



# Operation & Maintenance Manual

**NPR20N**

machinecatalogic.com

**SWHPU - 00211**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                         |                  |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|------------------|---------------|
| <b>13</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>EEPROM KO</b>        | <b>(Warning)</b> | <b>Stored</b> |
| <p>It's due to a hardware or software defect of the non-volatile embedded memory supporting the controller parameters. This alarm does not inhibit the truck operations, but the truck will work with the default values.</p> <p>Try to execute a CLEAR EEPROM operation. Switch the key off and on to check the result. If the alarm occurs permanently, it is necessary to replace the Combiac1 controller. If the alarm disappears, the previously stored parameters will have been replaced by the default.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                  |               |
| <b>19</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>LOGIC FAILURE #1</b> | <b>(Alarm)</b>   | <b>Stored</b> |
| <p>This fault is displayed when the controller detects an overvoltage or undervoltage condition. Overvoltage threshold is 45V; undervoltage threshold is 9V in the 24V controller.</p> <p>If fault displayed at startup or in standby; in this case it is due to an undervoltage, so it is important to check following:</p> <p>a) Key input signal down going pulses (below undervoltage threshold) due external loads, like DC/DC converters starting up, relays or contactors energizing/ denenergizing.</p> <p>b) If no voltage transient is detected on the supply line and the alarm is present every time the key is switched ON, the fault is in the Combiac1 controller.</p> <p>If fault is displayed during motor driving; in this case due to an undervoltage or an overvoltage condition.</p> <p>a) If the alarm happens during traction acceleration or driving hydraulic functions, the fault is an undervoltage condition; check battery charge level and power cable connections.</p> <p>b) If the alarm happens during release braking, the fault is an overvoltage condition; check line contactor tips and battery power cable connections.</p> |                         |                  |               |
| <b>28</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>PUMP VMN LOW</b>     | <b>(Alarm)</b>   | <b>Stored</b> |
| <p>Cause:<br/>The pump motor output is lower than expected, considering the pulswidthmodulation applied.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                         |                  |               |

controlled safety switch to close. Therefore, traction is disabled.  
ABSENT: Inhibit supervisor microprocessor functions (Not in use!).  
PRESENT: Enable diagnostic interaction between the main and supervisor microprocessors.  
Factory default is "PRESENT". Do not change the default value!

## **ENCODER CONTROL**

This parameter is not used in this application. Factory default value is "OFF". Do not change the default value!

## **FEEDBACK DEVICE**

This parameter controls what kind of feed back device is used.  
Factory default value is "OP #4". Do not change the default value!

## **AUTOCENTERING**

This parameter controls the automatic steering centring at key-on. Value range setting:  
ON: The steering centring is activated at key-on.  
OFF: The steering centring is not activated at key-on.

## **RECOVERY AT REST**

This parameter controls the steering recovery at rest, which is not used in this application. Factory default is "OFF". Do not change the default value!

## **AUX FUNCTION 1**

This parameter sets the steering mode after the feedback signals has reached the final position. The steering motor is turned on when a travel demand is active. Factory default setting is "0". Do not change the default value!

## **DIAG MOTOR TEMP**

This parameter controls the steering motor overheating alarm ( MOTOR TEMPERAT) enabling or disabling. ON: the detection of the alarm. OFF: Disables the detection of the alarm. Factory default setting is "ON". Do not change the default value!

