

1

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Available executions


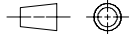
Execution No.	Material ID	Attribute 1: Turbocharger amount		Attribute 2: Emission class (Tier)			
		1	2	Tier II without SCR	Tier III HP-SCR off-engine	Tier III LP-SCR off-engine	iSCR
001	PAAD284311	X		X			
002	PAAD284312	X				X	
003	PAAD284210	X			X		
004	PAAD284313		X	X			
005	PAAD284314		X			X	
006	PAAD284211		X		X		
007	PTAA038780	X					X

NOTE

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.

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.

Prod.	X52								
Change History									
	-	sna102	mhu019	24.05.2023	CNAA003753	new Design		-	-
	Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Approved	Activity Code	E C
 Winterthur Gas & Diesel				EXHAUST SYSTEM MIDS master drawing					
separate BOM available				Dimension					
Scale	-		NX	Units [mm] [kg]		Basic Material		Net Weight 0.001	
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				Qty per		A4	Item ID PTAA025309	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	PAAD283945	Exhaust System	with one turbocharger			0.001
2	1	PAAD327310	SPECIFICATION	FOR WASTE GATE SELECTION			0.001

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Prod	5,6,7,8 X52										
Change History	C	npa101	mhu019	20.04.2023	CNAA003194	Main Design/Drawing Introduced				4	3
	B	sna102	mhu019	07.11.2022	CNAA002687	Main Design/Drawing Introduced				4	3
	A	sde101	mhu019	13.09.2019	EAAD090535	Legacy information. See corresponding ChangeNotice				4	3
	-	dki021	mhu019	28.02.2018	EAAD782404	-				-	-
	Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis			Activity Code	E	C

<div>WIN GD</div> <div>Winterthur Gas & Diesel</div>		Exhaust System										
Bill Of Material		Dimension										
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		Main Design		Yes		Design Group		9726	Q-Code	XXXXX	Standard	WDS
		Qty per		Engine		A4		Item ID		PAAD284311		BOM Page/s

SEQ NO	QTY	Item ID	Item Name	Dimension	Standard-ID	Basic Material	Net Weight
001	1	PAAD283945	Exhaust System	with one turbocharger			0.001
002	1	PAAD327310	SPECIFICATION	FOR WASTE GATE SELECTION			0.001

SEQ NO	QTY	Item ID	Item Name	Dimension	Standard-ID	Basic Material	Net Weight		
001	1	PAAD283945	Exhaust System	with one turbocharger			0.001		
002	1	PAAD219883	SCR PIPING GUIDE				0.001		
003	1	PAAD219316	SCR TURBOCHARGER PROTECTION				0.001		
004	1	PAAD327310	SPECIFICATION	FOR WASTE GATE SELECTION			0.001		
Prod.	5,6,7,8 X52								
Change History	C	npa101	mhu019	23.05.2023	CNA003752	Main Design/Drawing Introduced	4 3		
	B	sna102	mhu019	07.11.2022	CNAA002687	Main Design/Drawing Introduced	4 3		
	A	sde101	mhu019	13.09.2019	EAAD090535	Legacy information. See corresponding ChangeNotice	4 3		
	-	dki021	mhu019	28.02.2018	EAAD782404	-	- -		
	Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Approved	Activity Code	E C
<div>WIN GD</div> <div>Winterthur Gas & Diesel</div>				Exhaust System					
Bill Of Material				Dimension					
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				[m] [kg]				0.001	
				Main Design		Design Group		Standard	
				Yes		9726		XXXXX	
				Qty per		A4		BOM Page/s	
				Engine		Item ID		01/01	
						PAAD284210			

SEQ NO	QTY	Item ID	Item Name	Dimension	Standard-ID	Basic Material	Net Weight		
001	1	PAAD284205	Exhaust System	with two turbochargers			0.001		
002	1	PAAD327310	SPECIFICATION	FOR WASTE GATE SELECTION			0.001		
Prod.	5,6,7,8 X52								
Change History	C	npa101	mhu019	23.05.2023	CNA003752	Main Design/Drawing Introduced	4 3		
	B	sna102	mhu019	07.11.2022	CNAA002687	Main Design/Drawing Introduced	4 3		
	A	sde101	mhu019	13.09.2019	EAAD090535	Legacy information. See corresponding ChangeNotice	4 3		
	-	dki021	mhu019	28.02.2018	EAAD782404	-	- -		
	Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Approved	Activity Code E C	
<div>WIN GD</div> <div>Winterthur Gas & Diesel</div>			Exhaust System						
Bill Of Material			Dimension						
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			[m] [kg]				0.001		
			Main Design		Yes	Design Group		9726 Q-Code XXXXX	Standard WDS
			Qty per		Engine	A4	Item ID PAAD284314		BOM Page/s 01/01

