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Precision Disk 500
Precision Disk 500T
Disk Drill

SERVICE MANUAL

Part number 47648331
2nd edition English
June 2014
Replaces part number 47484207

CASE IH AGRICULTURE

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Safety rules

Personal safety



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible death or injury.

Throughout this manual and on machine safety signs, you will find the signal words DANGER, WARNING, and CAUTION followed by special instructions. These precautions are intended for the personal safety of you and those working with you.

Read and understand all the safety messages in this manual before you operate or service the machine.

⚠ DANGER indicates a hazardous situation that, if not avoided, will result in death or serious injury. The color associated with DANGER is RED.

⚠ WARNING indicates a hazardous situation that, if not avoided, could result in death or serious injury. The color associated with WARNING is ORANGE.

⚠ CAUTION indicates a hazardous situation that, if not avoided, could result in minor or moderate injury. The color associated with CAUTION is YELLOW.

FAILURE TO FOLLOW DANGER, WARNING, AND CAUTION MESSAGES COULD RESULT IN DEATH OR SERIOUS INJURY.

Machine safety

NOTICE: *Notice indicates a situation that, if not avoided, could result in machine damage or property damage. The color associated with Notice is BLUE.*

Throughout this manual you will find the signal word Notice followed by special instructions to prevent machine damage or property damage. The word Notice is used to address practices not related to personal safety.

Information

NOTE: *Note indicates additional information that clarifies steps, procedures, or other information in this manual.*

Throughout this manual you will find the word Note followed by additional information about a step, procedure, or other information in the manual. The word Note is not intended to address personal safety or property damage.

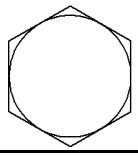
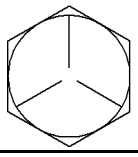
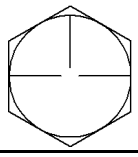
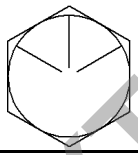
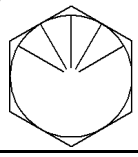
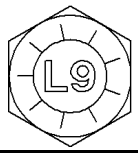
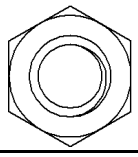
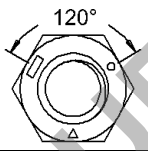
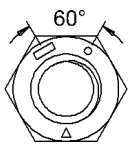
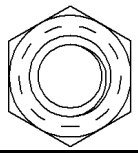
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Torque

BOLT TORQUE INFORMATION

1. Fasteners should be replaced with the same or higher grade fasteners. If higher grade fasteners are used, these should only be tightened to the strength of the original.
2. Make sure the fastener's threads are clean and that thread engagement is started. This will prevent them from failing when being tightened.
3. Tighten plastic insert or crimped steel-type lock nuts to approximately **50 %** of the dry torque, applied to the nut, not to the bolt head. Tighten toothed or serrated-type lock nuts to the full torque value.
4. The L9 (Alloy) fasteners torque values are for a bolt, nut, and two washers. When using L9 (Alloy) fasteners, do not use the values in this table for tapped holes.

	GRADE						
	1 or 2	**5**	**5.1**	**5.2**	**8**	**8.2**	**L9 (Alloy)**
SAE Markings for Bolts and Cap Screws							
	2	5			8		L9 (Alloy)
SAE Markings for Hex Nuts							

	GRADE 2*		GRADE 5, 5.1 or 5.2		GRADE 8 or 8.2		GRADE L9 (Alloy)	
SIZE	**Dry ****	**Lubricated ****	**Dry****	**Lubricated ****	**Dry****	**Lubricated ****	**Head**	**Nut**
1/4 UNF	**7.5 Nm**	**5.7 Nm**	**10.8 Nm**	**8.5 Nm**	**16.3 Nm**	**12.2 Nm**	**13.6 Nm**	**14.9 Nm**
	5.5 lb ft	**4.2 lb ft**	**8 lb ft**	**6.3 lb ft**	**12 lb ft**	**9 lb ft**	**10 lb ft**	**11 lb ft**
1/4 UNC	**8.5 Nm**	**6.4 Nm**	**13.6 Nm**	**9.8 Nm**	**19 Nm**	**13.6 Nm**	**16.3 Nm**	**17.6 Nm**
	6.3 lb ft	**4.7 lb ft**	**10 lb ft**	**7.2 lb ft**	**14 lb ft**	**10 lb ft**	**12 lb ft**	**13 lb ft**
5/16 UNF	**15 Nm**	**11 Nm**	**23 Nm**	**18 Nm**	**33 Nm**	**24 Nm**	**26 Nm**	28 **28 Nm**
	11 lb ft	**8 lb ft**	**17 lb ft**	**13 lb ft**	**24 lb ft**	**18 lb ft**	**19 lb ft**	**21 lb ft**
5/16 UNC	**16 Nm**	**12 Nm**	**26 Nm**	**19 Nm**	**37 Nm**	**27 Nm**	**27 Nm**	**31 Nm**
	12 lb ft	**9 lb ft**	**19 lb ft**	**14 lb ft**	**27 lb ft**	**20 lb ft**	**20 lb ft**	**23 lb ft**
3/8 UNF	**27 Nm**	**20 Nm**	**41 Nm**	**31 Nm**	**61 Nm**	**47 Nm**	**41 Nm**	**45 Nm**
	20 lb ft	**15 lb ft**	**30 lb ft**	**23 lb ft**	**45 lb ft**	**35 lb ft**	**30 lb ft**	**33 lb ft**
3/8 UNC	**31 Nm**	**23 Nm**	**47 Nm**	**34 Nm**	**68 Nm**	**47 Nm**	**47 Nm**	**52 Nm**
	23 lb ft	**17 lb ft**	**35 lb ft**	**25 lb ft**	**50 lb ft**	**35 lb ft**	**35 lb ft**	**38 lb ft**
7/16 UNF	**43 Nm**	**33 Nm**	**68 Nm**	**47 Nm**	**95 Nm**	**68 Nm**	**75 Nm**	**81 Nm**
	32 lb ft	**24 lb ft**	**50 lb ft**	**35 lb ft**	**70 lb ft**	**50 lb ft**	**55 lb ft**	**60 lb ft**
7/16 UNC	**49 Nm**	**37 Nm**	**75 Nm**	**54 Nm**	**108 Nm**	**81 Nm**	**81 Nm**	**88 Nm**
	36 lb ft	**27 lb ft**	**55 lb ft**	**40 lb ft**	**80 lb ft**	**60 lb ft**	**60 lb ft**	**65 lb ft**
1/2 UNF	**68 Nm**	**47 Nm**	**102 Nm**	**75 Nm**	**149 Nm**	**108 Nm**	**115 Nm**	**129 Nm**
	50 lb ft	**35 lb ft**	**75 lb ft**	**55 lb ft**	**110 lb ft**	**80 lb ft**	**85 lb ft**	**95 lb ft**
1/2 UNC	**75 Nm**	**54 Nm**	**115 Nm**	**88 Nm**	**163 Nm**	**122 Nm**	**129 Nm**	**142 Nm**
	55 lb ft	**40 lb ft**	**85 lb ft**	**65 lb ft**	**120 lb ft**	**90 lb ft**	**95 lb ft**	**105 lb ft**
9/16 UNF	**95 Nm**	**75 Nm**	**149 Nm**	**108 Nm**	**203 Nm**	**149 Nm**	**163 Nm**	**190 Nm**
	70 lb ft	**55 lb ft**	**110 lb ft**	**80 lb ft**	**150 lb ft**	**110 lb ft**	**120 lb ft**	**140 lb ft**
9/16 UNC	**108 Nm**	**81 Nm**	**163 Nm**	**122 Nm**	**231 Nm**	**176 Nm**	**183 Nm**	**203 Nm**
	80 lb ft	**60 lb ft**	**120 lb ft**	**90 lb ft**	**170 lb ft**	**130 lb ft**	**135 lb ft**	**150 lb ft**
5/8 UNF	**136 Nm**	**102 Nm**	**203 Nm**	**149 Nm**	**285 Nm**	**217 Nm**	**231 Nm**	**251 Nm**
	100 lb ft	**75 lb ft**	**150 lb ft**	**110 lb ft**	**210 lb ft**	**160 lb ft**	**170 lb ft**	**185 lb ft**
5/8 UNC	**149 Nm**	**115 Nm**	**231 Nm**	**176 Nm**	**325 Nm**	**244 Nm**	**258 Nm**	**278 Nm**
	110 lb ft	**85 lb ft**	**170 lb ft**	**130 lb ft**	**240 lb ft**	**180 lb ft**	**190 lb ft**	**205 lb ft**

