TC Amount	1				X	X	X
	2	X	X	X			
SCR	Without			X			X
	LP SCR		X			X	
	HP SCR	X			X		

Net Weight											
0,001	0,001	0,001	0,001	0,001	0,001						
1	1	1	-	-	-	003	PAAD284457	Exhaust System with two turbochargers	DAAD096766		0,001
-	-	-	1	1	1	002	PAAD284222	Exhaust System with one turbocharger	DAAD096695		0,001
1	-	-	1	-	-	001	PAAD219883	SCR PIPING GUIDE	DAAD064155		0,001
Quantity PER ENGINE						SEQ NO	Material ID	Material Name Dimension, Occ	Standard or Drawing	Basic Material Material Standard	Weight GR./NET
PAAD284468	PAAD284467	PAAD284466	PAAD284465	PAAD284464	PAAD284462	Free space for lic.				Q-Code XXXXX	Main Drw. H
Material ID										Standard ISO; JIS	

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

WIN GD Winterthur Gas & Diesel

Product 5-8RT-flex58T-D

Exhaust System
Abgassystem

Units mm kg	NX		Basic Material		Net Weight
SURFACE PROTECTION SEE GROUP 0344	Made	12.02.2018 dki021 DH.Kim	Scale -	Size A3 / Page 1/1	Material ID
TOLERANCING PRINCIPLE ISO8015	Chkd	14.02.2018 wwa008 Wang	Design Group 9726	Drawing ID DAAD096768	Rev. -
GENERAL TOLERANCES ACCORDING TO ISO2768-mK	Appd	28.02.2018 mhu019 Hug			

Approved

DID - DIMENSIONAL DRAWING - Confidential

Specifications which must be met:

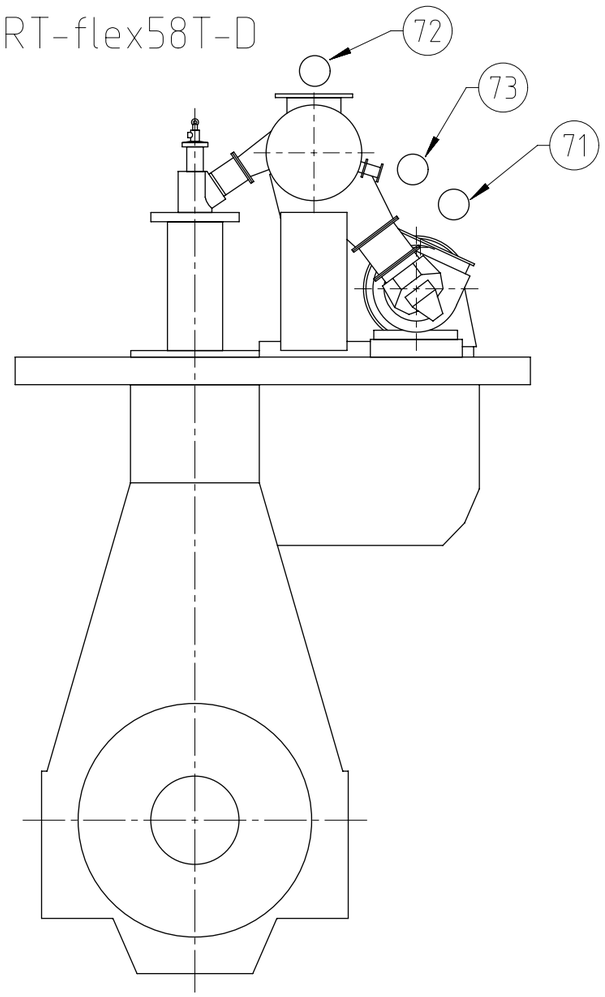
(72) OUTLET - Exhaust gas by-pass

- 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.

(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.

RT-flex58T-D



(71) OUTLET - Exhaust gas turbocharger

(A)

- 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: 30 mbar
  Fouled maximum: 50 mbar
  The radius of pipe bends must not be smaller than 1.5 x DN
- 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.

