M87 XL Pipe Shaver

for Taper/Taper, Quick-Lock® and Mechanical Pipe Joints in sizes 16 to 24 inch (400 - 600 mm)

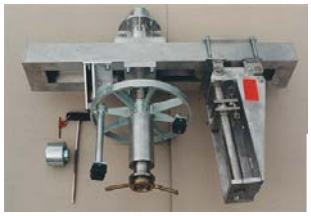
Introduction

The Bondstrand® M87 XL Pipe Shaver is designed to prepare a tapered or straight spigot on the cut end of a Bondstrand pipe in 16 inch to 24 inch (400 to 600 mm) size range allowing to fit a Bondstrand fitting with a matching tapered socket or Quick-Lock socket, as well as preparing ends for mechanical coupling e.g. Helden, Straub™, Viking Johnson™, etc.

The shaver is centred and fixed on the end of the pipe by an expanding arbor. Arbors are available for each pipe size.
The arbor slips into the pipe and expands to grip the inside of the pipe when the tensioning bolt is tightened. As the frame is rotated around the stationary centre shaft, the cutting tool advances automatically. The shaver is driven by a portable power drive. A key in the portable power drive engages in a matching slot on the power drive seat to rotate the shaver.

Each M87XL pipe shaver is supplied in a case complete with a 10 mm Hexagon spanner, a 10 mm Allen® Key and a Torx® key for the cutting tool. The shaver is driven by a portable power drive type Ridgid® 700. This power drive as well as the necessary arbors are not included and have to be ordered separately. A 24 mm spanner is required to tighten the clamping bolts. A pipe vise or suitable pipe clamp support is required to hold the pipe.

Note: The use of this shaving tool is restricted to Bondstrand pipe material.



M87 XL Pipe Shaver

EG-STATEMENT OF AGREEMENT
According to machinery directive 98/37/EG, appendix II, under a, this shaver
* complies with machinery directive 98/37/EG;
* complies with the following harmonised European Standards: NEN-EN 1050, NEN-EN 292-1 and NEN-EN 292-2.

CE

Safety precautions

Personal protection and safety

The following personal protection gear must be used when cutting, shaving, sanding and grinding Glassfiber Reinforced Epoxy (GRE) material:

- Safety shoes or boots;
- Work gloves (GRE material can be very sharp and may cause cuts or splinters);
- Proper fitting and buttoned up protective clothing must be worn when operating the shaver;
- A hard hat is to be used, if the situation requires so;
- A hair net must be worn, if applicable, when shaving, cutting, grinding, etc;
- An appropriate dust mask is to be used when cutting, shaving, grinding and sanding.

Operational safety

For safe operation of the shaving tool, the following rules must be followed:

- Pipe-shaver assembly must be at ergonomic height to be able to work in the proper posture;
- Only use the shaving tool i.e. workshop crane on a solid and leveled surface or floor;
- Ample rest should be taken to avoid physical and mental over stressing;
- Only authorized persons are to be allowed in the shaving area;
- Shaving area must be clearly marked as such;
- Shaving tool shall only be used to prepare spigots on Bondstrand pipe material;
- Pipe shaver shall only be operated by trained persons;
- Shaving tool must be kept in good working order to guarantee proper and safe operation. Defect parts must be replaced or repaired by qualified personnel only.

Note:

1. On special order, instructions of this shaver are available on CD-Rom or DVD.
2. The noise level of the shaver and power drive is less than 70 dB (A).

Operating instructions


Photo 1

The following procedure should be carefully followed to ensure satisfactory operation of the shaver and to give a correct spigot.


Photo 2

1.ASSEMBLING THE ARBOR

1.1 Mount the spider ring (*photo 2*) on the central hub (*photo 3*).


Photo 3

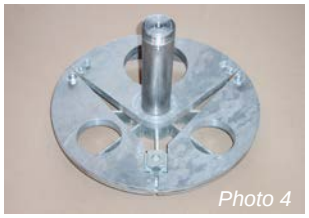


Photo 4

1.2 Mount 1 of the 2 arbor plates of the required size on the central hub (*photo 4*). Make sure that the nuts of the arbor plate are facing up. The rectangular slot between the 2 hinged parts must be fit over the spreader bolt assembly on the spider ring.

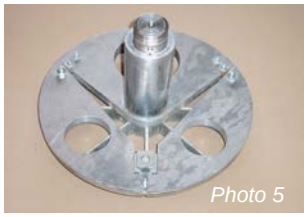


Photo 5

1.3 Mount the spacer tube on the central hub (*photo 5*).


Photo 6

1.4 Mount the long spreader bolt assembly (bolt, wedged nut, wedges and distance tube) on the spider ring (*photo 6*).

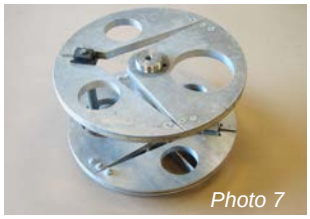


Photo 7

1.5 Mount the second arbor plate on the central hub (*photo 7*).


Photo 8

1.6 Mount the locking ring and nut on the central hub and tighten the nut (*photo 8*).

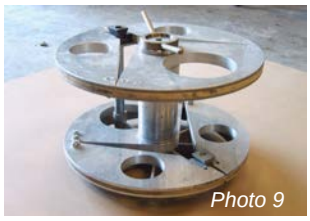


Photo 9

The completely assembled arbor (*photo 9*) can then be fitted into the pipe. The arbor should be fitted so that it is approx. 20-25 mm inside the pipe from the end.
As an alternative, the arbor can be fitted to the shaver, as described in point C, and the complete assembly of arbor and shaver fitted to the pipe. The two expander sections of the arbor plate located at the cut end of the pipe should be at the pipe bottom and in a vertical line with the innermost plate expander sections (i.e. then positioned at the top of the pipe). While slightly lifting the pipe-end arbor plate, the expanders can be tightened firmly.


Photo 10

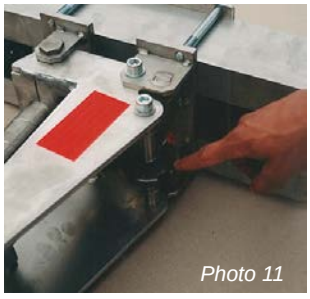


Photo 11

2. ADJUSTING THE M87XL SHAVER

A. Select the correct dimensions and/or spigot angle for the pipe diameter and series being used. For shave dimension for the various types of taper spigots, Quick-Lock and mechanical couplings refer to Tables 1, 2 and 3. For setting the taper angle, loosen the taper locking bolts (**part no. 135**) shown in *Photo 10.*

B. Pull the cutting head towards the center shaft so that the slotted disk (indicated in *Photo 11*) is free to rotate and turn this so that the slot for the appropriate angle fits over the stud on the fixed frame (slots have the different angles marked).

C. While pulling the head of the shaver away from the centre shaft, retighten the taper locking bolts (as in point 2, *Photo 10*). The taper angle is now correctly set. For the shaving of parallel spigots as used in Quick-Lock joints or for use with mechanical couplings such as Helden, Viking Johnson, etc., the same procedures apply and the slot marked "O" is used. The taper locking bolts are then retightened. This sets the shaver correctly to cut a parallel spigot.

