

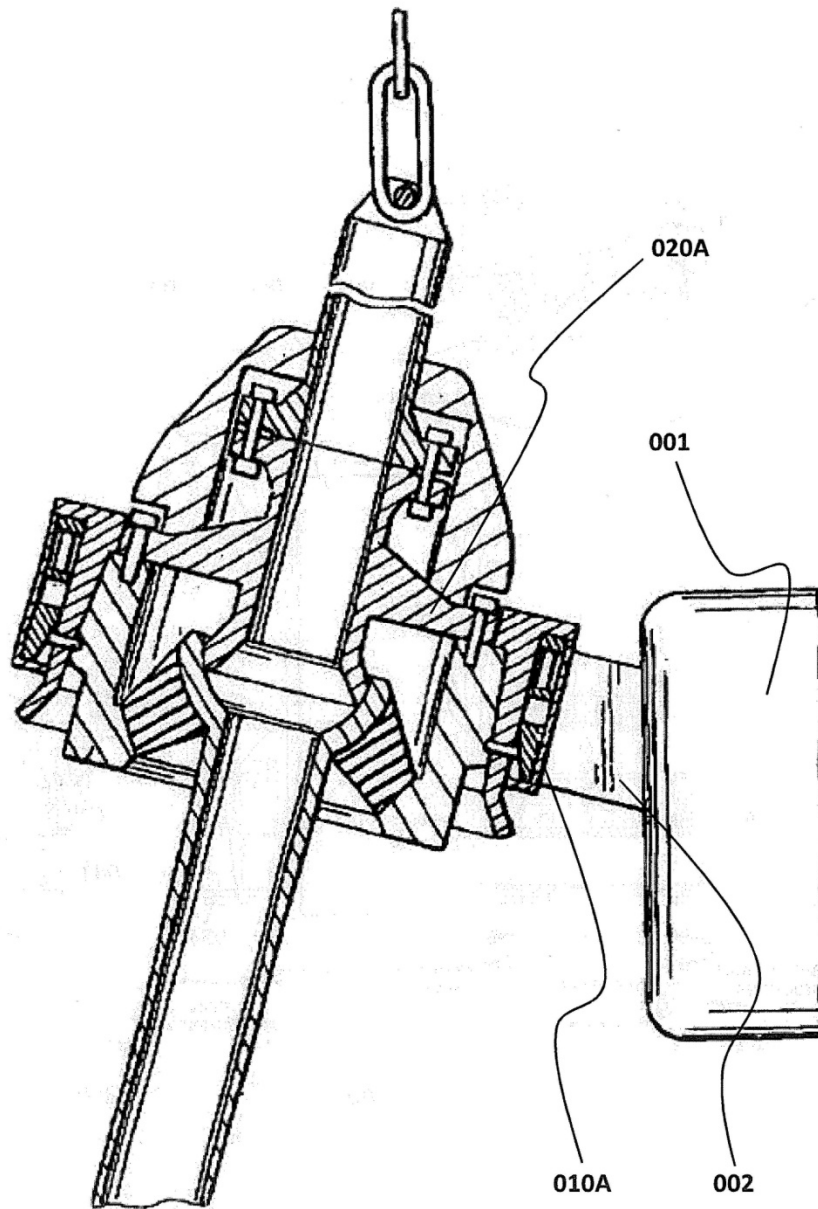


FIGURE 1 (PRIOR ART)