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
A	EAAD089374	25.04.2018						

WIN GD Winterthur Gas & Diesel

Product: 5-8RT-flex58T-D

Exhaust System with one turbocharger

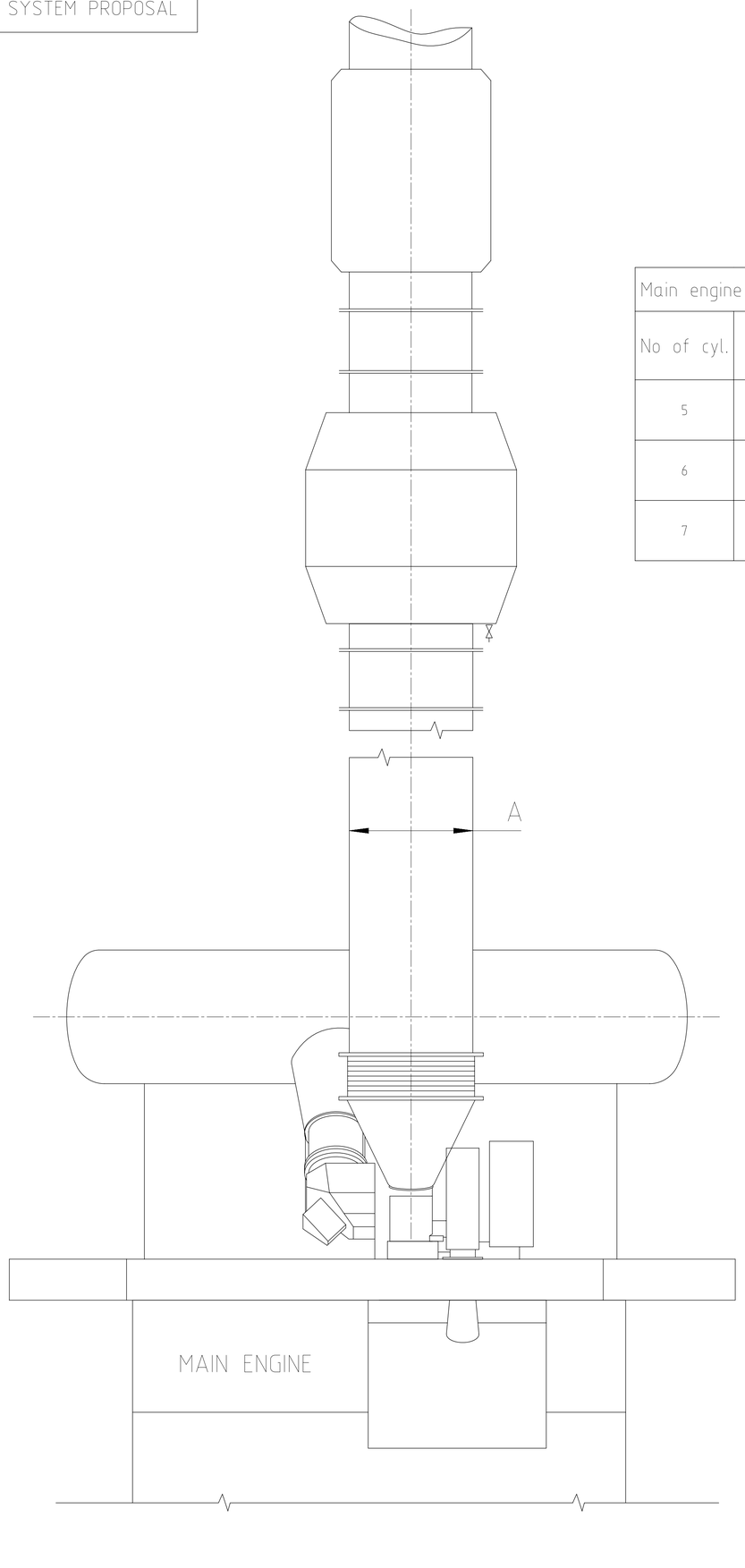
Units	mm kg	NX	Basic Material	Net Weight 0,001

SURFACE PROTECTION SEE GROUP 0344	Made	31.01.2018 dki021 DH.Kim	Scale -	Size A3	Page 1/2	Material ID PAAD284222
TOLERANCING PRINCIPLE ISO8015	Chkd	14.02.2018 wwa008 Wang	Design Group 9726	Drawing ID DAAD096695		Rev. A
GENERAL TOLERANCES ACCORDING TO ISO2768-mK	Appd	28.02.2018 mhu019 Hug				

