



## Operation & Maintenance Manual

NSV12N

NSV12NI

NSV16N

NSV16NI

NPV20ND

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| <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 If the alarm disappears, the previously stored parameters will have been replaced by the default.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>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                         |                  |               |

|                           |         |  |  |  |  |  |  |  |  |         |        |                                                                                 |
|---------------------------|---------|--|--|--|--|--|--|--|--|---------|--------|---------------------------------------------------------------------------------|
| LIMIT DEVICE              | ON      |  |  |  |  |  |  |  |  | ON      | ON/OFF | Steering angle electrical limitation                                            |
| DIRECTION GAUGE           | OP #1   |  |  |  |  |  |  |  |  | OP #1   |        | factory setting                                                                 |
| AUX FUNCTION 1            | 0       |  |  |  |  |  |  |  |  | 0       |        | factory setting                                                                 |
| DIAG MOTOR TEMP           | ON      |  |  |  |  |  |  |  |  | ON      |        | factory setting                                                                 |
| AUX OUTPUT #3             | 0       |  |  |  |  |  |  |  |  | 0       |        | factory setting                                                                 |
| TILLER DEAD ZONE          | OFF     |  |  |  |  |  |  |  |  | OFF     | ON/OFF | When set to ON and recycled the key -- > there are 20 degrees dead zone area.   |
| SPAC CONFIG               | OFF     |  |  |  |  |  |  |  |  | 0       | 0-1    | Which type of traction controller is used on a truck. 0 = AC1-SSL, 1 = Combi AC |
| <b>SET MODEL:</b>         |         |  |  |  |  |  |  |  |  |         |        |                                                                                 |
| SYSTEM CONFIG             | 1       |  |  |  |  |  |  |  |  | 2       |        | factory setting                                                                 |
| AUTO REQ TYPE             | 0       |  |  |  |  |  |  |  |  | 0       |        | factory setting                                                                 |
| CONNECTED TO              | EPS     |  |  |  |  |  |  |  |  | EPS     |        | 2 = traction, 6 = steering                                                      |
| MODEL TYPE                | x       |  |  |  |  |  |  |  |  | x       |        | factory setting                                                                 |
| <b>ADJUSTMENTS:</b>       |         |  |  |  |  |  |  |  |  |         |        |                                                                                 |
| ADJUSTMENT #01            | 0       |  |  |  |  |  |  |  |  | 0       |        | factory setting                                                                 |
| SET CURRENT               | 0       |  |  |  |  |  |  |  |  | 0       |        | factory setting                                                                 |
| ADJUSTMENT #02            | x       |  |  |  |  |  |  |  |  | 90      |        | factory setting                                                                 |
| ADJUSTMENT #03            | x       |  |  |  |  |  |  |  |  | x       |        | factory setting                                                                 |
| ADJUSTMENT #04            | x       |  |  |  |  |  |  |  |  | x       |        | factory setting                                                                 |
| SET BATTERY TYPE          | 24V     |  |  |  |  |  |  |  |  | 24V     |        | factory setting                                                                 |
| SET SAT. FREQ.            | 78 Hz   |  |  |  |  |  |  |  |  | 78Hz    |        | factory setting                                                                 |
| OVERSAT FREQ.             | 1 Hz    |  |  |  |  |  |  |  |  | 1Hz     |        | factory setting                                                                 |
| MAXIMUM SLIP              | 5,00 Hz |  |  |  |  |  |  |  |  | 5Hz     |        | factory setting                                                                 |
| AUX VOLTAGE #1            | x       |  |  |  |  |  |  |  |  | x       |        | factory setting                                                                 |
| AUX VOLTAGE #2            | x       |  |  |  |  |  |  |  |  | x       |        | factory setting                                                                 |
| NO LOAD CURRENT           | 13 A    |  |  |  |  |  |  |  |  | 13A     |        | factory setting                                                                 |
| ZERO SP POT               | x       |  |  |  |  |  |  |  |  | x       |        | teaching of the zero point of wheel                                             |
| SET STEER 0-POS.          | x       |  |  |  |  |  |  |  |  | x       |        | straight ahead adjustment                                                       |
| SET MIN FB POT            | x       |  |  |  |  |  |  |  |  | x       |        | teaching of the maximum anti-clockwise angle                                    |
| SET MAX FB POT            | x       |  |  |  |  |  |  |  |  | x       |        | teaching of the maximum clockwise angle                                         |
| <b>SPECIAL ADJUST:</b>    |         |  |  |  |  |  |  |  |  |         |        |                                                                                 |
| SET TEMPERATURE           | x       |  |  |  |  |  |  |  |  | x       |        | factory setting                                                                 |
| HIGH ADDRESS              | 0       |  |  |  |  |  |  |  |  | 0       |        | factory setting                                                                 |
| DEBUG OUTPUT              | 15      |  |  |  |  |  |  |  |  | 15      |        | factory setting                                                                 |
| MAX SP SLOPE              | 9       |  |  |  |  |  |  |  |  | 9       |        | factory setting                                                                 |
| <b>HARDWARE SETTINGS:</b> |         |  |  |  |  |  |  |  |  |         |        |                                                                                 |
| MAXIMUM CURRENT           | 50 A    |  |  |  |  |  |  |  |  | 50A     |        | factory setting                                                                 |
| CAN BUS                   | PRESENT |  |  |  |  |  |  |  |  | PRESENT |        | factory setting                                                                 |
| SET HI RESOL AD           | 1       |  |  |  |  |  |  |  |  | 1       |        | factory setting                                                                 |

