SERVICE MANUAL

T8.320 / T8.350 / T8.380 / T8.410 / T8.380 SmartTrax™ / T8.410 SmartTrax™

Powershift Transmission (PST)

Tractor

PIN ZFRE05001 and above

Part number 47918011
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Contents

INTRODUCTION

Engine 10

[10.001] Engine and crankcase 10.1

[10.101] Cylinder heads 10.2

[10.202] Air cleaners and lines 10.3

[10.216] Fuel tanks 10.4

[10.218] Fuel injection system 10.5

[10.254] Intake and exhaust manifolds and muffler 10.6

[10.304] Engine lubrication system 10.7

[10.310] Aftercooler 10.8

[10.400] Engine cooling system 10.9

[10.414] Fan and drive 10.10

Power coupling 19

[19.100] Drive shaft 19.1

[19.110] Flywheel damper 19.2

[19.120] Drive shaft shield assembly 19.3

Transmission 21

[21.105] Powershift transmission lubrication system 21.1

[21.113] Powershift transmission 21.2

[21.135] Powershift transmission external controls 21.3

[21.155] Powershift transmission internal components 21.4

[21.200] Dropbox 21.5

[21.900] Hydraulic pump drive 21.6

Four-Wheel Drive (4WD) system 23

[23.202] Electro-hydraulic control 23.1

[23.314] Drive shaft 23.2

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Front axle system 25
[25.100] Powered front axle 25.1
[25.102] Front bevel gear set and differential 25.2
[25.108] Final drive hub, steering knuckles, and shafts 25.3
[25.122] Axle suspension control 25.4
Rear axle system 27
[27.100] Powered rear axle 27.1
[27.106] Rear bevel gear set and differential 27.2
[27.120] Planetary and final drives 27.3
[27.610] Rear axle track yoke assembly 27.4
Power Take-Off (PTO) 31
[31.104] Rear electro-hydraulic control 31.1
[31.110] One-speed rear Power Take-Off (PTO) 31.2
[31.114] Two-speed rear Power Take-Off (PTO) 31.3
[31.146] Front Power Take-Off (PTO) 31.4
Brakes and controls 33
[33.110] Parking brake or parking lock 33.1
[33.202] Hydraulic service brakes 33.2
[33.220] Trailer brake hydraulic control 33.3
[33.224] Trailer brake pneumatic control 33.4
Hydraulic systems 35
[35.000] Hydraulic systems 35.1
[35.102] Pump control valves 35.2
[35.106] Variable displacement pump 35.3
[35.114] Three-point hitch control valve 35.4
[35.124] Three-point hitch hydraulic adjustment 35.5
[35.204] Remote control valves 35.6
[35.300] Reservoir, cooler, and filters 35.7

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[35.304] Combination pump units 35.8

Hitches, drawbars, and implement couplings 37

[37.110] Rear three-point hitch 37.1

[37.162] Front hitch 37.2

Steering 41

[41.101] Steering control 41.1

[41.200] Hydraulic control components 41.2

[41.206] Pump 41.3

[41.432] Autoguidance steering 41.4

[41.910] Auxiliary steering 41.5

Wheels 44

[44.520] Rear wheels 44.1

Tracks and track suspension 48

[48.100] Tracks 48.1

[48.130] Track frame and driving wheels 48.2

[48.134] Track tension units 48.3

[48.138] Track rollers 48.4

Cab climate control 50

[50.100] Heating 50.1

[50.200] Air conditioning 50.2

[50.300] Cab pressurizing system 50.3

Electrical systems 55

[55.000] Electrical system 55.1

[55.010] Fuel injection system 55.2

[55.012] Engine cooling system 55.3

[55.013] Engine oil system 55.4

[55.014] Engine intake and exhaust system 55.5

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Wiring harnesses - Electrical schematic sheet 23 - Brake switches