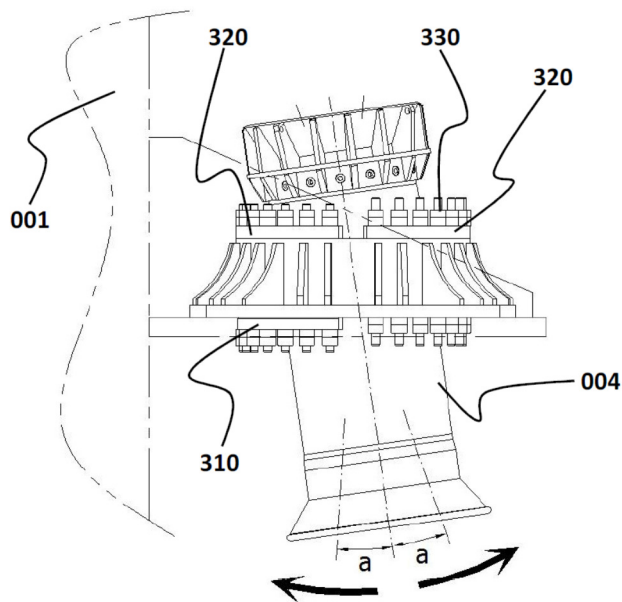


FIGURE 2A

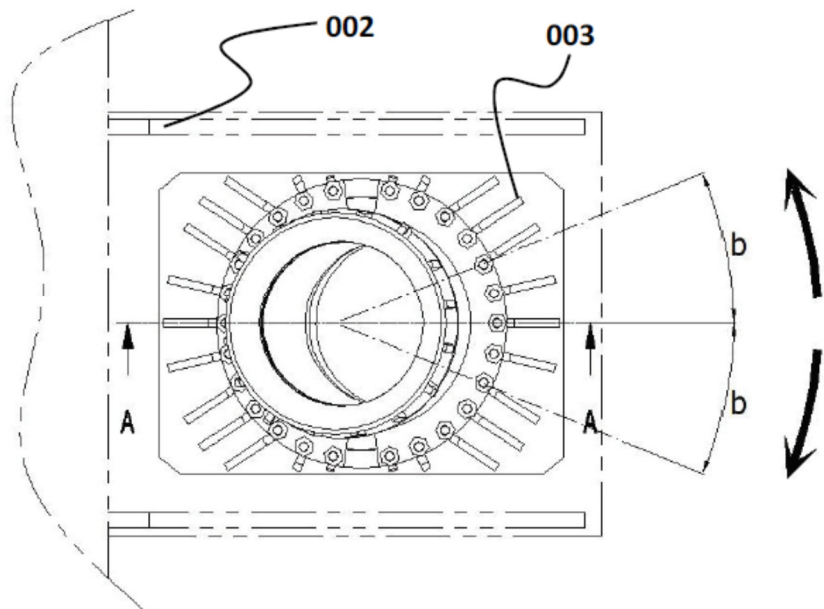


FIGURE 2B

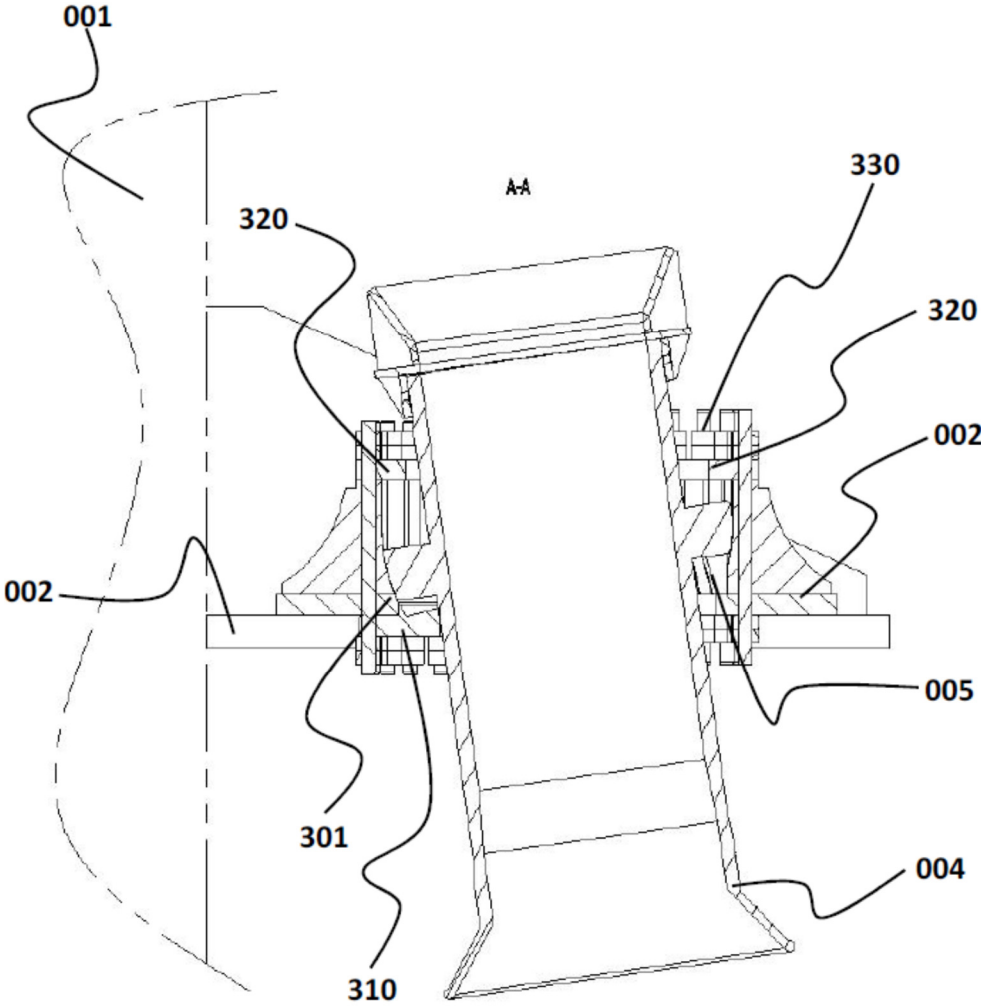


FIGURE 3A

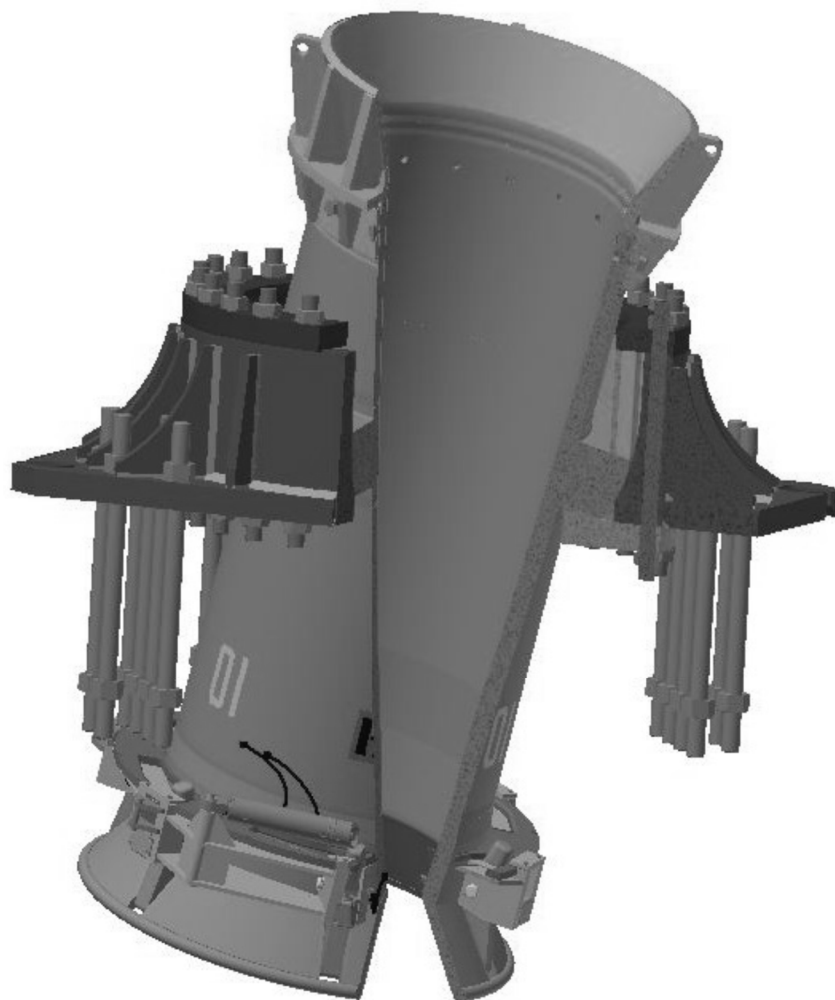


FIGURE 3B

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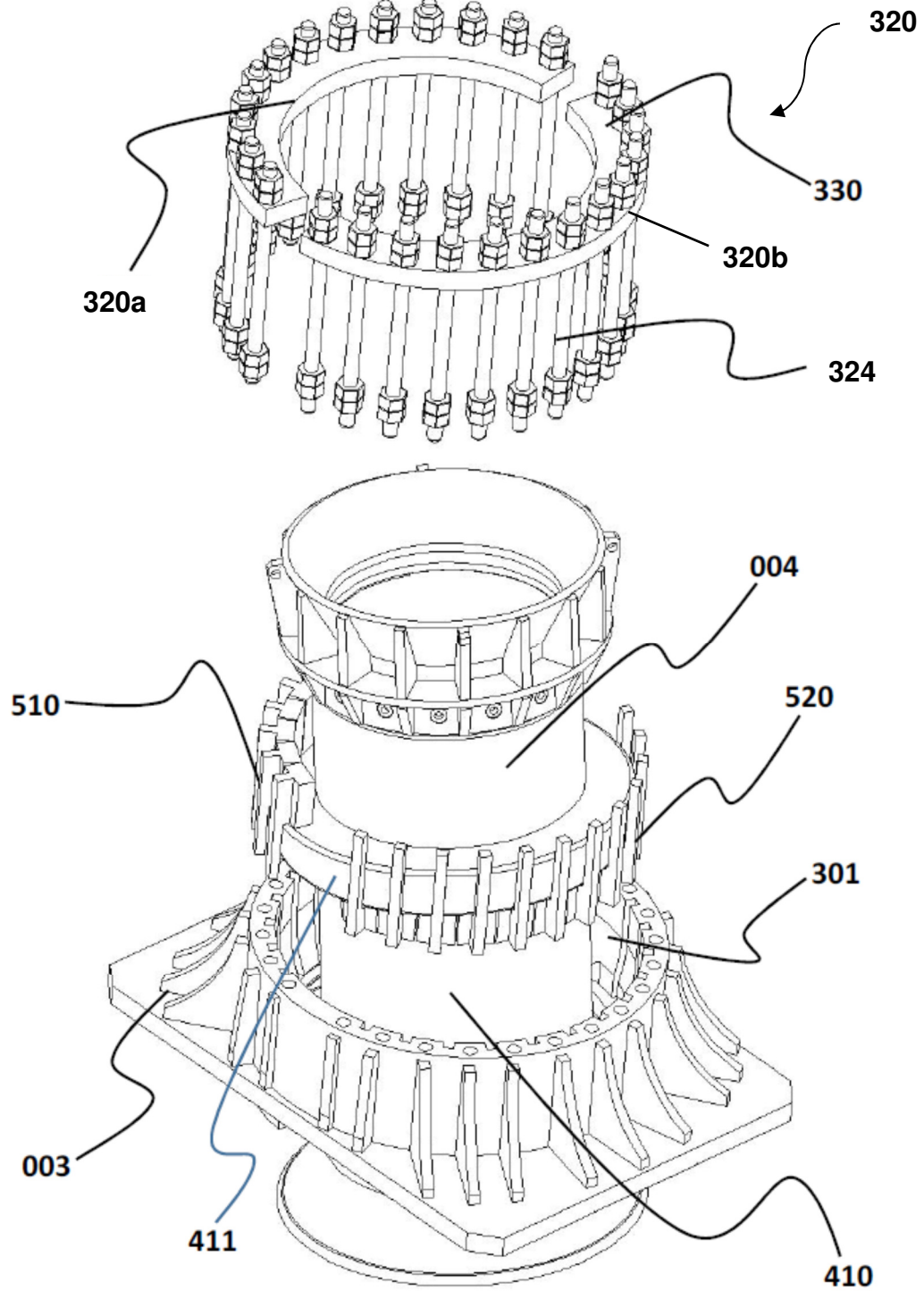


