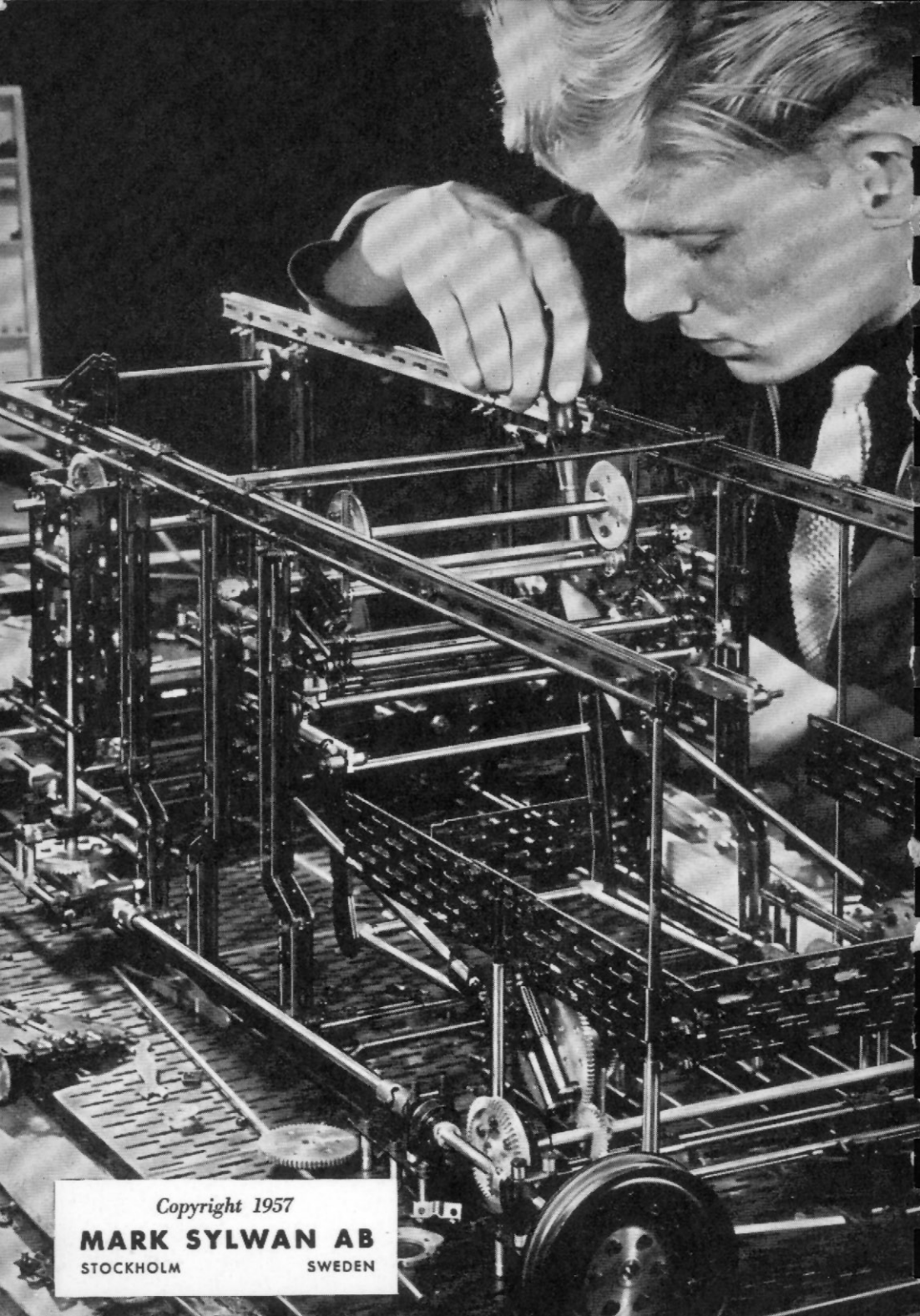




FAC

Parts List

Z2-03



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MARK SYLWAN AB

STOCKHOLM

SWEDEN

FAC

Universal Construction System

PARTS LIST



Trade mark

Developed and Manufactured by

MARK SYLWAN AB

STOCKHOLM · SWEDEN

Patents in: Australia No. 163.390, France No. 1063.092, Great Britain No. 745.129, Sweden No. 141.953,
Switzerland No. 310.747. Patents pending in other countries.

Catalogue No. Z2-03

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FOREWORD

This booklet contains drawings and data concerning all Parts in the FAC Construction System.

FAC is an entirely new and most valuable aid in the fields of Industrial Research and Machine Development, in Design and Planning, in Production and Sales. FAC is the ideal way to build working models, easily changed as ideas ripen in Research and Design Departments. FAC offers a fast and easy way to build special Testing Apparatus and clever Production Aids. A FAC-built model is perfect for demonstration purposes.

Because of this versatility of the FAC system, a chapter on **The Principle of FAC** is included in this Parts List along with **Standard dimensions and tolerances** used in the manufacture of FAC parts. These chapters will, together with the picture pages, demonstrate the thinking embodied in the FAC system and give a grasp of its possibilities.

Principles of FAC

The fundamental concept of FAC is the limited number of simple but versatile, high-quality standard components, allowing innumerable combinations due to their logical dimensioning and design.

The backbone of FAC structures is the round steel Rod, fig. 101, selected because of its mechanical qualities. It has the same bending moment in all directions and is easily cut to any desired length from the standard bar. Rods may be joined by Couplers. These are small grooved plates, which are screwed together in pairs to hold the rods rigidly.

Besides the plain Rods there are Threaded Rods. Their center section is similar to that of a Rod, but the ends are cut down in diameter and threaded. These threads mate with Tapped Sleeves of the same outside diameter as the plain middle part, fig. 102.



Fig. 101



Fig. 102



The Rod diameter is designated by the symbol \boxed{r} and the thread diameter by the symbol \boxed{s} . Both measurements are fundamental in the FAC system.

Two Rods may be coupled together parallel to each other by Clamps, fig. 103. The distance between Rod centerlines, designated by the symbol \boxed{m} , is then determined by the sum of the Screw diameter \boxed{s} and the Rod diameter \boxed{r} , thus

$$\boxed{m} = \boxed{s} + \boxed{r}.$$

\boxed{m} symbolizes the **FAC module**, the common dimensional denominator for all measurements relating to the interchangeability and versatility of FAC components.

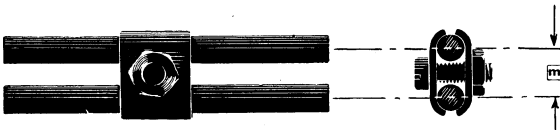


Fig. 103

When screw holes appear in pairs on Couplers and on other parts, the distance between hole centers regularly is $2m$. The reason for choosing this measurement is illustrated in fig. 104, where the distance between the center lines of two adjacent Rods as well as between the centers of two adjacent interspaces is m .

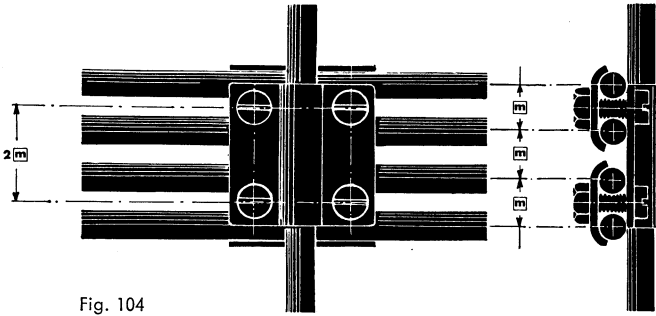


Fig. 104

Cross and T-couplers permit the joining of Rods at right angles to each other in the same plane, see figs. 105 and 106. Two identical Couplers have been placed face to face with the ends of the Rods butting at the crossing centerpoint.

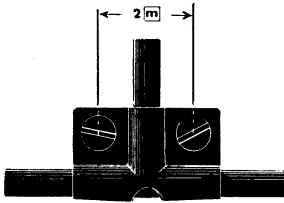


Fig. 105

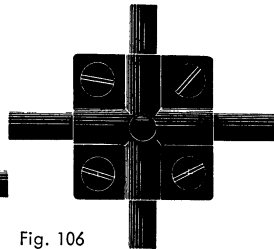


Fig. 106

If the positions of the Cross Coupler and the T-coupler, as shown in fig. 107, are reversed on the opposite (nut) side, a coupling with two parallel Rods at right angles to a single Rod is obtained, all three Rods being in the same plane.

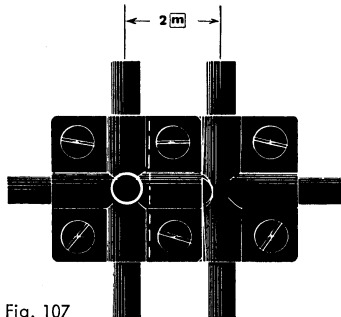


Fig. 107

The distance, center-to-center, between the two parallel Rods is logically the same as between two screw holes, i. e. $2 \overline{m}$. Beam Sections, see fig. 108, may be regarded as a development of an assembly of two parallel Rods into a single constructional part. The function of the Rods is taken by the Beam Section flanges, formed from the web material. Accordingly, the distance between beam flange centers equals $2 \overline{m}$.

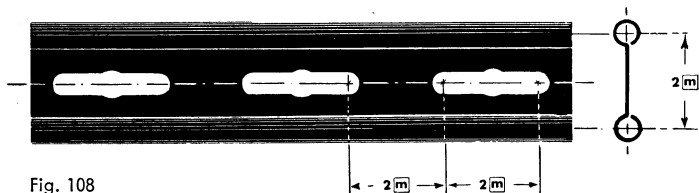


Fig. 108

The Beam Section web is perforated with slots along its center line. If Screws are placed in opposite ends of a slot, the distance between their centers is $2 \overline{m}$, as is the center distance between two Screws placed in the adjoining ends of two neighbouring slots.

The slot width corresponds to the Screw thread diameter. As the Rod diameter is bigger, the slots are widened in the middle to permit the passage of a Rod, or of a Shaft of the same nominal diameter as the Rod.

The Plates are perforated with slots, identical to those in the Beam Section webs. The transverse distance between neighboring slot centers equals \overline{m} , the lengthwise spacing is the same as in a Beam Section, see fig. 109.

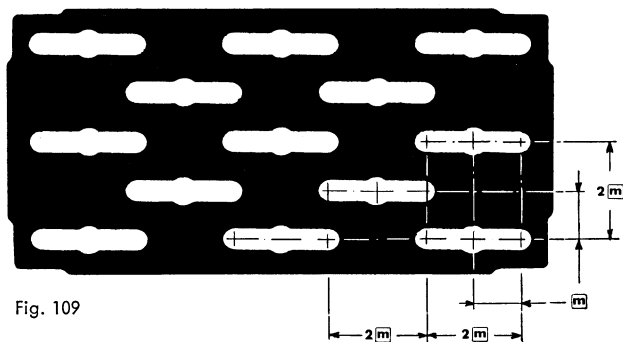


Fig. 109

Plates are used as needed together with Rods and Beam Sections. When a platform is desired, Plates may be simply butted together with Rods placed between the edges. The sequence of holes will then be unbroken and the module distances continued from Plate to Plate. Flanged Plates may be joined flange-to-flange with the same result. The examples shown will demonstrate the unlimited versatility of FAC.

FAC standard dimensions and tolerances

A number of carefully chosen measurements and manufacturing tolerances are standardized. They are used in dimensioning all FAC parts to obtain a maximum of simplicity, versatility and exchangeability.

In the FAC part drawings these standard measurements and tolerances are designated by symbols, which simplify comparisons between parts and make the drawings easy to read. FAC parts are designed and manufactured according to the metric system and the dimensional unit is thus the millimeter, which is designated mm. For your convenience all dimensions are given both in mm and in inches.

