Available executions

Execution No.	Material ID	Cylinder No.	Attribute 1: Engine execution		Attribute 2: Stays location		
			STANDARD	LEFT	FUEL PUMP SIDE	EXHAUST SIDE	BOTH SIDES
001	PTAA030761	6-12	X		X		
002	PTAA030760	6-12	X			X	
003	PTAA030759	6-12	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.

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Prod. X92DF-2.0

Change History

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis		Activity Code	E	C
–	tch101	yzh102	02.06.2022	CNAA001986	Main Design/Drawing Introduced	Approved		E	C

WIN GD
Winterthur Gas & Diesel

ENGINE STAYS
MIDS master drawing

separate BOM available

Scale	–			NX	Dimension					

Units [mm] [kg]   Basic Material   Net Weight 0.001

Main Design		Design Group	9715	Q-Code XXXXX	Standard	WDS
Qty per	A4	Item ID	PTAA030769		Drawing Page/s	1/1

SEQ NO	QTY	Item ID	Item Name	Dimension	Standard-ID	Basic Material	Net Weight
001	1	PTAA030750	ENGINE STAYS	FS, STD			0.001

Prod.	6,7,8,9,10,11,12 X92DF-2.0					

Change History

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Approved	Activity Code	E	C
-	sde101	yzh102	02.06.2022	CMAA001896	new Document			-	-

WIN GD
Winterthur Gas & Diesel

ENGINE STAYS

Bill Of Material

Dimension

Units	[m] [kg]	Basic Material				Net Weight	0.001
Main Design	Yes	Design Group	9715	Q-Code	XXXXX	Standard	WDS
Qty per	Engine	A4	Item ID	PTAA030761		BOM Page/s	01/01

Position of stay attachment points on engine / platform side

No. of Cyl.	CrankshaftParts	A	B	C	D
8	1	795	795	2385	2385
	2	795	832	2385	2496
9	2	795	832	2385	2496
10	2	795	832	2385	2496
11	2	795	832	2385	2496
12	2	795	832	2385	2496

Layout / Specification of "inner" stay platform attachment points

VIEW C
SCALE 1:10

F_h

42

VIEW D
SCALE 1:10

85
587
450

Max. permissible force in lateral direction	F_h	(kN)	± 200
Stiffness	k	(N/m)	0.6×10^9
Permissible vertical stays displacement	Def_v	(mm)	± 50
Permissible horizontal stays displacement	Def_h	(mm)	± 50
Permissible angular stays displacement	Def_a	(°)	2

Layout / Specification of "outer" stay platform attachment points

VIEW A
SCALE 1:10

F_h

42

VIEW B
SCALE 1:10

85
587
450

Max. permissible force in lateral direction	F_h	(kN)	± 200
Stiffness	k	(N/m)	0.6×10^9
Permissible vertical stays displacement	Def_v	(mm)	± 50
Permissible horizontal stays displacement	Def_h	(mm)	± 50
Permissible angular stays displacement	Def_a	(°)	2

Requirements for application of hydraulic stays on fuel side

- The selected stays must have maker's acceptance for one side engine installation.
  WinGD approved supplier : Green & Clean Technology Co., Ltd (Korea)
                            Hanmi Hydraulic Machinery Co., Ltd (Korea)
                            Nantong Navigation Machinery Group Co., Ltd (China)

- Installed on fuel side (FS).

- The amount of stays must be determined based on the requirement and stays suppliers specification.
  The transferred forces must be taken into consideration.
  The engine forces and moments are defined in the relevant engine dynamic data
  sheet "Forces and Moments" which is linked in the Marine Installation Manual (MIM).
  Stay pre-tensioning forces (max. piston hydraulic force) must also be considered and are provided
  by the stays supplier.

- The stay attachment point requirements must be crosschecked with the specification.
  The maximum forces transferred by the selected stays type must be within the range as defined
  on this drawing for standard engine execution. If the total force per stay exceeds the permissible
  range, reinforcement of the platform attachment points can be requested from the engine builder.

- The stays must adapt to the ship hull deformation and reduce the static reaction force
  acting on the engine and ship hull attachment points.

- The stays must increase the total stiffness of the system to avoid harmful resonance
  conditions. The dynamic stiffness of the stays (dynamic spring rate) is provided by the
  stays supplier.

- The stays must dampen accordingly to ensure that the acceptable vibrations (RMS limits) for the
  WinGD 2-stroke engine are met.

- The performance of the stays must be checked during sea trial by vibration measurements.

- Stay position in the vertical direction, respectively the distance to the bottom side of the
  upper platform beam must be arranged in a way that sufficient space for welding and
  application of the max. admissible stays inclination remains.

