


	1		2		3		4																																							
A	<div>Available executions</div> <table><tr><th rowspan="2">Execution No.</th><th rowspan="2">Material ID</th><th rowspan="2">Cylinder No.</th><th colspan="2">Attribute 1: Turbocharger lubrication</th></tr><tr><th>INTERNAL</th><th>EXTERNAL</th></tr><tr><td>001</td><td>PAAD251105</td><td>5</td><td></td><td>X</td></tr><tr><td>002</td><td>PAAD251106</td><td>5</td><td>X</td><td></td></tr><tr><td>003</td><td>PAAD251115</td><td>6</td><td></td><td>X</td></tr><tr><td>004</td><td>PAAD251118</td><td>6</td><td>X</td><td></td></tr><tr><td>005</td><td>PAAD278129</td><td>7</td><td></td><td>X</td></tr><tr><td>006</td><td>PAAD278130</td><td>7</td><td>X</td><td></td></tr></table>								Execution No.	Material ID	Cylinder No.	Attribute 1: Turbocharger lubrication		INTERNAL	EXTERNAL	001	PAAD251105	5		X	002	PAAD251106	5	X		003	PAAD251115	6		X	004	PAAD251118	6	X		005	PAAD278129	7		X	006	PAAD278130	7	X		A
Execution No.	Material ID	Cylinder No.	Attribute 1: Turbocharger lubrication																																											
			INTERNAL	EXTERNAL																																										
001	PAAD251105	5		X																																										
002	PAAD251106	5	X																																											
003	PAAD251115	6		X																																										
004	PAAD251118	6	X																																											
005	PAAD278129	7		X																																										
006	PAAD278130	7	X																																											
B	<div>SURFACE PROTECTION SEE GROUP 03/44</div> <div>TOLERANCING PRINCIPLE ISO8015</div>								B																																					
C									C																																					
D	<div>NOTE</div> <p>The above executions can be configured using the Engine Configurator. Detailed guidance for the executions is provided within the Marine Installation Manual (MIM). If a specific execution of interest is not shown in the above table, then it may still be under development or not available. For further information or in case of a project-specific request, WinGD must be contacted directly.</p> <p>This publication is designed to provide accurate and authoritative information with regard to the subject-matter covered as it was available at the time of printing. However, the publication deals with complicated technical matters suited only for specialists in the area, and the design of the subject-products is subject to regular improvements, modifications and changes. Consequently, the publisher and copyright owner of this publication cannot accept any responsibility or liability for any eventual errors or omissions in this document or for discrepancies arising from the features of any actual item in the respective product being different from those shown in this publication. The publisher and copyright owner shall under no circumstances be held liable for any financial consequential damages or other loss, or any other damage or injury, suffered by any party making use of this publication or the information contained herein.</p>								D																																					
E	Prod.	X52																																												
E	Change History																																													
		-	sna102			new Design																																								
		Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E	C																																				
F	<div>WIN GD</div> <div>Winterthur Gas &amp; Diesel</div>				LUBRICATING OIL SYSTEM																																									
	separate BOM available				Dimension																																									
	Scale	-		NX	Units [mm] [kg]	Basic Material		Net Weight	0.001																																					
	Copyright Winterthur Gas & Diesel Ltd. All rights reserved. By taking possession of the drawing the recipient recognizes and honours these rights. Neither the whole nor any part of this drawing may be used in any way for construction, fabrication, marketing or any other purpose nor copied in any way nor made accessible to third parties without the previous written consent of Winterthur Gas & Diesel Ltd.				Main Design		Design Group	9722	Q-Code	XXXXXX	Standard	WDS																																		
					Qty per		A4	Item ID	PTAA025306		Drawing Page/s	1/1																																		
	1		2		3		4																																							

SEQ NO	QTY	Item ID	Item Name	Dimension	Standard-ID	Basic Material	Net Weight
1	1	PAAD177914	LUBRICATING OIL SYSTEM				0.001
2	1	PAAD245338	LUBRICATING OIL SYSTEM				0.001
3	1	PAAD204254	LUBRICATING OIL DRAIN TANK				0.001
4	1	107.341.455.500	INSTRUCTION FOR FLUSHING				0.001
5	1	PAAD178480	LUBRICATING OIL DRAIN TANK				0.001

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Prod	5 X52										
Change History											
	-	dkl021	mhu019	09.02.2017	EAAD087222	Legacy information. See corresponding ChangeNotice				4	-
	Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis			Activity Code	E	C

				LUBRICATING OIL SYSTEM					
Bill Of Material				Dimension					
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				Main Design		Yes		Design Group	
				Qty per		Engine		A4	
								Item ID	
								PAAD251105	
								BOM Page/s	
								01/01	



SEQ NO	QTY	Item ID	Item Name	Dimension	Standard-ID	Basic Material	Net Weight
1	1	PAAD177914	LUBRICATING OIL SYSTEM				0.001
2	1	PAAD245338	LUBRICATING OIL SYSTEM				0.001
3	1	PAAD178472	LUBRICATING OIL DRAIN TANK				0.001
4	1	107.341.455.500	INSTRUCTION FOR FLUSHING				0.001
5	1	PAAD178480	LUBRICATING OIL DRAIN TANK				0.001

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Prod.	6 X52							
Change History								
	-	dkl021	mhu019	09.02.2017	EAAD087222	Legacy information. See corresponding ChangeNotice		4 -
	Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E C

<div>WIN GD</div> <div>Winterthur Gas &amp; Diesel</div>		LUBRICATING OIL SYSTEM					
Bill Of Material		Dimension					
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		Main Design Yes		Design Group 9722		Q-Code XXXXX	Standard WDS
		Qty per Engine	A4	Item ID PAAD251115		BOM Page/s 01/01	

SEQ NO	QTY	Item ID	Item Name	Dimension	Standard-ID	Basic Material	Net Weight
1	1	PAAD177914	LUBRICATING OIL SYSTEM				0.001
3	1	PAAD178472	LUBRICATING OIL DRAIN TANK				0.001
4	1	107.341.455.500	INSTRUCTION FOR FLUSHING				0.001
5	1	PAAD178480	LUBRICATING OIL DRAIN TANK				0.001

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Prod.	6 X52							
Change History								
	-	dkl021	mhu019	09.02.2017	EAAD087222	Legacy information. See corresponding ChangeNotice		4 -
	Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E C

<div> <div>WIN GD</div> <div>Winterthur Gas &amp; Diesel</div> </div>			LUBRICATING OIL SYSTEM					
Bill Of Material			Dimension					
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			Main Design		Yes		Design Group	
			Qty per		Engine		A4	
							Item ID	
							PAAD251118	
							BOM Page/s	
							01/01	

SEQ NO	QTY	Item ID	Item Name Dimension	Standard-ID	Basic Material	Net Weight
1	1	PAAD177914	LUBRICATING OIL SYSTEM			0.001
2	1	PAAD245338	LUBRICATING OIL SYSTEM			0.001
3	1	PAAD277820	LUBRICATING OIL DRAIN TANK			246
4	1	107.341.455.500	INSTRUCTION FOR FLUSHING			0.001
5	1	PAAD178480	LUBRICATING OIL DRAIN TANK			0.001


Prod.	7 X52			
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 <p>Winterthur Gas &amp; Diesel</p>	<p>LUBRICATING OIL SYSTEM</p> <p>PAAD278129</p>
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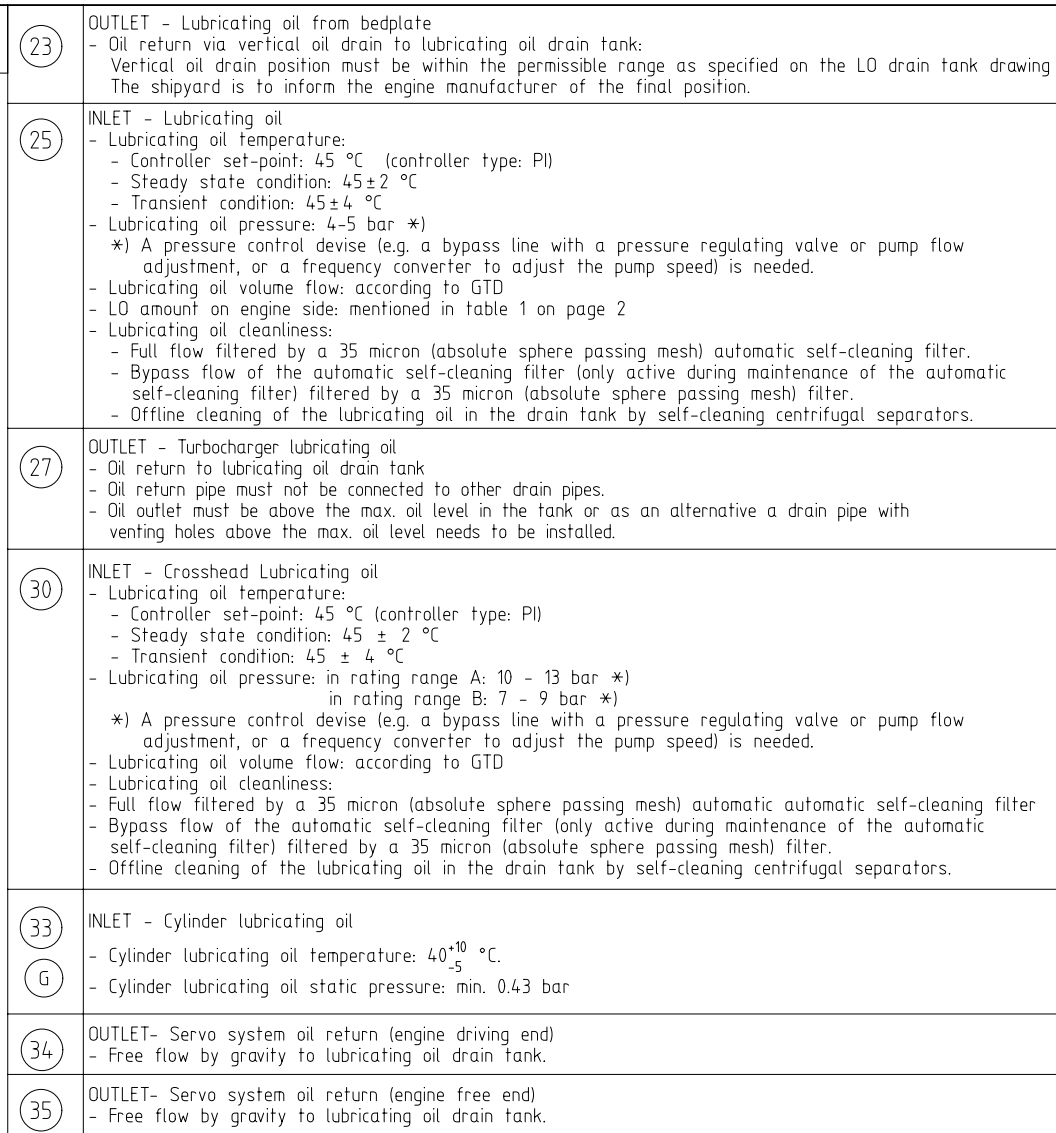
SEQ NO	QTY	Item ID	Item Name	Dimension	Standard-ID	Basic Material	Net Weight
1	1	PAAD177914	LUBRICATING OIL SYSTEM				0.001
3	1	PAAD277820	LUBRICATING OIL DRAIN TANK				246
4	1	107.341.455.500	INSTRUCTION FOR FLUSHING				0.001
5	1	PAAD178480	LUBRICATING OIL DRAIN TANK				0.001

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Prod	7 X52										
Change History											
	A	dkl021	mhu019	08.09.2020	EAAD091530	Legacy information. See corresponding ChangeNotice				4	-
	-	dkl021	mhu019	17.10.2017		-				-	-
	Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis				Activity Code	E

			LUBRICATING OIL SYSTEM PAAD278130					
Bill Of Material			Dimension					
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			Main Design Yes		Design Group 9722		Q-Code XXXXX	Standard WDS
			Qty per Engine	A4	Item ID PAAD278130		BOM Page/s	01/01

(38)	<p>OUTLET- Supply unit oil return</p> <p>- Free flow by gravity to lubricating oil drain tank.</p>	(23)	<p>OUTLET - Lubricating oil from bedplate</p> <p>- Oil return via vertical oil drain to lubricating oil drain tank:</p> <p>Vertical oil drain position must be within the permissible range as specified on the LO drain tank drawing</p>
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SURFACE PROTECTION SEE GROUP 0344		Copyright Winterthur Gas & Diesel Ltd. All rights reserved. By taking possession of the drawing the recipient recognizes and honours these rights. Neither the whole nor any part of this drawing may be used in any way for construction, fabrication, marketing or for any other purpose not covered in this way nor made accessible to third parties without the previous written consent of Winterthur Gas & Diesel Ltd.		Design Group	9722	Q-Code	X	X	M	Standard	WDS
TOLERANCING PRINCIPLE ISO8015		Main Design	Qty per	A2	PA00177404				Drawing Page/s	1/3	
GENERAL TOLERANCES ACCORDING TO ISO2768-mK											



### SYSTEM PROPOSAL

System oil and cylinder LO supply

Pos.	ENGINE CONNECTIONS *2)	Pos.	SYSTEM COMPONENTS *1)
23	OUTLET - Lubricating oil from bedplate	001	Lubricating oil drain tank (sump tank)
25	INLET - Lubricating oil	002	Heating device
27	OUTLET - Turbocharger lubricating oil *12) *14)	003	Suction strainer *11)
30	INLET - Crosshead lubricating oil	004	Lubricating oil pump
33	INLET - Cylinder lubricating oil	005	Lubricating oil cooler
34	OUTLET- Servo system oil return (engine driving end)	006	Autom. temperature control valve, constant temp. at engine inlet: 45 °C
35	OUTLET- Servo system oil return (engine free end)	007	Automatic self-cleaning filter, 35 micron, with backflushing oil treatment *12) *13)
38	OUTLET- Supply unit oil return	008	Transition piece (adaptor) *7)
		009	Deck connection
		010	Low BN cylinder lubricating oil storage tank *4)
		011	Low BN cylinder lubricating oil service tank *4)
		012	Three-way valve, manually or remotely operated
		013	Pressure regulating valve
		014	High BN cylinder lubricating oil storage tank *4)
		015	High BN cylinder lubricating oil service tank *4)
		016	Crosshead lubricating oil pump *8)
		017	Electrical trace heating

Number of cylinders		5	6	7	8
Main Engine X52 rated with CME speed 92 rpm	power (kW)	7925	9510	11095	12860
	speed (rpm)	92			

