

Boiler.

Warning: The boiler is a pressure vessel. Observe the following safety recommendations.

It is recommended that your boiler be tested by hydraulic pressure to 150% of the design working pressure every two years by a competent person.

Any alteration carried out to, or holes drilled in, the boiler will need to be followed by a further proof test as above.

This is my boiler design. I looked at other designs and decided to design my own, as it would suit the steam launch I was building.

In included in the drawings are all the fittings, sight glass fittings, steam dome, safety valve and a sensor for water level. The water sensor works on the principle that the electrical resistance of water and steam is different. So when the water level drops below the water sensor, the resistance changes and a electronic circuit activates the filling of the boiler.

The boiler body is made from 42mm OD copper tube. Cut to length and drill the holes for the fittings. The ends are made from 1.4mm sheet cooper. Anneal the copper so it can be easily formed.

Cut two pieces of copper pipe for the flue to the dimensions in the drawings. Make a flue end with a piece of flat copper. Drill the center flue for the vertical flue. Then silver soldered the flues together.

Cut four strips of copper to make the legs. Also cut four brass plates, these will be the nuts for the legs to be bolted to the base. Braze the copper plates to the copper strips for the legs.

The dome is made from 4 brass pieces, the main body and 3 bushes. They are machined and then brazed together.


Brazing of the boiler. When I first tried to silver solder the boiler, I was using a hand held propane torch. But it could not the boiler hot enough for the silver solder to run. So used a ring of a gas cooker to preheat the boiler for a few minutes, then used the torch to silver solder. This worked well, so if you are having problems brazing the boiler, try this.

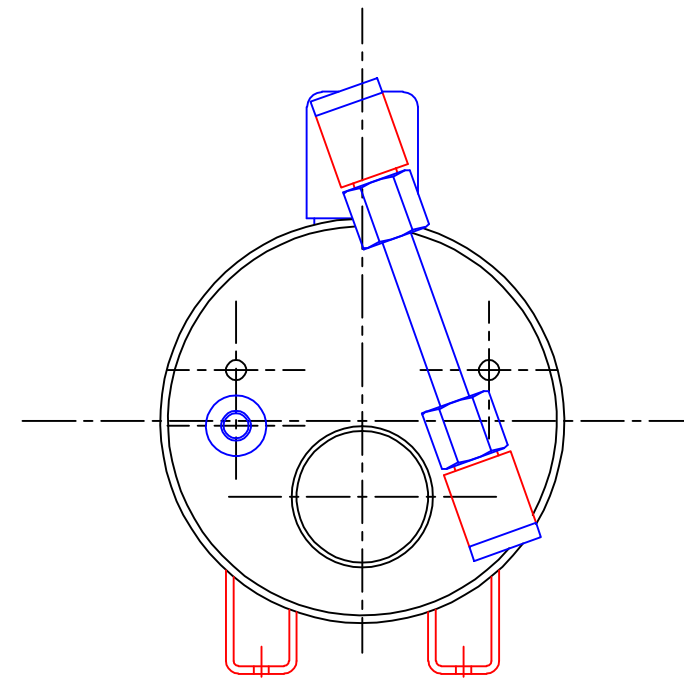
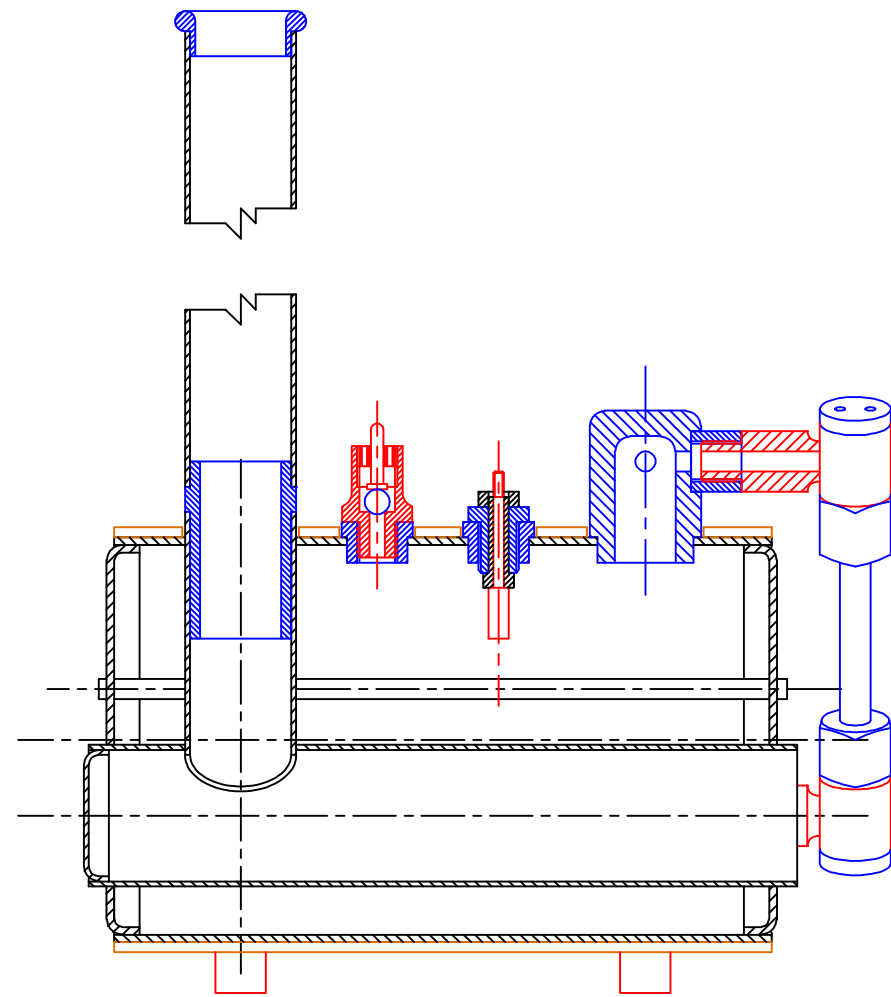
For more info on the building of the boiler and the steam launch it was designed for go to

<http://gersteamengines.yolasite.com/>

DRG. NO.				ISSUE	REVISIONS
ISSUE	DRAWN	CHECKED	APPROVED	DATE	REASON FOR CHANGE

DIMENSIONS STATED IN MM [INCHES] UNLESS OTHERWISE STATED
GENERAL TOLERANCE ON DIMENSIONS ±0.5 [0.020] ANGLE ±1/2°
UNLESS OTHERWISE STATED
BREAK ALL SHARP EDGES AND RADII CORNERS TO 0.1 [0.004]
TO 0.5 [0.020]

