SURFACE PROTECTION SEE GROUP 0344

TOLERANCING PRINCIPLE ISO8015

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	PAAD300929	5		X			X
002	PAAD300931	5		X		X	
003	PAAD300932	5		X	X		
004	PAAD300935	5	X				X
005	PAAD300937	5	X			X	
006	PAAD300939	5	X		X		
007	PAAD300922	6-8		X			X
008	PAAD300924	6-8		X		X	
009	PAAD300925	6-8		X	X		
010	PAAD300926	6-8	X				X
011	PAAD300927	6-8	X			X	
012	PAAD300928	6-8	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.

Prod.	X52DF							

Change History

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E	C
–	sna102				new Design			

WIN GD
Winterthur Gas & Diesel

ENGINE STAYS

MIDS master drawing

separate BOM available

Dimension

Scale	–	NX	Units [mm] [kg]	Basic Material	Net Weight	0.001
Main Design			Design Group	9715	Q-Code XXXXX	Standard WDS
Qty per			A4	Item ID PTAA025559		Drawing Page/s 1/1

SEQ NO	QTY	Item ID	Item Name Dimension	Standard-ID	Basic Material	Net Weight
1	1	PAAD294622	ENGINE STAYS Longitudinal Stays			3590
7	1	PAAD294782	ENGINE STAYS BS, LEFT			5777

Prod.				
	5 X52DF			

Change History

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E	C
B	sde101	mhu019	12.11.2020	EAAD095177	Legacy information. See corresponding ChangeNotice		4	3
A	dki021	mhu019	08.10.2018	EAAD089852	Legacy information. See corresponding ChangeNotice		4	-
-	dki021	mhu019	17.07.2018		-		-	-

WIN GD
Winterthur Gas & Diesel

ENGINE STAYS

PAAD300929

Bill Of Material

Dimension

Units	[m] [kg]	Basic Material				Net Weight	9367
Main Design	Yes	Design Group	9715	Q-Code	XXXXX	Standard	WDS
Qty per	Engine	A4	Item ID	PAAD300929		BOM Page/s	01/01

SEQ NO	QTY	Item ID	Item Name Dimension	Standard-ID	Basic Material	Net Weight
1	1	PAAD294622	ENGINE STAYS Longitudinal Stays			3590
6	1	PAAD294763	ENGINE STAYS ES, LEFT			0.001

Prod.				
	5 X52DF			

Change History

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E	C
B	sde101	mhu019	12.11.2020	EAAD095177	Legacy information. See corresponding ChangeNotice		4	3
A	dki021	mhu019	08.10.2018	EAAD089852	Legacy information. See corresponding ChangeNotice		4	-
-	dki021	mhu019	17.07.2018		-		-	-

WIN GD
Winterthur Gas & Diesel

ENGINE STAYS

PAAD300931

Bill Of Material

Dimension

Units	[m] [kg]	Basic Material				Net Weight	3590
Main Design	Yes	Design Group	9715	Q-Code	XXXXX	Standard	WDS
Qty per	Engine	A4	Item ID	PAAD300931		BOM Page/s	01/01

SEQ NO	QTY	Item ID	Item Name Dimension	Standard-ID	Basic Material	Net Weight
1	1	PAAD294622	ENGINE STAYS Longitudinal Stays			3590
5	1	PAAD294661	ENGINE STAYS FS, LEFT			0.001

Prod.				
	5 X52DF			

Change History

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E	C
B	sde101	mhu019	12.11.2020	EAAD095177	Legacy information. See corresponding ChangeNotice		4	3
A	dki021	mhu019	08.10.2018	EAAD089852	Legacy information. See corresponding ChangeNotice		4	-
-	dki021	mhu019	17.07.2018		-		-	-

WIN GD
Winterthur Gas & Diesel

ENGINE STAYS

PAAD300932

Bill **O**f **M**aterial

Dimension

Units	[m] [kg]	Basic Material				Net Weight	3590
Main Design	Yes	Design Group	9715	Q-Code	XXXXX	Standard	WDS
Qty per	Engine	A4	Item ID	PAAD300932		BOM Page/s	01/01

SEQ NO	QTY	Item ID	Item Name / Dimension	Standard-ID	Basic Material	Net Weight
1	1	PAAD294622	ENGINE STAYS Longitudinal Stays			3590
4	1	PAAD294648	ENGINE STAYS BS, STD			5777

Prod.				
	5 X52DF			

Change History

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E	C
B	sde101	mhu019	12.11.2020	EAAD095177	Legacy information. See corresponding ChangeNotice		4	3
A	dki021	mhu019	08.10.2018	EAAD089852	Legacy information. See corresponding ChangeNotice		4	-
-	dki021	mhu019	17.07.2018		-		-	-

WIN GD
Winterthur Gas & Diesel

ENGINE STAYS

PAAD300935

Bill **O**f **M**aterial

Dimension

Units	[m] [kg]	Basic Material				Net Weight	9367
Main Design	Yes	Design Group	9715	Q-Code	XXXXX	Standard	WDS
Qty per	Engine	A4	Item ID	PAAD300935		BOM Page/s	01/01