Certain typical measurements and design details recurring in several FAC components are shown below. For the sake of clarity they are mostly not repeated in the part drawings.

The FAC module

In »Principles of FAC« the background of the FAC module was given. Its symbol is \boxed{m} , which represents a nominal measure of 7 mm = appr. .28 in.

A majority of part linear dimensions are derived from this module by simple multiplication, so that the module is a common dimensional denominator.

The Rod diameter

For **Rods** and **parts with the same outer diameter as Rods**, as well as for **holes and grooves** designed to take Rods, a common diameter symbol is used:

\boxed{r} = 4 mm = appr. .16 in. This denotes a nominal diameter. Actual rod and hole diameters in manufactured parts are modified to obtain a suitable easy fit.

The screw thread and screw hole diameter

Threads and **holes designed to take threaded parts** as well as **tapped holes** share a common diameter symbol: \boxed{s} = 3 mm = appr. .12 in. This symbol denotes the nominal outer diameter of the metric thread used. Actual hole diameters in manufactured parts are modified to obtain a suitable easy fit.

In the part drawings screw hole diameters are not given, except when needed for clarity. Holes without diameter measure are always of a diameter = \boxed{s} .

Beam Section ends and Plate corners

When a Screw is placed in any slot next to the edge of a Beam Section or a Plate, the distance from the Screw center to the edge is $5 \text{ mm} = \text{appr. } .20 \text{ in.}$, see »a» in figs. 201 and 202.

The edge of a Plate is undercut at the corners, giving space for Couplers in girder constructions. The size of the undercut, referring to fig. 201, is: »b» = 1 mm = appr. $.04 \text{ in.}$ and »c» = $9 \text{ mm} = \text{appr. } .36 \text{ in.}$

Play between Couplers

Between the pair of Couplers in a joint there is a small distance »a», fig. 203, of $1 \text{ mm} = \text{appr. } .40 \text{ in.}$, to take a Beam Section web or a thin Plate. The slight elastic deformation occurring in the Couplers when the Screws are tightened gives a lock nut effect, holding the Nuts securely even under strong vibration.

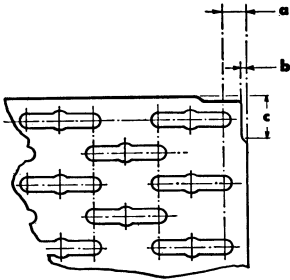


Fig. 201

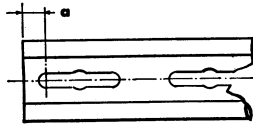


Fig. 202

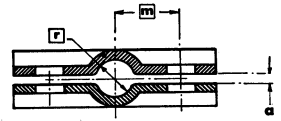


Fig. 203

Circular screw hole series

Certain wheels and wheel parts carry one or two circular series of evenly spaced screw holes. The linear distance between neighbouring hole centers is 2 m . Fig. 204 shows the typical hole spacing.

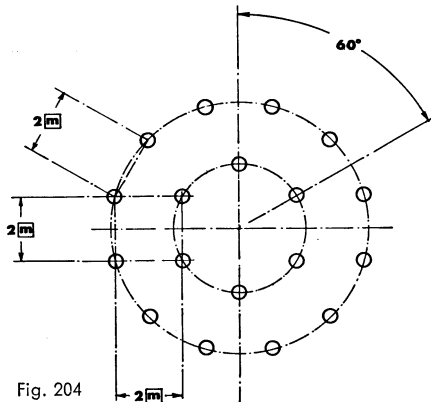


Fig. 204

Hub design

The three hub types shown in figs. 205, 206 and 207 are manufactured, although only the type in fig. 207 is shown in the part drawings. This type will be standardized. Set-screw holes are tapped to the standard thread diameter \boxed{s} .

The hub shown in fig. 207 has a drill-starter hole of 1.5 mm = appr. .06 in. diameter.

If a hub is to be locked onto a shaft by a Roll Pin, which is recommended when the torque is considerable, a drill of 1.5 to 1.6 mm gage, or 1/16 in. gage, should be used in the drill-starter hole to make a seat for the pin.

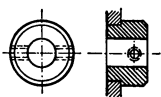


Fig. 205

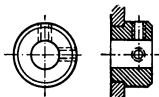


Fig. 206

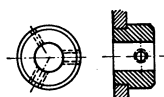


Fig. 207

Inner and outer centering diameters

Parts designed to fit together concentrically, such as a bearing in a bearing housing or a wheel center on a wheel disc, are made to one of four standard centering diameters, designed by the symbols \textcircled{w} , \textcircled{x} , \textcircled{y} , \textcircled{z} . Whenever one of these symbols occurs on an outer diameter of one part and on a inner diameter of another part, these parts fit together.

The hub in fig. 208 is used for wheels with a circular series of screw holes and has an outer centering diameter of \textcircled{x} . This centering diameter is the same for all hubs of this type and is shown in the part drawings even if the symbol \textcircled{x} is not entered.

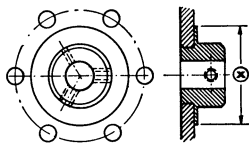


Fig. 208

List of symbols

\boxed{m} = 7 mm = appr. .28 in.

\boxed{r} = 4 mm = appr. .16 in.

\boxed{s} = 3 mm = appr. .12 in.

\textcircled{w} = 63,3 mm = appr. 2.49 in.

\textcircled{x} = 21 mm = appr. .82 in.

\textcircled{y} = 19 mm = appr. .75 in.

\textcircled{z} = 7 mm = appr. .28 in.

These are nominal dimensions and actual dimensions in manufactured parts are modified to obtain a suitable fit.

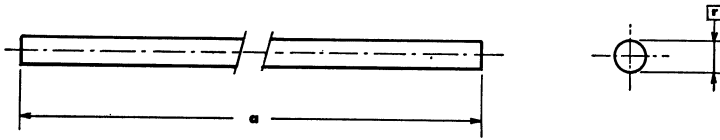
Tolerances

Shafts and parts designed to fit shafts, such as Wheel and Gear Wheel Hubs, Bushes and Ball Bearings, are manufactured to closer tolerances than those mentioned above. Two nominal shaft diameters are used for these kinds of parts. The symbols are taken directly from the manufacturing tolerance system used and limits are given below.

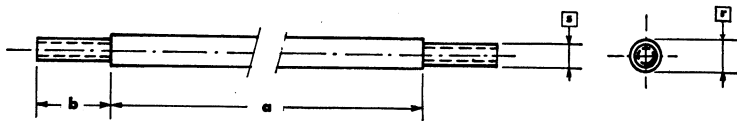
Tolerance symbol	Maximum and Minimum Diameter millimeter	Diameter inch	Notes
4 [h8]	$4 \begin{smallmatrix} + \\ - \end{smallmatrix} \begin{smallmatrix} .0000 \\ .0018 \end{smallmatrix}$.1571 \pm .0004	Shaft diameter
4 [H8]	$4 \begin{smallmatrix} + \\ - \end{smallmatrix} \begin{smallmatrix} .0018 \\ .0000 \end{smallmatrix}$.1579 \pm .0004	Hole diameter
4 [H9]	$4 \begin{smallmatrix} + \\ - \end{smallmatrix} \begin{smallmatrix} .0030 \\ .0000 \end{smallmatrix}$.1581 \pm .0006	
4 [E9]	$4 \begin{smallmatrix} + \\ + \end{smallmatrix} \begin{smallmatrix} .0050 \\ .0020 \end{smallmatrix}$.1589 \pm .0006	
4 [H11]	$4 \begin{smallmatrix} + \\ - \end{smallmatrix} \begin{smallmatrix} 0.075 \\ 0.000 \end{smallmatrix}$.159 \pm .0014	
6 [h8]	$6 \begin{smallmatrix} + \\ - \end{smallmatrix} \begin{smallmatrix} 0.0000 \\ 0.0018 \end{smallmatrix}$.2358 \pm .0004	Shaft diameter
6 [H8]	$6 \begin{smallmatrix} + \\ - \end{smallmatrix} \begin{smallmatrix} 0.0018 \\ 0.0000 \end{smallmatrix}$.2366 \pm .0004	Hole diameter
6 [H9]	$6 \begin{smallmatrix} + \\ - \end{smallmatrix} \begin{smallmatrix} 0.0030 \\ 0.0000 \end{smallmatrix}$.2368 \pm .0006	
6 [E9]	$6 \begin{smallmatrix} + \\ + \end{smallmatrix} \begin{smallmatrix} 0.0050 \\ 0.0020 \end{smallmatrix}$.2376 \pm .0006	
6 [H11]	$6 \begin{smallmatrix} + \\ - \end{smallmatrix} \begin{smallmatrix} 0.0075 \\ 0.000 \end{smallmatrix}$.238 \pm .0014	

4 [h8] means that the nominal diameter is 4 mm and the actual diameter is between the limits given in the above table.

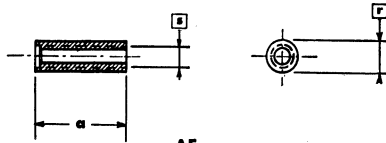
PARTS DRAWINGS
and
DIMENSION TABLES



A1-



A3-



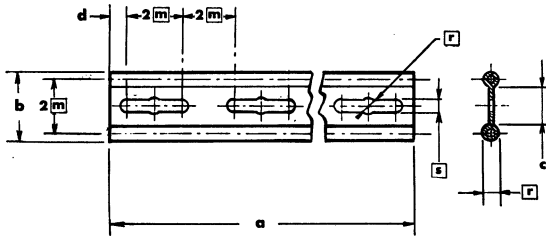
A5-

Drawn in scale 1:1

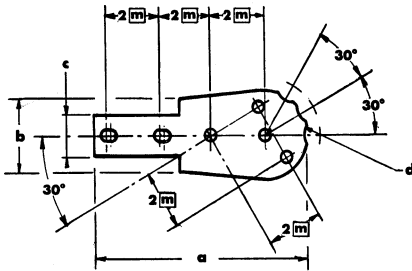
Part No.	Part name	Dimensions in millimeters		Dimensions in inches	
		a	b	a	b
A1-02	Rod	24		.95	
A1-03	Rod	38		1.50	
A1-04	Rod	52		2.05	
A1-05	Rod	66		2.60	
A1-06	Rod	80		3.15	
A1-07	Rod	94		3.70	
A1-08	Rod	108		4.25	
A1-10	Rod	136		5.35	
A1-40	Rod	556		21.89	
A3-10	Threaded Rod	10	10	.394	.40
A3-20	Threaded Rod	20	10	.787	.40
A3-30	Threaded Rod	30	10	1.181	.40
A3-40	Threaded Rod	40	10	1.574	.40
A3-50	Threaded Rod	50	10	1.968	.40
A3-60	Threaded Rod	60	10	2.362	.40
A3-70	Threaded Rod	70	10	2.756	.40
A5-05	Tapped Sleeve	5.2		.205	
A5-12	Tapped Sleeve	12.2		.480	

Material: steel, 4 mm diameter (.16 in.).

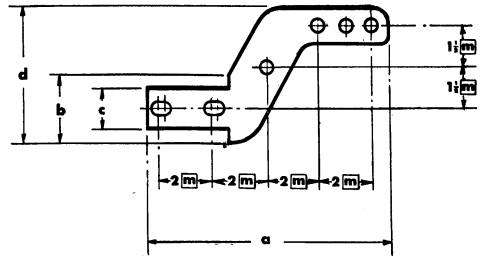
Re symbols **r** **s** **m** and **w** **x** **y** **z** see page 9. Re dimensional tolerances see page 10.



