S580N
580SN
580SN WT
590SN

Tractor Loader Backhoe

PIN NNC782640 and after

SERVICE MANUAL

Part number 51570597
English
May 2026

CASE CONSTRUCTION

Hydraulic systems - Overview Power Lift™ system pressure control for pilot control backhoe

On machines equipped with pilot backhoe controls, closed center system, the hydraulic pump output pressure **(7)** is not applied to the LS IN port **(3)** of the **Power Lift™** valve **(2)** and the pump does not remain fully stroked when no hydraulic functions are activated. In the closed center system the LS pressure is used to stroke the pump instead of destroke the pump, as in the open center system. In the closed center system, LS pressure **(1)** must increase to cause the pump to produce flow. The LS pressure signal **(1)** originating from the backhoe or loader valves (or hammer valve, if equipped) is sent to the LS IN port **(3)** of the **Power Lift™** valve **(2)**. The orifice in the LS IN port **(3)** is much larger than that used in mechanical control backhoes and it does not create a pressure drop as previously described when the unit has mechanical backhoe controls. Instead it is only used for LS pressure signal stability.

This LS pressure signal is sent to the pressure relief valves and to the LS compensator spool **(5)** of the pump. The system will build pressure until the pump output pressure **(7)** at the left side of the LS spool is **20 bar** (**290 psi**) higher than the LS signal pressure, then the LS spool **(5)** will overcome the spring tension, shift to the right, sending pump output pressure to the destroking piston **(6)** and reduce the flow of the pump.

With all hydraulic functions in a neutral position, minimal LS pressure (approximately **6.9 bar** (**100.0 psi**)) is present, so the pump will build to **20 bar** (**290 psi**) above the LS pressure, the LS spool **(5)** will shift to the right, and the pump will destroke. The pump will remain on stroke slightly to maintain the pump margin pressure above the LS pressure, accounting for system internal leakage.

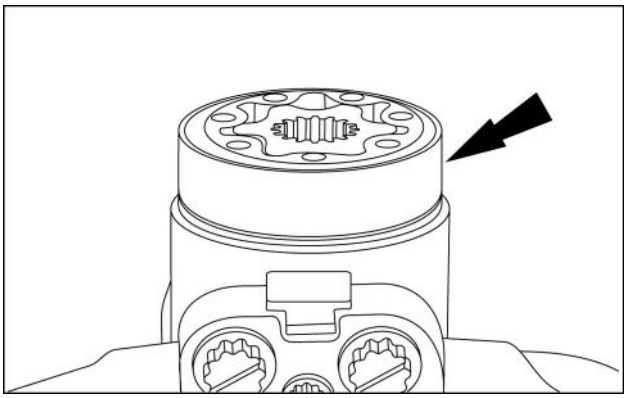
When a function is activated, LS pressure from the sectional compensator of the work valve section is sent to the **Power Lift™** valve **(2)**, the relief valves, and the LS compensator spool **(5)**. With the LS pressure at the right side of the LS spool, the spool will shift to the left, the destroking piston **(6)** pressure will vent to tank, and the swash plate will come “on stroke” to provide hydraulic flow. Because the LS pressure signal is connected to the work port of the function which is actuated, the pump will always modulate the swash plate and thus the pump flow output **(7)** to maintain an output pressure **20 bar** (**290 psi**) above the LS pressure. The **20 bar** (**290 psi**) pressure drop takes place across the work spool and/or sectional compensator valve of the working section. The pump will only provide the flow and pressure required to do the work based on maintaining the **20 bar** (**290 psi**) pressure differential. When a cylinder reaches the end of travel, or a heavy load is encountered, the LS pressure **(1)** will continue to rise until one of the **Power Lift™ (2)** relief valves open, and the pump output pressure will then rise until the LS spool **(5)** is shifted back to the right, destroking the pump. The pump will remain at a flow position required to maintain an output pressure **(7) 20 bar** (**290 psi**) above the LS pressure signal **(1)**.

The LS drain is also incorporated into the **Power Lift™** valve **(2)**. The LS drain **(4)** is a **0.700 L/min** (**0.025 cfm**) “leak,” designed into the LS circuit, which allows the LS signal **(3)** pressure to drain off quickly when a hydraulic function is returned to neutral. If the “leak” is too small, the pump may hang on stroke when a function is returned to neutral, but if the “leak” is too large, then the pump may be slow to come to stroke, or will not come on stroke when a function is activated.