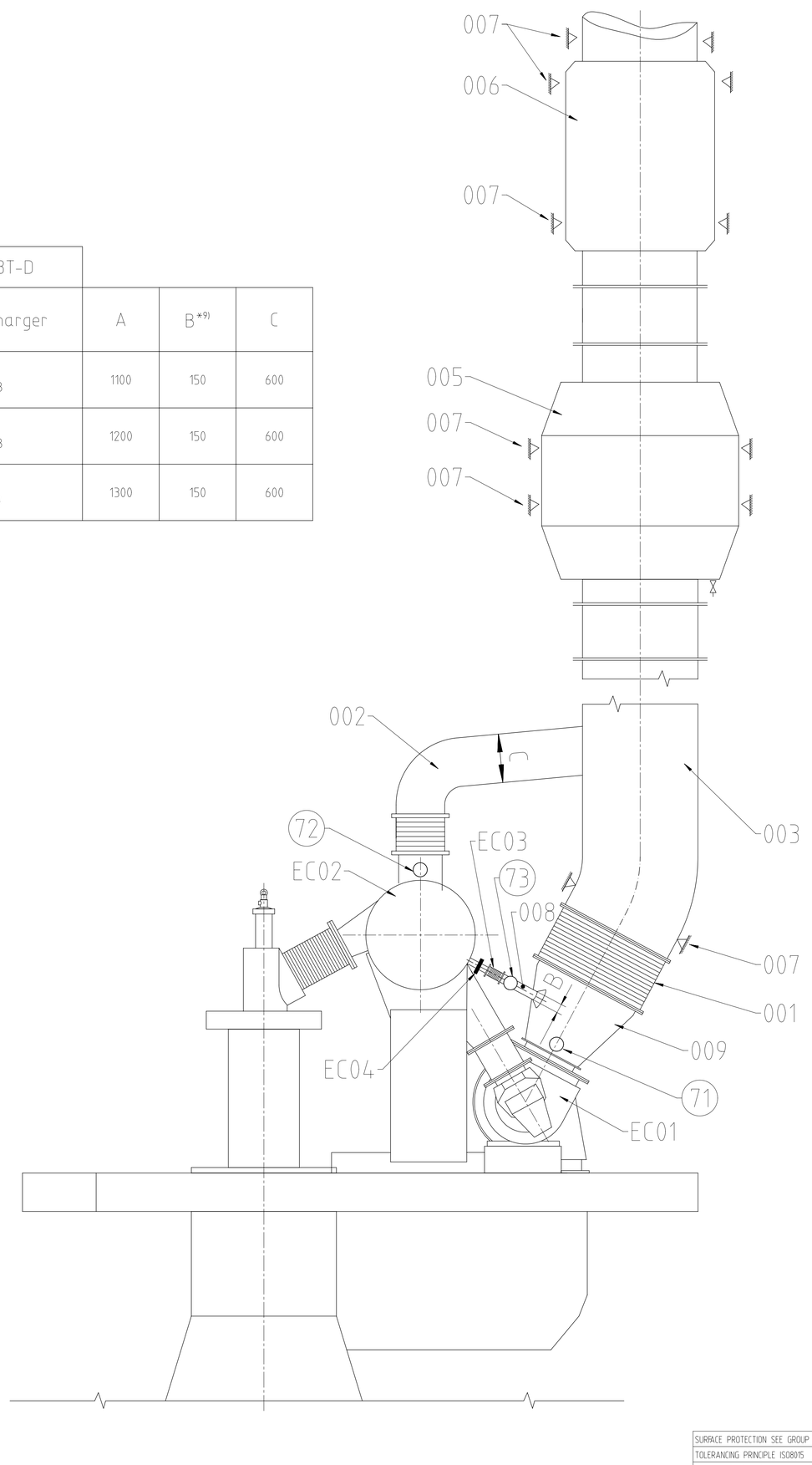
Approved

DID - DIMENSIONAL DRAWING - Confidential

SYSTEM PROPOSAL



Main engine RT-flex58T-D				
No of cyl.	Turbocharger	A	B *9)	C
5	1 x A270-L 1 x MET60MB	1100	150	600
6	1 x A175-L 1 x MET66MB	1200	150	600
7	1 x A275-L 1 x MET71MB	1300	150	600



Pos.	SYSTEM COMPONENTS *1)
001	Compensator *4)
002	Exhaust gas by-pass line *8)
003	Exhaust gas pipe
005	Boiler *11)
006	Silencer (with spark arrester) *10)
007	Support *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

(A) 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 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°

*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 DN125.

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

*11) Optional.

