

Service Manual

AC Stacker

22.07.2005

Revision Level: 3

If any problems are encountered during this test, take the truck out of use until it is fully operational.

3.4.12. Testing the parking brake

The trucks are equipped with an automatic parking brake. The brake should be active when the main power is off and also when the main power is on unless the accelerator is moved to issue a driving command. Test the parking brake by trying to move the truck. When the brake is active, the truck should not move forward or backward. The parking brake only affects the drive wheel so that the other wheels are still free to turn. The tiller arm can also be freely moved from side to side while the parking brake is active.

3.4.13. Testing the lifting hydraulics and controls

Test the operation of the lifting hydraulics by lifting and lowering the forks. Refer to *Chapter 2 Operating the truck* for information on the truck's controls. The forks should rise smoothly from the lowest position to the highest position. The forks should stop smoothly when reaching the upper position. If the forks hit the upper position at full speed, there may be a problem in the system. Refer to *Chapter 6 Mechanical maintenance* for information on mechanical maintenance.

3.5. Weekly maintenance

Like daily maintenance, weekly maintenance is important for keeping the truck in full working order. Weekly maintenance should be scheduled for a certain day of the week, so that the maintenance interval does not fluctuate. When weekly maintenance is due, complete all of the daily maintenance procedures first before continuing with the weekly maintenance procedures.

Before beginning, ensure that the main power of the truck is turned off. Open the main and top covers of the truck before commencing with the weekly maintenance procedures. Refer to *Section 3.2 Maintenance guidelines* for information on how to open the truck's covers.

Should the weekly maintenance procedures reveal anything that affects the use or safety of the truck, the truck must immediately be taken out of use until it is restored to full working order.

4.3.2.21. Parameter 81: Lift cut-off

This parameter controls the lift cut-off function. When it is active, that is, set to 1, lifting is disabled when the low battery warning is triggered. The low battery warning level is set with parameter 175.

4.3.2.22. Parameter 98: Stop mode tiller

This parameter controls how the controller decelerates when the tiller arm is removed from the driving position. There are three choices, indicated by the number 1, 2 or 3. The default and recommended value is 2. Its advantage is that it reduces the wear of the electrical brake. The alternatives are:

1. The motor's power feed is cut and the brake is applied at the same time.
2. The motor's deceleration ramp is applied and the brake is engaged after the truck has come to a standstill.
3. The motor's deceleration ramp is applied and the brake engaged at the same time.

4.3.2.23. Parameter 107: Warn. temp. contr.

This parameter sets the temperature level for the controller's high temperature warning. The value is entered in degrees Celsius (°C) and can be between 50 and 79. The default value is 70, which should not be changed.

4.3.2.24. Parameter 133: Acceleration

This parameter controls the rate at which the truck accelerates when the accelerator is moved to request traction. Acceleration is given in km/h/s with an accuracy of two decimals and in the range from 0.50 to 6.00. The default value is 1.60.

4.3.2.25. Parameter 134: Deceleration

This parameter controls the rate at which the truck decelerates when the accelerator is released to request stopping. Deceleration is given in km/h/s with an accuracy of two decimals and in the range from 0.50 to 6.00. The default value is 2.50.

2. Raise the forks and lift the truck slightly with a jack.
3. Remove the locking pin from the axle.
4. Remove the load wheel axle.
5. Replace the load wheel and reattach the axle and the locking pin.

To replace double load wheels:

1. Lift the truck using a jack. Place supporting brackets under the truck.
2. Remove the axle bolt using a 8 mm Allen key on both ends of the bolt.
3. Replace the load wheel and reattach the axle bolt.

6.1.3. Replacing the castor wheel

The supporting castor wheel is located under the main chassis opposite to the drive wheel. The castor wheel balances the truck and turns automatically to follow the direction of travel.

To replace the castor wheel:

1. Lift the truck using a jack. Place supporting brackets under the truck.
2. Remove the axle bolt using a wrench on both ends of the bolt.
3. Replace the castor wheel and reattach the axle bolt.

6.2. Replacing the tiller arm gas spring

This section gives instructions on how to replace the gas spring of the tiller arm. The purpose of the gas spring is to return the tiller arm automatically to the upright resting position. It is a safety device, which must always be fully operational.