Proposal for dimensioning *10)					
LO drain tank	capacity (m³)	For capacities refer to drawing "LO drain tank-Filling Guideline"			
Main LO pump	capacity (m³/h)	refer to GTD			
Crosshead LO pump	capacity (m³/h)	refer to GTD			
Cyl. LO storage tank	capacity (m³)	Based on a feed rate of 1 g/kWh (pulse)			
Cyl. LO service tank *15)	capacity (m³)	0.7	0.8	0.9	1.0
Nominal pipe diameter					
A	DN	200	200	250	250
B	DN	200	200	200	200
C	DN	80	80	100	100
D	DN	65	65	80	80
E	DN	150	200	200	200
F	DN	25	25	25	25

Cylinder	Volume
5	1618 l
6	1850 l
7	2081 l
8	2254 l

Remarks:

- Air vent pipes and drain valves where necessary.
- Air vent and drain pipes must be fully functional at all inclination angles of the ship at which the engine must be operational.
- \*1) To be delivered by external supplier and to be installed by the shipyard.
- \*2) Refer to "Pipe Connection Plan" for exact position and execution of the pipe connection.
- \*3) Optional heating coil.
- \*4) The cylinder LO service tank with metering device provides the possibility to supervise the cylinder LO consumption of the engine. Alternatively, if the cylinder LO service tank is omitted so that the engine is fed directly from the cylinder LO storage tank, the height of the storage tank must match the minimum height specified for the service tank. If additional elements are installed in the supply line to the engine (e.g. a flowmeter) this height must be increased to compensate the pressure drop.
- \*5) The bypass line with the pressure regulating valve can be omitted if one of the following conditions is fulfilled:
  - The pump speed is adjusted according to the required pressure at engine inlet, (e.g. by a frequency controller)
  - The pumps have built-in pressure regulating valves
  - The pump built-in safety valve is in any case mandatory and not to be used for pressure regulation (pure safety function).
- \*6) Three-way valve has to be fitted as close as possible to the engine inlet. This is to reduce the volume of remaining oil in the system (with the previous BNI after the change-over).
- \*7) Installed as required (check with the "Pipe Connection Plan")
- \*8) The LO pumps (pos. 004) and the crosshead LO pumps (pos. 016) are to be interlocked so that the crosshead LO pumps never can run alone.
- \*10) All capacities and the given pipe diameters are valid for the mentioned engine rating, including the oil amount for integrated TC lubrication, but excluding additional required oil for applied damper and/or PTO gear and/or all other externally installed ancillaries which are fed by system oil. To make the project specific layout, under consideration of the actual required flow rates / capacities, the guideline as given within DG730 - "Fluid velocities and flow rates, recommended values for pipework of diesel plants" has to be observed.
- \*11) Mesh size according to pump suppliers recommendation.
- \*12) The oil return pipe must not be connected to other drain pipes. If the oil is returned to the LO drain tank it is recommended to connect the oil outlet - as close as possible to the separator suction pipe - opposite to the main LO pump, i.e.
  - on tanks' forward end if the main LO pump is on tanks' aft end
  - on tanks' aft end if the main LO pump is on tanks' forward end
  - on tanks' forward or aft end if the main LO pump is in the middle of the tank.
- \*13) If the back-flushing process is driven by compressed air and the back-flushing oil is returned to the LO drain tank the oil outlet must be above the max. oil level. Alternatively a drain pipe with venting holes above the max. oil level needs to be installed to avoid back-flushing air blowing into the oil. Back-flushing oil must be treated.
- \*14) The oil outlet in the LO drain tank must be above the max. oil level or as an alternative a drain pipe with venting holes above the max. oil level needs to be installed.
- \*15) The proposed cylinder LO service tank capacity takes into account a filling interval of 2 days based on the above mentioned feed rate.

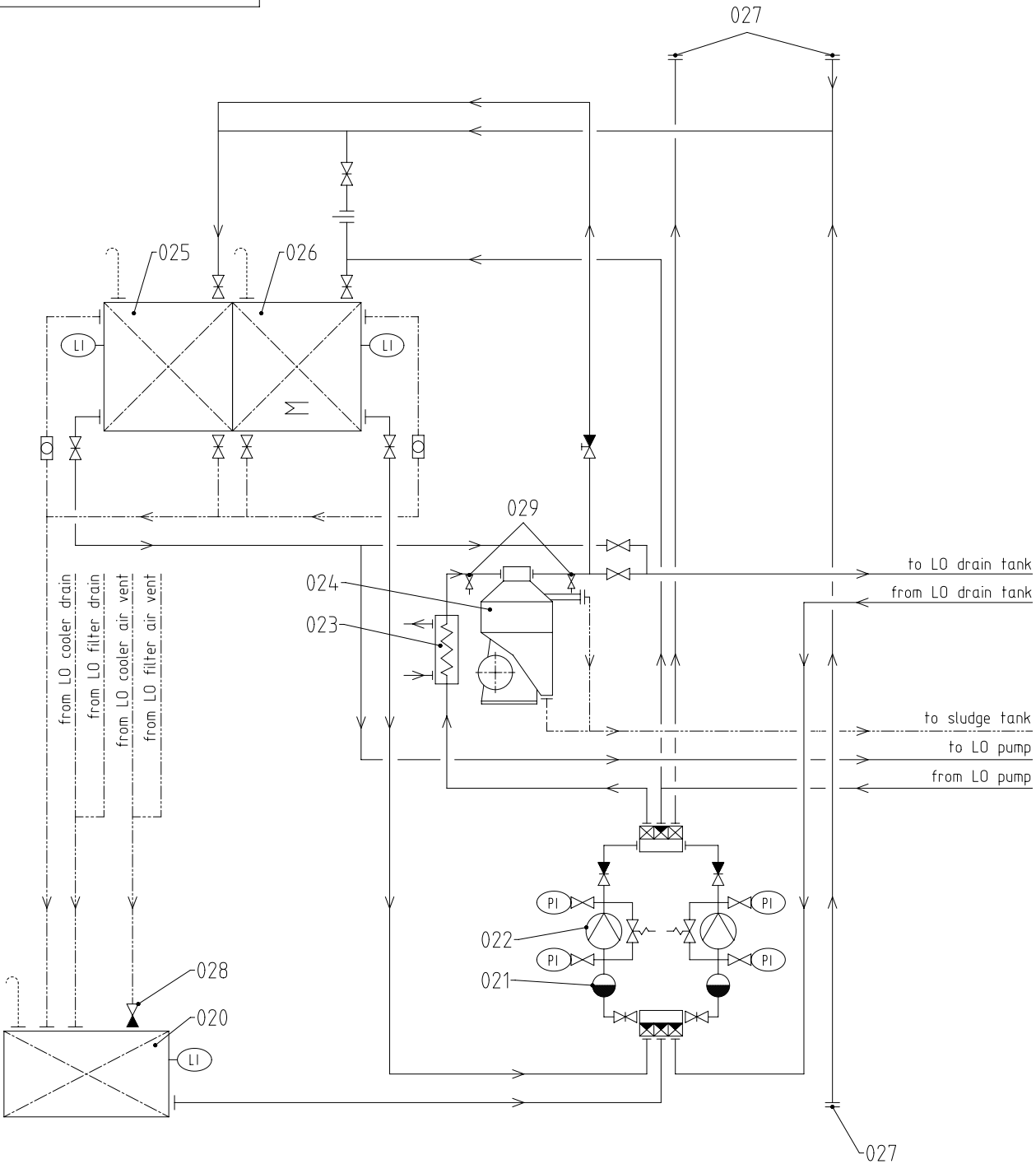
From clean LO tank

To dirty LO tank

Legend:

- Bearing LO pipes
- - - Cylinder LO pipes
- M - Cylinder LO pipes trace heated and insulated
- Pipes on engine
- Transfer/drain LO pipes
- - - Overflow/drain pipes
- - - Air vent pipes
- - - Crosshead LO pipes
- Pipe connections

SYSTEM PROPOSAL - LO treatment system



Pos.	SYSTEM COMPONENTS *1)
020	Residue oil tank
021	Suction strainer *11)
022	Lubricating oil pump one for transfer and separator service one for separator service
023	Lubricating oil heater with relief valve and temperature control
024	Self-cleaning centrifugal separator
025	Clean lubricating oil tank
026	Dirty lubricating oil tank
027	Deck connection
028	Float non-return valve
029	LO sampling cock *20)

X52		Number of cylinders			
		5	6	7	8
Clean LO tank	capacity (m³)	equal or bigger than LO drain tank volume			
Dirty LO tank	capacity (m³)	equal or bigger than LO drain tank volume			
LO separator	capacity (l/h)	1020	1230	1430	1640
Residue oil tank	capacity (m³)	Depending on ship's requirements			

Remarks:

- Air vents and drain valves where necessary.
- Air vent and drain pipes must be fully functional at all inclination angles of the ship at which the engine must be operational (check Class rules).
- Pipe diameters to be designed according to shipyards' practice and component suppliers' recommendations.

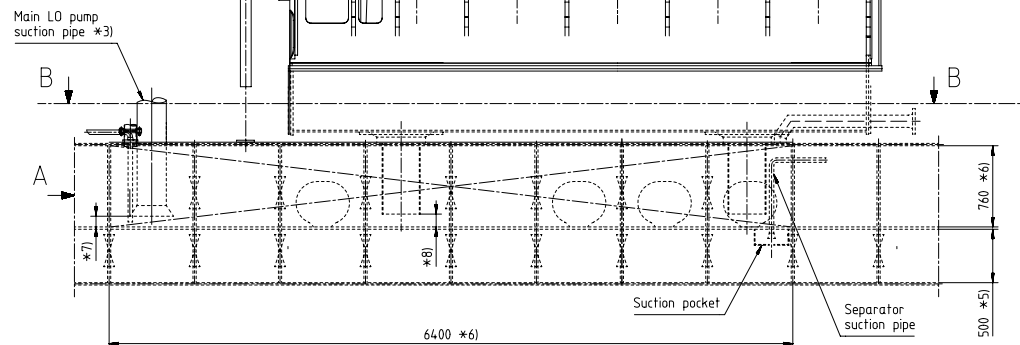
\*1) To be delivered by external supplier and to be installed by the shipyard.

\*11) Mesh size according to pump suppliers recommendation.

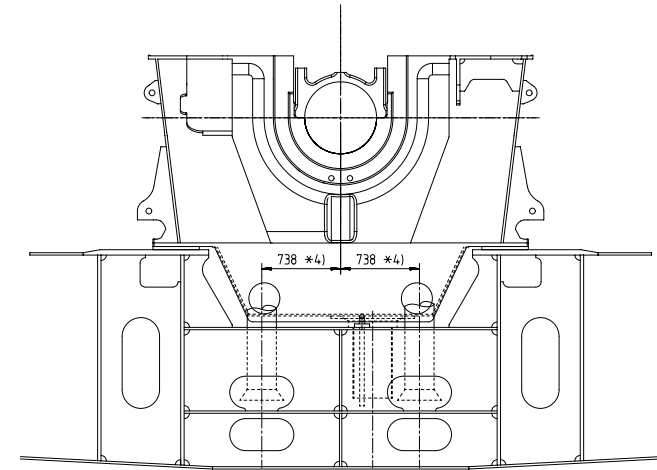
\*20) Recommended position for LO sampling to check LO quality / treatment efficiency.

— Main separating piping  
--- Transfer/dirty LO pipes  
... Overflow/drain pipes  
-.-.- Air vent pipes

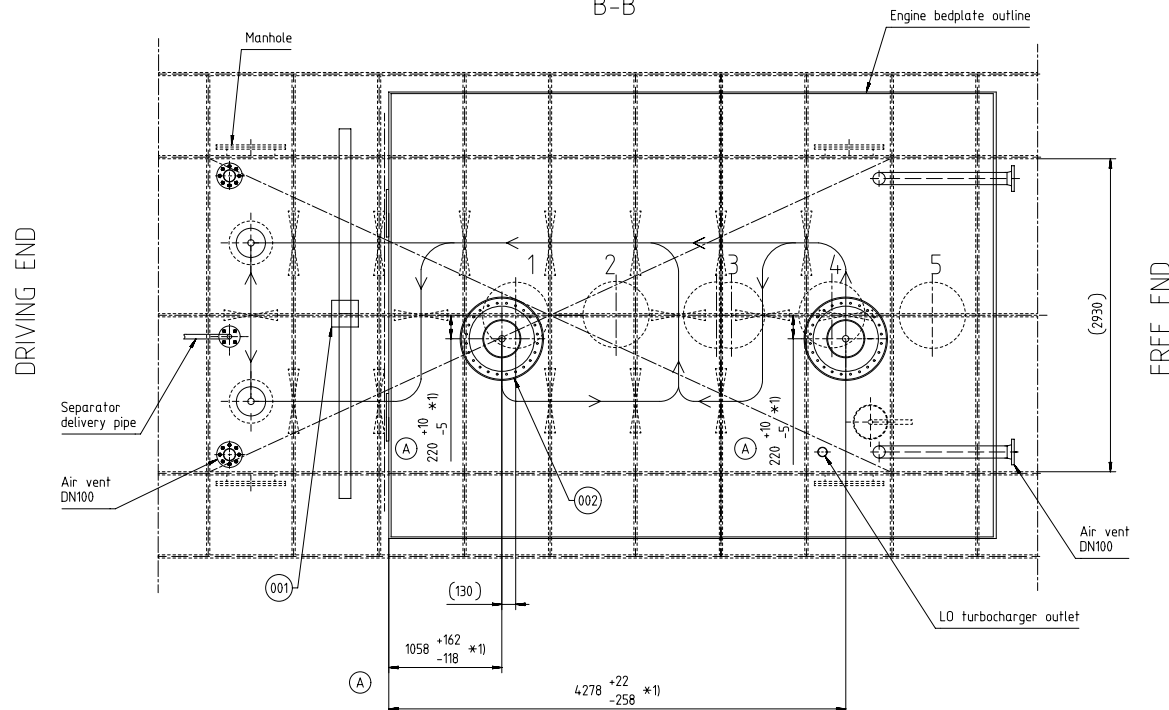
5X52/DF



A (DRIVING END)



