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Product: MULTI TERRAIN LOADER

Model: 287C MULTI TERRAIN LOADER MAS

Configuration: 287C Multi Terrain Loader MAS00001-UP (MACHINE) POWERED BY 3044C Engine

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Lift Cylinder Speed Check

Note: Perform the lift cylinder speed check without a work tool on the coupler.

1. Fasten the seat belt and lower the armrest.
2. Start the engine.
3. Disengage the parking brake.
4. If the automatic leveling switch is in the ON position, then turn the automatic leveling switch to the OFF position.
5. Run the engine at high idle with the hydrostatic electrohydraulic control in the HOLD position.
6. Operate the lift cylinder through at least five lift cycles. This operation will ensure that there is warm oil in the lift cylinders.
7. Tilt the work tool coupler to the full TILT BACK position. Lower the work tool coupler to the full LOWER position.
8. Raise the work tool coupler from the full LOWER position. Record the time from the full LOWER position to the full RAISE position.
9. Lower the work tool coupler from the full RAISE position. Record the time from the full RAISE position to the full LOWER position.
10. Raise the work tool coupler to the full RAISE position. Move the hydraulic control to the FLOAT position. Record the time from the full RAISE position to the full LOWER position.

Table 1

TRAVEL TIME (SPEED) FOR THE LIFT CYLINDERS		
Position of the Hydraulic Control	**277C / 277C2**	**287C / 287C2 / 297C**
RAISE	3.1 ± 0.5 seconds	4.7 ± 0.5 seconds
RAISE (High Flow XPS)	3.1 ± 0.5 seconds	4.5 ± 0.5 seconds
LOWER	2.8 ± 0.5 seconds	3.7 ± 0.5 seconds
LOWER (High Flow XPS)	2.8 ± 0.5 seconds	3.6 ± 0.5 seconds
FLOAT	4.0 ± 0.5 seconds	4.6 ± 0.5 seconds
FLOAT (High Flow XPS)	3.6 ± 0.5 seconds	4.7 ± 0.5 seconds

If the speeds are not correct, refer to the machine Testing and Adjusting, "Hydraulic System Troubleshooting".

Tilt Cylinder Speed Check

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of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, "Caterpillar Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

NOTICE

Do not adjust the main relief valve above the specified pressure. Adjustment of the main relief valve above the specified pressure may cause damage to the gear pump.

Before any tests are performed, prepare the machine for troubleshooting. Refer to Testing and Adjusting, "Machine Preparation". Before any tests are performed, visually inspect the complete hydraulic system. Refer to the Testing and Adjusting, "Visual Inspection".

Note: The oil in the hydraulic system must be at an operating temperature of 50° ± 10°C (122° ± 18°F). In order to increase the oil temperature, start the engine and operate all the cylinders for at least five cycles. Also, drive the machine forward and drive the machine rearward for a few minutes.

The following test is performed in order to determine if the main relief valve for the work tool is damaged or improperly set.

Table 2

Model	Main Relief Valve Setting
All standard flow models	23000 ± 700 kPa (3335 ± 102 psi)
All High Flow Extra Pressure System (XPS) models	23000 ± 1000 kPa (3335 ± 145 psi)

1. Engage the parking brake. Stop the engine.
2. Raise the cab. Refer to Operation and Maintenance Manual, "Cab Tilting" for the proper procedure.

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	24500 ± 700 kPa (3553 ± 102 psi)	27600 ± 700 kPa (4003 ± 102 psi)
Rack Back	27600 ± 700 kPa (4003 ± 102 psi)	27600 ± 700 kPa (4003 ± 102 psi)
Tilt	24500 ± 700 kPa (3553 ± 102 psi)	24500 ± 700 kPa (3553 ± 102 psi)
Auxiliary (standard)	24500 ± 700 kPa (3553 ± 102 psi)	24500 ± 700 kPa (3553 ± 102 psi)
Auxiliary (XPS)	31000 ± 700 kPa (4496 ± 102 psi)	31000 ± 700 kPa (4496 ± 102 psi)

