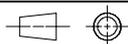


**Available executions**

Execution No.	Material ID	Attribute 2: Stays location		
		FUEL PUMP SIDE	EXHAUST SIDE	BOTH SIDES
001	PAAD328522			X
002	PAAD328523		X	
003	PAAD328524	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.	X82-2.0 X82DF-A-1.0		X82DF-M-1.0							
Change History										
	-	sde101			new Design					
	Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E C		
			ENGINE STAYS MIDS master drawing							
separate BOM available			Dimension							
Scale	-		NX	Units [mm] [kg]	Basic Material		Net Weight	0.001		
<small>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.</small>				Main Design	Design Group	9715	Q-Code	XXXXX	Standard	WDS
				Qty per	A4	Item ID	PTAA024845		Drawing Page/s	1/1

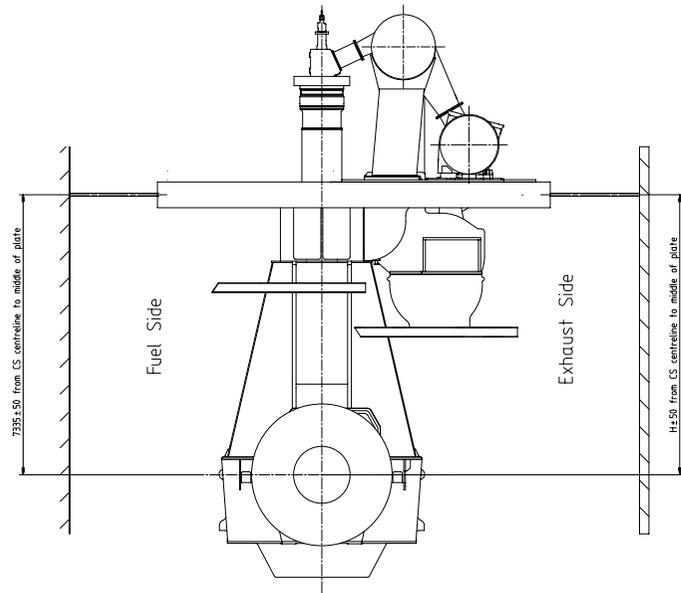
SEQ NO	QTY	Item ID	Item Name	Dimension	Standard-ID	Basic Material	Net Weight
1	1	PAAD328514	ENGINE STAYS	Both Sides			0.001

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Prod.	6,7,8,9 X82-2.0 6,7,8,9 X82DF-A-1.0			6,7,8,9 X82DF-M-1.0				
Change History	B	sde101	mhu019	08.05.2024	CNAA005779	New MainDesign introduced	4	3
	A	sde101	mhu019	06.10.2022	CNAA002208	Main Design/Drawing Introduced	-	-
	-	dkl021	mhu019	23.08.2019	EAAD784628	-	-	-
	Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E

	ENGINE STAYS
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<b>Bill Of Material</b>		Dimension							
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	Main Design	Yes	Design Group		9715	Q-Code	X X M	Standard	WDS
	Qty per	Engine	A4	Item ID	PAAD328522		BOM Page/s	01/01	

