SERVICE MANUAL

CR5.85
Rotary Combine

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Part number 48040954
English
February 2018

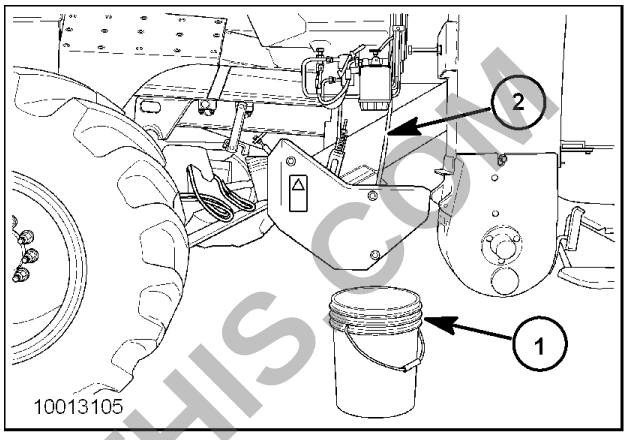
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Engine - Remove

NOTE: *The engine and cooling system used in the combine is designed to be removed as a modular unit. The following engine removal procedure demonstrates the removal of the engine only from the module. This procedure takes into consideration the possible unavailability of proper, or sufficient lifting equipment for complete module removal. When possible, remove the engine and cooling system module as designed.*

1. Remove the gearbox and hydraulic pumps from the engine. (Refer to **Main gearbox and drive - Remove (14.100)**)
   Place a suitable container **(1)** below the coolant drain hose **(2)**.



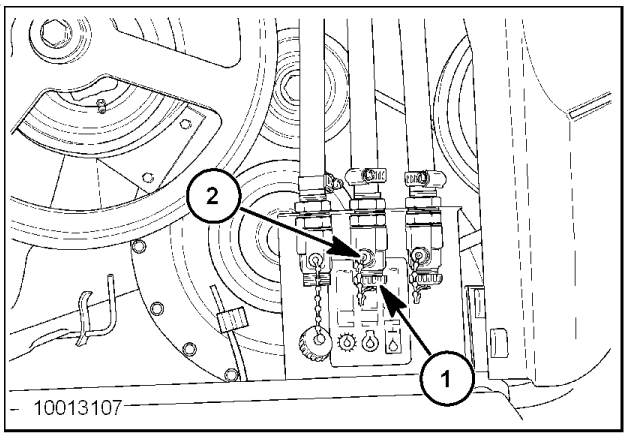
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NOTE: *Depending on model, the cooling system has a coolant capacity between **50 – 60 l** (**13.2 – 15.9 US gal**). Be sure to use clean containers with adequate capacity when draining the cooling system.*

2. Refer to **Expansion tank - Remove (10.400)** for the coolant fluid drain and removal of the engine coolant reservoir.

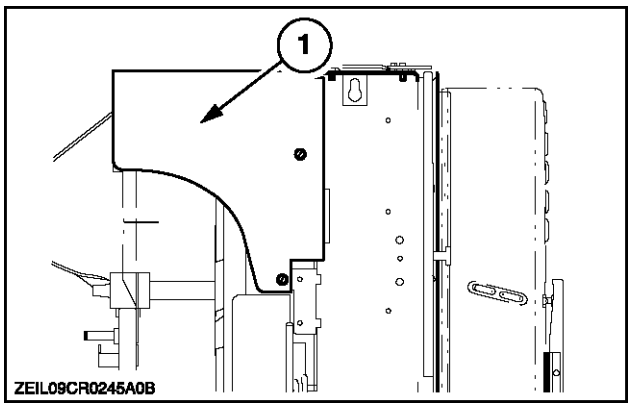
NOTE: *Depending on the model, the combine engine has an oil capacity between **29 – 35 l** (**7.7 – 9.2 US gal**). Be sure to use clean containers with adequate capacity when draining the engine oil.*

3. Remove the cap **(1)** and turn the engine oil drain valve **(2)**, to the open position. Drain all of the engine oil into suitable containers.



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4. Loosen and remove the mounting hardware from the protection cover **(1)**.
   Remove the cover **(1)** from the engine compartment.



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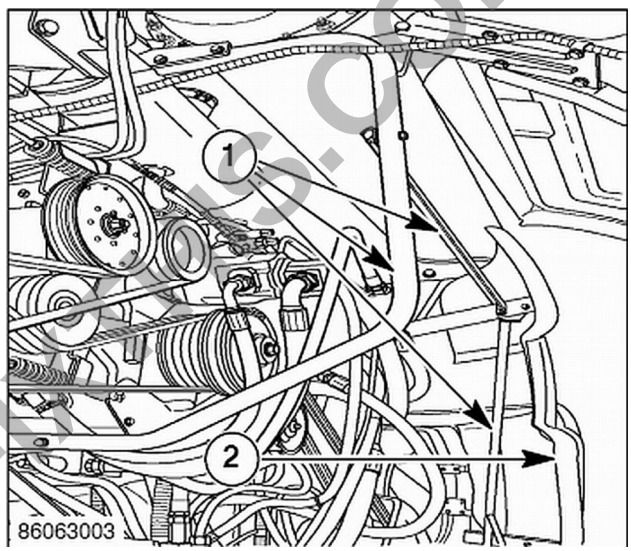
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Main clutch - Remove Clutch Packs

Prior operation:
Side shields - Remove (90.105).

NOTICE: *The engine gearbox clutch packs can be serviced without removing the gearbox from the combine. Although it is physically possible to remove the clutch packs, great care must be exercised when working at the gearbox level. The main clutch pack has a mass of approximately* ***31.7 kg*** *(* ***70 lbs****), the unload clutch pack will be slightly less. Any operation or repair to the clutch packs that would change the stack height of the unit, such as bearing replacement, will require the entire gearbox be removed from the machine. (Refer to* ***Main gearbox - Remove (14.100)****) Improperly shimmed clutch packs may cause early bearing failure.*

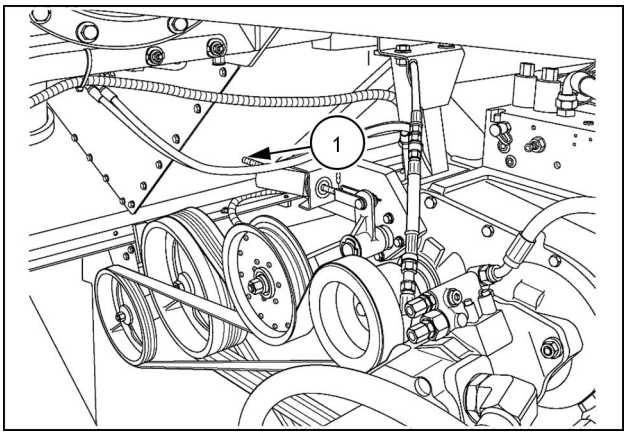
1. Remove the rear hinge support **(1)** and the rear fixed shield **(2)**.



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Clutch Pack Removal

2. Drain the oil from the engine gearbox into a clean, suitable container. Refer to the Operator's Manual for more information.
3. Drain the oil from the hydraulic oil reservoir into a clean, suitable container. Refer to the Operator's Manual for more information.
4. Loosen the unloading auger belt tensioner **(1)**. Remove the belt from the gearbox sheave.



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Final drive - Disassemble

Prior operation:
Final drive - Remove (25.310).

1. After draining the oil, remove the covers **(5)** and **(10)**.
2. Remove the wire that locks the three bolts **(11)**. Remove the three bolts, the washer **(12)** and the shim pack **(9)**.
3. Press the wheel hub **(23)** out of the final drive housing.

NOTE: *The inner ring of the bearing **(2)** and the spacer **(3)** will remain on the shaft. The seal **(1)** will remain in the housing.*

NOTICE: *In case mud seals are installed, only a part of the mud seal will remain on the shaft. The other part will remain in the housing. The surface between the two parts of the mud seal should be oiled before touching them.*

4. Remove the spacer **(3)** and the inner ring of the bearing **(2)** from the output shaft.

NOTE: *The bearing **(2)** will be damaged when it is removed.*

5. Remove the output gear **(4)**, the spacer **(6)** and the inner ring of the bearing **(8)** out of the final drive housing.
6. If necessary, remove the seal **(1)** from the final drive housing.