NOTICE: *Do not attempt to adjust the LS drain cartridge even though it appears to be adjustable. If a problem with the LS drain is suspected, then replace LS drain cartridge with a new one.*

1	Load sense from the backhoe valve and the loader valve.	5	Load sense spool
2	**Power Lift™** valve	6	Destroking piston
3	Load sense IN	7	Hydraulic pump output
4	Load sense drain		

5. Lift the spacer plate from the body.



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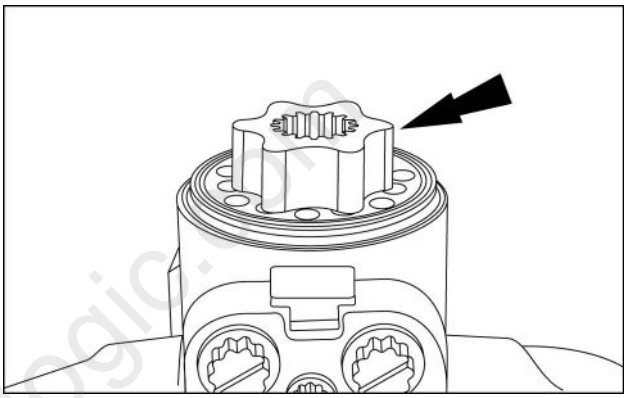
6. Remove the metering gear from the pump.



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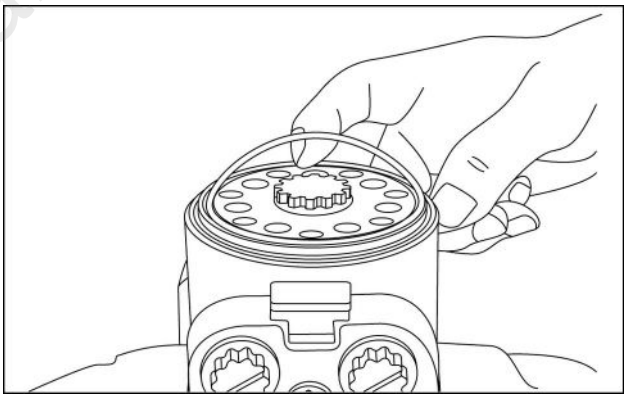
7. Remove the O-ring from the spacer plate, remove the spacer plate. Remove and discard the O-ring from the body.



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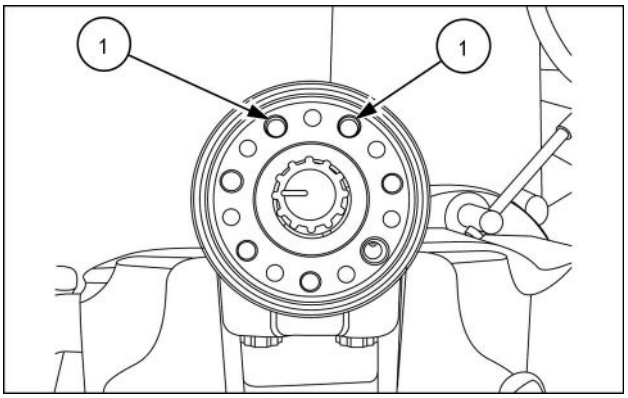
8. Find the anti-cavitation valves **(1)** in the body. Put identification marks on the body for use during assembly.



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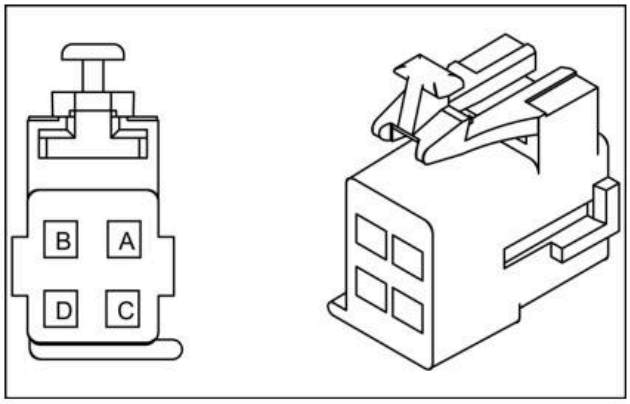
Pin	From	Wire	Description	Color-Size	Frame
S	**X-104A (Receptacle) pin A** - BLOWER MOTOR (87697720)	8801	BLOWER MOTOR LOW	BR - 3.0	**SHEET 16 SH16 - HVAC**