 THIRD ANGLE PROJ.
SCALES: NTS



REPORT ANY ERROR OR OMISSION

DO NOT SCALE

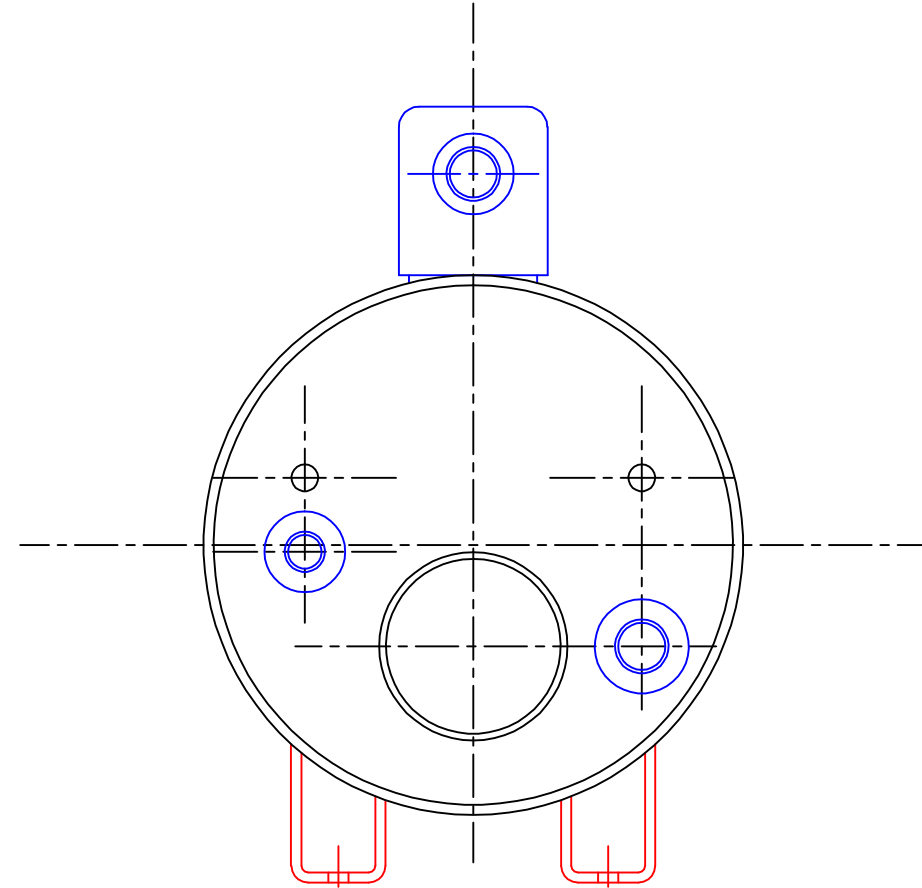
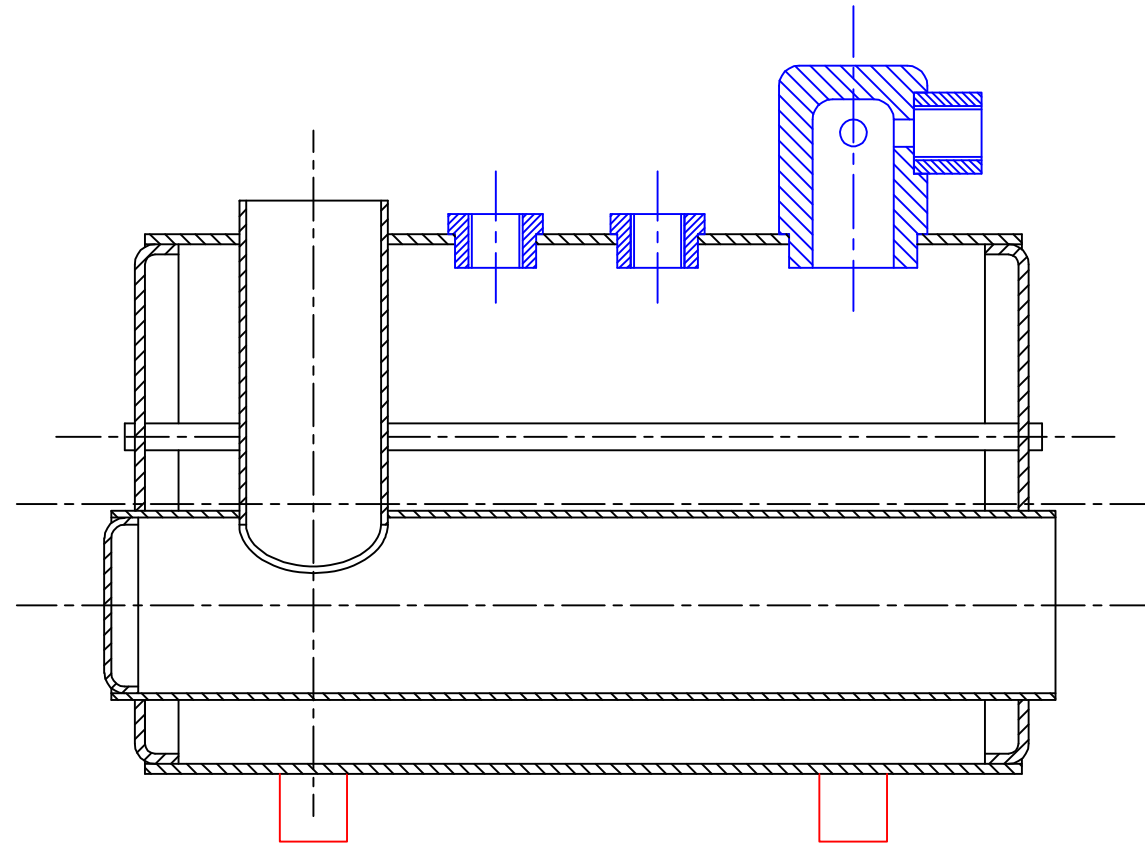
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Beattie Steam Engines				
DRAWN		TITLE: Steam boiler fittings		
CHECKED				
APPROVED		ENG. TYPE: VARIOUS	DRG. NO. SB1000	ISSUE A
		USED ON: VARIOUS	SHT. 1 OF 12	SHEETS

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ISSUE	DRAWN	CHECKED	APPROVED	DATE	REASON FOR CHANGE

DIMENSIONS STATED IN MM [INCHES] UNLESS OTHERWISE STATED
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 TO 0.5 [0.020]

THIRD ANGLE PROJ.
 SCALES: NTS



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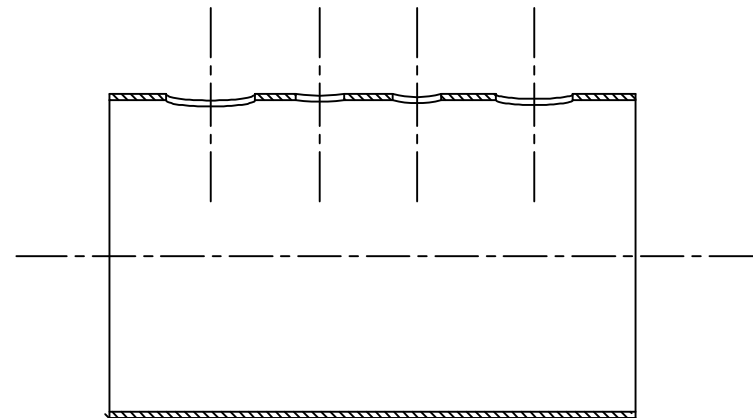
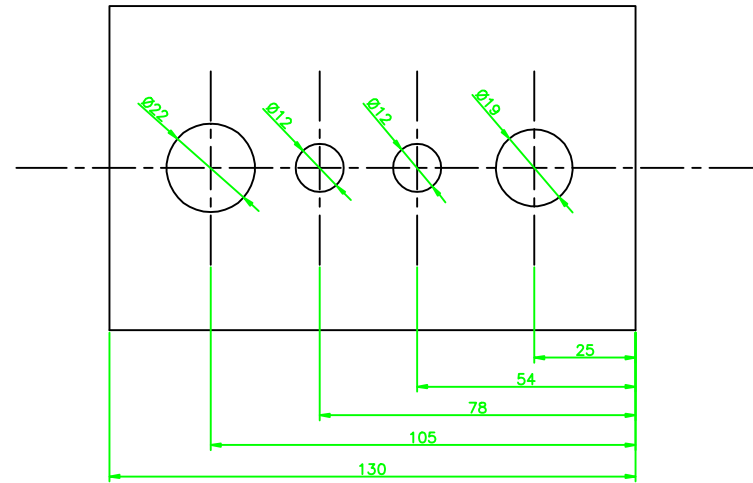
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		Beattie Steam Engines		
		TITLE: Steam boiler fittings		
		ENG. TYPE: VARIOUS	DRG. NO. SB1000	ISSUE A
		USED ON: VARIOUS	SHT. 2 OF 12 SHEETS	