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Disk drill dimensions

Metric dimensions (meters)

	19.1 cm Spacing		25.4 cm Spacing	
BASE MACHINE	**# of Openers**	**Width of Cut**	**# of Openers**	**Width of Cut**
9.1 m	48	**9.1 m**	36	**9.1 m**
12.2 m	64	**12.2 m**	48	**12.2 m**
15.2 m	80	**15.2 m**	60	**15.2 m**
18.3 m	96	**18.3 m**	72	**18.3 m**

BASE MACHINE	Transport Height (1)	Transport Width (2)	Drill Length (3) *
9.1 m	**3.99 m**	**3.66 m**	**8.43 m**
12.2 m	**4.17 m**	**5.69 m**	**9.09 m**
15.2 m	**4.01 m**	**5.69 m**	**9.88 m**
18.3 m	**4.50 m**	**5.69 m**	**9.88 m**

*Length is the machine length without any field hitches in transport position.

Imperial dimensions (feet)

	7.5 in Spacing		10 in Spacing	
BASE MACHINE	**# of Openers**	**Width of Cut**	**# of Openers**	**Width of Cut**
30 ft	48	**30 ft**	36	**30 ft**
40 ft	64	**40 ft**	48	**40 ft**
50 ft	80	**50 ft**	60	**50 ft**
60 ft	96	**60 ft**	72	**60 ft**

BASE MACHINE	Transport Height (1)	Transport Width (2)	Drill Length *
30 ft	**13 ft 1 in**	**12 ft**	**27 ft 8 in**
40 ft	**13 ft 8 in**	**18 ft 8 in**	**29 ft 10 in**
50 ft	**13 ft 2 in**	**18 ft 8 in**	**32 ft 6 in**
60 ft	**14 ft 98 in**	**18 ft 8 in**	**32 ft 6 in**

*Length is the machine length without any field hitches in transport position.

Safety chain

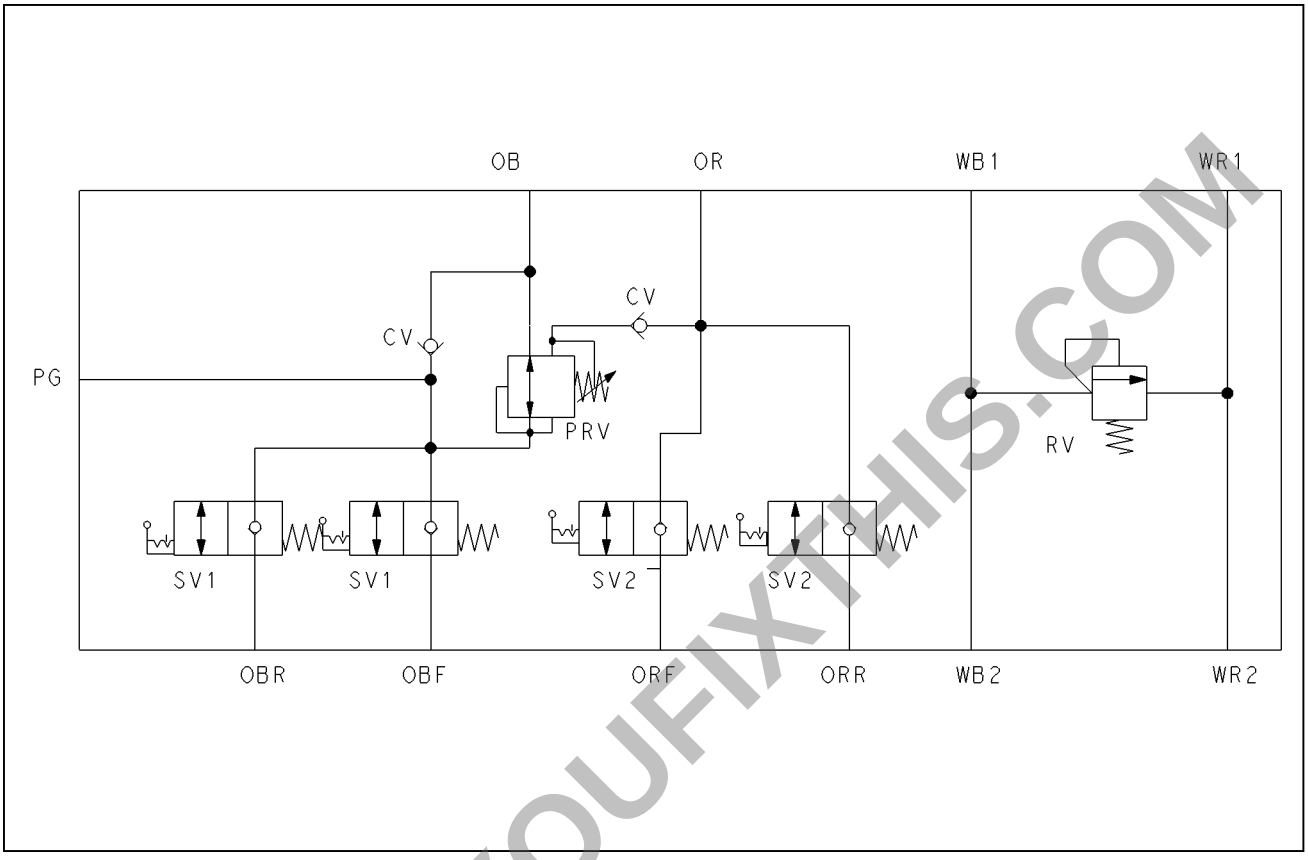
18140 kg (**40000 lb**) supplied (3 section machines)