NOTE: *The seal **(1)** will be damaged when it is removed.*

7. Use a soft punch to remove the outer rings of the bearings **(2)** and **(8)** from the housing.
   Input shaft
8. Remove the bolts **(22)** and the cover **(21)** with the seal **(20)**.
9. Remove the bolts **(14)** and the cover **(15)**.

NOTE: *The seal **(16)** and the O-ring **(17)** will remain in the cover.*

10. Remove the input shaft **(19)** by striking the shaft on the splined end with a soft hammer.
11. Use a soft punch to remove the outer ring of the bearing **(18)**.
12. If necessary, remove the inner rings of the bearings **(18)** from the input shaft.

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Hydrostatic drive system valves - Pressure setting S90 series pump

NOTE: *Although the pump is shown removed for clarity, most repairs and adjustments can be made without removing the hydrostat.*

⚠ WARNING ⚠

The machine must be operating to check system pressures. Make certain that everyone is clear of the machine and all gauges are secured.

Z023

⚠ CAUTION ⚠

Raise the combine drive wheels off the ground to prevent the combine from travelling uncontrolled when making adjustments. Be sure to use suitable blocking or jack stands to support the weight of the combine.

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⚠ CAUTION ⚠

If equipped with powered rear axle make certain the switch is off.

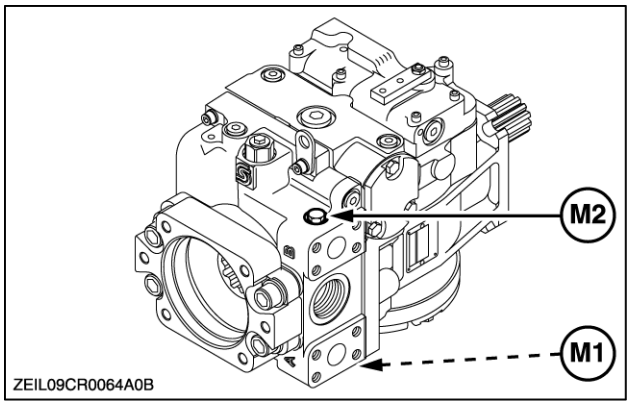
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Multifunction valve adjustment

1. In order to set the pressure on the limiter or relief valves, the motor output shaft must be locked so it does not rotate. This may be accomplished by locking the brakes.

NOTE: *Take necessary precautions that the motor shaft remains locked during the adjusting procedure.*

2. Install two **1000 bar** (**10000 psi**) pressure gauges in the high pressure gauge ports **(M1)** and **(M2)**.



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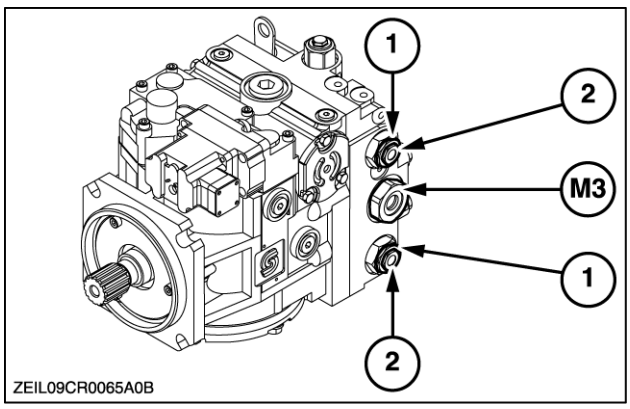
3. Install a **50 bar** (**1000 psi**) pressure gauge in the pump charge pressure gauge port **(M3)**.
4. Start the engine and operate at normal speed.
5. Loosen the locking nut **(1)**.
6. Insert a hex wrench into the pressure adjusting screw **(2)**.

NOTE: *A plastic dust cap may be installed in the adjusting screw **(2)**.*

⚠ CAUTION ⚠

Keep clear of all drives. Rotating elements may cause serious bodily injury.

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Motor valves - Static description S90 series pump

System in Neutral

Charge pump oil flows to both cavities **(20)**, from port **(21)**, oil also flows from port **(21)**, through the check valve orifice **(22)**, to the central land of servo spool valve **(28)**.
Charge pressure oil flows equally from cavity **(21)**, through the orifices **(A)** and **(B)**, to cavity **(23)**, to the case drain. As the electric solenoid **(24)**, is not energized oil flow from cavities **(20)**, into cavity **(23)**, is the same, so the pressure in cavities **(25)** and **(27)**, will be equal and the spool assembly will remain in neutral.

Servo Solenoid Valve 10a Energized

Anchor **(29)**, of the servo solenoid valve **(10a)** moves to the left when the solenoid is energized. The movement of anchor **(29)**, is proportional to the current through the solenoid dependant on the position of the hydrostatic lever.
Oil flow from the left hand cavity **(20)**, to case drain cavity **(23)**, will decrease and the flow from the right hand cavity **(20)**, to cavity **(23)**, will increase. The pressure in cavity **(25)**, on the left side of the servo spool **(26)**, is higher than the pressure in cavity **(27)**, on the right hand side of the spool **(28)**, causing the spools **(26)** and **(28)**, to move to the right.
The charge pump oil can now flow from the center of spool **(28)**, through the check valve orifice **(22)**, to the hydrostatic pump servo cylinder through orifice **(30)**, and port **(31)**, causing the pump swash plate to move.
As the oil flow increases to the servo cylinder through port **(31)**, the displaced oil on the opposite servo cylinder will flow back through port **(32)**, and orifice **(33)**, past the spool **(28)**, through to the case drain through orifice **(34)**, and port **(35)**.

NOTE: *When the opposite direction of travel is selected spools **(26)**, and **(28)**, will move to the left. The feed pressure to the servo cylinder will be through orifice **(33)**, and port **(32)**. Displaced oil from the opposite cylinder will flow to case drain through port **(36)**, and orifice **(37)**.*

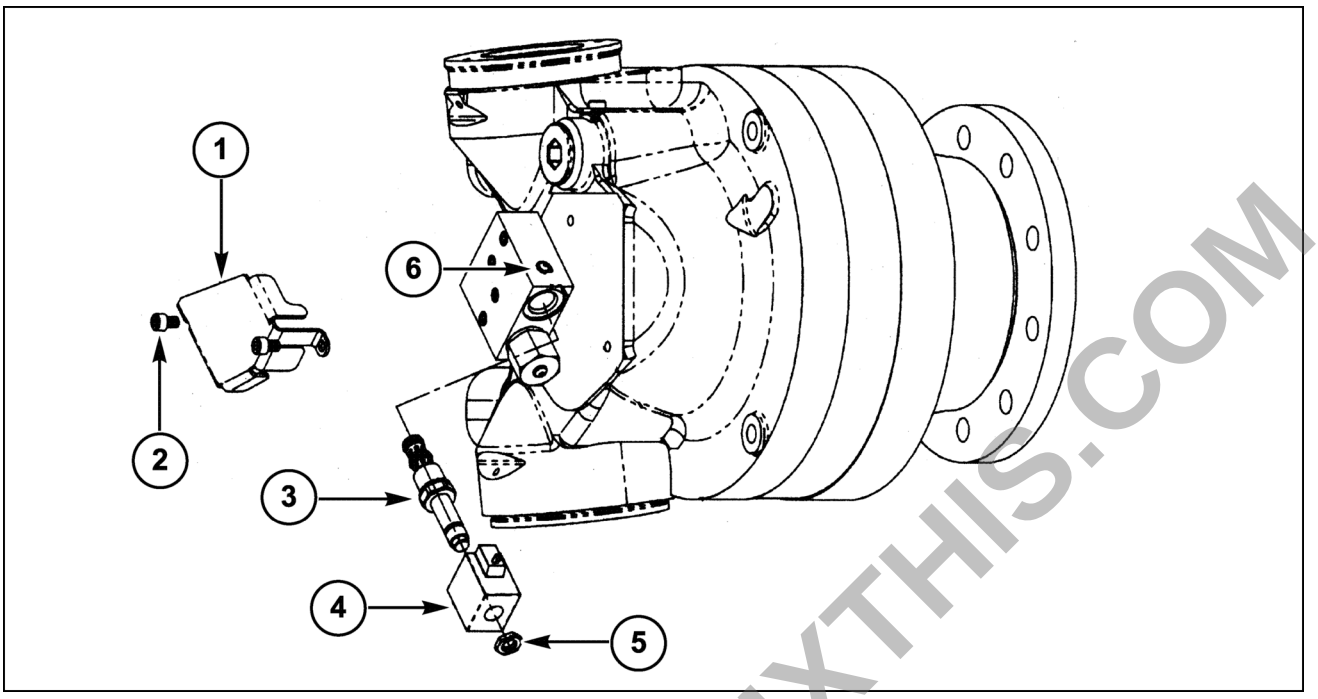
As the swash plate moves the mechanical feed back linkage will move to the right compressing its internal spring when the spring force is equal to the pressure in cavity **(25)**, spool **(28)**, will move back to neutral holding the swash plate in its new position.
Any movement of the swash plate or hydrostatic control lever will affect the balance of spring force and cavity pressure. The spool **(28)**, will then move to a position where the balance is restored
If a shock load occurs in the system it will be felt by the pump swash plate and will create an increase in pressure in the servo cylinder lines and servo valve. To protect the servo valve from the increased pressure in the system the check valve **(10c)** will open connecting the servo cylinder lined directly to the charge pressure circuit. In this circuit the pressure is limited by the charge pressure relief valve.