B1-



B9-01



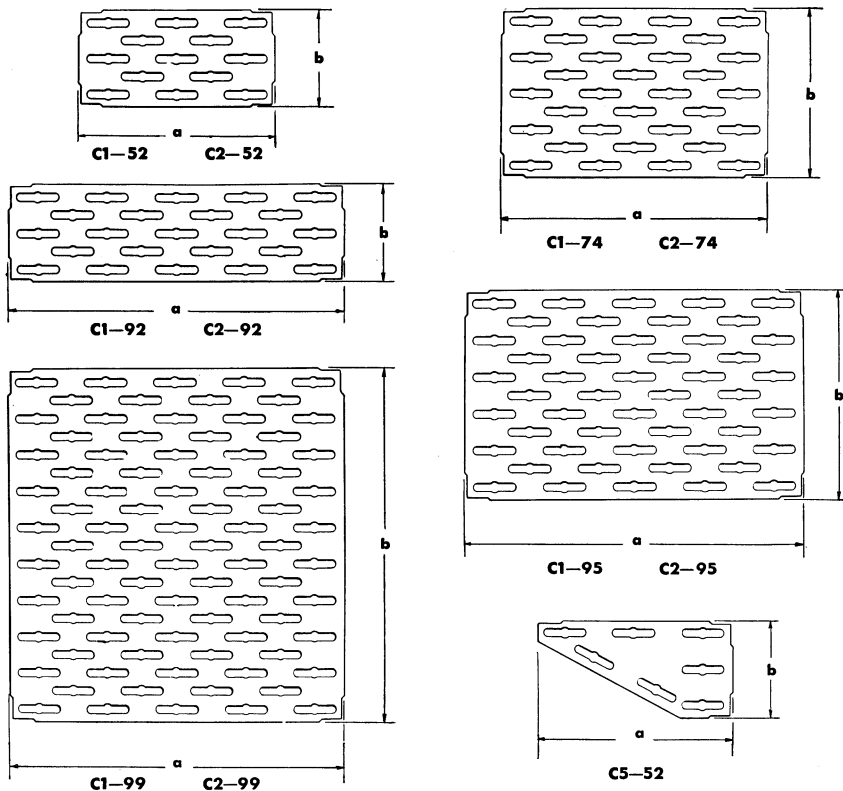
B9-02

Drawn in scale 1:2

Part No.	Part name	Dimensions in millimeters				Dimensions in inches			
		a	b	c	d	a	b	c	d
B1-02	Beam Section, 1 hole	24	18	10	5	.95	.70	.40	.20
B1-04	Beam Section, 2 hole	52	18	10	5	2.05	.70	.40	.20
B1-06	Beam Section, 3 hole	80	18	10	5	3.15	.70	.40	.20
B1-08	Beam Section, 4 hole	108	18	10	5	4.25	.70	.40	.20
B1-10	Beam Section, 5 hole	136	18	10	5	5.35	.70	.40	.20
B1-12	Beam Section, 6 hole	164	18	10	5	6.46	.70	.40	.20
B1-14	Beam Section, 7 hole	192	18	10	5	7.56	.70	.40	.20
B1-16	Beam Section, 8 hole	220	18	10	5	8.66	.70	.40	.20
B1-18	Beam Section, 9 hole	248	18	10	5	9.76	.70	.40	.20
B1-20	Beam Section, 10 hole	276	18	10	5	10.86	.70	.40	.20
B1-22	Beam Section, 11 hole	304	18	10	5	11.97	.70	.40	.20
B1-24	Beam Section, 12 hole	332	18	10	5	13.07	.70	.40	.20
B1-26	Beam Section, 13 hole	360	18	10	5	14.17	.70	.40	.20
B1-28	Beam Section, 14 hole	388	18	10	5	15.28	.70	.40	.20
B1-30	Beam Section, 15 hole	416	18	10	5	16.38	.70	.40	.20
B1-32	Beam Section, 16 hole	444	18	10	5	17.48	.70	.40	.20
B1-34	Beam Section, 17 hole	472	18	10	5	18.58	.70	.40	.20
B1-36	Beam Section, 18 hole	500	18	10	5	19.69	.70	.40	.20
B1-38	Beam Section, 19 hole	528	18	10	5	20.79	.70	.40	.20
B1-40	Beam Section, 20 hole	556	18	10	5	21.89	.70	.40	.20
B9-01	Beam End Plate steel 1 mm (.04 in.)	56	18	10	4	2.20	.70	.40	.16
B9-02	Beam Offset Plate steel 1.5 mm (.06 in.)	69	18	10	35	2.71	.70	.40	1.38

Material: steel, thickness .8 mm (.03 in.), unless otherwise stated.

Re symbols \square \square \square and \circ \circ \circ \circ see page 9. Re dimensional tolerances see page 10.

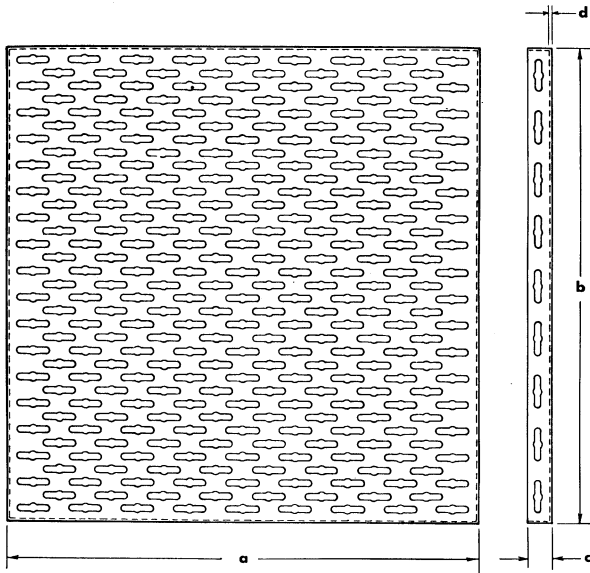


Drawn in scale 1:3

Part No.	Part name	Dimensions in millimeters		Dimensions in inches	
		a	b	a	b
C1-52	Plate , thickness .6 mm (.024 in.)	80	38	3.15	1.50
C1-74	Plate , thickness .6 mm (.024 in.)	108	66	4.25	2.60
C1-92	Plate , thickness .6 mm (.024 in.)	136	38	5.35	1.50
C1-95	Plate , thickness .6 mm (.024 in.)	136	80	5.35	3.15
C1-99	Plate , thickness .6 mm (.024 in.)	136	136	5.35	5.35
C2-52	Plate , thickness 1 mm (.040 in.)	80	38	3.15	1.50
C2-74	Plate , thickness 1 mm (.040 in.)	108	66	4.25	2.60
C2-92	Plate , thickness 1 mm (.040 in.)	136	38	5.35	1.50
C2-95	Plate , thickness 1 mm (.040 in.)	136	80	5.35	3.15
C2-99	Plate , thickness 1 mm (.040 in.)	136	136	5.35	5.35
C5-52	Corner Plate , thickness .6 mm (.024 in.)	79	38	3.11	1.50

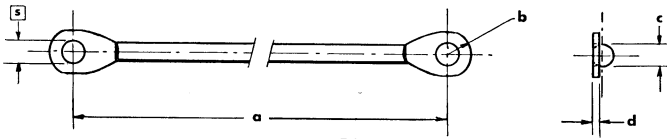
Material: steel.

Re symbols **r** **s** **m** and **w** **x** **y** **z** see page 9. Re dimensional tolerances see page 10.



C9-17

Drawn in scale 1:4



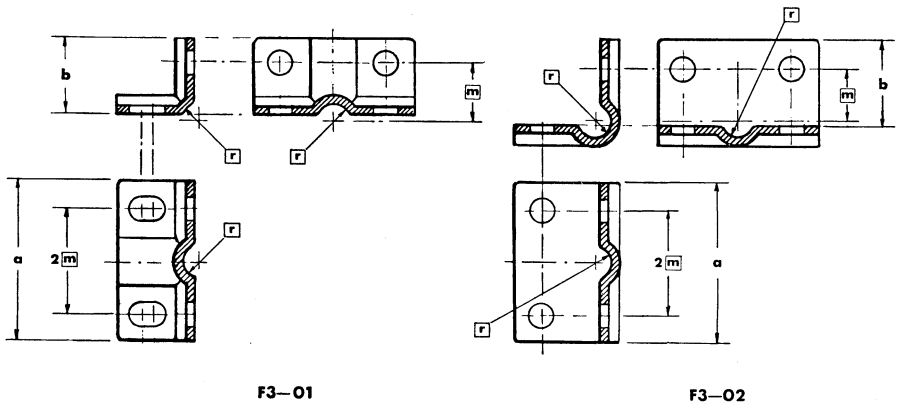
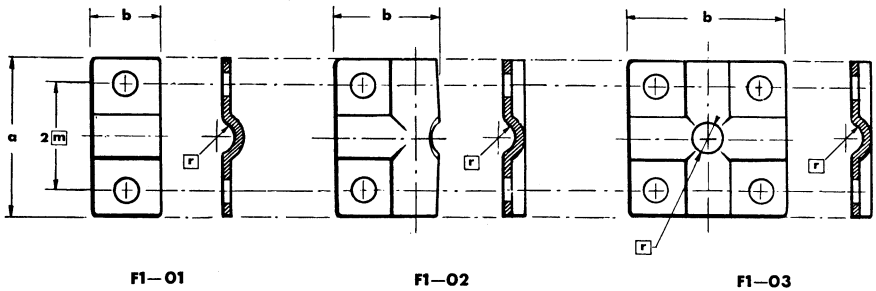
D1-

Drawn in scale 1:1

Part No.	Part name	Dimensions in millimeters				Dimensions in inches			
		a	b	c	d	a	b	c	d
C9-17	Flanged Plate	252	252	13	1	9.92	9.92	.50	.04
D1-12	Tie Rod	19.8	3	2.5	.8	.779	.12	.10	.03
D1-13	Tie Rod	24.3	3	2.5	.8	.955	.12	.10	.03
D1-20	Tie Rod	28.0	3	2.5	.8	1.102	.12	.10	.03
D1-22	Tie Rod	39.6	3	2.5	.8	1.559	.12	.10	.03
D1-23	Tie Rod	48.5	3	2.5	.8	1.909	.12	.10	.03
D1-40	Tie Rod	56.0	3	2.5	.8	2.205	.12	.10	.03
D1-42	Tie Rod	79.2	3	2.5	.8	3.117	.12	.10	.03
D1-43	Tie Rod	97.0	3	2.5	.8	3.819	.12	.10	.03
D1-80	Tie Rod	112.0	3	2.5	.8	4.409	.12	.10	.03
D1-82	Tie Rod	158.4	3	2.5	.8	6.235	.12	.10	.03

Material: steel.

Re symbols **r** **s** **m** and **w** **x** **y** **z** see page 9. Re dimensional tolerances see page 10.