36287 kg (**80000 lb**) supplied (5 section machines)

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Seeding hydraulic circuit - Hydraulic schematic frame 01 – subbar and pressure valve block



SAPE12SE00704FA 1

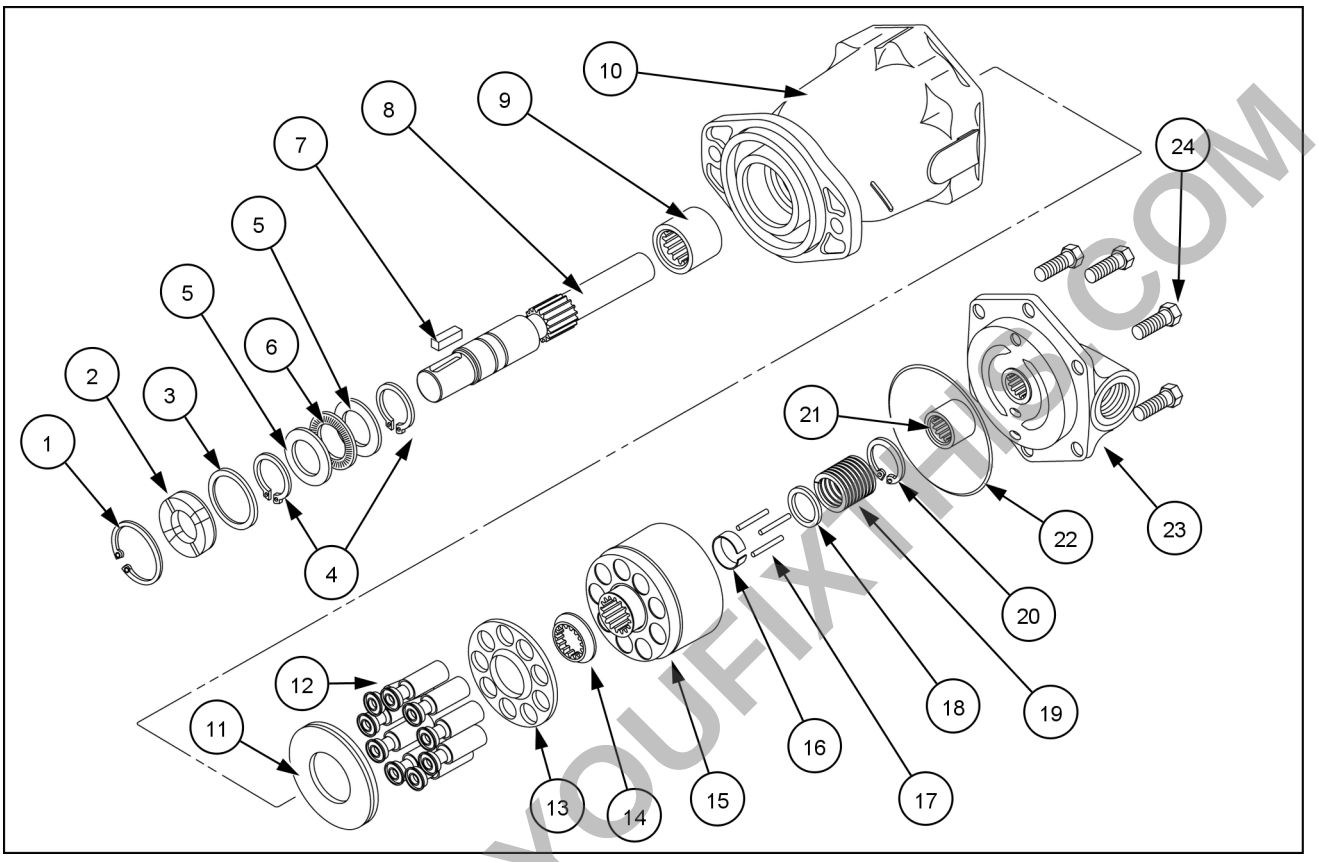
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Motor - Disassemble

Precision Disk 500T	

NOTE: *This motor is used on drills up to Serial Number YES056039.*



SAIL14SE00186FA 1

1. Snap ring	9. Needle bearing	17. Pin
2. Shaft seal	10. Housing assembly	18. Washer
3. Spacer	11. Thrust race	19. Spring
4. Snap ring	12. Piston assembly	20. Snap ring
5. Thrust washer	13. Spider	21. Needle bearing
6. Thrust bearing	14. Pivot	22. O-ring
7. Key	15. Piston block	23. Backplate assembly
8. Drive shaft	16. Pin keeper	24. Capscrew

1. Clean outside of unit thoroughly.
2. Remove snap ring **(1)** from housing assembly **(10)**.
3. Clamp shaft in a protected jaw vise with backplate **(23)** end up.
4. Remove the six capscrews **(24)** from the backplate **(23)**.
5. Use a plastic mallet and tap the backplate to loosen it; then pull the backplate straight out.
6. Remove O-ring **(22)** from backplate.
7. Remove the complete piston block assembly from the housing assembly.
8. Remove piston assemblies **(12)**, spider **(13)** and pivot **(14)** from the piston block assembly.

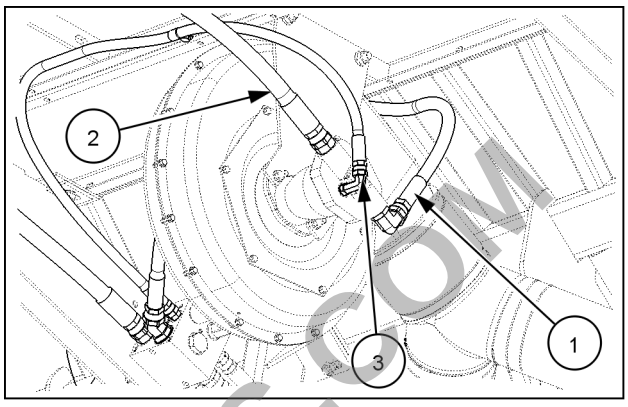
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Motor - Remove

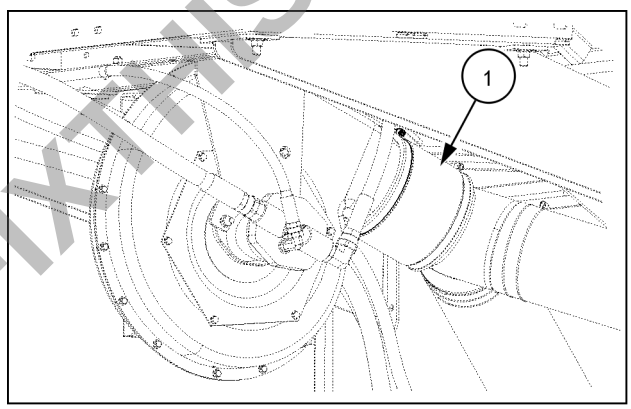
Precision Disk 500T	

1. Disconnect the supply **(1)**, return **(2)** and motor case drain **(3)** hoses to the fan motor. If the motor requires replacement, remove the adapter fitting from the motor ports discard the O-rings. Plug or cap all ports.