FIGURE 4

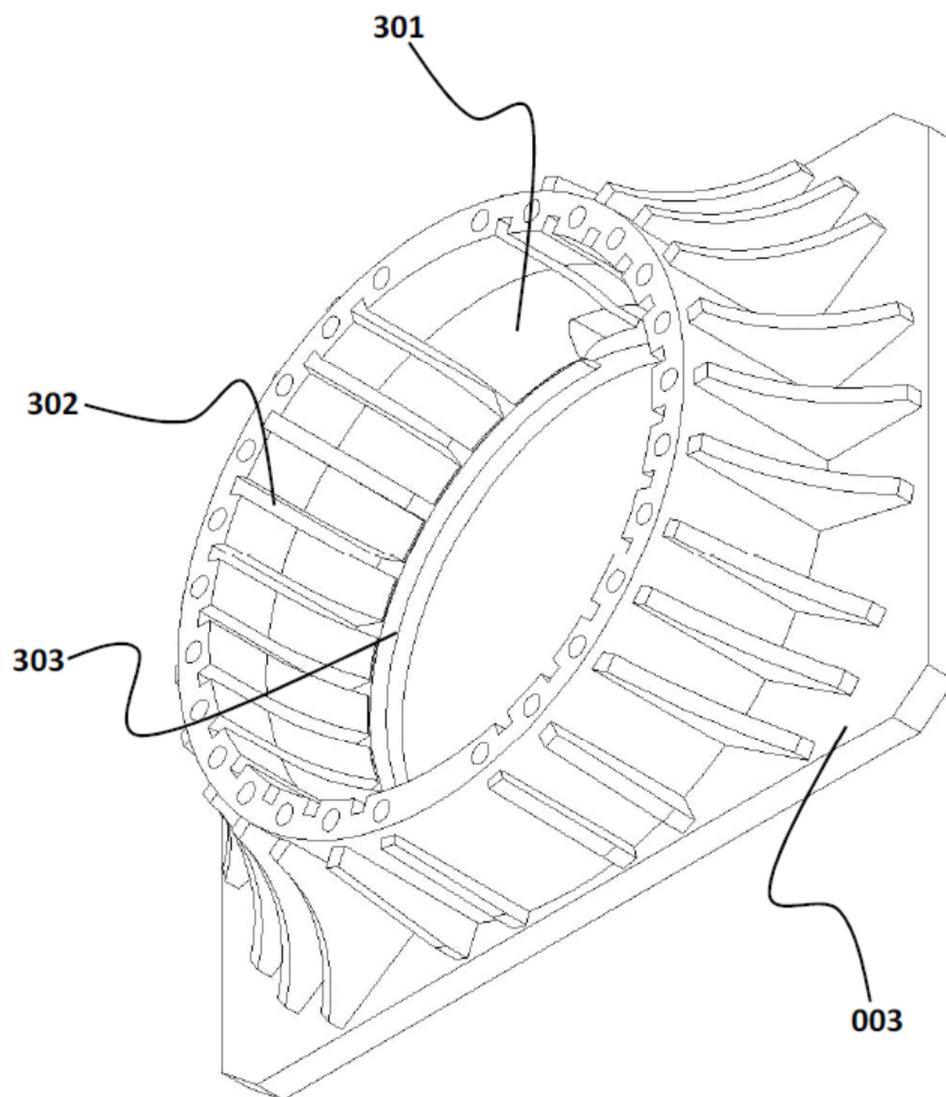


FIGURE 5

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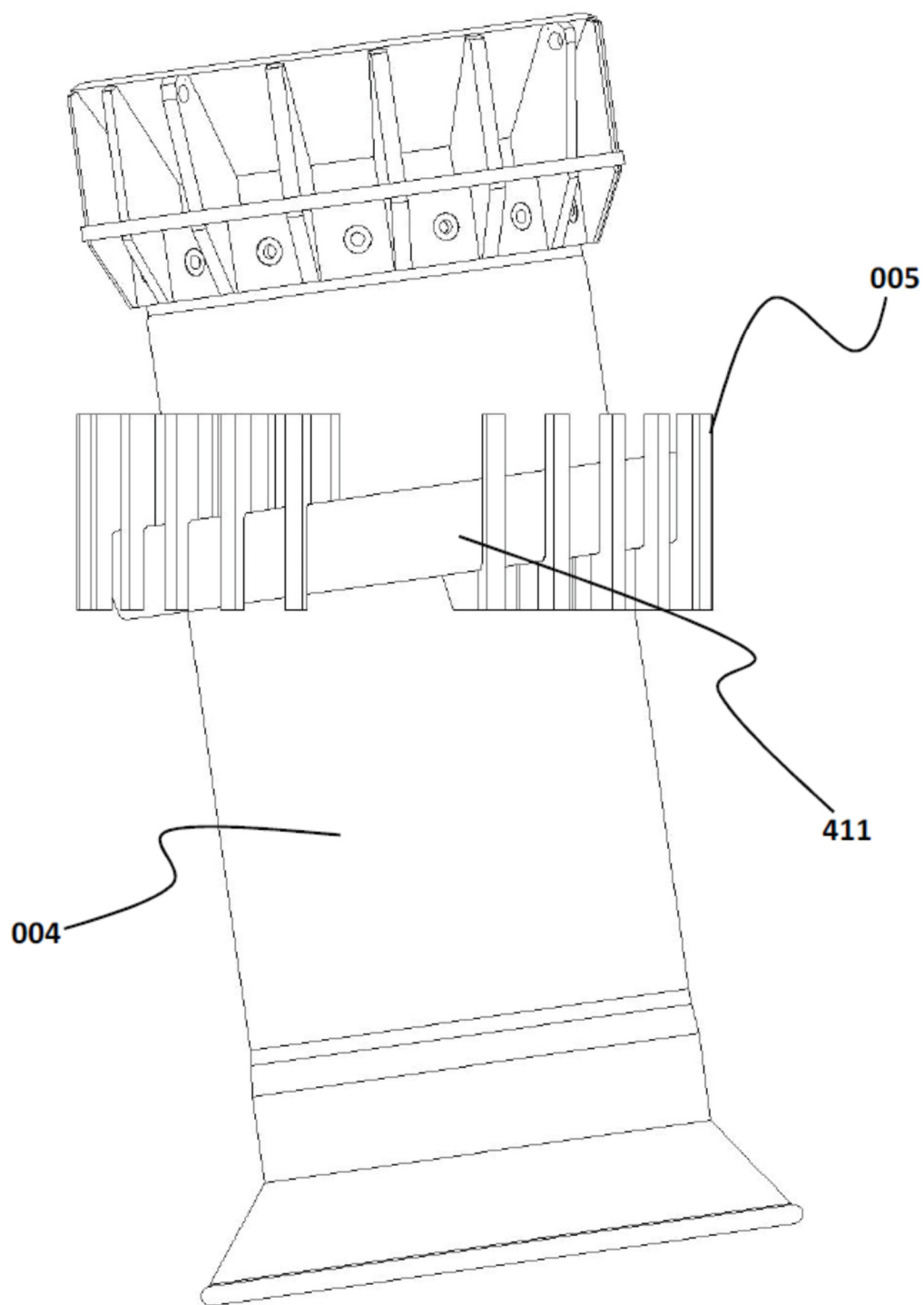


FIGURE 6A

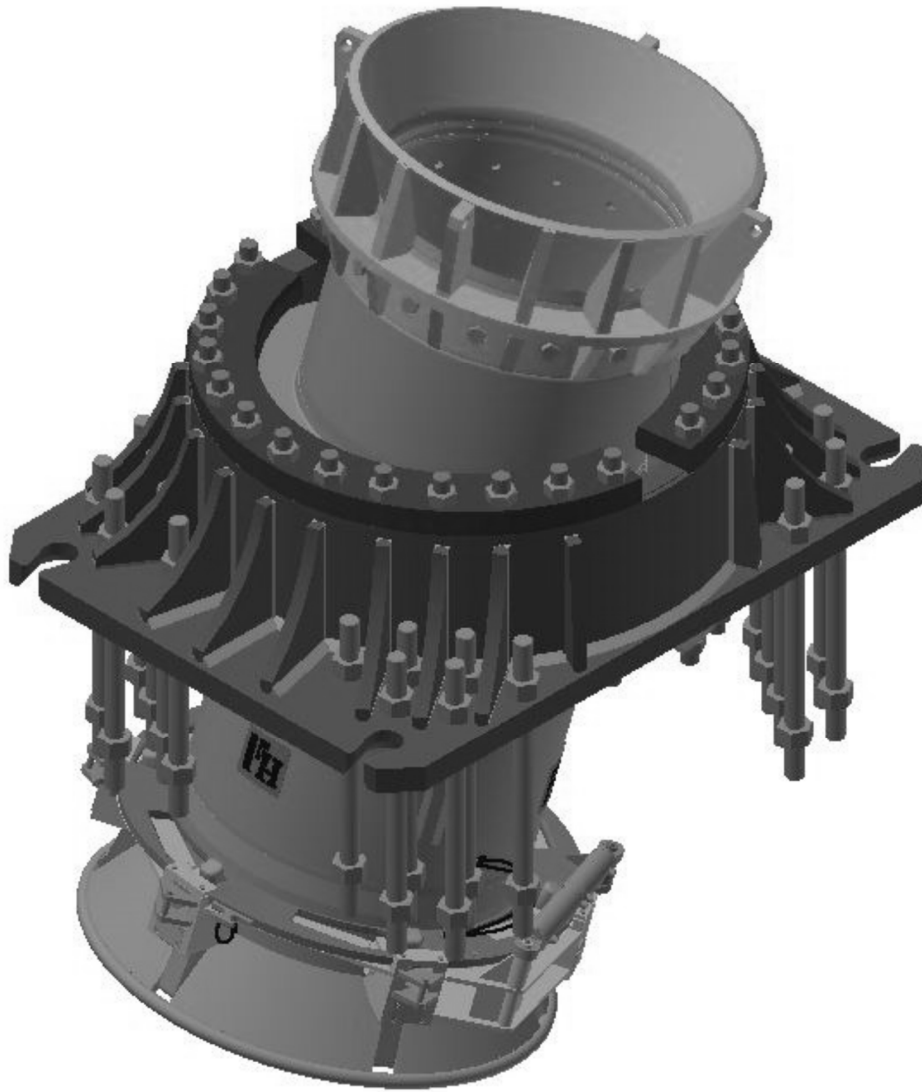


FIGURE 6B

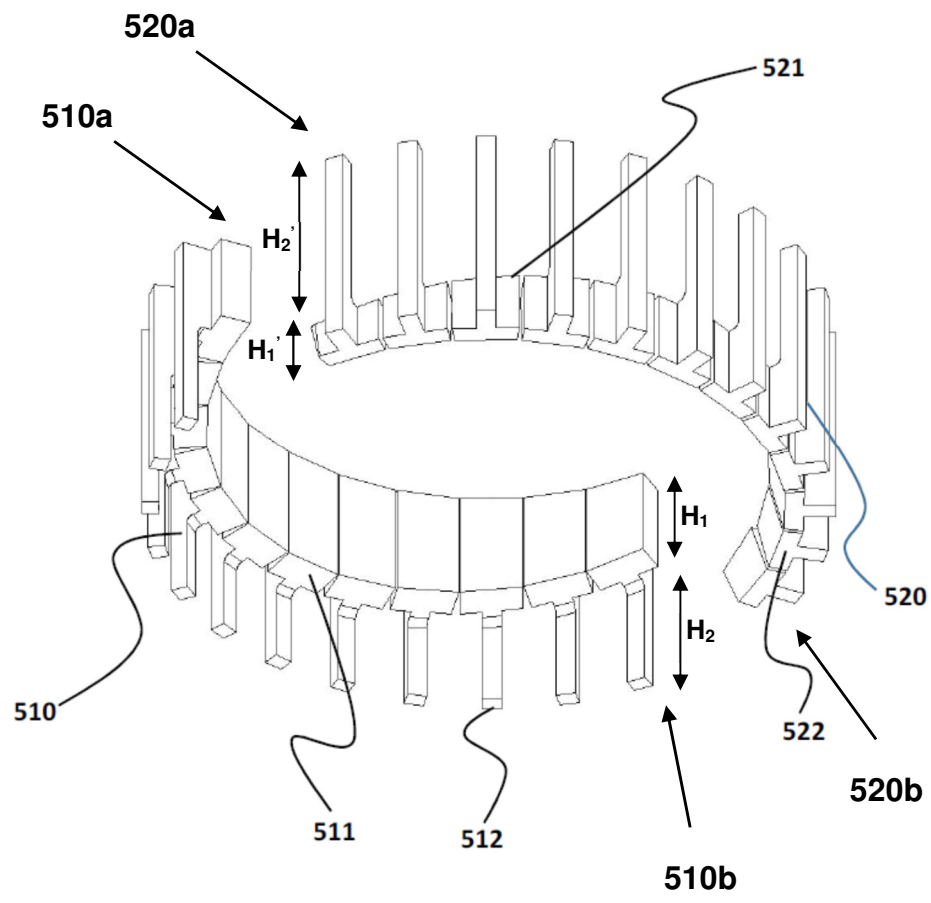


FIGURE 7

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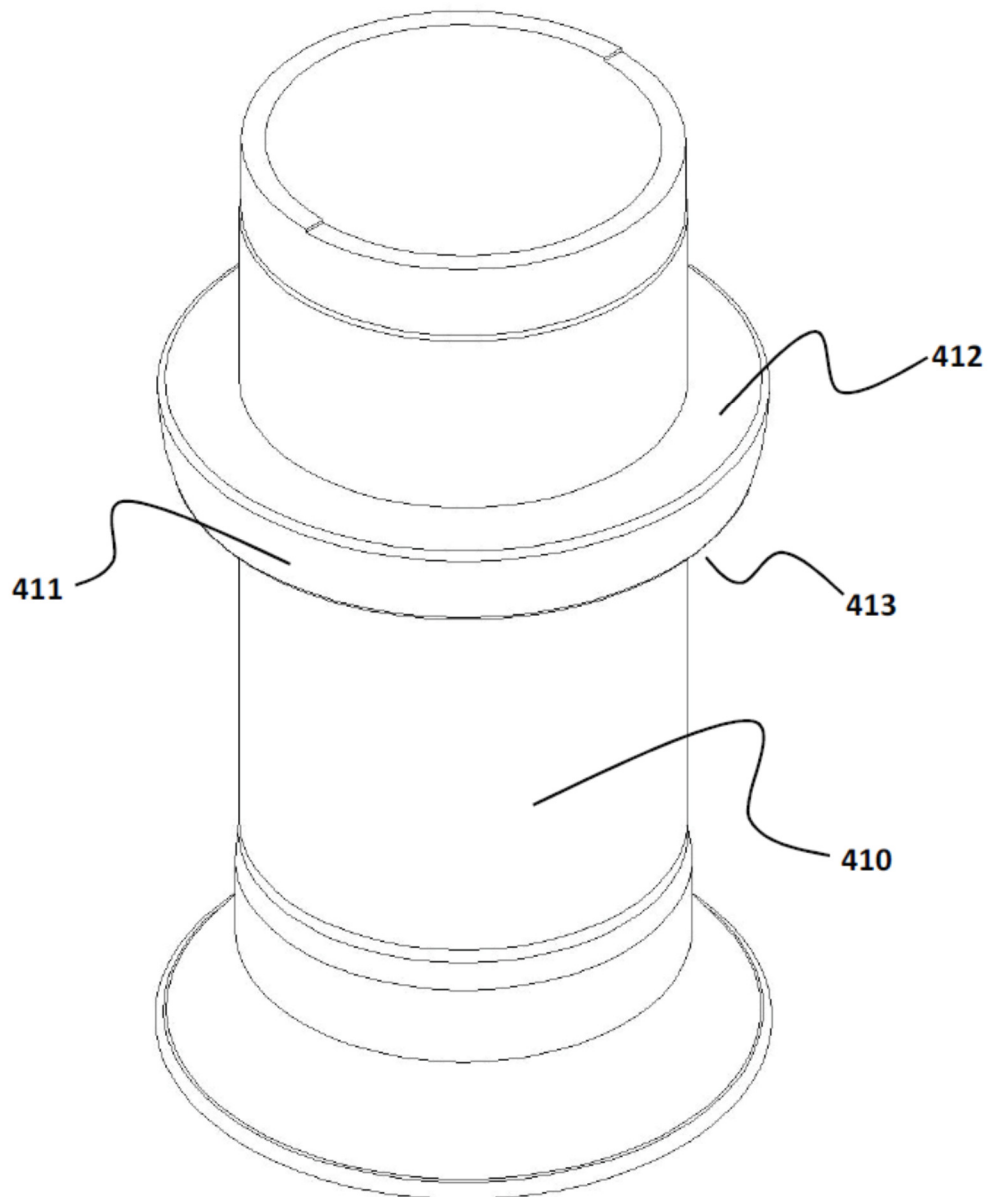