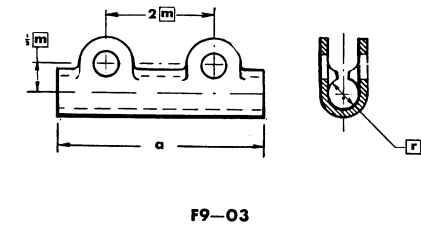
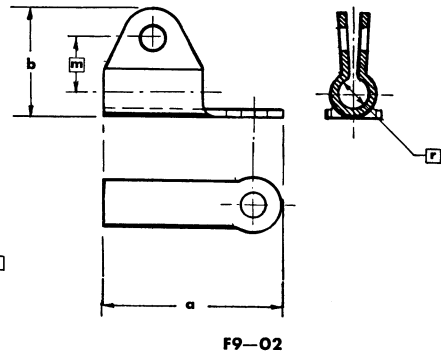
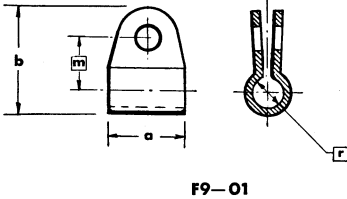
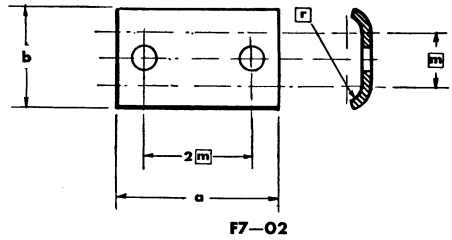
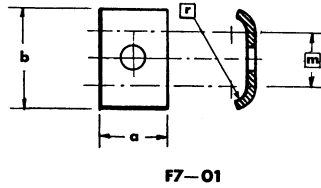
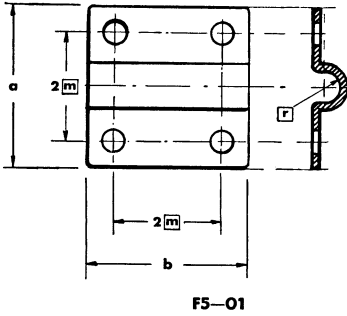


Drawn in scale 1:1

Part No.	Part name	Dimensions in millimeters		Dimensions in inches	
		a	b	a	b
F1-01	Strap Coupler	21	9	.83	.35
F1-02	T-Coupler	21	13.5	.83	.53
F1-03	Cross Coupler	21	21	.83	.83
F3-01	Inside Angle Coupler	21	10	.83	.40
F3-02	Outside Angle Coupler	21	11	.83	.44

Material: steel, thickness 1 mm (.04 in.).

Re symbols **r** **s** **m** and **w** **x** **y** **z** see page 9. Re dimensional tolerances see page 10.

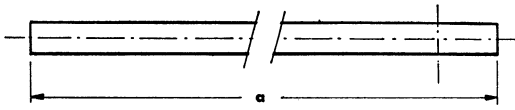


Drawn in scale 1:1

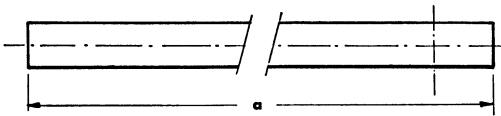
Part No.	Part name	Dimensions in millimeters		Dimensions in inches	
		a	b	a	b
F5-01	Saddle Coupler	21	21	.83	.83
F7-01	Short Clamp	9	13	.35	.51
F7-02	Long Clamp	21	13	.83	.51
F9-01	Plain Clip	10	13.5	.40	.53
F9-02	End Clip	23	13.5	.90	.53
F9-03	Joint Clip	27		1.06	

Material: steel, thickness 1 mm (.04 in.).

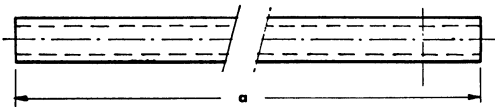
Re symbols **r** **s** **m** and **w** **x** **y** **z** see page 9. Re dimensional tolerances see page 10.



G4—40



G6—40



G7—40



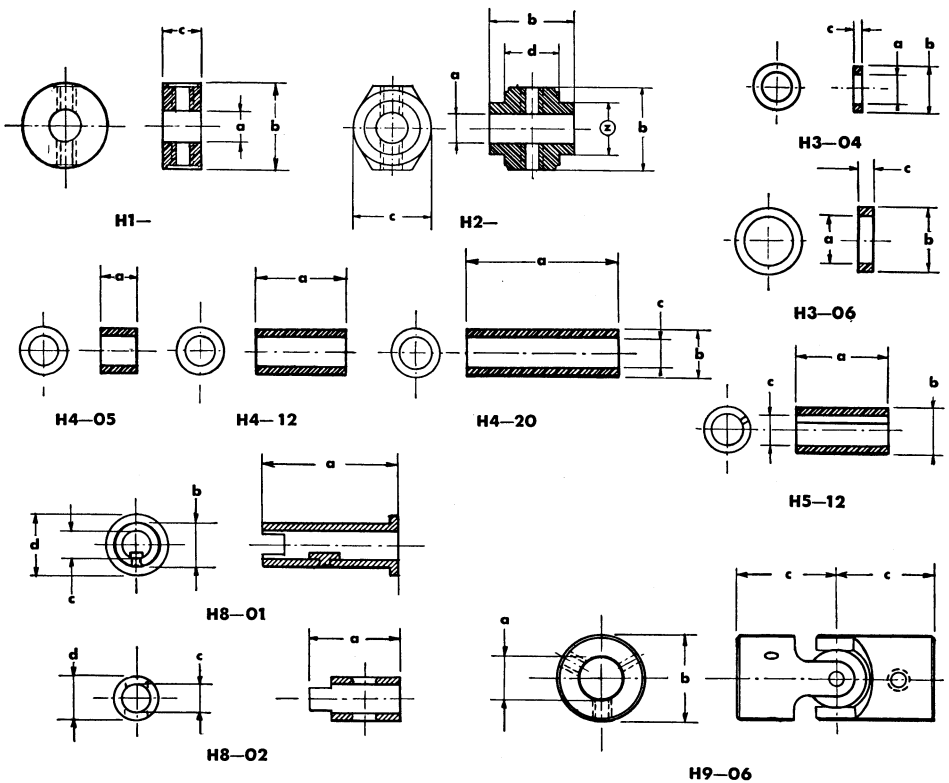
G8—40

Drawn in scale 1:1

Part No.	Part name	Dimensions in millimeters				Dimensions in inches			
		a	b	c	d	a	b	c	d
G4—40	Solid Shaft	556	4 [h8]			21.89	.1571		
G6—40	Solid Shaft	556	6 [h8]			21.89	.2358		
G7—40	Tubular Shaft	556	6 [h8]	4.1		21.89	.2358	.161	
G8—40	Grooved Shaft	556	4 [h8]	2.0	1.2	21.89	.1571	.079	.047

Material: silver steel.

Re symbols **r** **s** **m** and **w** **x** **y** **z** see page 9. Re dimensional tolerances see page 10.

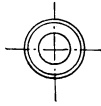
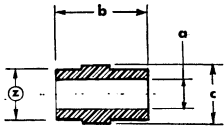


Drawn in scale 1:1

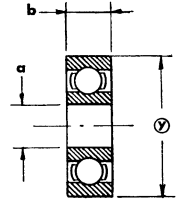
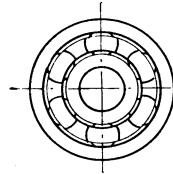
Part No.	Part name	Dimensions in millimeters				Dimensions in inches			
		a	b	c	d	a	b	c	d
H1—04	Collar	4[H9]	11	5		.1581	.433	.196	
H1—06	Collar	6[H9]	11	5		.2368	.433	.196	
H2—04	Cross Head	4[H9]	10.8	9.9	7	.1581	.425	.390	.275
H2—06	Cross Head	6[H9]	10.8	9.9	7	.2368	.425	.390	.275
H3—04	Spacer	4[H11]	6	1		.159	.235	.039	
H3—06	Spacer	6[H11]	8	2		.238	.315	.079	
H4—05	Sleeve	5	6	4		.196	.235	.159	
H4—12	Sleeve	12	6	4		.472	.235	.159	
H4—20	Sleeve	19.8	6	4		.780	.235	.159	
H5—12	Split Sleeve	12	6	4		.472	.235	.159	
H8—01	Sliding Dog Sleeve, steel	18	6[h8]	4[H8]	8	.709	.2358	.1579	.315
H8—02	Fixed Dog Sleeve, steel	12	6[h8]	4[H8]		.472	.2358	.1579	
H9—06	Universal Joint, steel	6[H9]	11	13		.2368	.433	.52	

Material: bronze unless otherwise stated.

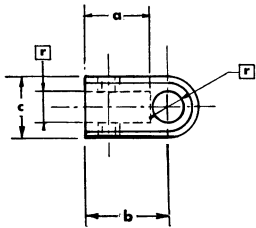
Re symbols **r** **s** **m** and **w** **x** **y** **z** see page 9. Re dimensional tolerances see page 10.



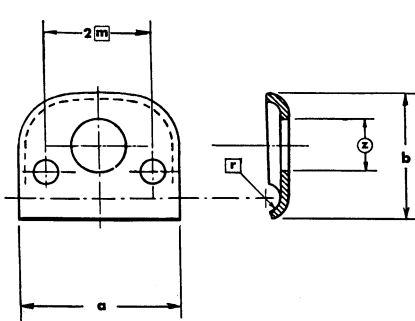
L1—



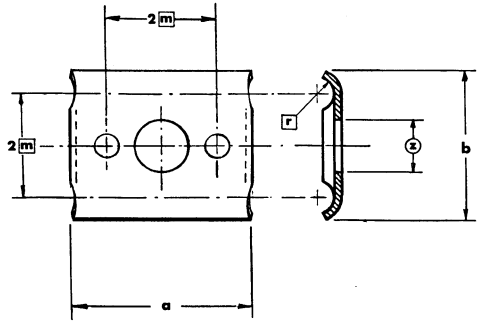
L3—06



L5—04



L9—01



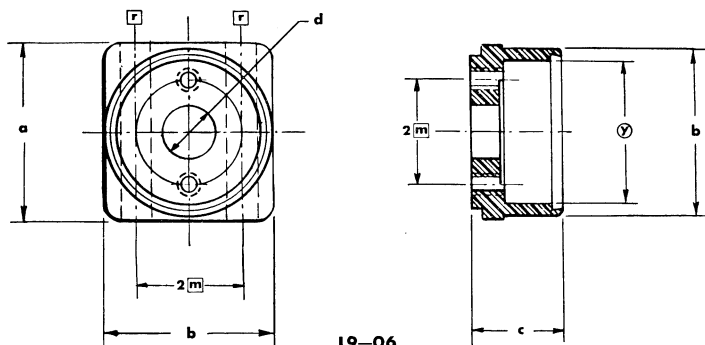
L9—02

Drawn in scale 1:1

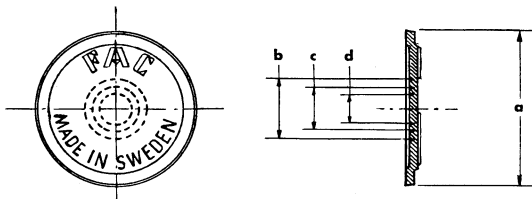
Part no.	Part name	Dimensions in millimeters				Dimensions in inches			
		a	b	c	d	a	b	c	d
L1—04	Bushing, bronze	4[E9]	12	8		.1589	.472	.315	
L1—06	Bushing, bronze	6[E9]	12	8		.2376	.472	.315	
L3—06	Ball Bearing steel, SKF, internat. standard dim.	6	6			.2361	.234		
L5—04	Link Bearing, bronze	7	11	8	5	.28	.433	.315	.196
L9—01	Bushing Clamp, single rod steel, thickness 1 mm (.04 in.)	21.5	17			.85	.67		
L9—02	Bushing Clamp, twin rod steel, thickness 1.2 mm (.05 in.)	23.5	20			.93	.79		

Material: as stated above.

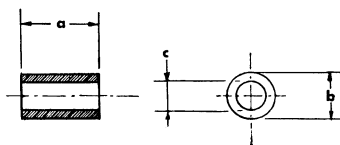
Re symbols **r** **s** **m** and **w** **x** **y** **z** see page 9. Re dimensional tolerances see page 10.