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
	A	EAAD089374	25.04.2018						

WIN GD Winterthur Gas & Diesel

Product 5-8RT-flex58T-D

Exhaust System with one turbocharger

Units	mm kg	NX	Basic Material	Net Weight 0,001

SURFACE PROTECTION SEE GROUP 0344	Made	31.01.2018	dki021	DH.Kim	Scale -	Size A1	Page 2/2
TOLERANCING PRINCIPLE ISO8015	Chkd	14.02.2018	wwa008	Wang	Design Group 9726	Drawing ID DAAD096695	Material ID PAAD284222
GENERAL TOLERANCES ACCORDING TO ISO2768-mK	Appd	28.02.2018	mhu019	Hug			Rev. A

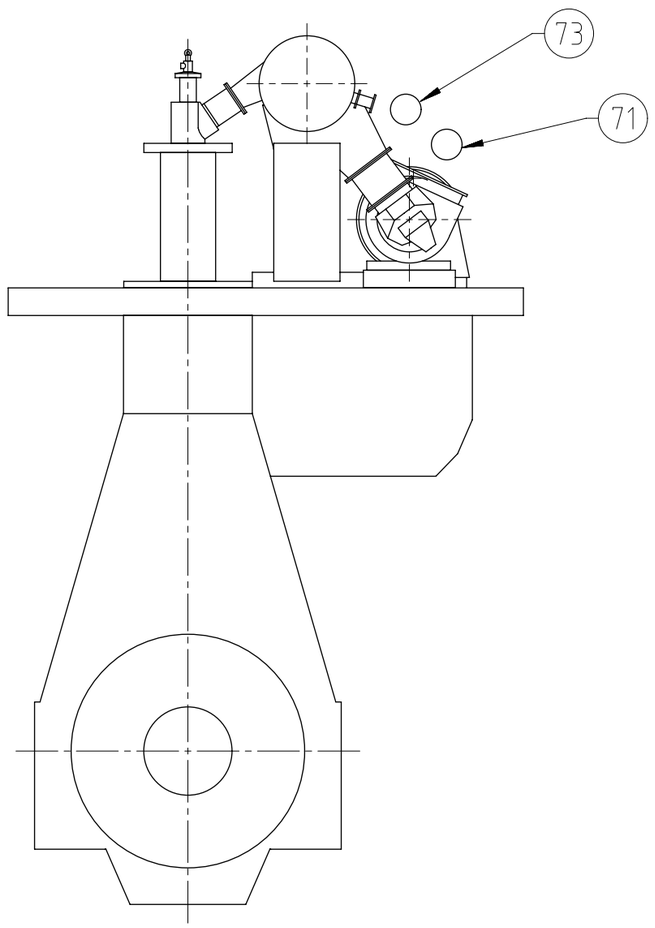
Approved

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.

RT-flex58T-D



(71) OUTLET - Exhaust gas turbocharger

(A)

- 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: 30 mbar
  Fouled maximum: 50 mbar
  The radius of pipe bends must not be smaller than 1.5 x DN
- 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.