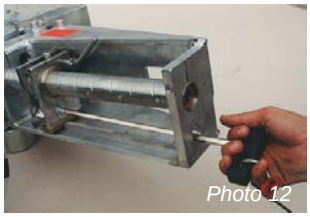


Photo 12

3. FIT THE SHAVER TO THE PIPE

The shaver can then be fit into the pipe and arbor. Ensure the claws on the centre shaft engage in the slots of the arbor. The central bolt is tightened so that the support roller on the shaver frame is in contact with the circular track on the arbor.

4. RETRACT THE CUTTING TOOL

Loosen the tool holder clamping bolt as shown in *Photo 12*. The bolt (**part no. 22**) should be left tight enough for the cutting tool to be moved reasonably easy, but not so loose that it can move by itself.

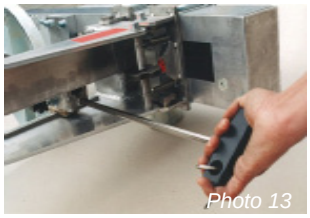


Photo 13

he tool is then turned back completely as far away from the pipe as possible, by turning the adjusting bolt counter clock wise (*Photo 13*).


Photo 14

5. ADJUST THE CUTTING HEAD

The bolts (**parts no. 68**) holding the cutting head are loosened as shown in *Photo 14*. This allows the cutting head to be moved towards the pipe.

To allow the head to move freely, the drive should be disengaged i.e. the lever in *Photo 15* should be set pointing towards the main frame of the shaver and the sliding pin back towards the main frame. The tool holder can then also be moved as close as possible to the frame. Set the cutting head so, that the cutting tool is just free of the pipe. The bolts **(parts no. 68)** are then retightened.

6. ADJUST THE CUTTING TOOL

The cutting tool should be adjusted to give a cut of max. 2 mm depth. One full clockwise turn of the adjusting bolt on the back of the cutting tool changes the cutting depth by 1 mm. So, a maximum of 2 mm cutting depth by two full clock wise turns reduces the pipe spigot diameter by 4 mm.

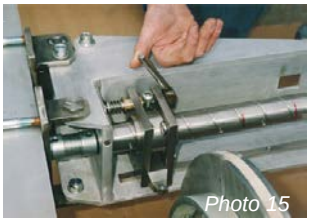


Photo 15

7. FIT POWER DRIVE TO SHAVER

The power drive is fitted to the adapter on the shaft of the shaver. Make sure that the spring-loaded key engages in the key ways.

8. ENGAGE THE CUTTING TOOL FEED

The feed is engaged by moving the lever, indicated in *Photo 8*, away from the main frame. The feed block may not engage the thread immediately but will engage automatically as soon as turning commences. The first cut can then be made.

9. Return the tool holder

The feed is disengaged as described in the underlined part in point 5.The tool holder can now be reset to its original position. As many cuts as required to give the correct spigot length and diameter can be made following the instruction in point 5-6-7. Tables 1 and 2 give the correct dimensions for the various series and diameters of pipe. Allowance in the shaving length is to be made for the radius of the cutting tool. The M87XL shaver automatically disengages the feed mechanism at the maximum limit of the tool holder travel.

10. RETRACT THE CUTTING TOOL
As in point 4.

11. REMOVE THE POWER DRIVE

12. RELEASE CENTRAL TENSIONING BOLT
Now the shaver can be removed from the arbor.

13. RELEASE THE EXPANDER BOLTS
Remove the arbor from the pipe, taking care not to damage the thin front edge of the pipe.

Making of short nipples

Pipe pieces and nipples so short that they can not be held satisfactory to support the shaver can be made as follows:

A. The central locating bolt (**part no. 188**) is removed from the shaft.


Photo 16

B. The power drive adapter is removed from the shaver main frame by undoing the four bolts (**part no. 201**), *Photo 16*.

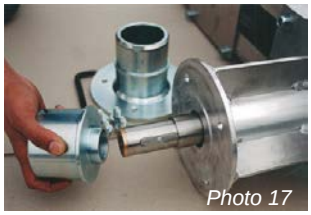


Photo 17

C. The adapter (**part no. 186**) supplied separately, is fitted to the shaft ensuring that the key is properly engaged (*Photo 17*).

D. The central location bolt (**part no. 188**) is reinserted and the shaver is fitted to the arbor which has already been fitted in the pipe nipple. Refit the power drive to the newly fitted adapter. Note: Do not lose the four unused bolts (**parts no. 201**).

E. The shaver can be used with the pipe nipple rotating and the shaver stationary. Note: The power drive must now rotate in the opposite direction.

The NOV Fiber Glass Systems M87XL pipe shaver has been designed as a maintenance-free unit. The following measures should be followed:

1. ***Clean the shaver on a regular basis***, paying special attention to the feed screw and its associated components. Keep threads of part no. 188 lubricated with a thread lubricant for smooth operation.

2. ***Check cutting blade regularly***, a dull cutting edge places unnecessary strain on the automatic feed components. The cutting edge can be loosened using the 2 mm Torx key provided and turned to provide a new sharp edge. This can be done until the complete blade is dull. Replacement cutting blades are available from NOV Fiber Glass Systems.

Shaving Joint Dimensions

Table 1: For Taper joints Series 2400

Nom. Pipe Size	Taper Angle	Nose Thickn. A	Spigot Dia. At Nose B	Nose Thickn. A	Spigot Dia. At Nose B
mm	degr.	**2410**			**2412**
400	2.5	1.5	396.7	1.5	396.7
450	2.5	1.5	436.8	1.5	436.8
500	2.5	2.0	486.1	2.0	486.1
600	2.5	2.0	582.6	2.0	582.6
mm	degr.	**2414**			**2416**
400	2.5	1.5	396.7	1.5	396.7
450	2.5	1.5	436.8	1.5	436.8
500	2.5	2.0	486.1	2.0	486.1
600	2.5	2.0	582.6	2.5	583.6
mm	degr.	**2420**			**2425**
400	2.5	1.5	396.7	2.5	396.7
450	2.5	1.5	436.8	2.5	438.8
500	2.5	2.0	486.1	3.0	488.1
600	2.5	2.5	583.6	3.5	585.6
mm	degr.	**2432**			**2440**
400	2.5	2.5	398.7	3.5	400.7
450	2.5	2.5	438.8	4.0	441.8
500	2.5	3.0	488.1	4.0	490.1
600	2.5	3.5	585.6		

Table 2: Taper joints series 2000M/7000M

Nom. Pipe Size	Taper Angle	Nose Thickness	Nose Insert Depth	Spigot Diameter at Nose
mm	degr.	A		B
400	2.5	6.1	110	398.2
450	2.5	4.6	114	443.0
500	2.5	5.0	127	492.2
600	3.5	3.8	178	586.3

