

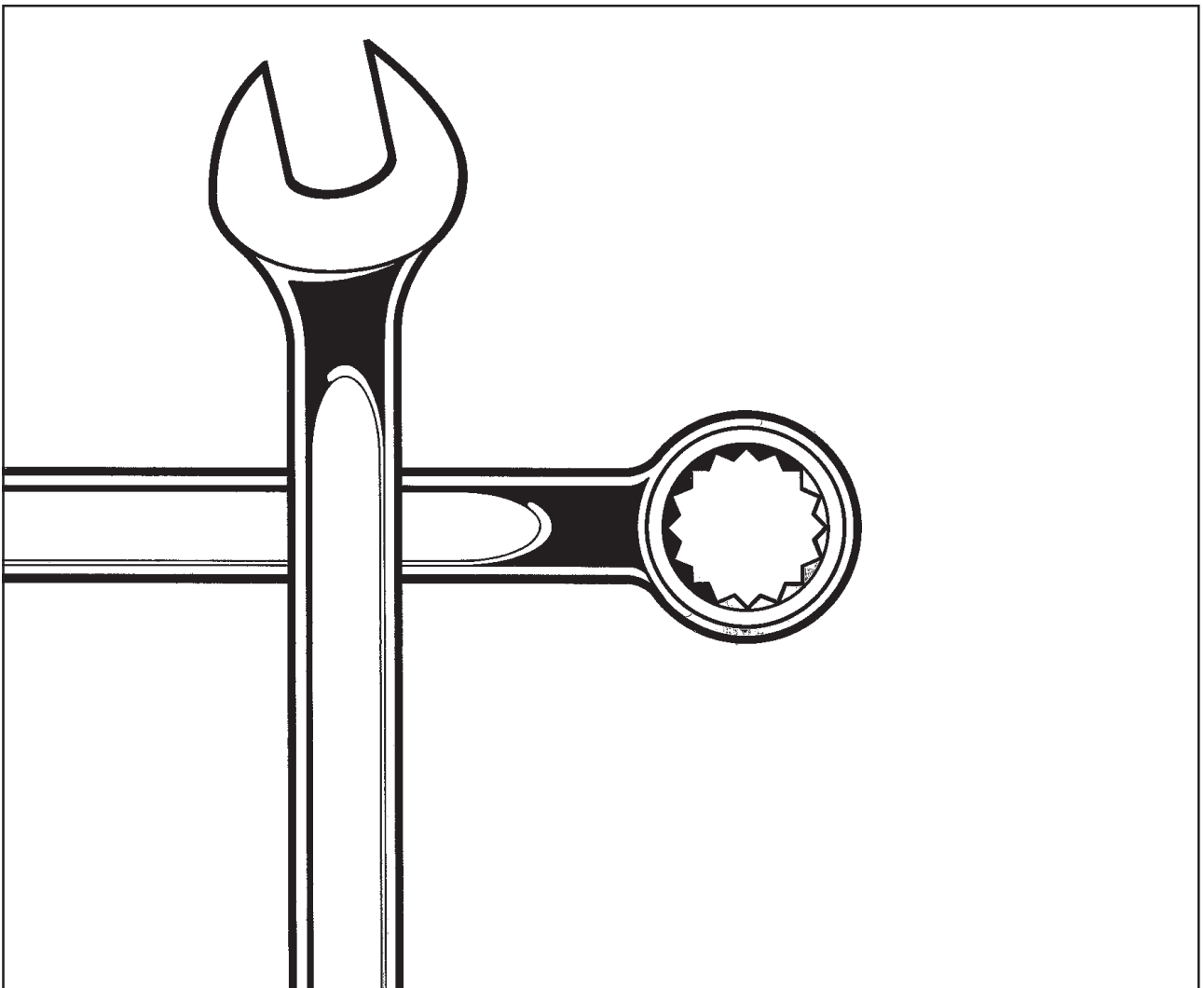
# **DYNAPAC**

# **CC 82/92/222/232/422**

# **WORKSHOP MANUAL**

# **VBS-RELAY**

**W1033EN3**



SVEDALA

**DYNAPAC**  
**Svedala Compaction Equipment AB**

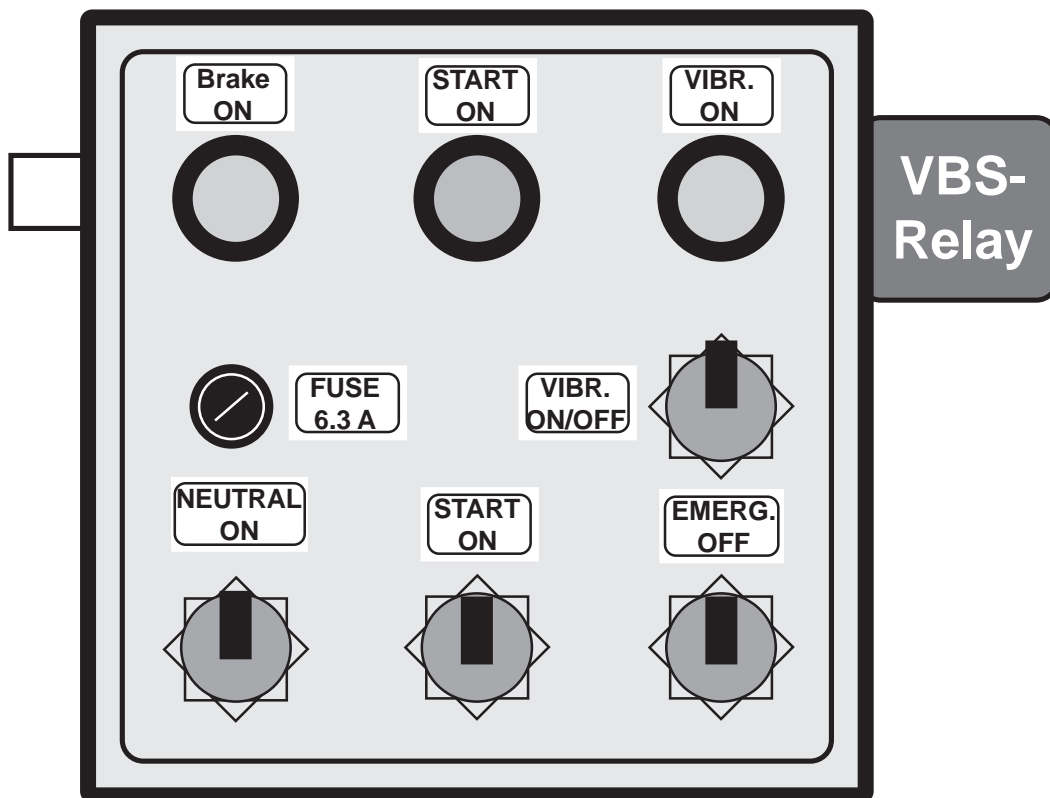
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## Vibratory and Combination Rollers CC 82/92/222/232/422

### Work Shop Manual, VBS-Relay W1033EN3

Valid for Relay P/N's: 35 88 00  
37 02 33







## General advice

- Make yourself familiar with the equipment of the machine.
- Only operate the machine if you are completely familiar with the operating and control elements as well as the functioning of the machine.
- Use your safety equipment like helmet, safety shoes and hearing protection.
- Make yourself familiar with your working field.
- Only operate the machine for its intended purpose.

**Please observe the guidelines of the machine manufacturer and safety manual.**



## Before starting

- Study and understand the operating instructions before starting.
- Check the machine for any serious faults.
- Do not operate the machine with defective instruments, warning lights or control elements.
- All safety devices must be in a secure position.
- Do not carry loose objects or secure them to the machine.
- Keep oily and inflammable material away from the machine.
- Before entering the driver's cab, check if persons or obstacles are in the way of or underneath the machine.
- Be careful when entering the driver's cab, use the steps.
- Adjust your seat before starting.

## Start

- When starting, all operation levers must be in "neutral position".
- Only start the machine from the driver's seat.
- Check the indicating instruments after start to ensure that all functions are in order.
- Do not leave the machine unattended when the engine is running.
- When starting with batteryconnection cables, connect plus to plus and minus to minus.
- Disconnect the earth (negative) fist. Connect it last.

## Warning



Exhaust fumes is dangerous. Ensure sufficient fresh air when starting in closed rooms!