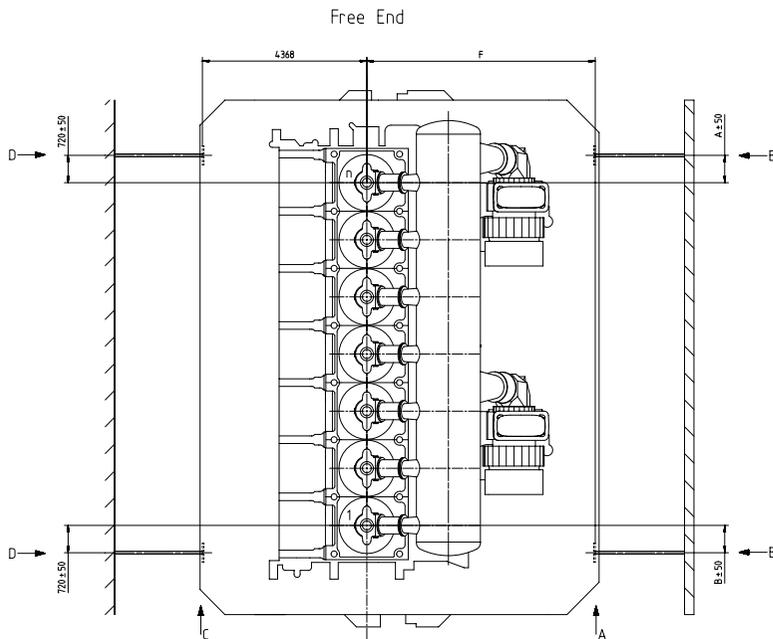


Position of stay attachment points on platform side

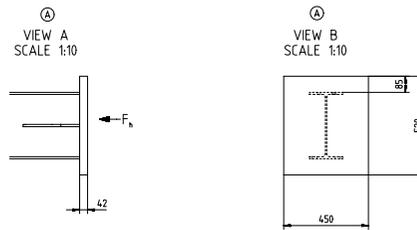
No. of Cyl.	Turbocharger type	A	B	F	H
6	2 x A270	720	720	6068	7335
7	2 x A275-L	720	720	6068	7335
	2 x MET71MB	720	720	6068	7335
	2 x MET83MB	720	720	6268	7335
8	ON REQUEST				
9	ON REQUEST				

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.

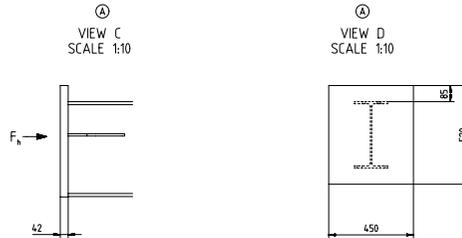


Layout / specification of stay attachment points on exhaust side



Max. permissible force in lateral direction	$F_n$ (kN)	±200
Stiffness	k (N/m)	$0.6 \times 10^7$
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 stay attachment points on fuel side



Max. permissible force in lateral direction	$F_n$ (kN)	±200
Stiffness	k (N/m)	$0.5 \times 10^7$
Permissible vertical stays displacement	$Def_v$ (mm)	±50
Permissible horizontal stays displacement	$Def_h$ (mm)	±50
Permissible angular stays displacement	$Def_a$ (°)	2

REV	DATE	DESCRIPTION	BY	CHK	APP
1	2023-01-12	Initial release			
2	2023-01-12	Drawing update			

**WINGD** ENGINE STAYS

Scale: 1:50 | Units: (mm) (kg) | Basic Material: | Max. Weight: 0.000

Design: 975 | Scale: X X M | Checked: WDS

Drawn: | Date: | Drawing No: PAAD328514 | Drawing Title: ENGINE STAYS

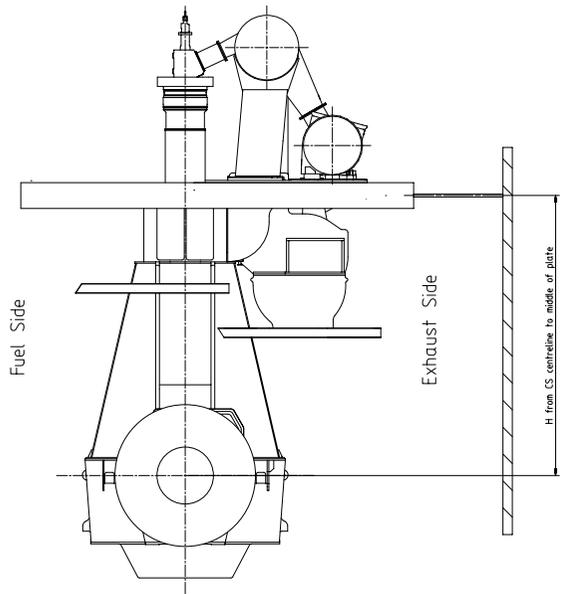
SEQ NO	QTY	Item ID	Item Name	Dimension	Standard-ID	Basic Material	Net Weight
1	1	PAAD328461	ENGINE STAYS	Exhaust Side			0

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Prod.	6,7,8,9 X82-2.0 6,7,8,9 X82DF-A-1.0			6,7,8,9 X82DF-M-1.0			
Change History	B	sde101	mhu019	08.05.2024	CNAA005779	New MainDesign introduced	4 3
	A	sde101	mhu019	06.10.2022	CNAA002208	Main Design/Drawing Introduced	- -
	-	dkl021	mhu019	23.08.2019	EAAD784628	-	- -
	Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code

	ENGINE STAYS
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<b>Bill Of Material</b>				Dimension								
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				Main Design	Yes	Design Group		9715	Q-Code	X X M	Standard	WDS
				Qty per	Engine	A4	Item ID	PAAD328523		BOM Page/s	01/01	