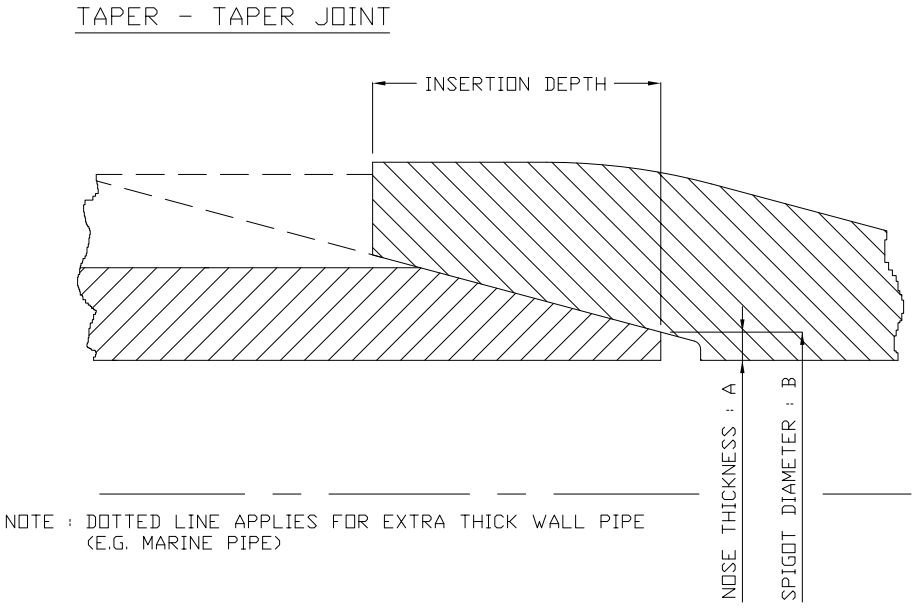
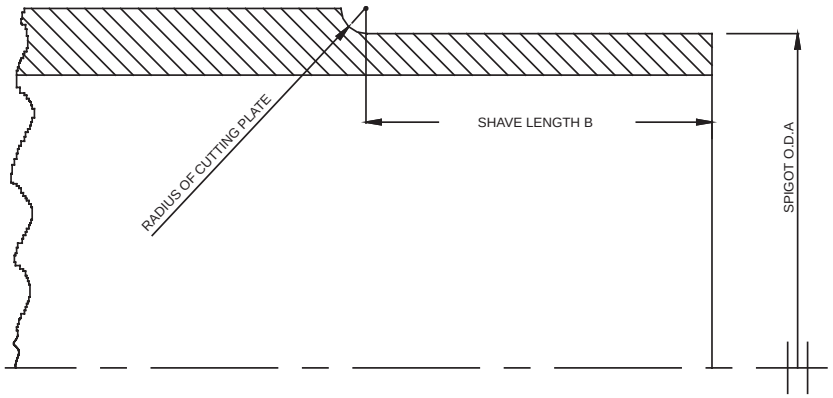


Table 3: For Quick-Lock spigots

Nominal Pipe Size			Pipe ID	Quick-Lock Spigot OD	Tol.	Shaved Length
mm	inch	type		A		B
400	16	Industry	394	404.30	± 0.20	103-106
400	16	IPS	386	404.30	± 0.20	103-106
400	16	MCI	407	427.25	± 0.25	103-106
450	18	IPS	434	455.55	± 0.25	107-110
450	18	MCI	456	478.25	± 0.25	107-110
500	20	IPS	482	506.35	± 0.25	113-116
500	20	MCI	505	529.65	± 0.25	113-116
600	24	IPS	579	607.95	± 0.25	129-132
600	24	MCI	603	633.05	± 0.25	129-132

Notes:
1. All dimensions are in mm;
2. IPS = Iron Pipe Size / MCI = Metric Cast Iron;
3. For shaving dimensions for mechanical couplings consult coupling supplier.



Part List for M87XL Shaver

Drawing Reference: 5-CD-718 Rev. O

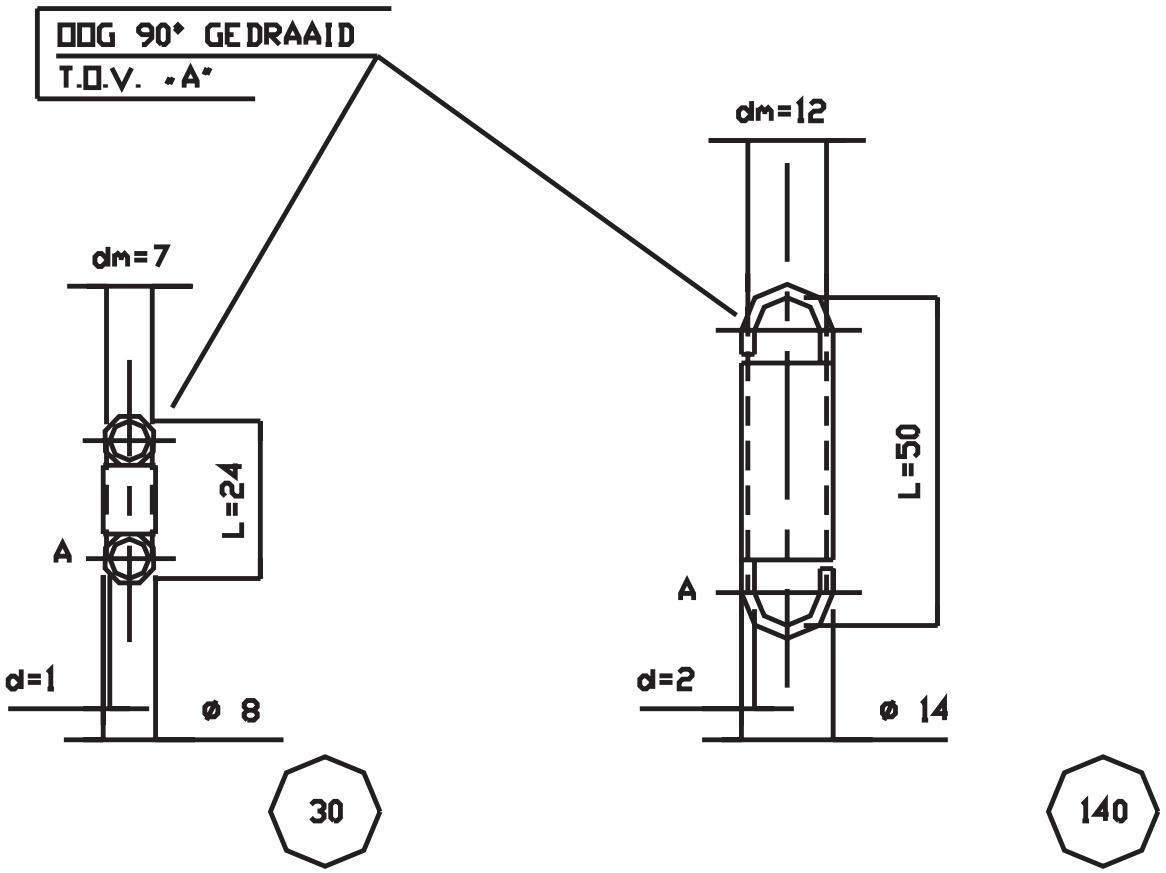
Part	Qty	Description	Dimension	Standard	Material
9	1	Bearing	ø 35 x ø 17 x 10	S.K.F	6003-2RS1
10	1	Tube	(ø 46 x ø 30) x 430	1. 4301	Stainless Steel
11	1	Support	ø 30 x 398	1.4301	
12	6	Countersink screw	M4 x 10	DIN 965	
13	1	Threaded rod	ø 20 x 440	1. 2379	Steel, hardened
16	1	Hex. cap. screw	M12 x 90	DIN 912	
17	2	Countersink screw	M6 x 25	DIN 965	Galvanised
18	1	Plate	11 x 30 x 70	AMPCO 18	Bronze
19	4	Countersink screw	M8 x 16 (3 or 4 pcs)	DIN 965	Galvanised
21	1	Key	8 x 12 x 365	1. 4301	Stainless Steel
22	1	Cil. Screw	M12 x 50	DIN 912	Galvanised
23	1	Washer	ø 13 x ø 24 x 2,5	DIN 125A	Galvanised
24	1	Toolbit	NR. RCMT 1204 MO-H13-A	RCMT-1204	Sandvik
25	1	Holder	NR 230-594-012-N100		Sandvik
26	1	Insert	NR 5512-090-01-N100		Sandvik
27	1	Screw	NR 5513-020-01		Sandvik
28	1	Shaft	ø 12 x 90	1. 4301	Stainless Steel
29	1	Block	22 x 36 x 44	1. 2842	HRD 56 - 58˚Rc
30	1	Tension Spring	see drawing page 11	1. 1200	Stainless Steel
31	1	Pin	ø 5 x 48	1. 4301	Stainless Steel
32	1	Block	12 x 12 x 15	1. 4301	Stainless Steel
33	1	Countersink screw	M3 x 20	DIN 965	Galvanised
34	1	Handle	ø 10 x 85	1. 4301	Stainless Steel
35	1	Fork	20 x 20 x 28	1. 4301	Stainless Steel
36	1	Pin	ø 4 x 20	DIN1481	Stainless Steel
41	1	Screw	M10 x 70	1. 4301	Bronze
42	1	Tube	ø 24 x 42	AMPCO 18	Bronze
43	1	Compr. spring	see drawing page 11	1. 1200	Stainless Steel
44	1	Disc	ø 20 x 6	1. 4301	
45	1	Cil. screw	M6 x 16	DIN 912	Galvanised
46	1	Safety ring	ø 17 x 1,0	DIN 471	
47	1	Bearing	ø 35 x ø 17 x 10	S.K.F.	6003-2RS1
48	2	Adjusting screw	M6 x 10	DIN 916	
49	1	Coupling	ø 35 x 65	Madler	602 020 Galvanised
50	1	Shaft	ø 20 x 96,5	1. 2301	
Part	**Qty**	**Description**	**Dimension**	**Standard**	**Material**
51	2	Bearing	ø 32 x ø 15 x 13	SKF	63002-2RS1
60	2	Countersink screw	M12 x 20	DIN 965	Galvanised
61	1	Safety ring	ø 15 x 1,0	DIN 471	
62	1	Pulley	Jasper 22L100	z=22	Pitch 3/8" Galvanised
63	2	Safety ring	ø 32 x 1,2	DIN 472	
64	2	Bearing	ø 32 x ø 15 x 13	SKF	63002-2RS1
65	1	Shaft	ø 18 x 80	1. 4301	Stainless Steel
67	2	Plug	ø 20 x 26	1. 4301	Stainless Steel
68	4	Cil. Screw	M12 x 120	DIN 912	Galvanised
69	4	Washer	ø 13 x ø 24 x 2,5	DIN 125 A	Galvanised
72	1	Safety ring	ø 15 x 1,0	DIN 471	

