



Standard Parts

Number:	FM-001
Date Issued:	A-FEB06

ELECTRONIC DOCUMENT IN THE VIEWER IS CONTROLLED. PRINTED COPY IS AN UNCONTROLLED DOCUMENT.

WASHERS METRIC SERIES (Superseded)

This standard has been superseded by CNH Standard Parts, STPF510 (87028358), Flat Washers - Metric - Preferred and Non-Preferred and STPF520 (87028359), Hardened Steel Flat Washers - Metric - Preferred and Non-Preferred.

The controlled versions of CNH specifications and standards are published on the CNH Intranet site.

The documents are also available on the CNH electronic viewing system (e.g. eViewer). Suppliers are able to access these documents on CSCN (CNH Supplier Communications Network).

The superseded standard remains available for viewing following this page if needed.

Supersedes Issue: FM-001	Dated: OCT 99	Page: 1 of 5
-----------------------------	------------------	-----------------



Standard Parts

Number:	FM-001
Date Issued:	A-FEB06

ELECTRONIC DOCUMENT IN THE VIEWER IS CONTROLLED. PRINTED COPY IS AN UNCONTROLLED DOCUMENT.

WASHERS METRIC SERIES (Superseded)

GENERAL SPECIFICATIONS

GENERAL: This specification contains the essentials of the following standards:

International Organization for Standardization: ISO 887, 4759/III, 7089, 7091, 7092, 7093, 7094.

The inclusion of dimensional data is not intended to imply that all the washers described are stock production sizes.

PREFERRED PARTS POLICY: Preferred parts are so designated to reduce the variety of parts and assure maximum availability, interchangeability, and cost savings.

Material:	CST (Soft)	HTS (Hardened)
Nominal Sizes:	2, 3, 4, 5, 6, 8, 10	12, 16, 20, 24, 30, 36
Finish:	Zinc Dichromate (ZND)	Phosphate Coated (PHC) Zinc Dichromate (ZND)
Outside Diameter:	Normal, Interim	

MATERIAL: Carbon Steel Washers (CST) per Case MS 436 except 0.23 maximum carbon permissible. Hardened Washers - Steel (HTS) 1040 to 1065 per Case MS 353, through harden and temper per Case Spec P-7 to 36 -42 HRC. Hardness of lightly polished surface shall be 82 HR15N maximum.

FINISHES: Washers shall be furnished in accordance with the Case class listed below:

Plain (PLN)	- Free from dirt and rust and coated with a light oil film
Zinc Dichromate (ZND)	- MS 201 Class 5A
Phosphate Coated (PHC)	- MS 91
Black Zinc (BZN)	- MS 203
Dorrltech (DOR)	- A-011 Standard Parts Book
Electro Polyseal (POL)	- A-011 Standard Parts Book

The determinant of plating thickness shall be the thickness of plating on the flat surface of the washer approximately midway between the inside and outside diameters.

WORKMANSHIP: Washers must be free from burrs and any other defect that might affect their serviceability.

Supersedes Issue:	Dated:	Page:
FM-001	OCT 99	2 of 5



Standard Parts

Number: FM-001

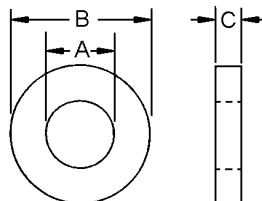
Date Issued: A-FEB06

ELECTRONIC DOCUMENT IN THE VIEWER IS CONTROLLED. PRINTED COPY IS AN UNCONTROLLED DOCUMENT.

WASHERS METRIC SERIES (Superseded)

TABLE I

Metric Series (Soft) Flat Washers
(Generally conforms to ISO 887 and referenced ISO standards for Medium Series)*



Dimensions in millimetres.

Nominal Bolt or Screw Size	A		C			B Outside Diameter**									
	Inside Diameter		Thickness			Small		Normal		Interim		Large		Extra Large	
	nom. min.	max.	nom.	max.	min.	nom. max.	min.	nom. max.	min.	nom. max.	min.	nom. max.	min.	nom. max.	min.
*1.6	1.7	1.84	.3	.35	.25	3.5	3.2	4	3.7						
*2	2.2	2.34	.3	.35	.25	4.5	4.2	5	4.7						
*2.5	2.7	2.84	.5	.55	.45	5	4.7	6	5.7						
*3	3.2	3.38	.5	.55	.45	6	5.7	7	6.64						
*4	4.3	4.48	.5	.55	.45	8	7.64	9	8.64	10	9.1				
5	5.5	5.8	1	1.2	.8	9	8.64	10	9.1	12	10.9	15	13.9		
6	6.6	6.96	1.6	1.8	1.4	11	10.57	12	10.9	15	13.9	18	16.9		
7	7.6	7.96	1.6	1.8	1.4			14	12.9						
8	9	9.36	1.6	1.8	1.4	15	14.57	16	14.9	20	18.7	24	22.7	28	26.7
			2	2.3	1.7									28	26.7
			3	3.6	2.4										
10	10.5	10.77	1.6	1.8	1.4	18	17.57	20	18.7	24	22.7	30	28.7		
	11	11.43	2	2.3	1.7										
			2.5	2.8	2.2										
12	13.5	13.93	2	2.3	1.7	20	19.48	24	22.7	30	28.7	37	35.4		
			2.5	2.8	2.2										
			3	3.6	2.4										
14	15.5	15.93	2.5	2.8	2.2	24	23.48	28	26.7			44	42.4		
			3	3.6	2.4										

Table 1 continued on following page

* Series A Fine dimensions and tolerances apply to sizes 1.6, 2, 2.5, 3 and 4 small.