L9-06



L9-60



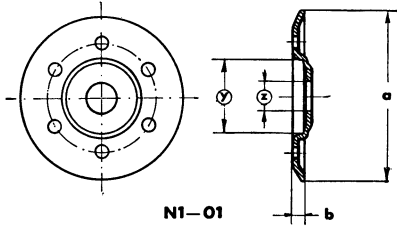
L9-64

Drawn in scale 1:1

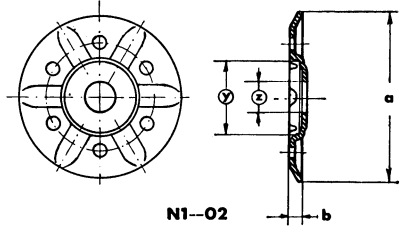
Part No.	Part name	Dimensions in millimeters				Dimensions in inches			
		a	b	c	d	a	b	c	d
L9-06	Ball Bearing Box bronze or aluminum	23.5	22	12.4	7	.93	.87	.48	.28
L9-60	Bearing Box Cover cellulose acetate	20	8.2	6.2	4.2	.79	.32	.24	.17
L9-64	Ball Bearing Sleeve , nylon	10	6	4		.40	.237	.157	

Material: as stated above.

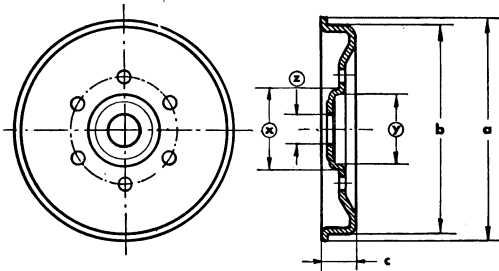
Re symbols $\square r$ $\square s$ $\square m$ and $\circ w$ $\circ x$ $\circ y$ $\circ z$ see page 9. Re dimensional tolerances see page 10.



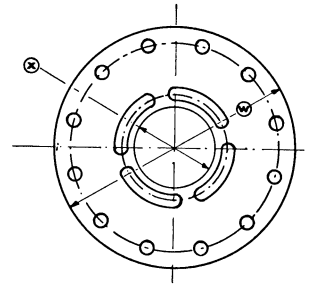
N1-01



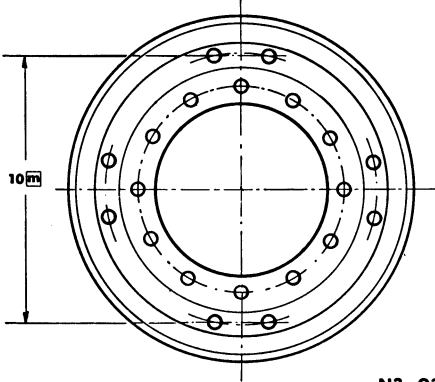
N1-02



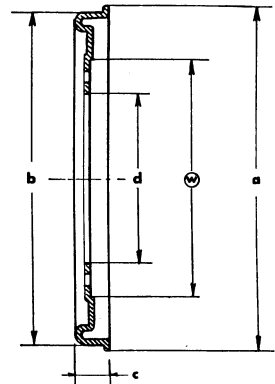
N1-05



N3-01



N3-03

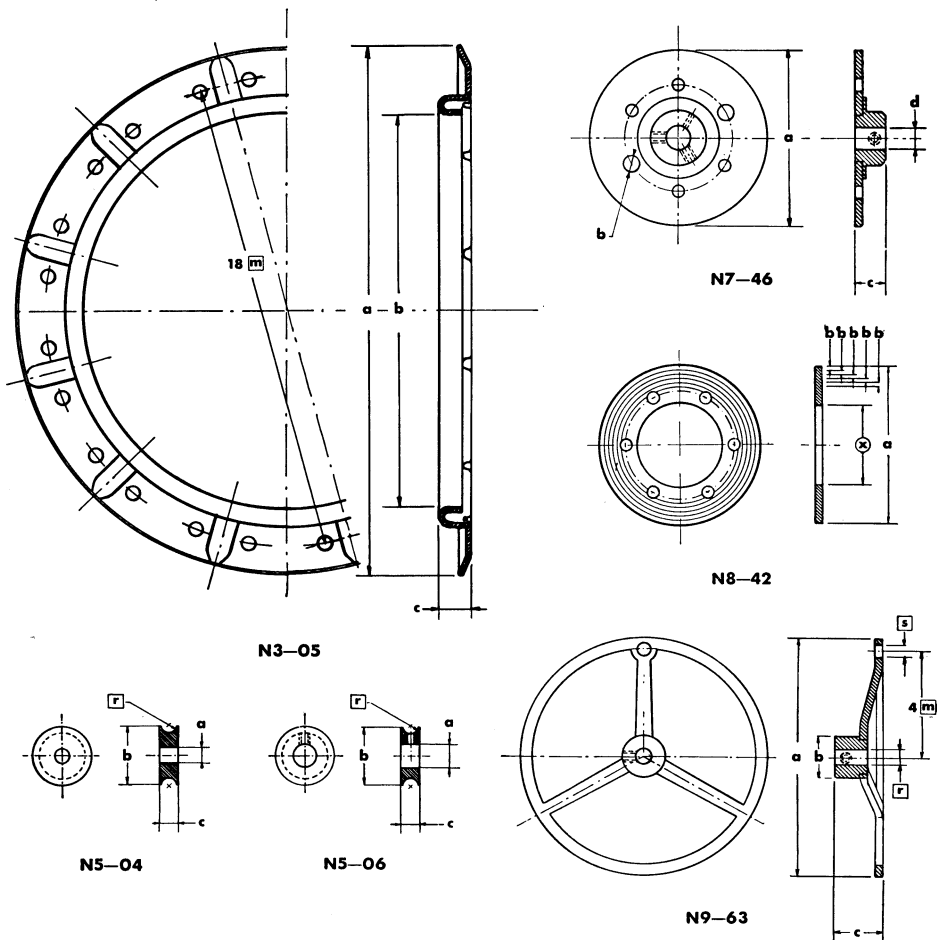


Drawn in scale 1:2

Part No.	Part name	Dimensions in millimeters				Dimensions in inches			
		a	b	c	d	a	b	c	d
N1-01	Angle Flanged Disc	42.5	35	2.6		1.67	1.38	.10	
N1-02	Spoke Wheel Center	42.5	35	2.6		1.67	1.38	.10	
N1-05	Rail Flanged Disc steel 1.2 mm (.05 in.)	57.5	54	8.5		2.25	2.13	.33	
N3-01	Flat Disc								
N3-03	Rail Flanged Rim	91	87.8	7.8	46.2	3.58	3.46	.31	1.83

Material: steel, thickness 1 mm (.04 in.) unless otherwise stated.

Re symbols **r** **s** **m** and **w** **x** **y** **z** see page 9. Re dimensional tolerances see page 10.

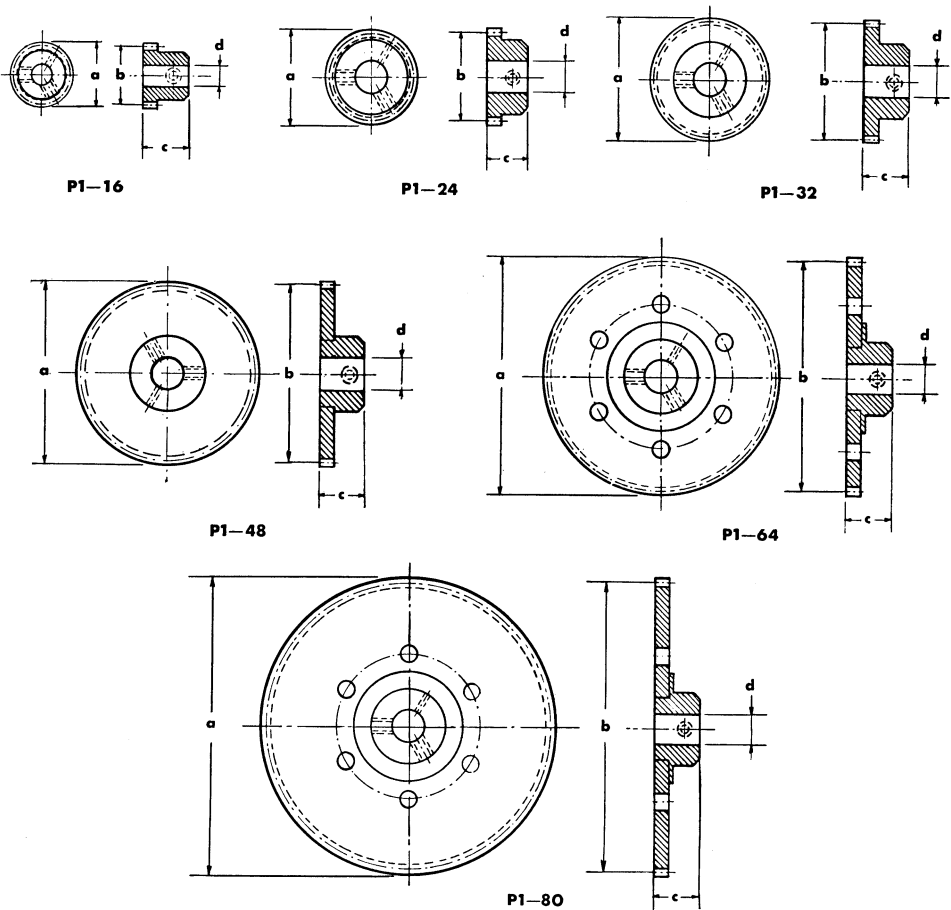


Drawn in scale 1:2

Part No.	Part name	Dimensions in millimeters				Dimensions in inches			
		a	b	c	d	a	b	c	d
N3-05	Turn Table Ring steel, 1 mm (.04 in.)	142	106	7.8		5.59	4.17	.31	
N5-04	Pulley , bronze	4[H9]	15.6	5		.1581	.61	.196	
N5-06	Set-Screw Pulley , bronze	6[H9]	15.6	5		.2368	.61	.196	
N7-46	Disc Hub	46.2	4	8	6[H8]	1.818	.1581	.315	.2366
N8-42	Cam Blank	42	1			1.654	.0394		
N9-63	Handwheel	63	11	12.5		2.48	.43	.49	

Material: steel thickness 2 mm (.08 in.) unless otherwise stated.

Re symbols **r** **s** **m** and **w** **x** **y** **z** see page 9. Re dimensional tolerances see page 10.



Drawn in scale 1:1.5

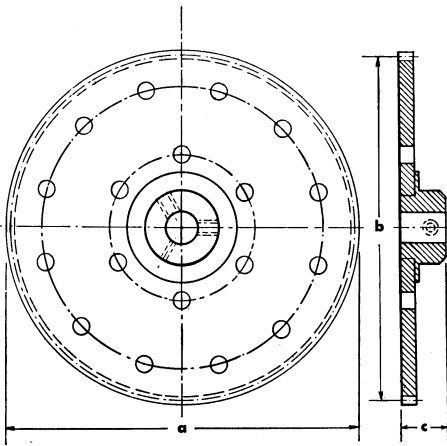
Part no.	Part name	Dimensions in millimeters				Dimensions in inches			
		a	b	c	d	a	b	c	d
P1—16	Spur Gear, 16 teeth	12.6	11.2	9	4 [H8]	.496	.4409	.354	.1579
P1—24	Spur Gear, 24 teeth	18.2	16.8	9	6 [H8]	.717	.6614	.354	.2366
P1—32	Spur Gear, 32 teeth	23.8	22.4	9	6 [H8]	.937	.8819	.354	.2366
P1—48	Spur Gear, 48 teeth	35.0	33.6	9	6 [H8]	1.378	1.3228	.354	.2366
P1—64	Spur Gear, 64 teeth	46.2	44.8	9	6 [H8]	1.819	1.7638	.354	.2366
P1—80	Spur Gear, 80 teeth	57.4	56.0	9	6 [H8]	2.260	2.2047	.354	.2366

Material: steel.