SEQ NO	QTY	Item ID	Item Name Dimension	Standard-ID	Basic Material	Net Weight
1	1	PAAD294622	ENGINE STAYS Longitudinal Stays			3590
3	1	PAAD294628	ENGINE STAYS ES, STD			0.001

Prod.				
	5 X52DF			

Change History

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E	C
B	sde101	mhu019	12.11.2020	EAAD095177	Legacy information. See corresponding ChangeNotice		4	3
A	dki021	mhu019	08.10.2018	EAAD089852	Legacy information. See corresponding ChangeNotice		4	-
-	dki021	mhu019	17.07.2018		-		-	-

WIN GD
Winterthur Gas & Diesel

ENGINE STAYS

PAAD300937

Bill **O**f **M**aterial

Dimension

Units	[m] [kg]	Basic Material				Net Weight	3590
Main Design	Yes	Design Group	9715	Q-Code	XXXXX	Standard	WDS
Qty per	Engine	A4	Item ID	PAAD300937		BOM Page/s	01/01

SEQ NO	QTY	Item ID	Item Name Dimension	Standard-ID	Basic Material	Net Weight
1	1	PAAD294622	ENGINE STAYS Longitudinal Stays			3590
2	1	PAAD294642	ENGINE STAYS FS, STD			0.001

Prod.				
	5 X52DF			

Change History

B	sde101	mhu019	12.11.2020	EAAD095177	Legacy information. See corresponding ChangeNotice		4	3
A	dki021	mhu019	08.10.2018	EAAD089852	Legacy information. See corresponding ChangeNotice		4	-
-	dki021	mhu019	17.07.2018		-		-	-
Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E	C

WIN GD
Winterthur Gas & Diesel

ENGINE STAYS

PAAD300939

Bill Of Material

Dimension

Units	[m] [kg]	Basic Material				Net Weight	3590
Main Design	Yes	Design Group	9715	Q-Code	XXXXX	Standard	WDS
Qty per	Engine	A4	Item ID	PAAD300939		BOM Page/s	01/01

SEQ NO	QTY	Item ID	Item Name / Dimension	Standard-ID	Basic Material	Net Weight
7	1	PAAD294782	ENGINE STAYS BS, LEFT			5777

Prod.				
	6,7,8 X52DF			

Change History

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E	C
B	sde101	mhu019	12.11.2020	EAAD095177	Legacy information. See corresponding ChangeNotice		4	3
A	dki021	mhu019	08.10.2018	EAAD089852	Legacy information. See corresponding ChangeNotice		4	-
-	dki021	mhu019	17.07.2018		-		-	-

WIN GD
Winterthur Gas & Diesel

ENGINE STAYS

PAAD300922

Bill Of Material

Dimension

Units	[m] [kg]	Basic Material				Net Weight	5777
Main Design	Yes	Design Group	9715	Q-Code	XXXXX	Standard	WDS
Qty per	Engine	A4	Item ID	PAAD300922		BOM Page/s	01/01

SEQ NO	QTY	Item ID	Item Name / Dimension	Standard-ID	Basic Material	Net Weight
6	1	PAAD294763	ENGINE STAYS ES, LEFT			0.001

Prod.				
	6,7,8 X52DF			

Change History

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E	C
B	sde101	mhu019	12.11.2020	EAAD095177	Legacy information. See corresponding ChangeNotice		4	3
A	dki021	mhu019	08.10.2018	EAAD089852	Legacy information. See corresponding ChangeNotice		4	-
-	dki021	mhu019	17.07.2018		-		-	-

WIN GD
Winterthur Gas & Diesel

ENGINE STAYS

PAAD300924

Bill **O**f **M**aterial

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	PAAD300924		BOM Page/s	01/01

SEQ NO	QTY	Item ID	Item Name / Dimension	Standard-ID	Basic Material	Net Weight
5	1	PAAD294661	ENGINE STAYS FS, LEFT			0.001

Prod.				
	6,7,8 X52DF			

Change History

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E	C
B	sde101	mhu019	12.11.2020	EAAD095177	Legacy information. See corresponding ChangeNotice		4	3
A	dki021	mhu019	08.10.2018	EAAD089852	Legacy information. See corresponding ChangeNotice		4	-
-	dki021	mhu019	17.07.2018		-		-	-

WIN GD
Winterthur Gas & Diesel

ENGINE STAYS

PAAD300925

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	PAAD300925		BOM Page/s	01/01

SEQ NO	QTY	Item ID	Item Name / Dimension	Standard-ID	Basic Material	Net Weight
4	1	PAAD294648	ENGINE STAYS BS, STD			5777

Prod.				
	6,7,8 X52DF			

Change History

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E	C
B	sde101	mhu019	12.11.2020	EAAD095177	Legacy information. See corresponding ChangeNotice		4	3
A	dki021	mhu019	08.10.2018	EAAD089852	Legacy information. See corresponding ChangeNotice		4	-
-	dki021	mhu019	17.07.2018		-		-	-

WIN GD
Winterthur Gas & Diesel

ENGINE STAYS

PAAD300926

Bill **O**f **M**aterial

Dimension

Units	[m] [kg]	Basic Material				Net Weight	5777
Main Design	Yes	Design Group	9715	Q-Code	XXXXX	Standard	WDS
Qty per	Engine	A4	Item ID	PAAD300926		BOM Page/s	01/01