X-102A - RADIO SPEAKERS (87697719) (Receptacle)



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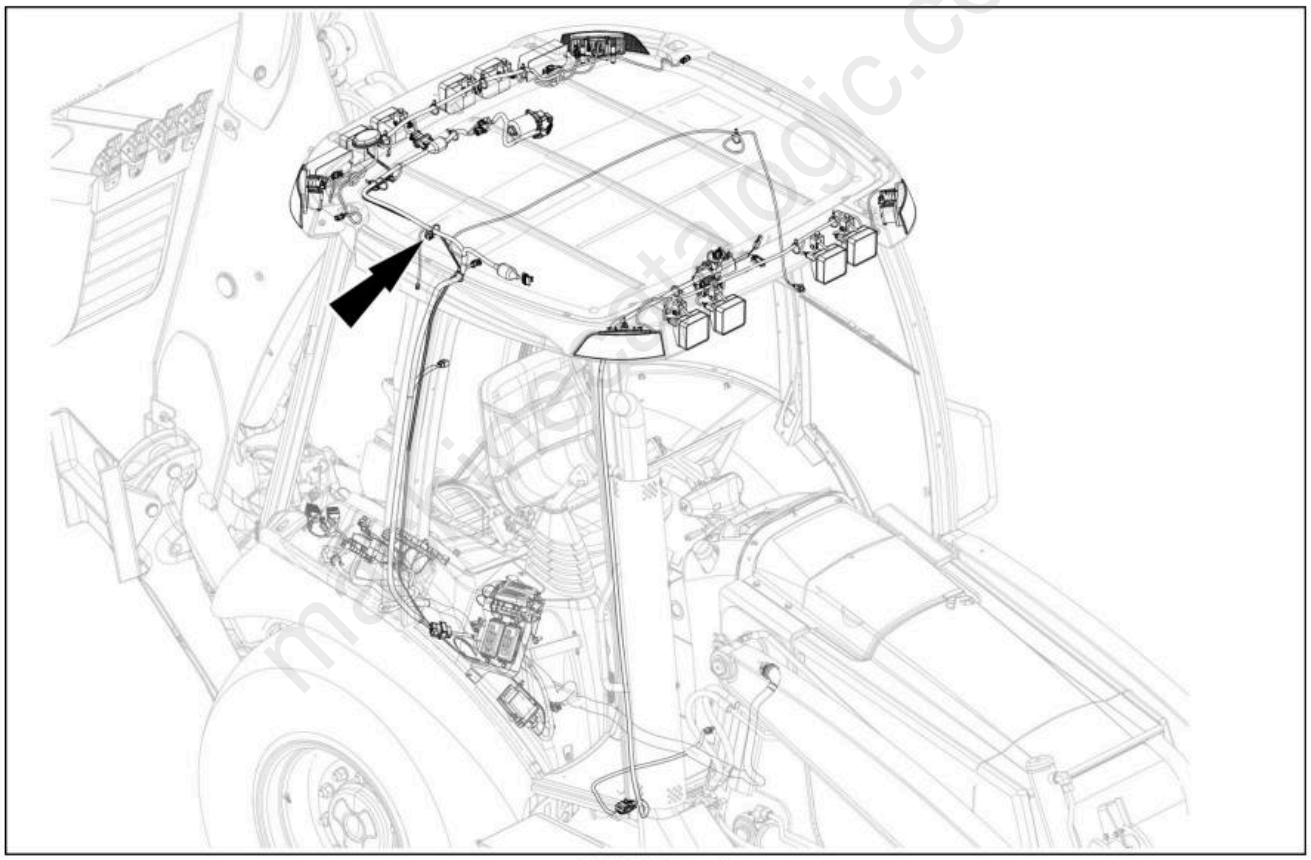

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Pin	From	Wire	Description	Color-Size	Frame
A	**X-109 (Plug) pin 5** - RADIO [A-004] (84257494)	3C01	RIGHT SPEAKER	BK - 0.5	**SHEET 17 SH17 - AUDIO**
B	**X-109 (Plug) pin 6** - RADIO [A-004] (84257494)	4D01	RIGHT SPEAKER	GY - 0.5	**SHEET 17 SH17 - AUDIO**
C	**X-109 (Plug) pin 2** - RADIO [A-004] (84257494)	5E01	LEFT SPEAKER	BK - 0.5	**SHEET 17 SH17 - AUDIO**
D	**X-109 (Plug) pin 4** - RADIO [A-004] (84257494)	6F01	LEFT SPEAKER	GY - 0.5	**SHEET 17 SH17 - AUDIO**