Part List for M87XL Shaver (continued)

Part	Qty	Description	Dimension	Standard	Material
73	1	Pulley	Jasper 22L100	z=22	Pitch 3/8" Galvanised
74	1	Adjusting screw	M18 x 25	DIN 914	
75	2	Bearing	ø 32 x ø 12 x 16	SKF	3201A-2 RS1-TN9
76	2	Cil. screw	M6 x 16	DIN 912	Galvanised
77	2	Disc	ø 20 x 3	1. 4301	
78	2	Cylinder	ø 38 x 40	1. 4301	
79	2	Safety ring	ø 32 x 1,2	DIN 472	Galvanised
84	2	Bolt	27 x 37,5	1. 4301	
85	2	Washer	ø 13 x ø 24 x 2,5	DIN 125 A	Galvanised
86	2	Self locking nut	M12	DIN 985	
103	8	Washer	ø 13 x ø 24 x 2,5	DIN 125 A	Galvanised
104	1	Nut	M12	DIN 934	
105	4	Hex. head bolt	M12 x 55	DIN 934	Galvanised
106	1	Washer	ø 17 x ø 30 x 3	DIN 125 A	Galvanised
112	1	Hex. head screw driver	see drawing page 11	46235	Fijnwerk B.V.
129	1	Disc	ø 68 x 12	1. 4301	
130	2	Safety ring	ø 20 x 1,2	DIN 471	
131	1	Axle	ø 20 x 160	1. 4301	
132	2	Cil. screw	M12 x 20	DIN 912	Galvanised
133	2	Washer	ø 13 x ø 24 x 2,5	DIN 125 A	Galvanised
134	2	Pipe ring	ø 25 x ø 21 x 2	1. 4301	
135	2	Cil. Screw	M12 x 30	DIN 912	Galvanised
136	2	Washer	ø 13 x ø 24 x 2,5	DIN 125 A	Galvanised
137	1	Nut	ø 18 x 8	2. 401	Brass
138	1	Screw	ø 12 x 45	1. 4301	
139	2	Countersink screw	M6 x 20	DIN 965	Galvanised
140	2	Tension spring	see drawing page 11	1. 1200	
152	1	Bearing bush	ø 50 x ø 42 x 60	AMPCO 18	Bronze
156	1	Key	NR 5680-016-01	POS 26-27	Sandvik
161	2	Bearing	ø 85 x ø 45 x 23	SKF	62209-2RS1
162	1	Pipe	ø 46 x ø 28 x 825	1. 4301	
163	1	Ring	ø 60 x 29	1. 4301	
164	1	Ring	ø 60 x 25	1. 4301	
165	1	Tube	ø 37.8 x 15	AMPCO 18	Bronze
166	1	Pully	Jasper 22L100	z=22	Pitch 3/8" Galvanised
167	1	Adjusting screw	M8 x 12	DIN 914	
168	1	Shaft	ø 20 x 50		
169	2	Safety ring	ø 20 x 1,2	DIN 471	
170	1	Roller	ø 20 x ø 52 x 20,5	SKF	305704 C-2Z
174	8	Washer	ø 13 x ø 24 x 2,5	DIN 125 A	Aluminium
175	4	Nut	M12	DIN 934	
176	4	Cil. screw	M12 x 30	DIN 912	Galvanised
180	8	Washer	ø 13 x ø 24 x 2,5	DIN 125 A	Galvanised
181	4	Nut	M12	DIN 934	
182	4	Hex. head bolt	M12 x 55	DIN 931	Galvanised
183	1	Geared Belt	25 mm	540 L"	Pitch 3/8" Galvanised

Part List for M87XL Shaver (continued)