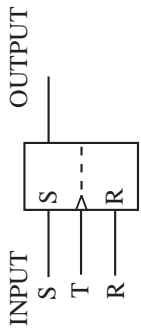
## Electrical and hydraulic equipment

1. Personal safety must be observed when batteries are handled or tested.
2. A fully equipped medical kit, including eye-wash facilities, should be available and protective clothing, including eye protection, should be worn.
3. Acid splashes in the eye should be treated immediately with plenty of clean water and neutralized with soldium bicarbonate solution.
4. Acid splashes on clothing must be treated with an alkali, such as ammonia, if holes are to be avoided.
5. A safety hazard exist during or after battery charging due to emission of a highly flammable hydrogen gas. Any testing involving production of sparks, e.g. electrical load test, must not be performed until the gas has dispersed from the cell. A similar hazard occurs when a battery is fitted on to a vehicle immediately after the battery has been removed form a charging plant.
6. Hydraulic equipment is under high pressure. Fluids (fuil, hydraulic oil) which escape under high pressure can penetrate the skin and cause serious injury. Therefore immediately consult a doctor in such injury occurs.
7. Notice the failure on the hydraulic or electrical system may give the roller an upredictabel and dangerous function.

# Electrical principles/ VBS-relay P/N 35 88 00 37 02 33

## Digital logic elements

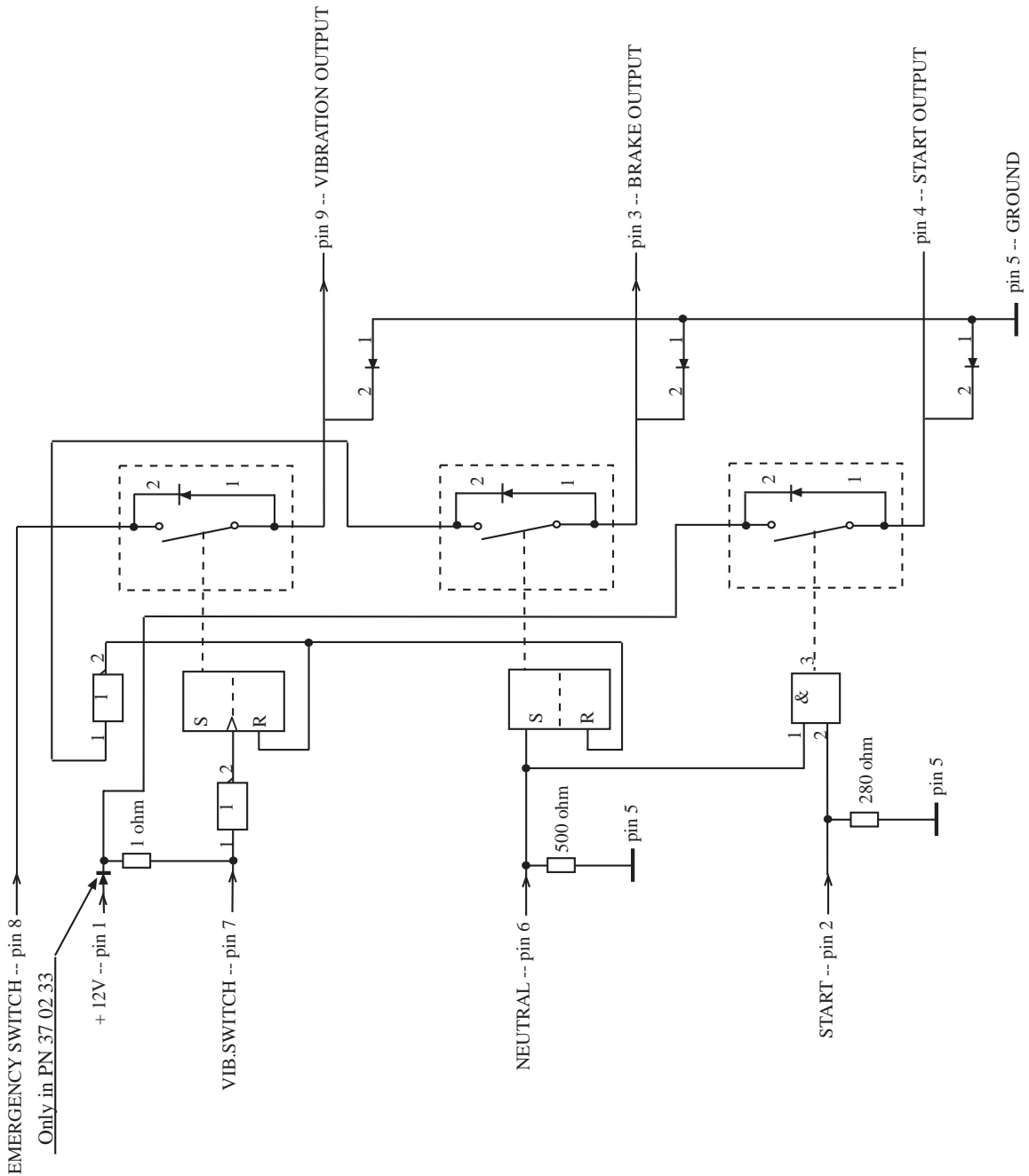
Bistable element (flip-flop)