10.	Servo Valve Assembly	28.	Spool
10a.	Servo Solenoid Valve	29.	Anchor
10b.	Orifice Check Valve	30.	Servo Cylinder Port
10c.	Servo Valve Spool	31.	Orifice
20.	Oil Cavity	32.	Servo Cylinder Port
21.	Oil Feed Port	33.	Orifice
22.	Check Valve Orifice	34.	Orifice
23.	Case Drain Cavity	35.	Case Drain Port
24.	Electric Proportional Solenoid	36.	Case Drain Port
25.	Spool Cavity	37.	Orifice
26.	Spool	38.	Swash Plate Assembly (Feed Back)
27.	Spool Cavity		

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Drive system Control valve - Overhaul



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⚠ WARNING ⚠

Before you do service under the machine, put the machine on a level surface, engage the parking brake and stop the engine. Put blocks at the front and rear of the tires. Failure to comply could result in death or serious injury.

46-77A

NOTE: *The solenoid valve can be replaced without removing the motor from the C-frame.*

1. Turn the wheel to the steering stop to gain access to the valve.

⚠ WARNING ⚠

Hydraulic fluid escaping under pressure can have enough force to penetrate the skin. Hydraulic fluid may also infect a minor cut or opening in the skin. If injured by escaping fluid, see a doctor at once. Serious infection or reaction can result if medical treatment is not given immediately. Make sure all connections are tight and that hoses and lines are in good condition before applying pressure to the system. Relieve all pressure before disconnecting the lines or performing other work on the hydraulic system. To find a leak under pressure use a small piece of cardboard or wood. Never use hands. Failure to comply could result in death or serious injury.

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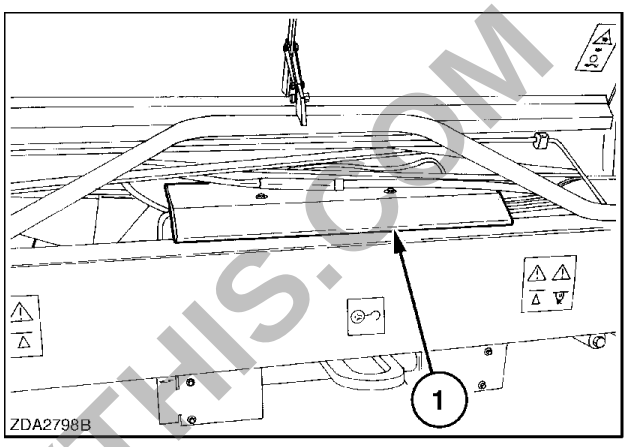
2. Release the pressure in the supply circuit.
3. Disconnect the drain line at the tank level to avoid siphoning.
4. Disconnect the electrical connection.
5. Remove the two capscrews **(2)** and cover **(1)**.
6. Remove the Hex nut **(5)**, magnetic winding **(4)** and cartridge valve **(3)**.
7. Make sure new cartridge valve is clean. Lubricate O-rings with hydraulic fluid. Install new cartridge valve **(3)** and torque to **24 – 30 Nm (17.8 – 22.2 lb ft)**.

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Hydraulic service brakes - Bleed

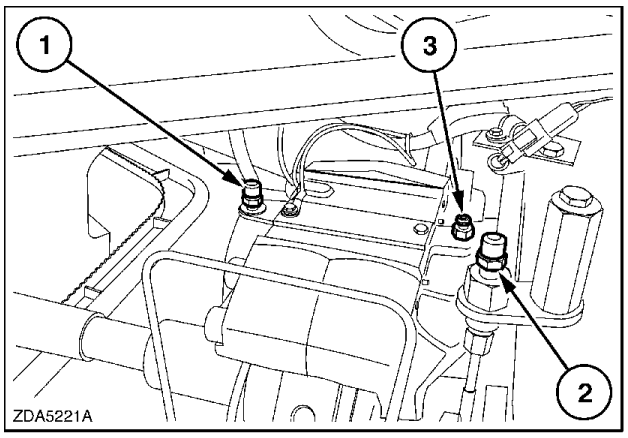
1. To bleed the brakes, proceed as follows:
   Block the wheels adequately to prevent runaway of the combine.
2. Raise the header and engage the header safety latch. Stop the engine.
3. Remove cover plate **(1)**.

NOTE: *As the brake pedals must be depressed several times while bleeding, this job has to be done with two persons.*



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4. Bleed the left-hand side circuit.
5. Bleed the connection pipe between the two main cilinders.
6. Bleed the right hand side circuit.
7. Bleeding the left-hand side circuit
   Remove rubber stops from left-hand side bleed screws **(1) (2)** and **(3)**.
   Slide a transparent hose over bleed screw **(1)** to catch the oil while bleeding.
   Open bleed screw **(1)** and depress the left-hand side brake pedal until fluid escapes.
   Close bleed screw **(1)**.



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8. Depress the left-hand side brake pedal several times to build up a pressure.
9. Keep the pedal depressed.
10. Open bleed screw **(1)** slightly to allow air and fluid to escape.
11. Close bleed screw **(1)** and release the brake pedal.
12. Repeat steps **8** to **11** until fluid free of air bubbles escapes through bleed screw **(1)**.