To replace the gas spring:

1. Remove the cover from the base of the tiller arm.

5.1.2.5. Initial lowering

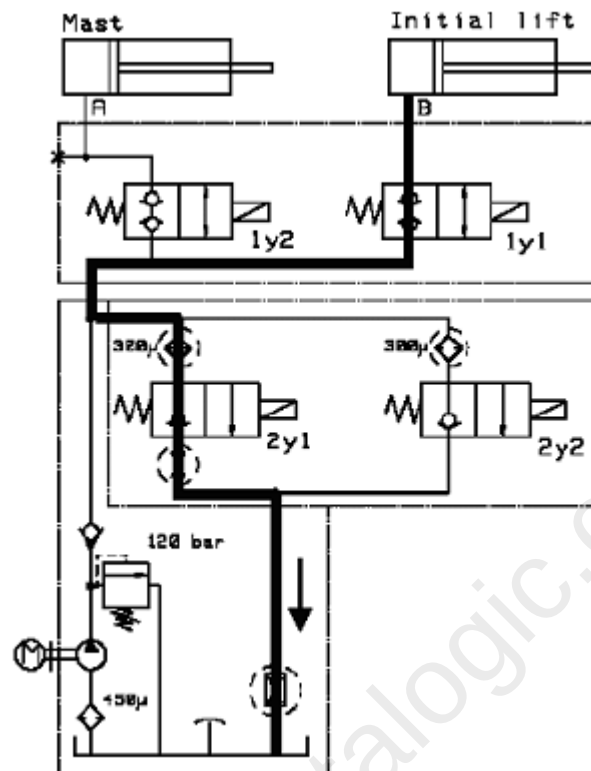


Figure 5.26. Hydraulic fluid flow during initial lowering

1. The operator activates the tiller switch for initial lowering. First the pressurised hydraulic fluid flows from the initial cylinder through the locking valve (1Y1) and then through the strainer.
2. The fluid flows through the first magnetic valve (2Y1).
3. The fluid flows through the flow restrictor back to the tank.

carriage. Note that the carriage can be lowered at two speeds. Press down lightly to lower the carriage slowly and press more firmly to lower the carriage faster.

If the truck is equipped with the initial lifting function, this is controlled with push buttons (6) on either side of the tiller arm head assembly. The button on the right-hand side lifts and the button on the left-hand side lowers.

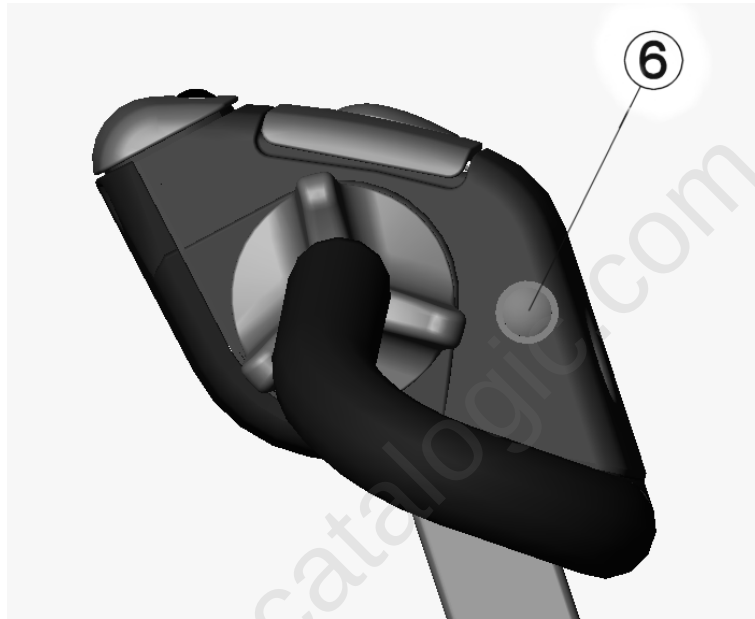


Figure 2.3. Push buttons (6) for controlling the initial lifting function

If the proportional lifting lever (7) is present, the height of the fork carriage can be controlled proportionally. Use the lifting lever (7) to position the carriage at the desired height. If the truck also has the initial lifting function, use the lifting and lowering controls (2) to control initial lifting and lowering. On a truck with proportional lifting but without the initial lifting function, the lifting and lowering controls (2) also control the fork carriage but not proportionally.