Inverter



AND-gate

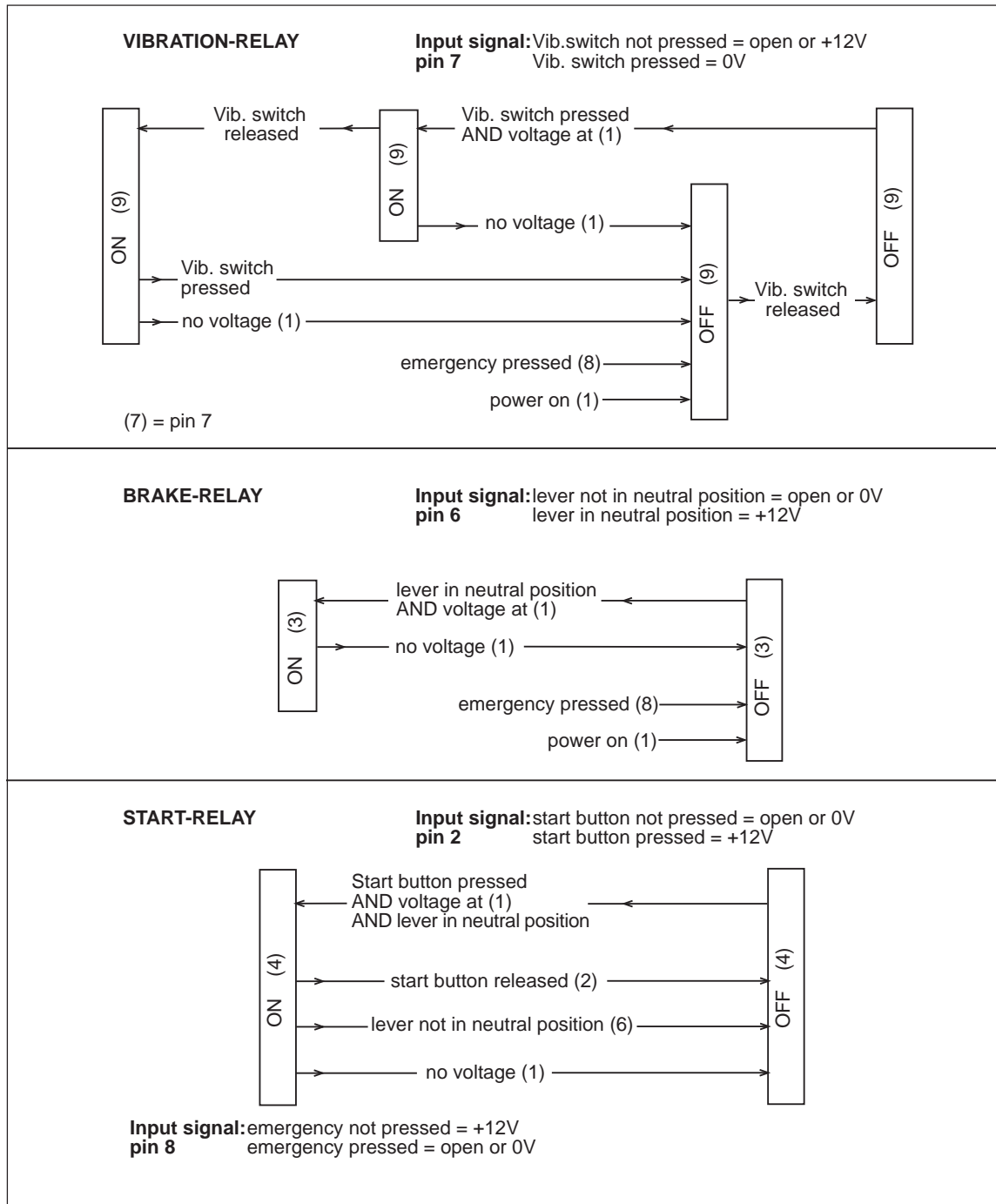




# P/N 35 88 00 Electrical principles/ VBS-relay 37 02 33

## Switching action:

Description of the output signals at alternative input signals.



## Description

A VBS-relay controls start of engine, brakes and vibrations.

α Input signals, potential difference

Pin 7    Vibration  
Pin 2    Start  
Pin 6    Neutral  
Pin 8    Emergency brake

α Output signals, potential difference

Pin 9    Vibration  