** See Preferred Parts Policy on Page 1.

Supersedes Issue:
FM-001

Dated:
OCT 99

Page:
3 of 5



Standard Parts

Number: FM-001

Date Issued: A-FEB06

ELECTRONIC DOCUMENT IN THE VIEWER IS CONTROLLED. PRINTED COPY IS AN UNCONTROLLED DOCUMENT.

WASHERS
METRIC SERIES
(Superseded)
TABLE 1 (continued)

Nominal Bolt or Screw Size	A		C			B Outside Diameter**									
	Inside Diameter		Thickness			Small		Normal		Interim		Large		Extra Large	
	nom. min.	max.	nom.	max.	min.	nom. max.	min.	nom. max.	min.	nom. max.	min.	nom. max.	min.	nom. max.	min.
16	17.5	17.93	2.5 3	2.8 3.6	2.2 2.4	28	27.48	30	28.7	39	37.4	50	48.4		
18	20	20.52	3	3.6	2.4	30	29.48	34				56	54.1		
20	22	22.52	3 4	3.6 4.6	2.4 3.4	34	33.38	37	35.4	50	48.4	60	58.1		
22	24	24.52	3 5	3.6 6	2.4 4	37	36.38	39	37.4			66	64.1		
24	26	26.84	4 5	4.6 6	3.4 4	39	38.38	44	42.4			72	70.1		
27	30	30.84	4 6	4.6 7	3.4 5	44	43.38	50	48.4			85	82.8		
30	33	33.62	4 6	4.6 7	3.4 5	50	48.38	56	54.1			92	89.8		
33	36	37	5 6	6 7	4 5	56	54.1	60	58.1			105	102.8		
36	39	40	5 8	6 9.2	4 6.8	60	58.1	66	64.1			110	107.8		
39	42	43	6 8	7 9.2	5 6.8			72	70.1			120	117.8		
42	45	46	8 10	9.2 11.2	6.8 8.8			78	76.1			125	122.5		
45	48	49	8 10	9.2 11.2	6.8 8.8			85	82.8			135	132.5		
48	52	53.2	8 10	9.2 11.2	6.8 8.8			92	89.8			145	142.5		
52	56	56.2	8 10	9.2 11.2	6.8 8.8			98	95.8			160	157.5		

** See Preferred Parts Policy on Page 1.

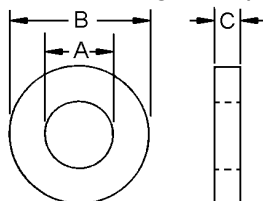
Supersedes Issue:
FM-001

Dated:
OCT 99

Page:
4 of 5

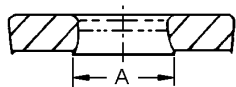
WASHERS METRIC SERIES (Superseded)

TABLE 2
Metric Hardened Flat Washers
(Conforms to existing Case practice)



Nom. Bolt or Screw Size	A		Normal					Large				
			B		C			B		C		
	I.D.		O.D.		Thickness			O.D.		Thickness		
	min.	max.	max.	min.	nom.	max.	min.	max.	min.	nom.	max.	min.
4	4.3	4.5	9.5	8.5	.8	.9	.7					
6	6.4	6.8	13	12	2	2.2	1.8	14.5	13.5	2.5	2.7	2.3
8	8.8	9.2	17.5	16.5	2	2.2	1.8	21.5	20.5	2.5	2.7	2.3
10	10.8	11.2	21.5	20.5	2.5	2.7	2.3	24.5	23.5	3	3.3	2.7
12	13.3	13.7	24.5	23.5	3	3.3	2.7	28.5	27.5	4	4.3	3.7
*14	15.3	15.7	28.5	27.5	3	3.3	2.7					
16	17.3	17.7	30.5	29.5	4	4.3	3.7	34.5	33.5	5	6	4
*18	19.8	20.3						41.5	40.5	5	6	4
20	21.8	22.3	37.5	36.5	4	4.3	3.7	44.5	43.5	5	6	4
*22	24	24.5	44.0	42.4	4	4.6	3.4					
24	25.8	26.3	44.5	43.5	5	6	4	56.5	55.5	6	7	5
*27	28.8	29.3	50.5	49.5	5	6	4					
30	32.8	33.4	56.5	55.5	5	6	4	66.5	65.5	6	7	5
36	38.8	39.4	66.5	65.5	6	7	5	78.5	77.5	7	8	6
42	45	45.6	78	76.1	8	9.2	6.8					

For hardened washers, the inside and outside diameters shall be concentric within a full indicator movement (FIM) equivalent to the tolerance permitted on the inside diameter. The tabulated inside diameter dimensions and tolerances apply only to the smallest hole size and not to the tapered breakout area. The tapered breakout area and permissible breakout tolerance shall be as shown:



Breakout ID shall not exceed 10% thickness

All washers shall be flat within a full indicator movement (FIM) of: 0.2 mm thru 25 mm OD
0.3 mm over 25 mm OD

* Non Preferred Size.