FIGURE 8

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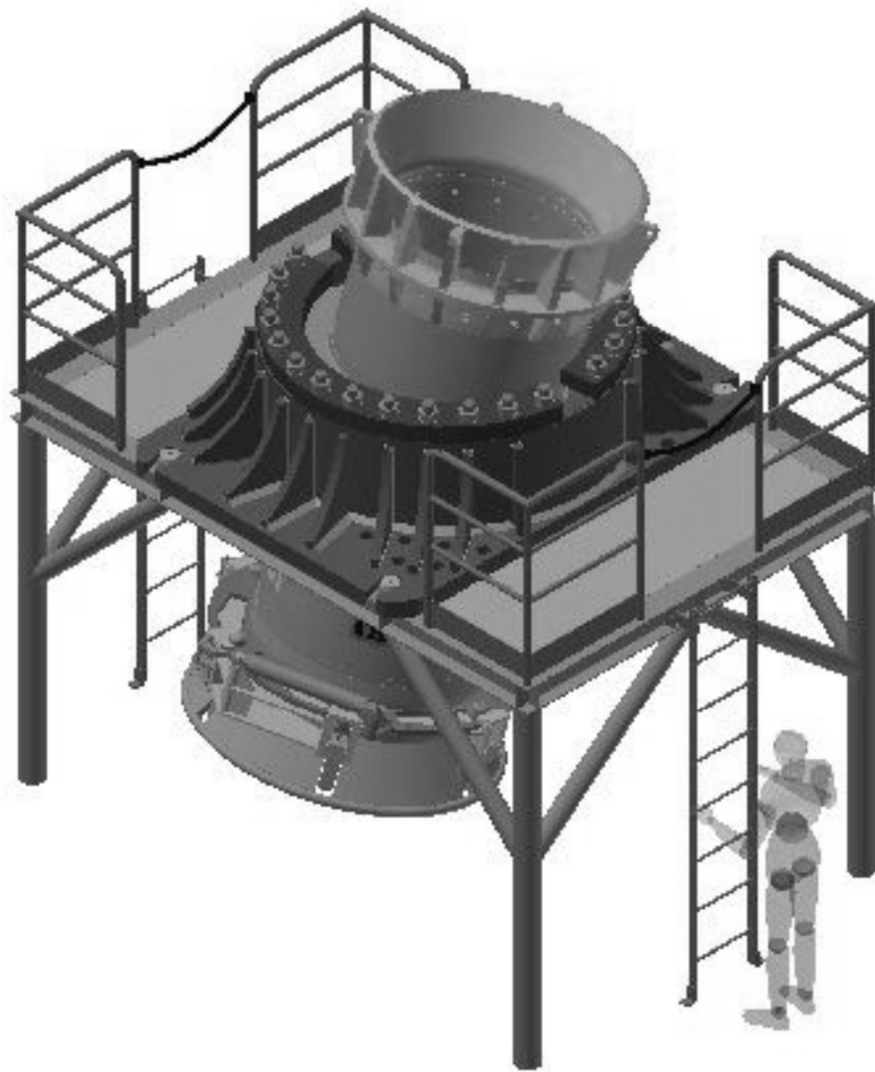
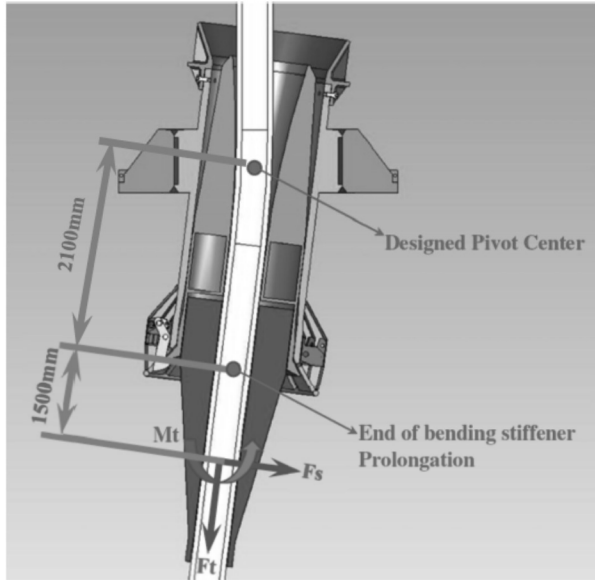


FIGURE 9

Flexible Riser Arrangement (DN48/40)



Rigid Riser Arrangement (DN48)

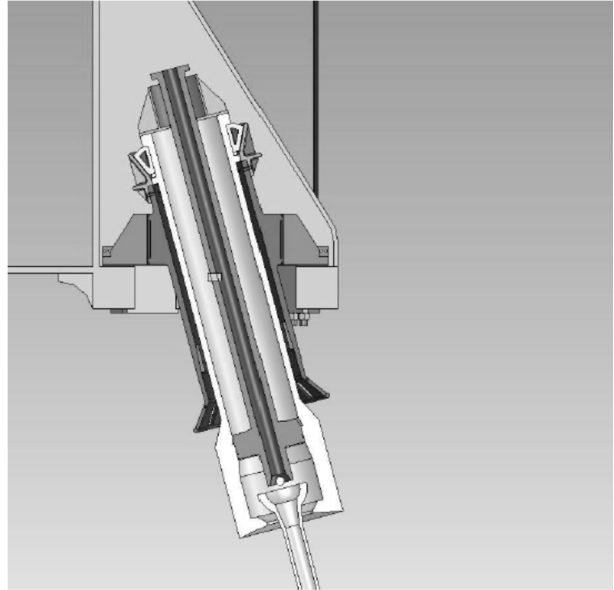


FIGURE 10A

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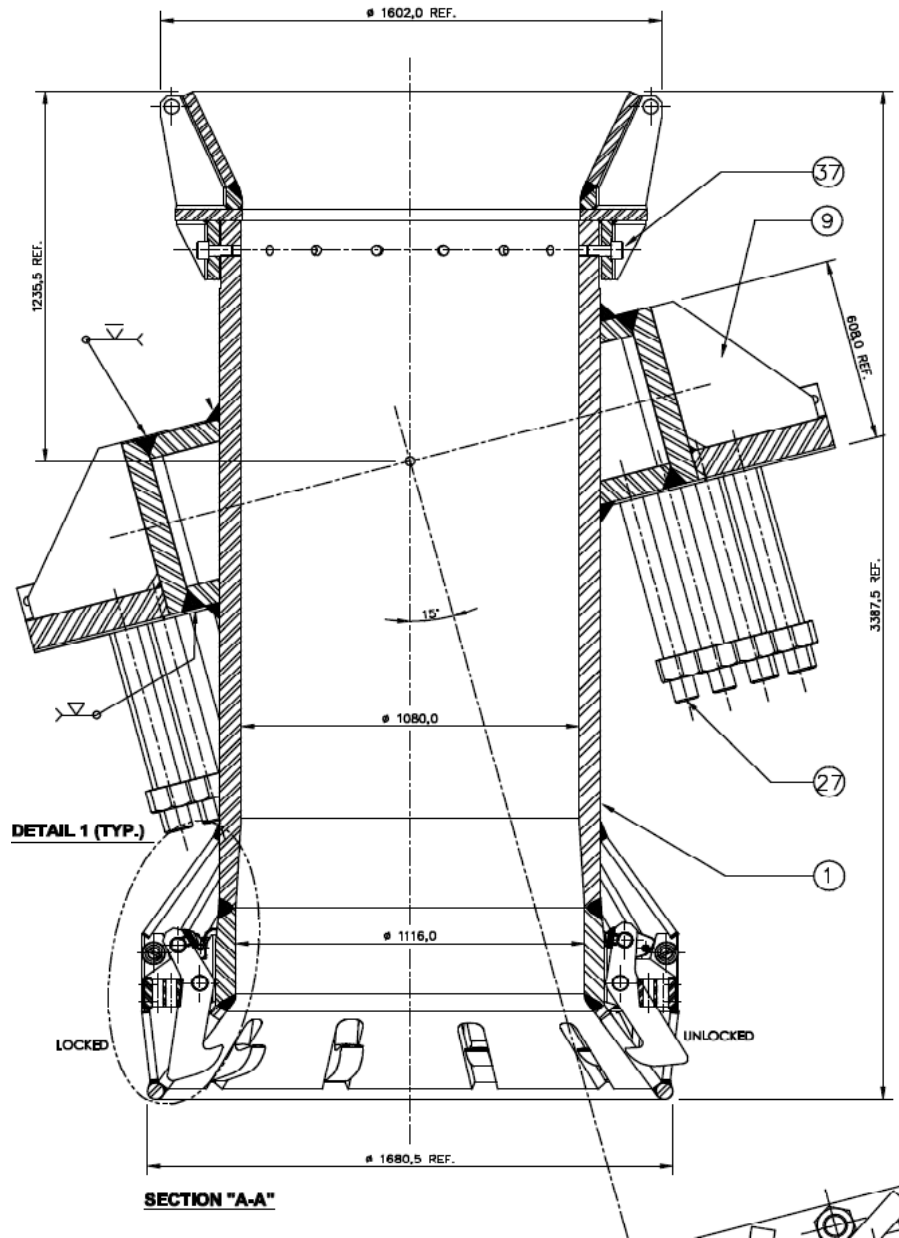


