Precision Hoe 800

Service Manual

87492443
Issued March, 2010
1st Printing

CASE IH AGRICULTURE

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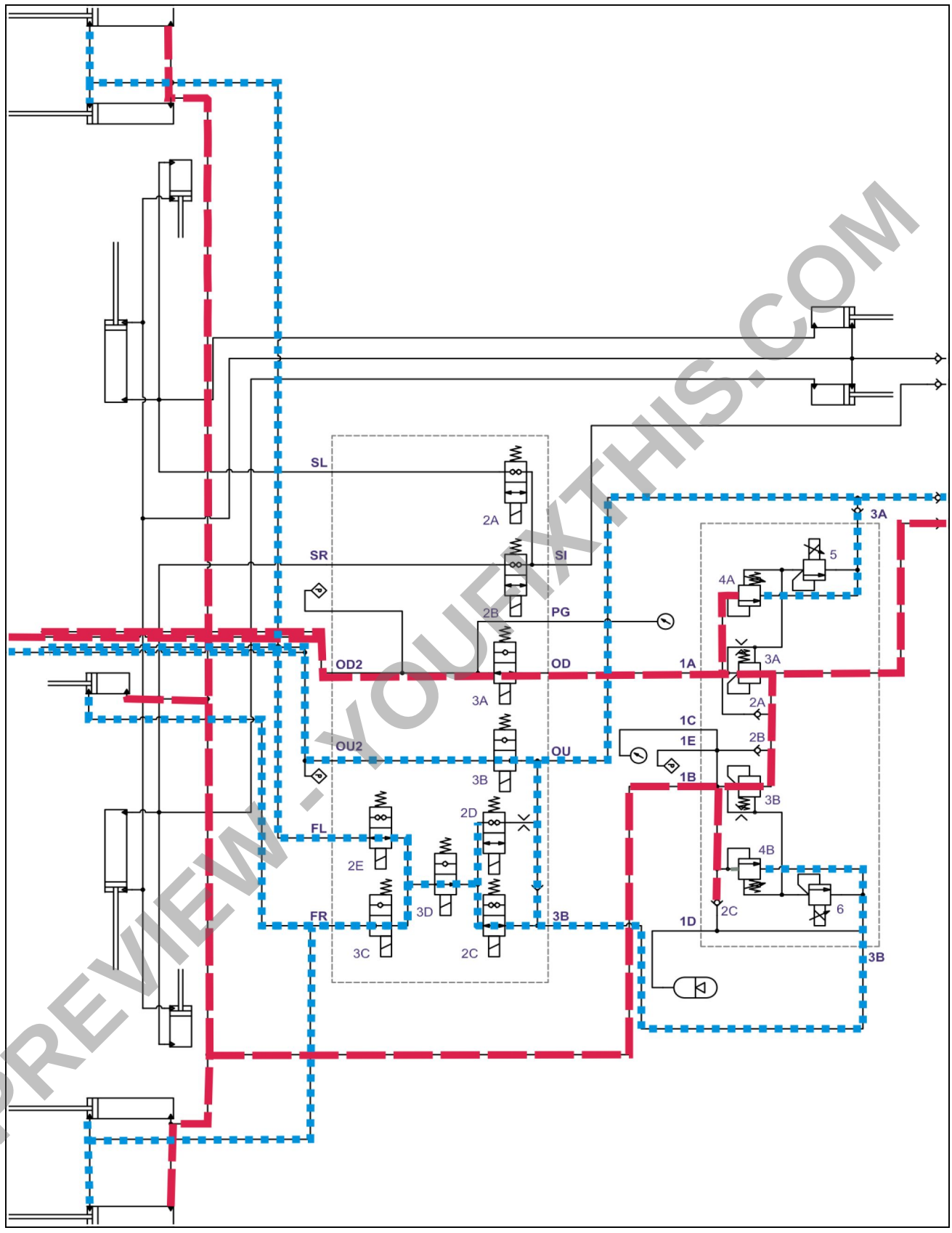
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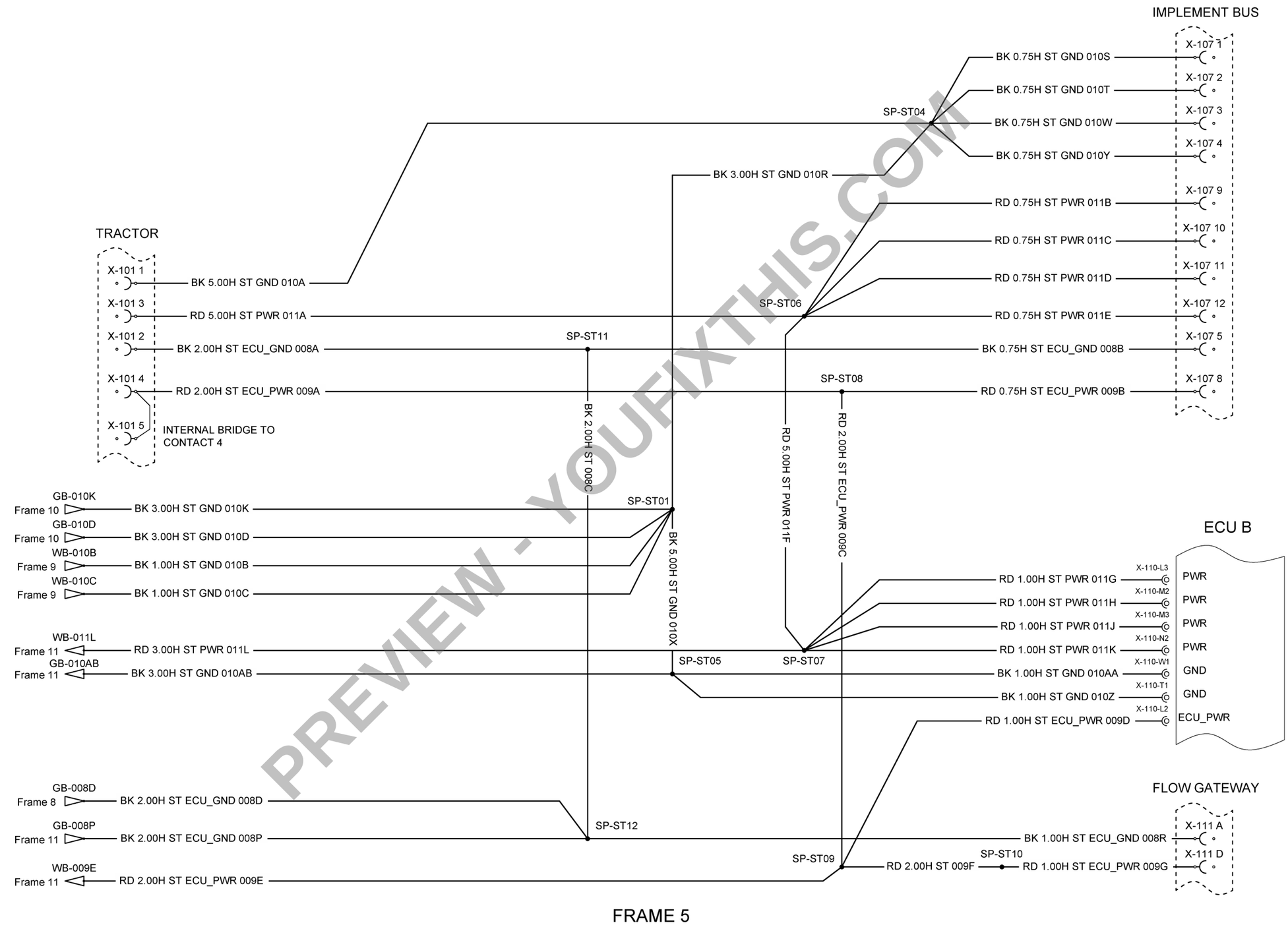
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POWER