SEQ NO	QTY	Item ID	Item Name / Dimension	Standard-ID	Basic Material	Net Weight
3	1	PAAD294628	ENGINE STAYS ES, STD			0.001

Prod.				
	6,7,8 X52DF			

Change History

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E	C
B	sde101	mhu019	12.11.2020	EAAD095177	Legacy information. See corresponding ChangeNotice		4	3
A	dki021	mhu019	08.10.2018	EAAD089852	Legacy information. See corresponding ChangeNotice		4	-
-	dki021	mhu019	17.07.2018		-		-	-

WIN GD
Winterthur Gas & Diesel

ENGINE STAYS

PAAD300927

Bill **O**f **M**aterial

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	PAAD300927		BOM Page/s	01/01

SEQ NO	QTY	Item ID	Item Name / Dimension	Standard-ID	Basic Material	Net Weight
2	1	PAAD294642	ENGINE STAYS FS, STD			0.001

Prod.			
	6,7,8 X52DF		

Change History

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E	C
B	sde101	mhu019	12.11.2020	EAAD095177	Legacy information. See corresponding ChangeNotice		4	3
A	dki021	mhu019	08.10.2018	EAAD089852	Legacy information. See corresponding ChangeNotice		4	-
-	dki021	mhu019	17.07.2018		-		-	-

WIN GD
Winterthur Gas & Diesel

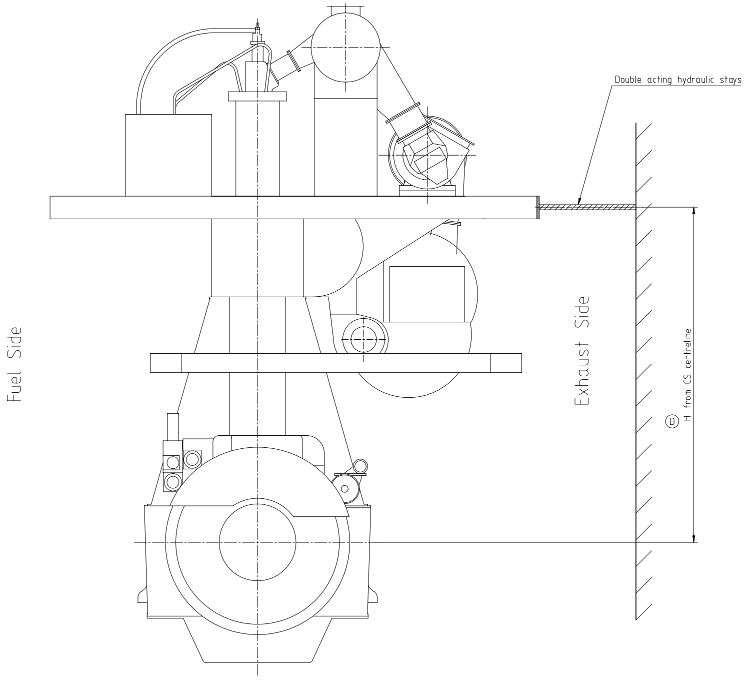
ENGINE STAYS

PAAD300928

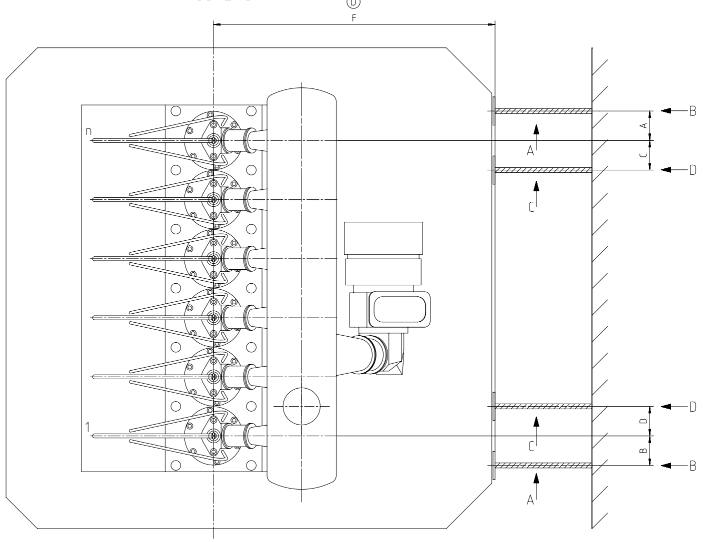
Bill Of Material

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	PAAD300928		BOM Page/s	01/01



Free End



Driving End

Remark:
The Engine outline view is drawn for a 6 cylinder with 1 TC. However, the specification of the stays attachment points in relation to the foremost/aft cylinder is vaild for all cylinder numbers and TC configulation. TC specific stay positions are provided in the table on right hand side.

