

M86 Pipe Shaver

for Taper/Taper adhesive-bonded Pipe Joints in sizes 2 to 6 inch (50 - 150 mm)

Introduction

The Bondstrand® M86 Pipe Shaver is designed to prepare a tapered spigot on the cut end of a Bondstrand pipe in the size 2 to 6 inch (50 to 150 mm) allowing a close-tolerance fit to a Bondstrand fitting with a matching tapered socket.

The shaver is centered 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 the O-rings expand to grip the inside of the pipe when the tensioning bolt is tightened. 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 M86 pipe shaver is supplied in a case with one 8 mm Allen® key for fitting the power drive adapter, one 6 mm Allen key for adjustment of tool holder and a Torx® key for cutting tool. An electric power drive and the necessary arbors are supplied separately. A 24 mm spanner is required to tighten the clamping bolt. 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.



M86 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 harmonized European Standards: NEN-EN 1050, NEN-EN 292-1 and NEN-EN 292-2.



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:

- Use left hand to hold the grip of power drive and the right hand to operate the power switch;
- Immediately release the power switch when the shaver seizes to avoid injury to self or damage to tooling;
- The optional power drive torque arm must never be used for safety reasons;
- Pipe-shaver assembly must be at ergonomic height to be able to work in the proper posture;
- Ample rest should be taken to avoid excess physical or mental stress;
- Only authorised persons are to be allowed in the shaving area;
- Before starting the power drive, ensure that the shaver will run free from pipe bench, table or support;
- 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;
- No other type of power drive shall be used if that works at a higher speed than the Ridgid 700;
- Power drive and shaving tool must be kept in good working order to guarantee proper and safe operation. Defective parts must be exchanged, or repaired by qualified persons 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.

A. SETTING THE CORRECT DIAMETER

Remove the power drive adapter (**part no. 40**), fitted to the main body by removing the four Allen screws and washers (**part no. 18**). The hairpin springclip (**part no. 39**) is then removed after which the complete cutting bar assembly (**part nos 28-38**) can be removed. The bar is re-inserted (**Photo 1**) into the holes for the correct size pipe(diameters are stamped in to the front flange plate).



Photo 2

The feed block housing is turned until the end of the cutting bar fits in the slot (**Photo 2**) and the hairpin clip is re-inserted.



Photo 3

Re-fit the power-drive adapter against the main body by sliding it over the center shaft (**Photo 3**). The feed unit protrudes throughout the slots in the adapter.



Insert the four Allen screws with washers from the inside of the main body towards the power-drive adapter and tighten with the 8 mm Allen key (**Photo 4**).



B. FITTING THE ARBOR

- 1) The round nut (part no. 1) is removed from the tensioning bolt (part no. 2).
- 2) The correct size arbor is placed on the shaft.
- 3) The nut is replaced taking care that the protrusions on the nut and on the shaver shaft engage in the slots (Photo 5). The nut and tensioning bolt are not to be tightened until the arbor has been fitted into the pipe to be shaved.

C. THE TAPER CUTTING ANGLE

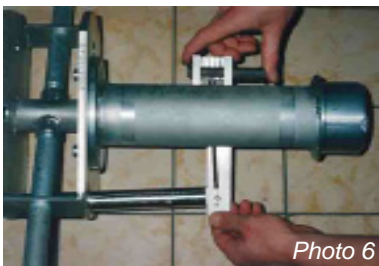
The taper angles are fixed in the shaver construction and can not be changed.

D. FIT THE SHAVER TO THE PIPE

The shaver with the appropriate arbor fitted is slid into the pipe so the arbor is completely in the pipe and flush with the cut pipe end. The shaver is then lifted slightly while the central tensioning bolt is firmly tightened. This is to ensure that the shaver is mounted as squarely as possible into the pipe. After positioning the shaver on the pipe and tightening the tensioning bolt, the power-drive is fitted on to the power-drive adapter on the shaft of the shaver. Make sure that the springloaded key engages in the keyway.