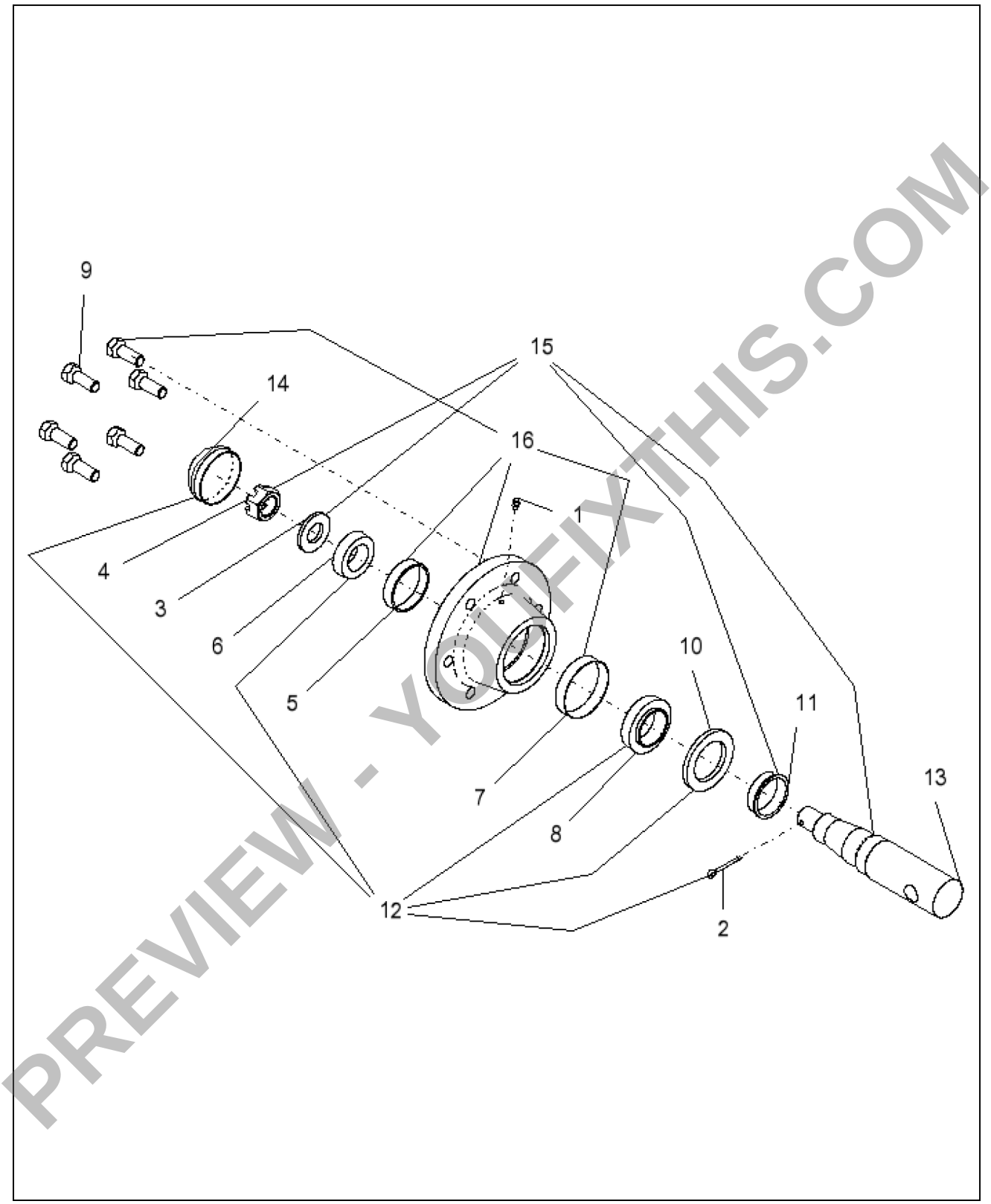
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Hub Components