FIGURE 10B

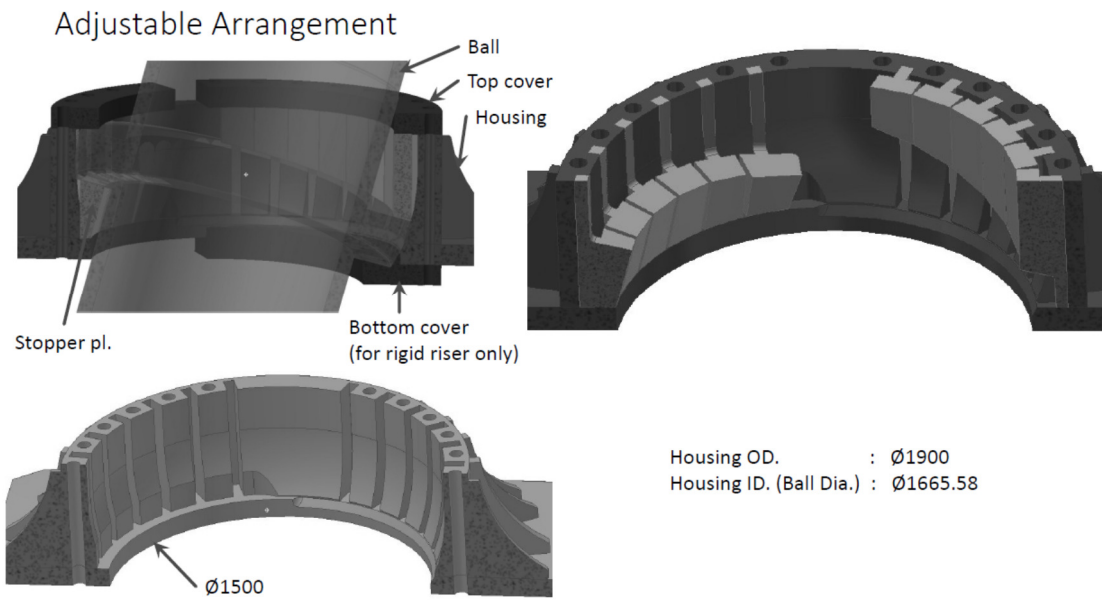


FIGURE 10C

a) ANSYS Setting

B: Static Structural

Static Structural

Time: 1 s

23/11/2016 1:19 PM

A Fixed Support**B** Standard Earth Gravity: 9.8066 m/s²**C** Frictionless Support**D** Moment: 6.9e+006 N·m**E** Force: 1.617e+006 N

FIGURE 10D

a) ANSYS Result

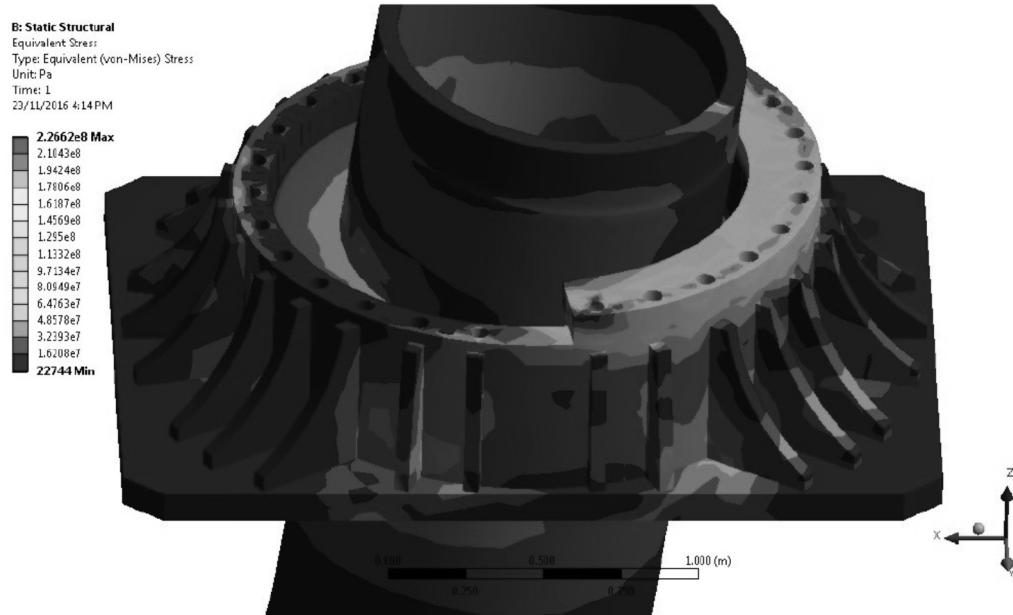


Figure 10E

a) ANSYS Result



FIGURE 10F

a) ANSYS Result

B: Static Structural
 Equivalent Stress
 Type: Equivalent (von-Mises) Stress
 Units: Pa
 Time: 1
 23/11/2016 4:11 PM

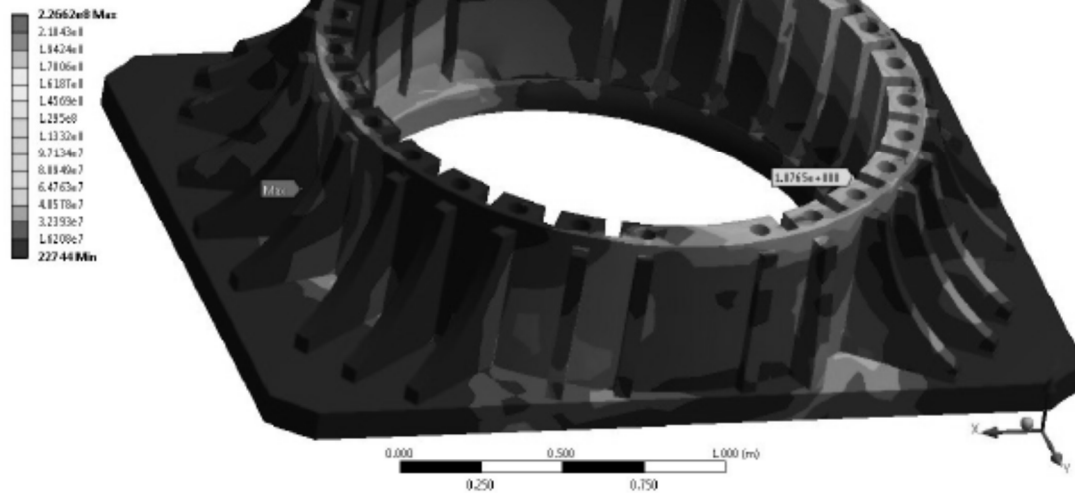


FIGURE 10G

a) ANSYS Result

B: Static Structural
 Equivalent Stress
 Type: Equivalent (von-Mises) Stress
 Units: Pa
 Time: 1
 23/11/2016 4:11 PM