Approved

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
A	EAAD089374	25.04.2018						

WIN GD Winterthur Gas & Diesel

Product: 5-8RT-flex58T-D

Exhaust System with two turbochargers

Units	mm kg	NX	Basic Material	Net Weight 0,001

SURFACE PROTECTION SEE GROUP 0344

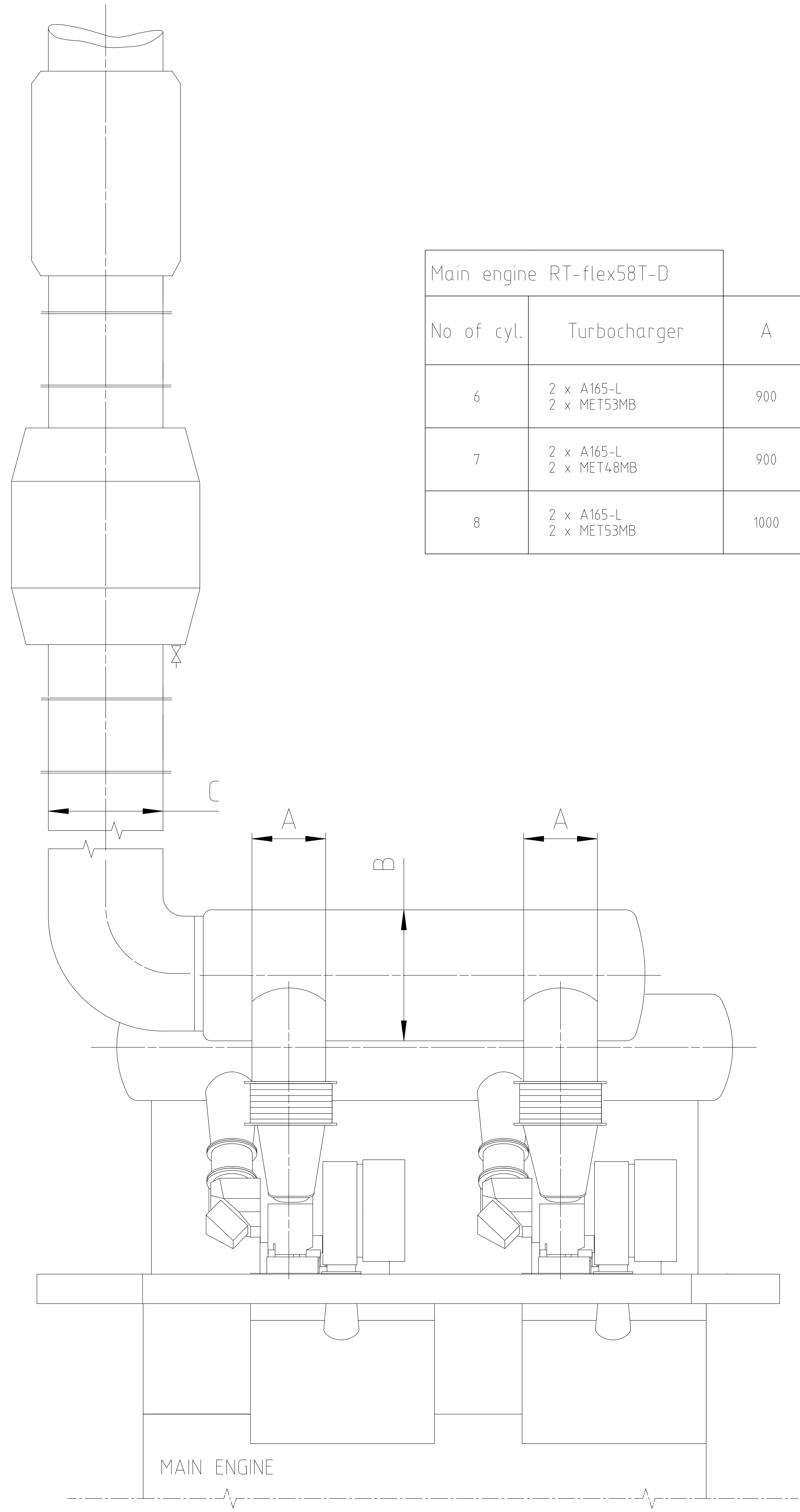
TOLERANCING PRINCIPLE ISO8015

GENERAL TOLERANCES ACCORDING TO ISO2768-mK

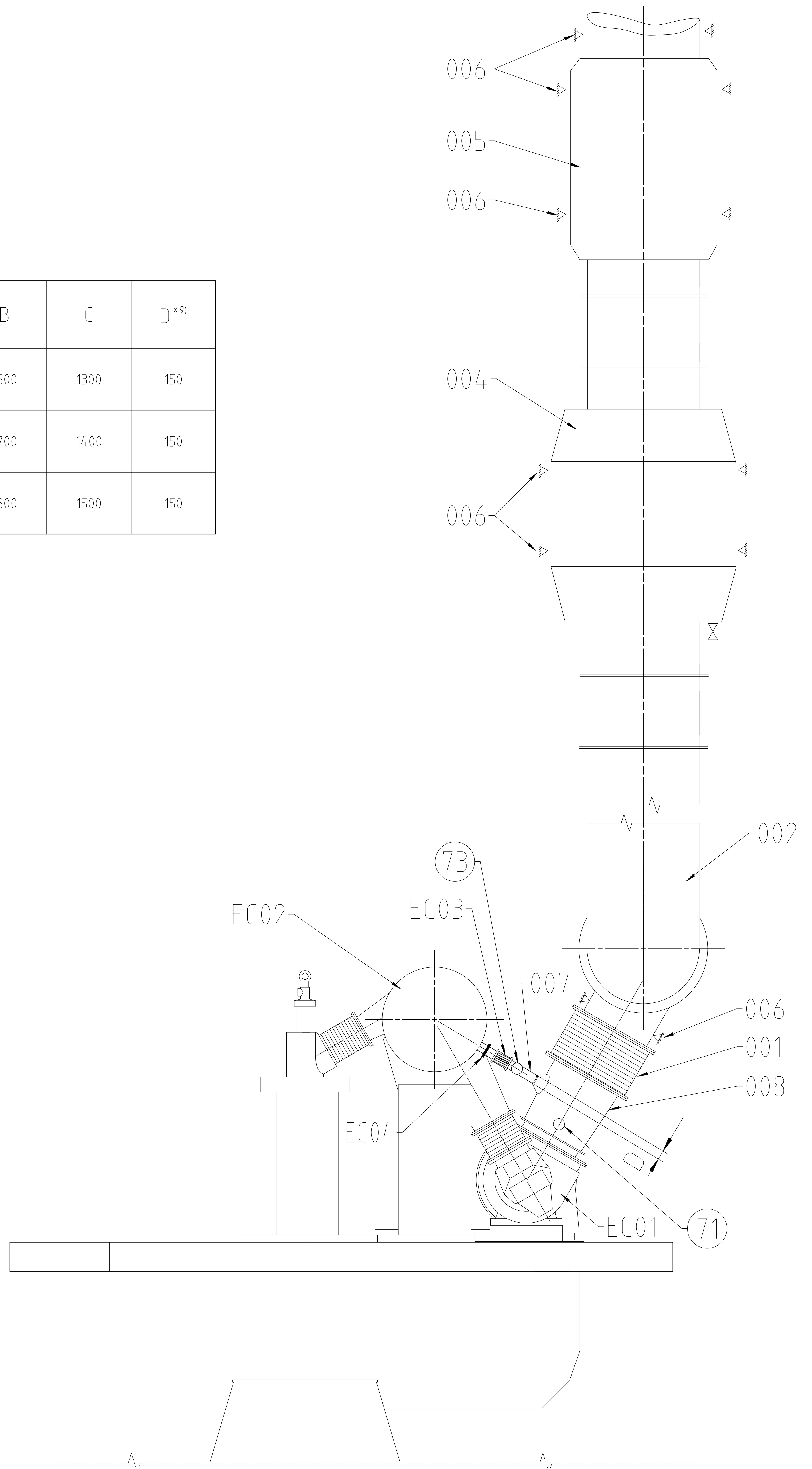
Made	30.01.2018	dki021 DH.Kim	Scale -	Size A3	Page 1/2	Material ID PAAD284457
Chkd	14.02.2018	wwa008 Wang	Design Group 9726	Drawing ID DAAD096766		Rev. A
Appd	28.02.2018	mhu019 Hug				

DID - DIMENSIONAL DRAWING - Confidential

SYSTEM PROPOSAL



Main engine RT-flex58T-D					
No of cyl.	Turbocharger	A	B	C	D*9)
6	2 x A165-L 2 x MET53MB	900	1500	1300	150
7	2 x A165-L 2 x MET48MB	900	1700	1400	150
8	2 x A165-L 2 x MET53MB	1000	1800	1500	150



Pos.	SYSTEM COMPONENTS *1)
001	Compensator *4)
002	Exhaust gas pipe
004	Boiler *11)
005	Silencer (with spark arrester) *10)
006	Support *6)
007	Waste gate pipe
008	Transition piece *7)

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 *4) *9)
EC04	Waste gate valve

(A) 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 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 DN125.

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

*11) Optional.

Q-Code XXXXX
Standard ISO; JIS
Modif. A EAAD089374 25.04.2018

WIN GD Winterthur Gas & Diesel

Product 5-8RT-flex58T-D

Exhaust System with two turbochargers

Units mm kg | NX | Basic Material | Net Weight 0,001
Made 30.01.2018 dki021 DH.Kim | Scale - | Size A1 | Page 2/2 | Material ID PAAD284457
Chkd 14.02.2018 wwa008 Wang | Design Group 9726 | Drawing ID DAAD096766 | Rev. A
Appd 28.02.2018 mhu019 Hug

SURFACE PROTECTION SEE GROUP 0344
TOLERANCING PRINCIPLE ISO8015
GENERAL TOLERANCES ACCORDING TO ISO2768-mK

MIDS_WinGD-RT-flex58T-D_EXHAUST-SYSTEM

TRACK CHANGES

DATE	SUBJECT	DESCRIPTION
2018-04-25	DRAWING SET	First web upload