E. ADJUST THE CUTTING TOOL

Loosen the toolholder clamping bolt (part no. 30) in order to turn the adjusting knob (part no. 35) on the back of the cutting tool for changing the cutting depth. The cutting tool should be adjusted to give a cut of max. 2 mm depth. One turn of the adjusting screw on the back of the cutting tool changes the cutting depth by 1 mm per side. So, a maximum of 2 mm cutting depth accomplished by two clock-wise turns, reduces the minor end pipe spigot diameter by 4 mm.



F. ENGAGE THE CUTTING TOOL FEED

The feed is engaged by moving the feed block locking bar (part no. 16) as indicated in Photo 6, towards the main frame. Once engaged, rotate the shaver frame clock-wise around the threaded feed tube by hand or optional power-drive and the cutting tool automatically advances.

G. RETURN THE CUTTING TOOL

First turn the cutting tool free from the pipe. Then the feed is disengaged by moving the slide mentioned in point F. away from the main frame and the cutting bar assembly is reset to its original position. As many cuts as are required to give the correct spigot end diameter can be made following the instructions in point E and F. Table 1a and b give the correct shave dimensions for the various series and diameters of pipe. The M86 shaver automatically disengages the feed mechanism at the maximum limit of the tool holder travel.

H. RETRACT THE CUTTING TOOL

As in point G.

I. REMOVE POWER DRIVE (if fitted)

J. RELEASE CENTRAL TENSIONING BOLT

The shaver can then be removed from the pipe. Care should be taken to pull the shaver straight out of the pipe in order not to damage the thin front edge of the spigot.

The NOV Fiber Glass Systems M86 taper 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 threaded feed tube and its associated components.
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 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.

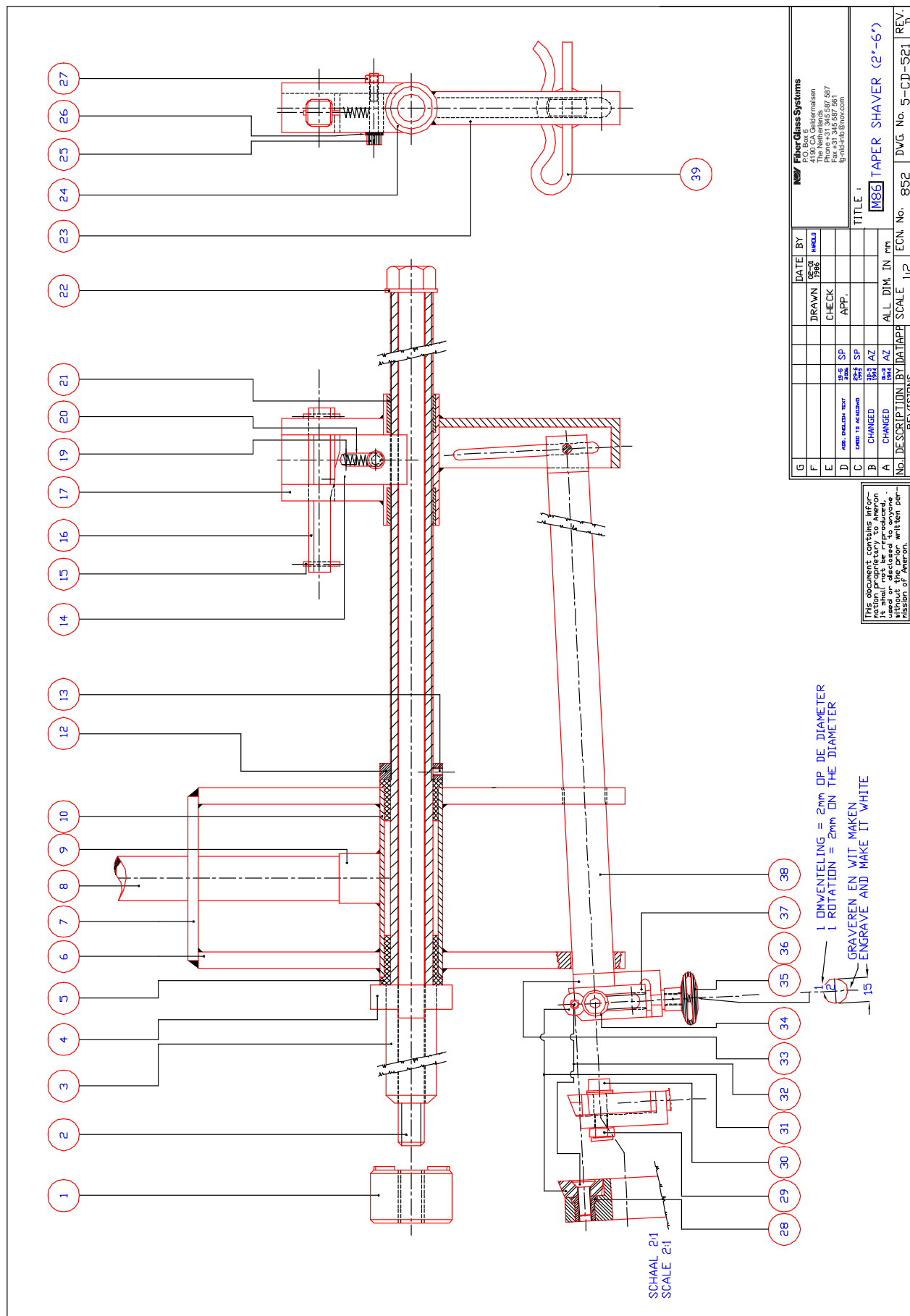
NOTE: On special order, a live instruction of the M86 Shaver Instructions can be supplied on DVD or CD-Rom.