SAPE14SE00181AA 1

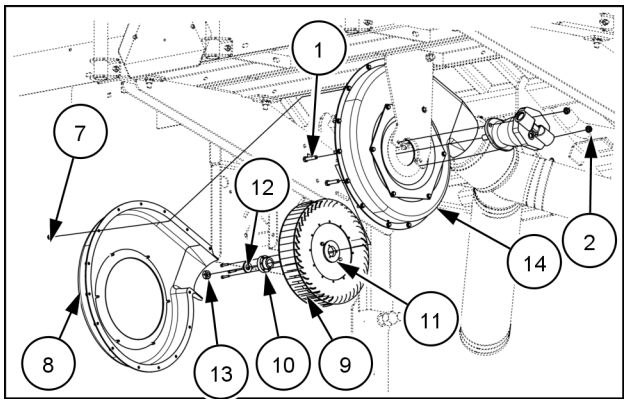
2. Loosen the clamp securing the **152 mm** (**6 in**) hose and disconnect the hose from the fan assembly.
3. Disconnect the harness connector to the fan speed sensor.



SAPE14SE00182AA 2

NOTE: *The connector is located at the rear of the fan assembly.*

4. Remove the 15 bolts and nuts **(7)** securing the left hand **(8)** and right hand **(14)** fan shrouds to each other.
5. Move the right hand fan and screen assembly **(14)** to the side for access to the motor shaft.
6. Holding the fan impeller **(9)** stationary, remove the flange nut **(13)** and flat washer **(12)** from the threaded end of the shaft.



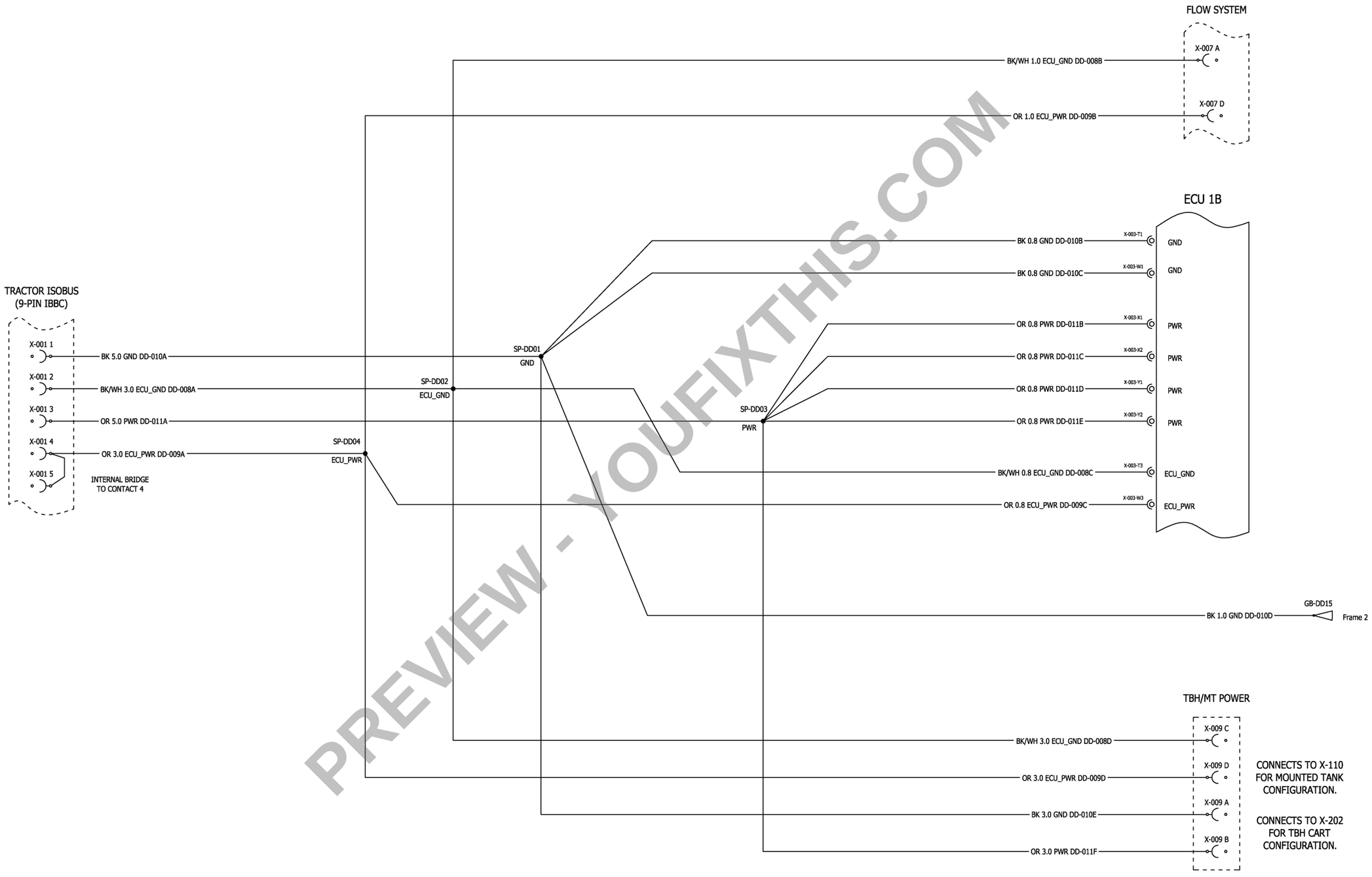
SAPE14SE00183AA 3

NOTICE: *The exploded view shows the flanged bushing **(10)** separated from the impeller hub **(11)** for clarity. The bushing is held on the hub with three hex cap screws and the bushing normally remains installed when removing the motor.*

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POWER CONNECTIONS



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FRAME 1 of 7

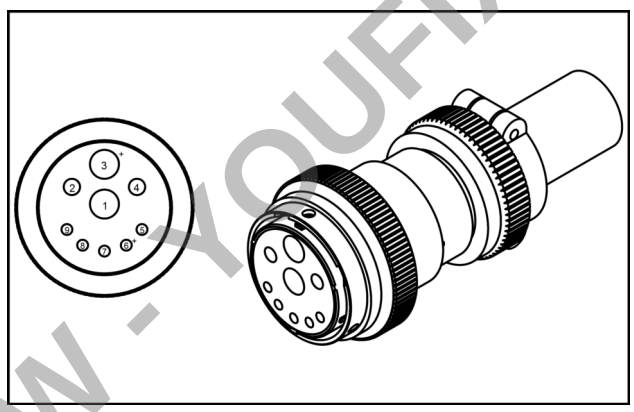
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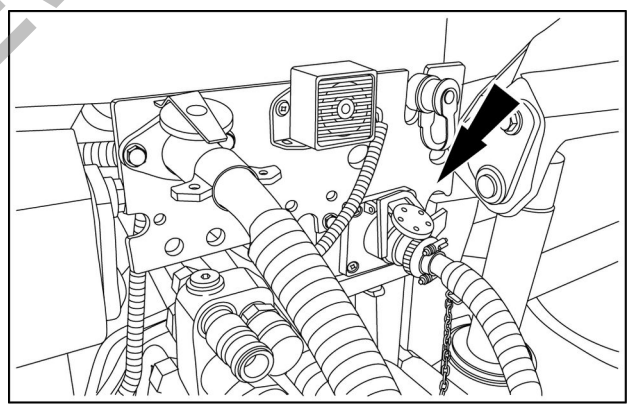
Wire connectors - Component Diagram 00