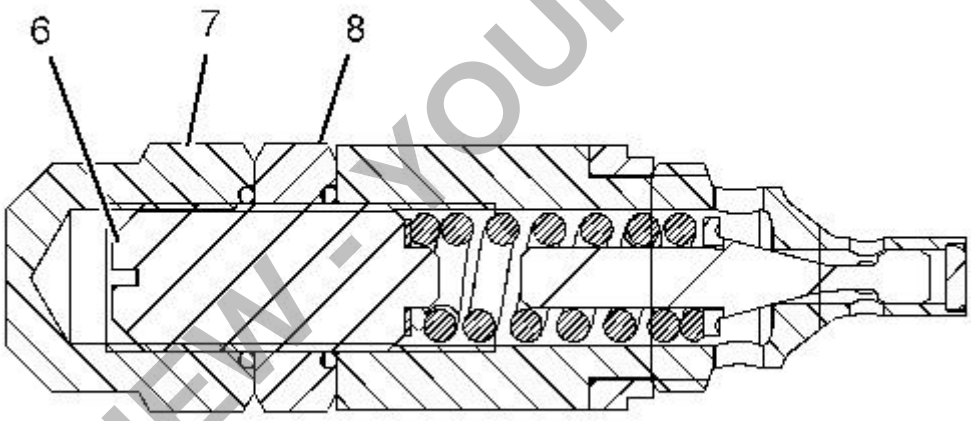


Illustration 4 g01371927

Typical line relief valve

(6) Cap

(7) Adjustment screw

(8) Locknut

13. If the line relief valve is within the specification, then go to Step 15. If the line relief valve is not within the specification, then an adjustment is required.

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The tracks keep coming off of the machine.

Probable Cause

- The track tension is too loose.
- The machine is being operated on a transition or a slope.
- There is debris in the undercarriage.

Problem 14

The track wears out too soon.

Probable Cause

- The track tension is not properly maintained.
- The machine is operated in rocky terrain, in concrete demolition, or in any application that requires a solid tire on the skid steer loader.

Problem 15

The hydrostatic system is noisy.

Probable Cause

- The flushing valve in the piston motor is malfunctioning.
- The piston pump is worn.
- The charge pressure is low.
- There is air in the hydraulic oil.

Problem 16

The two speed function will not operate.

Probable Cause

- The multifunction switch is not in the "2 SPEED" position.
- The parking brake is engaged.
- The solenoid valve (2 Speed) is sticking.
- The charge pressure may be low.
- The solenoid valve (2 Speed) is not receiving enough voltage.
- The piston motors are damaged.

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Note: Low idle and high idle have been preset at the factory. The setting of the low idle and the high idle on these engines should not be adjusted. Adjusting the setting can void the warranties on the fuel injection pump and the engine. Adjusting the setting can invalidate the standards for emissions. Adjustment of the low idle and the high idle should be made only by trained personnel. Some engine applications may have a different low idle and high idle.

14. Record the following items: the charge pressure, the engine speed and the fan speed.

Table 6

Baseline For The Hydrostatic System		
Test	**Low Idle**	**High Idle**
Engine Speed	1100 ± 50 rpm	2800 ± 50 rpm
Charge Pressure	2750 ± 200 kPa (400 ± 29 psi)	3300 ± 200 kPa (479 ± 29 psi)
Demand Fan	N/A	1100 rpm minimum

If the charge pressure is too low or too high at HIGH IDLE, perform the following checks.

- Check the gear pump for wear by performing the pump flow test. Refer to the machine Testing and Adjusting, "Pump Flow - Test" for the correct procedure.
- The possibility exists of a large internal leak in the following components: brakes, piston pump and piston motors. Refer to Table 6 in order to troubleshoot these components.
- Replace the charge relief valve and recheck the pressure.
- The fan motor may have failed.
- Check for a restriction in the filter.

Table 7

Component	**Test Procedure**
Piston Pumps	Check the pressure for the pump case.
Piston Motors	Refer to "Motor Speed Test (Maximum Runout)".

If the charge pressure is too low at low idle, perform the following checks.

- The possibility exists of a large internal leak in the following components: brakes, piston pump and piston motors. Refer to Table 7 in order to troubleshoot these components.

If the case pressure of the piston pump is high, perform the following checks.

- Check for a restriction in the hydrostatic case drain lines.
- Check the hydraulic oil temperature. Make sure that the operating temperature of the hydraulic oil is correct. Check the viscosity of the hydraulic oil.
- There may be an internal leak.
- The possibility exists of a worn piston pump.
- The poppet valve for the drain manifold is not functioning properly.

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