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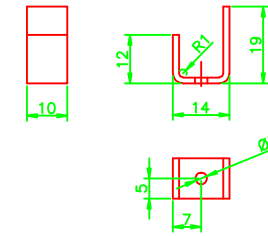
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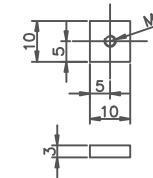
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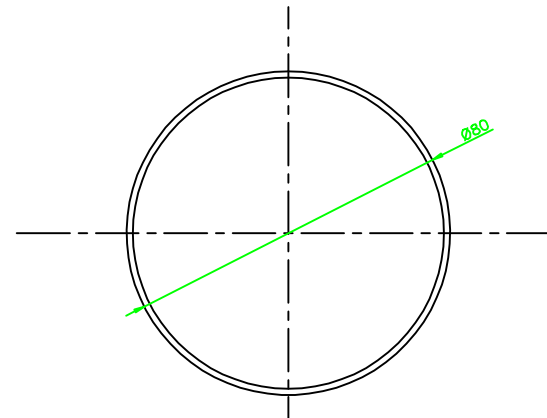
BP01



BP02



BP03



DO NOT SCALE

BP03	4	Boiler leg nut	Brass	
BP02	4	Boiler Leg	Copper	
BP01	1	Boiler shell	Copper	
ITEM	TOTAL QTY	DESCRIPTION	MATERIAL	REMARKS
DRAWN	Beattie Steam Engines			
	TITLE: Steam boiler fittings			
CHECKED	D M Y			
	D M Y			
APPROVED	ENG. TYPE: VARIOUS		DRG. NO. SB1000	ISSUE A
	D M Y		USED ON: VARIOUS	SHT. 3 OF 12 SHEETS

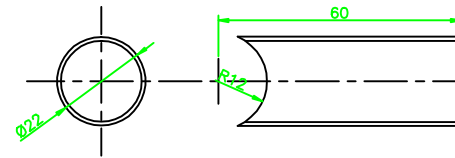
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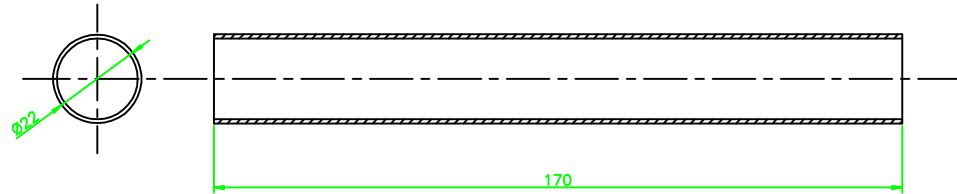
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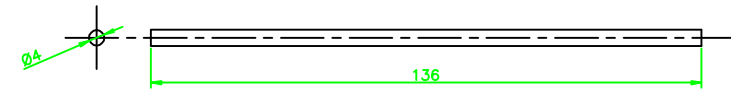
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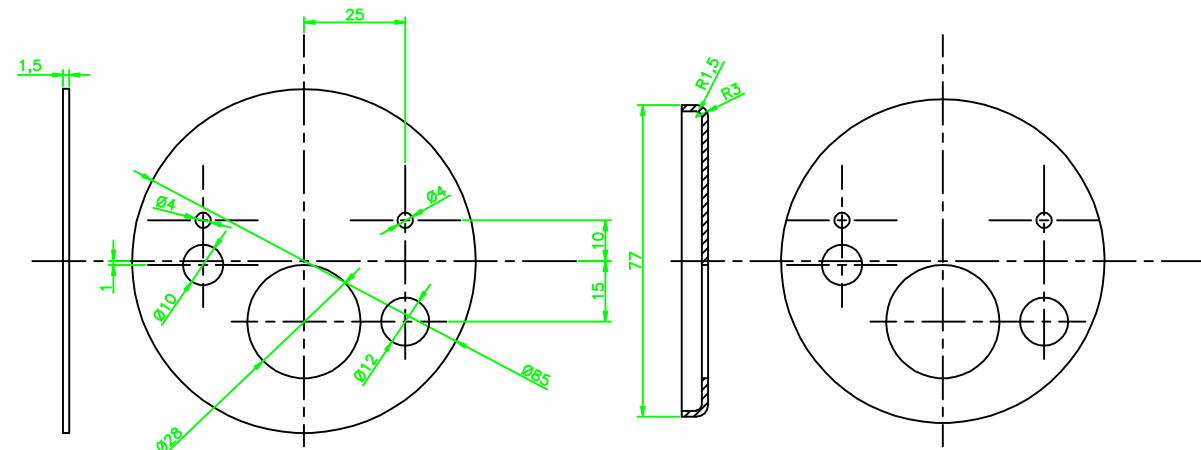
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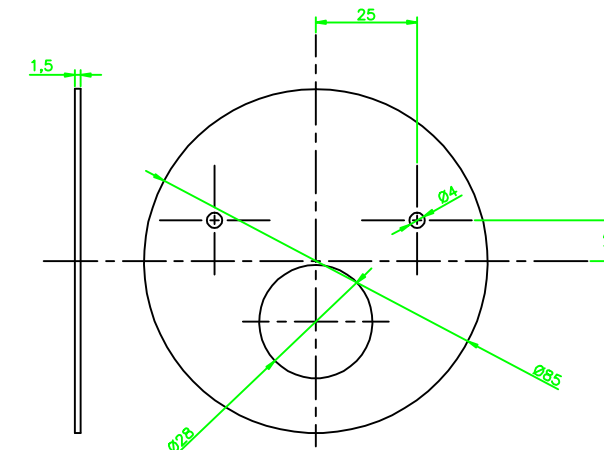
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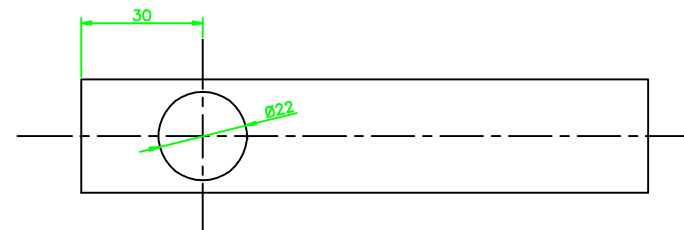
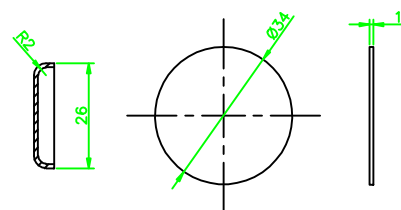
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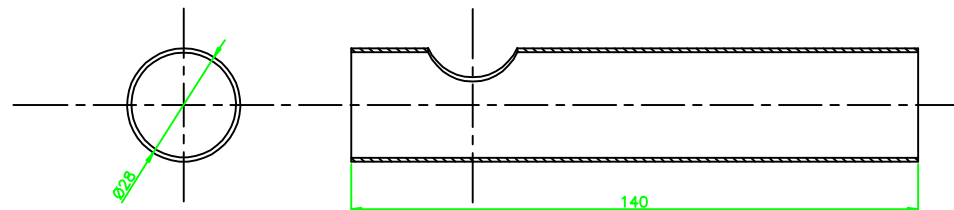
BP05



BP06



BP04



DO NOT SCALE

ITEM	TOTAL QTY	DESCRIPTION	MATERIAL	REMARKS
BP09	1	Funnel	Copper	
BP08	1	Vertical flue	Copper	
BP07	2	Boiler stay	Copper	
BP06	1	Forward plate	Copper	
BP05	1	Rear plate	Copper	
BP04	1	Central flue	Copper	

APPROVED	D	M	Y	Beattie Steam Engines		
CHECKED	D	M	Y	TITLE: Steam boiler fittings		
DRAWN	D	M	Y	ENG. TYPE: VARIOUS	DRG. NO. SB1000	ISSUE A
	D	M	Y	USED ON: VARIOUS	SHT. 4 OF 12 SHEETS	