Type	Component	Connector / Link	Description
ECU	**A-025**	**X-3570**	JAKE BRAKE
ECU	**A-026**	**X-1862**	AIR BRAKE DRYER
ECU	**A-044**	**X-490**	TCU CH18
Relay	**K-037**		DRYER RELAY
Switch	**S-007**	**X-048**	LEFT BRAKE PARK SW (N/C)
Switch	**S-008**	**X-047**	RIGHT BRAKE PARK SW (N/C)
Switch	**S-010**	**X-276**	PARK BRAKE PRESS SW
Switch	**S-011**	**X-277**	PRESS SW
Switch	**S-012**	**X-274A X-274B**	TRACTOR HYDRAULIC PRESSURE SWITCH
Switch	**S-013**	**X-275B X-275A**	TRAILER PRESSURE SWITCH
Switch	**S-020**	**X-162**	LEFT BRAKE SWITCH (NC)
Switch	**S-021**	**X-163**	RIGHT BREAK SWITCH (NC)
Connector	X-008	**X-008**	TO CAB HARNESS
Connector	X-010	**X-010**	TO OUTSIDE CAB HARNESS
Connector	X-025	**X-025**	TO CAB HARNESS
Connector	X-026	**X-026**	TO TRANSMISSION HARNESS
Connector	X-042	**X-042**	RELAY BLOCK
Connector	X-047	**X-047**	RIGHT BRAKE PARK SW (N/C)
Connector	X-048	**X-048**	LEFT BRAKE PARK SW (N/C)
Connector	X-049	**X-049**	PARK BRAKE SOL/ EURO PARK BRAKE SOL
Connector	X-053	**X-053**	CN4B
Connector	X-058	**X-058**	CN2B
Connector	X-070	**X-070**	TRAILER BRAKE PREFILL SOL
Connector	X-149	**X-149**	TO OUTSIDE CAB HARNESS
Connector	X-162	**X-162**	LEFT BRAKE SWITCH (NC)
Connector	X-163	**X-163**	RIGHT BREAK SWITCH (NC)
Connector	X-1862	**X-1862**	AIR BRAKE DRYER
Connector	X-265	**X-265**	RELAY BLOCK
Connector	X-274A	**X-274A**	TRACTOR HYDRAULIC PRESSURE SWITCH
Connector	X-274B	**X-274B**	TRACTOR HYDRAULIC PRESSURE SWITCH
Connector	X-275A	**X-275A**	TRAILER PRESSURE SWITCH
Connector	X-275B	**X-275B**	TRAILER PRESSURE SWITCH
Connector	X-276	**X-276**	PARK BRAKE PRESS SW
Connector	X-277	**X-277**	PRESS SW
Connector	X-279	**X-279**	BRAKE SOLENOID
Connector	X-355	**X-355**	CN3B
Connector	X-3570	**X-3570**	JAKE BRAKE
Solenoid	**Y-032**	**X-070**	TRAILER BRAKE PREFILL SOL
Solenoid	**Y-033**	**X-049**	PARK BRAKE SOL/ EURO PARK BRAKE SOL (PS)
Solenoid	**Y-035**	**X-279**	BRAKE SOLENOID

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6008-Steering angle sensor above maximum voltage limit

NOTE: *When the cause of the error code has been rectified, clear the error code and test the system for normal operation.*

Cause:
Steering angle sensor above maximum voltage limit of **4.98 V** volts for one second.

Possible failure modes:

1. Faulty connector
2. Faulty steering angle sensor
3. Faulty harness
4. Faulty controller

Solution:

1. Perform the steering angle sensor calibration procedure.

   Clear all fault codes. Test system operation.

   A. Fault code redisplays. Continue to step **2**.

   B. Fault code does not redisplay. Return unit to field operation.

2. Check connector **X-437** for the steering angle sensor (located in-line near the steering angle sensor at left front wheel). Check connectors **X-350** and **X-490** for the tractor control unit (TCU) and connector **X-407** for the auto-guidance controller.

   Check that the connectors are, not damaged, the pins are in the correct position and that the fit is tight.

   A. Connectors are damaged or loose. Repair or replace as required. Return unit to field operation.

   B. Connectors are okay. Continue to step **3**.

3. Check for **5 V** supply at connector **X-350** for the tractor control unit (TCU) .

   Turn the ignition switch on. Use back probe SPX 233788 to measure voltage between connector **X-350 (Female) pin 3** at the controller and ground.