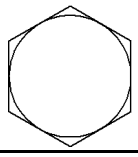
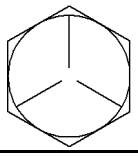
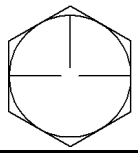
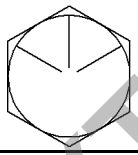
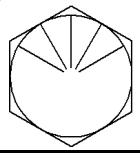
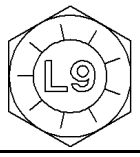
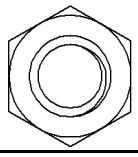
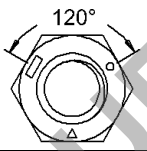
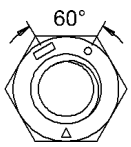
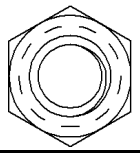
NOTICE: *Lubricating anti-friction bearings for the life of the bearing is essential. The r wheel bearings should be re-packed every 100 hours of use. Generally, anti-friction bearings do not wear out, but fail because of fatigue due to flexing, loads, and heat. A lubricant must do three jobs: reduce friction between balls or rollers and the separators, maintain a film between all elements of the bearing to reduce rubbing, and prevent components from rusting.*

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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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NOTE: *Before starting the disassembly procedure, be sure to have a clean table or surface on which to place all components.*

1. Securely block the wheel off the ground and remove the wheel.
2. Remove dust cap **(14)**, cotterpin **(2)**, and spindle nut **(4)**.
3. Pull hub off spindle **(13)** and remove washer **(3)** and outer bearing **(6)**.
4. Remove seal **(11)** and inner bearing **(9)**.
5. Inspect seal and bearings for damage. Replace as needed.

Next operation:
Go to the Hub Assembly section: **Hub - Assemble (D.10.A)**.

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SOIL PREPARATION Planting - Troubleshooting