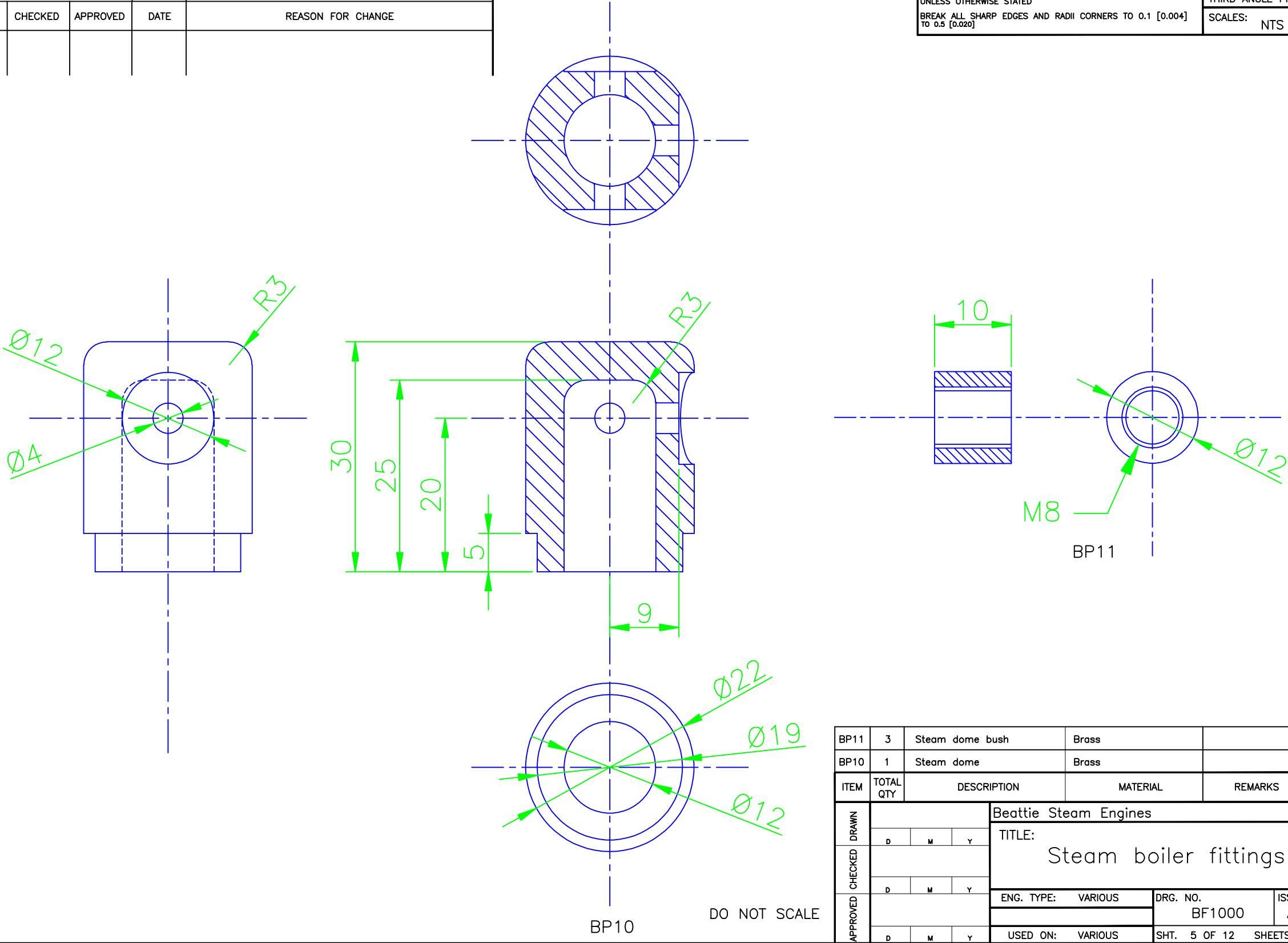
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THIRD ANGLE PROJ.
 SCALES: NTS



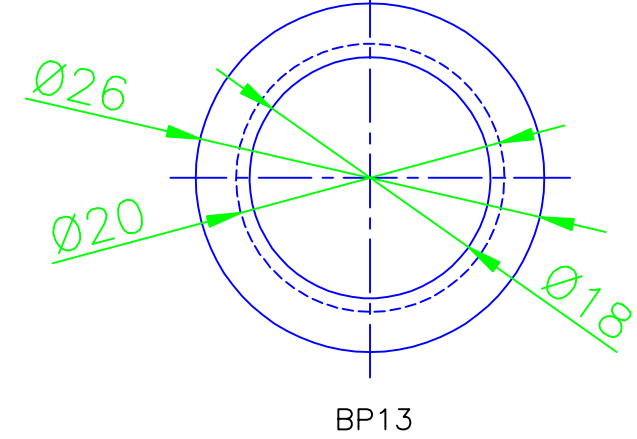
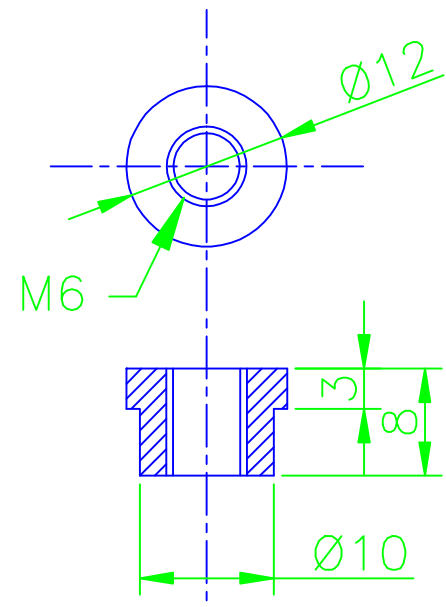
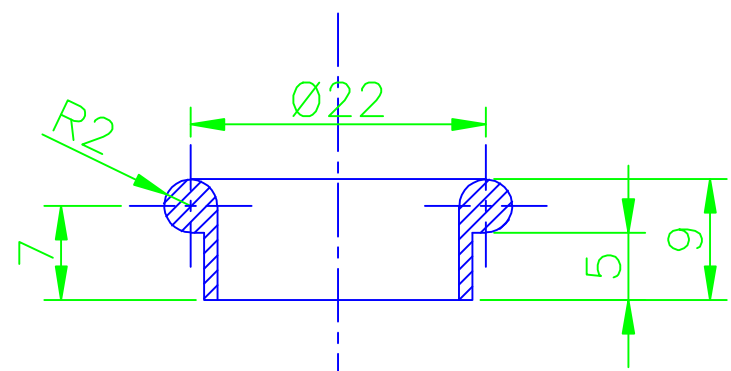
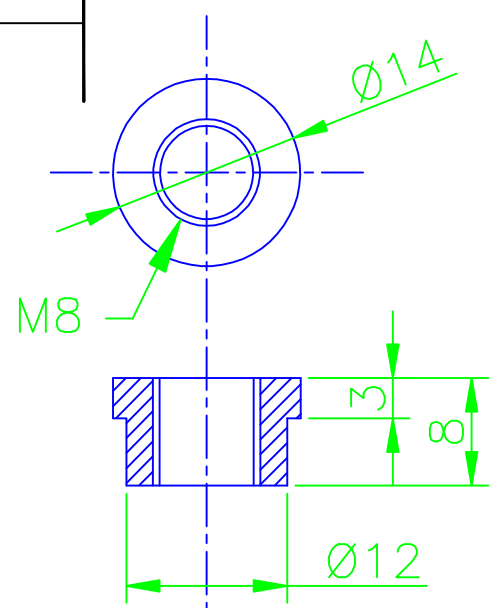
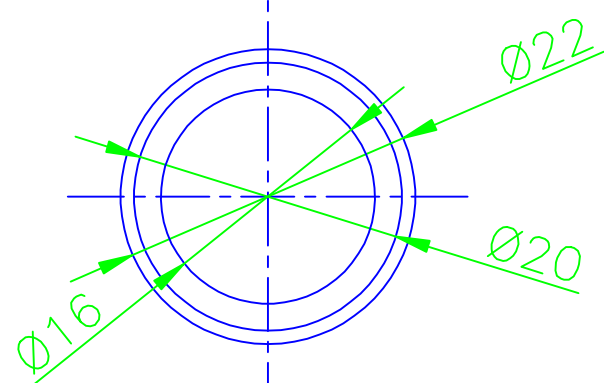
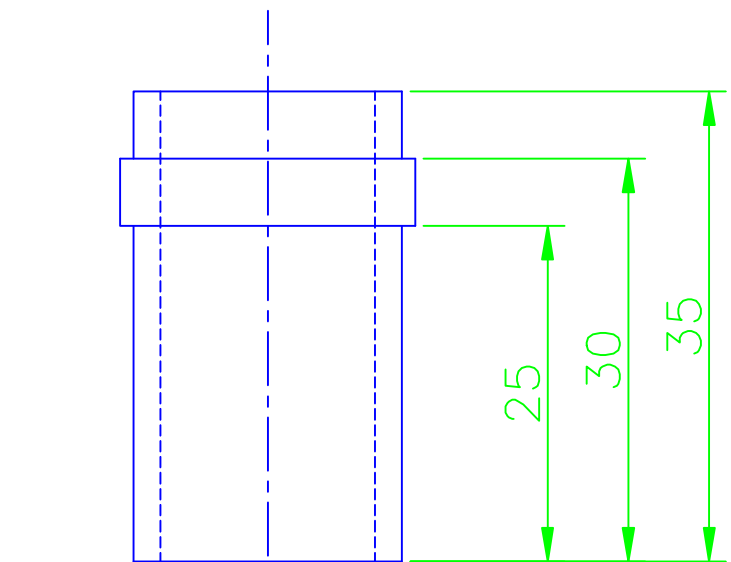
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BP11	3	Steam dome bush	Brass	
BP10	1	Steam dome	Brass	
ITEM	TOTAL QTY	DESCRIPTION	MATERIAL	REMARKS
DRAWN		Beattie Steam Engines		
CHECKED		TITLE: Steam boiler fittings		
APPROVED		ENG. TYPE: VARIOUS	DRG. NO. BF1000	ISSUE A
		USED ON: VARIOUS	SHT. 5 OF 12 SHEETS	