Part List for M86 Shaver (Drawing Ref: 5-CD-521 and 5-CD-525)

art #	Qty	Description	Dimension	Standard	Material	Remark
1	1	Nut	Ø 50x35		AMPCO 18	
2	1	Rod	Ø 16x635		14.301	
3	1	Shaft	Ø 30.4x580		1.2379/St.52	
4	1	Ring	Ø 50x20		12.379	
5	2	Bearing	Ø 38x30		Bronze	
6	2	Plate	Ø 260x10		St. 37	
7	2	Strip	6x40x100		St. 37	
8	2	Pipe	Ø 26.9x3.25; L=300		St. 37	
9	2	Socket	G ^{3/4} "		St. 37	
10	1	Bush	Ø 38x115		St. 37	
11	1	Flange	Ø 148x10		St. 37	
12	1	Nut	Ø 38x10		14.301	
13	1	Lock bolt	M5x8	DIN 913		
14	1	Slide nut	26x30x44		12.842	
15	2	Pin	Ø 3M6x20	DIN 6325		
16	1	Wedge	16x16x100		12.510	
17	1	Block	34x50x70		St. 37	
18	4	Bolt	M10x40	DIN 912		
19	1	Pin	Ø 6M6x10	DIN 6325		
20	1	Press spring	Ø 0.8x Ø 6.3x 33		Stainl. Steel (RVS)	
21	2	Bush	Ø 28x23		12.510	
22	1	Nut	M16-A2-70	DIN 934		
23	1	Shaft	20x30x113.5		St. 37	
24	1	Pipe	Ø 31.8x4; L=80		St. 37	
25	1	Bolt	M6x35	DIN 912	230-594-012-N100	Sandvik
26	1	Washer	Ø 6.4x Ø 12.5x1.6	DIN 125A		
27	1	Nut	M6	DIN 934		
28	1	Bush	M5x0.5		5512-090-01	
29	1	Lock nut	M8	DIN 985		
30	1	Bolt	M8x30	DIN 912		
31	1	Cutting plate		RCMT-1204 M0-H-13-A		Sandvik
32	1	Bolt	M3.5x0.6		5513-020-01	Sandvik
33	1	Adj. block	28x33x52.5		14.301	
34	2	Cone spring	18x8.2x0.8	DIN 2093		
35	1	Knob	Ø 32 M6	37503154		
36	1	Thread spindle	Ø 12x43		14.301	
37	1	Plate housing	13.5x20x50		14.301	
38	1	Rod	Ø 25 h9x347		14.301	
39	1	Clip	39610-6	DIN 11024		
40	1	Pipe	Ø 88.9x4; L=282		St. 37	
41	1	Nut	Ø 36x15		St. 37	
42	1	Bearing	Ø 50x25		Bronze	
43	1	Head	Ø 108x60		St. 37	
44	1	Key-Torx	Nr 5680-016-01			Sandvik
45	1	Hex. Key	width 6	DIN 911	(for part 30)	
46	1	Hex. Key	width 8	DIN 911	(for part 18)	