CONNECTOR X-001 - ISOBUS

CONNECTOR X-001 - ISOBUS			
PIN NUMBER	**WIRE NUMBER**	**CIRCUIT REFERENCE**	**ELECTRICAL SCHEMATIC FRAME**
1	1 (BK)	GND	**Wire harnesses - Electrical schematic sheet 02 (55.100)**
2	2 (BK/WH)	ECU_GND	**Wire harnesses - Electrical schematic sheet 02 (55.100)**
3	3 (OR)	PWR	**Wire harnesses - Electrical schematic sheet 02 (55.100)**
4	4 (OR)	ECU-PWR	**Wire harnesses - Electrical schematic sheet 02 (55.100)**
5	-	-	
6	25 (RD)	TBC_PWR	**Wire harnesses - Electrical schematic sheet 04 (55.100)**
7	26 (BK)	TBC_RTN	**Wire harnesses - Electrical schematic sheet 04 (55.100)**
8	27 (YE)	CAN_H	**Wire harnesses - Electrical schematic sheet 04 (55.100)**
9	28 (GN)	CAN_L	**Wire harnesses - Electrical schematic sheet 04 (55.100)**



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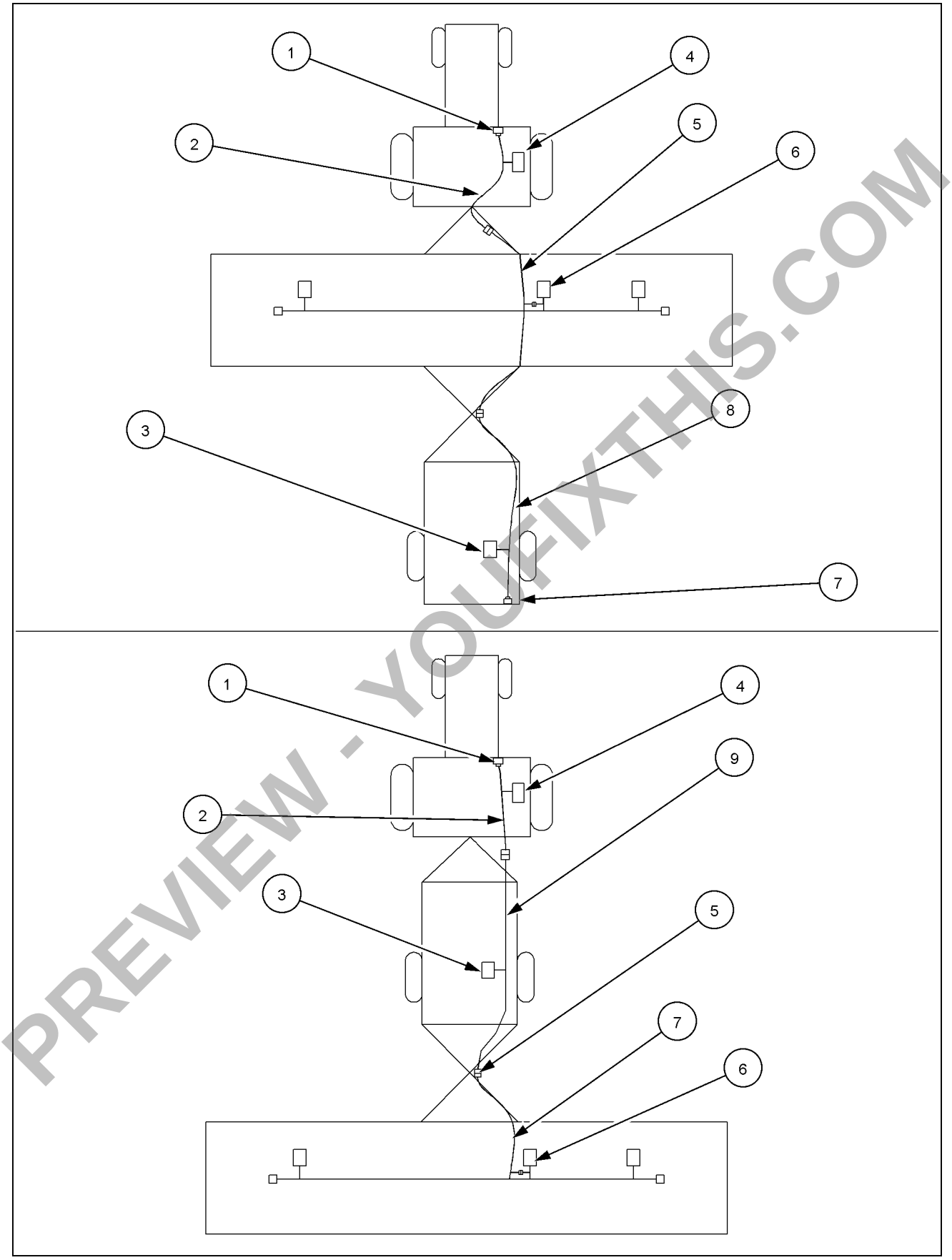


SAIL13SE00521AA 2

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IMPLEMENT BUS



SAIL14SE00257HA 1

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Seeding tank sensors - Adjust

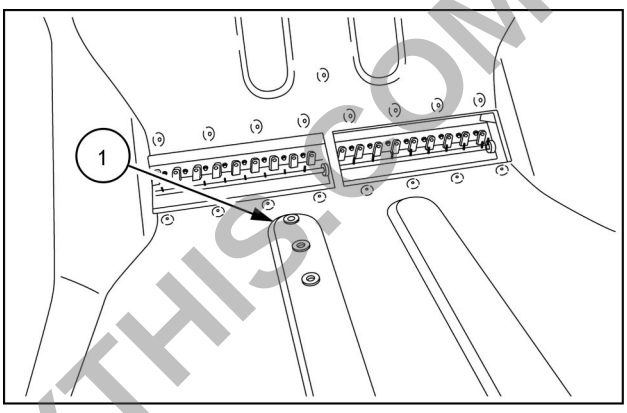
Precision Disk 500T	

⚠ CAUTION

Confined area!
Wear suitable protective clothing and breathing equipment when entering the tank.
Failure to comply could result in minor or moderate injury.