Pin 4    Start  
Pin 3    Brake

α Power supply

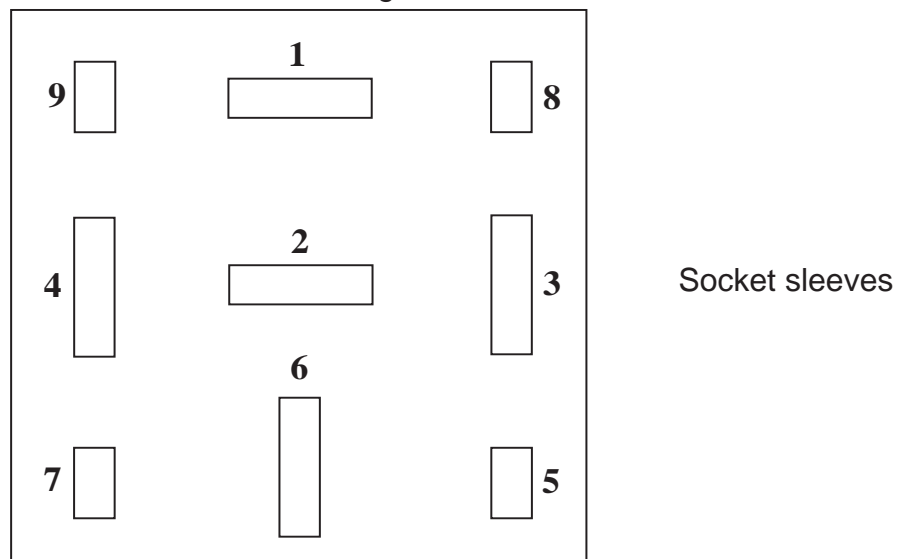
Pin 1    +12 V DC  
Pin 5    - 0V DC

## Analysis of the roller socket for the relay

If any of the functions, engine starting, braking or vibrations do not work and you suspect that it depends on the VBS-relay, check first the external circuits and functions by means of a multimeter.

✎ Remove the VBS-relay from it's socket

✎ Measure in the socket and check the following:



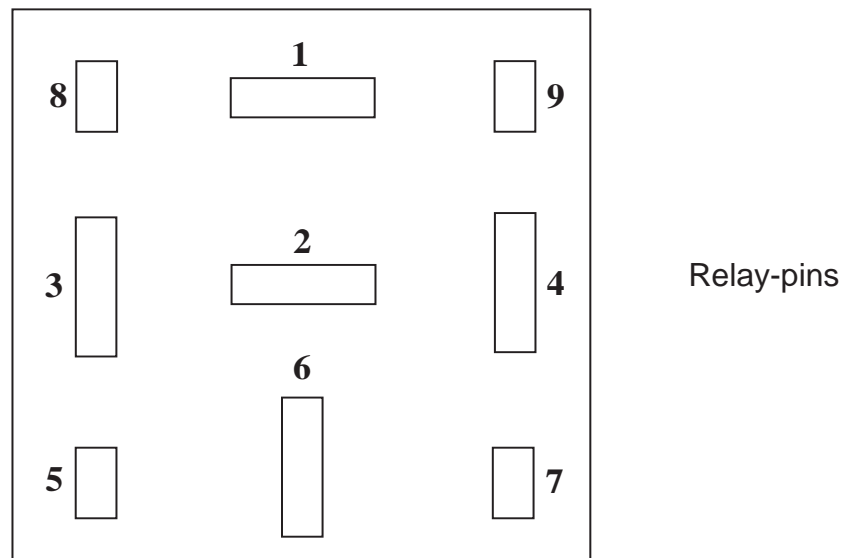
1. Check that you get voltage (+V) on sleeve 1.
2. Check that you get voltage (+12V) on sleeve 8 when the brake switch is pulled.
3. Check that sleeve 5 is connected to minus.
4. Check that outputs to brakes (sleeve 3), starter (sleeve 4) and vibrations (sleeve 9) are connected to their consumers and that they are not short cutted.  
Switch the ignition off.  
Now you can change the old relay with a new working one without risking that the new one gets damaged. Switch the ignition on and check the functions.  
If the roller still doesn't work. Switch the ignition off. Remove the relay from it's socket and check the following:
5. Check that you get voltage (+12V) on sleeve 2 when the ignition switch is in starter position.
6. Check that you get voltage (+12V) on sleeve 6 when the speed control is in neutral position.

7. Check that sleeve 7 is connected to minus when the vibration button in the speed control, (F&R) is pushed.

If the roller doesn't work when you have checked inputs and outputs according to item 1-4 and item 5-7, then VBS-relay is broken and the roller should work with a new working VBS-relay.

## Analysis of the VBS-relay

The following tests of the replaced relay will give us important information about any fault in the output circuits or input circuits of the relay and its internal logic functions.



## The pins of the relay

### Input signals, voltage

Pin 7	Vibration
Pin 2	Start
Pin 6	Neutral
Pin 8	Emergency brake

### Output signals, voltage

Pin 9	Vibration
Pin 4	Start
Pin 3	Brake

### Power supply

Pin 1	+ 12V DC
Pin 5	- 0V DC

**P/N 35 88 00  
37 02 33**

**Test 1 and 2**

**Equipment:** digital multimeter with voltage, diode and resistance measurement.

TEST 1: in this test the output circuity is checked with the realy not connected to the roller socket for the relay.

Connected polarity		Instrument reading for correct relay	
+	-	<u>diode measurement</u>	<u>resistance measurement</u>
8	9	more than 2 V	more than 200 kohm
8	3	more than 2 V	more than 200 kohm
8	4	more than 2 V	more than 200 kohm
9	8	0,5 - 0,7 V	more than 200 kohm
3	8	0,5 - 0,7 V	more than 200 kohm
4	8	0,5 - 0,7 V	more than 200 kohm
5	4	0,5 - 0,7 V	more than 200 kohm
5	3	0,5 - 0,7 V	more than 200 kohm
5	9	0,5 - 0,7 V	more than 200 kohm
4	1	0,5 - 0,7 V	more than 200 kohm

TEST 2: in this test the input circuity is checked with the relay not connected to the roller socket for the relay.

Connected polarity		Instrument reading for correct relay
+	-	<u>resistance measurement</u>
6	5	475 - 525 ohm
2	5	235 - 288 ohm
1	7	970 - 1030 ohm

## Test 3 Alternative 1

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TEST 3: in this test the internal logic functions is checked with the relay connected to power and outputs load. The relay is not connected to the roller socket.

Power connectons to the relay:

α + V DC and 8 Amp face to pin 1.