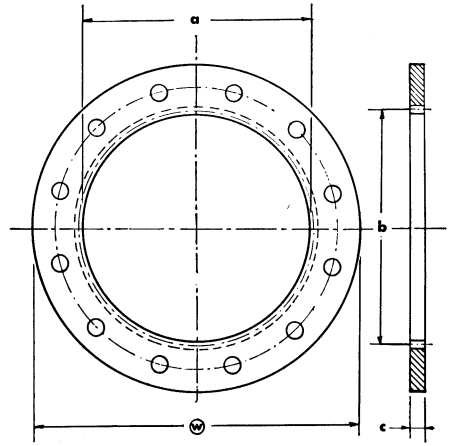
Modulus: 0.7 = Diametrical pitch: 1 per .7 mm (equals appr. 36 per in.).

Pressure angle: 20°. Gear tooth width 3 mm (.118 in.).

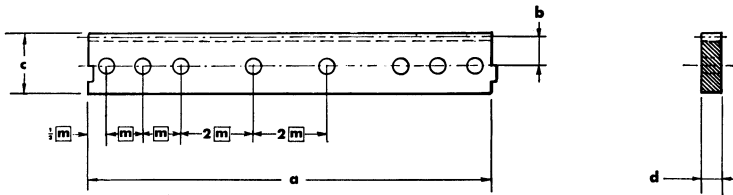
Re symbols **r** **s** **m** and **w** **x** **y** **z** see page 9. Re dimensional tolerances see page 10.



P1-96



P3-64



P5-35

Drawn in scale 1:1.5

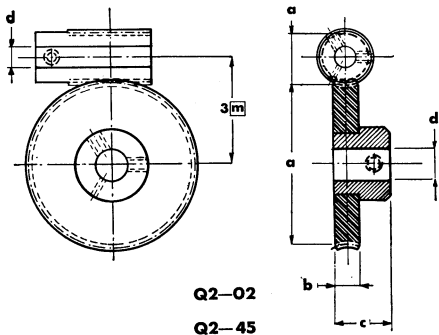
Part No.	Part name	Dimensions in millimeters				Dimensions in inches			
		a	b	c	d	a	b	c	d
P1-96	Spur Gear, 96 teeth	68.6	67.2	9.5	6 [H8]	2.701	2.6457	.37	.2366
P3-64	Internal Spur Gear Ring, 64 teeth	43.4	44.8	3		1.709	1.7638	.118	
P5-35	Rack, 35 teeth	77.0	5.6	11.8	4	3.032	.2205	.465	.157

Material: steel.

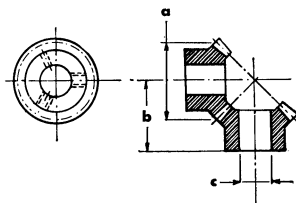
Modulus: 0.7 = Diametrical pitch: 1 per .7 mm (equals appr. 36 per in.).

Pressure angle: 20°. Gear tooth width 3 mm (.118 in.).

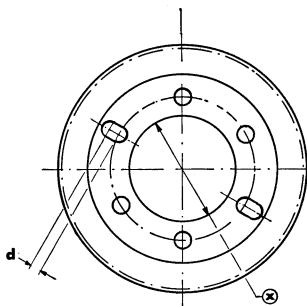
Re symbols **r** **s** **m** and **w** **x** **y** **z** see page 9. Re dimensional tolerances see page 10.



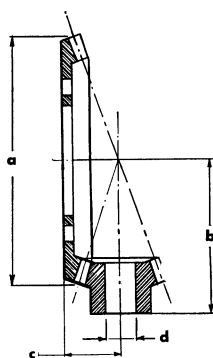
Q2-02
Q2-45



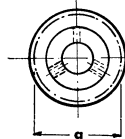
R1-18



R3-60



R3-20



Drawn in scale 1:1.5

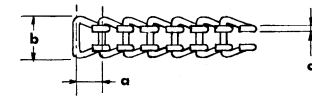
Part No.	Part name	Dimensions in millimeters				Dimensions in inches			
		a	b	c	d	a	b	c	d
Q2-02	Worm, double R. H. thread, steel	10.5			4 [H8]	.413			.1579
Q2-45	Worm Gear, 45 teeth bronze with steel hub	31.5	5	11	6 [H8]	1.240	.196	.43	.2366
R1-18	Bevel Gear, 18 teeth, bronze	15.5	13.7		6 [H8]	.61	.54	.2366	
R3-20	Bevel Gear, 20 teeth, bronze	17.5	29.8	11.4	6 [H8]	.69	1.17	.45	.2366
R3-60	Bevel Gear, 60 teeth, bronze	48.5	29.8	11.4	2	1.91	1.17	.45	.08

Material: as stated above.

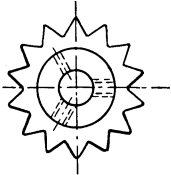
Worm Gears: Pressure angle 20°. Modulus: 0.7 = Diametrical pitch: 1 per .7 mm (equals appr. 36 per in.).

Bevel Gears: Modulus: 0.8 = Diametrical pitch: 1 per .8 mm (equals appr. 32 per in.).

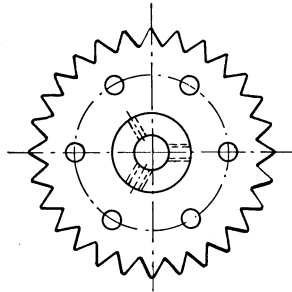
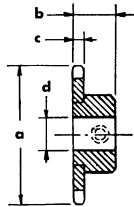
Re symbols **r** **s** **m** and **w** **x** **y** **z** see page 9. Re dimensional tolerances see page 10.



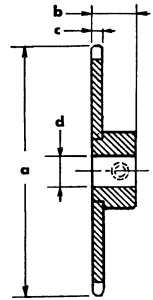
S1-01



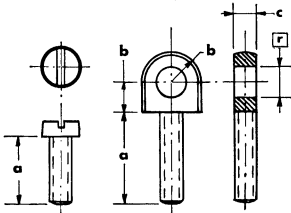
S1-14



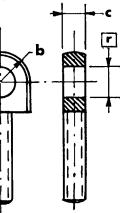
S1-28



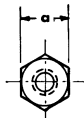
Drawn in scale 1:1.5



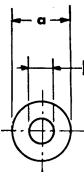
T1-



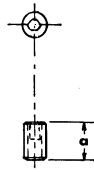
T3-12



T4-02



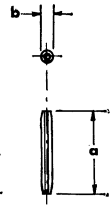
T5-08



T6-



T7-



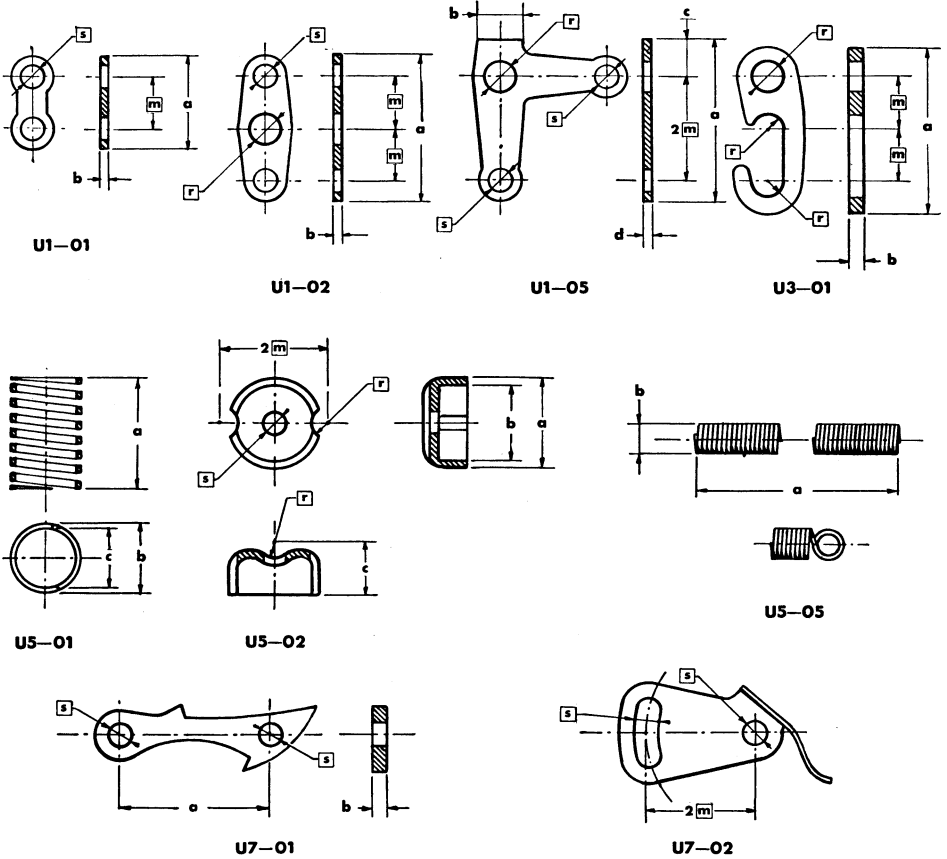
T9-

Drawn in scale 1:1

Part No.	Part name	Dimensions in millimeters				Dimensions in inches			
		a	b	c	d	a	b	c	d
S1-01	Wire Link Chain, 1 m (40 in.)	4.54	6.75	0.9		.179	.27	.035	
S1-14	Sprocket, 14 teeth	24.8	8	2	6 [H8]	.98	.32	.08	.2366
S1-28	Sprocket, 28 teeth	44.8	8	2	6 [H8]	1.76	.32	.08	.2366
T1-06	Screw, Fillister head	6				.24			
T1-09	Screw, Fillister head	9				.35			
T1-15	Screw, Fillister head	15				.59			
T1-24	Screw, Fillister head	24				.95			
T3-12	Eye Screw	12	4	3		.47	.16	.12	
T4-02	Nut, thickness 2 mm (.08 in.)	6				.24			
T5-08	Washer, thickness .8 mm (.03 in.)	8				.31			
T6-03	Set-Screw, Allen type	2.75				.11			
T6-05	Set-Screw, Allen type	5				.20			
T7-03	Set-Screw, slot type	2.75				.11			
T7-05	Set-Screw, slot type	5				.20			
T9-09	Roll Pin	9	1.7			.35	.07		
T9-12	Roll Pin	12	1.7			.47	.07		

Material: steel.

Re symbols **r** **s** **m** and **w** **x** **y** **z** see page 9. Re dimensional tolerances see page 10.

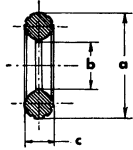
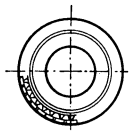


Drawn in scale 1:1

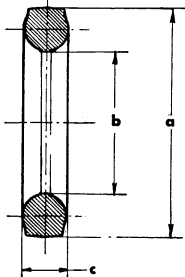
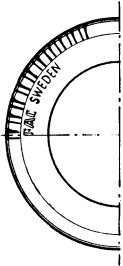
Part No.	Part name	Dimensions in millimeters				Dimensions in inches			
		a	b	c	d	a	b	c	d
U1-01	Two Hole Link	12.5	1.2			.49	.05		
U1-02	Three Hole Link	19.2	1.2			.77	.05		
U1-05	Angle Link	21.8	6	5	1.2	.86	.24	.20	.05
U3-01	Hook	22.5	2			.89	.08		
U5-01	Coil Compression Spring	15	9.8	7.8		.60	.386	.307	
U5-02	Spring Seat Cup	12	10	7		.47	.39	.28	
U5-05	Tension Spring ends may be formed as shown above	278	4			11	.157		
U7-01	Ratchet	19.2				.756			
U7-02	Ratchet Spring, phosphor bronze								

Material: steel, unless otherwise stated.