Problem	Possible Cause	Correction
Uneven working depth across machine.	Caster tire pressure not correct.	Check the tire pressure. Refer to the specifications section for correct tire pressures (page **WHEELS AND TRACKS Wheels - Tire pressure (D.50.C)**).
	Air hoe drill frame is not level.	Make sure the drill has been correctly levelled. Refer to adjustments, (page **FRAME - Adjust The Air Hoe Drill Leveling (E.10)**).
	Center caster tires running in tire tracks.	Check levelling in field conditions.
	Weight transfer due to draft loads.	Check levelling in field conditions.
	Soil conditions allowing caster wheels to sink into ground abnormally.	Check levelling in field conditions.
	Smaller wing caster wheels sinking into ground more than center caster wheels.	Check levelling in field conditions.
	Packer tire pressure is uneven.	Check packer tire pressure and adjust as required.
	Openers set to varying depth	Check that the openers are adjusted to the same working depth.
	Air flow too high.	Check air velocity using the Open Hose test method. Refer to your air cart operator's manual.
	Knife opener worn.	Replace worn knifes.
	Mud sticking to packer wheel.	Reduce packer wheel pressure to promote mud shedding, (minimum **70 kPa** (**10 psi**)).
	Wet field conditions.	Wait for field to dry.
Openers not cutting deep enough behind tractor, drill or air cart tires.	Soil has been compressed due to pressure from the tractor, drill or air cart tires.	Lower the affected openers using the opener depth adjustment.
Frames not running parallel with the terrain front to back.	Frames not level front to back.	Refer to levelling page **FRAME - Adjust The Air Hoe Drill Leveling (E.10)**.
	Draft load lifting rear of drill.	Increase frame weight transfer pressure.
	Too much weight transfer in soft seeding conditions.	Decrease frame weight transfer pressure.
Packer tires going flat.	Air pressure in packer tires is too low.	Increase the air pressure in the packer tires.
Openers will not lower after unfold.	The unfold sequence is not complete.	Press "NEXT" after unfolding the drill to complete the unfold sequence.
Tire wear	Locking caster is not aligned.	In transport position the locking caster be parallel to the boom. Refer to page **Caster wheel - Adjust (D.50.C)** for adjustment information.
Air drill does not track directly behind tractor in transport position.	Locking caster is not aligned.	In transport position the locking caster be parallel to the boom. Refer to page **Caster wheel - Adjust (D.50.C)** for adjustment information.
Tire wear.	Locking caster is not aligned.	In transport position, the locking caster must be parallel to the booms. Refer to **Caster wheel - Adjust (D.50.C)** for adjustment instructions.
Front casters are lifting off ground during field operation.	Frame weight transfer pressure is set too high.	Reduce frame weight transfer pressure.

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Air Drill Dimensions

Metric Dimensions (meters)

	25.4 cm Spacing		30 cm Spacing	
BASE MACHINE	**# of Openers**	**Width of Cut**	**# of Oeners**	**Width of Cut**
15.3 m	60	**15.3 m**	50	**15.3 m**
18.3 m	72	**18.3 m**	60	**18.3 m**
21.3 m	84	**21.3 m**	70	**21.3 m**

BASE MACHINE	Transport Height (1)	Transport Width (2)	Air Drill Length (3) *
15.3 m	**5.03 m**	**5.60 m**	**12.2 m**
18.3 m	**5.03 m**	**5.60 m**	**13.7 m**
21.3 m	**5.03 m**	**5.60 m**	**15.1 m**

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

Dimensions (feet)

	10 in Spacing		12 in Spacing	
BASE MACHINE	**# of Openers**	**Width of Cut**	**# of Openers**	**Width of Cut**
50 ft	60	**50 ft**	50	**50 ft**
60 ft	72	**60 ft**	60	**60 ft**
70 ft	84	**70 ft**	70	**70 ft**