B-B

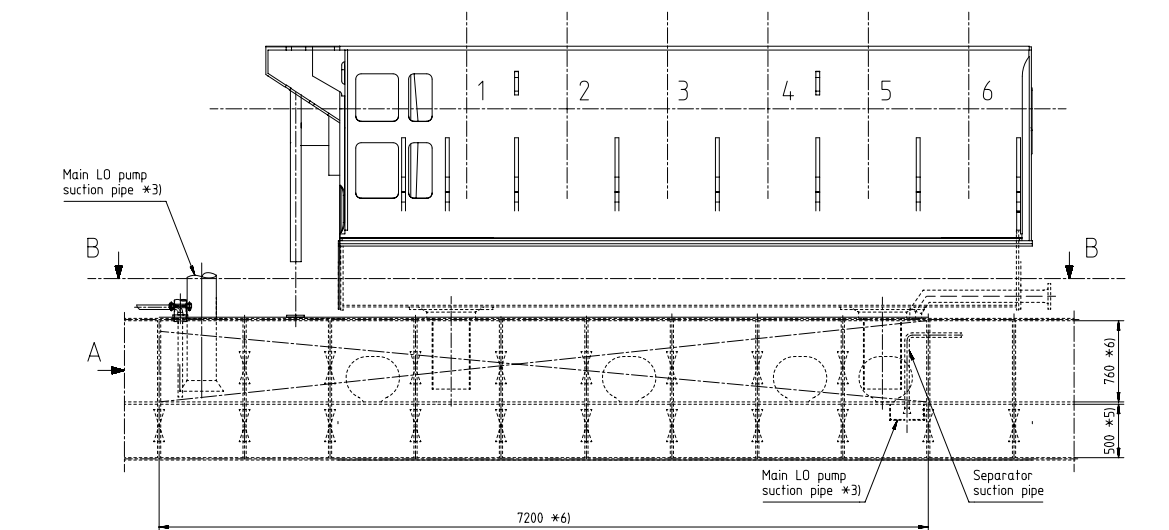


## REMARKS:

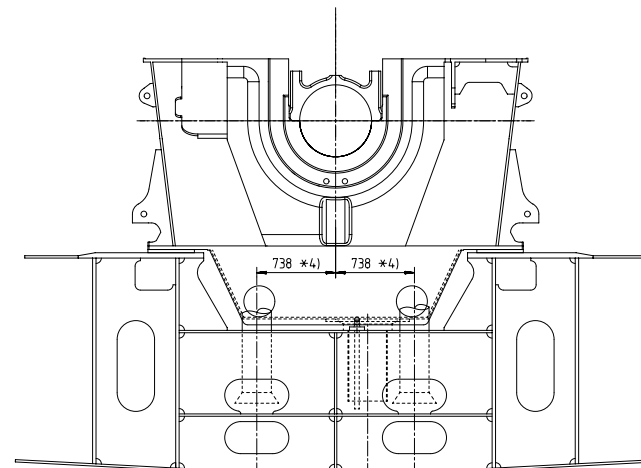
- \*1) Drains must be arranged by the shipyard in accordance with the ship hull structure and within the specified tolerance range. As soon as the final positions are determined the engine manufacturer must be informed so that the bedplate (oil pan) holes can be machined in compliance with the engine builder drawing "BEDPLATE OIL DRAIN" (DG1110).
- \*2) Recommendation regarding plate thickness is given in the Marine Installation Drawing Set (MIDS) "ENGINE / SEATING FOUNDATION" (foundation arrangement drawing, DG9710).
- \*3) Recommendation regarding the pipe size is given in the system proposal as provided in the MIDS "LUBRICATING OIL SYSTEM" (LO system drawing, DG9722).
- \*4) Final position depends on the size of the flywheel casing and required space for the main LO pump.
- \*5) Final height must be in accordance with the rules of the relevant classification society.
- \*6) Proposal, final tank dimensions are to be determined by the shipyard in accordance with the ship hull structure, minimum required filling / circulation volume, pump suction requirements and rules of the relevant classification society. Requirements / design criteria for the tank layout are provided in the MIDS "LUBRICATING OIL DRAIN TANK - Filling Guidelines" (DG9722).
- \*7) Distance according to pump makers specification.
- \*8) The drain pipe outlet must be below the min. LO level (LO low level alarm height) though a gap of min. half of the drain pipe diameter (min. 1/2\*DN) to the drain tank bottom has to be maintained.

2	002	107.246.182.200	VERTICAL OIL DRAIN	107.246.182		76,9
1	001	107.246.799.200	PLATE	107.246.799		15,0
QTY	SEQ. NO.	Material ID	Material Name	Standard or Drawing	Basic Material Material: Standard Q-Code XXXXXX Standard ISO, JIS	Weight GR/NET
Mod.	Free space for file	EAAD09035	02.01.2019			
Number	Drawn date	Number	Drawn date	Number	Drawn date	Number
Units	mm kg	NX	Basic Material	Scale	1:25	Size
MADE	14.09.2015	Jaimin Prajapati	Scale	1:25	Size	AT
Chd	26.11.2015	mhu019 Hug	Design Group	9722	DAAD070533	Rev. A
Appd	26.11.2015	bha009 Haag	Design Group	9722	DAAD070533	Rev. A
SURFACE PROTECTION SEE GROUP 0344						
TOLERANCING PRINCIPLE ISO8015						
GENERAL TOLERANCES ACCORDING TO ISO2768-mK						
Product 5X52DF						
LUBRICATING OIL DRAIN TANK WITH VERTICAL DRAINS						
Units mm kg NX						
Net Weight 169						
Material ID PAAD204254						
Drawing DAAD070533						
Rev. A						

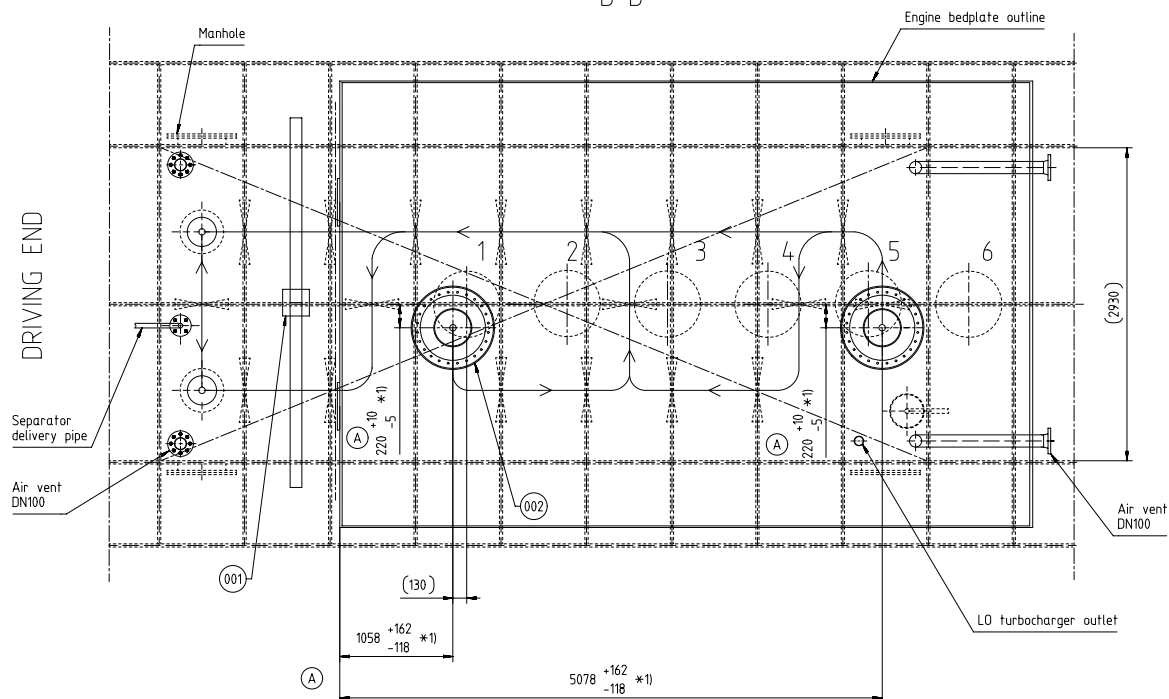
6X52/DF



A (DRIVING END)



B-B



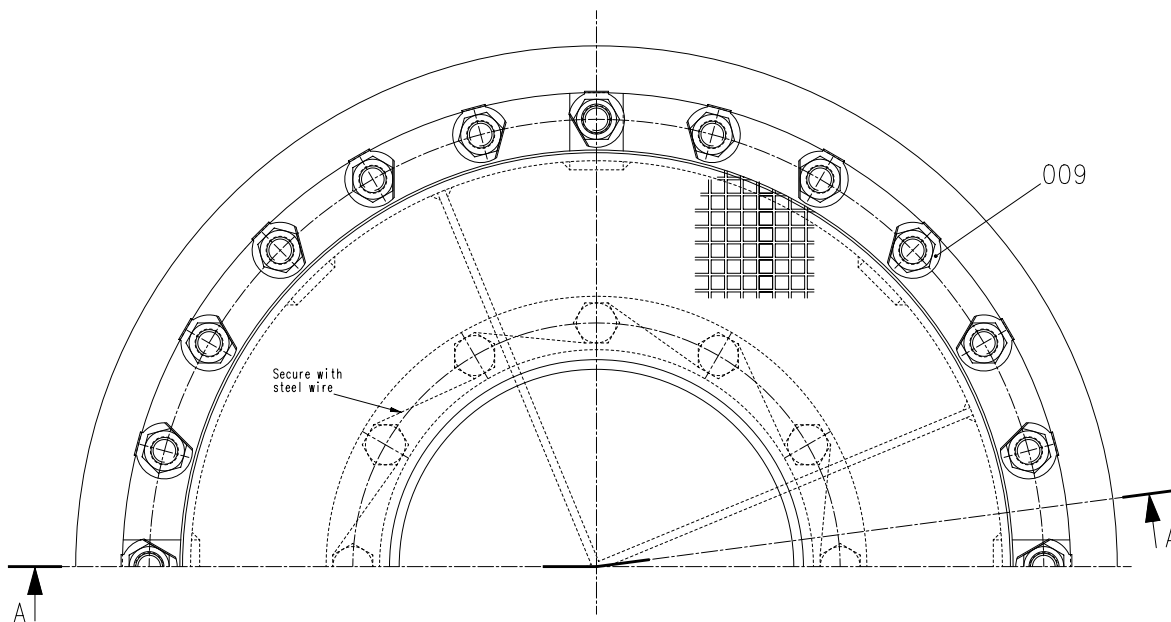
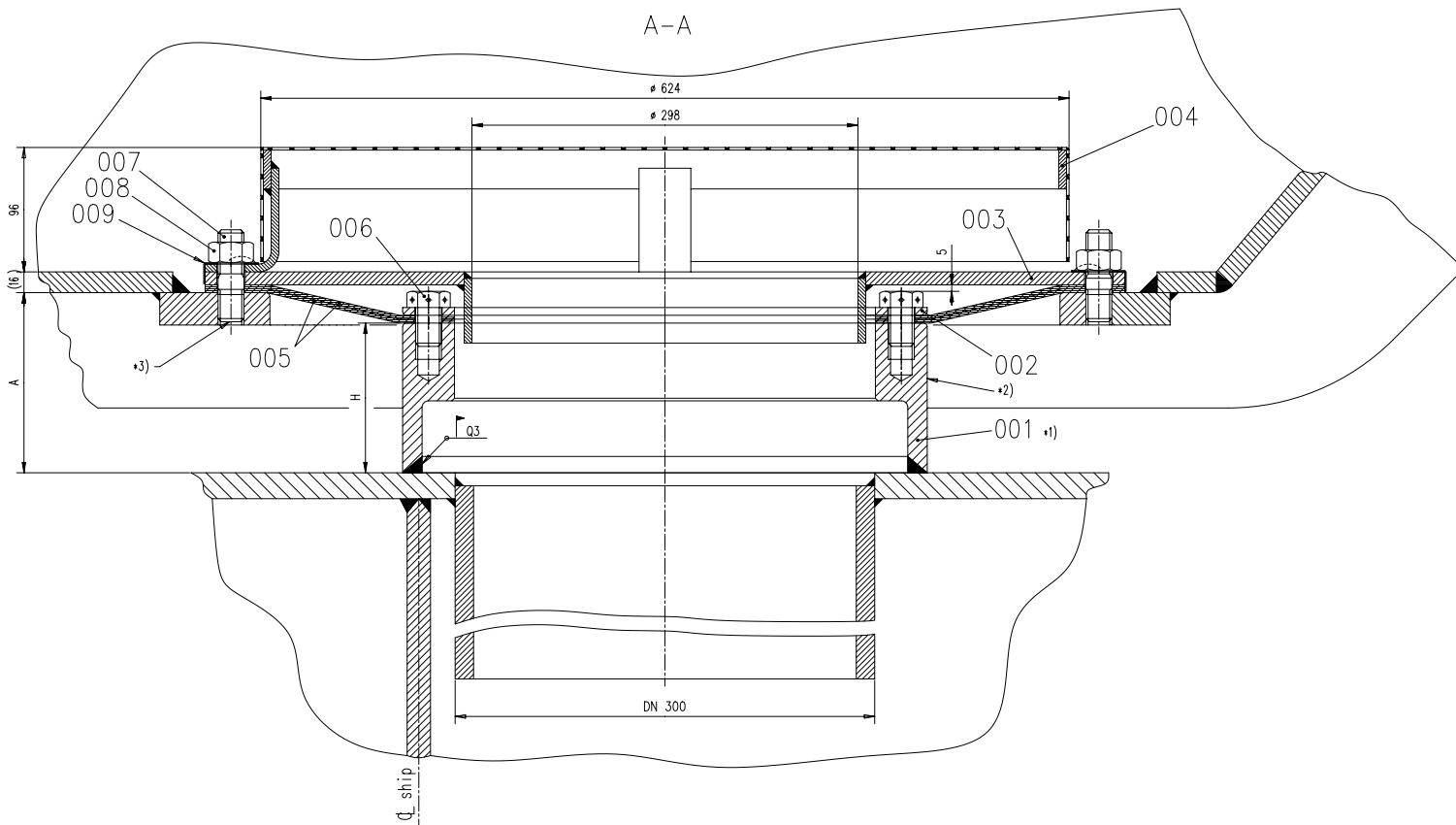
## REMARKS:

- \*1) Drains must be arranged by the shipyard in accordance with the shipull structure and within the specified tolerance range. As soon as the final positions are determined the engine manufacturer must be informed so that the bedplate (oil pan) holes can be machined in compliance with the engine builder drawing "BEDPLATE OIL DRAIN" (DG1110).
- \*2) Recommendation regarding plate thickness is given in the Marine Installation Drawing Set (MIDS) "ENGINE / SEATING FOUNDATION" (foundation arrangement drawing, DG9710).
- \*3) Recommendation regarding the pipe size is given in the system proposal as provided in the MIDS "LUBRICATING OIL SYSTEM" (LO system drawing, DG9722).
- \*4) Final position depends on the size of the flywheel casing and required space for the main LO pump.
- \*5) Final height must be in accordance with the rules of the relevant classification society.
- \*6) Proposal, final tank dimensions are to be determined by the shipyard in accordance with the shipull structure, minimum required filling / circulation volume, pump suction requirements and rules of the relevant classification society. Requirements / design criteria for the tank layout are provided in the MIDS "LUBRICATING OIL DRAIN TANK - Filling Guidelines" (DG9722).
- \*7) Distance according to pump makers specification.
- \*8) The drain pipe outlet must be below the min. LO level (LO low level alarm height) though a gap of min. half of the drain pipe diameter (min. 1/2\*DN) to the drain tank bottom has to be maintained.