Position of stay attachment points on platform side

No. of Cyl.	Turbocharger type	A	B	C	D	F	H
5	1 x A265-L	470	470	470	470	4475	5210
5	1 x A165	470	470	470	470	4475	5210
6	1 x A265-L	470	470	470	470	4475	5210
7	1 x MET60MB	470	470	470	470	4475	5210
	1 x MET66MB	470	470	470	470	4475	5210
8	2 X A165	470	470	470	470	4475	5210

No. of Cyl.	Turbocharger type	HP-SCR Interface	A	B	C	D	F	H
7	1 x A270-L	X	470	470	470	470	3700	5105

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

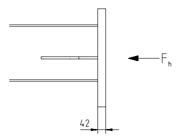
Max. force acting on ship's hull	Fh_{max}	(kN)	*1)
Minimum stiffness	$k_{min.}$	(N/m)	0.5 x 10^9
Permissible deflection per 100 kN	$Def_{max.}$	(mm)	0.2

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

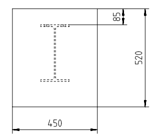
Provided stay attachment points on engine / platform side

Layout of "inner" attachment points according to WinGD standard design

View "C" (1:10)



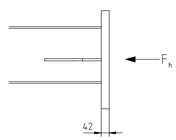
View "D" (1:10)



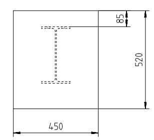
Max. permissible force in lateral direction	F_h	(kN)	± 90
Stiffness	k	(N/m)	0.5 x 10^9
Permissible vertical stays displacement	Def_v	(mm)	± 50
Permissible horizontal stays displacement	Def_h	(mm)	± 50
Permissible angular stays displacement	Def_a	(°)	2

Layout of "outer" attachment points according to WinGD standard design

View "A" (1:10)



View "B" (1:10)



Max. permissible force in lateral direction	F_h	(kN)	± 320
Stiffness	k	(N/m)	0.5 x 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 exhaust side

- The selected stays must have makers' acceptance for one side engine installation.
- 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.

Prod.: X52DF

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	E	C
D	sde101	mhu019	02.09.2022	CNAA002408	Drawing Updated	4	3
C	sde101	mhu019	27.10.2020	EAAD092791	Legacy information. See corresponding ChangeNotice	4	3
B	sde101	mhu019	05.07.2019	EAAD090559	Legacy information. See corresponding ChangeNotice	4	3
-	dki021	mhu019	17.07.2018		-	-	-