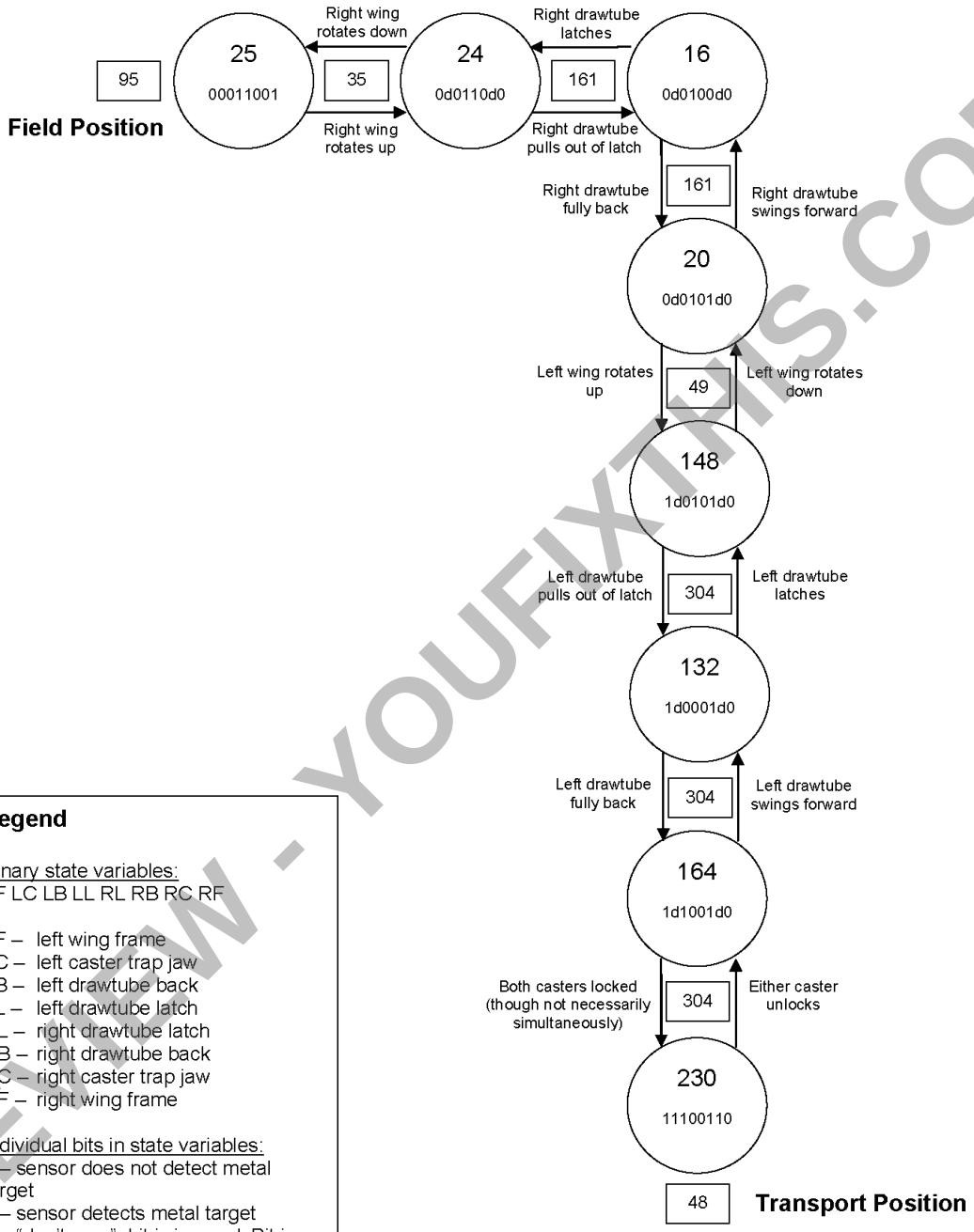
BASE MACHINE	Transport Height (1)	Transport Width (2)	Air Drill Length (3) *
50 ft	**16 ft 6 in**	**18 ft 4 in**	**40 ft 2 in**
60 ft	**16 ft 6 in**	**18 ft 4 in**	**45 ft 1 in**
70 ft	**16 ft 6 in**	**18 ft 4 in**	**49 ft 5 in**

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

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PHD Frame States with Corresponding Valve States



Legend

Binary state variables:
LF LC LB LL RL RB RC RF

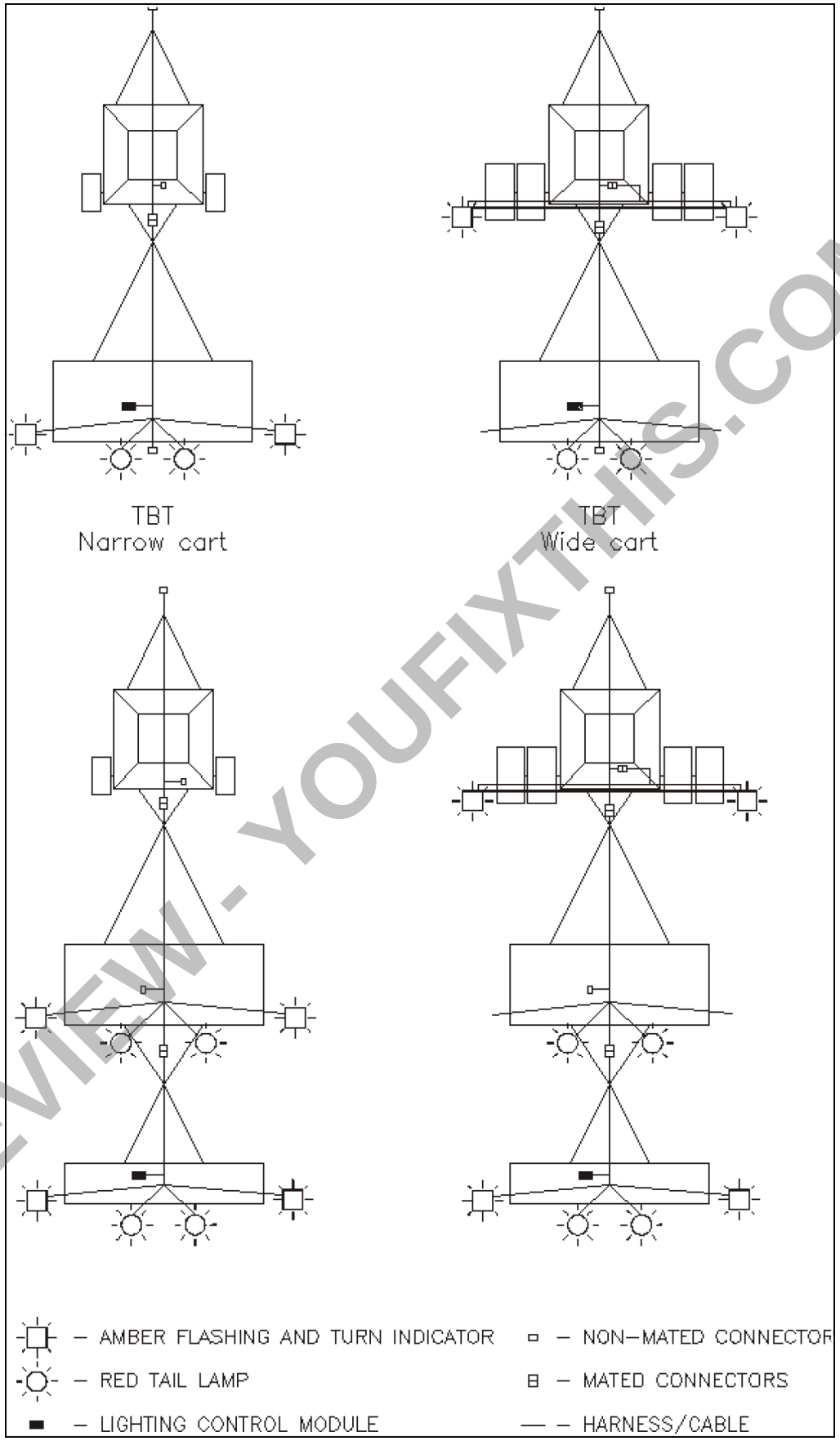
LF – left wing frame
LC – left caster trap jaw
LB – left drawtube back
LL – left drawtube latch
RL – right drawtube latch
RB – right drawtube back
RC – right caster trap jaw
RF – right wing frame