2	002	107.246.182.200	VERTICAL OIL DRAIN	107.246.182		76,9
1	001	107.246.799.200	PLATE	107.246.799		15,0
QTY	SEQ. NO.	Material ID	Material Name	Standard or Drawing	Basic Material Material: Standard	Weight GR/NET
					Q-Code XXXXXX	Man. Drw.
					Standard ISO, JIS	
Mod.	EAAD09035	02.01.2019				
Number	Drawn date	Number	Drawn date	Number	Drawn date	Number
WINGD			LUBRICATING OIL DRAIN TANK WITH VERTICAL DRAINS			
Units: mm kg NX			Basic Material			
Made 10.12.2014 wwa008 W.WANG			Scale 1:25			
TOLERANCING PRINCIPLE ISO8015			Size A1			
GENERAL TOLERANCES ACCORDING TO ISO2768-mK			Page 1/1			
			Material ID PAAD178472			
			Drawing ID DAAD061872			
			Rev. A			
			Net Weight 169			







#### REMARKS:

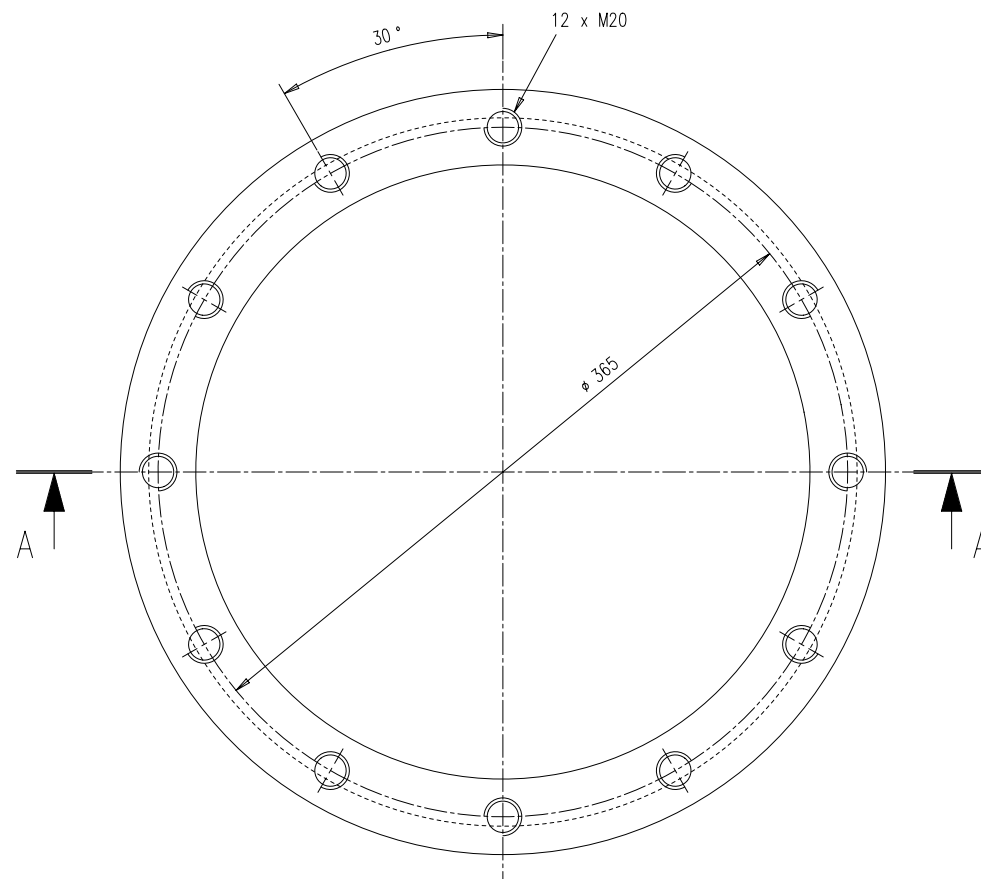
- \*1) To be aligned after engine is in final position.
- \*2) Pos. 001, 002, 005 and 006 to be pre-assembled prior to alignment. After alignment the Pos. 001 (flange) can be welded in place.
- \*3) Driven in oil tight with jointing compound.



A	To be measured after alignment of the engine
H	A-23.5mm

Items 001 to 009 are yard delivery

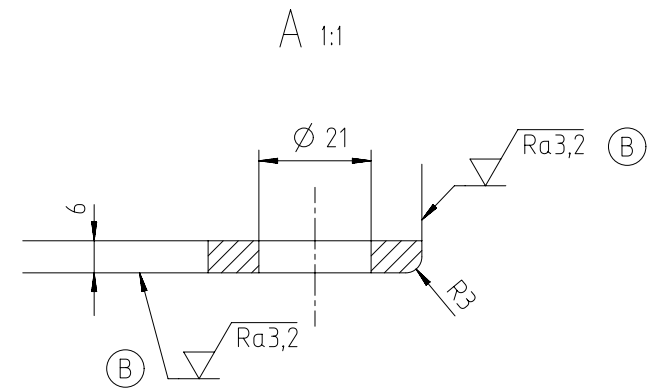
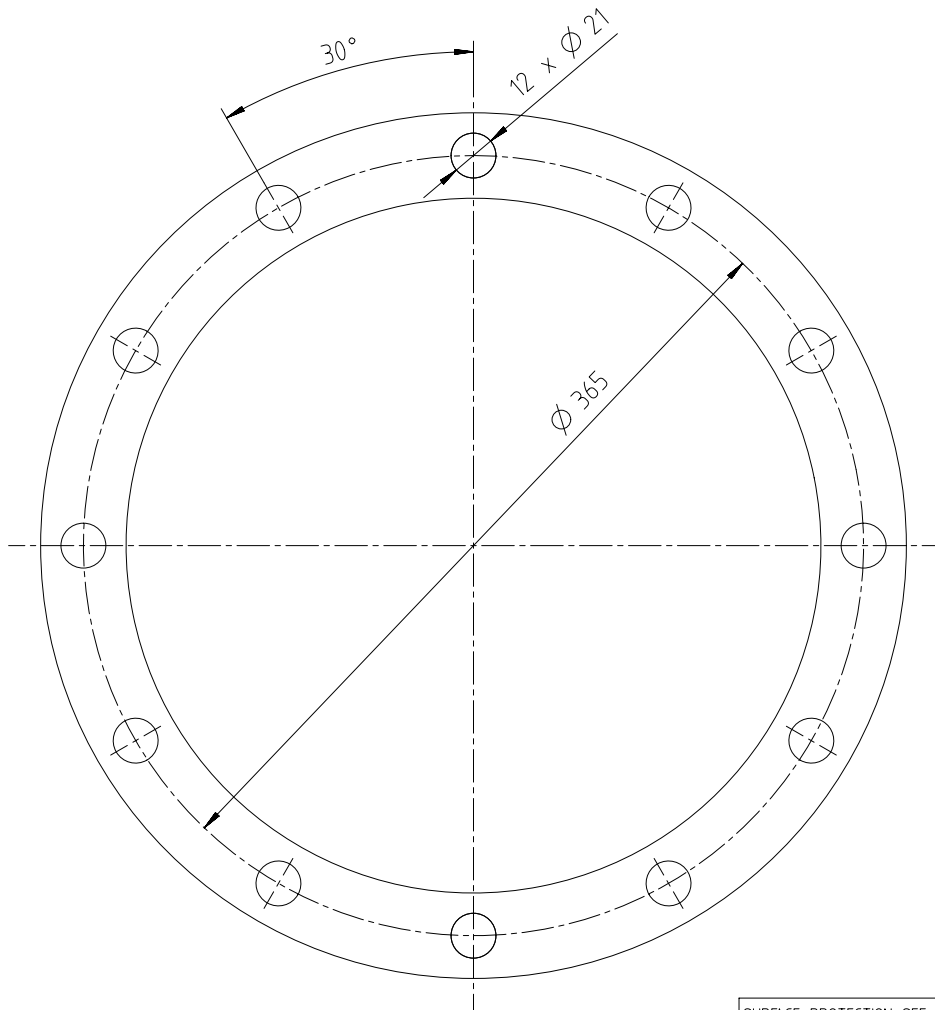
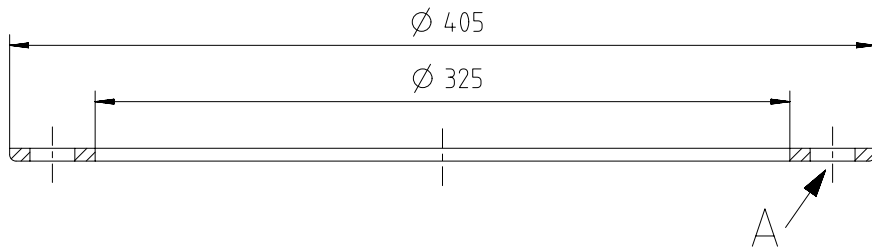
24	009	015.507.360.910	TAB WASHER	21	DIN 93	Steel Zn 5 bk	0,1
24	008	015.201.012.510	HEXAGON NUT	M20	ISO 4032	8	0,064
24	007	015.101.214.271	STUD	M20x4,5		8,8	0,17
12	006	015.151.374.201	HEXAGON HEAD SCREW	M20x30		8,8	0,12
2	005	107.246.190.001	RUBBER GASKET		107.246.190	NER 70 Sh	1,2
1	004	107.049.681.200	OIL STRAINER		107.049.681		8,3
1	003	107.246.187.200	COVER		107.246.187		26,6
1	002	107.246.186.001	RING		107.246.186	W-FU-235-JR	2,0
1	001	107.246.183.001	WELDING FLANGE		107.246.183	W-FU-235-JR	28,0
QTY	SEQ. NO.	Material ID	Material Name	Dimension, Qty	Standard or Drawing	Basic Material Material: Standard	Weight GR/NET
						Q-Code XXXXXX	Man. Drw.
						Standard ISO, JIS	

Mod.	17.08.1995	10.07.1998	25.01.1999	20.11.2019			
Number	Drawn date	Number	Drawn date	Number	Drawn date	Number	Drawn date
Product W-25				VERTICAL OIL DRAIN ASSEMBLY DRAWING			
WINGD				Delablauf vertikal			
Units	mm kg	NX	Basic Material	Size	Page	Material ID	Net Weight 76,7
Scale	1:2	Size	A1	Page	1/1	Material ID	107.246.182.200
Design Group	9722	Design Group	9722	Design Group	9722	Material ID	107.246.182
Appd	06.02.1996	MLL011	LUTH	Appd	06.02.1996	MLL011	LUTH
SURFACE PROTECTION SEE GROUP 0344				TOLERANCING PRINCIPLE ISO8015			
GENERAL TOLERANCES ACCORDING TO ISO2768-mK				Rev. D			




Free space for ILC											Q-Code XXXXXX		Main Drw.
											Standard ISO; JIS		
Modif.	A	EAAD014378	10.07.1998	B	EAAD091567	18.11.2019	<input type="radio"/>			<input type="radio"/>			
	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number	Drawn date	
 <b>WIN GD</b> Winterthur Gas & Diesel				Product W-25		WELDING FLANGE  Anschweisflansch							
Units	mm kg	NX				Basic Material W-FU-235-JR					Net Weight 28		
Made	21.08.1995 A. Horsford				Scale 1:2		Size A2	Page 1/1	Material ID	107.24.6.183.001			
Chkd					Design Group								
Appd	17.10.1995 MLU011 Lüthi				9722		Drawing ID	107.24.6.183			Rev.	B	