## **SUBMENU: SET MODEL**

## **SYSTEM CONFIG**

|                    |         |         |         |         |  |  |  |  |  |  |         |          |                                                                                                                |
|--------------------|---------|---------|---------|---------|--|--|--|--|--|--|---------|----------|----------------------------------------------------------------------------------------------------------------|
| AUTO REQ TYPE      | 0       | 0       | 0       | 0       |  |  |  |  |  |  | 0       |          | Factory setting                                                                                                |
| CONNECTED TO       | EPS     | EPS     | EPS     | EPS     |  |  |  |  |  |  | EPS     |          | 2 = traction controller, 5 = pump controller, 6 = steering controller, 10 = encoder card                       |
| MODEL TYPE         | x       | x       | x       | x       |  |  |  |  |  |  | x       |          |                                                                                                                |
| ADJUSTMENTS:       |         |         |         |         |  |  |  |  |  |  | 0       |          |                                                                                                                |
| ADJUSTMENT #01     | 0       | 0       | 0       | 0       |  |  |  |  |  |  | 0       |          | Factory setting                                                                                                |
| SET CURRENT        | 0       | 0       | 0       | 0       |  |  |  |  |  |  | 0       |          | Factory setting                                                                                                |
| ADJUSTMENT #02     | x       | x       | x       | x       |  |  |  |  |  |  | 90      |          | Factory setting                                                                                                |
| ADJUSTMENT #03     | x       | x       | x       | x       |  |  |  |  |  |  | x       |          | Factory setting                                                                                                |
| ADJUSTMENT #04     | x       | x       | x       | x       |  |  |  |  |  |  | x       |          | Factory setting                                                                                                |
| SET BATTERY TYPE   | 24V     | 24V     | 24V     | 24V     |  |  |  |  |  |  | 24V     |          | Factory setting                                                                                                |
| SET SAT. FREQ.     | 90 Hz   | 90 Hz   | 90 Hz   | 90 Hz   |  |  |  |  |  |  | 90Hz    |          | Factory setting                                                                                                |
| OVERSAT FREQ.      | 1 Hz    | 1 Hz    | 1 Hz    | 1 Hz    |  |  |  |  |  |  | 1Hz     |          | Factory setting                                                                                                |
| MAXIMUM SLIP       | 5,00 Hz | 5,00 Hz | 5,00 Hz | 5,00 Hz |  |  |  |  |  |  | 5Hz     |          | Factory setting                                                                                                |
| AUX VOLTAGE #1     | x       | x       | x       | x       |  |  |  |  |  |  | x       |          | Factory setting                                                                                                |
| AUX VOLTAGE #2     | x       | x       | x       | x       |  |  |  |  |  |  | x       |          | Factory setting                                                                                                |
| NO LOAD CURRENT    | 24 A    | 24 A    | 24 A    | 24 A    |  |  |  |  |  |  | 24A     |          | Factory setting                                                                                                |
| ZERO SP POT        | x       | x       | x       | x       |  |  |  |  |  |  | x       |          | Factory setting                                                                                                |
| SET STEER 0-POS.   | x       | x       | x       | x       |  |  |  |  |  |  | x       |          | Straight ahead steering position adjustment                                                                    |
| SET STEER 180      | x       | x       | x       | x       |  |  |  |  |  |  | x       |          | Factory setting                                                                                                |
| SET ENC AT 180     | x       | x       | x       | x       |  |  |  |  |  |  | x       |          | Autoteaching sets this parameter. Value is about 1,6 - 1,7V                                                    |
| SET ENC AT 360     | x       | x       | x       | x       |  |  |  |  |  |  | x       |          | Autoteaching sets this parameter. Value is about 3,3 - 3,4V                                                    |
| SPECIAL ADJUST:    |         |         |         |         |  |  |  |  |  |  | 0       |          |                                                                                                                |
| SET TEMPERATURE    | x       | x       | x       | x       |  |  |  |  |  |  | x       |          | Factory setting                                                                                                |
| HIGH ADDRESS       | 0       | 0       | 0       | 0       |  |  |  |  |  |  | 0       |          | Factory setting                                                                                                |
| DEBUG OUTPUT       | 15      | 15      | 15      | 15      |  |  |  |  |  |  | 15      |          | Factory setting                                                                                                |
| HARDWARE SETTINGS: |         |         |         |         |  |  |  |  |  |  | 0       |          |                                                                                                                |
| MAXIMUM CURRENT    | 50 A    | 50 A    | 50 A    | 50 A    |  |  |  |  |  |  | 50A     |          | Factory setting                                                                                                |
| CAN BUS            | PRESENT | PRESENT | PRESENT | PRESENT |  |  |  |  |  |  | PRESENT |          | Factory setting                                                                                                |
| SET HI RESOL AD    | 1       | 1       | 1       | 1       |  |  |  |  |  |  | 1       |          | Factory setting                                                                                                |
| AUTOTEACHING       | OFF     | OFF     | OFF     | OFF     |  |  |  |  |  |  | OFF     | ON / OFF | OFF = Automatic teaching for steering disabled. ON = Automatic steer teaching activated on next truck startup. |
| AUX FUNCTION 11    | 5       | 3       | 5       | 5       |  |  |  |  |  |  | x       |          | Defines steering motor and feedback sensors positions                                                          |

## Overhead guard and load support

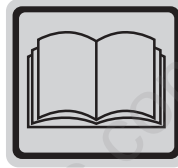
Trucks driven sitting or standing that are capable of lifting a load higher than 1.8 m must be equipped with an overhead guard. Modifications to the overhead guard that could possibly weaken its structure are not allowed. If it is possible for objects to fall through the openings in the overhead guard, the size of the openings must be reduced. Trucks used for transporting small objects or unstable loads must be equipped with a load support.

## Legend for warning symbols

**Note!** A truck may cause serious accidents unless you are sufficiently familiar with its operation and unless you know its operating and maintenance instructions.



**For more information, see the truck manual.**  
Familiarise yourself with the truck manual and its contents before operating or servicing the truck.



**Do not touch moving parts.**



**Do not use the truck to lift personnel.**



**Do not walk or stand underneath the truck's raised forks.**



### 3. Operating environment

#### General Information

Use the truck in dry, indoor facilities with substantially firm, smooth, level and prepared surfaces. The truck may be continuously operated at a temperature of +5...+25°C and for short periods at a temperature of 0...+45°C. The recommended humidity is 30...95% (non-condensing). If the operating temperatures differ from those mentioned above, contact your truck dealer and acquire a truck specifically designed for cold and freezing or extremely high temperatures. A special machine for freezing conditions can be used in temperatures down to -35°C. A special machine for hot conditions can be continuously used in temperatures up to + 45 °C.