SEQ NO	QTY	Item ID	Item Name Dimension	Standard-ID	Basic Material	Net Weight
001	1	PAAD284205	Exhaust System with two turbochargers			0.001
002	1	PAAD219883	SCR PIPING GUIDE			0.001
003	1	PAAD219316	SCR TURBOCHARGER PROTECTION			0.001
004	1	PAAD327310	SPECIFICATION FOR WASTE GATE SELECTION			0.001

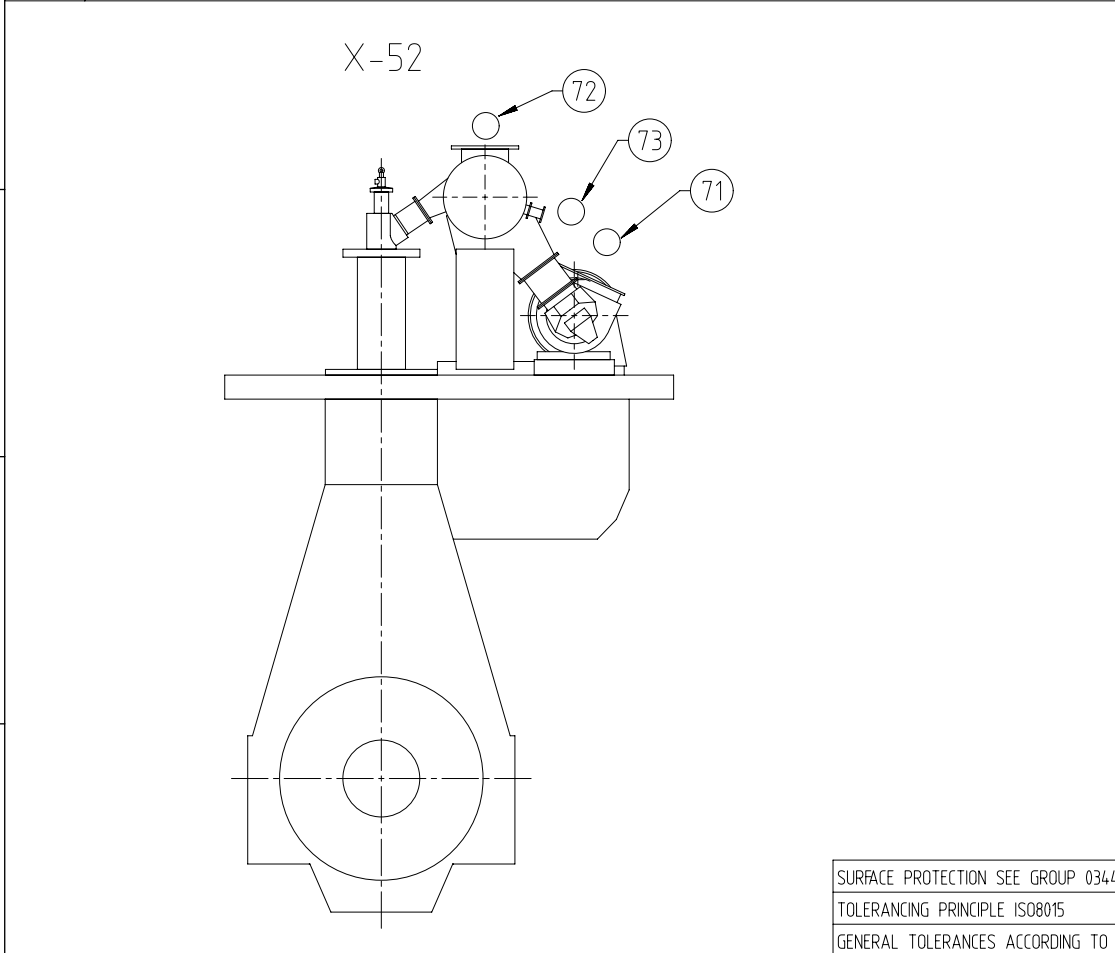
Prod.	5,6,7,8 X52			
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<div>WIN GD</div> <div>Winterthur Gas & Diesel</div>		Exhaust System							
Bill Of Material		Dimension							
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	Main Design	Yes	Design Group		9726	Q-Code	XXXXX	Standard	WDS
	Qty per	Engine	A4	Item ID	PAAD284211		BOM Page/s	01/01	



SEQ NO	QTY	Item ID	Item Name			Dimension	Standard-ID	Basic Material		Net Weight
001	1	PTAA038752	Exhaust System			with one turbocharger				0.001