Part	Qty	Description	Dimension	Standard	Material
186	1	Tube	ø 100 x 85	1. 0110	Galvanised
187	1	Disc	ø 50 x 8	1. 0110	Galvanised
188	1	Rod	ø 16 x 898	1. 4301	
189	1	Nut	M16	DIN 934	
190	1	Key	7 x 10 x 50	1. 4301	
191	1	Countersink screw	M4 x 12	DIN 965	Galvanised
199	1	Safety ring	ø 45 x 1,75	DIN 471	
198	1	Plate	ø 190 x 8		Aluminium
199	1	Safety ring	ø 45 x 1,75	DIN 471	
200	4	Washer	ø 13 x ø 24 x 2,5	DIN 125 A	Galvanised
201	4	Cil. screw	M12 x 20	DIN 912	Galvanised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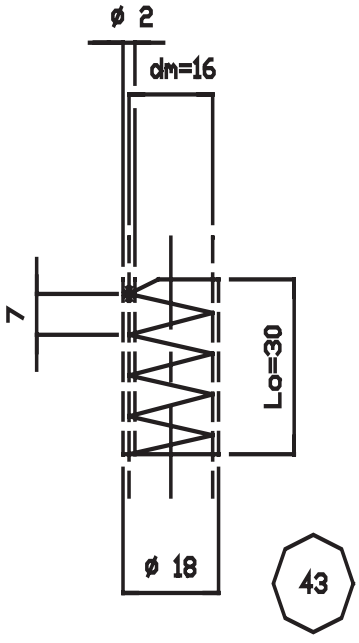
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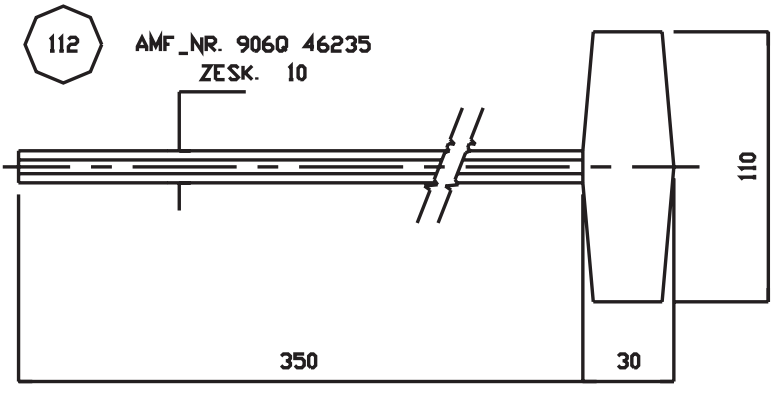
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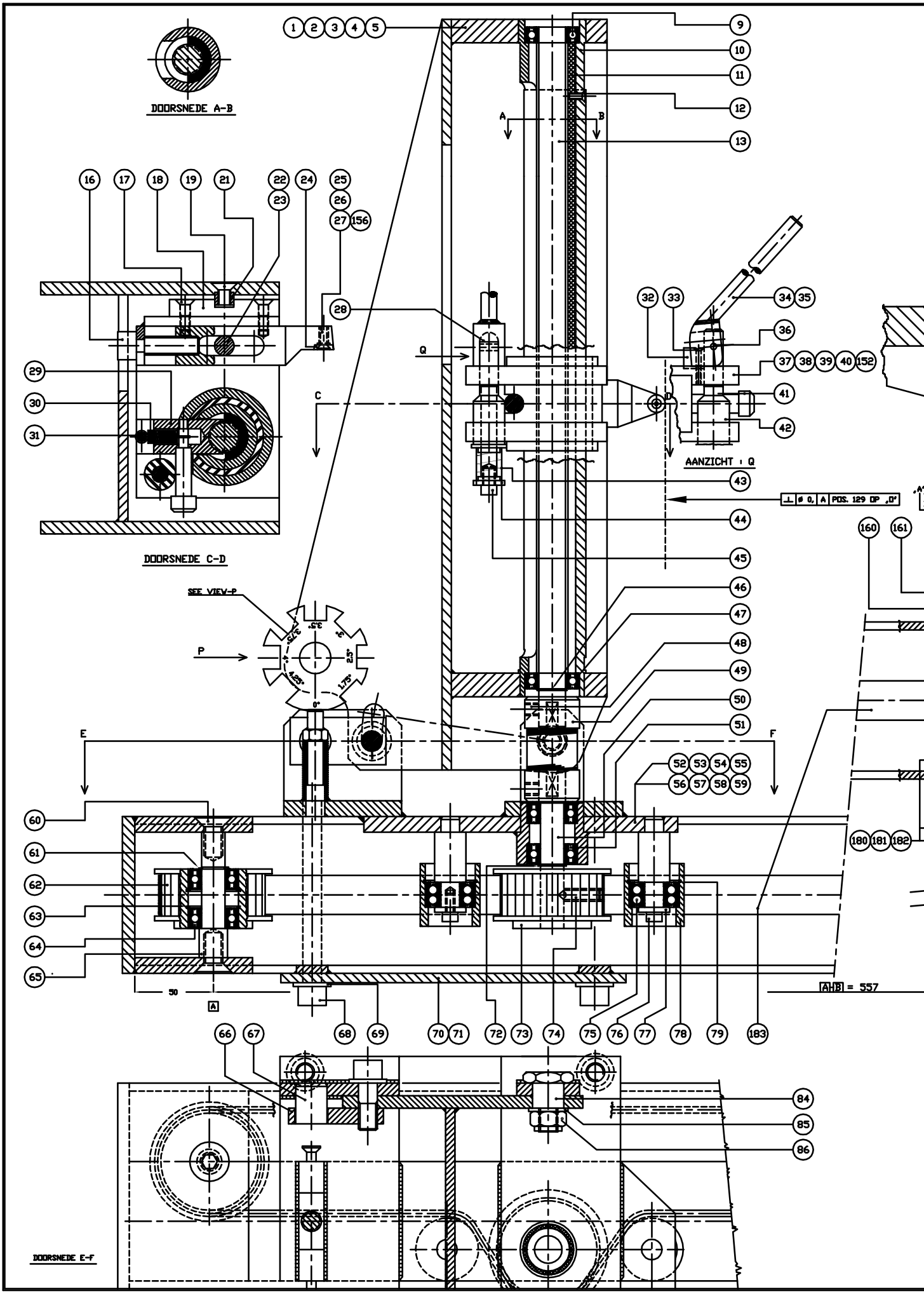
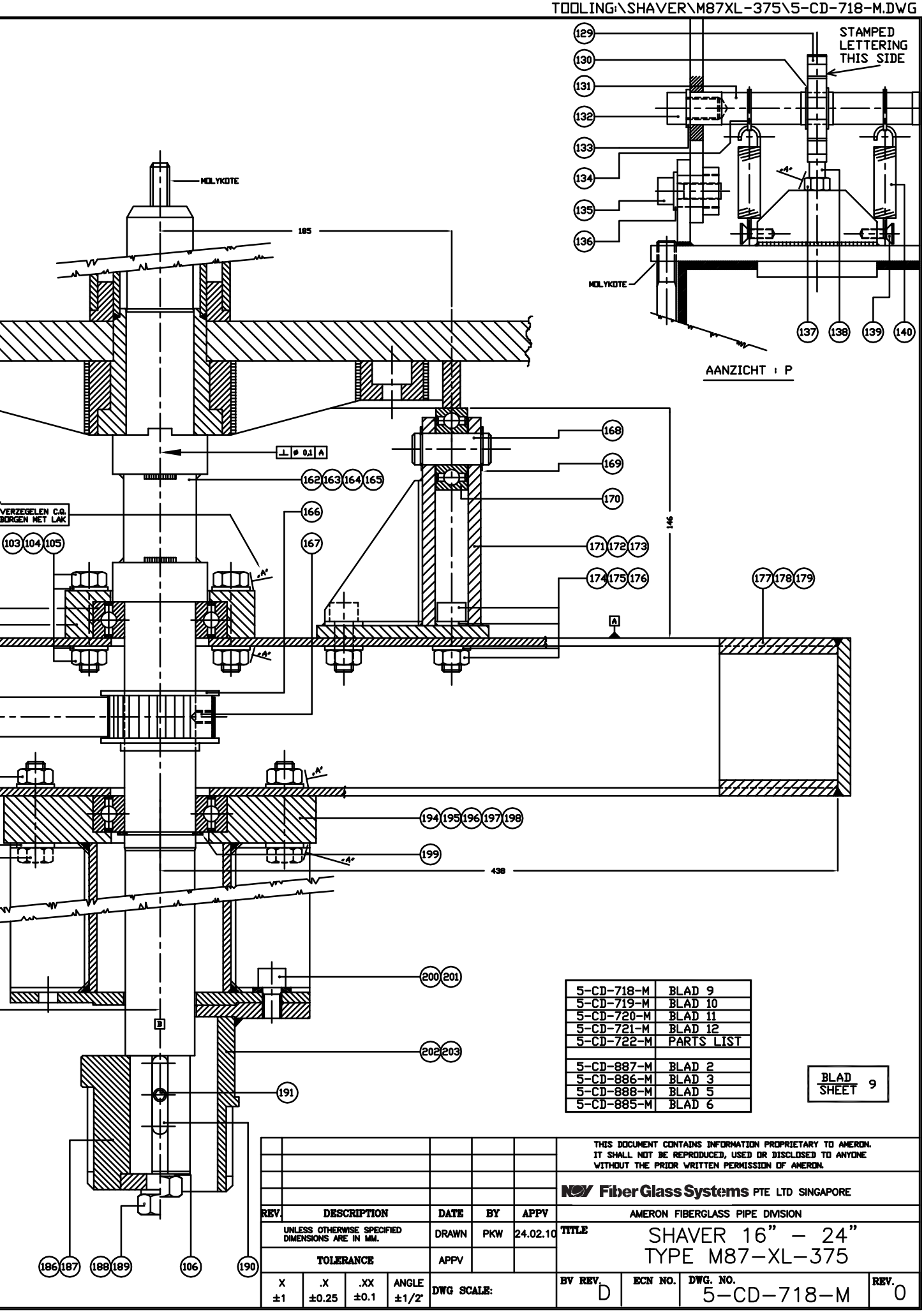