Shaver & Assembly Drawing

Drawing 5-CD-521



	DATE	BY	SCALE	1:2
G				
F		DRAWN		
E		CHECK		
D		APP.		
C		ENG. IN CHARGE	SP	SP
B		CHANGED	AZ	AZ
A			AZ	AZ

No. DESCRIPTION BY DATE

REVISIONS

1:2

ECN No. 852

DWG. No. 5-CD-521

REV. J

15

GRAVEREN EN VIT MAKEN
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1 DWENTELING = 2mm OP DE DIAMETER
1 ROTATION = 2mm ON THE DIAMETER

SCHAAL 2:1
SCALE 2:1

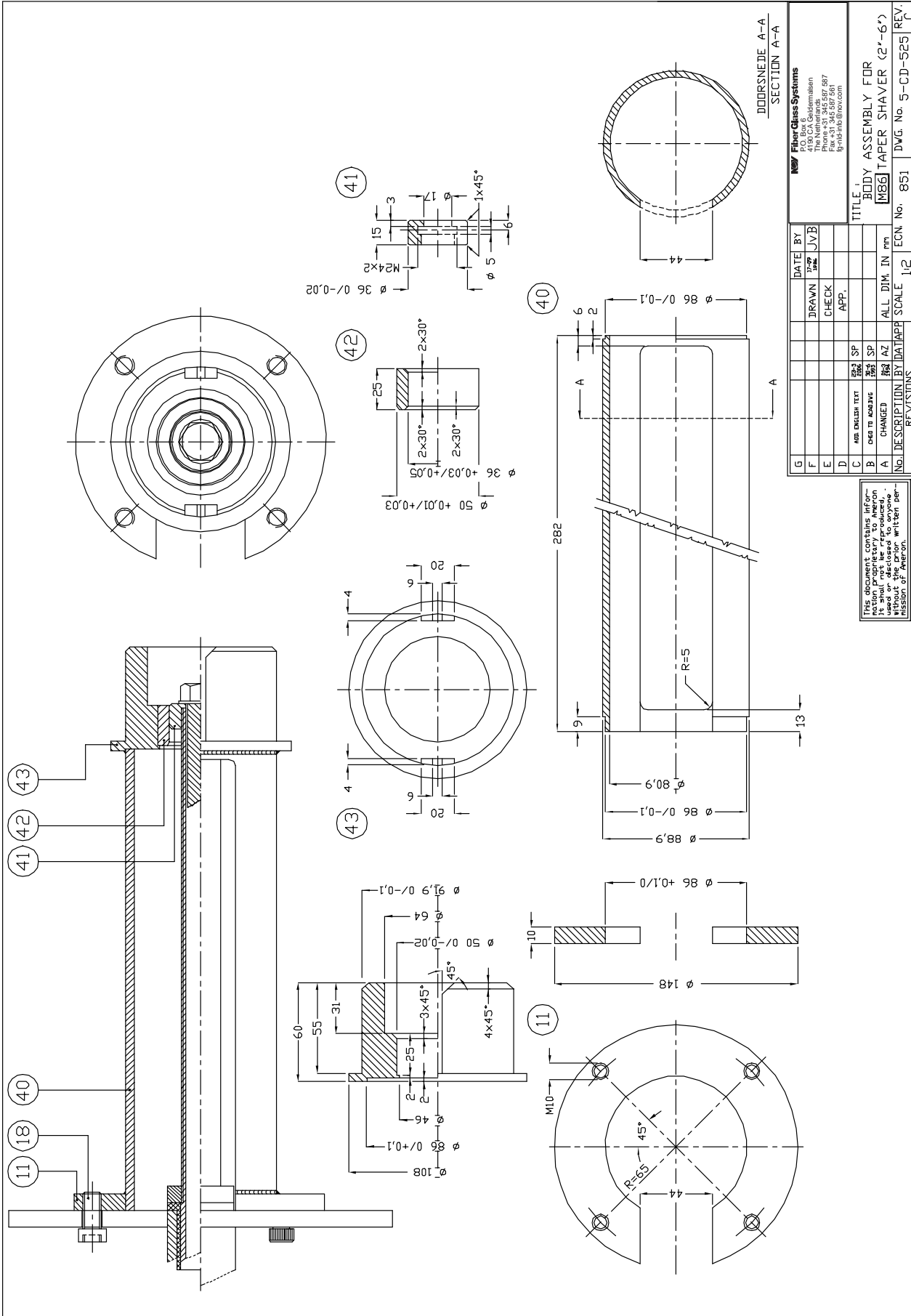
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TITLE 1
MSG TAPER SHAVER (2*-6*)