- The installation and commissioning of the stays must be in accordance with the supplier's
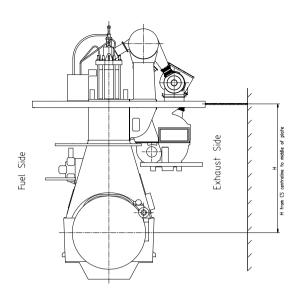 instructions.

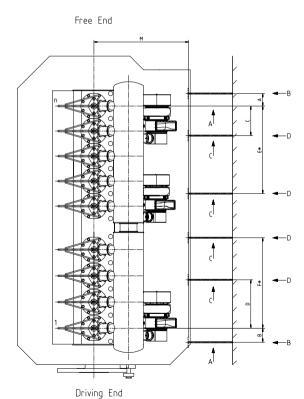Requirements on stays attachment points at ship hull side (per engine stay)

Max. force acting on ship's hull	Fh_{max}	(kN)	*1)
Minimum stiffness	k_{min}	(N/m)	0.5×10^9
Permissible deflection per 100 kN	$Def_{max.}$	(mm)	0.2

*1) Maximum engine force resulting from lateral moments of X/H type at
    the project specific rating plus stays pre-tensioning force according to
    stays supplier's specification

Fuel Side
Exhaust Side

8175 from CS centreline to middle of plate

Free End

4925

Driving End

* Only for 11 and 12 cylinders.

B
D
D
A
C
C
D
D
C
C
A
B

5565*
(3180)*
5874*
(3328)*

WinGD
Winterthur Gas & Diesel

ENGINE STAYS

FS, STD

Scale 1:30 | NX | Units [mm] [kg] | Basic Material | Net Weight 0.001

new Design

9715 | D-Code XXXXX | Standard | WDS
A0 | PTAA030750 | Drawing Pages 1/1

SEQ NO	QTY	Item ID	Item Name		Dimension	Standard-ID	Basic Material	Net Weight
001	1	PTAA030754	ENGINE STAYS		ES, STD			0

Prod. 6,7,8,9,10,11,12 X92DF-2.0

Change History

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis		Approved	Activity Code	E	C
-	sde101	yzh102	02.06.2022	CWAA001896	new Document				-	-

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ENGINE STAYS

Bill Of Material

Dimension

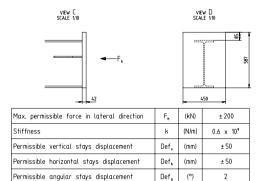|					
Units	[m] [kg]	Basic Material		Net Weight	0
Main Design	Yes	Design Group	9715	Q-Code XXXXX	Standard WDS
Qty per	Engine	A4	Item ID	PTAA030760	BOM Page/s 01/01

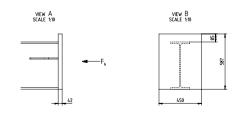## Position of stay attachment points on engine / platform side

No. of Cyl.	Crankshaft Parts	Turbocharger type	HP-SCR Interface	A	B	C	D	E*	F*	M	H
8	1	2 x MET83MB	Without	855	855	795	1301	–	–	6175	8175
8	2	2 x MET83MB	Without	855	892	795	1412	–	–	6175	8175
9	2	2 x MET71MB	Without	855	892	795	1412	–	–	6175	8175
9	2	2 x A280-L	Without	855	892	795	1412	–	–	6175	8175
9	2	2 x MET83MB	Without	855	892	795	1412	–	–	6175	8175
9	2	3 x MET66MB	Without	795	892	1579	1712	–	–	6175	8175
9	2	3 x A275-L	Without	795	892	1579	1712	–	–	6175	8175
10	2	3 x MET66MB	Without	795	892	1879	1412	–	–	6175	8175
10	2	3 x MET83MB	Without	795	892	1879	1412	–	–	6175	8175
10	2	3 x MET71MB	Without	795	892	1879	1412	–	–	6175	8175
11	2	3 x MET71MB	Without	795	892	1879	1412	5565	4086	6175	8175
12	2	3 x MET83MB	Without	795	892	1879	3076	5565	5750	6175	8175

* Only for 11 and 12 cylinders.