C0068A

1. It is important that the sensor is flush with it's mount, or even pokes a little inside the tank. If the sensor sits back inside it's mount it can pick up a false signal, and indicate the tank is full when it's actually empty. The sensor is shown in the lowest position **(1)**.
2. Check that the sensor protrudes into the tank between **0 - 2 mm** (**0 - 0.1 in**).



SAIL12SE00435AA 1

3. Adjust the position using the plastic nut so that the sensor is correctly positioned.
4. Torque the nut to **5 N·m** (**3.7 lb ft**).

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Flow monitoring - Problem solving

Precision Disk 500T	

Blockage sensor does not show population when split row seeding is selected.

OPERATION

Ensure the harness connectors are plugged into to the correct openers.

The connectors on the seed sensor harness for seed module 3 (**7.6 m** (**25 ft**) and **9.1 m** (**30 ft**) drill) or seed module 4 (on **12.2 m** (**40 ft**) drill) with **19 cm** (**7.5 in**) spacing have been connected to the incorrect openers at the "Y" splitters during the set-up process.

TROUBLESHOOTING

Ensure the harness connectors are plugged into to the correct openers.

- Connect the right hand wing harness connector tag W1 to the outer even numbered opener on the rear rank. This row number varies by drill size. Connect the harness connector W2 to the outer odd numbered opener on the front rank. This row number varies by drill size
- Connect the left hand wing harness connector tag W1 to the outer odd numbered opener on the front rank and connect harness connector W2 to the outer even numbered opener rear rank.

NOTICE: *Refer to* ***Flow monitoring - Configure (55.516)*** *for sensor mapping.*

Flow monitoring - Troubleshooting

Precision Disk 500	

Problem	Possible Cause	Correction
Alarms are being reported even though there is flow	Flow sensitivity set incorrectly for product being applied.	Increase flow sensitivity.
	Sensors may not be functioning correctly.	Test sensors and replace if faulty.
	Sensors not positioned correctly.	Check position of sensors.
	Sensor harness may be damaged or disconnected.	Check sensor cable between flow Rate ECU and sensor.
	Incorrect setup.	Verify that the runs are correctly assigned and that they match the tank setup.
Many Inadequate Flow alarms are being reported.	Air cart fan speed too slow.	Increase the fan speed.
	Air cart tanks empty.	Ensure there is product in the tank.
	Openers may be plugged or worn out.	Inspect openers for wear and replace if necessary.
	Secondary distribution hoses have been blocked by wet soil.	Clear the blockage.
	Primary hoses may be plugged.	Check primary hoses for blockages.
	Incorrect setup.	Verify sensor setup.
	Not enough material passing sensors to indicated flow.	Flow of material is less that the equivalent of canola at 3 lbs/ac at **3 mph**. Increase the application rate.
Inadequate Flow	Empty tank.	Check that the air cart tank contains product.
	Obstruction or air lead in delivery system.	Check the manifold, headers and distribution system for leaks or blockages.
	Flow sensor internal fault.	Check sensor.

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520193-03-ECU_PWR, Voltage above normal, or shorted to high source

Control Module : Disk Drill Rate ECU

Context:
The Rate ECU detected an abnormally high voltage on its ECU_PWR ("quiet power") supply.

Cause:
High battery voltage, short to high source, or defective component.

Possible failure modes:

1. Failed tractor alternator resulting in high ECU_PWR voltage.
2. High short on ECU_PWR to a voltage greater than **16 V**.
3. Faulty Rate ECU hardware or software.

Solution:

1. Determine if the fault code is still active:

   Cycle system power or reset the Rate ECU.

   Select UTIL > FAULT and check both ACTIVE and INACTIVE faults. Refer to **Electronic control - Check faults (55.516)**.
   Review: Fault Count, First Time, Latest Time

   Also view the voltage/current/frequency bar graphs for the faulted signal as measured by the Rate ECU.
   Select DIAGN > MONTR and choose ECU_PWR. Refer to **Electronic control - Check monitor (55.516)**.

   A. Fault 520193-3 is active. Go to Step **2**.

   B. Fault is inactive. Continue operation and monitor for recurring fault.

2. Disconnect the IBBC (Implement Bus Breakaway Connector) at the rear of the tractor **X-001** or air cart **X-201** if a tow-between air cart is connected. Measure the following voltages on the tractor/air cart connector:

Measure with Voltmeter		Measured Voltage	Interpretation and Action
Positive lead	Negative lead		
ECU_PWR (cavity 4)	ECU_GND (cavity 2)	**11 - 16 V**	Normal
		>16 V	Check for failed tractor alternator or high short on ECU_PWR to a voltage source greater than **16 V**.
		<11 V	Should not occur. Double-check measurement, double-check fault code

   A. Measurement normal or fault 520193-3 is active after repair made. Go to Step **3**.

   B. Fault is inactive. Continue operation.

3. Perform the Rate ECU troubleshooting procedure described in **Electronic module - Problem solving (55.640)**.

   A. Fault 520193-3 is active. Reinstall original Rate ECU and contact your service organization.

   B. Fault is inactive. Return to operation.

Wire harnesses - Electrical schematic sheet 02 (55.100.DP-C.20.E.02)
Wire harnesses - Electrical schematic sheet 04 (55.100.DP-C.20.E.04)
Wire harnesses - Electrical schematic sheet 08 (55.100.DP-C.20.E.08)

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Basic instructions - Shop and assembly

Shimming

For each adjustment operation, select adjusting shims and measure the adjusting shims individually using a micrometer, then add up the recorded values. Do not rely on measuring the entire shimming set, which may be incorrect, or the rated value shown on each shim.

Rotating shaft seals

For correct rotating shaft seal installation, proceed as follows:

1. Before assembly, allow the seal to soak in the oil it will be sealing for at least thirty minutes.
2. Thoroughly clean the shaft and check that the working surface on the shaft is not damaged.
3. Position the sealing lip facing the fluid.

   NOTE: *With hydrodynamic lips, take into consideration the shaft rotation direction and position the grooves so that they will move the fluid towards the inner side of the seal.*
4. Coat the sealing lip with a thin layer of lubricant (use oil rather than grease). Fill the gap between the sealing lip and the dust lip on double lip seals with grease.
5. Insert the seal in its seat and press down using a flat punch or seal installation tool. Do not tap the seal with a hammer or mallet.
6. While you insert the seal, check that the seal is perpendicular to the seat. When the seal settles, make sure that the seal makes contact with the thrust element, if required.
7. To prevent damage to the seal lip on the shaft, position a protective guard during installation operations.

O-ring seals

Lubricate the O-ring seals before you insert them in the seats. This will prevent the O-ring seals from overturning and twisting, which would jeopardize sealing efficiency.

Sealing compounds

Apply a sealing compound on the mating surfaces when specified by the procedure. Before you apply the sealing compound, prepare the surfaces as directed by the product container.

Spare parts

Only use CNH Original Parts or CASE IH Original Parts.

Only genuine spare parts guarantee the same quality, duration, and safety as original parts, as they are the same parts that are assembled during standard production. Only CNH Original Parts or CASE IH Original Parts can offer this guarantee.