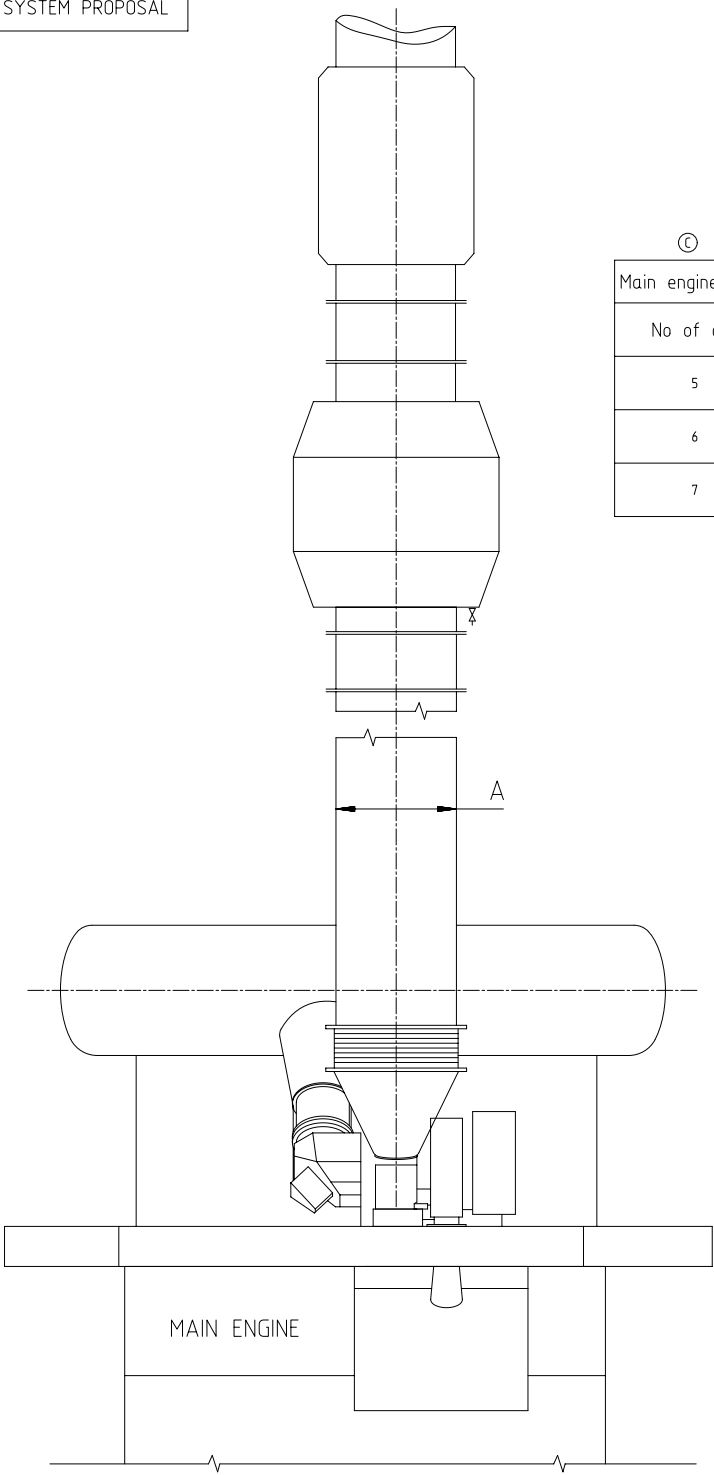
Specifications which must be met:

A	<p>72 OUTLET - Exhaust gas by-pass</p> <ul style="list-style-type: none"> - The installation of a by-pass line between exhaust gas manifold and turbocharger may be requested by owner and class if only one turbocharger is installed. Its purpose is to allow engine operation even after a turbocharger failure. - Blinded off during normal operation.
B	<p>73 OUTLET - Exhaust gas manifold waste gate</p> <ul style="list-style-type: none"> - Size and layout of connection flange is provided in the "Pipe Connection Plan" - Pipe diameter according to parameter "B" on page 2. - Waste gate connection pipe to main exhaust gas pipe must be kept as short as possible to avoid swirl and extensive back pressure.