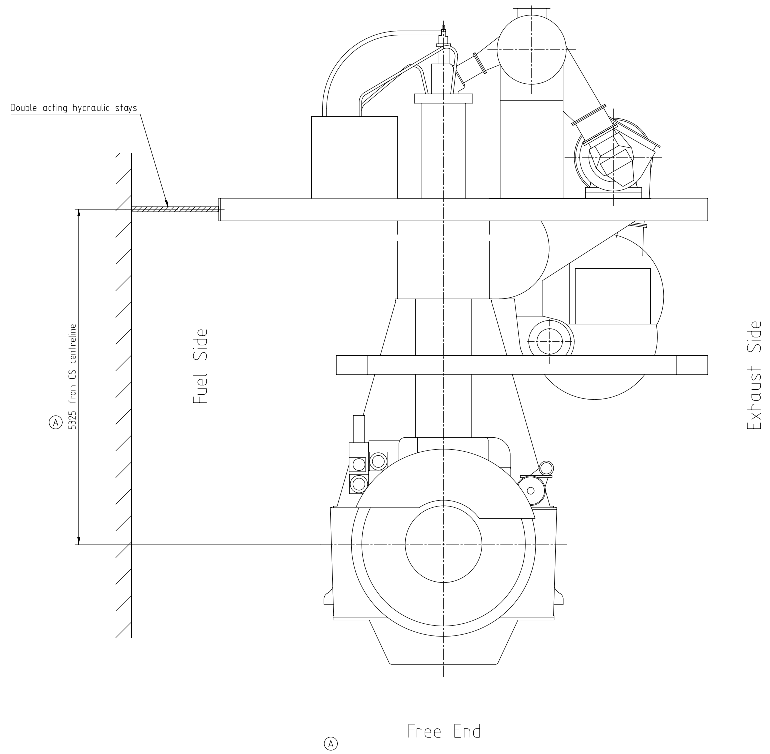
Approved

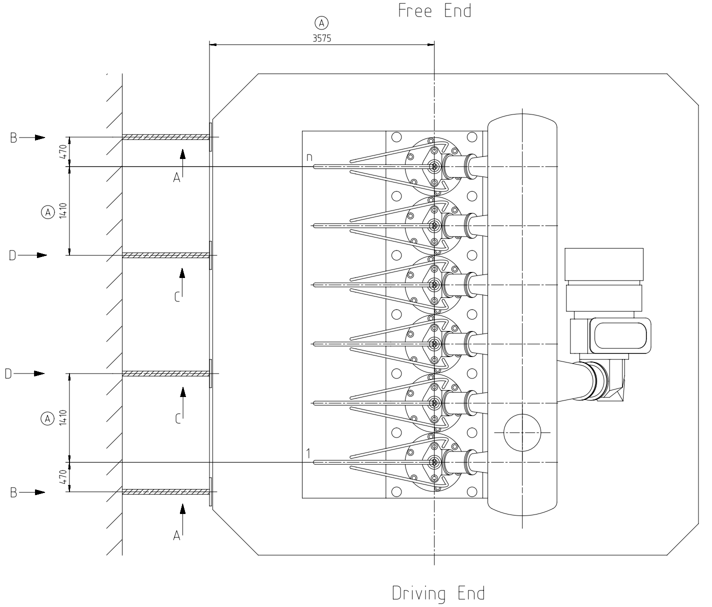
WIN GD Winterthur Gas & Diesel

ENGINE STAYS

Dimension: ES, STD
Scale 1:30 NX | Units [mm] [kg] | Basic Material | Net Weight 0.001
Main Design | Design Group 9715 | Q-Code XXXXX | Standard WDS
Qty per | A0 | Item ID PAAD294628 | Drawing Page/s 1/1

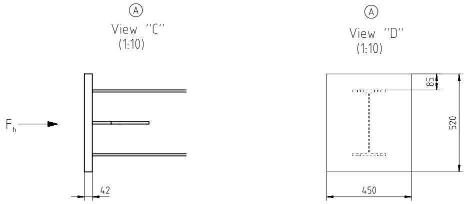
SURFACE PROTECTION SEE GROUP 0344
TOLERANCING PRINCIPLE ISO8015
GENERAL TOLERANCES ACCORDING TO ISO2768-mK





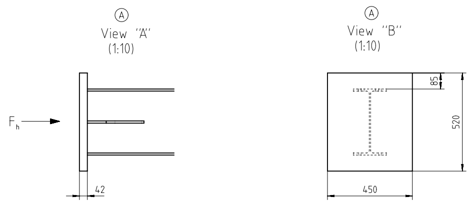
Provided stay attachment points on engine / platform side

Layout of "inner" attachment points according to WinGD standard design



Max. permissible force in lateral direction	F_h	(kN)	± 90
Stiffness	$k_{min.}$	(N/m)	0.5 x 10^9
Deflection per 100 kN	$Def_{max.}$	(mm)	0.2

Layout of "outer" attachment points according to WinGD standard design



Max. permissible force in lateral direction	F_h	(kN)	± 320
Stiffness	$k_{min.}$	(N/m)	0.5 x 10^9
Deflection per 100 kN	$Def_{max.}$	(mm)	0.2

Ⓐ

Requirements for application of hydraulic stays on fuel side

- The selected stays must have makers' acceptance for one side engine installation.
- 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 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 x 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 satys supplier's specification

Remark:
The Engine outline view is drawn for a 6 cylinder with 1 TC. However, the specification of the stays attachment points in relation to the foremost/aft cylinder is vaild for all cylinder numbers and TC configulation. TC specific stay positions are provided in the table on right hand side.

X52DF

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis
A	sde101	mhu019	03.08.2022		Drawing Updated
-	dko021	mhu019	17.07.2018		-