M86 Power Drive Adaptor
Drawing 5-CD-525



DOORSNEDE A-A
SECTION A-A

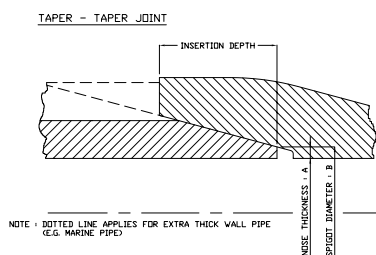
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G	F	E	D	C	B	A	NO.	DESCRIPTION	BY	DATE	DATE	DATE	DATE
							12	SCALE		1/2			
								REVISIONS					

TITLE: BODY ASSEMBLY FOR M86 TAPER SHAVER (2'-6")

ECN No. 851 DWG. No. 5-CD-525 REV. C

Shaving Joint Dimensions *For Taper joints Series 3400 and 2400*



Nom. Pipe Size mm	Taper angle degr.	Nose thickness A	Spigot dia at nose B	Nose thickness A	Spigot dia at nose B	Nose thickness A	Spigot dia at nose B	
			3410/2410		3412/2412		3414/2414	
50	1.75	1.0	55.2	1.0	55.2	1.0	55.2	
75	1.75	1.0	83.8	1.0	83.8	1.0	83.8	
100	1.75	1.0	107.2	1.0	107.2	1.0	107.2	
150	2.50	1.0	161.0	1.0	161.0	1.0	161.0	
			3416/2416		3420/2420		3425/2425	
50	1.75	1.0	55.2	1.0	55.2	1.0	55.2	
75	1.75	1.0	83.8	1.0	83.8	1.0	83.8	
100	1.75	1.0	107.2	1.0	107.2	1.0	107.2	
150	2.50	1.0	161.0	1.0	161.0	1.0	161.0	
			3432/2432		3440/2440		3450/2450	
50	1.75	1.0	55.2	1.0	55.2	1.0	55.2	
75	1.75	1.0	83.8	1.0	83.8	1.5	84.8	
100	1.75	1.0	107.2	1.5	108.2	2.0	109.2	
150	2.50	1.0	161.0	1.5	162.0	2.0	163.0	

Note:

1. All dimensions are in mm.
2. For insertion depth refer to pipe/fitting data sheets.

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