand allowed it) when the combine would reverse the header.
- Note: In MY2021 a check valve was added to the CF port. This check valve could also be added to any MY2019 or 2020 headers. Figure 295. The check valve was used to make sure the reel would run in reverse and not the cross-auger.



- 3. The reel pressure hose from the combine attaches to the "IN" port on the valve. The oil is then split between the reel and the cross auger. The return oil from the reel and the cross auger go directly the combine return line. Figure 296
- 4. The control handle is used to regulate the speed of the cross auger.
- 5. The oil goes through the valve ports as shown in. Figure 297
- 6. The valve does not have a relief valve in the system. The combine relief for the reel drive provides the protection.
- 7. To test the system, check the amount of oil flow into the "IN" side of the valve. This should be done with the combine reel drive in the manual mode so oil is always provided during testing.
- 8. If there is flow at this point then the flow should be checked at the CF port on the valve. If oil is flowing at this point then the issue is either with the hydraulic motor or the auger is binding and not able to turn.
- 9. If there is an issue with the reel then check the flow out of the "EX" port on the valve



Figure 296



Figure 297

15. Options

15.1. Skid Shoes

- The optional skid shoes provide extra protection for the header when harvesting crop. See section 13 for more information. The skid shoes are adjustable from 2-4". The skid shoes are attached to each of the paddles. The shoes will slide over the front of the paddle and be attached to the rear with a bolt. The skid shoes can be adjusted by changing the mounting holes for either a 2", 3", or 4" cut height
- 2. The skid shoes are used when the header is being used in the rigid position.
- There are skid shoe extensions that can be used to gain more height for the cutterbar. Figure 298



Figure 298

15.2. Terrace Kit

The terrace kit is used when the header is being used in the flex mode on terrace ground

- The terrace kits include UHMW plastic on the rear of the cutterbar Figure 299. This plastic skid plate keeps material from coming up under the cutterbar when the header is operating on a terrace.
- 2. The terrace shoe kit includes
 - a. Two shoes for 25' headers
 - b. Five shoes for 30' and 36' headers
 - c. Seven for 40'through50'
- 3. The plastic plate is secured to the rear of the cutterbar.at each outside strut.
- 4. Each plate is mounted to the cutterbar with four 3/8"X1" bolts and locknuts, Figure 299



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Figure 299

- 5. The terrace kit also includes a skid shoe that is mounted on the outside strut
- 6. This shoe will help the ends of the cutterbar float over the terraces or any uneven ground.
- 7. Just the end skid shoe can be ordered without the center plastic plates. Figure 300
- The end skid shoe is retained to the end strut with two 3/8"X1" carriage bolts, nuts and a one ½" Cap-screw with lock nuts in the front of the shoe.
- One ½"X4 1/2" cap-screw in the rear of the shoe.



Figure 300

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15.4. Header Tilt Options

The optional top link/tilt cylinder joins the header to the subframe and adjusts the forward angle of the table. This directly affects the angle of the cutter bar.

/ WARNING!

Engage the Parking Brake, shut down the engine and wait for all moving parts to stop before exiting the cab.

Δ DANGER!

DO NOT EXTEND THE TILT CYLINDER BEYOND 48.1 cm-19.25") OR THE HEADER WILL UNEXPECTEDLY DROP FROM THE SUBFRAME.

- 1. To adjust the top link: Loosen the lock tab on the top link.
- 2. Adjust the length of the top link by turning the link clockwise to tilt the header back.
- 3. Turn the link counter-clockwise to tilt the header forward.
- 4. Retighten the lock tab once the desired header angle is reached. Failure to

tighten the lock tab will allow the head to tilt during operation.

5. When adjusting the manual tilt cylinder do not exceed the range shown in the illustration below.



Figure 301

 Hydraulic Tilt Option. A cylinder is installed in the center of the header and is controlled by the AX Lite box in the cab to energize a solenoid to divert oil from the fore/aft cylinders to the tilt cylinder. Figure 302





Figure 302

2. See section 9 of this manual for diagnostic information.

15.5. Narrow Reel Finger Spacing

The option for Narrow reel finger spacing is available on the header. The narrow spacing will help in short or thin crops This will change every other reel bat from 4.25" tine spacing to 1.75" tine spacing. This will give you a 2.5" spacing between the tips of the tines. Figure 303



Figure 303

- 1. The narrow spacing of the fingers can be installed on any reel on the SDX.
- 2. The extra fingers can be installed on every other bat. First remove the long spacer between the fingers. The spacer can be removed by using a needle nose vice-grips and pulling out the spacer.



Figure 304

 Once the 4.25" spacer is removed replace the spacer with a 1.75" spacer and add the extra tine by installing the extra tine in the bat by turning it ¼ turn. Continue this process over the remaining portion of the bat. Figure 305



Figure 305

15.6. The Cam Reel

If you have bushy crops like peas, inconsistent feeding can stall or plug your feeder house. The cam reel is more aggressive and helps deliver the crop from the cutterbar to draper belt.





15.7. Cross-Auger

A cross-auger is available to the header to help move a fluffy crop across the back of the header to the center draper.