Approved

WIN GD Winterthur Gas & Diesel

ENGINE STAYS

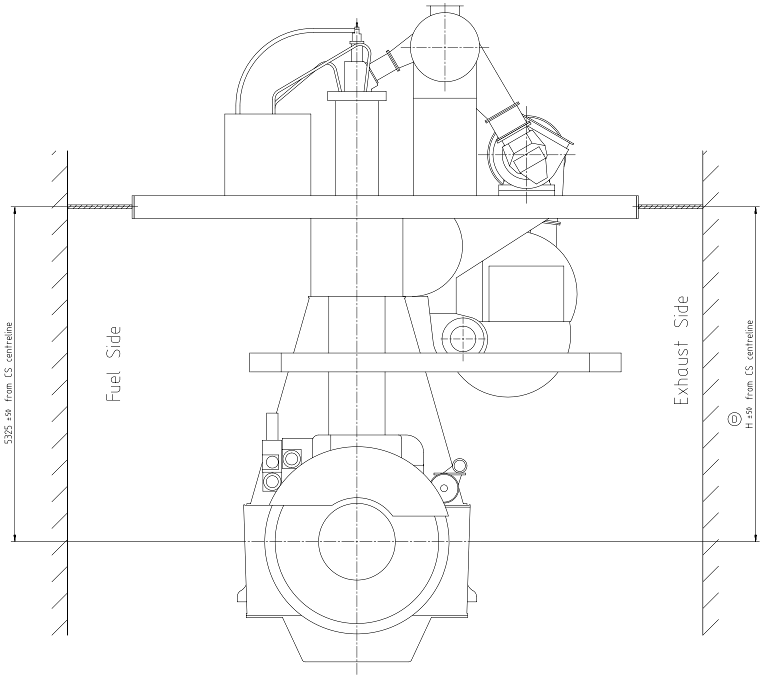
FS, STD

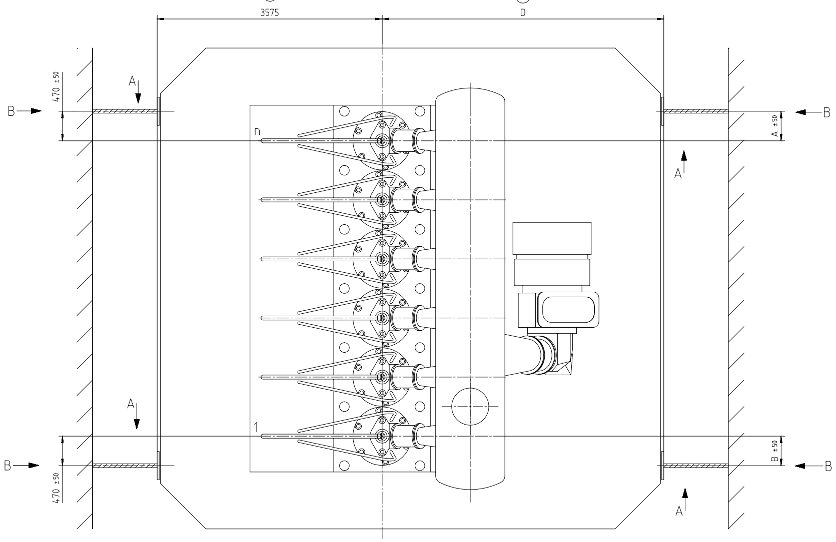
Scale 1:30 | NX | Units [mm] [kg] | Basic Material | Net Weight 0.001

SURFACE PROTECTION SEE GROUP 8344
TOLERANCING PRINCIPLE ISO8015
GENERAL TOLERANCES ACCORDING TO ISO2768-mK

Main Design | Design Group 9715 | Q-Code XXXXX | Standard WDS

A0 | PAAD294642 | Drawing Page/s 1/1





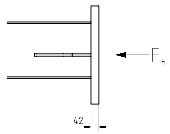
Ⓓ
Position of stay attachment points on platform side

No. of Cyl.	Turbocharger type	A	B	D	H
5	1 x A265-L	470	470	4475	5325
5	1 x A165	470	470	4475	5325
6	1 x A265-L	470	470	4475	5325
7	1 x MET60MB	470	470	4475	5325
	1 x MET66MB	470	470	4475	5325
8	ON REQUEST				

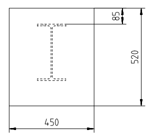
No. of Cyl.	Turbocharger type	HP-SCR Interface	A	B	D	H
7	1 x A270-L	X	470	470	3700	5105

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

Ⓓ
View "A"
(1:10)



Ⓓ
View "B"
(1:10)



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 satys supplier's specification

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

- The selected stays must have makers' acceptance for both side engine installation.
- 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.

Max. permissible force in lateral direction	F_h	(kN)	± 320
Stiffness	k	(N/m)	0.5×10^9
Permissible vertical stays displacement	Def_v	(mm)	± 50
Permissible horizontal stays displacement	Def_h	(mm)	± 50
Permissible angular stays displacement	Def_a	(°)	2

Remark:
The Engine outline view is drawn for a 6 cylinder with 1 TC. However, the specification of the stays attachment points in relation to the foremost/aft cylinder is vaild for all cylinder numbers and TC configulation. TC specific stay positions are provided in the table on right hand side.

Prod.: X52DF

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	E	C
D	sde101	mhu019	02.09.2022	CNAA002408	Drawing Updated	4	3
C	sde101	mhu019	27.10.2020	EAAD092791	Legacy information. See corresponding ChangeNotice	4	3
B	sde101	mhu019	05.07.2019	EAAD090559	Legacy information. See corresponding ChangeNotice	4	3
–	dki021	mhu019	17.07.2018		–	-	-