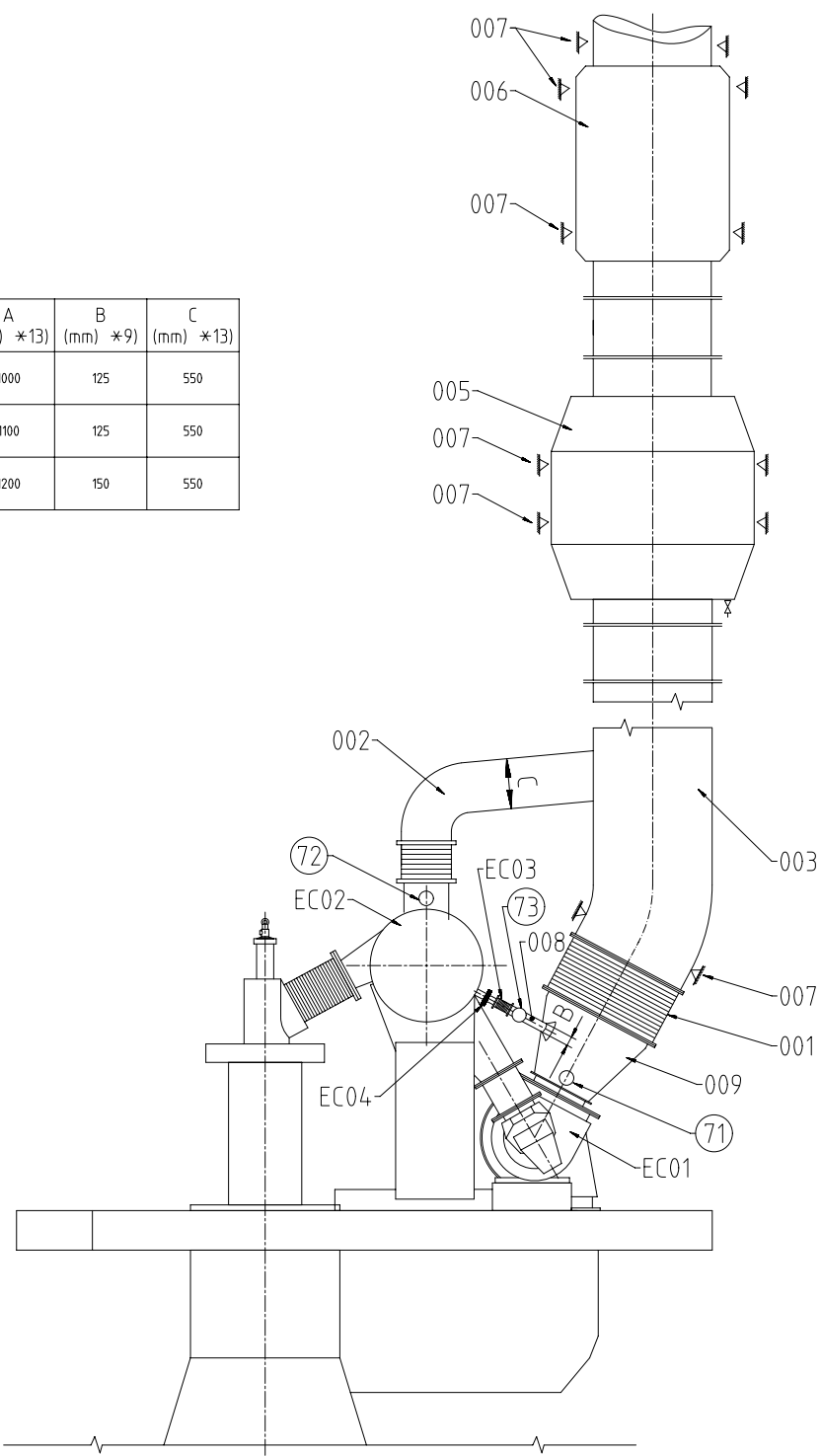


<p>71 OUTLET - Exhaust gas turbocharger</p> <ul style="list-style-type: none"> - Exhaust gas temperature and volume flow: according to GTD - The total back pressure of the exhaust gas system must be kept in the admissible range of: Design maximum (new condition) without exhaust gas treatment system: 30 mbar Design maximum (new condition) with exhaust gas treatment system: 60 mbar - Operational maximum (fouled condition) without exhaust gas treatment system: 50 mbar Operational maximum (fouled condition) with exhaust gas treatment system: 80 mbar - Pipe dimensions laid out according to the recommended gas velocities provided in the the Marine Installation Manual (MIM) and by GTD. - The exhaust piping must be arranged in a way to avoid gases from accumulating. - The piping layout must consider the thermal expansion and vibration from turbocharger (TC) and main engine (ME). Thermal expansion of the ME to be calculated according to the formula in MIM, TC specific thermal expansion are provided by the TC supplier. - Supports (fixation points) for carrying piping and exhaust gas system components deadweight must be installed in sufficient size and amount. Inadmissible tensions in the piping and forces acting on the turbocharger are not acceptable. - Exhaust gas pipes of several engines must not be connected. - Drains in adequate size and amount must be installed in the exhaust gas piping. - When the noise level on the bridge wing exceeds the class requirement (normally 60 - 70 dB(A)) a silencer must be applied.
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Free space for lic.							Q-Code XXXXX	Main Drw.						
							Standard ISO; JIS							
Modif.	A	EAAD089374	11.05.2018	B	EAAD090105	11.01.2019	C	EAAD090535	05.04.2019					
		Number	Drawn date		Number	Drawn date		Number	Drawn date		Drawn date			
		Product 5-8X52		Exhaust System with one turbocharger										
Units	mm kg	NX				Basic Material			Net Weight 0,001					
SURFACE PROTECTION SEE GROUP 0344		Made	26.01.2018	dk1021	DH.Kim		Scale	-	Size	A3	Page	1/2	Material ID	PAAD283945
TOLERANCING PRINCIPLE ISO8015		Chkd	14.02.2018	www008 Wang			Design Group	9726		Drawing ID	DAAD096594		Rev.	C
GENERAL TOLERANCES ACCORDING TO ISO2768-mK		Appd	28.02.2018	mhu019 Hug										



