NetWeight
0,001

Quantity PER ENGINE	SEQ NO	Material ID	Material Name / Dimension, Occ	Standard or Drawing	Basic Material / Material Standard	Weight GR./NET
1	001	PAAD329033	Exhaust System with two turbochargers	DAAD117073		0,001

MaterialID	Free space for lic.	Q-Code	Main Drw.
PAAD329110		XXXXX Standard: ISO; JIS	H

Modif.	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number	Drawn date

WIN GD Winterthur Gas & Diesel

Product: W6-9X82DF

Exhaust System

Units	mm kg	NX	Basic Material	Net Weight

SURFACE PROTECTION SEE GROUP 0344	Made	04.06.2019 dki021 DH.Kim	Scale –	Size A3	Page 1/1	Material ID
TOLERANCING PRINCIPLE ISO8015	Chkd	04.07.2019 wwa008 Wang	Design Group 9726	Drawing ID DAAD117106		Rev. –
GENERAL TOLERANCES ACCORDING TO ISO2768-mK	Appd	05.07.2019 mhu019 Hug				

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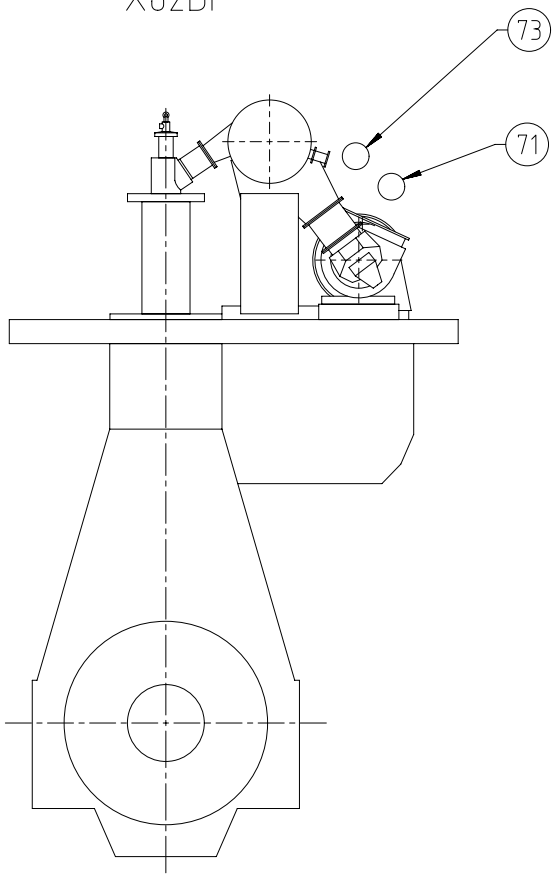
Specifications which must be met:

(73) OUTLET - Exhaust gas manifold waste gate

- Size of connection flange described in the pipe connection plan.
- Pipe diameter according to value B, defined on page 2.
- Waste gate connection pipe to main exhaust gas pipe should be kept as short as possible to avoid swirl and extensive back pressure.

X82DF



(71) OUTLET - Exhaust gas turbocharger

- 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) in gas mode and in diesel mode without exhaust gas treatment system: 30 mbar
  Design maximum (new condition) in diesel mode with exhaust gas treatment system: 60 mbar
  Operational maximum in gas mode: 45 mbar
  Operational maximum (fouled condition) in diesel mode without exhaust gas treatment system: 50 mbar
  Operational maximum (fouled condition) in diesel mode with exhaust gas treatment system: 80 mbar
- Pipe dimensions laid out according to the recommended gas velocities provided in 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 claculated according to the formula in MIM, TC specific thermal expansion are provided by the TC supplier.
- Explosion relief devices with flameless pressure relief (rupture discs or spring loaded valves) must be installed in accordance with class requirements.
- A continuous (extensive) exhaust gas flow into the engine room must be avoided.
- Supports (fixation points) for carrying piping and exhaust gas system components deadweight must be installed in sufficient size and amount. In admissible 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.

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Free space for lic.								Q-Code XXXXX		Main Drw.	
								Standard ISO; JIS			
Modif.		Number	Drawn date		Number	Drawn date		Number	Drawn date		Number	Drawn date
WIN GD Winterthur Gas & Diesel		Product 6-9X82DF		Exhaust System							
Units mm kg	NX		Basic Material								Net Weight 0,001
SURFACE PROTECTION SEE GROUP 0344	Made	03.06.2019 dki021 DH.Kim	Scale –	Size A3	Page 1/2	Material ID PAAD329033					
TOLERANCING PRINCIPLE ISO8015	Chkd	04.07.2019 wwa008 Wang	Design Group 9726	Drawing ID DAAD117073						Rev. –	
GENERAL TOLERANCES ACCORDING TO ISO2768-mK	Appd	05.07.2019 mhu019 Hug									