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 SCALES: NTS



BP15	1	M8 boiler bush	Brass	
BP14	1	M6 boiler bush	Brass	
BP13	1	Flue cap	Brass	
BP12	1	Flue joiner ring	Brass	

ITEM	TOTAL QTY	DESCRIPTION	MATERIAL	REMARKS
		Beattie Steam Engines		
		TITLE: Steam boiler fittings		
		ENG. TYPE: VARIOUS	DRG. NO. BF1000	ISSUE A
		USED ON: VARIOUS	SHT. 6 OF 12 SHEETS	

DO NOT SCALE

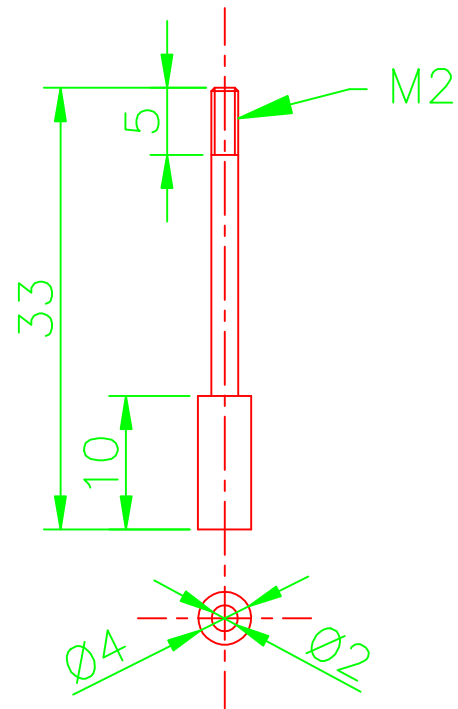
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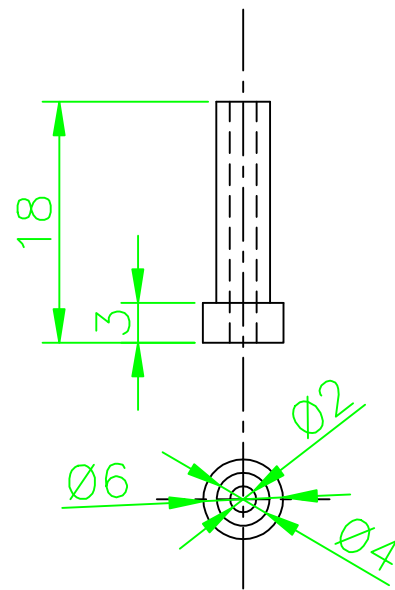
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ISSUE	DRAWN	CHECKED	APPROVED	DATE	REASON FOR CHANGE

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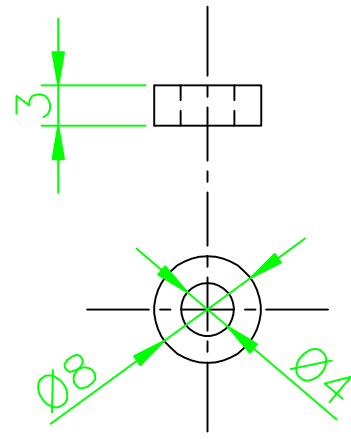
THIRD ANGLE PROJ.
 SCALES: NTS