This truck conforms to the requirements of the EU machine safety directive (98/37/EC) and thus has the CE marking.

#### Never use the truck:

- To transport or lift people
- At premises with risk of fire
- In explosive atmospheres
- At premises with insufficient floor load capacity
- If it is damaged
- As a mounting surface
- As an access board
- To tow another truck
- Under the influence of intoxicating substances.

#### Free space

Make sure that the truck has sufficient moving space with respect to overhead structures. Before driving through aisles or door openings, ensure that there is enough space for the truck, the load and yourself.

**NOTE** *Always drive at a safe distance from the edge of loading platforms or bridges.*

#### Bearing capacity of the floor

Make sure that the combined weight of the truck and the load does not exceed the bearing capacity of the floor.

#### Using elevators

You need a permission from the site supervision to use an elevator to transport the truck between floors. Make sure that the combined weight of the truck, the load and yourself does not exceed the maximum load capacity of the elevator. Always drive the truck into elevators and any other narrow spaces with the load in front.

**NOTE** *Do not let other people enter the elevator while driving the truck in or out. The parking brake of the truck must be engaged before the elevator starts moving.*

#### Working on ramps

You need a permission from the site supervision to drive on a slope or ramp. The inclination of the ramp should not exceed 10%. We recommend using warning signs in places where this is exceeded.

**NOTE** *All truck types are not suitable for driving on ramps. Make sure that the truck you are using is suitable for this purpose.*

Observe extreme caution when driving on a ramp. When the truck is loaded, travel with the load pointing uphill. To ensure steerability and braking, the grip of the ramp must be equivalent to a standard floor.

**NOTE** *Do not turn the steering wheel abruptly on a ramp; the truck might overturn.*

#### Working on loading bridges

Always check the bearing capacity and the fastening of the bridge before loading or unloading. If you need to drive the truck onto another vehicle, ensure that the vehicle cannot move during this procedure. Do not drive to the edges of a loading bridge because there is always the risk of overturning.

- Fork height (3), optional.  
Height is displayed when the forks are above free lift range.
- Speed display (4)
- Weight display (5), optional.  
Weight is displayed when the forks are in free lift range.
- Performance mode selection (6)
- Lifting height preselection (7), optional
- Information menu (8)
- Travel direction display (9)
- Crawling mode symbol (10).

machinecatalogic.com

Malfunctions in the steering system are reported on the truck's display. If there is a malfunction notification on the display, the truck cannot be operated.

**NOTE** *In case of malfunction, turn off power. Wait for three seconds before turning the power back on. If the malfunction persists, contact service personnel.*

## General driving instructions

Practice steering and controlling the truck carefully in a safe area.

- Drive slowly at intersections and when turning.
- Handle the truck responsibly and always keep it under control.
- Avoid sudden starts and stops.
- Steer and brake smoothly.
- Decrease the speed if the floor is slippery, e.g. because of humidity.
- Take great care when driving on a slanted surface.
- Do not drive over any loose objects on the floor.

When driving, keep the load lowered and, if possible, tilted backwards. Do not lift the load except when stacking. This does not apply to trucks designed to be driven with the load raised.

### Be especially careful

- when there are other people or objects in the working area.
- when the load reduces visibility.
- when driving in narrow aisles. Make sure that there is enough space for the truck and the load.

## Driving position

Always drive the truck from the operator's position, left foot on the safety pedal. Keep your left hand on the steering wheel and the right on the control panel handle. When driving, always keep your body completely within the outlines of the truck. Make your driving position ergonomic; adjust the arm rest correctly.

## Speed

Control the speed according to the situation. Take into consideration the load, visibility, people in the working area and the working environment. Slow down at cross aisles and whenever vision is obstructed. If the visibility is inadequate, use an assistant to help guide you.

Uncontrolled acceleration or braking, excessive speed at turning points, and fast and sudden turning may overturn the load and cause an accident. In all conditions, drive the truck at a speed that enables you to stop it safely.

## Parking

Park the truck in a reserved parking place. When you park the truck, the forks must be in the down position. Ensure that the truck cannot move by itself or that an inexperienced person cannot start driving it at any circumstances.

**NOTE** *Never park or stack goods in front of fire doors, fire extinguishers, emergency exits and the like. Do not park on a slanted surface.*

## Traffic rules

Maintain good visibility in the driving direction and keep sufficient safety distances. Follow traffic regulations and speed limits. Do not drive the truck outside a private area without an order or permission from the site supervision. Outside a private area, the truck is subject to general traffic rules and regulations. If a door opening is so narrow that two trucks cannot possibly pass through it at the same time, drive in the middle of the opening. When two trucks meet in a narrow or cross aisle, the loaded truck has the right of way.

**NOTE** *When driving, you should sound the horn when necessary to warn others in the same area.*



# **Full Version Available**

## **Caterpillar NPR20N Pallet Truck Operator Manual (SWHPU-00211)**

Caterpillar NPR20N pallet truck operator manual, covers controls, safe operation, battery care, and routine checks. Searchable PDF download.

**[VIEW THE FULL MANUAL](#)**