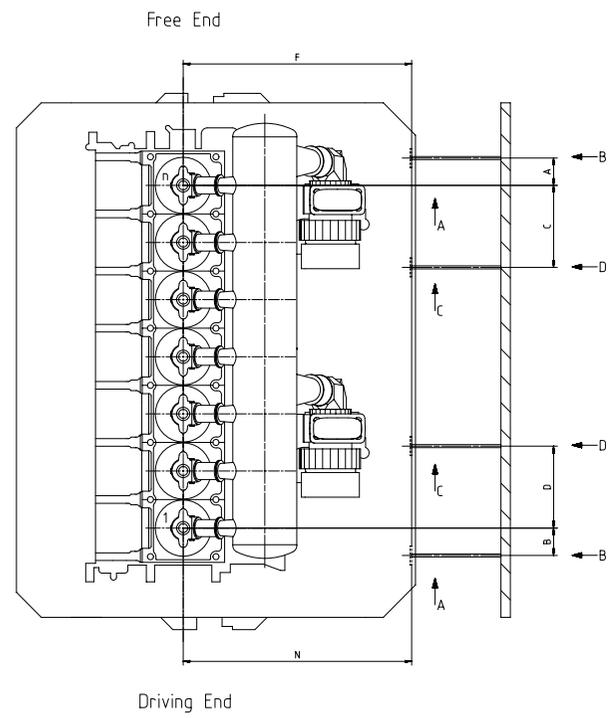


Position of stay attachment points on platform side

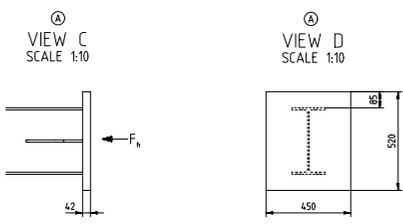
No. of Cyl.	Turbocharger type	A	B	C	D	F	N	H
6	2 x A270	720	720	2160	2160	6068	6068	7335
	2 x A275-L	720	720	2160	2160	6068	6068	7335
7	2 x MET71MB	720	720	2160	2160	6068	6068	7335
	2 x MET83MB	720	720	2160	2160	6268	6268	7335
8	ON REQUEST							
9	ON REQUEST							

Requirements for application of hydraulic stays on exhaust side

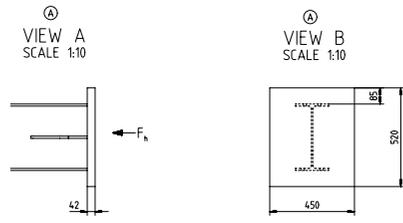
- The selected stays must have maker's acceptance for one side engine installation. WinGD approved supplier : Green & Clean Technology Co., Ltd (Korea)  
Hammi Hydraulic Machinery Co., Ltd (Korea)  
Nantong Navigation Machinery Group Co., Ltd (China)
- Installed on exhaust side (ES).
- The amount of 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.
- The installation and commissioning of the stays must be in accordance with the supplier's instructions.



Layout / specification of "inner" stay attachment points



Layout / specification of "outer" stay attachment points



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

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

REVISION		NO.	DATE	BY	CHECKED	APPROVED
1	Initial	1	2023-01-10	AD	AD	AD
2	Update	2	2023-01-15	AD	AD	AD

**WINGD**  
 WinGD Marine Gas & Diesel

**ENGINE STAYS**

Scale: 1:50 | NX | Units: (mm) [kg] | Basic Material: | Exhaust Side | Max Weight: 3,000

SOURCE PROTECTION SEE GROUP GHA. | TOLERANCING PROBLE 15015. | DESIGN: 9715 | Scale: X X M | WDS | DIMENSIONS ACCORDING TO SYSTEM: | AD | PAAD328461 | Drawing:

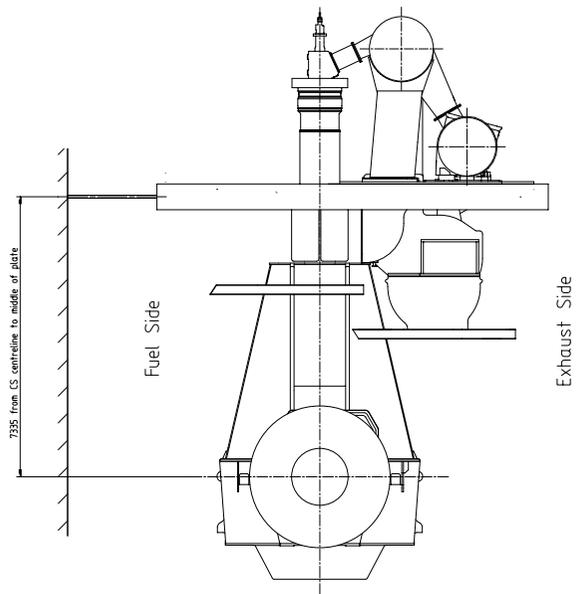
SEQ NO	QTY	Item ID	Item Name	Dimension	Standard-ID	Basic Material	Net Weight
1	1	PAAD328504	ENGINE STAYS	Fuel Side			0.001