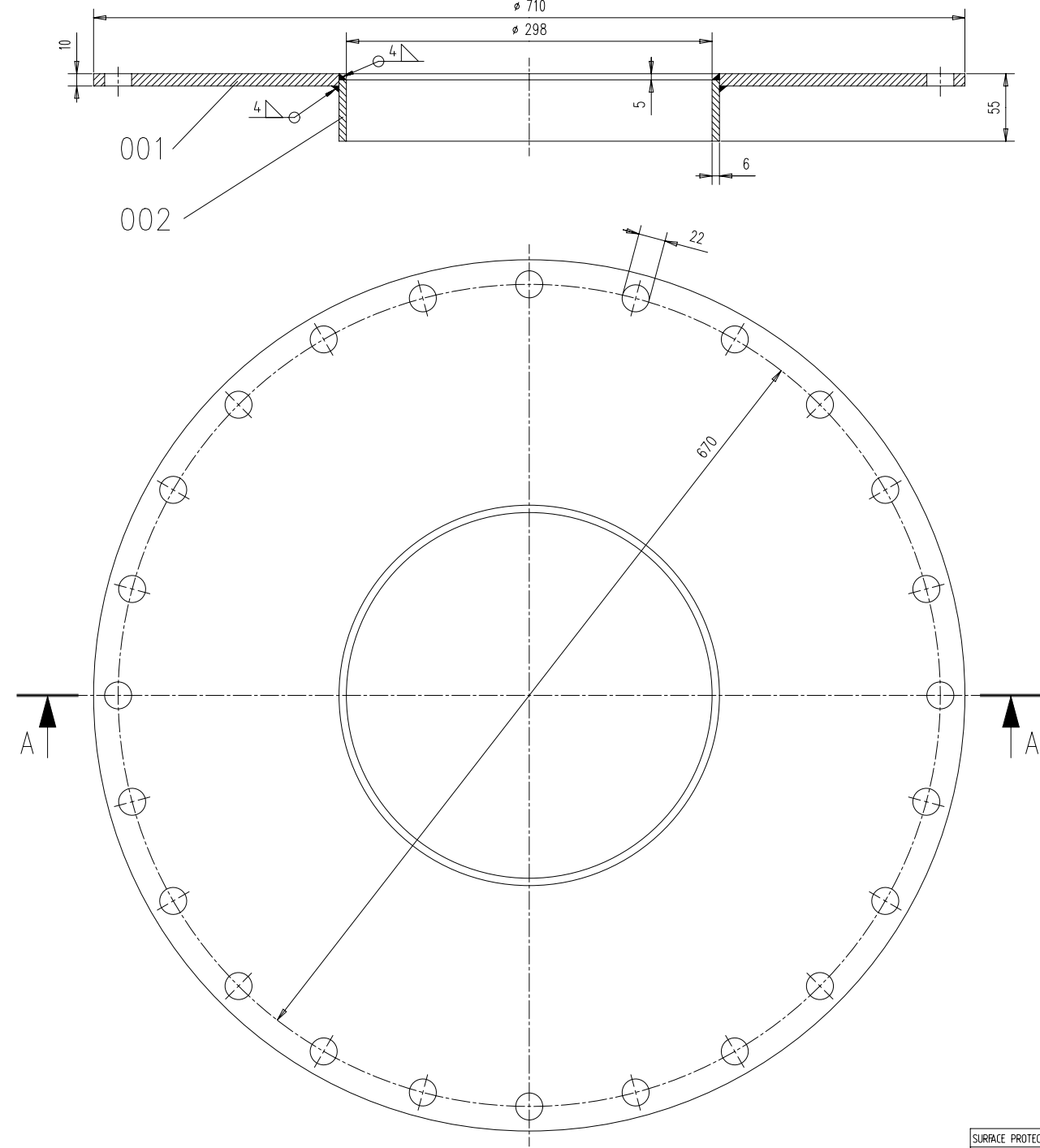


SHARP EDGES REMOVED



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								XXXXXX				
								Standard ISO; JIS				
Modif.	A	EAAD014378	10.07.1998	B	EAAD091567	18.11.2019						
		Number	Drawn date		Number	Drawn date		Number	Drawn date		Number	Drawn date
<div>WIN GD</div> <div>Winterthur Gas &amp; Diesel</div>			Product W-2S			RING  Ring						
Units	mm kg	NX		Basic Material			W-FU-235-JR			Net Weight 2		
Made	21.08.1995 A. Horsfjord			Scale 1:2.5		Size	Page	Material	107.246.186.001			
Chkd				Design Group		A3	1/1	ID				
Appd	17.10.1995 MLU011 Lüthi			9722		Drawing ID			107.246.186		Rev.	B

A-A

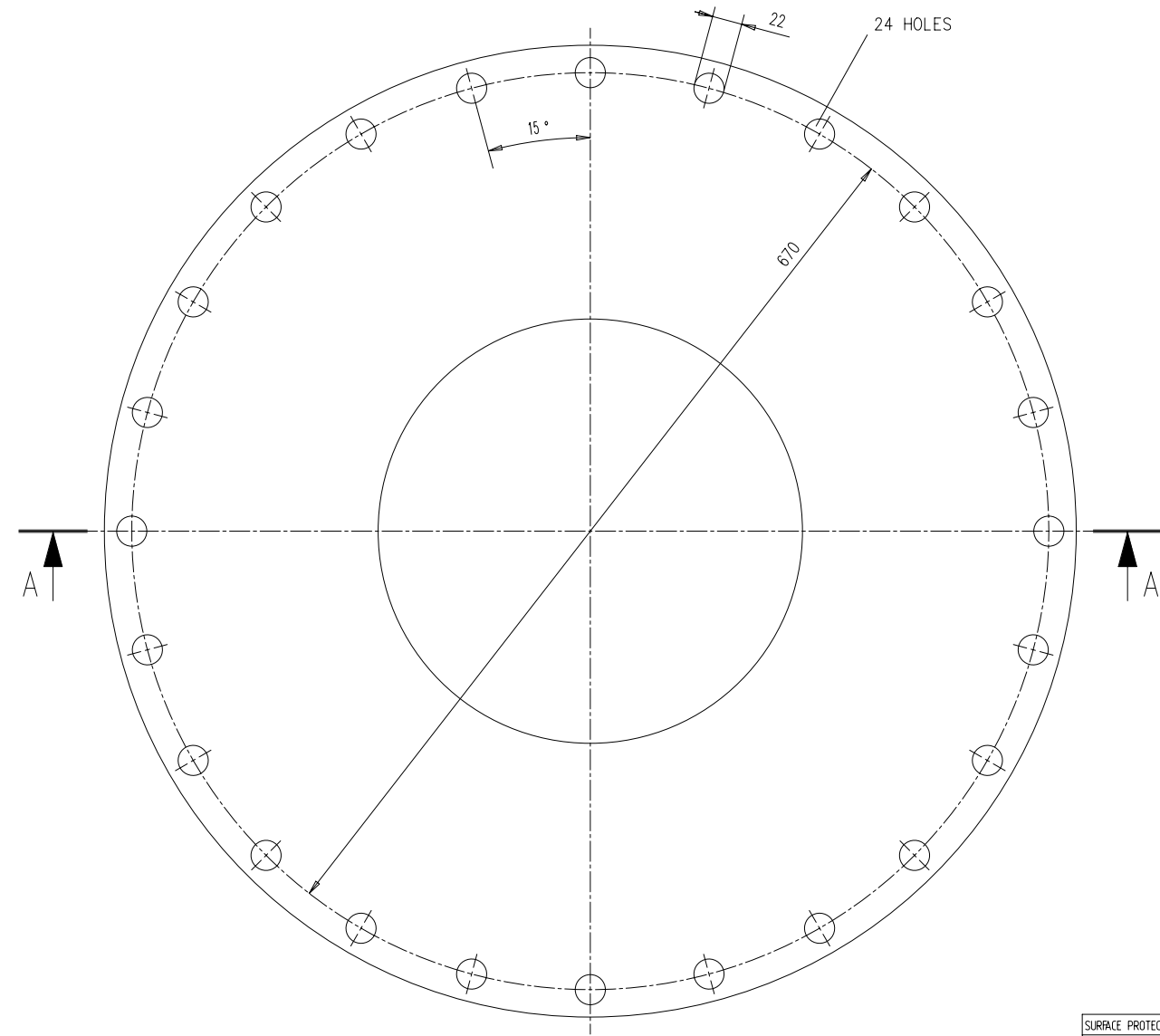
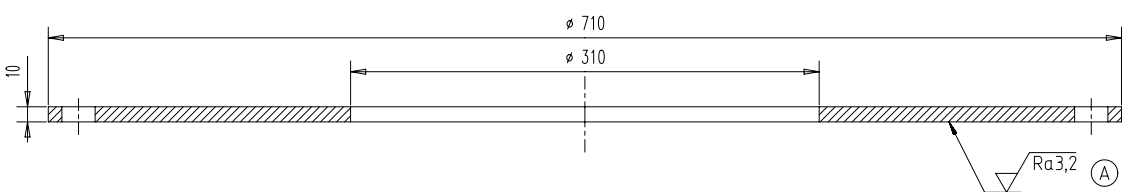
ø 710  
ø 298



Ⓐ WELD QUALITY LEVEL D (SEE DAAD007749; PAAD013544)

1	002	107.246.189.001	RING			107.246.189	W-FU-235-JR	2,2
1	001	107.246.188.001	PLATE			107.246.188	W-FU-235-JR	24,4
QTY	SEQ NO	Material ID	Material Name			Standard or Drawing	Basic Material Material Standard	Weight GR./NET
Free space for lic.							Q-Code XXXXXX	Main Drw.
							Standard ISO; JIS	
Modif.	A	EAAD091567	18.11.2019					
	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number	Drawn date
 Winterthur Gas & Diesel			Product W-2S		COVER  Deckel			
Units	mm kg	NX				Basic Material		Net Weight 26,6
Made	21.08.1995 A. Horsfjord		Scale 1:2,5		Size A2	Page 1/1	Material ID 107.246.187.200	107.246.187.200
Chkd			Design Group		Drawing ID 107.246.187		Rev. A	
Appd	17.10.1995 MLU011 Lüthi		9722					

A-A

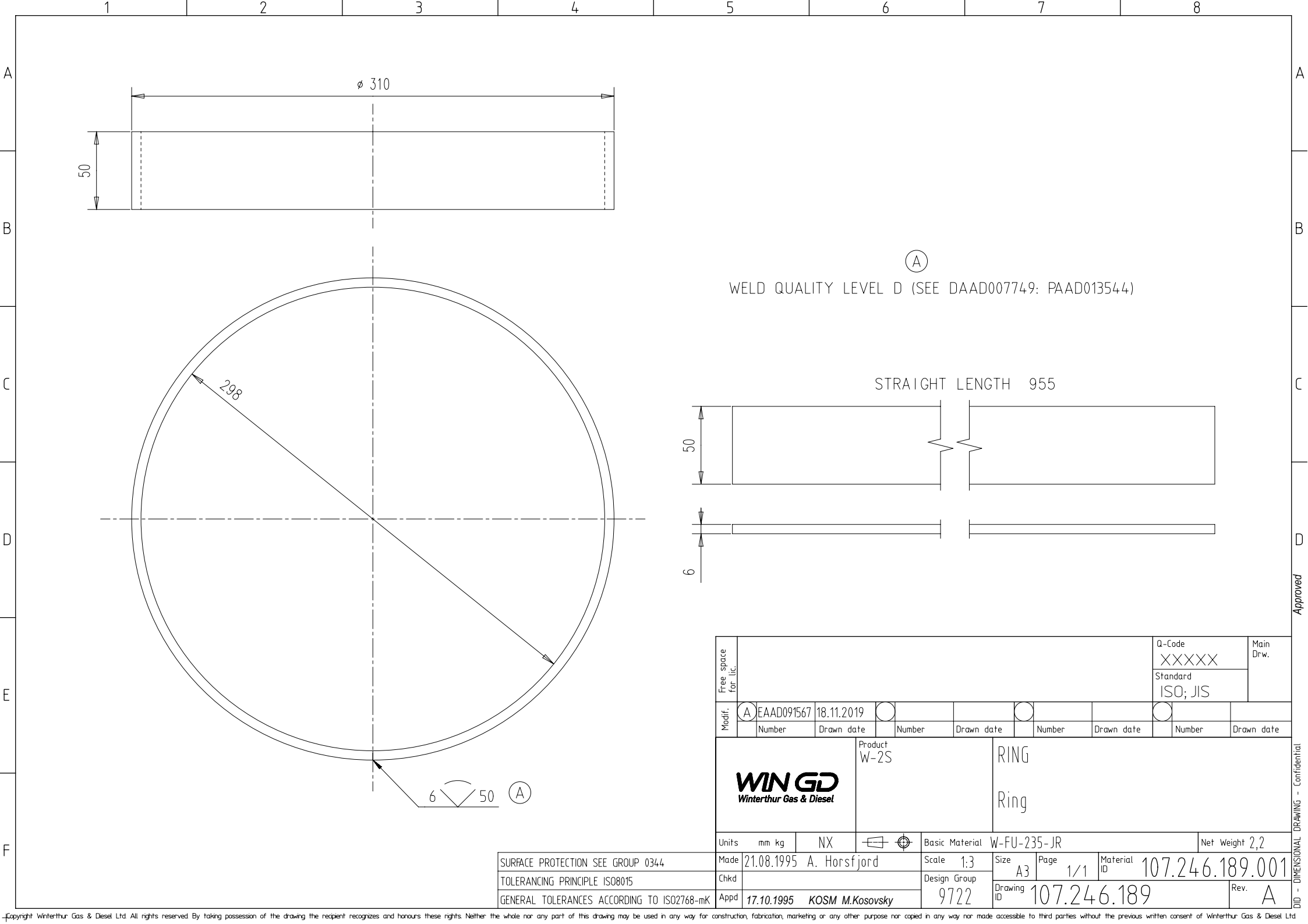


Modif.	Free space for lic.						Q-Code XXXXXX Standard ISO; JIS		Main Drw.		
	A		EAAD091567		18.11.2019						
Units		mm kg		NX		Product W-2S		Basic Material W-FU-235-JR		Net Weight 24,4	
SURFACE PROTECTION SEE GROUP 0344		Made		21.08.1995 A. Horsfjord		Scale 1:2.5		Size A2		Page 1/1	
TOLERANCING PRINCIPLE ISO8015		Chkd				Design Group		9722		Material ID 107.246.188.001	
GENERAL TOLERANCES ACCORDING TO ISO2768-mK		Appd		17.10.1995 MLU011 Luthi		Drawing ID		107.246.188		Rev. A	