- 2. A control valve is mounted above the hydraulic manifold. This valve can be used to control the speed of the auger.
- 3. This valve will divert some of the oil from the reel drive to the cross auger. The flow of the oil will be provided by the combine.
- 4. The check valve on the cross-auger control valve will assist when the header is reversed. The check valve will stop the flow of oil from the cross-auger and divert the oil so the reel will run in reverse with the header. Note: MY2019 and above. Figure 308
- 5. When the cross-auger is installed the header must have the standard back panels installed.



Figure 307



Figure 308 15.8. Back Panel

There are two style of back panels available that are installed behind the draper belt

 The draper panel is a curved panel above the draper belt. This curved panel will help feed the crop to the center draper belt if the crop is light and moves up the panel. This panel does obstruct the view of the draper belt. Figure 309

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Figure 309

2. The standard back panel is an option for a straight panel. In most standard crops it will keep material flowing to the center draper without bunching. Figure 310



16. Specifications

Important Torque Specification	Torque Spec (Ft.lbs)	Torque Spec (NM)	Use Red Loctite
AirBag Mounting bolts	15-20 Ft. lbs.	20-27Nm	No
Bell Crank Nuts	765 Ft. Lbs.	1037Nm	No
Knife Head Bolts	170 Ft. Lbs	203 Nm	Yes
Tie Rod Clamp Bolts	100 Ft. Lbs	135Nm	Yes
Tie Rod Nut	230 Ft. Lbs.	311Nm	Yes
Connecting Rod Carriage Bolts	68 Ft. Lbs	92Nm	Yes
Guard Bolt Model Year 2021 and below	40 Ft. Lbs	54Nm	No
Guard Bolt Model year 2022 and Above	47 Ft Lbs	64Nm	No
The nuts will be a full-size nut			
Drive Paddle Mounting bolts	200 Ft. Lbs	271NM	Yes
Rear Bearing Clamp Bolts	120 Ft. Lbs	163Nm	Yes
Rear Bearing Center Bolt	315 Ft. Lbs	427Nm	Yes
Flywheel Drive Hub RH side	38 Ft. Lbs	52Nm	Yes
Flywheel drive Hub LH Side	28 Ft.Lbs	38Nm	Yes
Auger Spider Mounting Bolts	23 Ft.Lbs	31Nm	Yes
Connecting Rod Bearing Hub	23 Ft.Lbs	31Nm	Yes
End Shield bolts	16 ft.lbs	21Nm	No
Center Reel Tower Clamp Bolts	280 ft. lbs	380Nm	Yes
Note: the clamp bolts must be Grade 8 Bolts			
16.1. Belt Adjustment Guide



Figure 311







16.3. Drive Paddle Assembly Information





16.4. Air Bag Position Charts







Figure 316

16.5. Pulley Size Information

16.5.1. Model Year 2019 and above Right-Hand Drive Pulleys

(Item #1)	Pulley PN (Item #1)	Front Knife Drive Pulley (Item #2)	Pulley PN (Item #2)	Front Draper Drive Pulley (Item #3)	Idler Tensioner Bolt
50T	101448	50T	101448	32T 101452	4.5" 29080
45T	101447	56T	101450	32T 101452	4.5" 29080
507	101448	47T	203059	32T 101452	3.5" 29085
56T	101450	45T	101447	32T 101452	4.5" 29080
567	101450	47T	203059	32T 101452	4.5" 29080
50T	101448	45T	101447	32T 101452	3.5" 29085
	Rear pulley (item #1) 50T 45T 50T 50T 56T 56T 50T	Rear pulley (Item #1) Pulley PN (Item #1) 50T 101448 45T 101447 50T 101448 56T 101450 56T 101450 50T 101448	Rear pulley (Item #1) Pulley PN (Item #1) Pront knine Drive Pulley (Item #2) 50T 101448 50T 45T 101447 56T 50T 101448 47T 50T 101448 47T 56T 101450 45T 56T 101450 45T 56T 101448 45T	Rear pulley (Item #1) Pulley PN (Item #1) Profit Knife Drive Pulley (Item #2) Pulley PN (Item #2) 50T 101448 50T 101448 45T 101447 56T 101450 50T 101448 47T 203059 56T 101450 45T 101447 56T 101450 45T 101447	Rear pulley (Item #1) Pulley PN (Item #1) Profit Knife Drive Pulley (Item #2) Pulley PN (Item #2) Profit Draper Drive Pulley (Item #3) 50T 101448 50T 101448 32T 101452 45T 101447 56T 101450 32T 101452 50T 101448 47T 203059 32T 101452 56T 101450 45T 101447 32T 101452 56T 101450 45T 101447 32T 101452 56T 101450 45T 101447 32T 101452 56T 101450 47T 203059 32T 101452 56T 101450 47T 203059 32T 101452 56T 101450 47T 203059 32T 101452