When ordering spare parts, always provide the following information:

- Machine model (commercial name) and Product Identification Number (PIN)
- Part number of the ordered part, which can be found in the parts catalog

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Tire description	Where used	Number of tires	Torque
Walking Tandem 12.51L x 15 (D)	Front center section and wings	12	**170 N·m** (**125 lb ft**)
Walking 18L -16.1 E	Rear center section	4	**170 N·m** (**125 lb ft**)

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Seeding hydraulic circuit - Dynamic description

Precision Disk 500	

Port	Function
F	Fold
UF	Unfold
LUF1	Left unfold stage 1
LUF2	Left unfold stage 2
LF1	Left fold stage 1
LF2	Left fold stage 2
RUF1	Right unfold stage 1
RUF2	Right unfold stage 2
RF1	Right fold stage 1
RF2	Right fold stage 2

Valve component	Description
(1)	**2300 psi** Prevents intermediate frame or outer wing from unfolding before inner wings are unfolded.(stage 1)
(2)	**1200 psi** Prevents outer wings from unfolding before intermediate frames are unfolded (stage 2). Works in conjunction with the ball valve located on each intermediate hitch.
(3)	**2300 psi** Prevents intermediate frames and inner wings from folding before outer wings are folded (stage 1)
(4) — Ball valve	Prevents outer wings unfolding before intermediate frames are unfolded (stage 2)

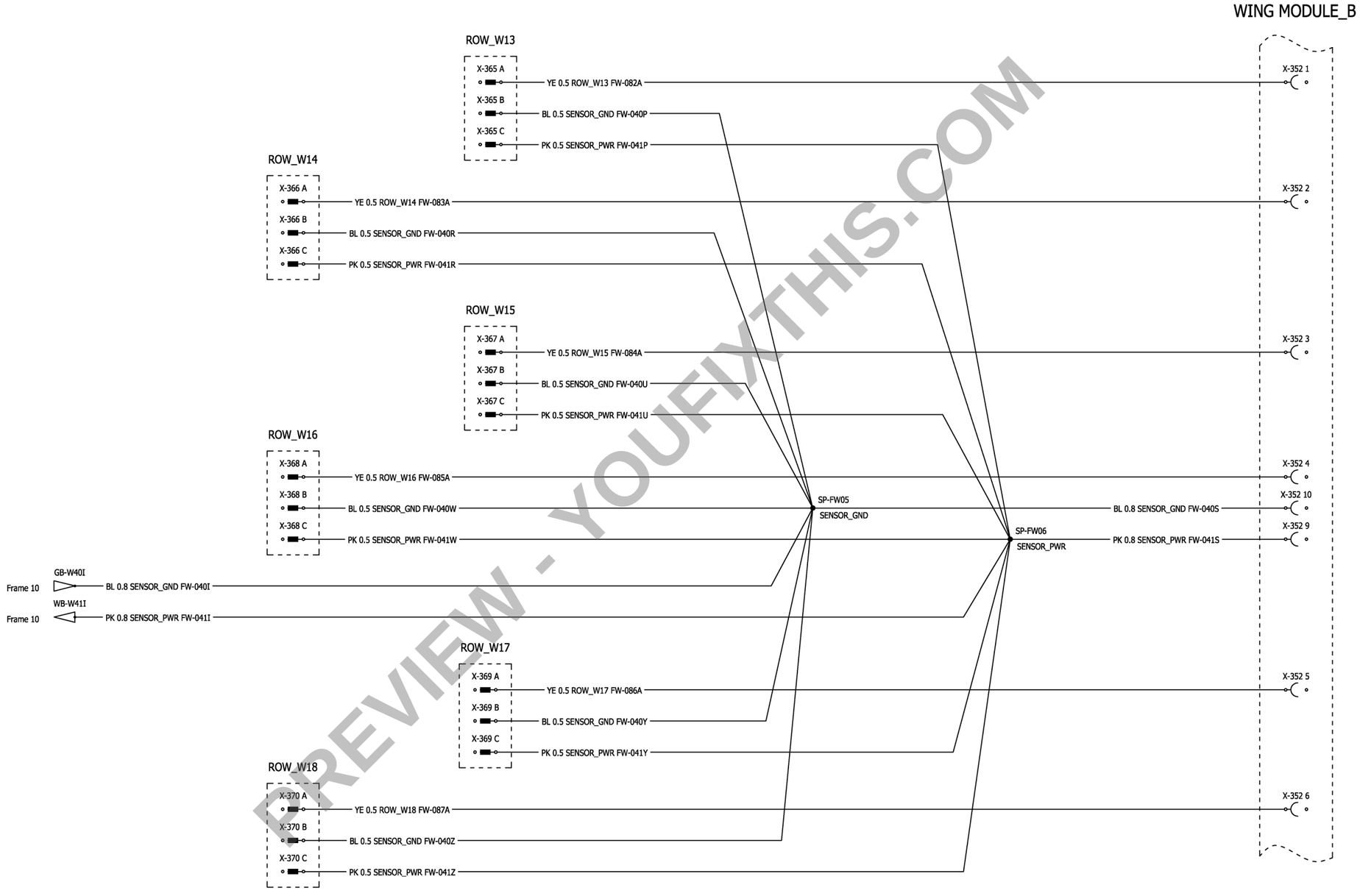
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WING 18: ROWS 13-18



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FRAME 11 of 11

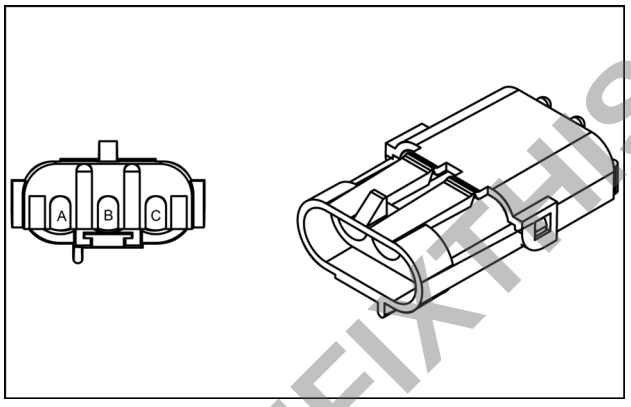
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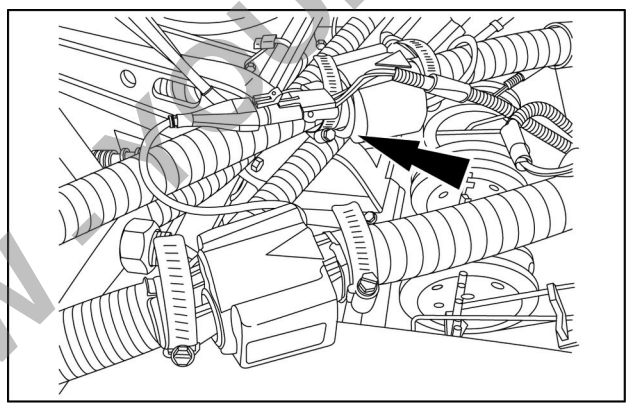
Wire connectors - Component diagram 33