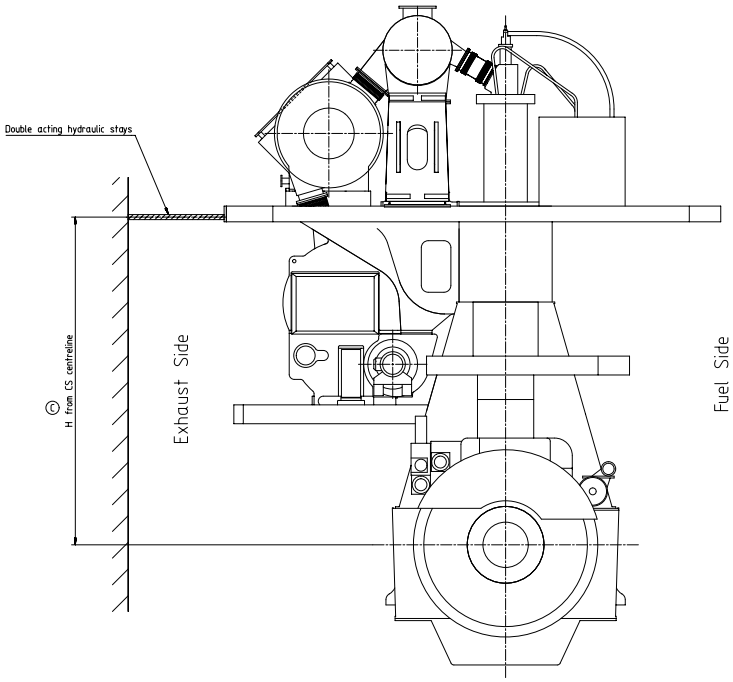
Approved — Activity Code

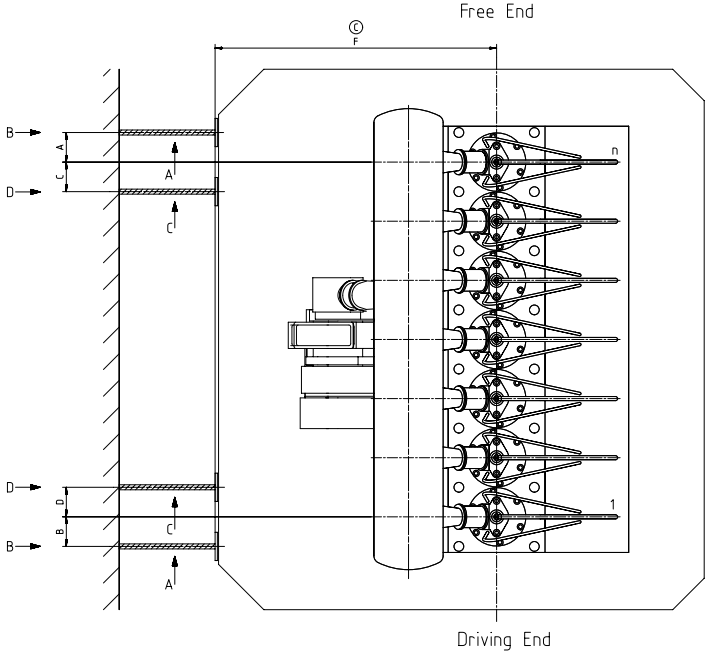
WIN GD Winterthur Gas & Diesel

ENGINE STAYS

Dimension: BS, STD
Scale 1:30 — NX — Units [mm] [kg] — Basic Material — Net Weight 0.001
Main Design — Design Group 9715 — Q-Code XXXXX — Standard WDS
Qty per — A0 — Item ID PAAD294648 — Drawing Page/s 1/1

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





Remark:
The Engine outline view is drawn for a 7 cylinder with 1 TC. However, the specification of the stays attachment points in relation to the foremost/aft cylinder is vaild for all cylinder numbers and TC configulation. TC specific stay positions are provided in the table on right hand side.

Ⓒ

Position of stay attachment points on platform side

No. of Cyl.	Turbocharger type	A	B	C	D	F	H
5	1 x A170-L	ON REQUEST					
	1 x A265-L						
	1 x MET66MB						
6	1 x A175-L	ON REQUEST					
	1 x A265-L						
	1 x A270-L						
	1 x MET66MB						
7	1 x A175-L	ON REQUEST					
	1 x A270-L	470	470	470	470	4475	5210
	1 x MET60MB	470	470	470	470	4475	5210
	1 x MET66MB	470	470	470	470	4475	5210
	1 x MET71MB	ON REQUEST					
	2 x A165-L						
	2 x MET48MB						
8	2 x A165-L	ON REQUEST					
	2 x MET53MB						

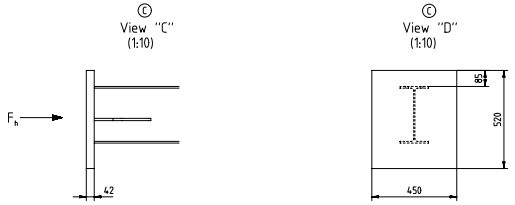
Requirements on stays attachment points at ship hull side (per engine stay)

Max. force acting on ship's hull	Fh_{max}	(kN)	*1)
Minimum stiffness	$k_{min.}$	(N/m)	0.5 x 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 satys supplier's specification

Provided stay attachment points on engine / platform side

Layout of "inner" attachment points according to WinGD standard design



Layout of "outer" attachment points according to WinGD standard design

Ⓒ

Requirements for application of hydraulic stays on exhaust side

- The selected stays must have makers' acceptance for one side engine installation.
- 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.

Max. permissible force in lateral direction	F_h	(kN)	± 90
Stiffness	k	(N/m)	0.5 x 10^9
Permissible vertical stays displacement	Def_v	(mm)	± 50
Permissible horizontal stays displacement	Def_h	(mm)	± 50
Permissible angular stays displacement	Def_α	(°)	2

Max. permissible force in lateral direction	F_h	(kN)	± 320
Stiffness	k	(N/m)	0.5 x 10^9
Permissible vertical stays displacement	Def_v	(mm)	± 50
Permissible horizontal stays displacement	Def_h	(mm)	± 50
Permissible angular stays displacement	Def_α	(°)	2

Index	Date	Author	Change No.	Change Synopsis	Approved	Activity Code
C	sde101	mhu019	12003222	CHA003408	Drawing Updated	4 3
B	sde101	mhu019	12.11.2020	EAAD095177	Legacy information. See corresponding ChangeNotice	4 3
A	dkr021	mhu019	06.10.2018	EAAD089852	Legacy information. See corresponding ChangeNotice	4 -
-	dkr021	mhu019	17.07.2018		-	- -