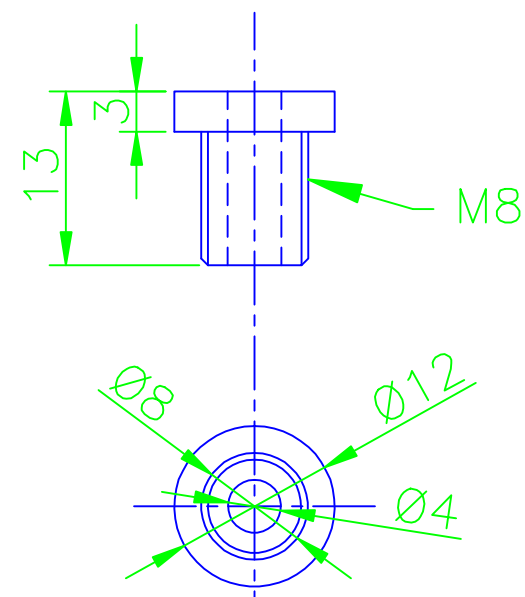
WS01



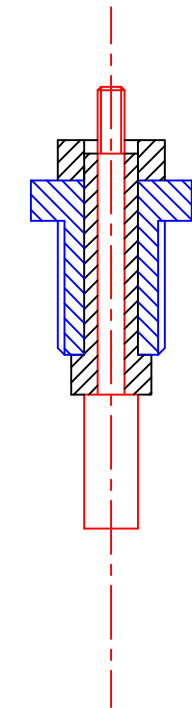
WS02



WS03



WS04



REPORT ANY ERROR OR OMISSION

DO NOT SCALE

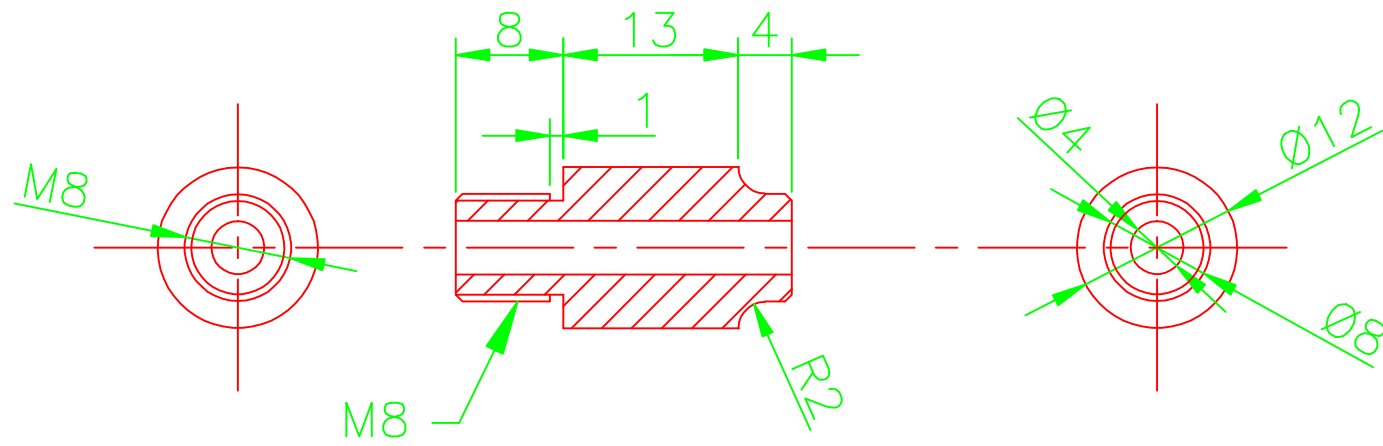
WS04	1	Water sensor bush	Brass	
WS03	1	Insulator washer	PTFE	
WS02	1	Insulator	PTFE	
WS01	1	Water sensor probe	Brass	
ITEM	TOTAL QTY	DESCRIPTION	MATERIAL	REMARKS
		Beattie Steam Engines		
		TITLE: Steam boiler fittings		
		ENG. TYPE: VARIOUS	DRG. NO. WS1000	ISSUE A
		USED ON: VARIOUS	SHT. 7 OF 12 SHEETS	

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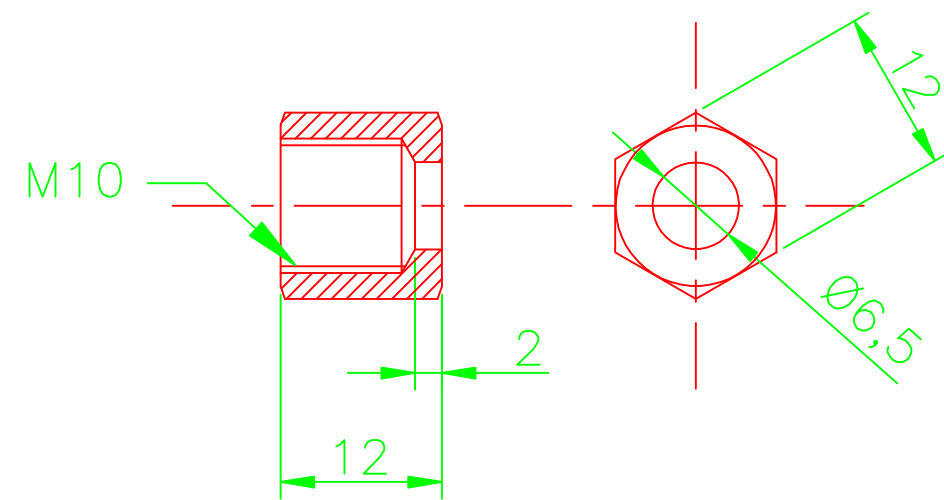
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ISSUE	DRAWN	CHECKED	APPROVED	DATE	REASON FOR CHANGE

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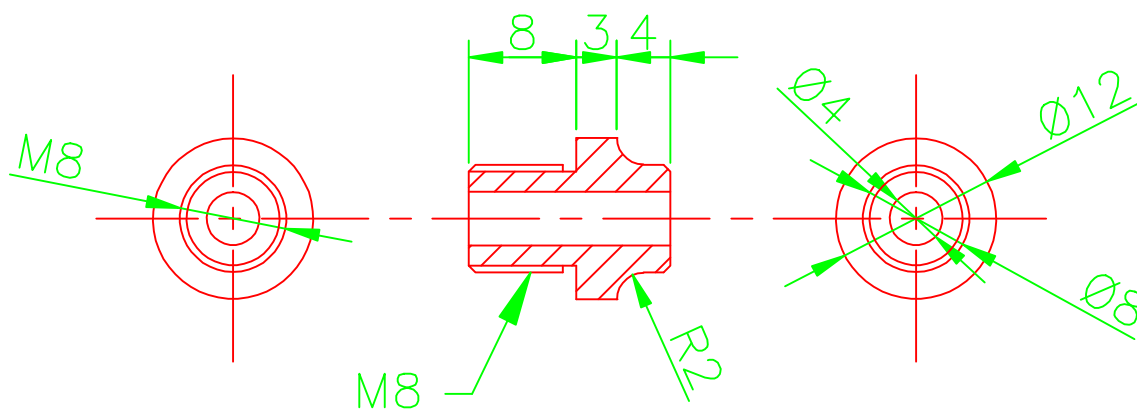
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WG04



WG05



WG03

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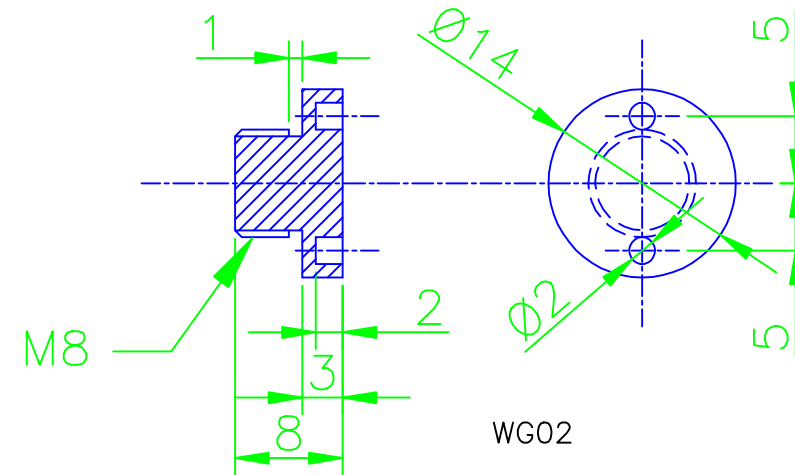
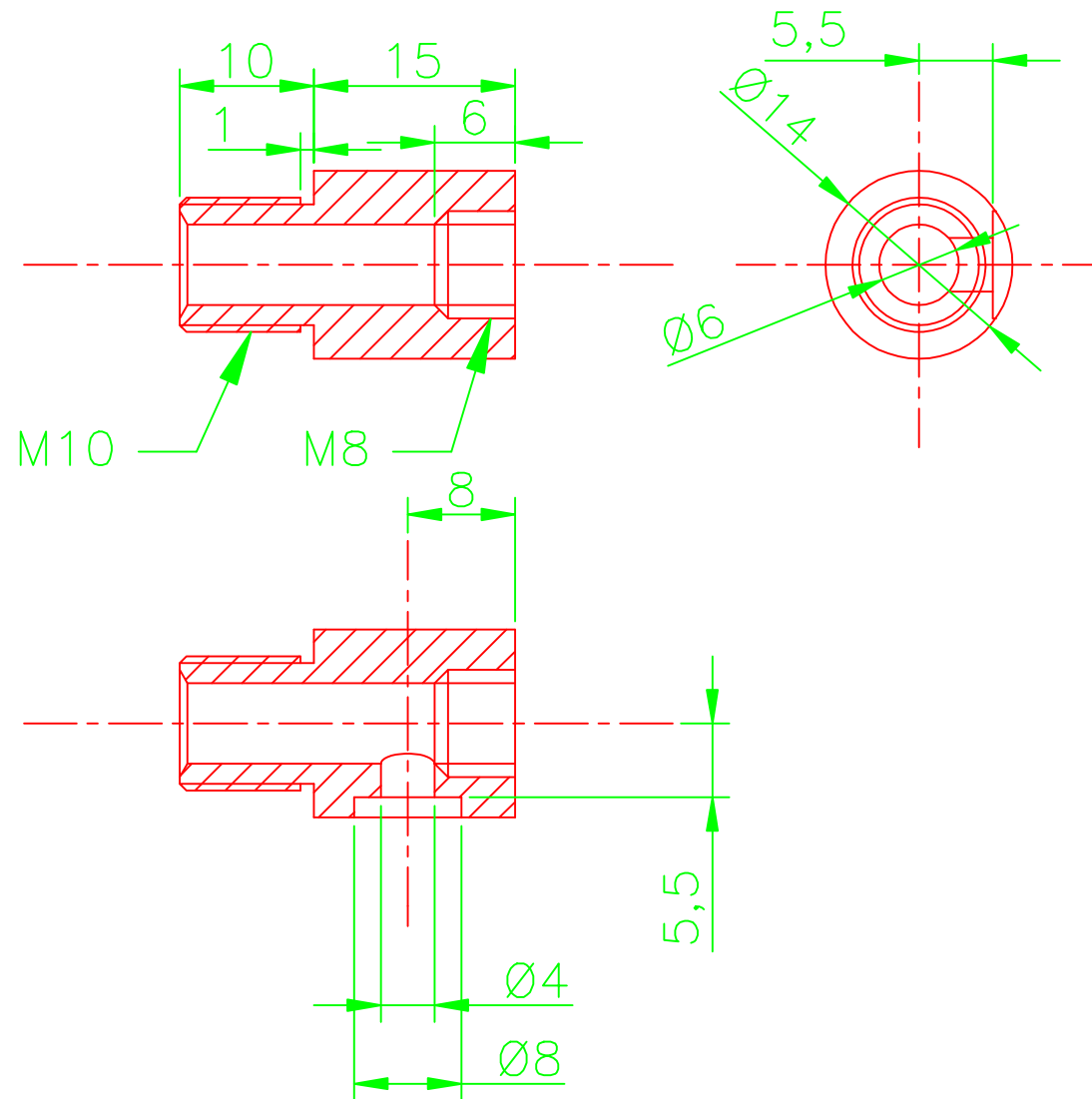
WG05	2	Water gauge glass nut	Brass	
WG04	1	Water gauge long boss	Brass	
WG03	1	Water gauge short boss	Brass	
ITEM	TOTAL QTY	DESCRIPTION	MATERIAL	REMARKS
DRAWN		Beattie Steam Engines		
CHECKED		TITLE: Steam boiler fittings		
APPROVED		ENG. TYPE: VARIOUS	DRG. NO. WG1000	ISSUE A
		USED ON: VARIOUS	SHT. 8 OF 12	SHEETS