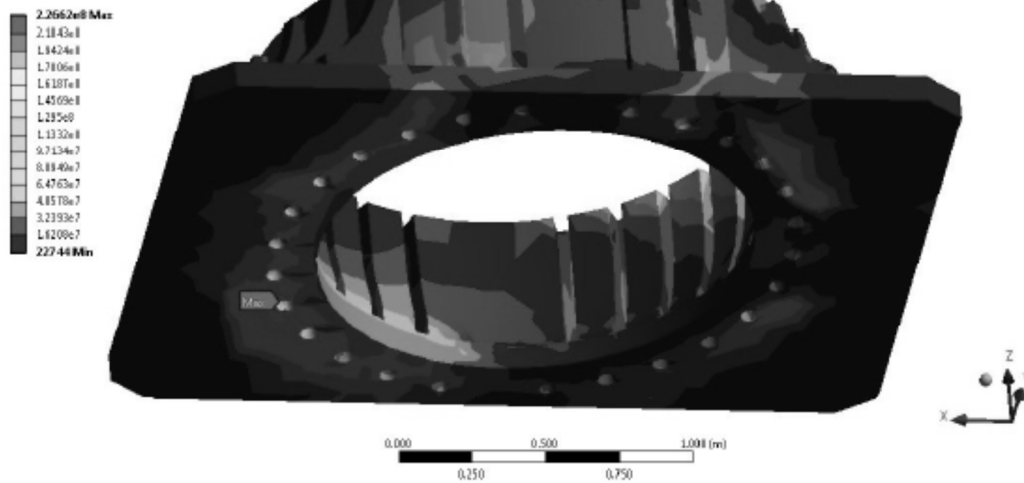


FIGURE 10H

a) ANSYS Result

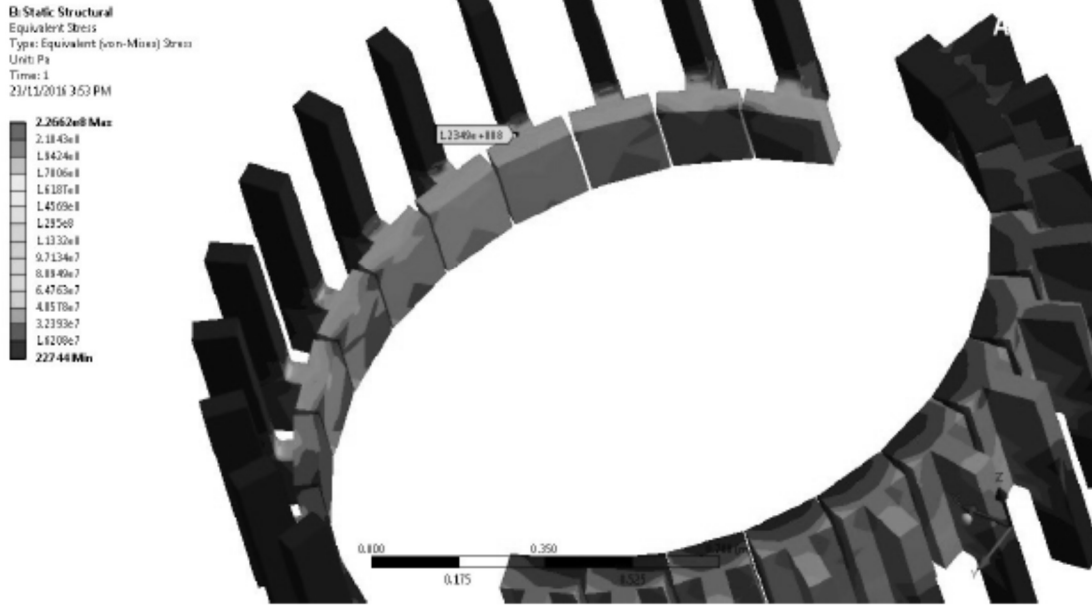


FIGURE 10I

a) ANSYS Result

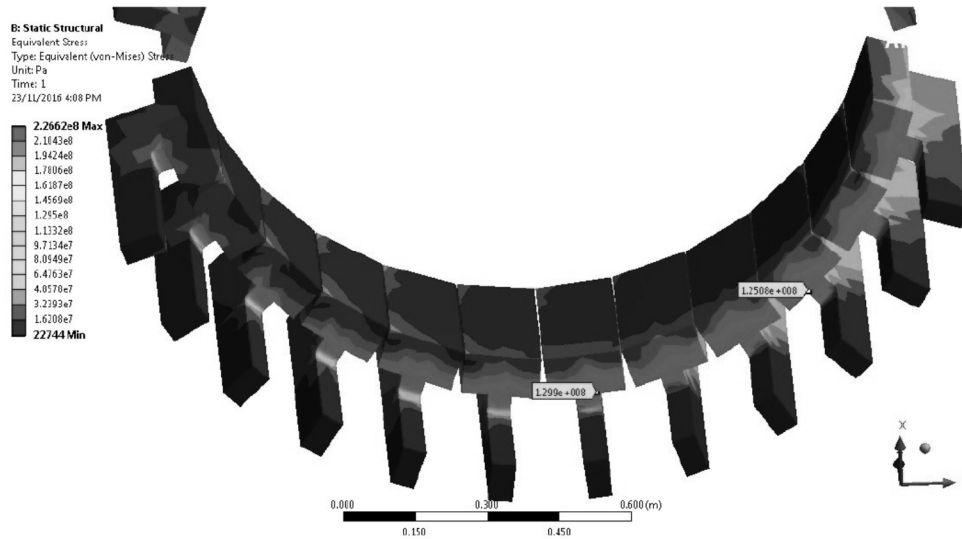


FIGURE 10J

a) ANSYS Result

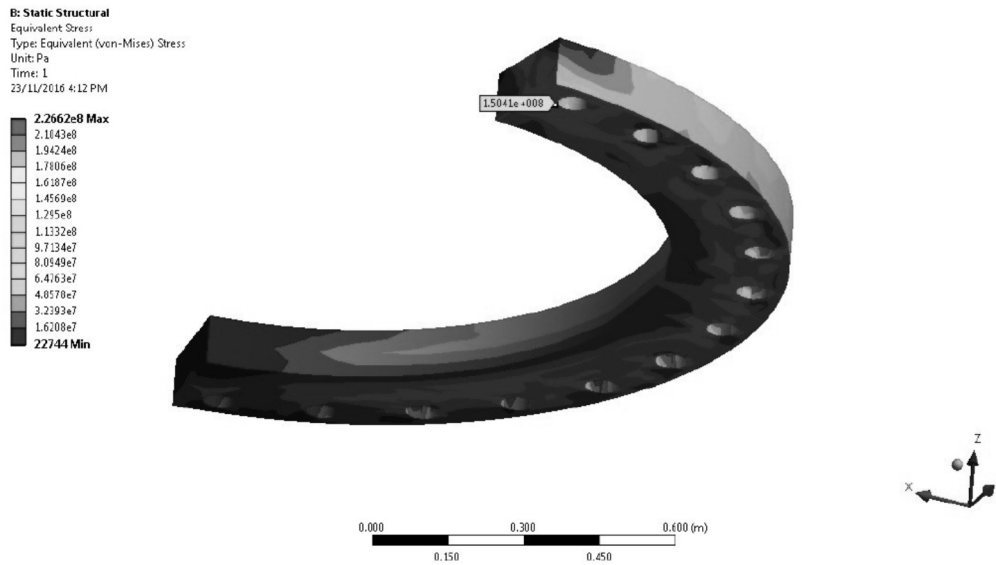


FIGURE 10K

a) ANSYS Result

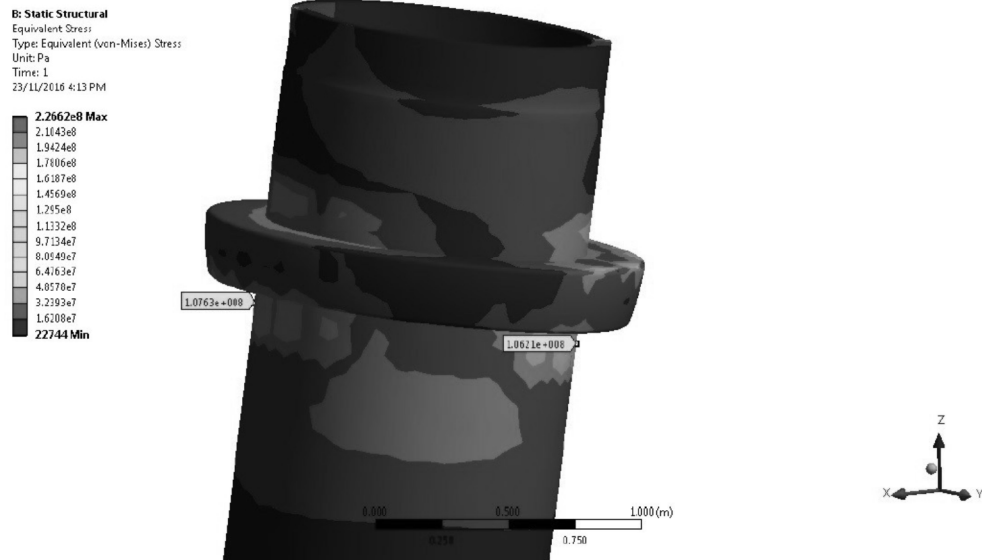


FIGURE 10L

b) ANSYS Setting

B: Static Structural
 Static Structural
 Times: 1 :
 25/11/2016 10:51 AM

- A** Fixed Support
- B** Standard Earth Gravity: 9.8066 m/s²
- C** Frictionless Support
- D** Moment: 1.673e+006 N-m
- E** Force: 1.14e+006 N
- F** Force Z: 5.931e+006 N

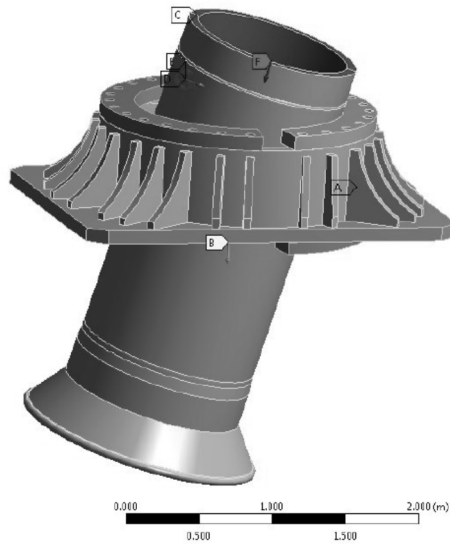


FIGURE 10M

b) ANSYS Result

B: Static Structural
 Equivalent Stress
 Type: Equivalent (von-Mises) Stress
 Unit: Pa
 Time: 1
 25/11/2016 10:48 AM

2.0976e8 Max

1.5338e8
1.7851e8
1.6362e8
1.4876e8
1.3388e8
1.1901e8
1.0413e8
8.9257e7
7.4392e7
5.9591e7
4.4632e7
2.9757e7
1.4892e7
6696.2 Min