Individual bits in state variables:
0 – sensor does not detect metal target
1 – sensor detects metal target
d – "don't care", bit is ignored. Bit is counted as a zero for purposes of determining a decimal state (e.g. 1d0001d0 = 10000100 = 132).

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100365C 2

Air Cart/Seeding Tool Combinations for Transport Lighting - Tow Between

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Turn system power on.

A. Fault 520194-4 is active. Go to Step **3**.

B. Fault is inactive. Continue operation.

3. Replace PHD Rate ECU.

Turn system power off.

Remove and replace the PHD Rate ECU.

Turn system power on.

A. Fault 520194-4 is active. Reinstall the original PHD Rate ECU. Submit a concern through ASSIST.

B. Fault 520194-4 is inactive. Write the fault code on the failed PHD Rate ECU. Continue operation.

ELECTRONIC SYSTEM - Electrical schematic frame 05 (A.50.A-C.20.E.05)
ELECTRONIC SYSTEM - Electrical schematic frame 11 (A.50.A-C.20.E.11)

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520237-05-Valve Solenoid 2E Current below normal, or open circuit

Control Module : Rate ECU

Context:
The PHD Rate ECU monitors both voltage and current for some outputs, and voltage only for some outputs. Voltage and current faults operate independently.

A single problem e.g. PHD Rate ECU output shorted to ground , may produce both a voltage fault and a current fault, or only a voltage fault or only a current fault.

When a PHD Rate ECU output is open circuit (nothing connected) the voltage will be pulled to approximately **75 %** of the PWR voltage.

Cause:
(See above)

Possible failure modes:

1. Faulty Valve Solenoid 2E circuit
   - Valve Solenoid 2E circuit is open or has an intermittent connection.
   - Valve Solenoid 2E circuit is shorted to a high voltage.
2. Faulty valve solenoid.
3. Faulty Rate ECU.

Solution:

1. Determine if the fault code is still active:

   Cycle system power or reset the PHD Rate ECU.

   Select UTIL > FAULT and check both ACTIVE and INACTIVE faults. Refer to **SEEDING Electronic system - Check Faults (L.10.C)**.
   Review: Fault Count, First Time, Last Time

   Also view the Valve Solenoid 2E voltage as measured by the PHD Rate ECU.
   Select DIAGN > MONTR and choose Valve Solenoid 2E. Refer to **SEEDING Electronic system - Check Diagnostics - Monitor (L.10.C)**.

   A. Fault 520237-5 is active. Go to Step **2**.

   B. Fault is inactive. Continue operation and monitor for recurring fault.
2. Check if the Valve Solenoid 2E circuit in the PHD implement harness is open or has an intermittent connection or is shorted to a high voltage:

   Measure the Valve Solenoid 2E circuit voltage with respect to GND within the PHD implement harness(es).

   The Valve Solenoid 2E circuit is located at connectors: **X-110** and **X-123**.

   Inspect the connectors listed above and ensure:
   All contacts are clean and free of dirt and corrosion.
   Contacts are not bent.
   All contacts are properly seated in their connector housing.
   The housings of each connector pair are securely mated and locked together.

   Locate and repair any open, intermittent connection or is short to a high voltage in the Valve Solenoid 2E circuit.

   Cycle system power or reset the PHD Rate ECU.

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B. If the fault does not reoccur (remains inactive). Write the fault code on the failed controller. Return unit to field operation.