   Expected reading is approximately **5 V**.

   A. Voltage reading is greater than **5 V**. Locate and repair the short to power. Repair or replace the harness as required. Return the unit to field operation.

   B. Voltage reading is correct. Continue to step **4**.

4. Check for **5 V** supply at connector **X-407** for the autoguidance controller.

   Turn the ignition switch on. Use back probe SPX 233788 to measure voltage between connector **X-407 (Female) pin 38** at the controller and ground.

   Expected reading is approximately **5 V**.

   A. Voltage reading is greater than **5 V**. Locate and repair short to power. Repair or replace the harness as required. Return the unit to field operation.

   B. Voltage reading is correct. Continue to step **5**.

5. Check signal voltage for the steering angle sensor on connector **X-490** at the tractor control unit (TCU).

   Turn the ignition switch on. Use back probe SPX 233788 to measure voltage between connector **X-490 (Female) pin 9** at the sensor and ground.

   Expected reading is less than **5 V**.

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19095-DEF/AdBlue tank temperature sensor plausibility failure

T8.380 PST TIER 2 CHELNY [ZFRE05001 -]

Context:
For information regarding the functional operation of the Selective Catalytic Reduction (SCR) system see **Selective Catalytic Reduction (SCR) electrical system - Dynamic description (55.988)**. The Engine Control Unit (ECU) A-9000 checks for temperature increase in the DEF/AdBlue® fluid during defrost. If the DEF/AdBlue® fluid temperature fails to increase by:
1.46 °C (**2.63 °F**) at **-35.04 °C** (**-31.07 °F**) within **60 min** or
1.46 °C (**2.63 °F**) at **-25.04 °C** (**-13.07 °F**) within **60 min** or
1.46 °C (**2.63 °F**) at **-14.04 °C** (**6.73 °F**) within **120 min** or
0.96 °C (**1.73 °F**) at **-5.04 °C** (**22.93 °F**) within **30 min**, this fault will occur.

Cause:
The ECU A-9000 has determined that the DEF/AdBlue® fluid temperature did not increase the required minimum amount within the allotted time and the DEF/AdBlue® tank heater valve is actuated.

Possible failure modes:

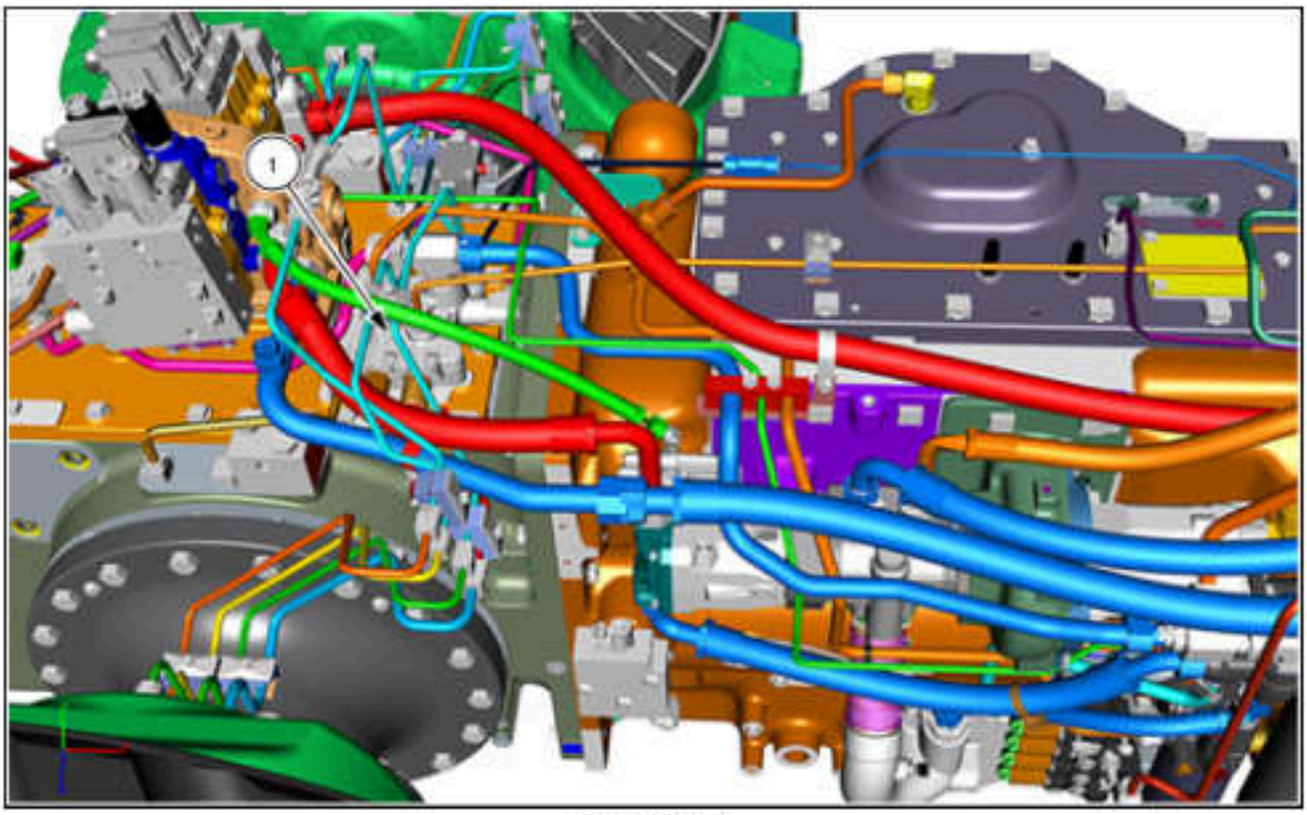
1. Extreme ambient conditions, time required is outside the established parameters.
2. Insufficient engine load, not great enough to generate required engine heat.
3. Faulty DEF/AdBlue® tank heater valve, stuck in deactivated position.
4. Faulty coolant line between DEF/AdBlue® tank and DEF/AdBlue® tank heater valve, damaged or restricted.
5. Faulty DEF/AdBlue® system, coolant lines improperly connected to the DEF/AdBlue® tank heater valve.

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Power Take-Off (PTO) control valve - Dynamic description

T8.380 SmartTrax™ PST TIER 2 [ZFRE05001 -]	
T8.410 SmartTrax™ PST TIER 2 [ZFRE05001 -]	

The Power Take-Off (PTO)/differential lock/lube valve is located on top of the rear frame housing. The PTO/differential lock/lube valve controls the PTO and differential lock operation and distributes lube flow.



RAIL14TR0481220A 1

1. PTO/differential lock/lube valve	

The regulated pressure circuit supplies the PTO and differential lock functions. The regulated supply to both the PTO and differential lock is limited to **22.4 - 24.5 bar** (**325 - 355 psi**). The supply to the PTO clutch and differential lock are internally ported through the rear frame assembly.

The charge/lube circuit supplies the lubrication functions of the valve for these lubrication points: differential lock, pinion, front and rear hydro bearings, rear axle final drives, and service brakes. The amount of lube to the left and right brakes is controlled with the lube solenoid valve. The lube solenoid is used by the Tractor Control Unit (TCU) to minimize lube to the brakes and direct oil to the lube points when the brakes are not applied. When the brakes are applied, a signal from brake pedal switch energizes the lube solenoid to increase flow to the brakes.

The Tractor Control Unit (TCU) controller lubricates the rear axle final drive when these conditions are met:

- engine speed is above **1400 RPM**
- or ground speed is above **35 km/h** (**22 mph**)
- and oil temperature is above **65 °C** (**149 °F**).