Electrical components - Load description

580N Four-Wheel Drive (4WD) Tier 4B (final) [NNC779021 -]	(TRANSMISSION = 4WD STD TRANSMISSION)
580N Two-Wheel Drive (2WD) Tier 4B (final) [NNC779021 -]	(TRANSMISSION = 2WD STD TRANSMISSION)
580SN Four-Wheel Drive (4WD) Tier 4B (final) [NNC780095 -]	(TRANSMISSION = 4WD STD TRANSMISSION)
580SN Two-Wheel Drive (2WD) Tier 4B (final) [NNC780095 -]	(TRANSMISSION = 2WD STD TRANSMISSION)
580SN WT Four-Wheel Drive (4WD) Tier 4B (final) [NNC782036 -]	(TRANSMISSION = 4WD STD TRANSMISSION)
590SN Four-Wheel Drive (4WD) Tier 4B (final) [NNC782640 -]	(TRANSMISSION = 4WD STD TRANSMISSION)
590SN Two-Wheel Drive (2WD) Tier 4B (final) [NNC782640 -]	(TRANSMISSION = 2WD STD TRANSMISSION)

L-002 - Load (Load)

Component Type	Load
Wiring frames	**SHEET 09 SH09 - PILOT CONTROLS**

3531 (DTC A36E) - Downstream NOx sensor internal failure (heater performance plausibility error)

Fault Description:
The SCR downstream NO_X sensor has internal monitoring and delivers information about its error status and the results of self diagnosis procedure, via the CAN bus to the Engine Control Unit (ECU). One of the monitored conditions is whether or not the SCR downstream NO_X sensor reached the appropriate operating temperature within the allotted time. Once the dew point has been reached, the sensor has **3.0 min** to reach heat up. If the sensor heat up is not completed in time, then this fault will occur. For information regarding the functional operation of the smart Selective Catalytic Reduction (SCR) downstream NO_X sensor, refer to the engine service manual **Nitrogen Oxide (NOx) sensor - Dynamic description (55.988)**.

Cause:
The SCR downstream NO_X sensor has reported, via CAN bus to the ECU, that the sensor failed to reach heater working temperature in the allotted time.

Possible failure modes:

1. A faulty SCR downstream NO_X sensor.
2. A faulty ECU.

Solution:

1. Verify that the fault is present and active.

   Use the Electronic Service Tool (EST) to check the status of this fault.

   A. If the fault is present and active, then continue with step **2**.

   B. If the fault is no longer present or in an inactive state, then the fault may be intermittent and not currently active. Continue with step **4**.
2. Check for other relevant faults.

   Use the EST to check for the presence of fault **19050 – Downstream NOx sensor supply voltage is out of range**.

   A. If fault **19050 – Downstream NOx sensor supply voltage is out of range** is present, resolve fault **19050 – Downstream NOx sensor supply voltage is out of range**. Then check to see that fault **3531 – Downstream NOx sensor internal failure (Heater Performance Plausibility Error)** is also resolved.

   B. If fault **19050 – Downstream NOx sensor supply voltage is out of range** is not present, then continue with step **3**.
3. As there is no method for field testing or re-flashing the sensor controller, replace the SCR downstream NO_X sensor.

   Run the machine and use the EST capability to view parameters to verify that the sensor has reached dew point.

   Then check to see that this fault is resolved.

   A. If this fault is resolved, return the machine to service.

   B. If this fault is not resolved, check the ECU for the appropriate software and re-flash, if necessary.
4. Visually inspect the relevant harnesses and connectors for damage, bent or dislocated pins, corroded terminals, or broken wires. Verify that the connectors are fully installed. Flex the harnesses involved to reveal intermittent breaks or shorts in the wiring concerned. Operate the machine while you monitor the display.

   A. If you find damage or the display indicates other than normal display readings, then repair the damage discovered during the inspection or locate and repair the other than normal display condition and verify that the error has been resolved.

Full Version Available

Case S580N, 580SN, 580SN WT, 590SN Tractor Loader Backhoe Service Manual (51570597) (May 2026)

This is a short preview. The complete document contains all sections, diagrams, part numbers or specifications, and full procedures.