DOORSNEDE A-B
DOORSNEDE C-D
AANZICHT : Q
SEE VIEW-P
DOORSNEDE E-F
AHB = 557



5-CD-718-M	BLAD 9
5-CD-719-M	BLAD 10
5-CD-720-M	BLAD 11
5-CD-721-M	BLAD 12
5-CD-722-M	PARTS LIST
5-CD-887-M	BLAD 2
5-CD-886-M	BLAD 3
5-CD-888-M	BLAD 5
5-CD-885-M	BLAD 6

BLAD 9 / SHEET

REV.	DESCRIPTION	DATE	BY	APPV
	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM.	DRAWN	PKW	24.02.10
	TOLERANCE	APPV		

X	.X	.XX	ANGLE
±1	±0.25	±0.1	±1/2°

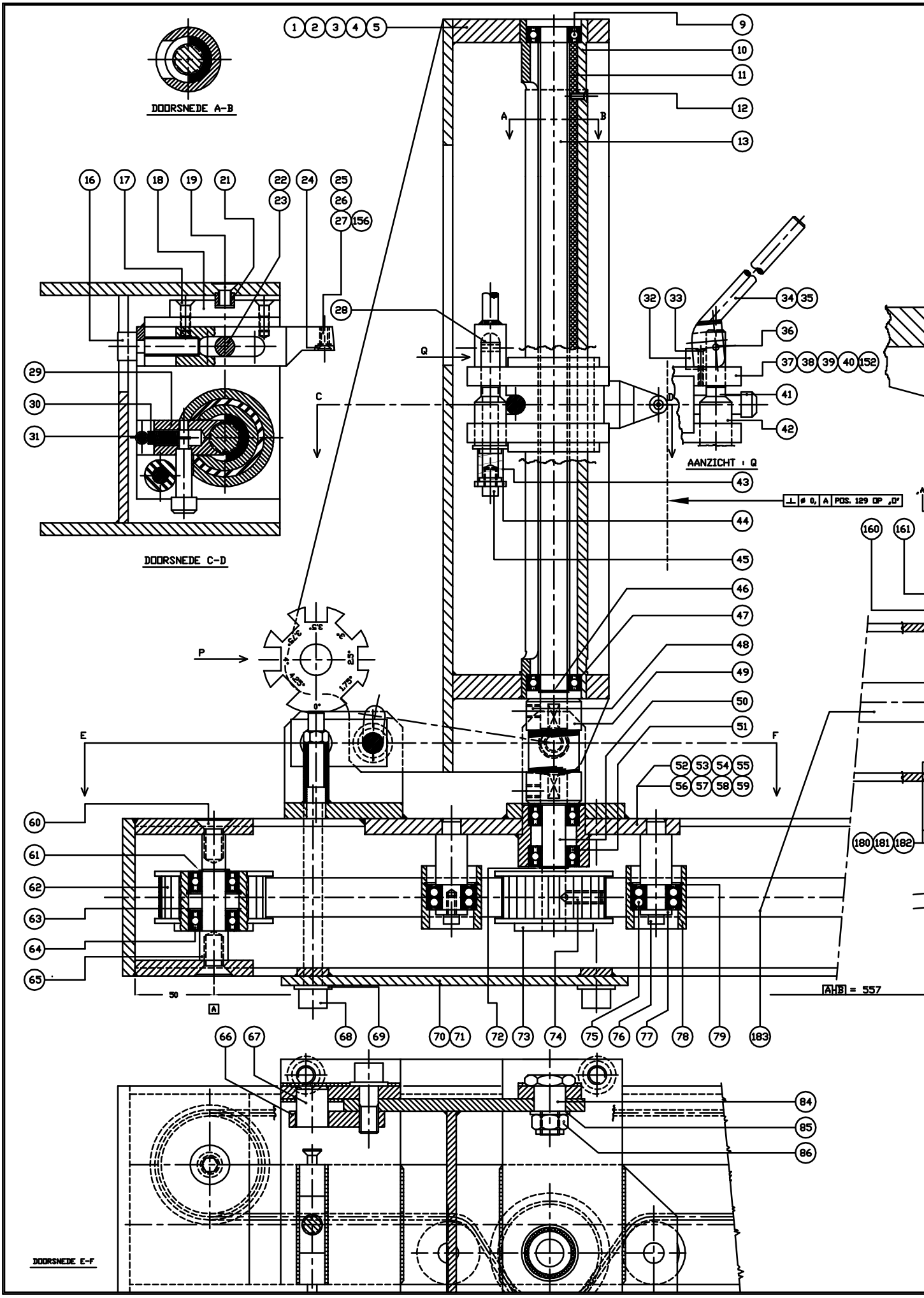
DWG SCALE:

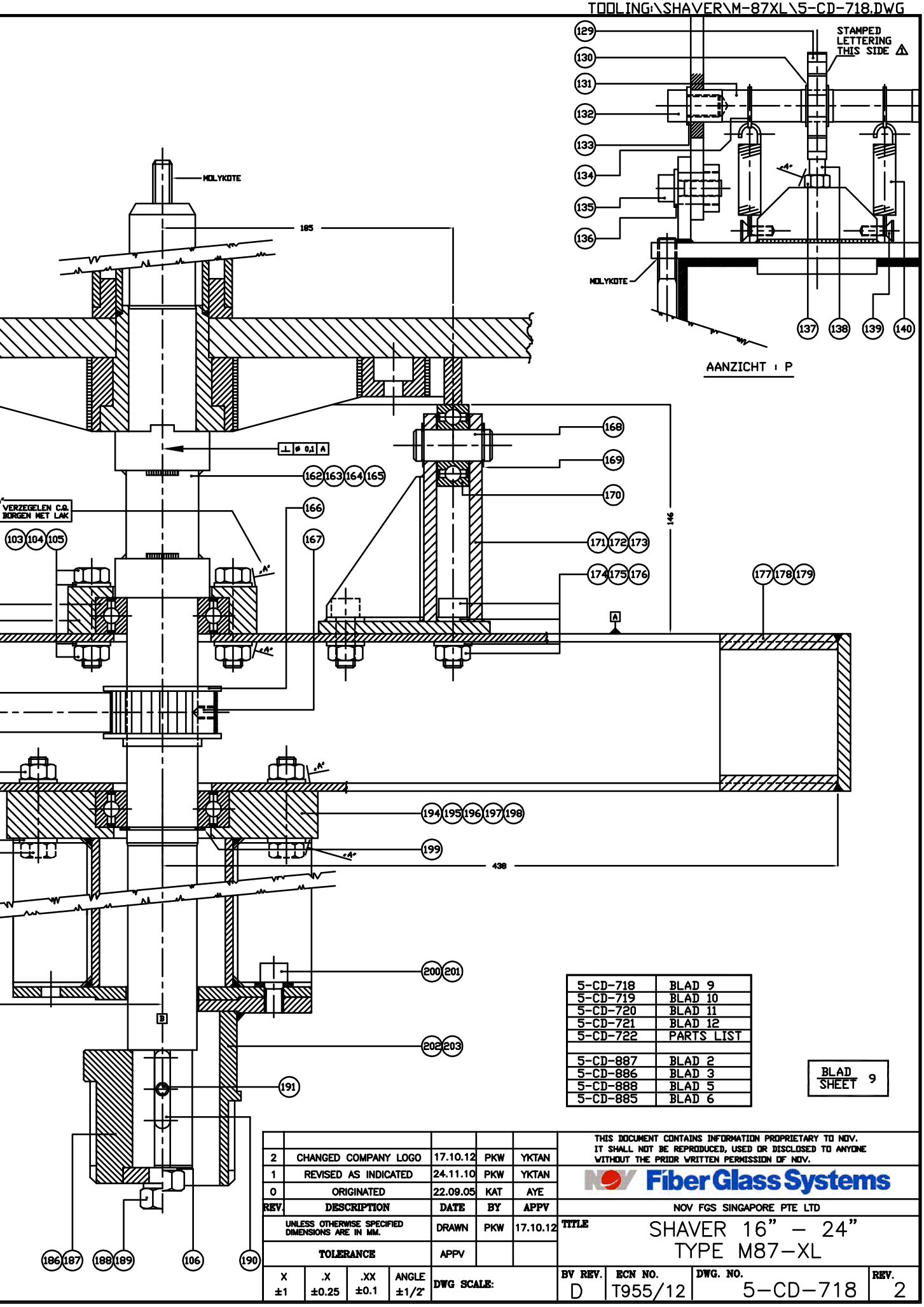
NOV Fiber Glass Systems PTE LTD SINGAPORE

AMERON FIBERGLASS PIPE DIVISION

TITLE: SHAVER 16" – 24" TYPE M87-XL-375

BV REV.	ECN NO.	DWG. NO.	REV.
D		5-CD-718-M	0


DOORSNEDE A-B
DOORSNEDE C-D
AANZICHT : Q
DOORSNEDE E-F
A-B = 557
POS. 129 OP „0"



5-CD-718	BLAD 9
5-CD-719	BLAD 10
5-CD-720	BLAD 11
5-CD-721	BLAD 12
5-CD-722	PARTS LIST
5-CD-887	BLAD 2
5-CD-886	BLAD 3
5-CD-888	BLAD 5
5-CD-885	BLAD 6

BLAD 9
SHEET

REV	DESCRIPTION	DATE	BY	APPV
2	CHANGED COMPANY LOGO	17.10.12	PKW	YKTAN
1	REVISED AS INDICATED	24.11.10	PKW	YKTAN
0	ORIGINATED	22.09.05	KAT	AYE

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM.

TOLERANCE

X	.X	.XX	ANGLE
±1	±0.25	±0.1	±1/2°

DRAWN PKW 17.10.12
APPV

DWG SCALE:

NOV Fiber Glass Systems

NOV FGS SINGAPORE PTE LTD

TITLE: SHAVER 16" – 24" TYPE M87–XL

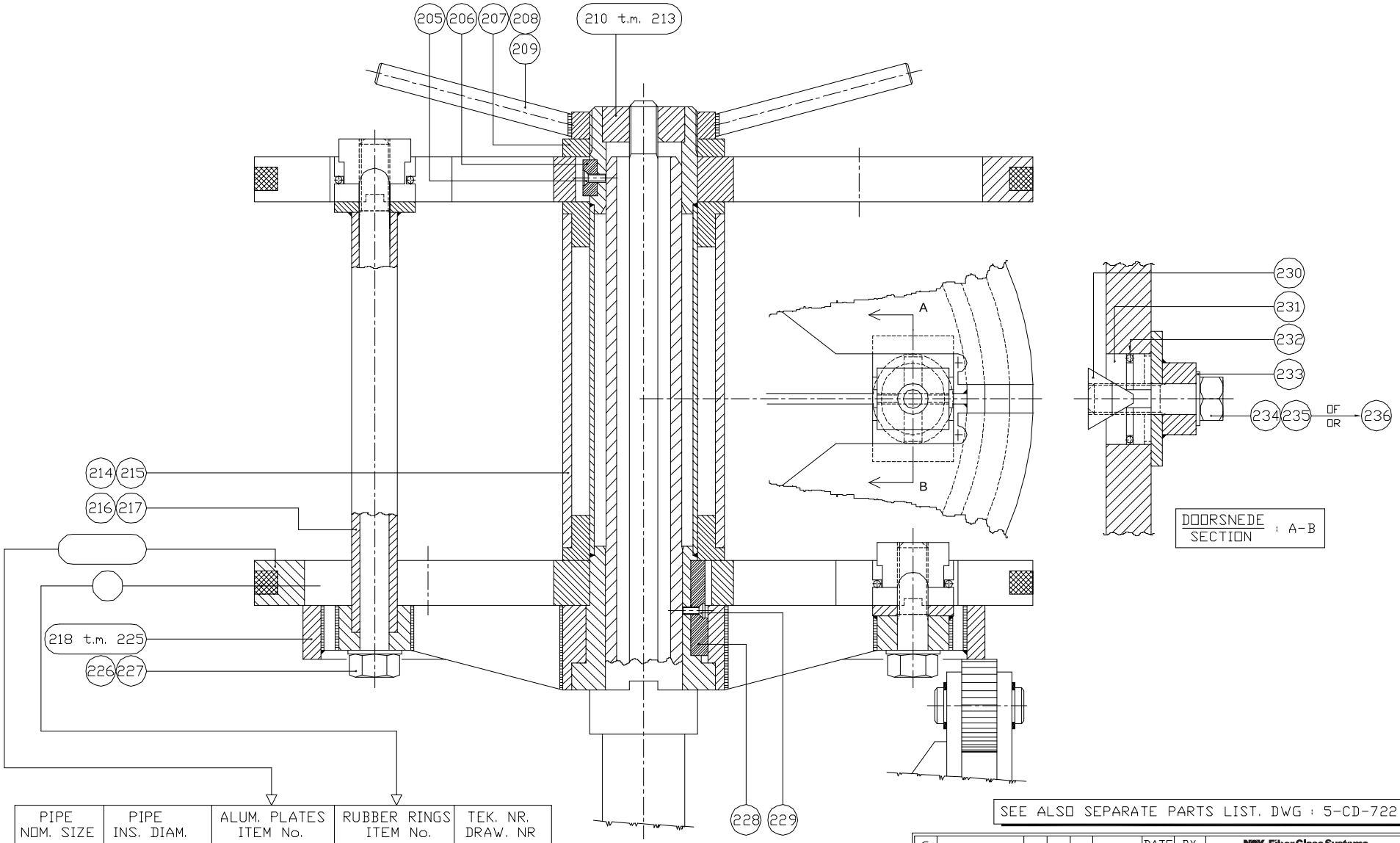
BV REV.	ECN NO.	DWG. NO.	REV.
D	T955/12	5–CD–718	2