16.5.2. Model Year 2019 and above Left-Hand Auger Drive

Combine	Auger Drive Pulley (Item #4)	Pulley PN (Item #4)	Rear draper drive Pulley (Item #5)	Pulley PN (Item #5)	Front draper drive Pulley (Item #6)	Pulley PN (Item #6)
AGCO	45T	101447	32T	101452	45T	101454
Lexion	40T	101445	32T	101452	53T	101455
CNH	50T	101448	32T	101452	45T	101454
JD 490/520	56T	101450	40T	101453	45T	101454
Rostselmash	56T	101450	40T	101453	45T	101454
	4		52 52			







16.5.3. Model Year 2018 Right-Hand Drive Pulleys

Combine	Rear pulley (Item #1)	Pulley PN (Item #1)	Front Knife Drive Pulley (Item #2)	Pulley PN (Item #2)	Front Draper Drive Pulley (Item #3)	Idler Tensioner Bolt	Knife Speed (RPM)
AGCO	50T	101448	50T	101448	40T (PN#101453)	4" (HB#29079)	612
Claas/Lexion	45T	101447	56T	101450	40T (PN#101453)	4.5" (HB#29080)	608
CNH	50T	101448	47T	203059	40T (PN#101453)	3.5" (HB#29085)	604
JD 490	56T	101450	45T	101447	40T (PN#101453)	4.5" (HB#29080)	602
JD 520	56T	101450	47T	203059	40T (PN#101453)	4.5" (HB#29080)	612
CIH 2100- 2500	50T	101448	45T	101447	40T (PN#101453)	4.5"(HB#29080)	592
Rostselmash	50T	101448	45T	101447	40T (PN#101453)	3.5" 29085	579





16.5.4. Model Year 2018 Left-Hand Drive Pulleys

Combine	Auger Drive Pulley (Item #4)	Pulley PN (Item #4)	Rear draper drive Pulley (Item #5)	Pulley PN (Item #5)	Front draper drive Pulley (Item #6)	Pulley PN (Item #6)
AGCO	45T	101447	40T	101453	45T	101454
Claas/Lexion	40T	101445	32T	101452	45T	101454
CNH	50T	101448	45T	101454	45T	101454
JD 490/520	56T	101450	53T	101455	45T	101454
CIH 2100- 2500	50T	101448	45T	101454	45T	101454
Rostselmash	56T	101450	45T	101454	45T	101454



Low Profile Left-Hand Knife 16.5.5.



Location #	Bolt Size
1	6mm X 16mm Spline
2	6mm X 22mm CL10.9 Bolt
3	6mm X 28mm CL 8.8 Loctite
4	6mm X 30mm CL 10.9
5	6mm X 40mm CL8.8
6	6mm X 35mm CL10.9

Low Profile Right-Hand Knife 16.5.6.



Location #	Bolt Size	
1	6mm X 16mm Spline	
2	6mm X 22mm CL10.9 Bolt	
3	6mm X 28mm CL 8.8 Loctite	
4	6mm X 30mm CL 10.9	
5	6mm X 40mm CL8.8	
6	6mm X 35mm CL10.9	
		_







Location #	Bolt Size	
1	6mm X 16mm Spline	
2	6mm X 25mm CL 10.9 Bolt	

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17. Wiring DiagramsWiring Diagrams

17.1. Transport System Model Year 2017 and above

17.1.1. Transport Harness















17.2.3. Agco "Bee-Box" Harness









17.2.6. CNH Multi-Coupler Harness



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17.3.5. CNH/Agco Cigarette Lighter Adapter

Cav	No.	Col.	Spec	Type
1	RED	RED	_AWG_22	_PVC
2	12V	RED	22AWG	TXL
3	BLK	BLK	_AWG_22	_PVC
4	GND	BLK	22AWG	TXL
5	TILT	BLK	22AWG	TXL
6	L-HH	YLW	22AWG	TXL
7	R-HH	YLW	22AWG	TXL
8	CTR-SEN	YLW	22AWG	TXL
9	5VREF	RED	22AWG	TXL
10	PRGD	RED	22AWG	TXL
11	PFLX	RED	22AWG	TXL
12	AIR-PRES	YLW	22AWG	TXL
13	SGND	BLK	22AWG	TXL
14	ADD-AIR	BLK	22AWG	TXL
15	DMP-AIR	BLK	22AWG	TXL



POS

Cav	No.	Col.	Spec	Type
1	-	-8	-2	-2
2	12V	RED	22AWG	TXL
3	-	12	-	*
4	GND	BLK	22AWG	TXL
5	TILT	BLK	22AWG	TXL
6	L-HH	YLW	22AWG	TXL
7	R-HH	YLW	22AWG	TXL
8	CTR-SEN	YLW	22AWG	TXL
9	5VREF	RED	22AWG	TXL
10	PRGD	RED	22AWG	TXL
11	PFLX	RED	22AWG	TXL
12	AIR-PRES	YLW	22AWG	TXL
13	SGND	BLK	22AWG	TXL
14	ADD-AIR	BLK	22AWG	TXL
15	DMP-AIR	BLK	22AWG	TXL

Name Part N	e: CIG	-PLUC	3	
Cav	No.	Col.	Spec	Type
POS	RED	RED	_AWG_22	_PVC
NEG	BLK	BLK	_AWG_22	_PVC