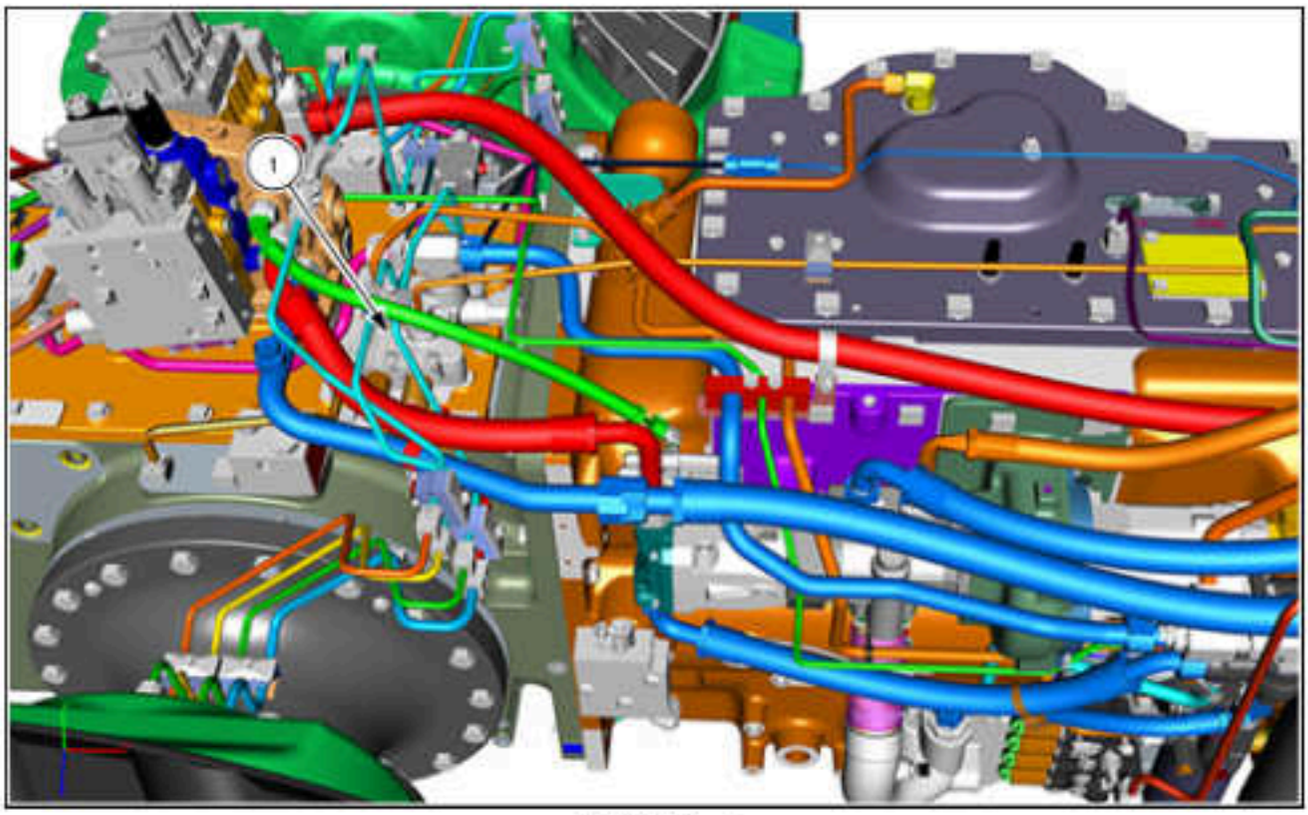
When the TCU detects no ground speed or when transmission temperature is below **65 °C** (**149 °F**), the lubrication solenoid is deenergized, which blocks lube oil flow to the rear axle final drives.

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Differential lock control valve - Dynamic description

T8.380 SmartTrax™ PST TIER 2 [ZFRE05001 -]	
T8.410 SmartTrax™ PST TIER 2 [ZFRE05001 -]	

The Power Take-Off (PTO)/differential lock/lube valve is located on top of the rear frame housing. The PTO/differential lock/lube valve controls the PTO and differential lock operation and distributes lube flow.



RAIL14TRD481204A 1

1. PTO/differential lock/lube valve	

The regulated pressure circuit supplies the PTO and differential lock functions. The regulated supply to both the PTO and differential lock is limited to **22.4 - 24.5 bar** (**325 - 355 psi**). The supply to the PTO clutch and differential lock are internally ported through the rear frame assembly.