Part List for M87XL Arbor

Drawing Reference: 5-CD-728 Rev. C

Part	Qty	Description	Dimension	Standard	Material
205	1	Countersink screw	M4 x 12	DIN 965	Galvanised
206	1	Key	8 x 10 x 11	1. 4305	Stainless Steel
207	1	Ring	ø 90 x 10	1. 4305	Stainless Steel
208	2	Handle	ø 12 x 40	1. 0116	Galvanised
209	1	Nut	ø 80 x 15	1. 0116	Galvanised
210	1	Nut	ø 46 x 20	1. 0116	Galvanised
211	1	Threaded bar	ø 60 x 60	1. 0116	Galvanised
212	1	Pipe	G2" L=195	1. 0116	Galvanised
213	1	Hub	ø 80 x 80	1. 0116	Galvanised
214	1	Pipe	ø 90 x ø 80	L=186	Aluminium
215	2	Ring	ø 90 x ø 25		Aluminium
216	1	Plate	10 x 45 x 70	1. 0116	Galvanised
217	1	Pipe	ø 25 x ø 17 x 234	1. 0116	Galvanised
218	1	Plate	10 x 45 x 70	1. 0116	Galvanised
219	1	Plug	ø 40 x 19	1. 0116	Galvanised
220	1	Hub	ø 90 x 47	1. 0116	Galvanised
221	1	Plug	ø 40 x 25	1. 0116	Galvanised
222	6	Strip	6 x 46 x 135	1. 0116	Galvanised
223	1	Edge	10 x 30 x 1163	1. 0116	Galvanised
224	2	Strip	6 x 46 x 85	1. 0116	Galvanised
225	2	Strip	6 x 10 x 25	1. 0116	Galvanised
226	1	Nut	M16	DIN 934	Galvanised
227	1	Threaded bar	ø 16 x 300	1. 6582	Galvanised
228	1	Key	10 x 10 x 53	1. 4305	Stainless Steel
229	2	Countersink screw	M4 x 12	DIN 965	Galvanised
230	2	Wedge Block	25 x 34 x 40	1. 2510	Hard. 54˚Rc
231	2	Exp. Grip	25 x 45 x 45	1. 2510	Hard. 54˚Rc
232	2	Tension Spring	Dm=3,0 D=0,5	L=95 T408	Tevema
233	2	Washer	ø 17 x ø 30 x 3	DIN 125 A	Galvanised
234	1	Nut	M16	DIN 934	Galvanised
235	1	Threaded bar	ø 16 x 75	1. 6582	Galvanised
236	1	Hex. Head bolt	M16 x 60-8,8	DIN 931	Galvanised
33	1	Disc	ø 434 x 25	3. 2315	Aluminium 51 pcs

Part	Qty	Description	Dimension	Standard	Material
34	2	Plate	10 x 30 x 75	1. 4301	Stainl. Steel AISI-305
35	2	Countersink screw	M10 x 35	DIN 7995	Stainless Steel
36	2	Nut	M10	DIN 985	Stainless Steel
37	4	Countersink screw	M8 x 35	DIN 7991	Stainless Steel
38	4	Nut	M8 x 35	DIN 985	Stainless Steel
39	2	Ring	13 x 13 L=1323	EPDM	Eriks
40	1	Disc	ø 482 x 25	3. 2315	Aluminium 51 pcs
41	2	Plate	10 x 30 x 75	1. 4301	Stainl. Steel AISI-304
42	2	Countersink screw	M10 x 35	DIN 7991	Stainless Steel
43	2	Nut	M10	DIN 985	Stainless Steel
44	4	Countersink screw	M8 x 35	DIN 7991	Stainless Steel
45	4	Nut	M8	DIN 985	Stainless Steel
46	2	Ring	13 x 13 L=1474	EPDM	Eriks
47	1	Disc	ø 579 x 25	3. 2315	Aluminium 51 pcs
48	2	Plate	10 x 30 x 75	1. 4301	Stainl. Steel AISI-304
49	2	Countersink screw	M10 x 35	DIN 7991	Stainless Steel
50	2	Nut	M10	DIN 985	Stainless Steel
51	4	Countersink screw	M8 x 35	DIN 7991	Stainless Steel
52	4	Nut	M8	DIN 985	Stainless Steel
53	2	Ring	13 x 13 L=1775	EPDM	Eriks
54	1	Disc	ø 530,1 x 25	3. 2315	Aluminium 51 pcs
55	2	Plate	10 x 30 x 75	1. 4301	Stainl. Steel AISI-304
56	2	Countersink screw	M10 x 35	DIN 7991	Stainless Steel
57	2	Self-locking nut	M10	DIN 985	Stainless Steel
58	4	Countersink screw	M8 x 35	DIN 7991	Stainless Steel
59	4	Self-locking nut	M8	DIN 985	Stainless Steel
60	2	Ring	13 x 13 L=1627	EPDM	Eriks
61	2	Disc	ø 393,4 x 25	3. 2315	Aluminium 51 pcs
62	2	Plate	10 x 30 x 75	1. 4301	Stainl. Steel AISI-304
63	2	Countersink screw	M10 x 35	DIN 7991	Stainless Steel
64	2	Self-locking nut	M10	DIN 985	Stainless Steel
65	4	Countersink screw	M8 x 35	DIN 7991	Stainless Steel
66	4	Self-locking nut	M8	DIN 985	Stainless Steel
67	2	Ring	13 x 13 L=1198	EPDM	Eriks



PIPE NOM. SIZE	PIPE INS. DIAM.	ALUM. PLATES ITEM No.	RUBBER RINGS ITEM No.	TEK. NR. DRAW. NR
16″	393,9-393,4	61 t.m. 66	67	5-CD-880
18″	434,0-433,5	33 t.m. 38	39	5-CD-731
20″	482,3-481,8	40 t.m. 45	46	5-CD-732
22″	530,6-530,1	54 t.m. 59	60	5-CD-879
24″	578,8-578,3	47 t.m. 52	53	5-CD-733

SEE ALSO SEPARATE PARTS LIST. DWG : 5-CD-722

No.	DESCRIPTION	BY	DAT	APP
G				
F				
E				
D				
C	CHGD PDS NR'S	S.P.	02-12 2007	
B	CHGD TO ACAD.DWG	S.P.	25-4 2006	
A	TO COMPLETE	A.Z.	18-03 1996	

REVISIONS

	DATE	BY
DRAWN	03-12 1991	A.Z.
CHECK		
APP.		

ALL DIM. IN mm

SCALE NONE

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TITLE : SHAVER 16″ - 24″ M87XL SHAVER

ECN. No. 836 | DWG. No. 5-CD-728 | REV. C

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NOV Fiber Glass Systems

TLS 2005 supersedes FP 455 C - November 2012