Layout / specification of "inner" stay attachment points

VIEW C SCALE 1:10

VIEW D SCALE 1:10

Max. permissible force in lateral direction	F_h	(kN)	±200
Stiffness	k	(N/m)	0.6×10^9
Permissible vertical stays displacement	Def_v	(mm)	±50
Permissible horizontal stays displacement	Def_h	(mm)	±50
Permissible angular stays displacement	Def_a	(°)	2

Layout / specification of "outer" stay attachment points

VIEW A SCALE 1:10

VIEW B SCALE 1:10

Max. permissible force in lateral direction	F_h	(kN)	±200
Stiffness	k	(N/m)	0.6×10^9
Permissible vertical stays displacement	Def_v	(mm)	±50
Permissible horizontal stays displacement	Def_h	(mm)	±50
Permissible angular stays displacement	Def_a	(°)	2

Fuel Side

Exhaust Side

H from CS centreline to middle of plate

Free End

Driving End

Requirements for application of hydraulic stays on exhaust side

- The selected stays must have maker's acceptance for one side engine installation.
  WinGD approved supplier : Green & Clean Technology Co., Ltd (Korea)
                            Hanmi Hydraulic Machinery Co., Ltd (Korea)
                            Nantong Navigation Machinery Group Co., Ltd (China)

- Installed on exhaust side (ES).

- The amount of stays must be determined based on the requirement and stays suppliers specification. The transferred forces must be taken into consideration.
  The engine forces and moments are defined in the relevant engine dynamic data sheet "Forces and Moments" which is linked in the Marine Installation Manual (MIM). Stay pre-tensioning forces (max. piston hydraulic force) must also be considered and are provided by the stays supplier.

- The stay attachment point requirements must be crosschecked with the specification. The maximum forces transferred by the selected stays type must be within the range as defined on this drawing for standard engine execution. If the total force per stay exceeds the permissible range, reinforcement of the platform attachment points can be requested from the engine builder.

- The stays must adapt to the ship hull deformation and reduce the static reaction force acting on the engine and ship hull attachment points.

- The stays must increase the total stiffness of the system to avoid harmful resonance conditions. The dynamic stiffness of the stays (dynamic spring rate) is provided by the stays supplier.

- The stays must dampen accordingly to ensure that the acceptable vibrations (RMS limits) for the WinGD 2-stroke engine are met.

- The performance of the stays must be checked during sea trial by vibration measurements.

- Stay position in the vertical direction, respectively the distance to the bottom side of the upper platform beam must be arranged in a way that sufficient space for welding and application of the max. admissible stays inclination remains.

- The installation and commissioning of the stays must be in accordance with the supplier's instructions.

Requirements on stays attachment points at ship hull side (per engine stay)

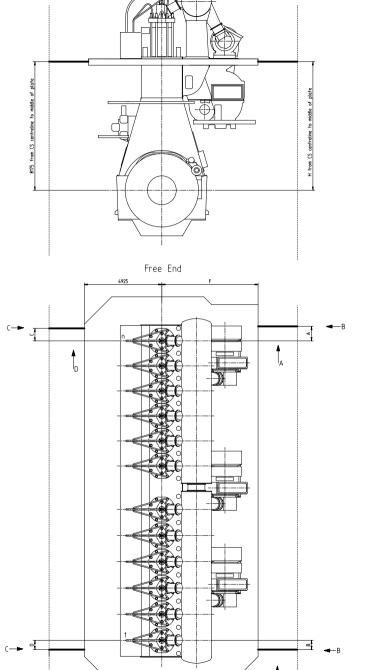|			
Max. force acting on ship's hull	Fh_{max}	(kN)	*1)
Minimum stiffness	k_{min}	(N/m)	0.5×10^9
Permissible deflection per 100 kN	$Def_{max.}$	(mm)	0.2

*1) Maximum engine force resulting from lateral moments of X/H type at the project specific rating plus stays pre-tensioning force according to stays supplier's specification

SURFACE PROTECTION SEE GROUP 6944
TOLERANCING PRINCIPLE ISO8015
GENERAL TOLERANCES ACCORDING TO ISO2768-mK

SEQ NO	QTY	Item ID	Item Name	Dimension	Standard-ID	Basic Material	Net Weight
001	1	PTAA030748	ENGINE STAYS	BS, STD			0

Prod. 6,7,8,9,10,11,12 X92DF-2.0

Change History

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Approved	Activity Code	E	C
-	sde101	yzh102	02.06.2022	CWAA001896	new Document			-	-

WIN GD
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ENGINE STAYS

Bill Of Material

Dimension

Units	[m] [kg]	Basic Material			Net Weight	0
Main Design	Yes	Design Group	9715	Q-Code XXXXX	Standard	WDS
Qty per	Engine	A4	Item ID	PTAA030759	BOM Page/s	01/01