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THIRD ANGLE PROJ.
 SCALES: NTS



WG01

WG02

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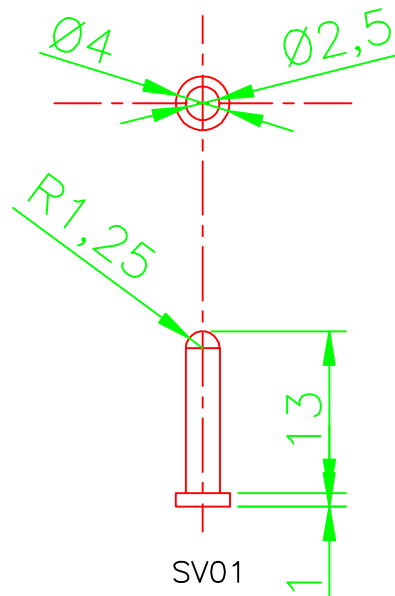
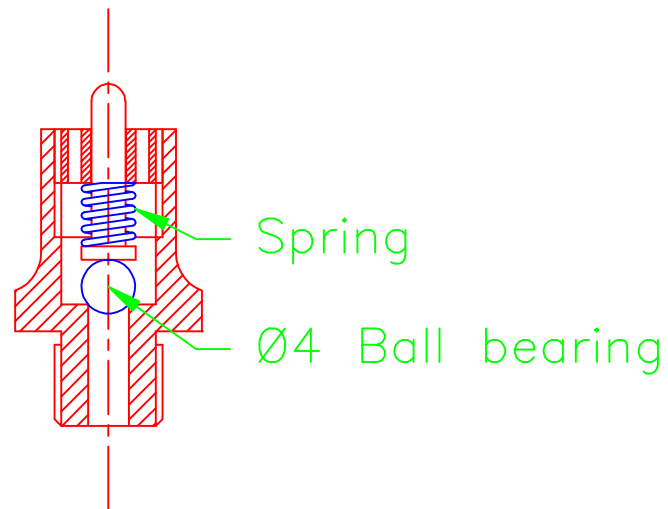
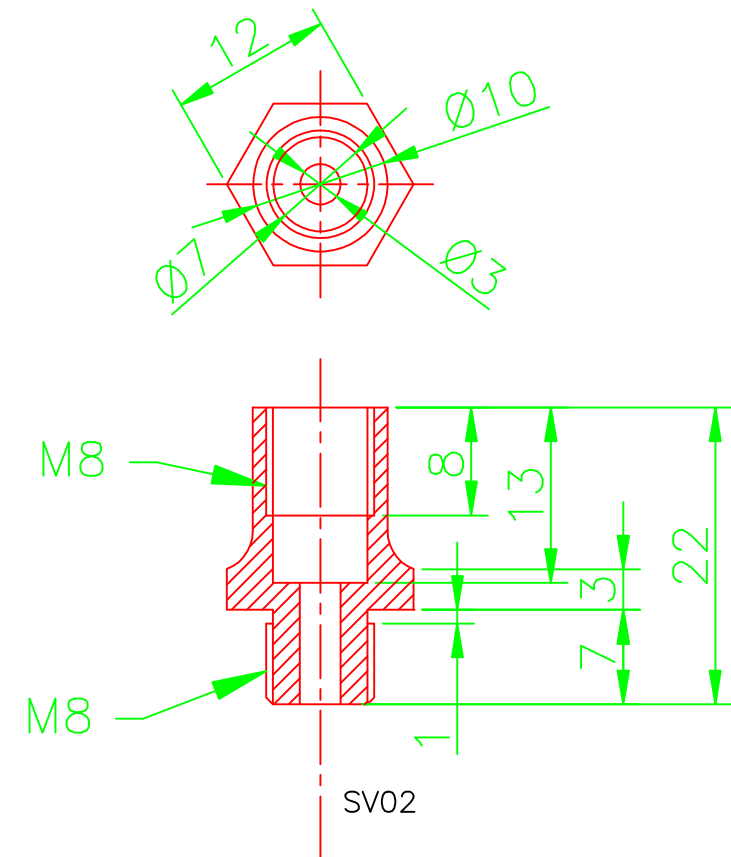
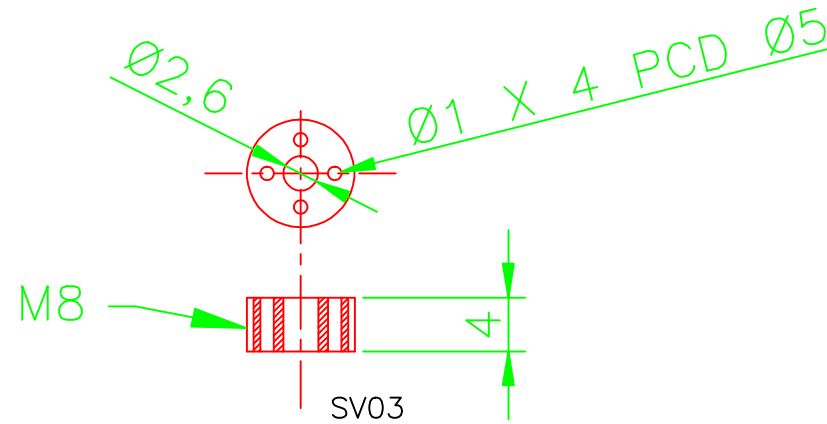
WG02	2	Water gauge nut	Brass	
WG01	2	Water gauge body	Brass	
ITEM	TOTAL QTY	DESCRIPTION	MATERIAL	REMARKS
		Beattie Steam Engines		
		TITLE: Steam boiler fittings		
		ENG. TYPE: VARIOUS	DRG. NO. WG1000	ISSUE A
		USED ON: VARIOUS	SHT. 9 OF 12 SHEETS	

