

Change description

See CI 9920

Document Release Status

**RELEASED**

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1

## WAVE SPRING WASHERS

Steel  
Electroplated based on zinc-nickel, black  
As per ELV directive

### 1 Requirements

#### 1.1 Material

Spring steel, hardened and annealed. Hardness Rockwell HRC 43-50. (Vickers hardness HV 430-520).  
Hardness test as per STD 1014,312 and STD 1014,316.

#### 1.2 Surface treatment

Treated ZnNi black passivated Y200-3 color black VCS 5737,29

#### 1.3 Others

The surface of the washers shall be smooth and free from scale and burrs.  
Symbols, designations and general drawing methods VCS 5023,509.

Part must comply with restricted substance management standard: WSS-M99P9999-A1 to help safeguard health, safety and the environment.

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Document Name  
**SPRING WASHER**

Document Type  
**MULTI-PART DRAWING**

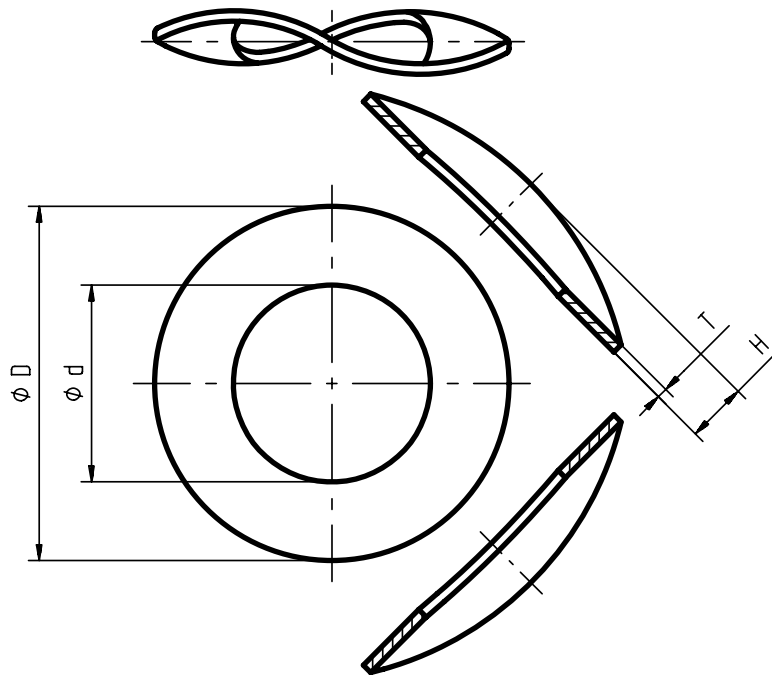
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**VOLVO**

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## 1.4 Dimensions



d 1)		D 1)		T		H		For screw dimension		Part No.
nom	tol H14	nom	tol js16	nom	tol	min	max	M	Unified	
4,3	+0,3	9	$\pm 0,45$	0,5	$\pm 0,05$	1	2	4	nr/No. 8	986649
5,3	0	11	$\pm 0,55$	0,5	$\pm 0,06$	1,1	2,2	5	nr/No. 1	986650
6,4	+0,36	12	$\pm 0,55$	0,5		1,3	2,6	6	1/4	986651
(6,7)	0	12		$\pm 0,55$	0,5	1,5	3	-	1/4	986652
7,4		14	0,8		1,5	3	7	-	986653	
8,4		15	0,8		1,5	3	8	5/16	986654	
8,4	(10)	15	$\pm 0,65$	0,8	2,25	3	8	5/16	986655	
(10)		18		1	2,1	4,2	-	3/8	986656	
10,5	+0,43	21	$\pm 0,65$	1	$\pm 0,07$	2,1	4,2	10	-	986657
(11,5)	0	21	$\pm 0,65$	1	$\pm 0,07$	2,1	4,2	11	7/16	986658
13		24		1,2		2,5	5	12	-	986659
(13,5)		24		1,2		2,5	5	-	1/2	986660
15		28	$\pm 0,08$	1,6	$\pm 0,08$	3	5,9	14	9/16	986661
17		30		1,6		3,2	6,3	16	5/8	986662

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## 2 TEST PROCEDURE

If defects are established, two supplementary tests may be made for each test which has not been approved. Both of these tests must be approved, otherwise the entire batch may be rejected.

### 2.1 Load test

The test washers shall be compressed, first for a period of three minutes and the three times at rapid succession. The force applied shall be the one indicated below. After unloading, the spring height may not be less than H min in the table on page 2.

d	4,3	5,3	6,4 6,7	7,4	8,4	10- 11,5	13 13,5	15	17	19	21	23	25	27	28	31	33 34
Force kN	2,9	4,7	6,7	9,6	12,2	19,3	28	38	52	64	81	101	117	140	153	187	251

Conversion factor: 1 kN = 100 kp

### 2.2 Endurance test

10 test washers, separated from each other by flat washers, are threaded onto a screw and firmly screwed together (solid height). At unloading after 48 hours, no washer may show any fracture or go below the H min value of the table.

## 3 Information

This standard agrees with German Standard DIN 137, form B, December 1970, except for d = 6, 7, 10, 11,5, 13,5, 27, 33 mm and H min for part No. 986655.

Dimensions within brackets should be avoided for new designs.

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