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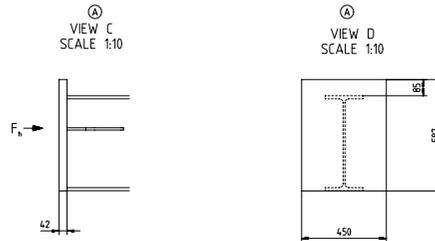
Prod.	6,7,8,9 X82-2.0 6,7,8,9 X82DF-A-1.0			6,7,8,9 X82DF-M-1.0				
Change History	B	sde101	mhu019	08.05.2024	CNAA005779	New MainDesign introduced	4	3
	A	sde101	mhu019	06.10.2022	CNAA002208	Main Design/Drawing Introduced	-	-
	-	dkl021	mhu019	23.08.2019	EAAD784628	-	-	-
	Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E

	ENGINE STAYS
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<b>Bill Of Material</b>		Dimension							
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	Main Design	Yes	Design Group		9715	Q-Code	X X M	Standard	WDS
	Qty per	Engine	A4	Item ID	PAAD328524		BOM Page/s	01/01	



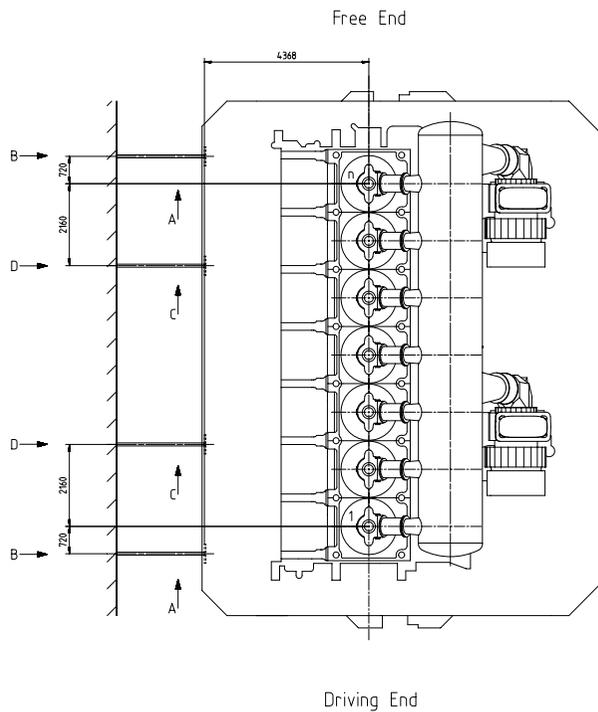
Layout / Specification of "inner" stays platform attachment points



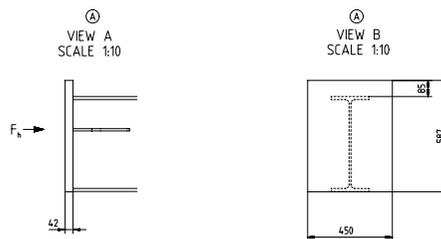
Max. permissible force in lateral direction	$F_n$	(kN)	$\pm 200$
Stiffness	$k$	(N/m)	$0.5 \times 10^9$
Permissible vertical stays displacement	$Def_v$	(mm)	$\pm 50$
Permissible horizontal stays displacement	$Def_h$	(mm)	$\pm 50$
Permissible angular stays displacement	$Def_a$	(°)	2

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



Layout / Specification of "outer" stays platform attachment points



Max. permissible force in lateral direction	$F_n$	(kN)	$\pm 200$
Stiffness	$k$	(N/m)	$0.5 \times 10^9$
Permissible vertical stays displacement	$Def_v$	(mm)	$\pm 50$
Permissible horizontal stays displacement	$Def_h$	(mm)	$\pm 50$
Permissible angular stays displacement	$Def_a$	(°)	2

WINGD		ENGINE STAYS	
Scale: 1:50	Units: (mm) [kg]	Basic Material:	Fuel Side
Sheet: 1	Design: 975	Scale: X X M	Weight: 3,000
Drawn: AD	Checked: h	Approved: PAAD328504	Drawing: WDS
REVISIONS: TOLERANCES ACCORDING TO ISO2768-M			

**MIDS – Engine Stays (DG9715)**  
WinGD X82-2.0, X82DF-M-1.0, X82DF-A-1.0

**TRACK CHANGES**

DATE	SUBJECT	DESCRIPTION
2019-08-23	DRAWING SET	First web upload
2024-05-08	PAAD328504 PAAD328522 PAAD328523 PAAD328524 PAAD328514 PAAD328461 PAAD328504	New executions

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