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Hydraulic systems - Troubleshooting

Problem	Possible Cause	Correction
No Steering and No Other High Pressure System Functions	Fault in CCLS pump circuit.	Perform tests for CCLS pump
Steering Working Okay but No Other High Pressure System Functions	Fault in priority valve.	Inspect spool for jamming in the valve housing.
All high pressure system functions affected	A fault common to all functions, possibly the CCLS pump is faulty, the system relief valve is stuck open or a blocked pressure filter.	
Both the high and low pressure systems are affected	A common fault affecting the pumps, possibly a pump drive fault or a fault in the gearbox	
Only one function affected, other functions operating normally	Fault specific to that function. Is an error code displayed on the MDF. If an error code is displayed investigate the error code and eliminate before proceeding. Determine if fault is electrical or hydraulic. If the solenoid has a manual push button, activate, if function operates okay, the fault is electrical.	Check the solenoid valve assembly (resistance of coil), check connector pins, check for voltage on the connector, check for short circuits on connector either to ground or + voltage. Inspect the wiring harness and check for open circuits and check the operation of the cab switch.
	If the function does not operate with the manual button check the hydraulic circuit.	If possible install a pressure gauge to the component being operated if pressure is indicated this may suggest a seized or non--functioning component. If there is no output pressure from the valve then there may be a fault within that valve slice, remove the valve and inspect for sticking spools, broken springs or dirt ingress in galleries.
A function will only operate in one direction	Is an error code displayed on the MDF. If an error code is displayed investigate the error code and eliminate before proceeding. Determine if fault is electrical or hydraulic. If the solenoid has a manual push button, activate, if function operates okay, the fault is electrical.	Check the solenoid valve assembly (resistance of coil), check connector pins, check for voltage on the connector, check for short circuits on connector either to ground or + voltage. Inspect the wiring harness and check for open circuits.
		Fault in valve, possibly a sticking spool Component seized or damaged.
Oil overheating	Relief valve continually blowing, check for broken spring or dirt ingress and reset.	
	Oil cooler blocked or thermostatic bypass valve faulty not allowing oil to circulate around the cooler.	
Jerky or inconsistent Operation	On functions requiring consistent and fine control the system pressure is maintained by a pressure compensation valve located within the valve slices. If these stick and fail to operate jerky or inconsistent operation may result.	
Components may drop gradually or Move gradually out of position without being operated	Functions that contain lock--out valves may drop or move if the seals within that function are slightly worn and the lock out valve is not functioning. This may be due to dirt ingress or the valve sticking open. If the lock out valve sticks closed this may lead to a function not operating or operating very slowly.	

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Ambient Temperature °C (°F)	% Relative Humidity		Louver Temps* °C (°F)		Normal Low Side Pressure kPa (psig)		Normal Hlgh Side Pressure kPa (psig)	
	Low RH	High RH	Low RH	High RH	Low RH	High RH	Low RH	High RH
21 (70)	19 to 21	81 to 89	4 (40)	11 (51)	62 to 62 (9 to 9)	83 to 97 (12 to 14)	779 to 862 (113 to 125)	807 to 889 (117 to 129)
27 (80)	18 to 20	69 to 77	8 (46)	14 (57)	69 to 83 (10 to 12)	103 to 117 (15 to 17)	917 to 1014 (133 to 147)	993 to 1103 (144 to 160)
32 (90)	16 to 18	58 to 64	12 (53)	18 (64)	90 to 103 (13 to 15)	131 to 145 (19 to 21)	1089 to 1200 (158 to 174)	1207 to 1331 (175 to 193)
38 (100)	14 to 16	48 to 53	16 (60)	21 (70)	117 to 131 (17 to 19)	165 to 179 (24 to 26)	1276 to 1413 (185 to 205)	1427 to 1579 (207 to 229)
43 (110)	12 to 14	36 to 40	19 (66)	25 (77)	152 to 165 (22 to 24)	200 to 228 (29 to 33)	1510 to 1669 (219 to 242)	1662 to 1841 (241 to 267)
49 (120)	10 to 12	26 to 28	23 (73)	28 (83)	200 to 221 (29 to 32)	248 to 276 (36 to 40)	1779 to 1972 (258 to 286)	1910 to 2117 (277 to 307)

* Temperatures shown are highest normal temperatures expected - actual louver temperatures may be cooler.
* Louver temperature is measured in the top left round louver facing the operator.

NOTE: *The Air Conditioning Temperature/Pressure Chart is based on testing conducted on a Denso Compressor with a **3/4 in** suction hose. The chart is provided as a guide only.*

Check For Leaks

14. The A/C system should not leak. “Topping off" a leaky air conditioning system perpetuates the escape of refrigerant to the atmosphere. The proper service procedure is to locate and then correct the leak before putting any refrigerant into the system.

NOTICE: *Any refrigerant introduced into the system for the purpose of finding leaks must also be recovered from the system.*

NOTICE: *Always use the same type of refrigerant for checking leaks as was originally installed.*

NOTICE: *Never use compressed air to detect system leaks. The introduction of air into the system may create a fire or explosion hazard, may overload the desiccant with moisture, and could contaminate the system with dirt.*

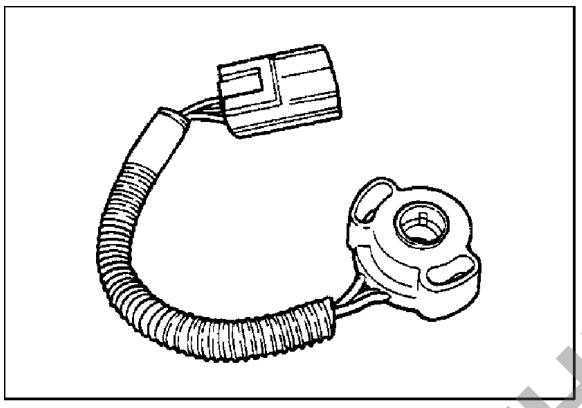
15. A small amount of refrigerant leakage is normal. Much of the normal leakage comes from the slow seepage of refrigerant through the flexible hoses. Other common sources of leaks are at joints between the flexible hose and metal tubing or at threaded hose connections. These are usually much larger leaks than the natural seepage through the walls of the hose and are almost always repairable. When servicing them it is important that leakage be minimized.

16. Be certain to use an electronic leak detector, Tool # OEM 1486 or equivalent, for detecting R-134a.

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POTENTIOMETERS

Potentiometers are variable resistors which are dependant on mechanical movement, i.e. Lateral float movement, to vary the resistance of the component and therefore alter the output voltage.
In order to verify the correct operation of a potentiometer, the resistance should be measured at the minimum and maximum positions and a smooth and continuous change of resistance should be observed between. As the resistance varies with temperature, the test specifications are usually given at **20 °C**.

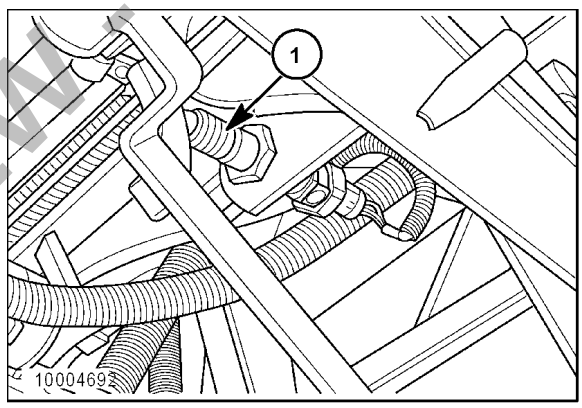


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POTENTIOMETER ADJUSTMENT

When installing potentiometers, it is important to ensure that they do not bottom out in either direction, to prevent damage. Most potentiometers have slotted mounting holes to allow some adjustment. Before tightening the mounting hardware, operate the attaching linkage fully in both directions to confirm proper potentiometer positioning.
The feeder angle sensor **(1)** and optional header stubble height potentiometers (not shown) require further adjustment to provide proper HHC operation as follows:

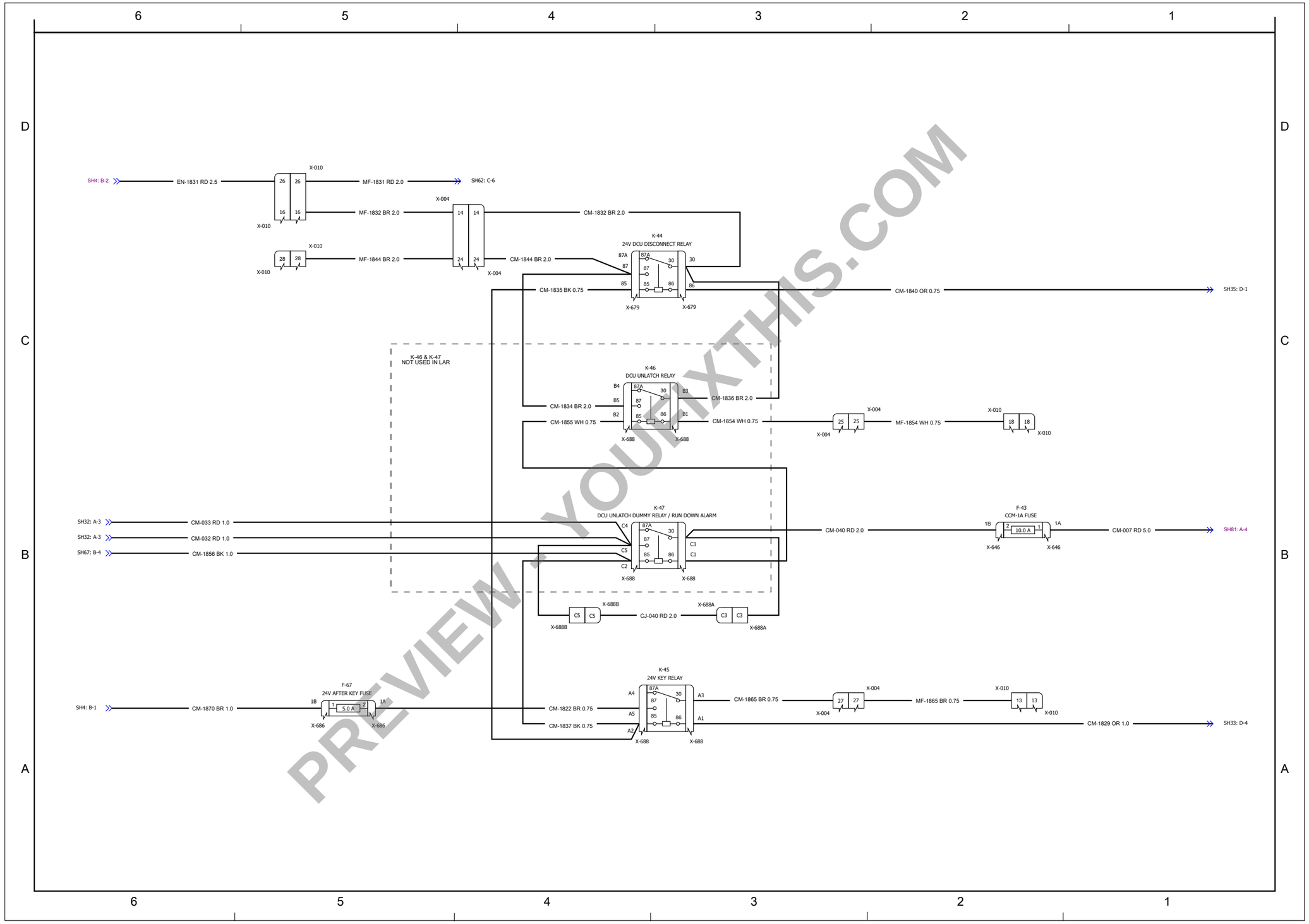
A. Enter the monitor Diagnostic screen for the potentiometer.
B. Adjust the potentiometer so that the indicated voltage on the screen stays within a range of **2.5 – 7.5 V** throughout the normal operating motion of the potentiometer. In practice, this is most easily accomplished by raising the feeder fully, and adjust the potentiometers so that the diagnostic screen indicates less than **7.5 V**.



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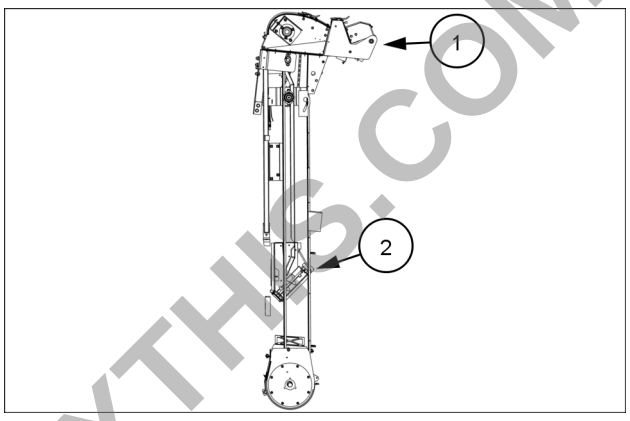
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Precision farming system - Dynamic description - Yield monitoring - Theory of operation

The yield monitoring system is intended to give the user an accurate assessment of how yields vary within a field. As the grain elevator moves the crop flow through the system, a small amount of grain is directed to the moisture bypass unit. The moisture bypass unit is used to determine the moisture and grain temperature of the crop. After a small amount of grain sample has been processed through the bypass unit, it re-enters the grain elevator and proceeds to the yield sensor. The yield sensor measures the crop flow force as it strikes the sensor face plate. An electronic signal, proportional to crop flow, is sent to the monitoring computer.

Typical components of the yield monitoring system are

- Yield sensor **(1)** also known as grain flow sensor.
- Moisture sensor, part of the moisture bypass unit **(2)**, see **Precision farming system - Dynamic description (55.785)** .
- Global Positioning System (GPS) receiver (not shown).
- Monitoring computer (not shown).



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Always check for proper adjustment of the yield monitoring system:

Level sensor

- For troubleshooting the level sensor, see **Precision farming system - Test - Auger motor (55.785)**.
- Level sensor adjustment, see **Precision farming system - Adjust - Level (proximity) sensor (55.785)**.

Yield sensor

- Mass flow sensor
  - Mounted in the top of the grain elevator
  - Senses yield on the go
- Sensor plate
  - Attached to:
    Pivoting device
    Counterweight
  - Keeps the system balanced when working on slopes
  - Neutralizes the rubbing effect of different kinds of grain
  - Sensor requires calibration
- To check the yield sensor, see **Precision farming system - Check - Grain flow sensor (if installed) (55.785)**.
- To adjust the yield sensor, see **Precision farming system - Adjust - Grain flow sensor (55.785)** or **Precision farming system - Adjust - Grain flow sensor (alternate in the field method) (55.785)**.

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E0042-06 - Current Sense Reverser Short Circuit

Control Module: CM1

Cause:
The reverser (M-10) circuit indicates high current draw.

Possible failure modes:

1. Circuit connection shorted.
2. Excessive mechanical load on motor.
3. Controller internal failure (internal regulator failure).

Solution:

1. Use the display monitor diagnostics capability to view "Parameter" status, reference **Instrument cluster - Detailed view (55.408)**, if needed.

   Record and erase service history.
   Start the combine, engage the threshing mechanism and operate fan speed and straw elevator reverser circuits in both directions.
   Record in which direction(s) the fan speed increase or decrease operates. Does straw elevator reverser engage?
   Reload error history.
   Check for the following fault codes: E0041-06, E0042-06, E0076-05 and E0077-05.
   Use the table above to determine the location of the fault.

SYMPTOM	FAULT CODES				
	E0041-06	E0042-06	E0076-05	E0077-05	
Fan operates in 1 direction only	X				Go to step 2
			X		Go to step 3
Fan and reverser operate in 1 direction only			X	X	Go to step 7
Fan does not operate in either direction			X		Go to step 11
			X		Go to step 18
Reverser operates in 1 direction only		X			Go to step 19
				X	Go to step 20
Reverser does not operate in either direction				X	Go to step 24
				X	Go to step 31
Both fan and reverser do not operate in either direction			X	X	Go to step 32

2. The cleaning fan adjustment motor is bound up.

   A. See the appropriate service manual chapter for repair.

3. The fan operates in one direction only. Fault codes indicate a short to ground. Disconnect the fan adjustment motor connector **X090**.

   A. Measure the resistance on connector **X090** between pin A and pin B. The proper resistance range for the coil is **1.0 – 5.0 Ω**. If out of specification, replace the fan adjustment motor.

   B. If the motor coil resistance is within specification continue with step **4**.

4. Measure the resistance on connector **X090** between pin A and chassis ground. Flex the lower frame and front frame harnesses while making this check.