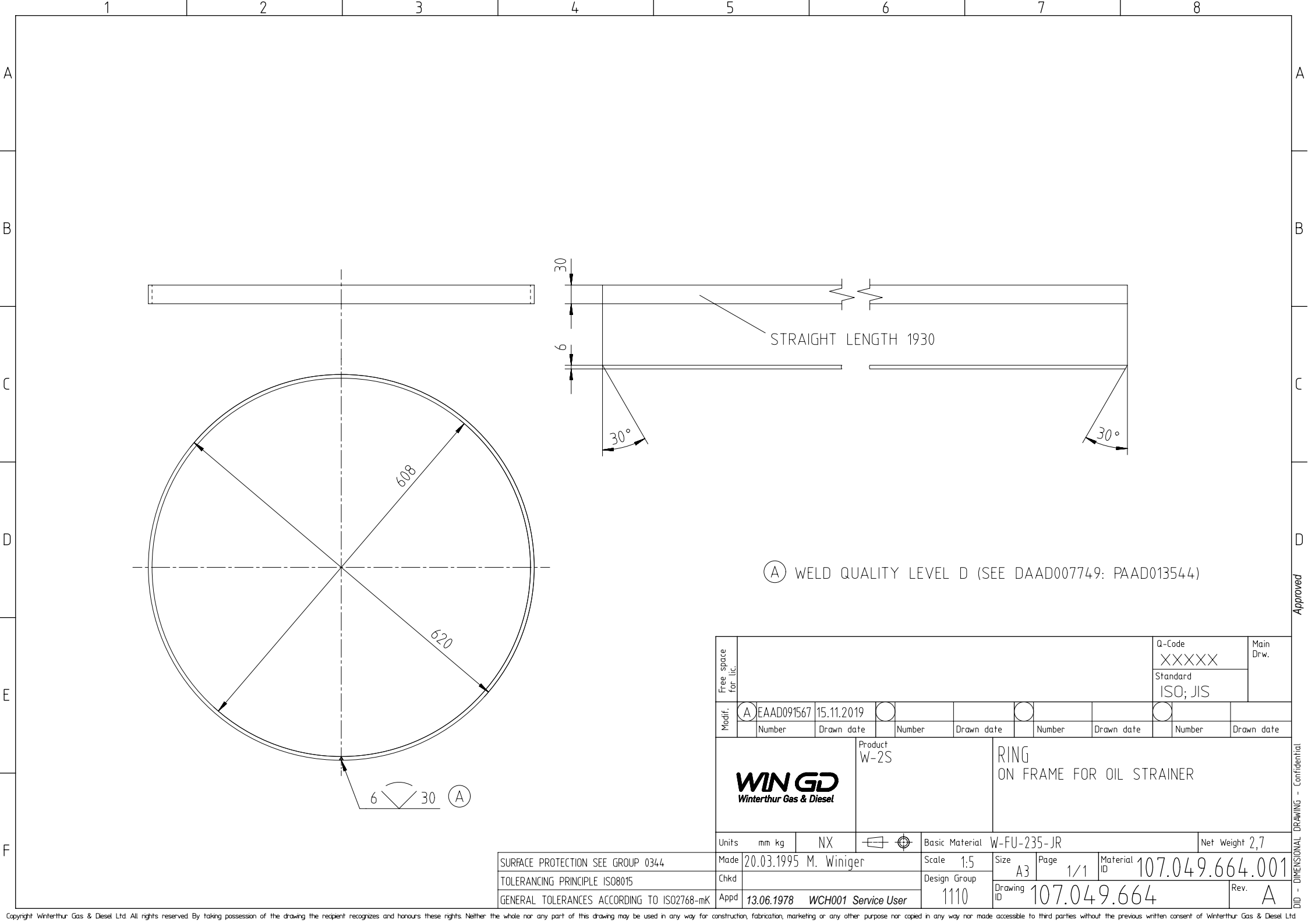
WIN GD  
Winterthur Gas & Diesel

PLATE  
Blech


107.246.188

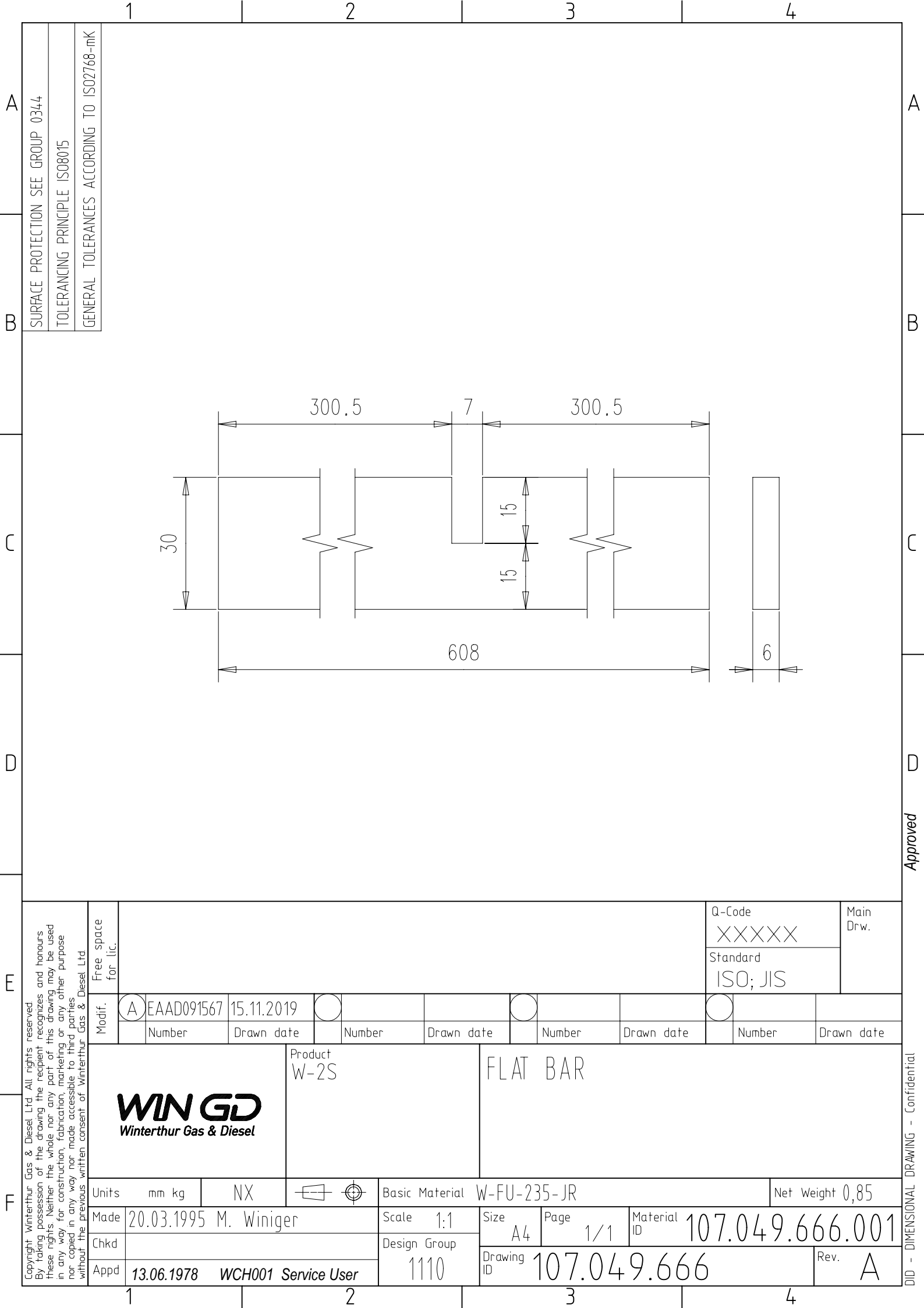






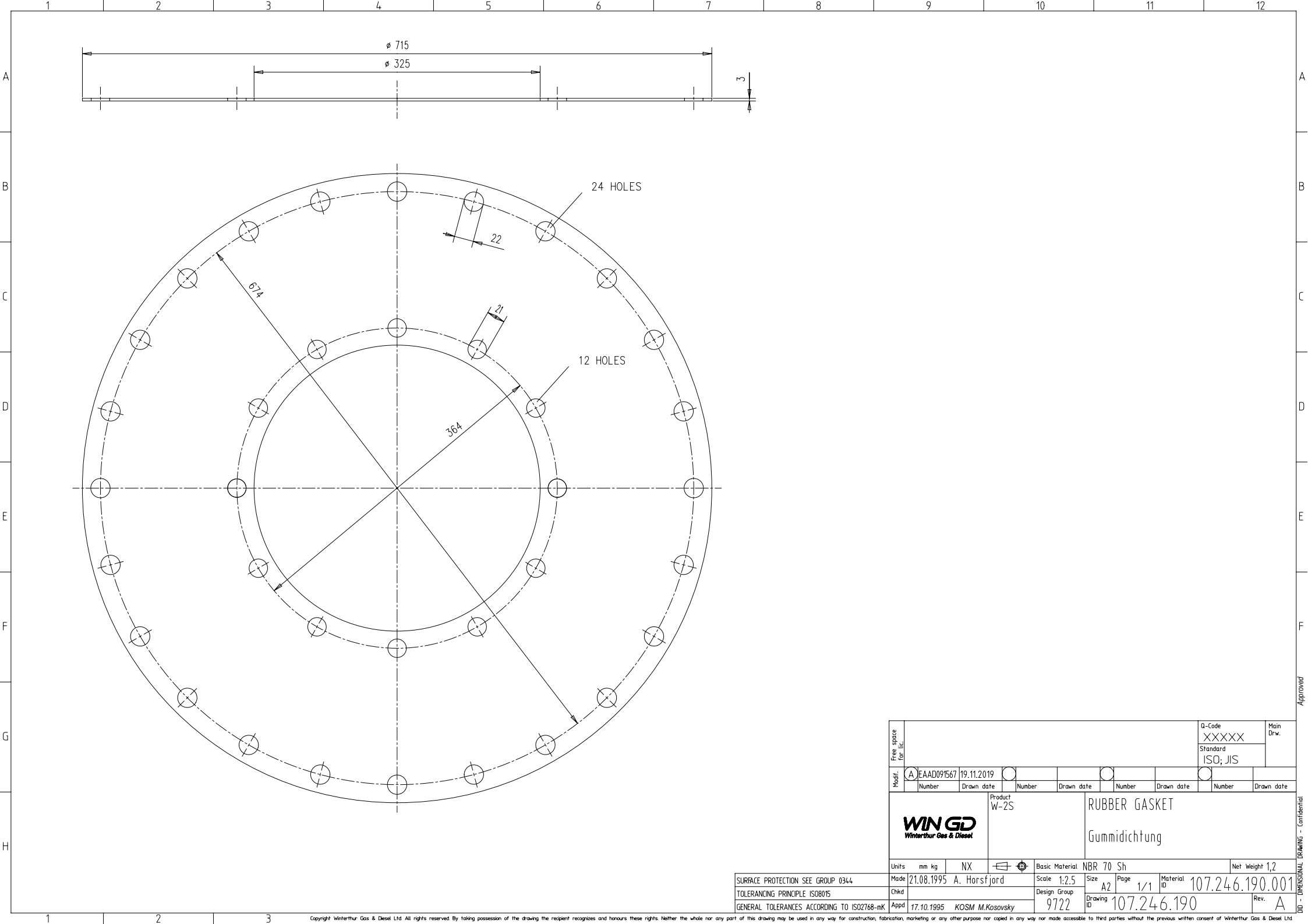
Ⓐ WELD QUALITY LEVEL D (SEE DAAD007749: PAAD013544)

Free space for lic.								Q-Code XXXXX	Main Drw.
								Standard ISO; JIS	
Modif.	Ⓐ	EAAD091567	15.11.2019	⊙		⊙		⊙	
	Number	Drawn date		Number	Drawn date		Number	Drawn date	
<b>WIN GD</b> Winterthur Gas & Diesel		Product W-2S		RING ON FRAME FOR OIL STRAINER					
		Units    mm kg    NX 		Basic Material    W-FU-235-JR				Net Weight 2,7	
SURFACE PROTECTION SEE GROUP 0344		Made 20.03.1995 M. Winiger		Scale 1:5		Size A3	Page 1/1	Material ID 107.049.664.001	
TOLERANCING PRINCIPLE ISO8015		Chkd		Design Group 1110		Drawing ID 107.049.664		Rev. A	
GENERAL TOLERANCES ACCORDING TO ISO2768-mK		Appd 13.06.1978 WCH001 Service User							



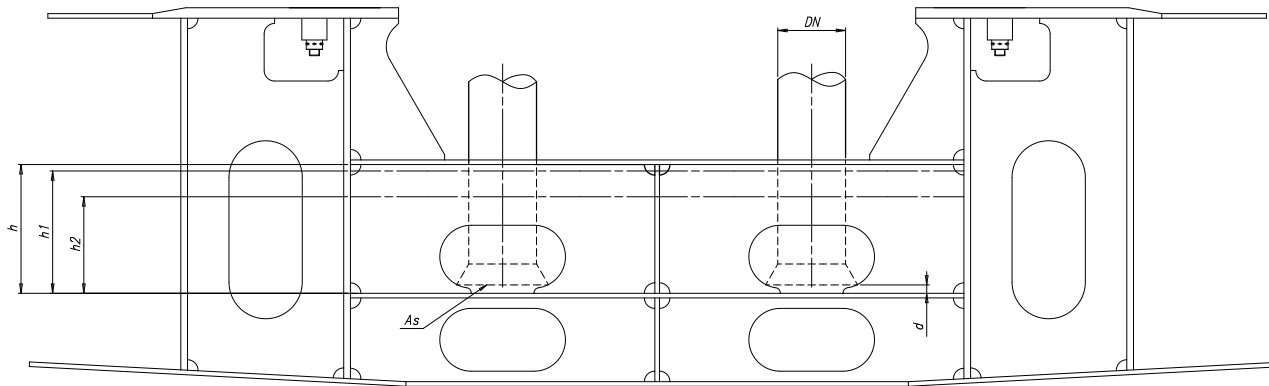
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A	SURFACE PROTECTION SEE GROUP 03/44																																																																											
B	TOLERANCING PRINCIPLE ISO8015																																																																											
	GENERAL TOLERANCES ACCORDING TO ISO2768-mK																																																																											
	<div><div><div>STRAIGHT LENGTH 127</div><div><div><div>6</div><div>20</div><div>38</div><div>58</div></div><div><div>40</div><div>20</div><div>20</div></div><div><div>22</div></div><div><div>80</div></div><div><div>R 13</div></div></div></div></div>																																																																											
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F	<div><div><div>Copyright Winterthur Gas &amp; Diesel Ltd. All rights reserved. By taking possession of the drawing the recipient recognizes and honours these rights. Neither the whole nor any part of this drawing may be used in any way for construction, fabrication, marketing or any other purpose nor copied in any way nor made accessible to third parties without the previous written consent of Winterthur Gas &amp; Diesel Ltd.</div><div><div>Free space for lic.</div><div>Q-Code XXXXXX</div><div>Standard ISO; JIS</div><div>Main Drw.</div></div></div><table><tr><td>Modif.</td><td>A</td><td>EAAD091567</td><td>15.11.2019</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td>Number</td><td>Drawn date</td><td></td><td>Number</td><td>Drawn date</td><td></td><td>Number</td><td>Drawn date</td><td></td><td>Number</td></tr></table><div><div><div><div><div>WIN GD</div><div>Winterthur Gas &amp; Diesel</div></div><div>Product W-2S</div></div><div>HOLDER</div></div></div><table><tr><td>Units</td><td>mm kg</td><td>NX</td><td><div><div></div><div></div></div></td><td>Basic Material</td><td colspan="3">W-FU-235-JR</td><td>Net Weight</td><td colspan="3">0,24</td></tr><tr><td>Made</td><td colspan="3">20.03.1995 M. Winiger</td><td>Scale</td><td>1:1</td><td>Size</td><td>A4</td><td>Page</td><td>1/1</td><td>Material ID</td><td>107.049.665.001</td></tr><tr><td>Chkd</td><td colspan="3"></td><td>Design Group</td><td colspan="3">1110</td><td>Drawing ID</td><td colspan="3">107.049.665</td></tr><tr><td>Appd</td><td colspan="3">13.06.1978 WCH001 Service User</td><td></td><td colspan="3"></td><td>Rev.</td><td colspan="3">A</td></tr></table></div>				Modif.	A	EAAD091567	15.11.2019											Number	Drawn date		Number	Drawn date		Number	Drawn date		Number	Units	mm kg	NX	<div><div></div><div></div></div>	Basic Material	W-FU-235-JR			Net Weight	0,24			Made	20.03.1995 M. Winiger			Scale	1:1	Size	A4	Page	1/1	Material ID	107.049.665.001	Chkd				Design Group	1110			Drawing ID	107.049.665			Appd	13.06.1978 WCH001 Service User							Rev.	A		
Modif.	A	EAAD091567	15.11.2019																																																																									
		Number	Drawn date		Number	Drawn date		Number	Drawn date		Number																																																																	
Units	mm kg	NX	<div><div></div><div></div></div>	Basic Material	W-FU-235-JR			Net Weight	0,24																																																																			
Made	20.03.1995 M. Winiger			Scale	1:1	Size	A4	Page	1/1	Material ID	107.049.665.001																																																																	
Chkd				Design Group	1110			Drawing ID	107.049.665																																																																			
Appd	13.06.1978 WCH001 Service User							Rev.	A																																																																			
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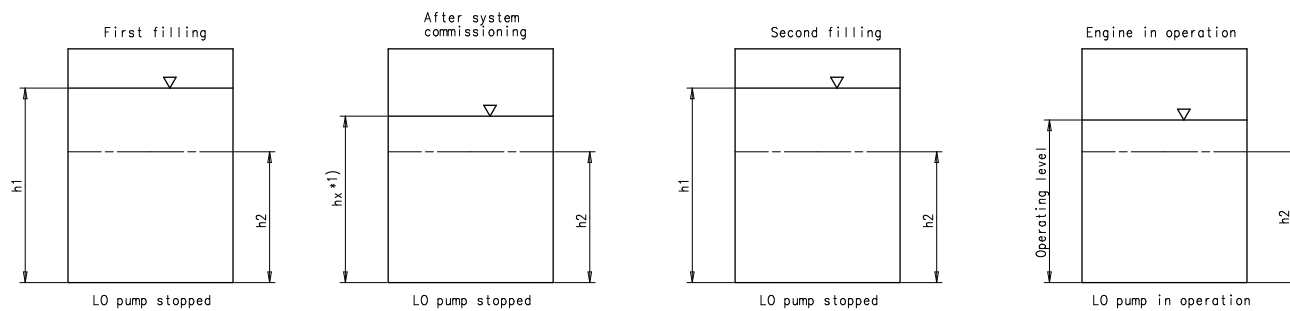