| TRUCK TYPES                        |                     |           |           |           |           |                             |                                                                                                                                                                                                                           |
|------------------------------------|---------------------|-----------|-----------|-----------|-----------|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                    | NSV12N /<br>NSV12NI | NPV20ND   | NSV16N    | NSV16NI   | Default   | Adjustment<br>range         | NOTE!                                                                                                                                                                                                                     |
| EV1 OPEN DELAY                     | 1                   | 1         | 1         | 1         | 1         | 0,1-5                       | Not used                                                                                                                                                                                                                  |
| EV1 CLOSE DELAY                    | 2                   | 2         | 2         | 2         | 2         | 0,1-5                       | Not used                                                                                                                                                                                                                  |
| START LOWER RED.                   | 10                  | 10        | 10        | 10        | 10        | 1-100                       | Lower speed reduction starting point on mast stage delay.                                                                                                                                                                 |
| DUAL PUMP DEL                      | LEVEL = 2           | LEVEL = 2 | LEVEL = 2 | LEVEL = 2 | LEVEL = 2 | 0-9                         | Dual pump delay. Pump controller tries to drive pump motor with maximum current. If current stays on maximum value this time --> only one pump is used.                                                                   |
| <b>CONFIG MENU/<br/>SET MODEL:</b> |                     |           |           |           |           |                             |                                                                                                                                                                                                                           |
| MODEL TYPE                         | 5                   | 5         | 5         | 5         | 5         | 5                           | 2 = traction, 5 = pump, 6 = steering, 10 = encoder-card                                                                                                                                                                   |
| <b>SET OPTIONS:</b>                |                     |           |           |           |           |                             |                                                                                                                                                                                                                           |
| HOURLY COUNTER                     | RUNNING             | RUNNING   | RUNNING   | RUNNING   | RUNNING   |                             | factory set                                                                                                                                                                                                               |
| EVP TYPE                           | DIGITAL             | DIGITAL   | ANALOG    | ANALOG    | ANALOG    |                             | Proportional valve type, analog = proportional valve, digital = on/off valve                                                                                                                                              |
| EV1 TYPE                           | DIGITAL             | DIGITAL   | DIGITAL   | DIGITAL   | DIGITAL   |                             | Proportional valve type, analog = proportional valve, digital = on/off valve                                                                                                                                              |
| SET TEMPERATURE                    | NONE                | NONE      | NONE      | NONE      | NONE      |                             | factory set                                                                                                                                                                                                               |
| SIDE STABILIZER                    | ABSENT              | ABSENT    | ABSENT    | ABSENT    | ABSENT    | ABSENT /<br>PRESENT         | PRESENT = Side stabilizers in use ABSENT = No side stabilizers                                                                                                                                                            |
| AUX OUTPUT #6                      | LEVEL = 3           | LEVEL = 3 | LEVEL = 3 | LEVEL = 3 | LEVEL = 3 | 0-7                         | Output XA1/14<br>0 = Not used<br>1 = Traction forward active<br>2 = traction backward active<br>3 = Traction active<br>4 = Lift active<br>5 = Lower active<br>6 = Lift/lower active<br>7 = Traction and lift/lower active |
| AUX OUTPUT #5                      | LEVEL = 9           | LEVEL = 9 | LEVEL = 9 | LEVEL = 9 | LEVEL = 9 | 0-9                         | Output XA1/32<br>0 = not used<br>1 = Traction forward active<br>2 = traction backward active<br>3 = Traction active<br>4 = Lift active<br>5 = Lower active<br>6 = Lift/lower active<br>7 = Traction and lift/lower active |
| DUAL PUMP                          | ABSENT              | ABSENT    | ABSENT    | ABSENT    | ABSENT    | ABSENT /<br>PRESENT         | PRESENT = Dual pump in use, ABSENT = Dual pump not used                                                                                                                                                                   |
| AUTO INIT LOWER                    | NONE /<br>OPTION #1 | NONE      | NONE      | OPTION#1  | OPTION#1  | NONE, OPTION#1,<br>OPTION#2 | Automatic initial lower from input XA1/20. NONE = not used, OPTION#1 = automatic initial lower, OPTION#2 = manual initial lower.                                                                                          |

# **Full Version Available**

## **Caterpillar NSV12NS Stacker Operator Manual (SWHSU-00112)**

Caterpillar NSV12NS stacker manual, operating safety, controls, inspections, and battery care in PDF. Fast PDF access.

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