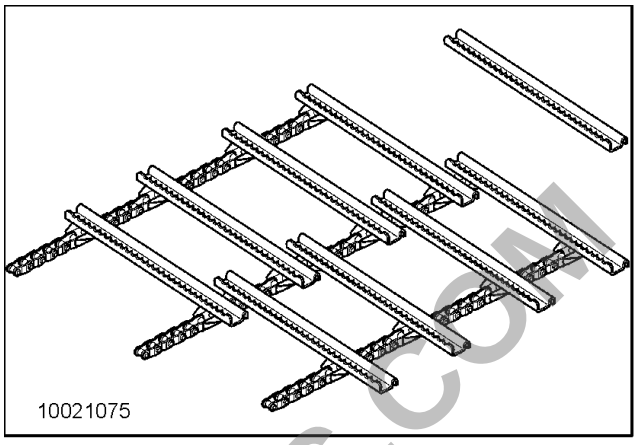
   A. If no continuity to ground is found, erase the fault code and continue operation.

   B. If there is continuity to ground, continue with step **5**.

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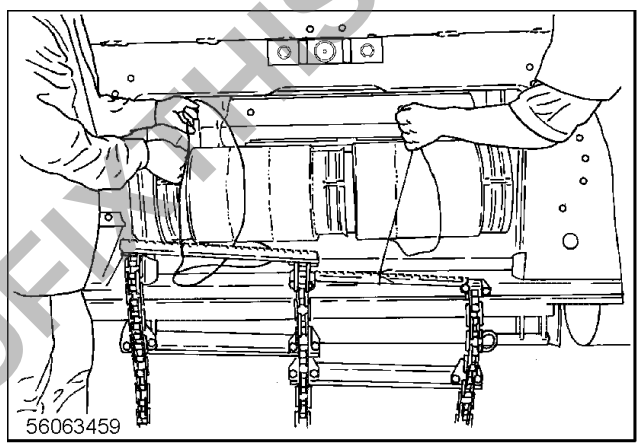
Feed chain Feeder housing - Install

1. Before installation, clean the chain with an appropriate solvent. Inspect the links and serrated slats for damage or excessive wear. Replace damaged or worn parts. If any slats are replaced, torque the fastening bolts to a minimum of **47 Nm** (**35 lb ft**). Lubricate the chain with **NEW HOLLAND AMBRA HYPOIDE 90 GEAR LUBE**.



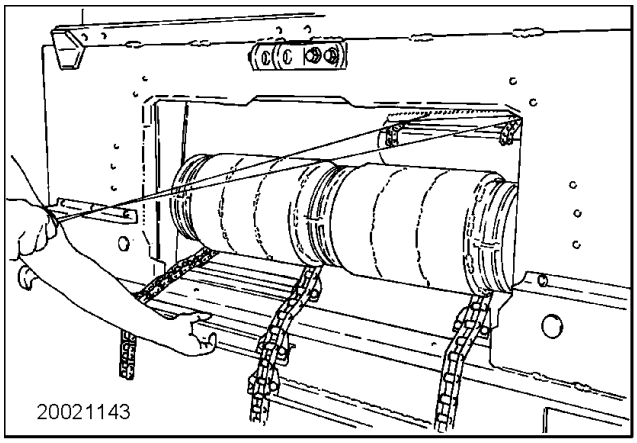
10021075 1

2. To facilitate installation, attach a rope or twine to each leading slat of the straw elevator chain. The leading slats have the serrated portion of the slat to the front, in the direction of travel. Make the rope long enough to go through the front of the feeder, around the pivot shaft, and out of the feeder.



56063459 2

3. Route the straw elevator chain through the bottom of the straw elevator and around the pivot shaft. Make sure that the chain is properly oriented before installation. Disconnect the rear straw elevator drive chain so that the pivot shaft is able to rotate freely. If necessary, completely lower the straw elevator to access the straw elevator chain through the top.



20021143 3

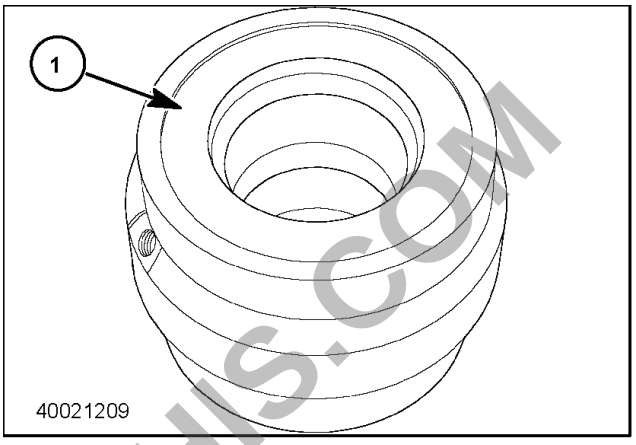
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Transmission driven pulley and shaft Cross and bearing - Inspect

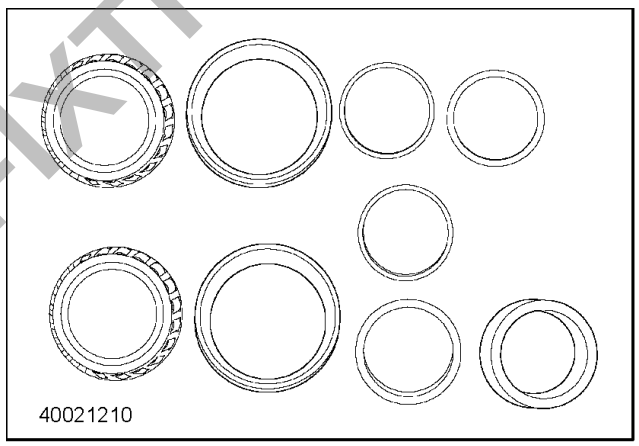
Prior operation:
Transmission driven pulley and shaft Cross and bearing - Disassemble (66.260)

1. Remove and discard the seals **(1)** from the bearing assemblies.



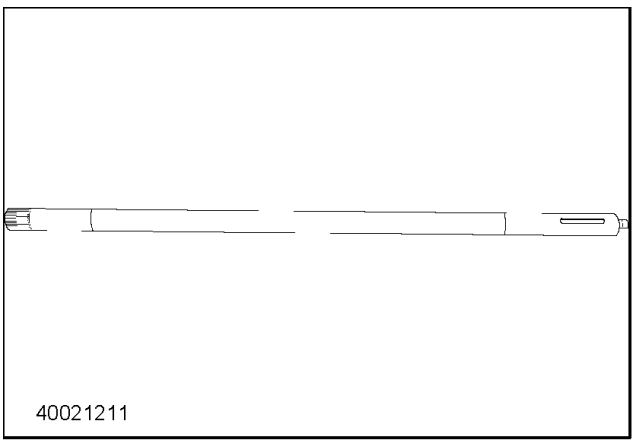
40021209 1

2. Remove the spacers, the shims and the bearings from each bearing assembly. Remove grease from the all parts. Clean the parts in a suitable solvent and allow them to dry.
3. Inspect the bearings for each side of the main shaft for free movement, excessive lateral play, or damage. Inspect the bearing races in the bearing housing for signs of wear or damage. Replace if necessary. ALWAYS replace the bearings, races and shims as a matched set.
4. Inspect the spacers and the shims for signs of excessive wear or damage. Replace the spacers as necessary. The shims and the internal spacer are part of the bearing assembly set, which comes with the proper amount of shims with the spacers, the races and the bearings.



40021210 2

5. Inspect the main shaft for cracks, bends, fatigue or other signs of excessive wear or damage. Check the splines for wear. Repair or replace the shaft when necessary.