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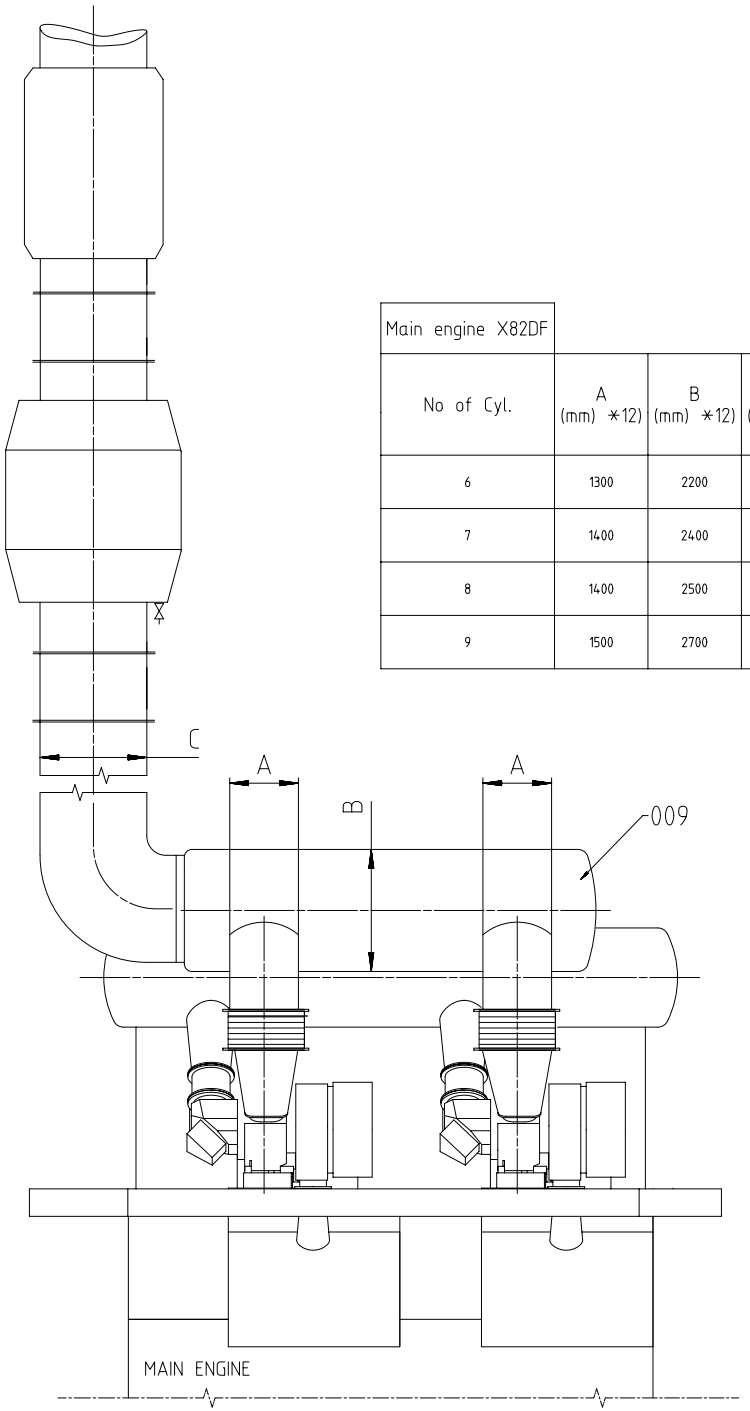
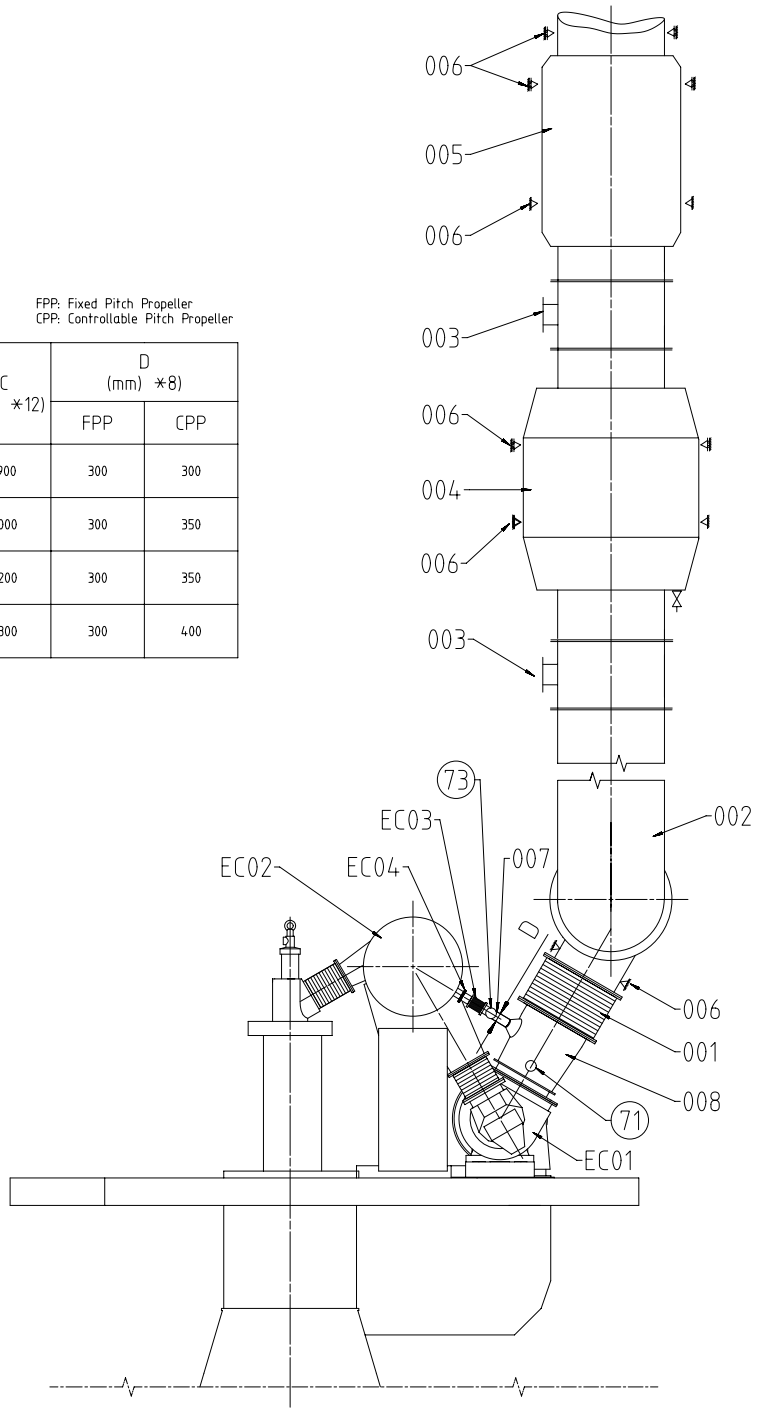
SYSTEM PROPOSAL