CONNECTOR X-330 - ROW_C25

CONNECTOR X-330 - ROW_C25			
PIN NUMBER	**WIRE NUMBER**	**CIRCUIT REFERENCE**	**ELECTRICAL SCHEMATIC FRAME**
A	66 (YE)	ROW_C25	**Wire harnesses - Electrical schematic sheet 07 (55.100)**
B	40U (BL)	SENSOR_GND	**Wire harnesses - Electrical schematic sheet 07 (55.100)**
C	41U (PK)	SENSOR_PWR	**Wire harnesses - Electrical schematic sheet 07 (55.100)**



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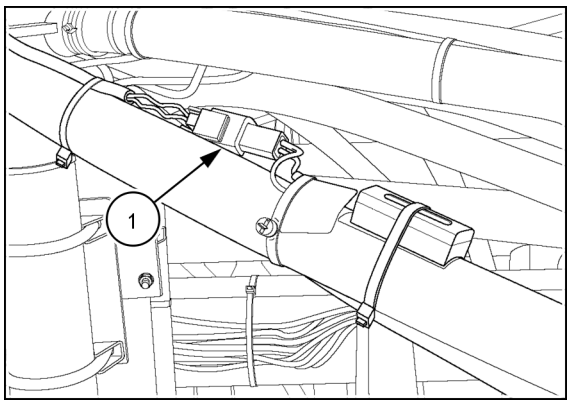
CONNECTOR X-331 - ROW_C26

CONNECTOR X-331 - ROW_C26			
PIN NUMBER	**WIRE NUMBER**	**CIRCUIT REFERENCE**	**ELECTRICAL SCHEMATIC FRAME**
A	67 (YE)	ROW_C26	**Wire harnesses - Electrical schematic sheet 07 (55.100)**
B	40W (BL)	SENSOR_GND	**Wire harnesses - Electrical schematic sheet 07 (55.100)**
C	41W (PK)	SENSOR_PWR	**Wire harnesses - Electrical schematic sheet 07 (55.100)**

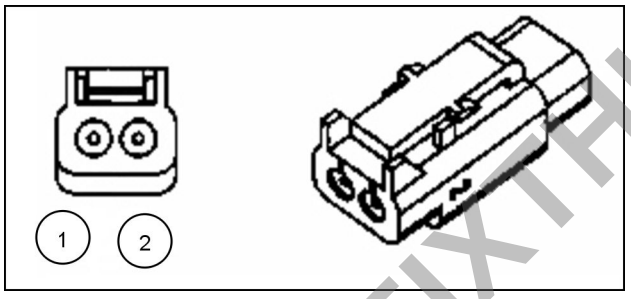
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P10 to P24 - Connector to Sensor 1 to 24



105145C 2



222135A 3

Position	Description
1	SENSOR (N) GROUND
2	SENSOR (N) POWER

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520203-03-Implement CAN_L, Voltage above normal, or shorted to high source

Control Module : Disk Drill Rate ECU

Context:
The Rate ECU detected an abnormally high voltage on its CAN_L signal.

Cause:
Short to high source, or defective component.

Possible failure modes:

1. High short on CAN_L.
2. High short on TBC_RTN.
3. Bad connection or open circuit on TBC_RTN.
4. Faulty device.
5. Faulty Rate ECU hardware or software.

Solution:

1. Determine if the fault code is still active:

   Cycle system power or reset the Rate ECU.

   Select UTIL > FAULT and check both ACTIVE and INACTIVE faults. Refer to **Electronic control - Check faults (55.516)**.
   Review: Fault Count, First Time, Latest Time

   Also view the voltage/current/frequency bar graphs for the faulted signal as measured by the Rate ECU.
   Select DIAGN > MONTR and choose CAN_L. Refer to **Electronic control - Check monitor (55.516)**.

   A. Fault 520203-3 is active. Go to Step **2**.

   B. Fault is inactive. Continue operation and monitor for recurring fault.

2. Disconnect the IBBC (Implement Bus Breakaway Connector) **X-001** at the rear of the tractor or air cart if a tow-between air cart is connected. Measure the following voltages on the tractor/air cart connector:

Measure with Voltmeter		Measured Voltage	Interpretation and Action
Positive lead	Negative lead		
CAN_L (cavity 9)	ECU_GND (cavity 2)	**0.1 - 2.7 V**	Normal
		> 2.7 V	Check for short to high source or faulty component in tractor/air cart.
		< 0.1 V	Should not occur. Double-check measurement, double-check fault code.
TBC_RTN (cavity 7)	ECU_GND (cavity 2)	**~0 V**	Normal
		> 0 V	Check for short to high source, bad connection or open circuit, or faulty component in tractor/air cart.

   A. Measurement normal or fault 520203-3 is active after repair made. If mounted tank or Tow between not mounted, go to Step **3**. If Tow between not mounted, go to Step **6**.

   B. Fault is inactive. Continue operation.

3. Reconnect the IBBC. Disconnect the disk drill Rate ECU connectors (**X-002** and **X-003**) and unplug the disk drill CAN terminator **X-004** . Measure the following voltages on the terminator connector and TBH/MT POWER connector:

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520316-03-Section 2 Clutch, Voltage above normal, or shorted to high source

Control Module : Disk Drill Rate ECU

Context:
The Rate ECU detected an abnormally high voltage on its section 2 clutch output while the ECU output is turned off.

Cause:
Bad connection or open circuit, short to high source, or defective component.

Possible failure modes:

1. Bad connection or open circuit in signal wiring between device and Rate ECU.
2. Bad connection or open circuit in ground wiring to device.
3. High short on signal wiring between device and Rate ECU.
4. High short on ground wiring to device.
5. Faulty device.
6. Faulty Rate ECU hardware or software.

Solution:

1. Determine if the fault code is still active:

   Cycle system power or reset the Rate ECU.

   Select UTIL > FAULT and check both ACTIVE and INACTIVE faults. Refer to **Electronic control - Check faults (55.516)**.
   Review: Fault Count, First Time, Latest Time

   Also view the voltage/current/frequency bar graphs for the faulted signal as measured by the Rate ECU.
   Select DIAGN > MONTR and choose Section 2 Clutch. Refer to **Electronic control - Check monitor (55.516)**.

   A. Fault 520316–3 is active. Go to Step **2**.

   B. Fault is inactive. Continue operation and monitor for recurring fault.
2. Inspect wires and contacts at both mating ends of all connectors referenced by the diagnostic procedures.

   Repair all contacts that are bent, broken, or improperly seated in their connector housing.

   Clean dirty or corroded contacts.

   Ensure that connector mating ends are securely mated back together.

   Cycle power and check for active fault.

   A. Fault 520316–3 is active. Go to Step **3**.

   B. Fault is inactive. Continue operation.
3. Ensure that the meter master is OFF on the disk drill RUN screen. Disconnect connector **X-105**. Measure the following voltages on the implement harness connector:

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