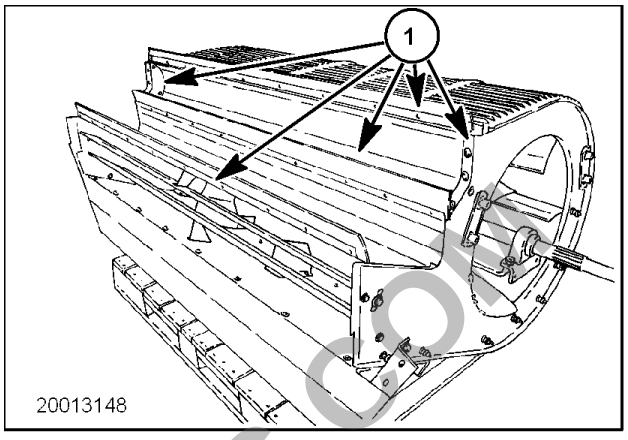
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Fan housing - Reseal

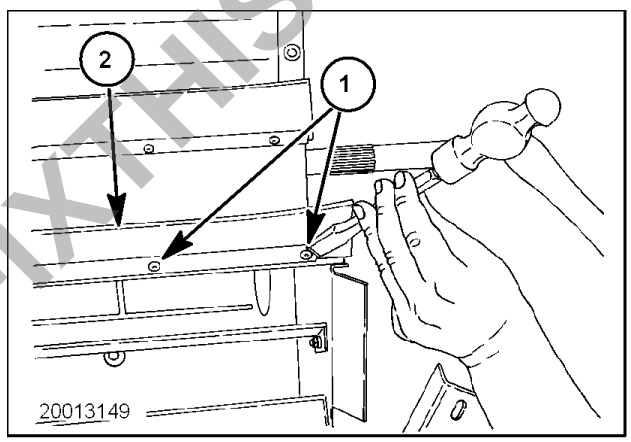
1. Removal and Installation
   The canvas seals **(1)** on the cleaning fan housing should be inspected for distortion, wear and/or damage when the cleaning fan housing is removed from the combine. If distortion, wear or damage is found, the seals need to be replaced. The procedure to remove and install the canvas seals follows.
   Remove the cleaning fan housing from the combine. (See **Fan housing - Remove (74.130)**.)



20013148 1

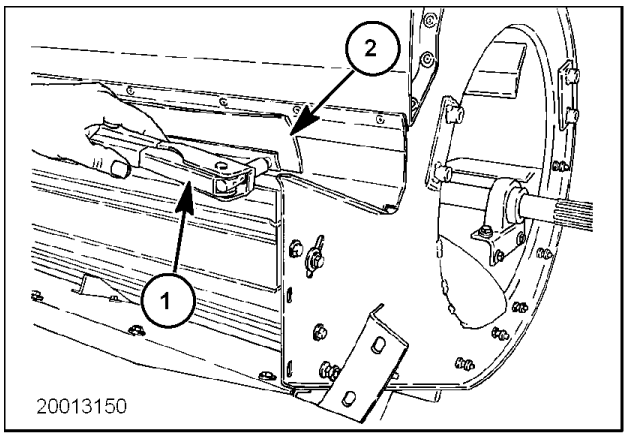
2. Use a sharp chisel and a hammer to remove the rivets **(1)**, from the canvas seal **(2)** Repeat for the remaining rivets.
   Clean the mounting surface on the cleaning fan housing and position a new canvas seal **(2)** on the housing, aligning the mounting holes.

NOTICE: *Note the mounting position of the horizontal seals during removal. The seals must be installed on the same side of the flange they were removed from.*



20013149 2

3. Use a pop-rivet tool **(1)** to install new rivets in the mounting holes of the seal **(2)** and the housing.
   Repeat the procedure for the remaining seals being replaced on the fan housing.

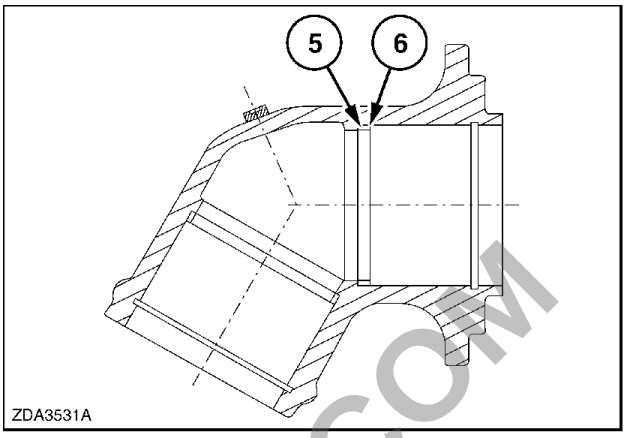


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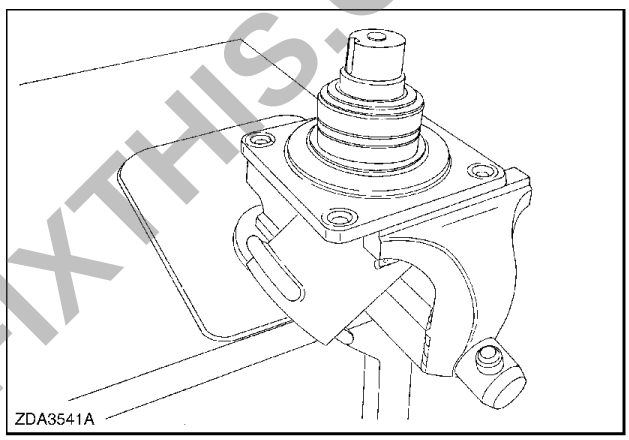
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4. Install original shim packs **(5)** and spacer **(6)**.



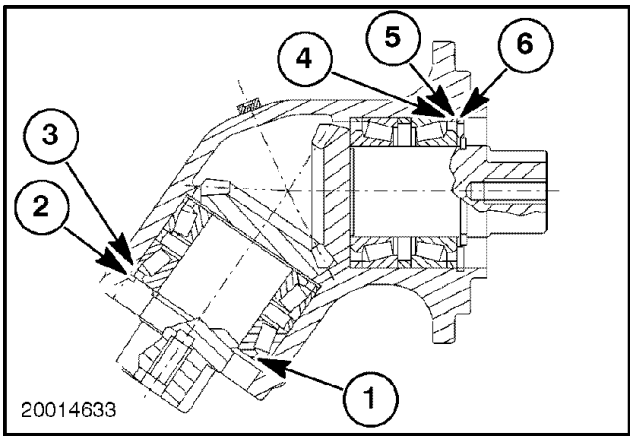
ZDA3531A_1365 4

5. Install the pre-assembled shafts partially in, by only pushing on the outer ring of the bearings. Check if the preload of these pinions is still between the range shown. This preload (assembly) should be **1.2 – 2.0 N·m**. (**11 – 18 in. lbs**).



ZDA3541A 5

6. On the output shaft, install the spacer **(4)** outer shim pack **(5)** and circlip **(6)**. Add shims at **(5)** as required to ensure there is no clearance (zero endplay) between the spacer and circlip.
   On the input shaft, install the spacer **(3)** outer shim pack **(1)** and circlip **(2)**. Add shims at **(1)** as required to ensure there is no clearance (zero endplay) between the shaft assembly and the circlip.
   While holding the output shaft to apply a light load to it, rotate the input shaft clockwise several revolutions, as viewed from the end of the shaft. This will seat the bearing rollers, and will also mark the gear contact pattern in the bluing compound on the gear teeth.
   Check the gear backlash. The back lash should be between **0.11 – 0.3 mm** (**0.004 – 0.012 in**).
   Remove the input shaft from the gearbox, and check the gear contact pattern on the gears; the contact pattern should be **40%** central-toe, as shown in Figure **7**.



20014633 6

7. Backlash Adjustment
   The shaft that is moved to adjust the backlash depends on whether the backlash needs to be increased or decreased, and on the gear contact pattern observed. Refer to the following chart to determine the adjustment required.

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Pneumatically-adjusted operator seat - Problem solving

OPERATION

The seat system has a power seat height adjustment using an air motor adjustment.

The seat height is adjusted with air pressure controlled with a switch.

The seat adjustment system is supplied by an unswitched battery circuit, allowing adjustment at all times.

Refer to : **Wiring harnesses - Electrical schematic sheet 42 (55.100)**.
Refer to : **Wiring harnesses - Electrical schematic sheet 44 (55.100)**.