List of succeeding displayable parameters:

text	parameter number
software version	0
serial number	7
operating hours	9
actual speed	10
speed set value	11
temp. inverter	17
operating state	25
value speed pot.	30
temp. inverter	32
battery voltage	33
connector X1	46
connector X2	47
connector X3	48
connector X4	49
connector X5	50
connector X6	51

Description of the parameters:

Serial number:	Explicit number identifying each individual unit
Operating hours:	Actual counted time in which the motor has been operated.
Actual speed:	The actual measured speed of the controlled motor.
Speed set value:	The actual speed demand of the controlled motor.
Operating state:	0= Fault, 1= Ready, 2= Power stage active (current in motor)
Speed potentiom.:	Displays the analog voltage on input pin X6.6 in the range of 0..1023. This input is the speed reference coming from the tiller head.
Battery voltage:	Displayed in % of the nominal voltage (e.g. 24V, 48V or 80V)

State display for connectors X1 - X6:

Example 1:

Connector X1

connector X1
2

This display shows that the pin 2 on connector X1 is active, meaning that the internal transistor connects pin 2 to battery minus.

- Pin 1: Key Switch (Battery voltage)
- Pin 2: Digital output 2**
- Pin 3: Analogue output minus
- Pin 4: Analogue output

Example 2:

Connector X3

connector X3
67 A

This display shows that the inputs pin 6, pin 7 and pin 10 (A=10) are activated.

- Pin 1: Protected key switch voltag
- Pin 2: Protected key switch voltag
- Pin 3: Supply voltage for the horn
- Pin 4: Supply voltage for the lowering valve
- Pin 5: Supply voltage for the contactor that switches on the pump-motor
- Pin 6: Input safety socket**

			NSP10N	NSP12N	NSP12NI	NSP16N	NSP16NI	NSP_N(i) Speed Red.		D=Diagnostics
Warn.temp.Contr.	107	x	70	70	70	70	70	70	50°C...79°C	Level of high temp.warning
Acceleration	133	x	1.60	1.60	1.60	1.60	1.60	1.60	0,50kmh/s...6,00kmh/s	
Deceleration	134	x	2.50	2.50	2.50	2.50	2.50	2.50	0,50kmh/s...6,00kmh/s	
Smoothing Curve	137	x	5	5	5	5	5	5	0...9	
Progress. Curve	138	x	75	75	75	75	75	75	0...100	
Reverse Braking	139	x	3.50	3.50	3.50	3.50	3.50	3.50	0,50kmh/s...6,00kmh/s	
Dec.Belly&Tiller	142	x	6.00	6.00	6.00	5.00	5.00	5.00	0,50kmh/s...9,00kmh/s	
Level low batt.	175	x	2	2	2	1	1	1	1...5	Level for lift cut-off activation
Low Batt.Speed	176	x	33	33	33	33	33	33	10%...100%	% of Max.Speed
Min. voltage to reactivate the brake PWM	178	0	16.1	16.1	16.1	16.1	16.1	16.1		
Max.Speed FWD	211	x	5.60	5.60	5.60	6.00	6.00	6.00	0,50km/h...6,00km/h	
Max.Speed BWD	216	x	5.60	5.60	5.60	6.00	6.00	6.00	0,50km/h...6,00km/h	
Opt.Speedlimit1	221	x	100	100	100	100	100	10	10%...100%	% of Max.Speed
Brake Rel.Speed	222	x	33	33	33	33	33	33	10%...100%	% of Max.Speed
Tiller Type	223	x	0	0	0	0	0	0	0=with NO contact (SICK) 1=with NO+NC contact (TELEMECANIQUE)	
Start Up Delay	224	0	1.5	1.5	1.5	1.5	1.5	1.5	0-10 s	Start up delay for traction . Active when throttle lever is pushed before tiller switch state is changed to driving position
Error message	249	x	D	D	D	D	D	D	0	Error number
Program throttle	251	x	0	0	0	0	0	0	1=program throttle	

Full Version Available

Caterpillar NSP16N Stacker Service, Operator and Schematic Manual (WHSM0005)

Caterpillar NSP16N Stacker service manual, covers hydraulics, mast, drive unit, wiring, and diagnostics. Instant PDF download.

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