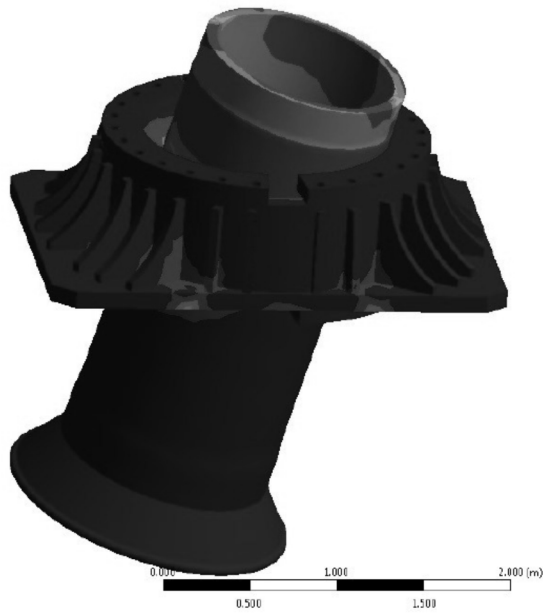


FIGURE 10N

b) ANSYS Result



FIGURE 100

b) ANSYS Result

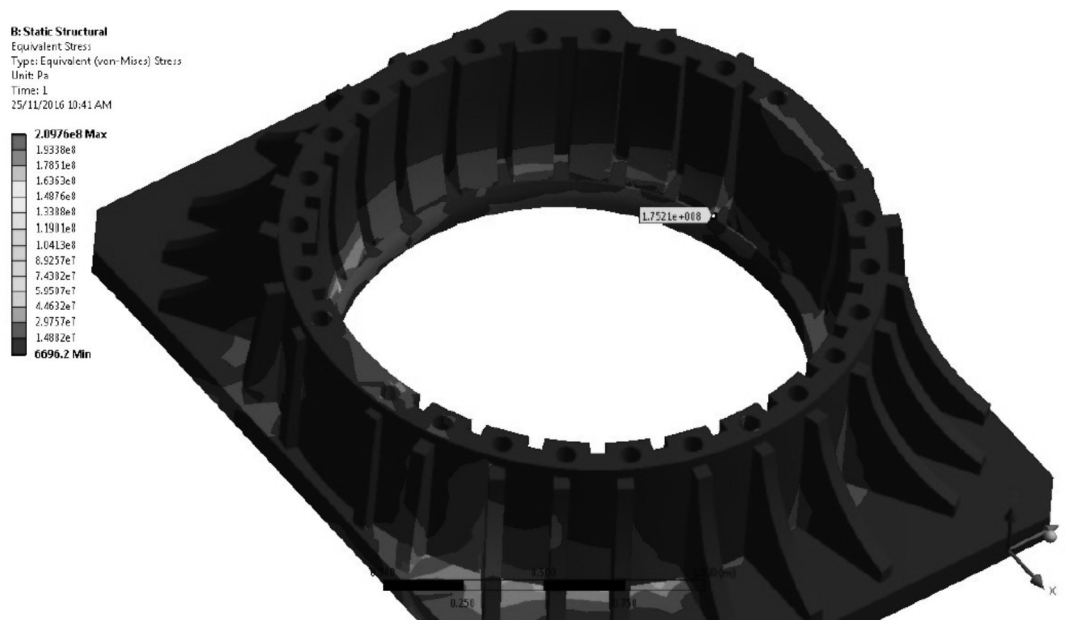


FIGURE 10P

b) ANSYS Result

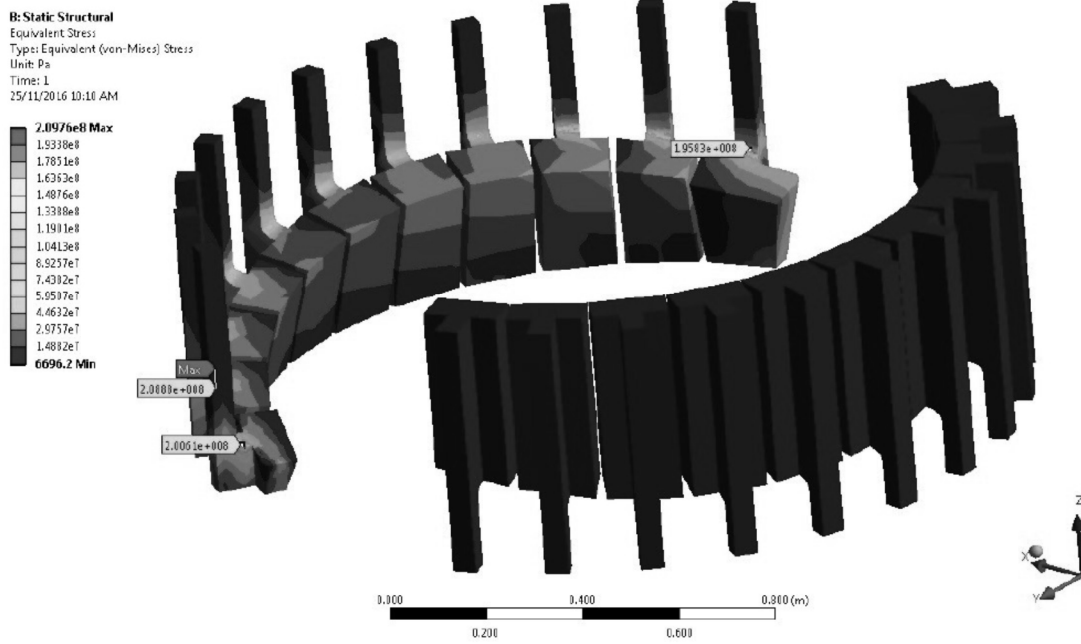


FIGURE 10Q

b) ANSYS Result

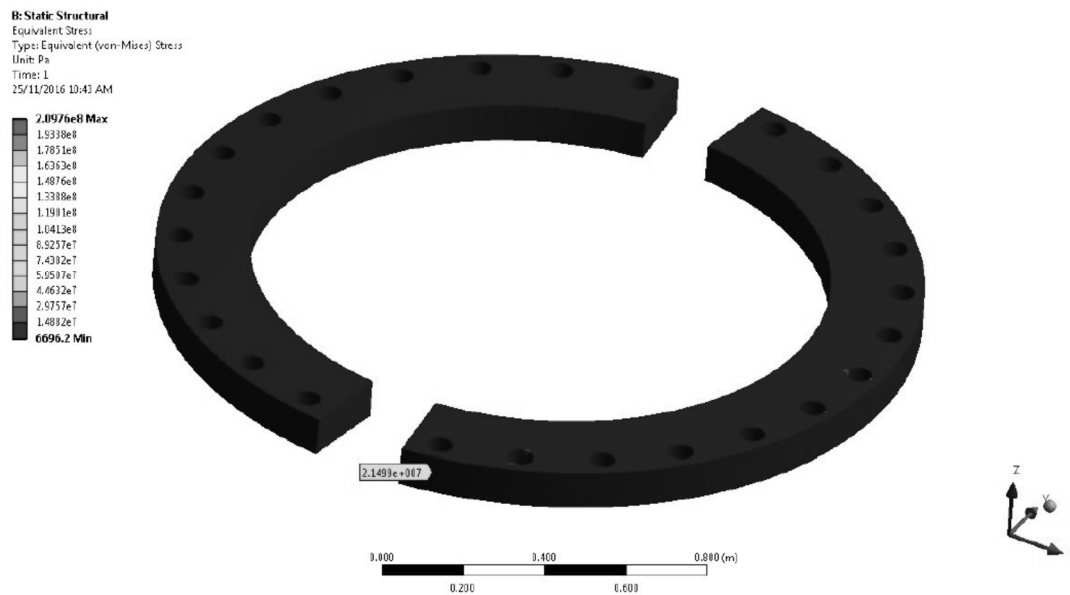


FIGURE 10R

b) ANSYS Result

B: Static Structural
 Equivalent Stress
 Type: Equivalent (von-Mises) Stress
 Unit: Pa
 Time: 1
 25/11/2016 10:46 AM

2.0076e8 Max
 1.9338e8
 1.7851e8
 1.6363e8
 1.4876e8
 1.3388e8
 1.1911e8
 1.0436e8
 8.9597e7
 7.4792e7
 5.9997e7
 4.5192e7
 3.0392e7
 1.5592e7
 6696.2 Min

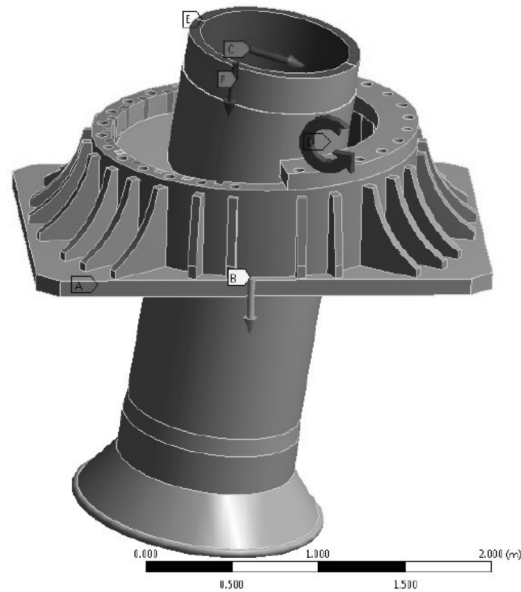


FIGURE 10S

c) ANSYS Setting

B: IAB8 AA 25
 Static Structural
 Time: 1
 25/11/2016 3:22 PM

A Fixed Support
B Standard Earth Gravity: 9.8066 m/s²
C Fx: 1.325e+006 N
D Mx: 4.99e+006 N-m
E Frictionless Support
F Fy: 1e+006 N



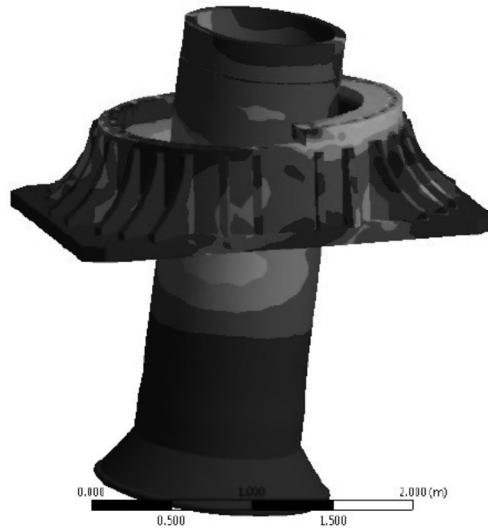
ANSYS
 R16.2

FIGURE 10T

c) ANSYS Result

B: TA 8 & AA 25
 Equivalent Stress
 Type: Equivalent (von-Mises) Stress
 Unit: Pa
 Time: 1
 25/11/2016 3:07 PM

1.614e9 Max
 1.4987e8
 1.3835e8
 1.2682e8
 1.1529e8
 1.0376e8
 9.2238e7
 8.071e7
 6.9183e7
 5.7656e7
 4.6129e7
 3.4602e7
 2.3075e7
 1.1548e7
 20816 Min



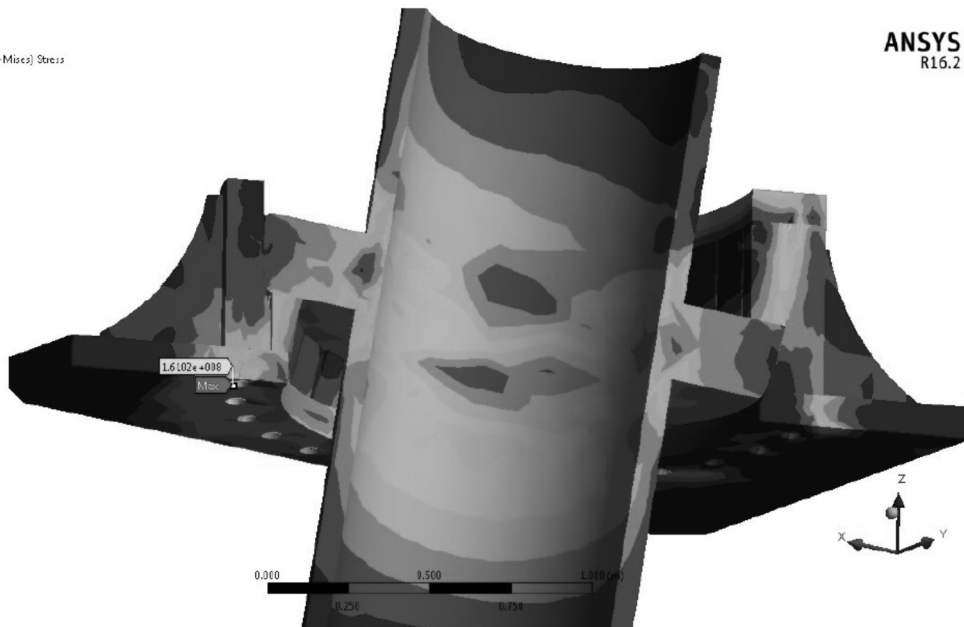
ANSYS
 R16.2

FIGURE 10U

c) ANSYS Result

B: TA 8 & AA 25
 Equivalent Stress
 Type: Equivalent (von-Mises) Stress
 Unit: Pa
 Time: 1
 25/11/2016 3:09 PM