TROUBLESHOOTING

Before troubleshooting the seat system make sure that the following operating conditions are met:

A. The batteries are fully charged and all connections are clean and tight.

B. Transmission in neutral or park.

C. Check all connectors for full installation, loose, corroded, pushed out, or bent terminals.

D. Check fuse #16 and #49.Power Seat System Symptom Chart.

NOTE: *The batteries must be fully charged and all connections clean and tight. Use a multimeter (DVOM) for these tests. For battery testing and service, see the battery section in the service manual.*

⚠ CAUTION ⚠

DO NOT use a self-powered test light for any of these tests. Use of a self-powered light can cause damage to components in this system.

M979

⚠ CAUTION ⚠

Before performing any of the electrical tests, be sure all operating controls are in neutral or park lock position. This will eliminate accidental movement of the machine or start-up of power driven equipment. Failure to comply could result in death or serious injury.

M980

Problem	Possible Cause	Correction
Height adjustment not operating	Power and ground supply, Seat Pump Motor, Seat Solenoid.	B - Height Adjustment Circuit Test **Pneumatically-adjusted operator seat - Testing (90.124)**.
	Air system leaking.	Check air lines for leakage.
Operator presence is malfunctioning	Seat Switch CCM System's circuits	C - Operator Presence Switch Circuit Test **Operator presence switch Seat switch - Testing (55.408)**.

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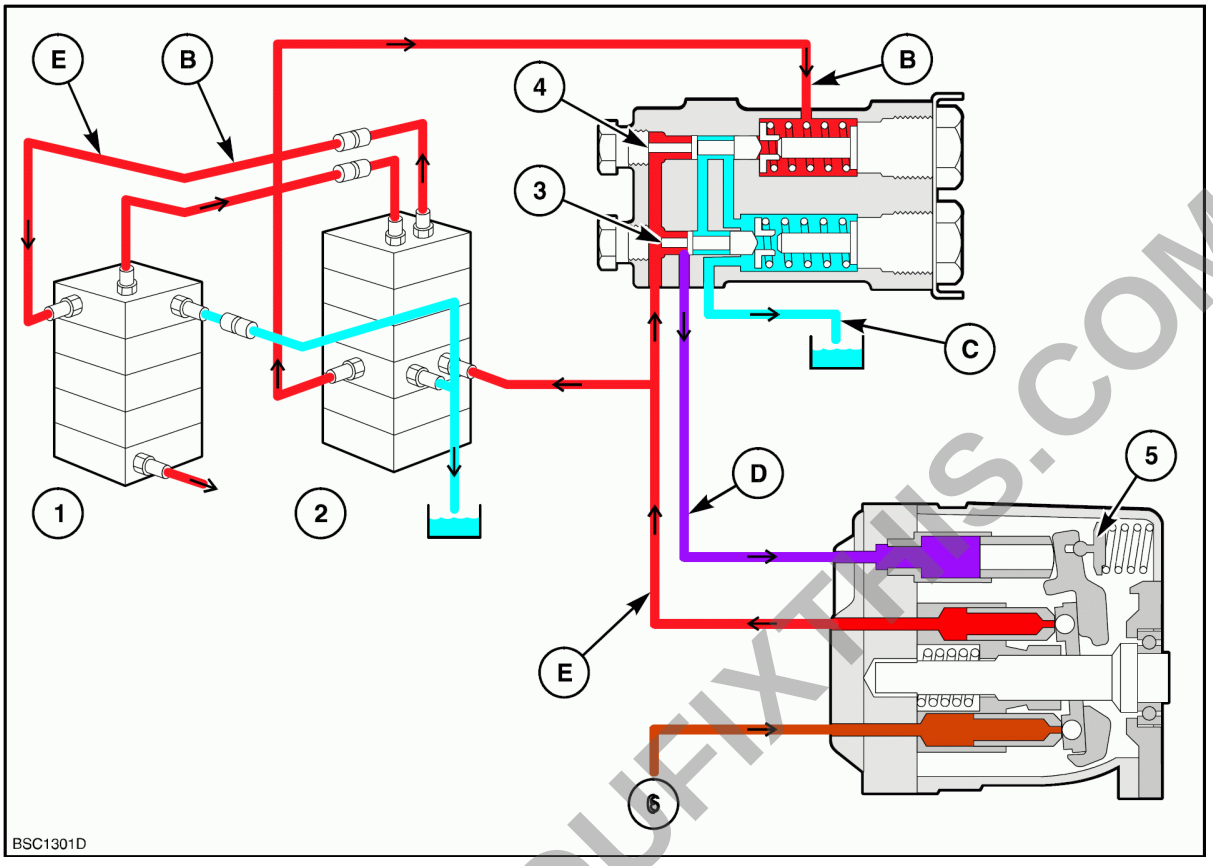
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Controlling Maximum System Pressure



BSC1301D 5

Controlling Maximum System Pressure

	Standby Pressure @ **190 bar** (**2755 psi**)		Return to Reservoir
	Control Pressure		Charge Pressure

1 Straw elevator stack valve
2 Main frame stack valve
3 Pressure Compensating Valve
4 Flow Compensating Valve
5 Swash Plate
6 Return oil from hydrostatic motors

To limit the maximum output pressure of the piston pump and prevent consequential damage that may occur due to excessive pressures, a pressure compensating valve, located adjacent to the flow compensator valve, is incorporated in the swash plate control circuit. This valve limits the pressure to **197 bar** (**2857 psi**) and operates as follows:-
As the pressure in gallery **(E)**, increases to **197 bar** (**2857 psi**) the pressure compensator valve spool **(2)** moves against the valve return spring and opens gallery **(E)**, to gallery **(D)**. The pressure in gallery **(D)**, is now applied to the servo piston which changes the swash plate angle to reduce pump output to minimum flow. This operating mode is referred to as high pressure standby.
Functions requiring sensitive control, like the header height, lateral flotation and hydraulic reel drive have an additional pressure compensation valve in their circuit to ensure that the operational speed is constant what ever the pump pressure is (see high pressure circuit diagram).

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E0525-11 - HHC Accumulator Valve Unidentified Failure Code

Control Module: HHC

Cause:
The Header Height Control (HHC) has detected that the Accumulator Valve circuit is disconnected or faulty.

Possible failure modes:

1. The HHC Accumulator Valve circuit is disconnected or faulty.
2. Header Height Accumulator solenoid (L-06) failure.

Solution:

1. Verify the fault is present. Disconnect the main valve stack (MV) harness connector **X281**. Use a multimeter to measure the continuity between pins 1 and 2 of the solenoid. The reading should be **4.5 Ω +/- 0.5**.

   A. If the multimeter indicates high resistance or an open circuit, replace header height accumulator solenoid (L-06).

   B. If the reading is within the proper limits, the solenoid is good. Continue troubleshooting at step **2**.

   NOTE: *Visually inspect the wiring harness and connectors. Verify that the connectors are fully installed. Inspect the terminals and wires at each connector for pushed back or corroded terminals or damaged wires. Flex the harness involved to reveal intermittent breaks or shorts in the wiring concerned.*
2. Verify the accumulator valve power circuit is good. Turn off the ignition switch. Disconnect the main valve stack (MV) harness connector **X281**. Use a multimeter to measure the continuity between main valve stack (MV) harness wire 759 white connector **X281** pin 1 and connector **X280** pin 1.

   A. If the meter indicates continuity, this segment of the circuit is good. Continue with step **3**.

   B. If the meter indicates an open. Locate and repair the open. Continue with step **4**.
3. Verify the accumulator valve ground circuit is good. Disconnect the main valve stack (MV) harness connector **X280**. Use a multimeter to measure the continuity between Main Frame (MF) harness wire 760 black connector **X280** pin 2 on the Main Frame (MF) harness side to chassis ground.

   A. If the meter indicates continuity, this segment of the circuit is good. The fault must be intermittent. Inspect front frame ground wire 483 black. Continue with step **4**.

   B. If the meter indicates an open, locate and repair the open.
4. Visually inspect the harness and connectors for damage, bent or dislocated pins, broken or pinched wires.

   A. Repair any damage found during visual inspection.

   B. If no damage is found, erase the fault code and continue operation.

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