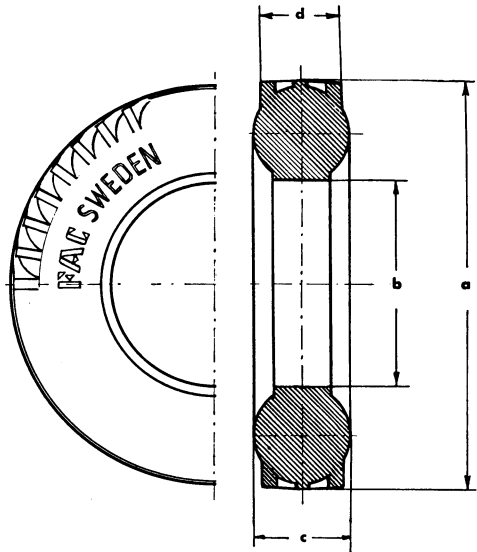
Re symbols **r** **s** **m** and **w** **x** **y** **z** see page 9. Re dimensional tolerances see page 10.



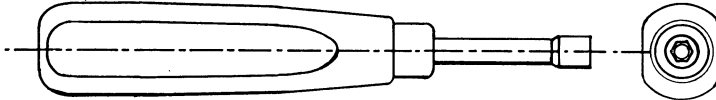
W1-01



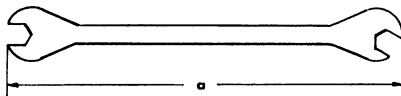
W1-02



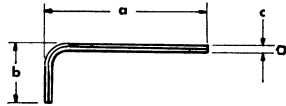
W1-03



W9-01



W9-02



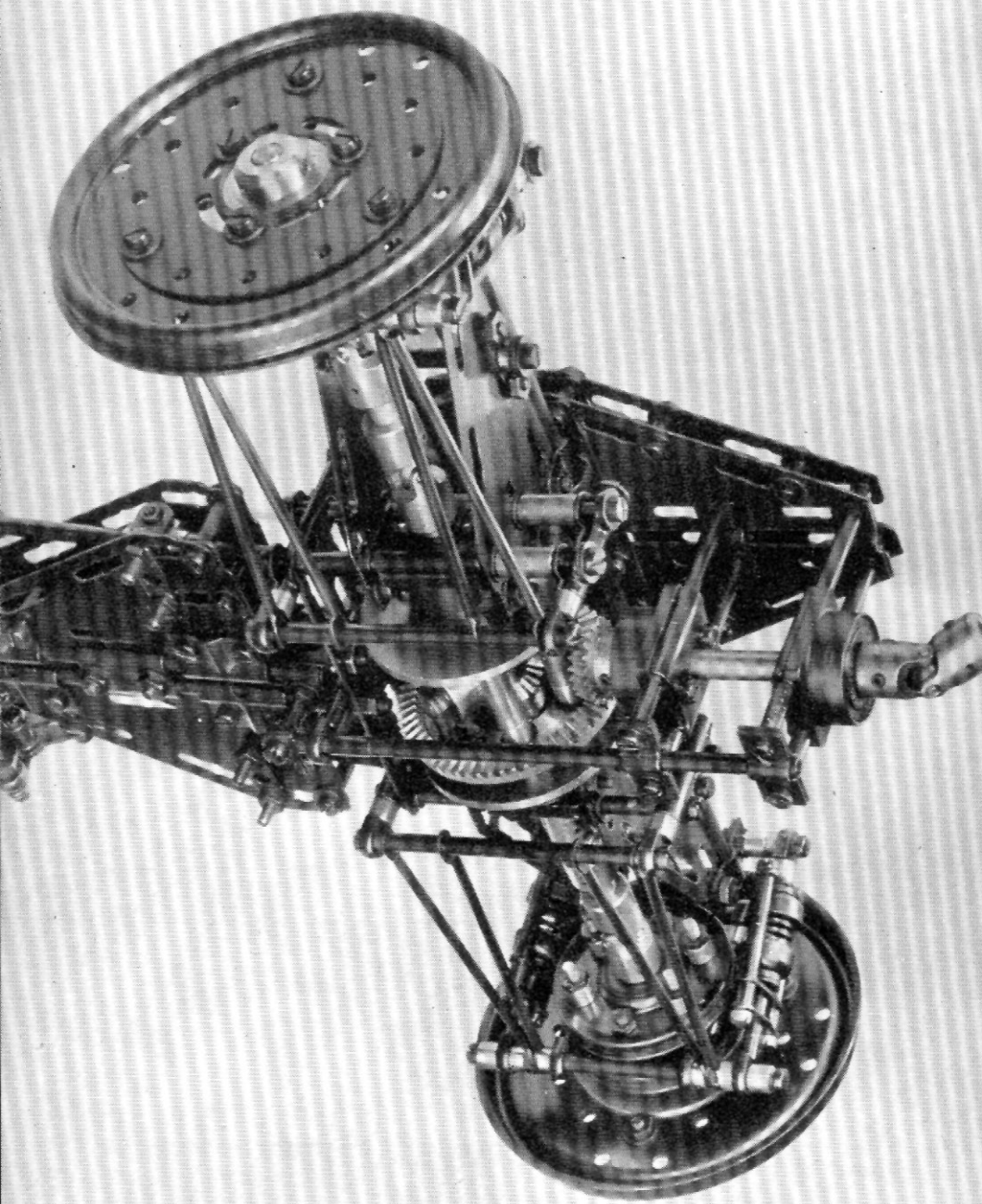
W9-03

Drawn in scale 1:2

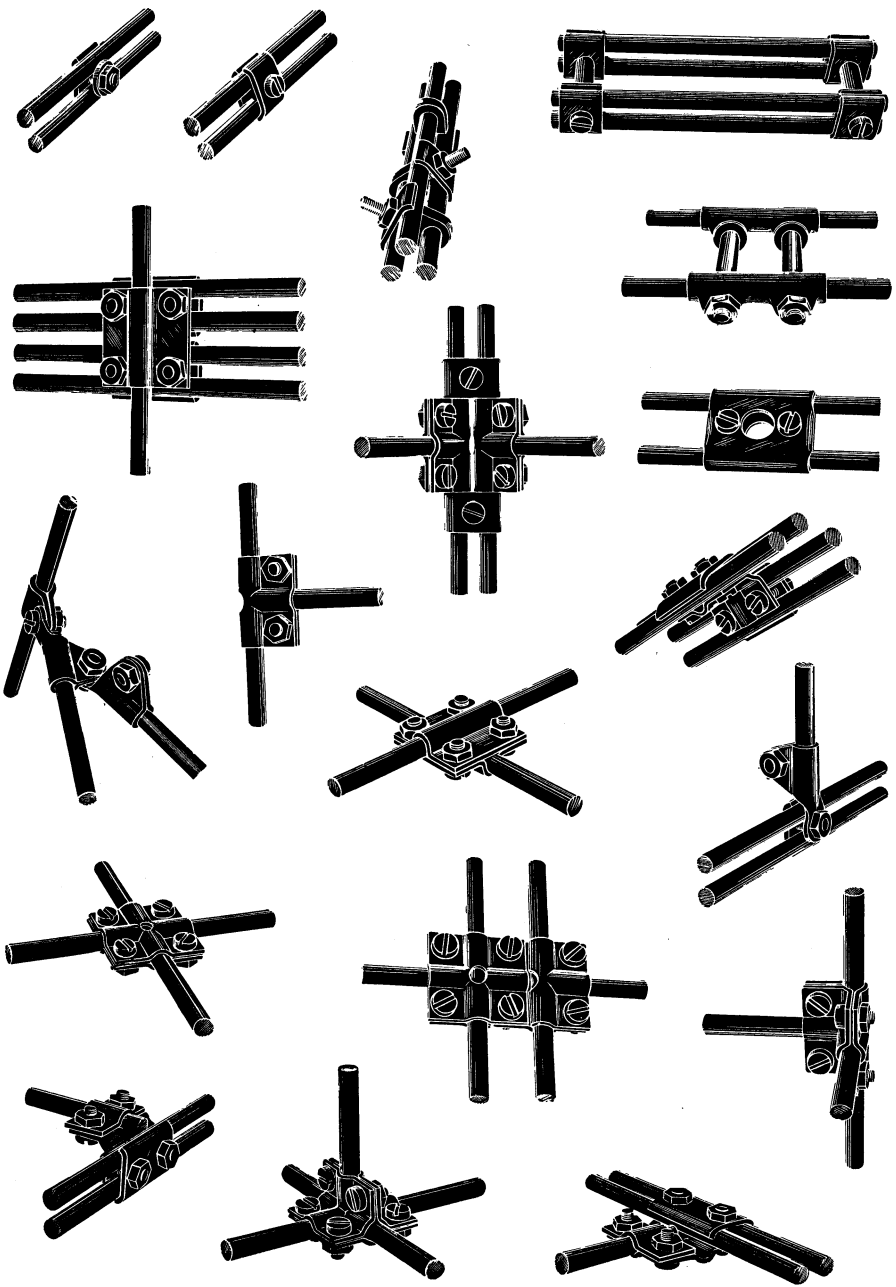
Part No.	Part name	Dimensions in millimeters				Dimensions in inches			
		a	b	c	d	a	b	c	d
W1-01	Rubber Tire , vehicle type fits N5-04 or N5-06	26	12.5	7.5		1.00	.50	.30	
W1-02	Rubber Tire , vehicle type fits a pair of N1-01 or N1-02	60	37	11		2.40	1.50	.45	
W1-03	Rubber Tire , vehicle type fits a pair of N1-05	104	53.5	25	20	4.10	2.10	1.00	.80
W9-01	Socket Wrench								
W9-02	Open End Wrench steel, thickness 2 mm (.08 in.)	105				4.10			
W9-03	Allen Wrench	43	16	1.27		1.70	.63	.05	

Material: as stated above.