Main engine X-52			
No of cyl.	A (mm) *13	B (mm) *9	C (mm) *13
5	1000	125	550
6	1100	125	550
7	1200	150	550



Pos.	SYSTEM COMPONENTS *1)
001	Compensator *4)
002	Exhaust gas by-pass line *8)
003	Exhaust gas pipe *12)
005	Boiler *11)
006	Silencer (with spark arrester) *10)
007	Support *4) *6)
008	Waste gate pipe
009	Transition piece *7)
Pos.	ENGINE CONNECTIONS *2)
71	OUTLET - Exhaust gas turbocharger
72	OUTLET - Exhaust gas by-pass
73	OUTLET - Exhaust gas manifold waste gate
Pos.	ENGINE COMPONENTS *3)
EC01	Turbocharger
EC02	Exhaust gas manifold
EC03	Waste gate compensator *4) *9)
EC04	Waste gate valve
Remarks:	①
	- Drain plugs and drain cocks to be installed where necessary.
	*1) Refer to the 'Pipe Connection Plan' for the execution and location of the engine pipe connections.
	*2) To be delivered by external supplier and to be installed by the shipyard.
	*3) To be delivered by the engine builder, i.e. already equipped on engine side
	*4) Dimension of expansion piece (compensator) must be defined by the shipyard taking into account the thermal growth of exhaust manifold and exhaust pipe. Vibrations of the pipe after the compensator must be lower than 45 mm/s RMS (root mean square).
	*6) Installed as fixed or sliding type in accordance with the requirements. Final amount and position have to be defined by the shipyard under consideration of system layout and requirements based on installation specific calculation.
	*7) Area ratio between outlet/inlet diameter = 1.1..1.6 Taper angle $\leq 40^\circ$
	*8) Optional, needs just to be installed if requested by owner and class to ensure engine operation even after a turbocharger failure.
	*9) Pipe dimension on engine side (before compensator) is one nominal pipe size smaller.
	*10) Optional, installed as required to meet noise requirements.
	*11) Optional.
	*12) The radius of pipe bends should be not smaller than 1.5 x DN.
	*13) The provided dimensions refer to an R1 rated engine and serve just as proposal. To make the project specific layout, data as provided by GTD and by the turbocharger supplier must be taken into account.

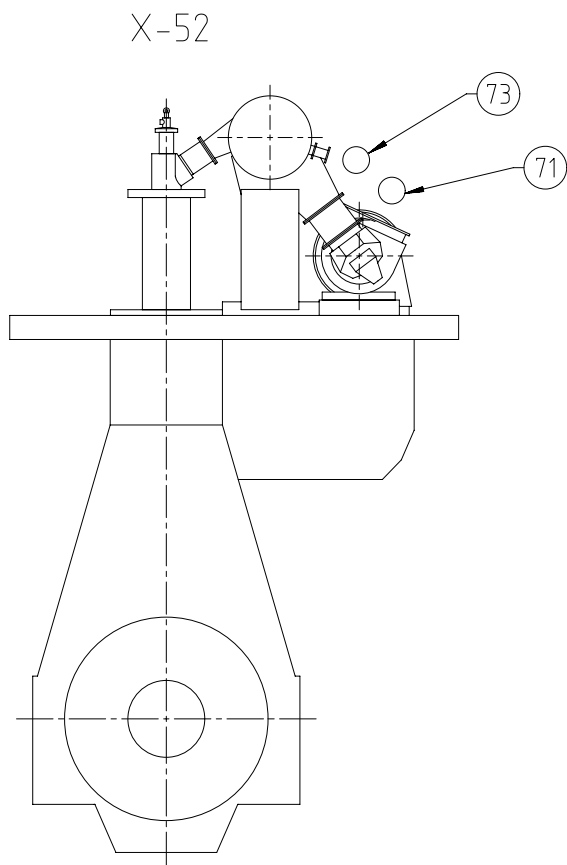
Free space for ID						Q-Code	XXXXXX	Main Drw.		
A EAAD089374 11.05.2018						B EAAD090805 11.01.2019	C EAAD090535 05.04.2019	ISO: JIS		
Model	Number		Drawn date		Number	Drawn date		Number	Drawn date	
WIN GD Wärthner Gas & Diesel					Product 5-BX52		Exhaust System with one turbocharger			
Units	mm	kg	NX		Basic Material			Net Weight		0,001
Made	26.01.2018	dk1021	DH.Kim		Scale	-	Size	Page	Material ID	PAAD283945
Chd	14.02.2018	wwa008	Wang		Design Group		A1	2/2	DAAD096594	Rev. C
Appd	28.02.2018	mtu019	Hug		9726		DAAD096594			
SURFACE PROTECTION SEE GROUP 0344										
TOLERANCING PRINCIPLE ISO8015										
GENERAL TOLERANCES ACCORDING TO ISO2768-mK										