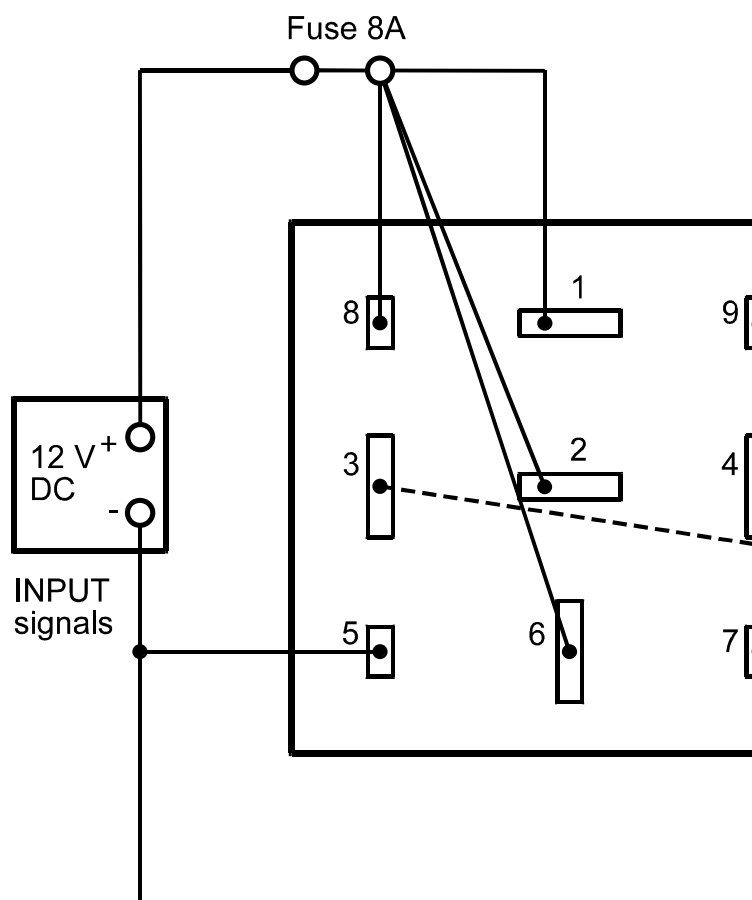
α 0V DC to pin 5.

### Alternative 1

The outputs should be loaded with a 12 V, 5 W to 25 W lamp connected to 0 V DC.  
See figure below.

A multimeter for power difference measurement may be used in parallel with the load.

Figure showing the load connected for test of pin 4 in test 3, number 4. The lamp is flashing if the internal logic function is OK.



TEST 3 continues

## Test tabel

The test tabel is to be followed in the chronological order for input and output signals.

### INPUT SIGNALS: Voltage

TEST NR	VIB (7)=pin (2)	START	NEU-TRAL (6)	EMER-GENCY (8)
1	open	open	open	+12 (off)

### Power on

2	open	+12 (on)	open	+12 (off)
3	open	open	+12 (on)	+12 (off)
4	open	+12 (on)	+12 (on)	+12 (off)
5	open	open	open	+12 (off)
6	1) 0	open	open	+12 (off)
7	open	open	open	+12 (off)
8	1) 0	open	open	+12 (off)
9	open	open	open	+12 (off)
10	open	open	open	open
11	open	open	open	+12 (off)
12	open	open	+12 (on)	+12 (off)

### OUTPUT SIGNALS: Voltage

VIB (9)	START (4)	BRAKE (3)	
-	-	-	
0	0	0	START
0	0	+12 (light)	
0	+12 (light)	+12 (light)	
0	0	+12 (light)	VIB
+12 (light)	0	+12 (light)	
+12 (light)	0	+12 (light)	
0	0	+12 (light)	
0	0	+12 (light)	EMERGENCY
0	0	0	
0	0	0	
0	0	+12 (light)	

Note 1) When testing with the lamp in the first alternativ of test 3, you have to touch - negative terminal with wire from pin 7 (that is the same as pressing the button for vibration engagements, 0V DC (ground)).

## Alternative 2

By means of the test box, see figure below, for VBS-relay all the input and output signals easily can be tested. The procedure is simplified.

The relay is connected to the test box relay socket.

The input signals and output signals are engaged according to the test tabel in test 3 above.

The signal lamps on the testbox will flash when the output signal is +12 V DC.

The test box for VBS-relay can be ordered from Dynpapac After Sales department.

- Connect the power to the test box, 12 V DC
- Put all switches of the box in "off" position according to test nr 1 in the tabel and disconnect the power supply for initial position of the relay.
- Power on.
- Follow the test order. When performing test nr 6 the vibration button has to be pressed (=0 or ground). In test 7 the vibration button has to be released (=open or +12V DC).