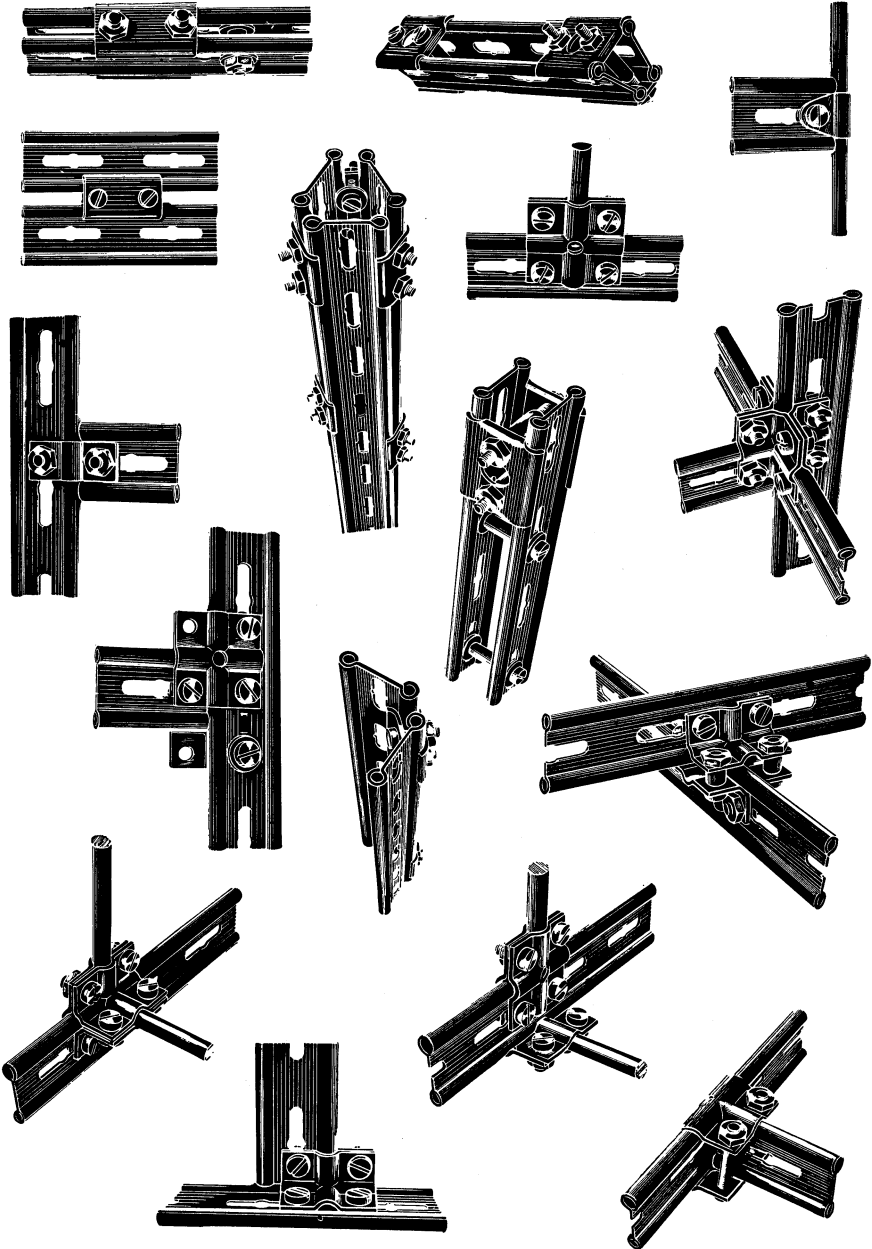
Re symbols **r** **s** **m** and **w** **x** **y** **z** see page 9. Re dimensional tolerances see page 10.



Typical rod couplings



Typical beam couplings



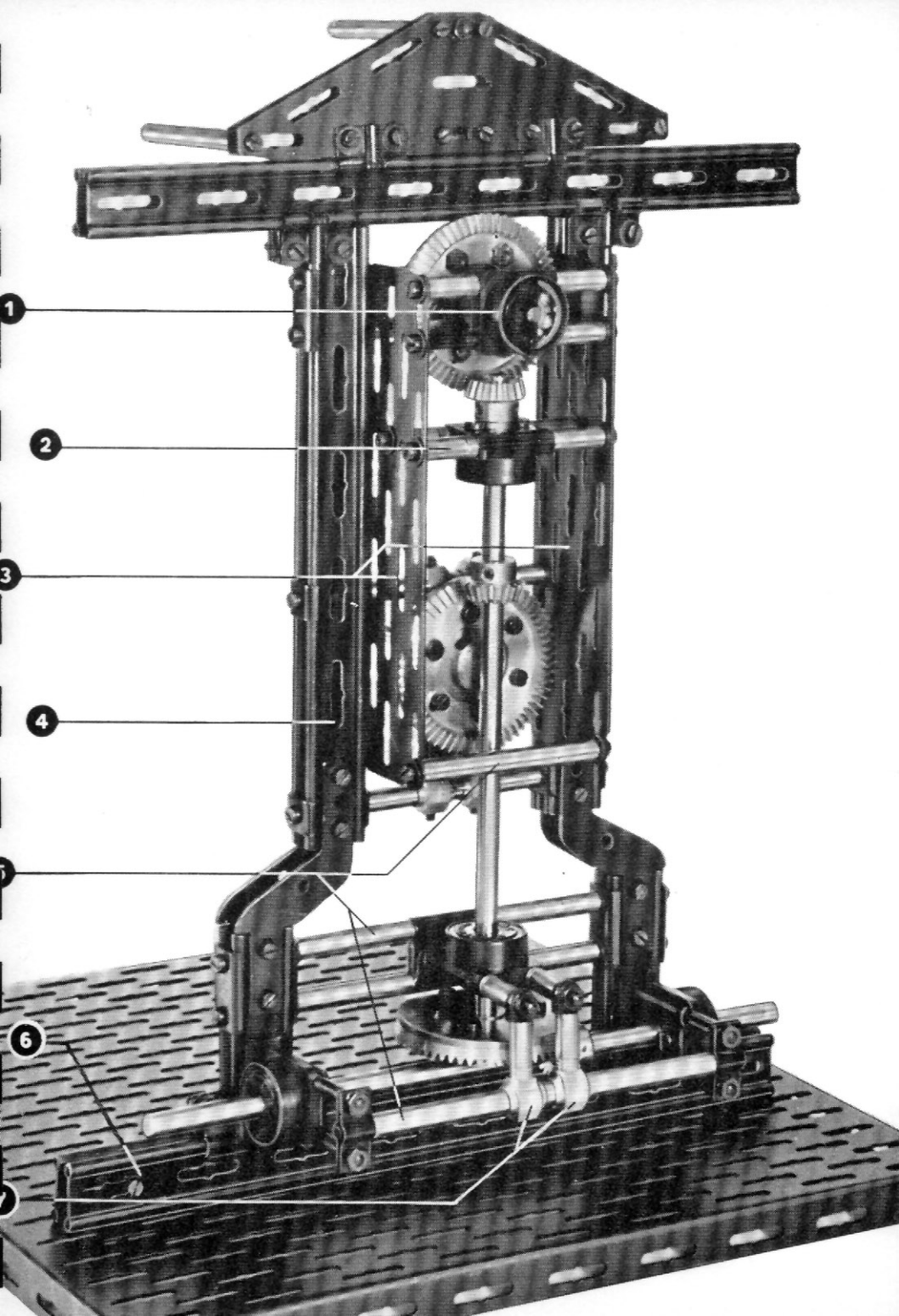
Beam joints

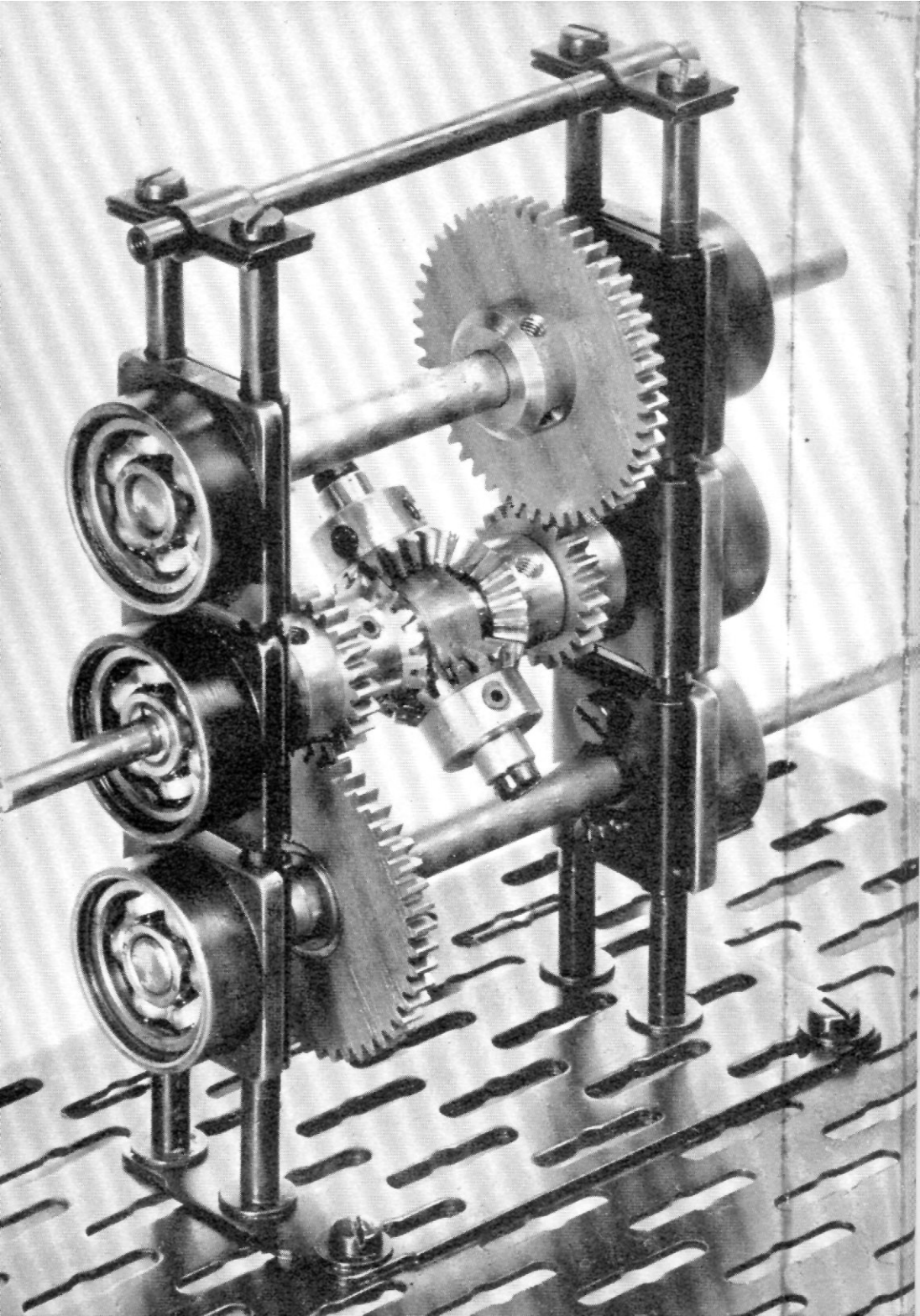


Example of framework for axles carrying heavy loads

The construction joins great strength with unlimited possibilities of adjusting the axle centres vertically as well as horizontally.

- 1 Ball Bearing Box L9—06 with partly cut-away Bearing Box Cover L9—60.
- 2 Spacing material consisting of Sleeve H4—12 and Spacer H3—04 to fix the bearing.
- 3 Plates C2—92, screwed directly on to the coupled Beam Sections, provide suitable fixing points for bearings and spacers.
- 4 The framework, formed by Beam Sections, allows adjustment of axle centres in every direction.
- 5 Tubular Shafts G7—40 are here used as reinforcement and spacers around Rods (threaded and non-threaded).
- 6 The vertical frame members stand on horizontal girders consisting of coupled Beam Sections and may be moved sideways for exact adjustment. The Beam Sections are coupled by means of Screws and Tapped Sleeves A5—05. Eye Screws T3—12 around the Tapped Sleeves between the Beam Sections are screwed on to the Flanged Plate C9—17. The upper flanges of the Beam Sections are consequently free and allow an unobstructed lateral movement of the vertical frame members.
- 7 Cross Heads H2—06, attached to a Tubular Shaft G7—40, support the lower bearing of the vertical shaft.





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FAC X1 – Minor Industrial Kit

This kit is intended for student engineers as well as professional engineers. In composing the kit, emphasis has been placed on designs with numerous moving parts. The top section of the case contains an assortment of gears and other special machine elements. As a foundation for future enlargement, this kit meets demands for completeness and variety.

Size of case: 600×380×70 mm
23 ½" × 15" × 2 ¾"

Weight of kit: 11 kg
24.2 lbs.

FAC X2 – Major Industrial Kit

This complete kit has been specially composed to meet industrial requirements. It contains approx. 4.700 parts chosen according to use frequency calculations. The case contains three tiers, the middle one being made up of two separate cases holding plastic-packaged coupling elements, screws, nuts and other small items.

Size of case: 600×380×110 mm
23 ½" × 15" × 4 ¾"

Weight of kit: 17,8 kg
39.1 lbs.

All FAC parts are available as individual items