Specifications which must be met:

73

OUTLET - Exhaust gas manifold waste gate

- Size and layout of connection flange is provided in the "Pipe Connection Plan"
- Pipe diameter according to parameter "B" on page 2.
- Waste gate connection pipe to main exhaust gas pipe must be kept as short as possible to avoid swirl and extensive back pressure.



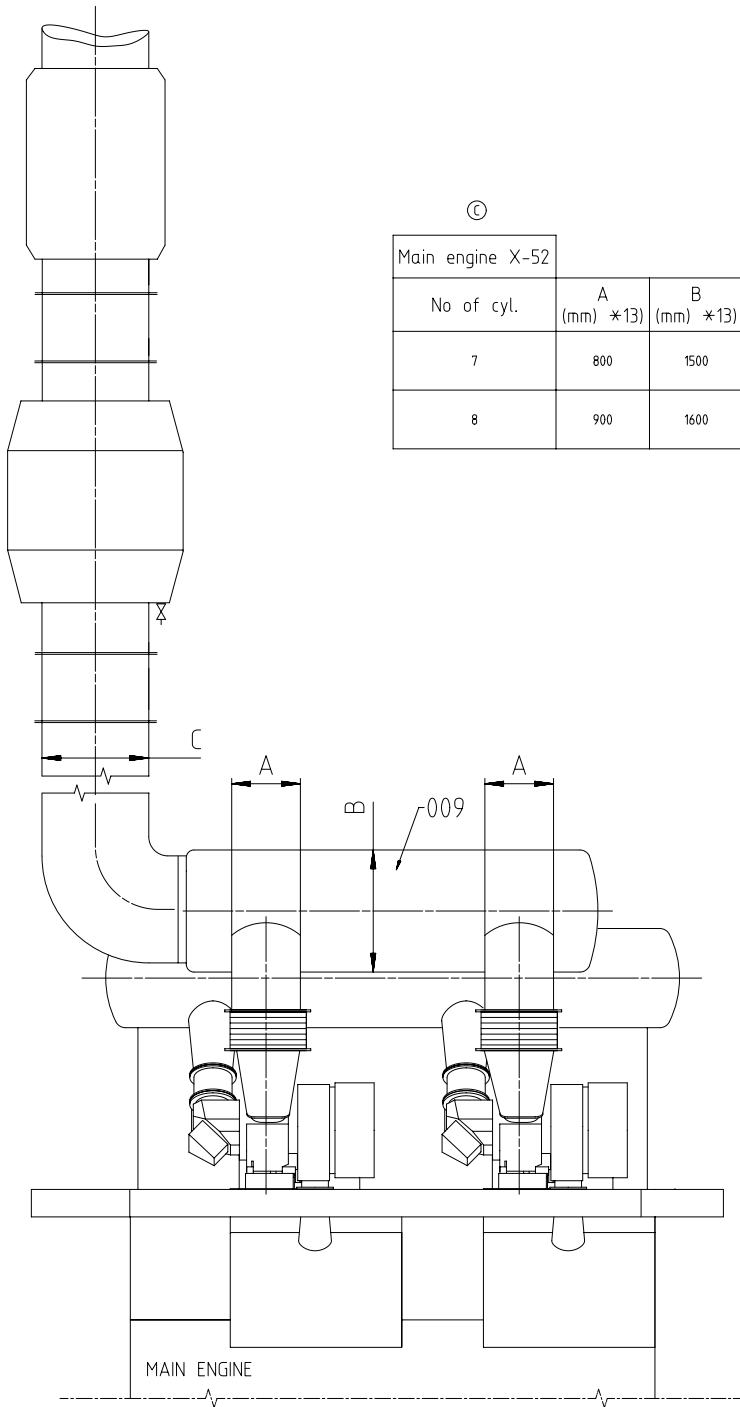
71

OUTLET - Exhaust gas turbocharger

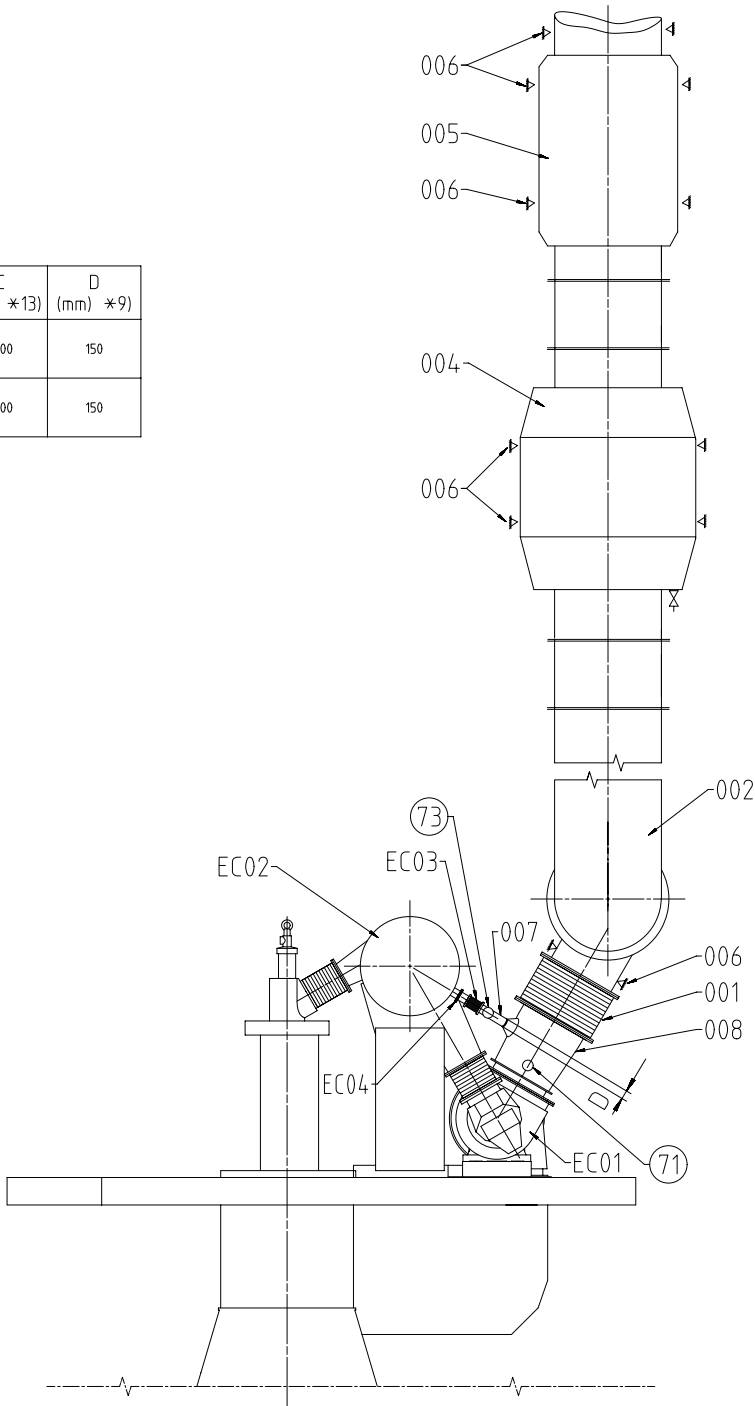
C

- Exhaust gas temperature and volume flow: according to GTD
- The total back pressure of the exhaust gas system must be kept in the admissible range of:
Design maximum (new condition) without exhaust gas treatment system: 30 mbar
Design maximum (new condition) with exhaust gas treatment system: 60 mbar
Operational maximum (fouled condition) without exhaust gas treatment system: 50 mbar
Operational maximum (fouled condition) with exhaust gas treatment system: 80 mbar
- Pipe dimensions laid out according to the recommended gas velocities provided in the the Marine Installation Manual (MIM) and by GTD.
- The exhaust piping must be arranged in a way to avoid gases from accumulating.
- The piping layout must consider the thermal expansion and vibration from turbocharger (TC) and main engine (ME).
Thermal expansion of the ME to be calculated according to the formula in MIM, TC specific thermal expansion are provided by the TC supplier.
- Supports (fixation points) for carrying piping and exhaust gas system components deadweight must be installed in sufficient size and amount. Inadmissible tensions in the piping and forces acting on the turbocharger are not acceptable.
- Exhaust gas pipes of several engines must not be connected.
- Drains in adequate size and amount must be installed in the exhaust gas piping.
- When the noise level on the bridge wing exceeds the class requirement (normally 60 - 70 dB(A)) a silencer must be applied.
- An exhaust gas collector after the turbocharger must be installed.