Electronic control - Electrical schematic frame 09 (F.10.E.92-C.20.E.09)
Electronic control - Electrical schematic frame 10 (F.10.E.92-C.20.E.10)

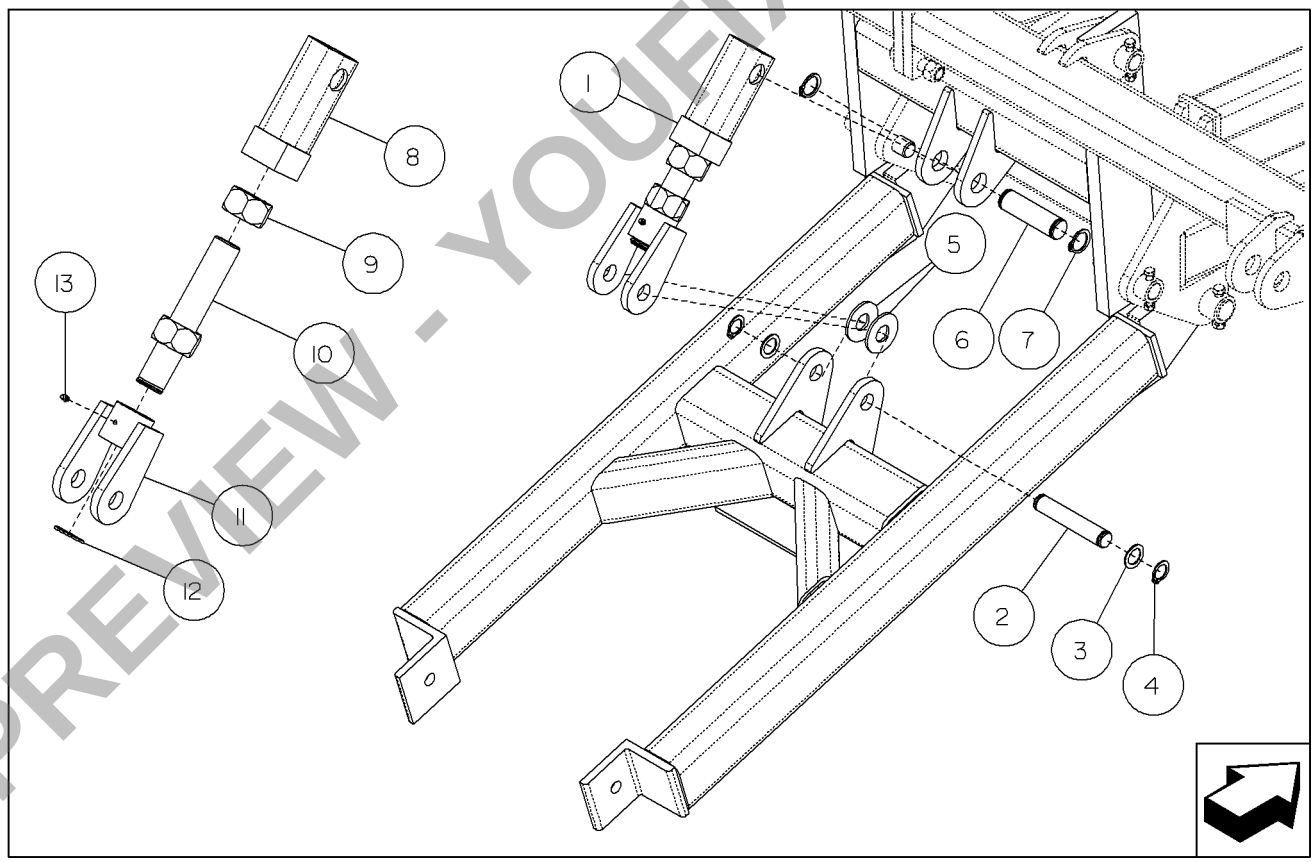
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3. Remove the wheel stop link **(1)** from between the hitch support frame and the center wheel arm. Remove the pin **(6)** and two snap rings **(7)**. Remove the clevis side **(11)** of the wheel stop to the center wheel arm by removing the pin **(2)**, two washers **(3)**, two washers **(5)**, and two snap rings **(4)**.

NOTE: *Remember the position of the washers **(5)** on the outside of the clevis **(11)** and the inside of the center wheel arm weldments.*

REF	DESCRIPTION
1	LINK ASSY WHEEL STOP CTR
2	PIN 25.4 X 126 UL CHROME
3	WASHER 1.015 ID 1.5 14GA YZD
4	SNAP RING EXT .91 ID .078 TK
5	WASHER 1.062 ID 2.5 .165 ZND
6	PIN 31.75 X 101 UL ZND
7	SNAP RING EXT 1.15 ID .093 TK
8	LINK WHEEL STOP CTR
9	NUT 1.5 UNC GR5 YZD
10	PIN CLEVIS SWIVEL ZND
11	CLEVIS/W DEPTH ADJUSTMENT
12	SNAP RING 1.378 ID X .109 THK
13	GREASE ZERK STR .25NF TR ZND