The charge/lube circuit supplies the lubrication functions of the valve for these lubrication points: differential lock, pinion, front and rear hydro bearings, rear axle final drives, and service brakes. The amount of lube to the left and right brakes is controlled with the lube solenoid valve. The lube solenoid is used by the Tractor Control Unit (TCU) to minimize lube to the brakes and direct oil to the lube points when the brakes are not applied. When the brakes are applied, a signal from brake pedal switch energizes the lube solenoid to increase flow to the brakes.

The Tractor Control Unit (TCU) controller lubricates the rear axle final drive when these conditions are met:

- engine speed is above **1400 RPM**
- or ground speed is above **35 km/h** (**22 mph**)
- and oil temperature is above **65 °C** (**149 °F**).

When the TCU detects no ground speed or when transmission temperature is below **65 °C** (**149 °F**), the lubrication solenoid is deenergized, which blocks lube oil flow to the rear axle final drives.

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Hydraulic schematic 47904542 — Sheet 2— PowershiftTransmission. Optional mega flow

	PFC PISTON PUMP
	REGULATED CIRCUIT PRESSURE
	CHARGE / LUBE PUMP FLOW
	RETURN TO TANK / SUMP
	OIL COOLER / FILTRATION AUX. CHARGE PUMP FLOW
	TWIN FLOW PUMP MEGA FLOW PUMP

1. REMOTE SECTION	33. INLET BRAKE VALVE
2. LOAD SENSE DIAGNOSTIC	34. PRIORITY REGULATOR VALVE T8.380 and T8.410 only See sheet 4 or 5 for other models.
3. PILOT / HITCH DRAIN	35. THERMAL BYPASS VALVE
4. PILOT SUPPLY	36. OIL COOLER
5. RETURN	37. LUBE REGULATOR
6. SUPPLY	38. PRESSURE AND FLOW COMPENSATED (PFC) PISTON PUMP
7. HITCH VALVE	39. FILTER
8. CATEGORY 4 HITCH	40. PTO CLUTCH LUBE
9. HITCH CYLINDERS	41. ODD / EVEN LUBE
10. RETURN	42. DROP BOX LUBE
11. SUPPLY	43. CREEP DRIVE LUBE
12. SIGNAL	44. MASTER CLUTCH LUBE
13. CASE DRAIN	45. RIGHT BRAKE / DIFFERENTIAL LUBE
14. POWER BEYOND MANIFOLD (OPTIONAL)	46. MFD / RANGE LUBE
15. PTO / DIFFERENTIAL LOCK VALVE	47. LEFT BRAKE / DIFFERENTIAL LUBE
16. PTO CLUTCH / BRAKE	48. TO PARK BRAKE VALVE SOLENOID
17. DIFFERENTIAL LOCK CLUTCH	49. SERVICE BRAKE
18. BEVEL PINION LUBE	50. MASTER CLUTCH
19. LUBE SUPPLY	51. INLET
20. MFD CLUTCH	52. MASTER CLUTCH INCHING VALVE
21. LOW CLUTCH	53. PARK / EMERGENCY BRAKE
22. MEDIUM CLUTCH	54. BRAKE RELEASE PUMP
23. HIGH CLUTCH	55. STEERING HAND PUMP
24. REVERSE CLUTCH	56. STEERING CYLINDERS
25. FIFTH CLUTCH	57. BYPASS VALVE
26. THIRD CLUTCH	58. BRAKE VALVE
27. FIRST CLUTCH	59. NOTE: SWITCH IS OPENED WHEN PEDAL REACHES FULL STROKE WHEN HYDRAULIC POWER IS LOST
28. EVEN CLUTCH	60. ACCUMULATOR
29. ODD CLUTCH	61. TWINFLOW PUMP MEGAFLOW PUMP
30. CREEPER CLUTCH	62. TWINFLOW MANIFOLD PLUGS MEGAFLOW MANIFOLD PLUGS
31. TRANSMISSION CONTROL VALVES	63. NOT USED
32. PARK CLUTCH	64. MARKER DRAIN

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