Free space for file		Q-Code XXXXXX Standard ISO; JIS						Main Drw.	
		A		EAAD091567		19.11.2019			
Modif.		Number		Drawn date		Number		Drawn date	
WIN GD Winterthur Gas & Diesel		Product		W-2S		RUBBER GASKET			
						Gummidichtung			
Units		mm kg		NX		Basic Material		NBR 70 Sh	
SURFACE PROTECTION SEE GROUP 0344		Made		21.08.1995 A. Horsfjord		Scale		1:2.5	
TOLERANCING PRINCIPLE ISO8015		Chkd				Design Group		A2	
GENERAL TOLERANCES ACCORDING TO ISO2768-mK		Appd		17.10.1995 KOSM M.Kosovsky		9722		Drawing ID	
								107.246.190	
								Rev.	
								A	
								Net Weight 1,2	
								Material ID	
								107.246.190.001	

② W-X52/W-X52DF



#### LO DRAIN TANK - FILLING PROCESS



Specifications that need to be met:

Dimensioning guidelines and capacities for tank design

No. of cylinders		4	5	6	7	8
h	Recommended total tank height (mm)	according to installation requirements				
	Recommended total tank volume: 105% *4) (m <sup>3</sup> )	10	12	13	15	17
h1	Recommended filling level (mm)	according to installation requirements				
	Recommended volume: 100% *4) (m <sup>3</sup> )	9	11	13	14	16
h2	Low-level alarm (mm)	*2)				
	Volume (m <sup>3</sup> )					
Vr	Min. retention volume *5) (m <sup>3</sup> )	6	7	8	9	10
d	Distance between suction pipe and bottom of tank (mm)	*3)				
As	Suction area	min. 1.5 x suction pipe area (DN)				

#### REMARKS:

- \*1) Level after filling of external system. Volume and level in the LO drain tank depend on capacity of pipes, coolers, filters, etc. The oil volume in tank contains a part of the oil quantity, which drains back when the pumps are stopped.
- \*2) The low-level alarm (h2) has to be positioned in such a way that a proper pump suction is ensured under the conditions defined by the classification societies.

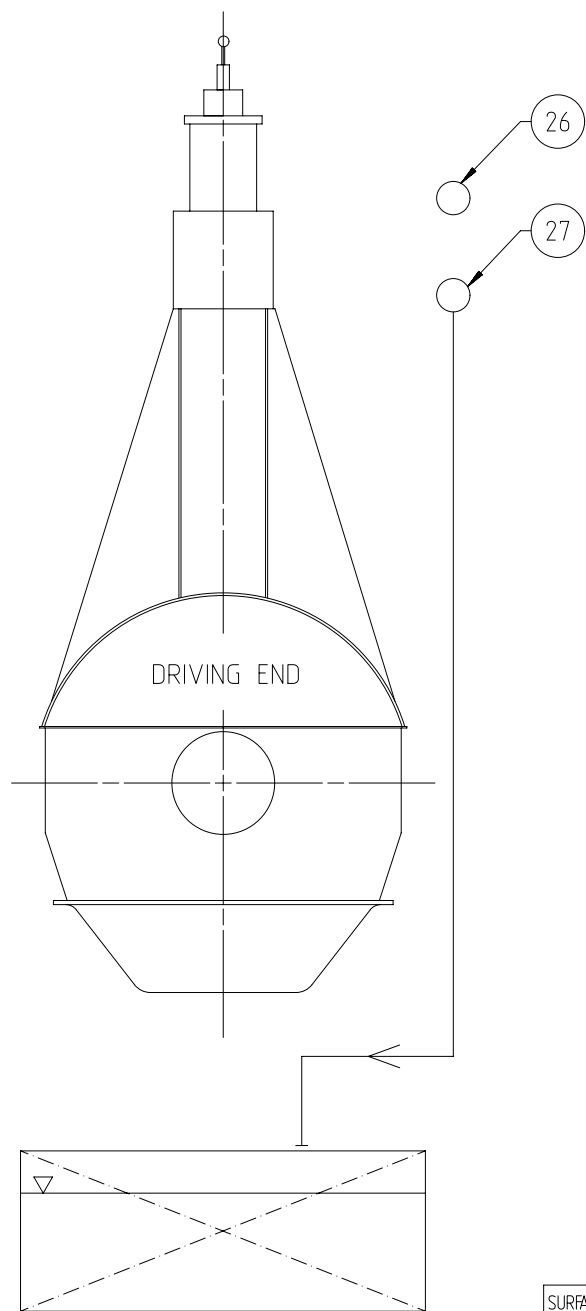
Minimum inclination angles comply with the rules of classification societies:

Heel to each side	15°
Rolling to each side	±22.5°
Trim	500/L, max. 5°
	L: ship length in meter
	Example L = 250 m
	Trim = 500/250 = 2°
Pitching	± 7.5°

Additionally this level has to be above or equal to the minimum retention volume (Vr) for M/E operation.

- \*3) Distance (d) between suction pipe inlet of main LO pumps and LO drain tank bottom has to be in accordance with the requirements of the pump manufacturer. As guideline the following formula can be applied:  $d = DN/4 + 40$ ,  $d = \text{min. } 80 \text{ mm}$ .
- \*4) The stated tank volume represent the min. requirement. Final tank dimensions have to be aligned in regard to dimensional restrictions by ship and engine structure and the pump suction requirement.
- \*5) To be maintained during engine operation (LO pump suction without LO drain back-flow (emergency case) is ensured for at least 3 minutes).

Free space for I.C.		Q-Code XXXXX		Min. Drw.	
Standard ISO JIS					
A EAA0086282 16.11.2015		B EAA0086531 31.03.2016			
Number	Drawn date	Number	Drawn date	Number	Drawn date
WIN G2		Product W-52		LUBRICATING OIL DRAIN TANK FILLING GUIDELINE	
Units mm kg	IDE	Basic Material	Scale 1:25	Size A1	Page 1/1
Mode 10.12.2014	WANG	Design Group	9722	Material ID	PAAD178480
Chkd 16.01.2015	mhu019 Hug	Design Group	9722	Material ID	DAAD061878
Appd 16.01.2015	bha009 Haag	Design Group	9722	Material ID	DAAD061878
SURFACE PROTECTION SEE GROUP 0344		TOLERANCING PRINCIPLE ISO8015		GENERAL TOLERANCES ACCORDING TO ISO2768-mK	
Copyright Wintorther Gas & Diesel Ltd. All rights reserved. By taking possession of the drawing the recipient recognizes and honours these rights. Neither the whole nor any part of this drawing may be used in any way for construction, fabrication, marketing or any other purpose nor copied in any way nor made accessible to third parties without the previous written consent of Wintorther Gas & Diesel Ltd.					

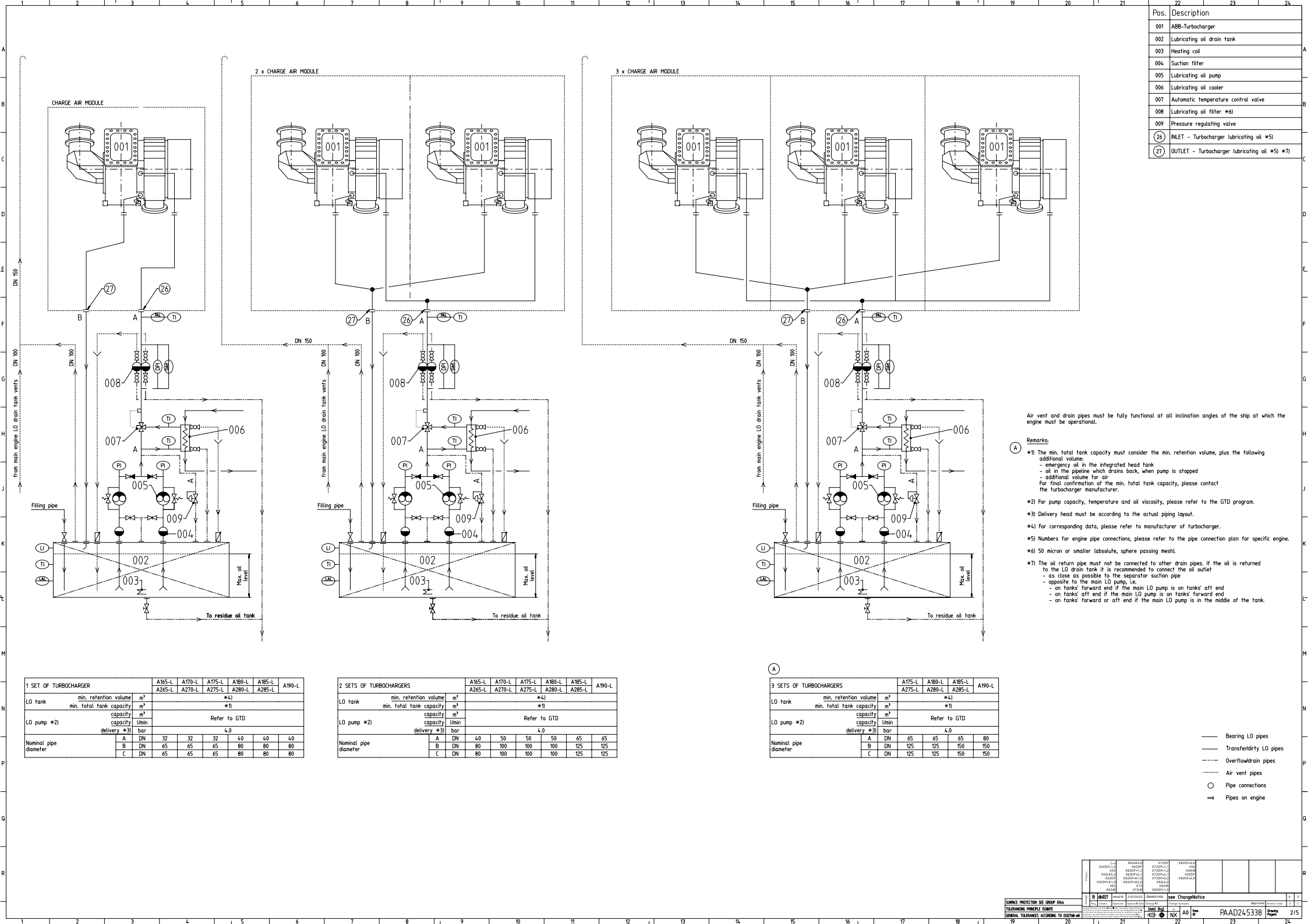


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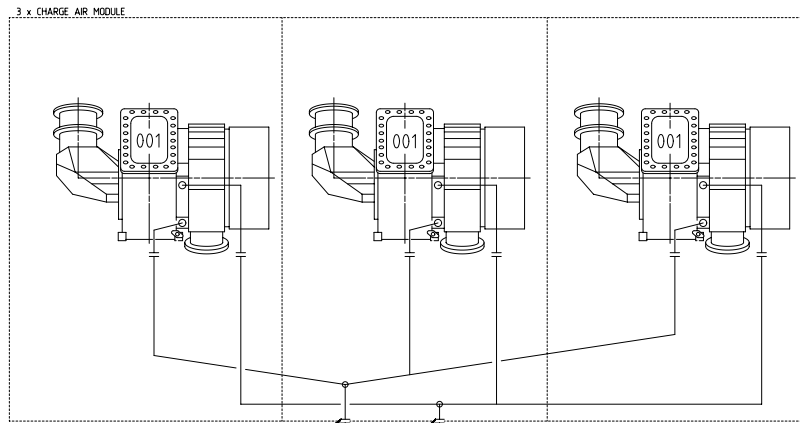
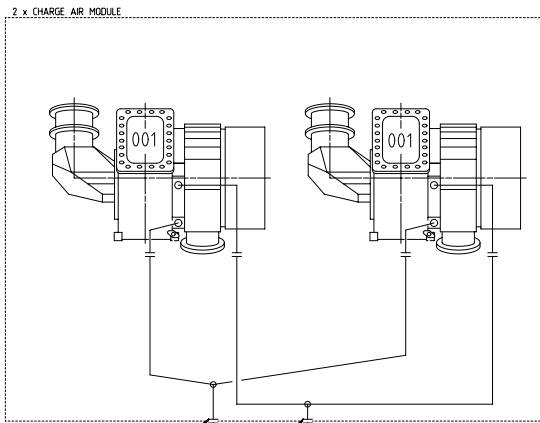
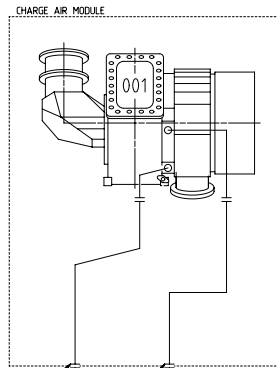
## SPECIFICATION which must be met

- 26 INLET - Turbocharger lubricating oil
- Lubricating oil temperature:
    - ABB: 30 ~ 85 °C
    - MHI: 35 ~ 50 °C
  - Lubricating oil pressure
    - ABB: 0.8 ~ 2.5 bar
    - MHI: 0.6 ~ 1.5 bar
  - Lubricating oil volume flow: according to the turbocharger maker's recommendation
  - Lubricating oil cleanliness:
    - Full flow filtered by a 50 micron (absolute sphere passing mesh) automatic self-cleaning filter
    - Offline cleaning of the oil return (including back-flushing oil)
- 27 OUTLET - Turbocharger lubricating oil
- Oil return to lubricating oil drain tank
  - Oil return pipe must not be connected to other drain pipes.
  - Oil outlet must be above the max. oil level in the tank or as an alternative a drain pipe with venting holes above the max. oil level needs to be installed.