Main engine X82DF					
No of Cyl.	A (mm) *12)	B (mm) *12)	C (mm) *12)	D (mm) *8)	
				FPP	CPP
6	1300	2200	1900	300	300
7	1400	2400	2000	300	350
8	1400	2500	2200	300	350
9	1500	2700	2300	300	400

FPP: Fixed Pitch Propeller
CPP: Controllable Pitch Propeller

Pos.	SYSTEM COMPONENTS *1)
001	Compensator *7)
002	Exhaust gas pipe *9)
003	Explosion relief device (rupture discs or spring loaded valves) *5)
004	Boiler *11)
005	Silencer (with spark arrester) *10)
006	Support *4)
007	Waste gate pipe
008	Transition piece *6)
009	Exhaust gas collector

Pos.	ENGINE CONNECTIONS *2)
(71)	OUTLET - Exhaust gas turbocharger
(73)	OUTLET - Exhaust gas manifold waste gate

Pos.	ENGINE COMPONENTS *3)
EC01	Turbocharger
EC02	Exhaust gas manifold
EC03	Waste gate compensator *7) *8)
EC04	Waste gate valve

Remarks:

- 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 by delivered by the engine builder, i.e. already equipped on engine side.

*4) Installed as fixed or sliding type in accordance with requirements.
In between fixed supports a compensator (bellow) must be installed.
Final amount and position have to be determined by the shipyard under consideration of the system layout and requirements based on installation specific calculation.

*5) Type of device (rupture discs or self-closing spring loaded valve) to be selected in accordance with class requirements and/or specification of the shipowner.
Final amount and position must be defined by the system designer/shipyard under consideration of the system layout and requirements determined by calculation.
For installation with rupture discs it is required to either send an opening control signal to the safety system, which trigger an engine shutdown to avoid a continuous exhaust gas flow into the engine room, or to apply a duct leading the exhaust to the outside.

*6) Area ratio between outlet/inlet diameter = 1.1...1.6
Taper angle = ≤ 40°

*7) 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).

*8) Pipe dimension on engine side (before compensator) is one nominal pipe size smaller.

*9) To be laid out and installed according to the requirements.
The radius of bends should be not smaller than 1.5 x DN.

*10) Optional, installed as required to meet noise requirements.

*11) Optional.

*12) 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 turbocharger supplier must be taken into account.

Free space for lic.
Q-Code XXXXX
Standard ISO; JIS
Main Drw.

Modif.	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number	Drawn date

WIN GD Winterthur Gas & Diesel

Product 6-9X82DF

Exhaust System

Units	mm kg	NX	Basic Material	Net Weight 0,001

SURFACE PROTECTION SEE GROUP 0344	Made	03.06.2019	dki021 DH.Kim	Scale -	Size A1	Page 2/2	Material ID PAAD329033
TOLERANCING PRINCIPLE ISO8015	Chkd	04.07.2019	wwu008 Wang	Design Group 9726	Drawing ID DAAD117073		Rev. -
GENERAL TOLERANCES ACCORDING TO ISO2768-mK	Appd	05.07.2019	mhu019 Hug				

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WinGD X82DF – Exhaust System (DG9726)

TRACK CHANGES

DATE	SUBJECT	DESCRIPTION
2019-07-12	DRAWING SET	First web upload

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