1.614e9 Max
 1.4987e8
 1.3835e8
 1.2682e8
 1.1529e8
 1.0376e8
 9.2238e7
 8.071e7
 6.9183e7
 5.7656e7
 4.6129e7
 3.4602e7
 2.3075e7
 1.1548e7
 20816 Min



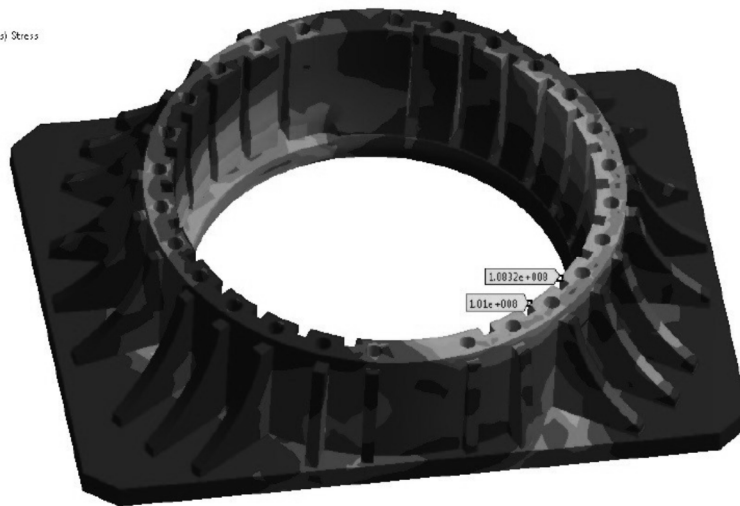
ANSYS
 R16.2

FIGURE 10V

c) ANSYS Result

B-TAB & AA-25
Equivalent Stress
Type: Equivalent (von-Mises) Stress
Unit: Pa
Time: 1
25/11/2016 3:10 PM

1.614e8 Max
1.4987e8
1.3835e8
1.2692e8
1.1529e8
1.0376e8
9.2238e7
8.071e7
6.9133e7
5.7656e7
4.6129e7
3.4692e7
2.3075e7
1.1548e7
20816 Min



ANSYS
R16.2

0.000 0.500 1.000 (m)
0.250 0.750

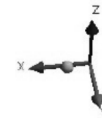
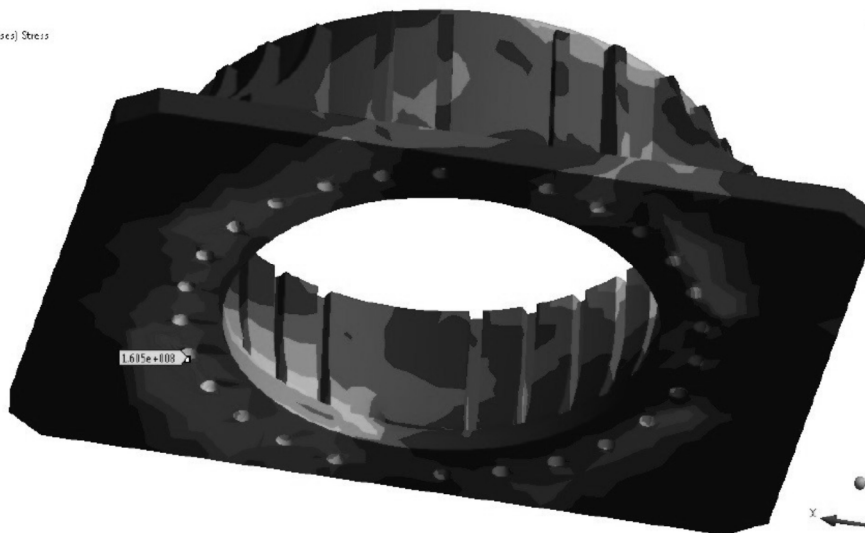


FIGURE 10W

c) ANSYS Result

B-TAB & AA-25
Equivalent Stress
Type: Equivalent (von-Mises) Stress
Unit: Pa
Time: 1
25/11/2016 3:11 PM

1.614e8 Max
1.4987e8
1.3835e8
1.2692e8
1.1529e8
1.0376e8
9.2238e7
8.071e7
6.9133e7
5.7656e7
4.6129e7
3.4692e7
2.3075e7
1.1548e7
20816 Min



ANSYS
R16.2

0.000 0.500 1.000 (m)
0.250 0.750



FIGURE 10X

c) ANSYS Result

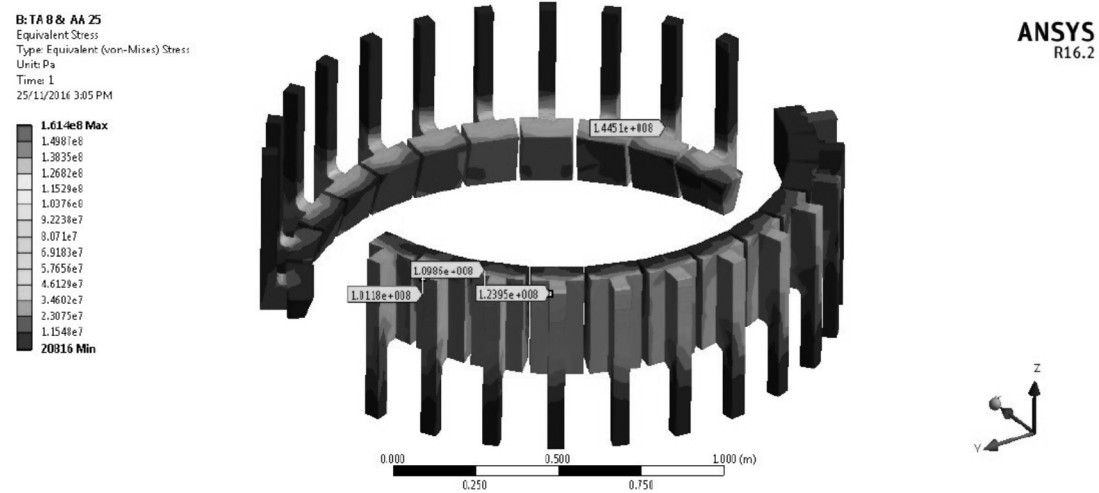


FIGURE 10Y

c) ANSYS Result

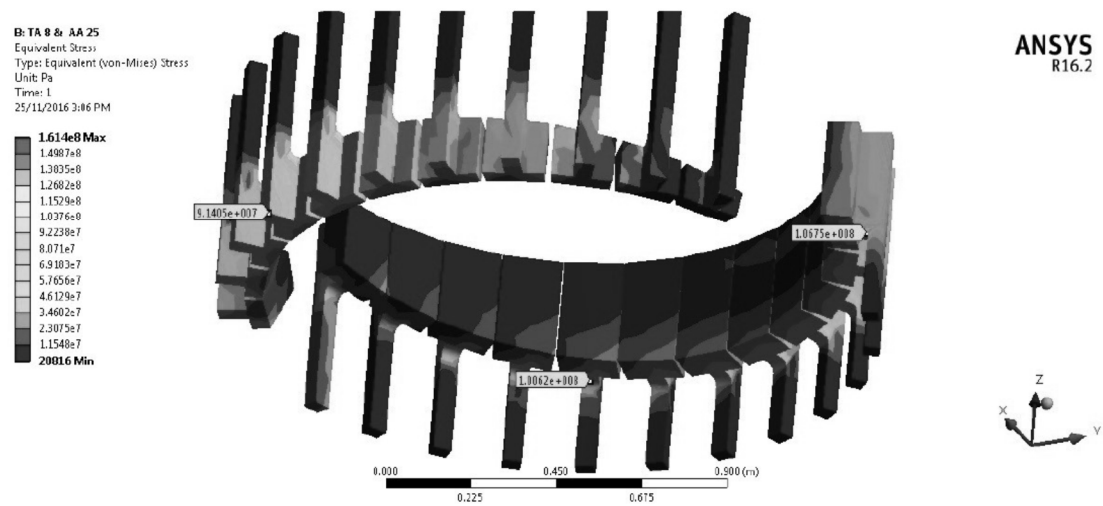


FIGURE 10Z

c) ANSYS Result

B: TAB8 & AA 25

Equivalent Stress

Type: Equivalent (von-Mises) Stress

Unit: Pa

Time: 1

25/11/2016 3:13 PM

1.614e8 Max
1.4997e8
1.3835e8
1.2692e8
1.1529e8
1.0376e8
9.2238e7
8.071e7
6.9193e7
5.7656e7
4.6129e7
3.4692e7
2.3075e7
1.1548e7
20816 Min

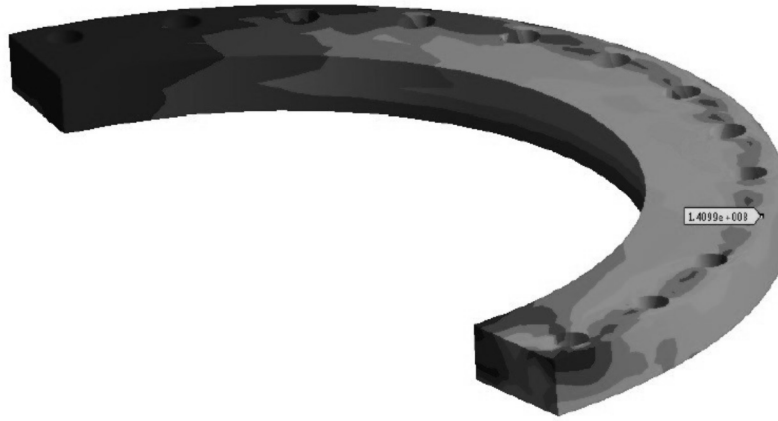


FIGURE 11A

c) ANSYS Result

B: TAB8 & AA 25

Equivalent Stress

Type: Equivalent (von-Mises) Stress

Unit: Pa

Time: 1

25/11/2016 3:14 PM

1.614e8 Max
1.4997e8
1.3835e8
1.2692e8
1.1529e8
1.0376e8
9.2238e7
8.071e7
6.9193e7
5.7656e7
4.6129e7
3.4692e7
2.3075e7
1.1548e7
20816 Min



FIGURE 11B

ANSYS
R16.2

ANSYS
R16.2