Prod.	CX40DF CX52		RT-flex48T-D RT-flex50-B		RT-flex50-D RT-flex50DF		RT-flex58T-B RT-flex58T-D		RT-flex58T-D V1 RT-flex58T-D V2		RT-flex58T-ES RT-flex58TD ER-3		CR-HHM-PILOT X35-B		X40-B [...]	
Change History	B	dkl021	mhu019	21.01.2022	CNAA001108	see ChangeNotice									4	3
	A	dkl021	mhu019	08.09.2020	EAAD091530	Legacy information. See corresponding ChangeNotice									4	-
	-	dkl021	bha009	16.12.2016		-									-	-
	Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis								Approved	Activity Code	E
<div>WINGD Winterthur Gas &amp; Diesel</div>					LUBRICATING OIL SYSTEM FOR SEPARATED TC LUBRICATING											
					Dimension											
Scale		-														







Pos.	Description
001	M4-Turbocharger (MET-MB)
002	Lubricating oil drain tank
003	Heating coil
004	Suction filter
005	Lubricating oil pump
006	Lubricating oil cooler
007	Automatic temperature control valve
008	Lubricating oil filter #6)
009	Pressure regulating valve
26	INLET - Turbocharger lubricating oil #5)
27	OUTLET - Turbocharger lubricating oil #5) #7)

- Remarks:
- \*1) The min. total tank capacity must consider the min. retention volume, plus the following additional volume:
    - emergency oil in the integrated head tank
    - oil in the pipeline which drains back, when pump is stopped
    - additional volume for air
 For final confirmation of the min. total tank capacity, please contact the turbocharger manufacturer.
  - \*2) For pump capacity, temperature and oil viscosity, please refer to the GTD program.
  - \*3) Delivery head must be according to the actual piping layout.
  - \*5) Numbers for engine pipe connections, please refer to the pipe connection plan for specific engine.
  - \*6) 30 micron or smaller (absolute, sphere passing mesh).
  - \*7) The oil return pipe must not be connected to other drain pipes. If the oil is returned to the LO drain tank it is recommended to connect the oil outlet
    - as close as possible to the separator suction pipe
    - opposite to the main LO pump, i.e.
      - on tanks' forward end if the main LO pump is on tanks' aft end
      - on tanks' aft end if the main LO pump is on tanks' forward end
      - on tanks' forward or aft end if the main LO pump is in the middle of the tank.

(A)												
1 SET OF TURBOCHARGER			MET33MB	MET37MB	MET42MB	MET48MB	MET53MB	MET60MB	MET66MB	MET77MB	MET83MB	MET90MB
LO tank	min. retention volume	m³	0.21	0.26	0.31	0.41	0.49	0.61	0.77	1.01	1.23	1.50
	min. total tank capacity	m³	*1)									
LO pump *2)	capacity	l/min	Refer to GTD									
	delivery *3)	bar	4.0									
Nominal pipe diameter	A	DN	20	25	25	32	32	32	32	32	40	50
	B	DN	40	50	50	65	65	80	80	100	100	125
	C	DN	40	50	50	65	65	80	80	80	100	100

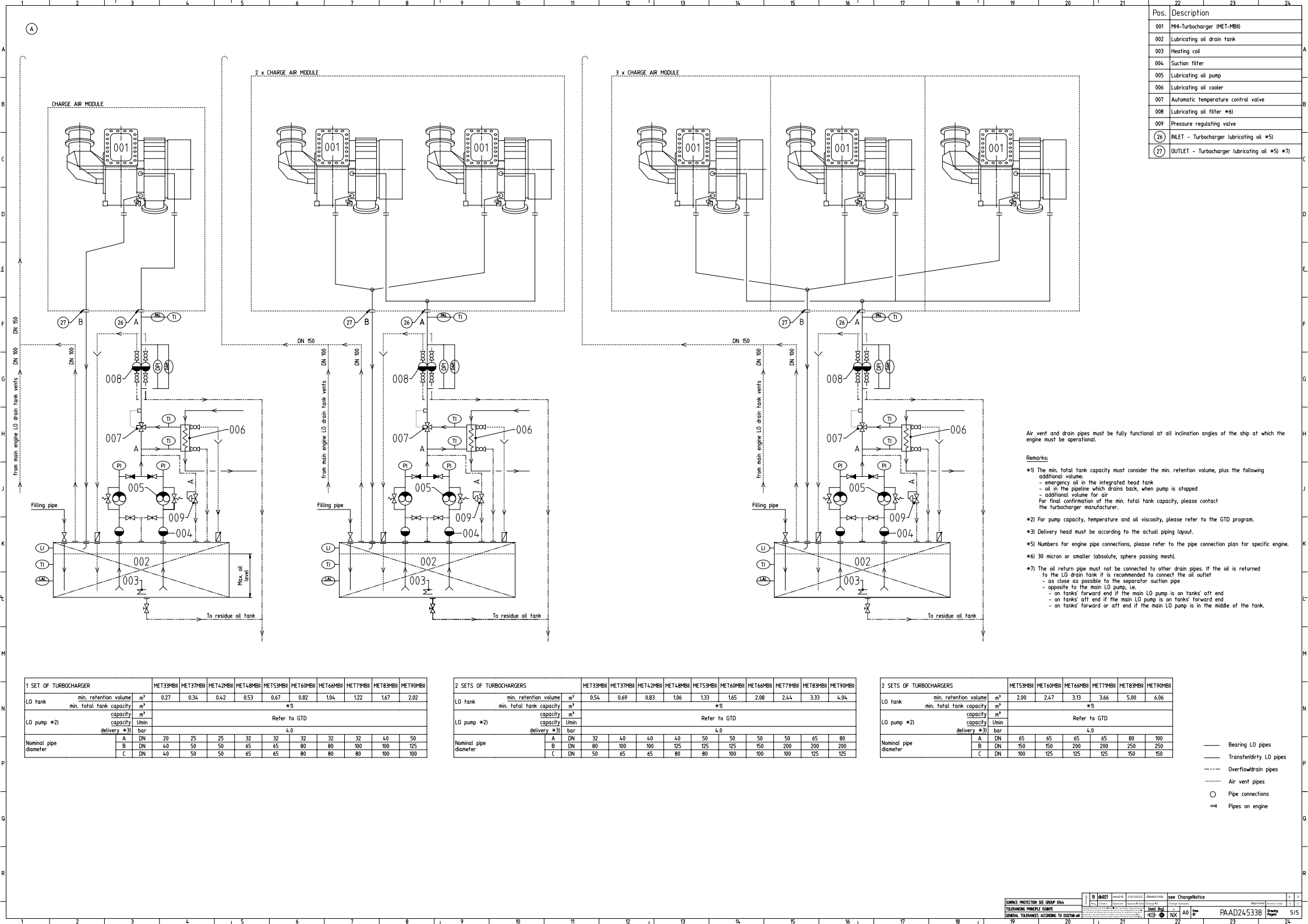
(A)																						
2 SETS OF TURBOCHARGERS			MET33MB		MET37MB		MET42MB		MET48MB		MET53MB		MET60MB		MET66MB		MET77MB		MET83MB		MET90MB	
LO tank	min. retention volume	m <sup>3</sup>	0.41		0.52		0.62		0.82		0.99		1.22		1.53		2.02		2.46		2.99	
	min. total tank capacity	m <sup>3</sup>	*1)																			
LO pump *2)	capacity	m <sup>3</sup>	Refer to GTD																			
	capacity	l/min																				
	delivery *3)	bar	4.0																			
Nominal pipe diameter	A	DN	32	40	40	40	50	50	50	50	50	50	65	80								
	B	DN	80	100	100	100	125	125	125	150	200	200	200	200	200							
	C	DN	50	65	65	65	80	80	80	100	100	100	100	125	125	125						

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**3 SETS OF TURBOCHARGERS**

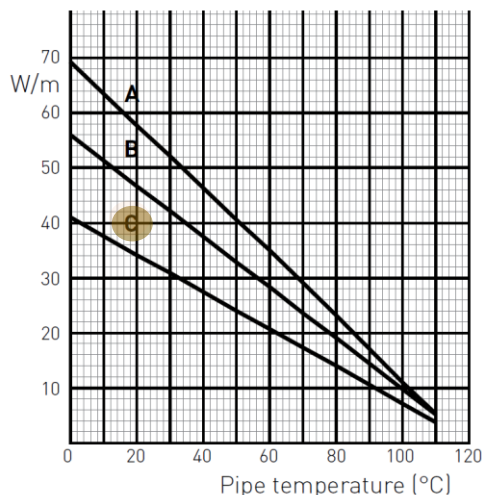
			MET33MB	MET60MB	MET66MB	MET77MB	MET83MB	MET90MB
LO tank	min. retention volume	m <sup>3</sup>	0.41	0.52	0.62	0.82	0.99	1.22
	min. total tank capacity	m <sup>3</sup>	*1)					
LO pump *2)	capacity	m <sup>3</sup>	Refer to GTD					
	capacity	l/min						
	delivery *3)	bar	4.0					
Nominal pipe diameter	A	DN 65	45	45	45	45	80	100
	B	DN 150	150	200	200	200	250	250
	C	DN 100	125	125	125	125	150	150

- Bearing LO pipes
- Transferdry LO pipes
- Overflow/drain pipes
- Air vent pipes
- Pipe connections
- ≡ Pipes on engine



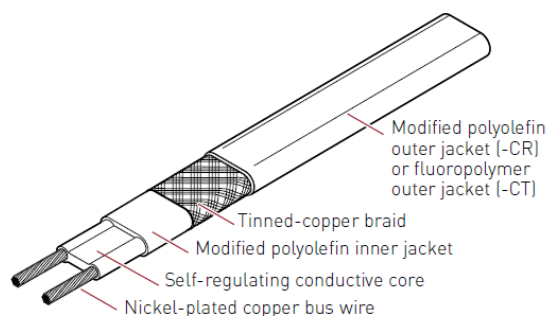
# Self-Regulating Heating Cable 10QTVR2-CT

Order drawing



C 10QTVR2-CT

## Heating cable construction



### Specification:

Description: 10QTVR2-CT  
Order No.: 391991-000  
Area Classification: Non-hazardous and hazardous locations  
Traced surface type: Metal and plastic  
Chemical Resistance: Exposure to aqueous inorganic chemicals: Use -CR (modified polyolefin outer jacket)  
Exposure to organic chemicals or corrosives: Use -CT (fluoropolymer outer jacket)  
Supply Voltage: 200-277 VAC  
Temperature Rating: Maximum maintain or continuous exposure temperature (power on) 225°F (110°C)  
Maximum intermittent exposure temperature, 1000 hours (power on) 225°F (110°C)  
Minimum installation temperature -76°F (-60°C)  
Minimum Bending Radius: 13 mm at 20°C  
35 mm at -60°C  
Height: 4.5 mm  
Width: 11.8 mm  
Weight: 0.126 kg/m

Supplier:  **PENTAIR**  
www.pentairthermal.com

MAXIMUM CIRCUIT LENGTH BASED ON TYPE 'C' CIRCUIT BREAKERS ACCORDING TO EN60898		
SUPPLY VOLTAGE 230 VAC		
Electrical protection sizing	Start-up temperature	Maximum heating cable length per circuit [m]
16A	-20°C	65
	+10°C	80
25A	-20°C	95
	+10°C	115
32A	-20°C	115
	+10°C	115
40A	-20°C	115
	+10°C	115

Substitute for: PC Q-Code X S X X X

Modif	A	EAAD090454	05.03.2019						
Number	Drawn Date	Number	Drawn Date	Number	Drawn Date	Number	Drawn Date	Number	Drawn Date

**WINGD**  
Winterthur Gas & Diesel

Product  
**W-2S**

Heating Element  
Order Drawing

Made	24.10.2018	P. Kowalski	Main Drw.	Page	1 / 1	Material ID	<b>PAAD308926</b>		
Chkd	24.10.2018	R. Leutwyler	Design Group	Drawing ID		<b>DAAD106761</b>		Rev	
Appd	24.10.2018	W. Östreicher	<b>0009</b>						



## MIDS - LUBRICATING-OIL-SYSTEM (DG9722)

WinGD X52

### TRACK CHANGES

DATE	SUBJECT	DESCRIPTION
2017-02-15	DRAWING SET	First web upload
2017-10-19	DAAD093782 DAAD0093645	Main drawing + Tank arrangement - New drawings for 7 cyl. engine version
2018-05-18	DAAD056631	System drawing – new revision
2019-07-17	DAAD070533 DAAD061872 DAAD093645 DAAD097843	Tank drgs – new revision
2020-09-21	DAAD093782 DAAD056631 107.246.182 107.246.183 107.246.186 107.246.187 107.246.188 107.246.189 107.049.681 107.049.664 107.049.666 107.049.665 107.246.190 DAAD083642	System and tank assembly drgs – new revision
2021-05-19	107.246.799	Hydraulic jack plate positioning drawing – new revision
2022-07-12	PAAD177914	System drg – new revision
2022-09-29	PAAD177914	System drg – new revision

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2023-01-05	PAAD177914	System drg – new revision
2023-07-12	PAAD177914G	New revision