Positions of stay attachment points on engine / platform side

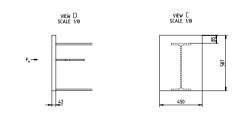| No. of Cyl.	CrankshaftParts	Turbocharger type	A	B	C	D	F	H
8	1	2 x MET83MB	855	855	795	795	6175	8175
	2	2 x MET83MB	855	892	795	832	6175	8175
9	2	2 x MET71MB	855	892	795	832	6175	8175
	2	2 x A280-L	855	892	795	832	6175	8175
	2	2 x MET83MB	855	892	795	832	6175	8175
	2	3 x MET66MB	795	892	795	832	6175	8175
	2	3 x A275-L	795	892	795	832	6175	8175
10	2	3 x MET66MB	795	892	795	832	6175	8175
	2	3 x MET83MB	795	892	795	832	6175	8175
	2	3 x MET71MB	795	892	795	832	6175	8175
11	2	3 x MET71MB	795	892	795	832	6175	8175
12	2	3 x MET83MB	795	892	795	832	6175	8175

Free End

Layout of stays attachment points on platform exhaust side according to WinGD standard design

VIEW A
SCALE 1:10

VIEW B
SCALE 1:10

F_h

Max. permissible force in lateral direction	F_h	(kN)	±200
Stiffness	k	(N/m)	0.6×10^9
Permissible vertical stays displacement	Def_v	(mm)	±50
Permissible horizontal stays displacement	Def_h	(mm)	±50
Permissible angular stays displacement	Def_a	(°)	2

Layout of stays attachment points on platform fuel side according to WinGD standard design

VIEW D
SCALE 1:10

VIEW C
SCALE 1:10

F_h

Max. permissible force in lateral direction	F_h	(kN)	±200
Stiffness	k	(N/m)	0.6×10^9
Permissible vertical stays displacement	Def_v	(mm)	±50
Permissible horizontal stays displacement	Def_h	(mm)	±50
Permissible angular stays displacement	Def_a	(°)	2

Requirements for application of hydraulic stays on fuel side AND exhaust side

- The selected stays must have maker's acceptance for both side engine installation.
  WinGD approved supplier : Green & Clean Technology Co., Ltd (Korea)
  Hanmi Hydraulic Machinery Co., Ltd (Korea)
  Nantong Navigation Machinery Group Co., Ltd (China)

- Installed on fuel side (FS) AND exhaust side (ES).

- The amount of stays must be determined based on the requirement and stays suppliers specification.
  The transferred forces must be taken into consideration.
  The engine forces and moments are defined in the relevant engine dynamic data
  sheet "Forces and Moments" which is linked in the Marine Installation Manual (MIM).
  Stay pre-tensioning forces (max. piston hydraulic force) must also be considered and are provided
  by the stays supplier.

- The stay attachment point requirements must be crosschecked with the specification.
  The maximum forces transferred by the selected stays type must be within the range as defined
  on this drawing for standard engine execution. If the total force per stay exceeds the permissible
  range, reinforcement of the platform attachment points can be requested from the engine builder.

- The stays must adapt to the ship hull deformation and reduce the static reaction force
  acting on the engine and ship hull attachment points.

- The stays must increase the total stiffness of the system to avoid harmful resonance
  conditions. The dynamic stiffness of the stays (dynamic spring rate) is provided by the
  stays supplier.

- The stays must dampen accordingly to ensure that the acceptable vibrations (RMS limits) for the
  WinGD 2-stroke engine are met.

- The performance of the stays must be checked during sea trial by vibration measurements.

- The installation and commissioning of the stays must be in accordance with the supplier's
  instructions.

Requirements on stays attachment points at ship hull side (per engine stay)

Max. force acting on ship's hull	Fh_{max}	(kN)	*1)
Minimum stiffness	$k_{min.}$	(N/m)	0.5×10^9
Permissible deflection per 100 kN	$Def_{max.}$	(mm)	0.2

*1) Maximum engine force resulting from lateral moments of X/H type at
   the project specific rating plus stays pre-tensioning force according to
   stays supplier's specification

ENGINE STAYS

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| A | gj101 | mtud19 | 21.12.2022 | CNAA002652 | add TC type for cylinder 9 |
| | sde101 | yzh102 | 02.06.2022 | CNAA001896 | new Design |

Scale 1:30 NX Units [mm] [kg] Basic Material

BS, STD

9715 XXXXX WDS

A0 PTAA030748 1/1

SURFACE PROTECTION SEE GROUP 6944
TOLERANCING PRINCIPLE ISO8015
GENERAL TOLERANCES ACCORDING TO ISO2768-mK

MIDS - WinGD X92DF-2.0 - Engine Stays (DG9715)

TRACK CHANGES

DATE	SUBJECT	DESCRIPTION
2022-06-08	DRAWING SET	First web upload
2022-12-23	PTAA030754 PTAA030748	System drgs. – new revision