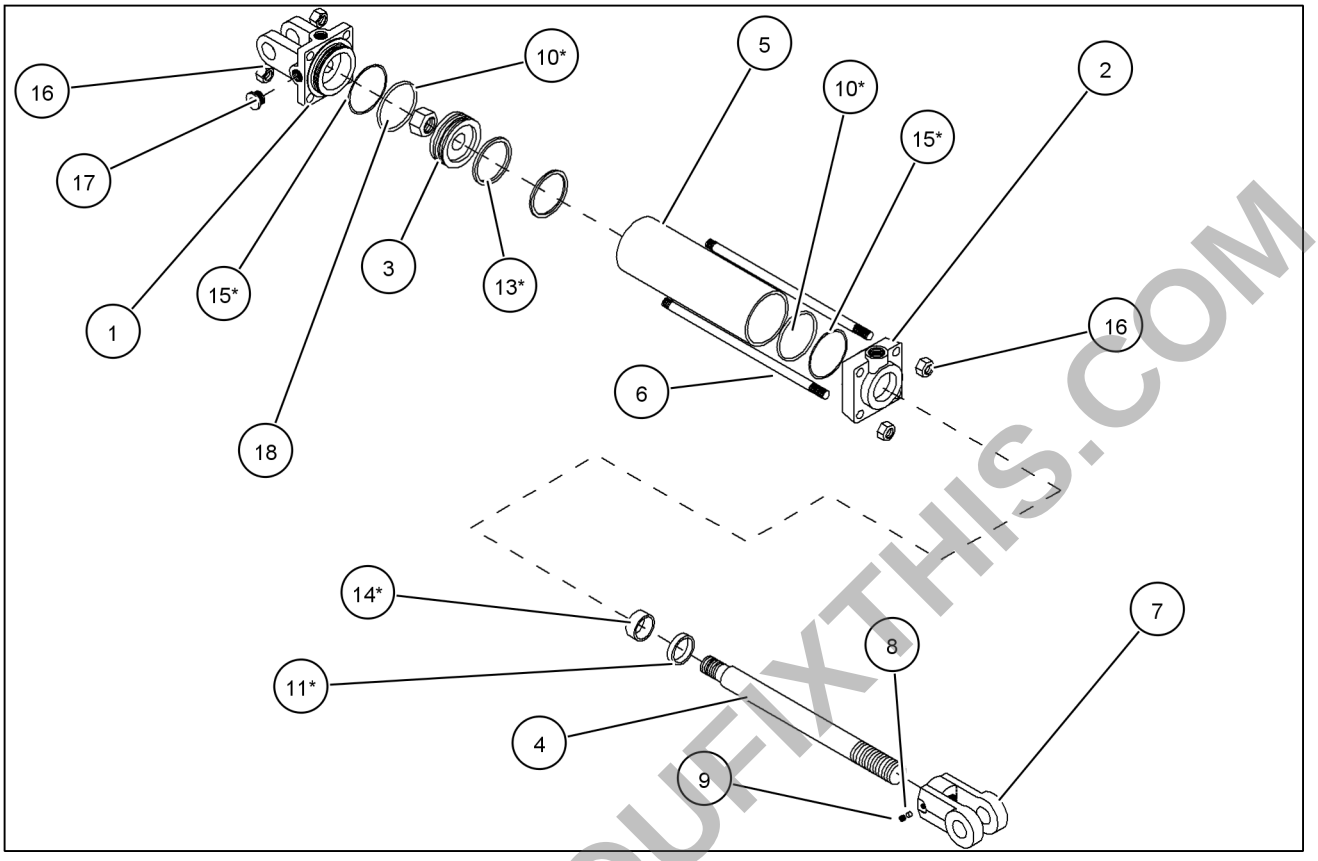


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Cylinder - Overhaul Boom Swing Cylinder



210009C 1

REF	DESCRIPTION		
1	HEAD cylinder base 5" bore;	10*	End Cap O-ring
2	HEAD cylinder front 5" bore x 2" rod	11*	Rod Dust Seal
3	PISTON cylinder, 5" bore	13*	Piston Wear Ring
4	SHAFT cylinder, 5" x 30"	14*	Wear ring
5	TUBE cylinder, 5" x 30"	15*	End Cap Backup Washers
6	TIE-ROD cylinder 3/4"	16	425-1112 NUT 3/4"-16, G5
7	CLEVIS cylinder cast	17	PLUG Hex Soc, 3/4"-16 ORB
8	SET SCREW Hex Soc, 3/8"-16 x 1/2"	18	232-46324 LOCK NUT 1 1/2"-12, GC
9	PLUG nylon 5/16" od x 1/4" pln solid	* - Included in seal kit (Not serviced separately)	

1. Refer to the illustration and list of parts to service the cylinder.

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