Free space for lic.								Q-Code XXXXX	Main Drw.		
								Standard ISO; JIS			
Modif.	A	EAAD089374	11.05.2018	B	EAAD090105	11.01.2019	C	EAAD090535	05.04.2019		
		Number	Drawn date		Number	Drawn date		Number	Drawn date		Drawn date
WIN GD Winterthur Gas & Diesel		Product 5-8X52		Exhaust System with two turbochargers							
Units	mm kg	NX				Basic Material				Net Weight 0,001	
SURFACE PROTECTION SEE GROUP 0344		Made	26.01.2018 dki021 DH.Kim		Scale	-		Size	A3	Page	1/2
TOLERANCING PRINCIPLE ISO8015		Chkd	14.02.2018 wwa008 Wang		Design Group	9726		Material ID	PAAD284205		
GENERAL TOLERANCES ACCORDING TO ISO2768-mK		Appd	28.02.2018 mhu019 Hug		Drawing ID	DAAD096685		Rev.	C		



Main engine X-52				
No of cyl.	A (mm) *13)	B (mm) *13)	C (mm) *13)	D (mm) *9)
7	800	1500	1200	150
8	900	1600	1300	150



Pos.	SYSTEM COMPONENTS *1)
001	Compensator *4)
002	Exhaust gas pipe *12)
004	Boiler *11)
005	Silencer (with spark arrester) *10)
006	Support *6)
007	Waste gate pipe
008	Transition piece *7)
009	Exhaust gas collector
ENGINE CONNECTIONS *2)	
73	OUTLET - Exhaust gas turbocharger
	OUTLET - Exhaust gas manifold waste gate
ENGINE COMPONENTS *3)	
EC01	Turbocharger
EC02	Exhaust gas manifold
EC03	Waste gate compensator *4) *9)
EC04	Waste gate valve
Remarks: C	
- Drain plugs and drain cocks to be installed where necessary.	
*1) Refer to the "Pipe Connection Plan" for the execution and location of the engine pipe connections.	
*2) To be delivered by external supplier and to be installed by the shipyard.	
*3) To be delivered by the engine builder, i.e. already equipped on engine side	
*4) Dimension of expansion piece (compensator) must be defined by the shipyard taking into account the thermal growth of exhaust manifold and exhaust pipe. Vibrations of the pipe after the compensator must be lower than 45 mm/s RMS (root mean square).	
*6) Installed as fixed or sliding type in accordance with the requirements. Final amount and position have to be defined by the shipyard under consideration of system layout and requirements based on installation specific calculation.	
*7) Area ratio between outlet/inlet diameter = 1.1...1.6 Taper angle ≤ 40°	
*9) Pipe dimension on engine side (before compensator) is one nominal pipe size smaller.	
*10) Optional, installed as required to meet noise requirements.	
*11) Optional.	
*12) The radius of pipe bends should be not smaller than 1.5 x DN.	
*13) The provided dimensions refer to an R1 rated engine and serve just as proposal. To make the project specific layout, data as provided by GTD and by the turbocharger supplier must be taken into account.	

Free space for file						Q-Code XXXXXX Standard ISO, JIS		Main Dwg.	
Mod.	A EAAD089374 11.05.2018		B EAAD090805 11.01.2019		C EAAD090535 05.04.2019				
	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number	Drawn date	
WIN GD Wingnut Gear & Diesel			Product 5-8X52			Exhaust System with two turbochargers			
Units mm kg NX						Basic Material		Net Weight 0,001	
Made	26.01.2018		dk1021	OH.Kim	Scale	-	Size A1	Page 2/2	Material ID PAAD284205
Chd	14.02.2018		wwa008	Wang	Design Group	9726	Drawing D	DAAD096685	Rev. C
Appd	28.02.2018		mtu019	Hug					



- [illegible]

SURFACE PROTECTION SEE GROUP 0344
TOLERANCING PRINCIPLE ISO8015



MIDS - EXHAUST SYSTEM (DG9726)

WinGD X52

TRACK CHANGES

DATE	SUBJECT	DESCRIPTION
2018-04-19	DRAWING SET	First web upload
2018-05-18	DAAD096594 DAAD096685	System drg – new revision
2019-01-15	DAAD096594 DAAD096685	System drg – new revision
2019-09-18	DAAD096686 DAAD096594 DAAD096685	Main and system drgs.- new revision
2019-09-18	PTAA038780 PTAA038752	New main and system drgs with iSCR - added
2023-04-20	PAAD284311 PAAD284313 PTAA038780	Main and system drgs.- new revision
2023-05-25	PAAD284311 PAAD284313 PTAA038780 PAAD284314 PAAD284210 PTAA066955_	Main and system drgs.- new revision
2023-07-27	PTAA038780-C	New revision

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