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 SCALES: NTS



SV03	1	Safety valve nut	Brass	
SV02	1	Safety valve body	Brass	
SV01	1	Safety valve push rod	Brass	
ITEM	TOTAL QTY	DESCRIPTION	MATERIAL	REMARKS
DRAWN		Beattie Steam Engines		
CHECKED		TITLE: Steam boiler fittings		
APPROVED		ENG. TYPE: VARIOUS	DRG. NO. SV1000	ISSUE A
		USED ON: VARIOUS	SHT. 10 OF 12	SHEETS

DO NOT SCALE

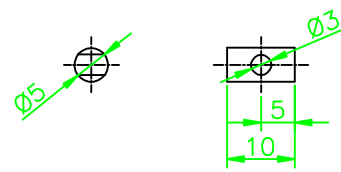
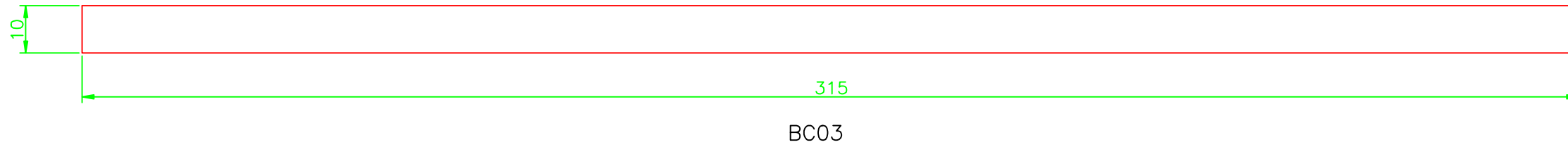
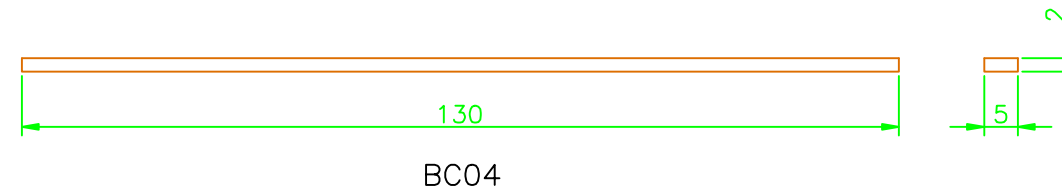
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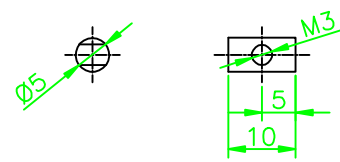
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THIRD ANGLE PROJ.
 SCALES: NTS



BC01



BC02

BC04	50	Cladding	Teak	
BC03	3	Cladding band	Brass	
BC02	3	Band nut	Brass	
BC01	3	Band clamp	Brass	
ITEM	TOTAL QTY	DESCRIPTION	MATERIAL	REMARKS

DO NOT SCALE

DRAWN				Beattie Steam Engines	
	D	M	Y	TITLE: Steam boiler fittings	
CHECKED					
	D	M	Y		
APPROVED				ENG. TYPE: VARIOUS	DRG. NO. BC1000
	D	M	Y	USED ON: VARIOUS	SHT. 11 OF 12 SHEETS

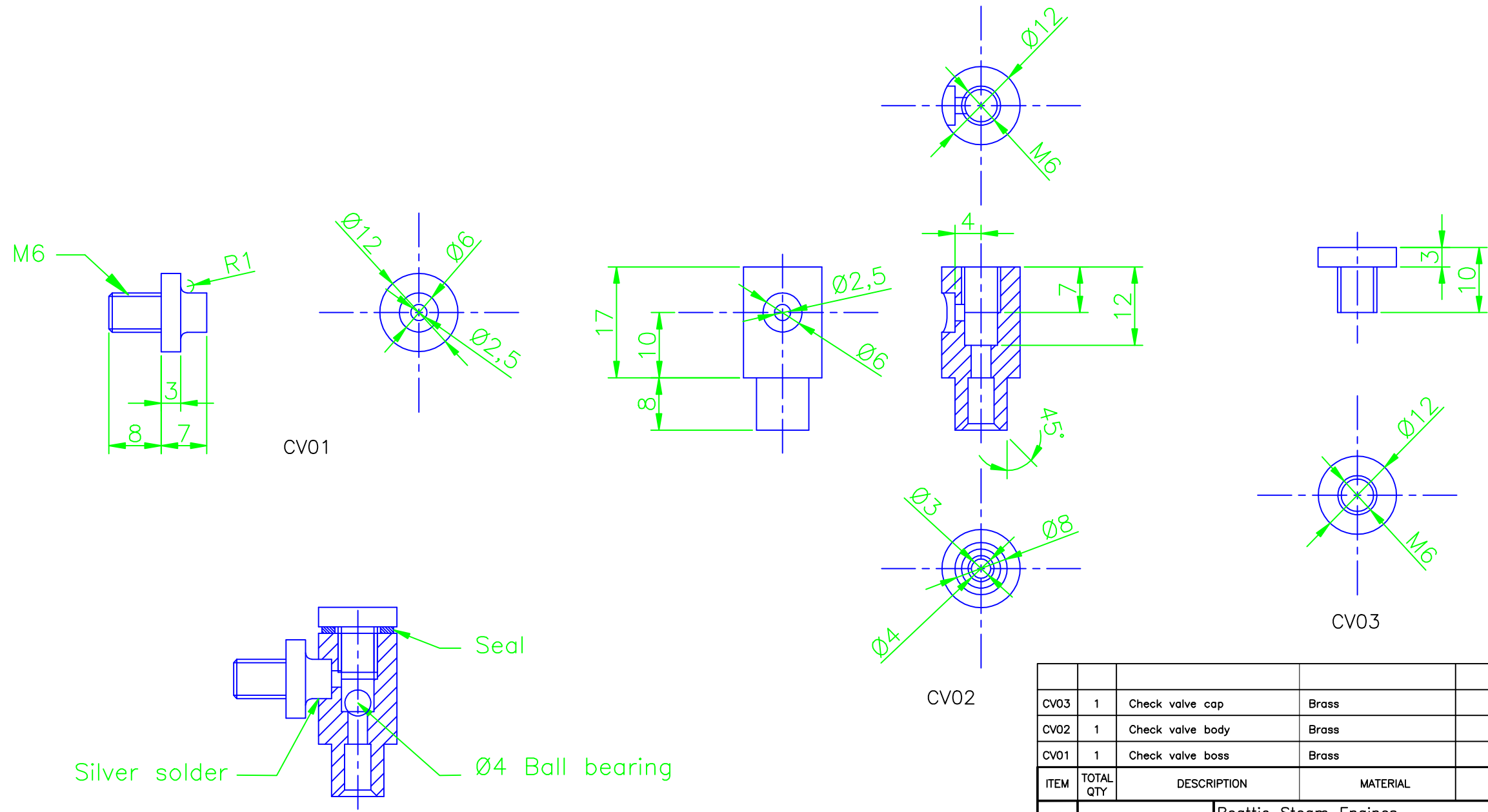
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CV03	1	Check valve cap	Brass	
CV02	1	Check valve body	Brass	
CV01	1	Check valve boss	Brass	

ITEM	TOTAL QTY	DESCRIPTION	MATERIAL	REMARKS

DRAWN	Beattie Steam Engines		
	D	M	Y
CHECKED	TITLE: Steam boiler fittings		
	D	M	Y
APPROVED	ENG. TYPE: VARIOUS		DRG. NO. BF1000
	D	M	Y
USED ON: VARIOUS		SHT. 12 OF 12	SHEETS

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