XS20T

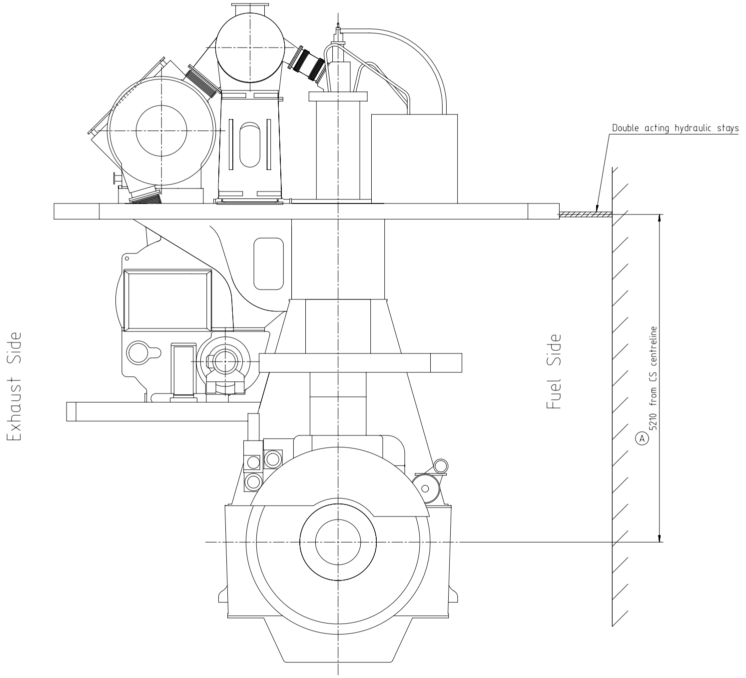
WinGD Winterthur Gas & Diesel

ENGINE STAYS

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

SURFACE PROTECTION SEE GROUP 1944
TOLERANCING PRINCIPLE ISO8015
GENERAL TOLERANCES ACCORDING TO ISO2768-mK

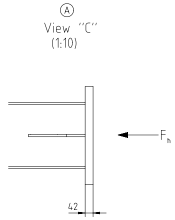
Main Design | Design Group: 9715 | Co-Code: XXXXX | Standard: WDS
Qty per: | Item to: A0 | PAAD294763 | Drawing Pages: 1/1



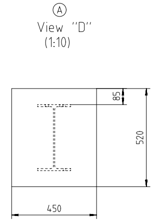
Provided stay attachment points on engine / platform side

Layout of "inner" attachment points according to WinGD standard design

View "C" (1:10)



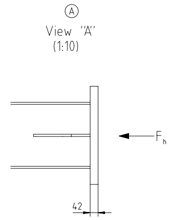
View "D" (1:10)



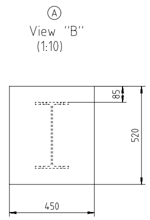
Max. permissible force in lateral direction	F_h	(kN)	± 90
Stiffness	$k_{min.}$	(N/m)	0.5 x 10^9
Deflection per 100 kN	$Def_{max.}$	(mm)	0.2

Layout of "outer" attachment points according to WinGD standard design

View "A" (1:10)



View "B" (1:10)



Max. permissible force in lateral direction	F_h	(kN)	± 320
Stiffness	$k_{min.}$	(N/m)	0.5 x 10^9
Deflection per 100 kN	$Def_{max.}$	(mm)	0.2

A

Requirements for application of hydraulic stays on fuel side

- The selected stays must have makers' acceptance for one side engine installation.
- 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 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.

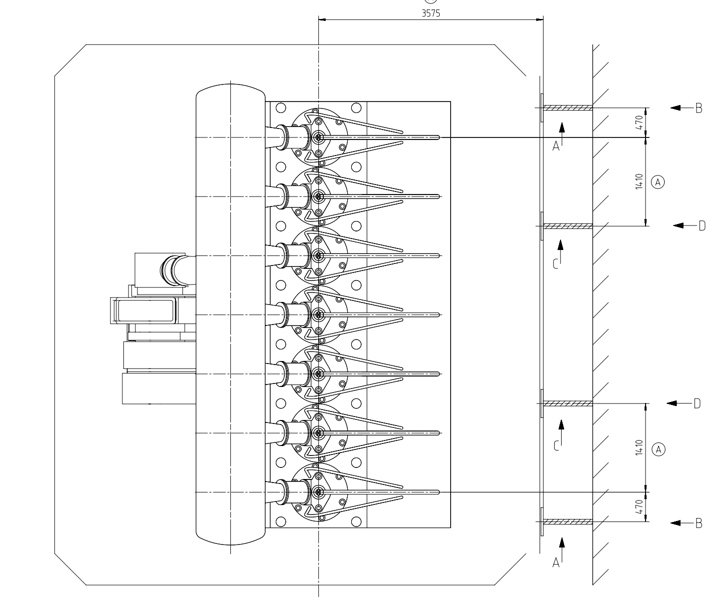
A

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 x 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 satys supplier's specification

Free End



Driving End

Remark:
The Engine outline view is drawn for a 7 cylinder with 1 TC. However, the specification of the stays attachment points in relation to the foremost/aft cylinder is vaild for all cylinder numbers and TC configulation. TC specific stay positions are provided in the table on right hand side.

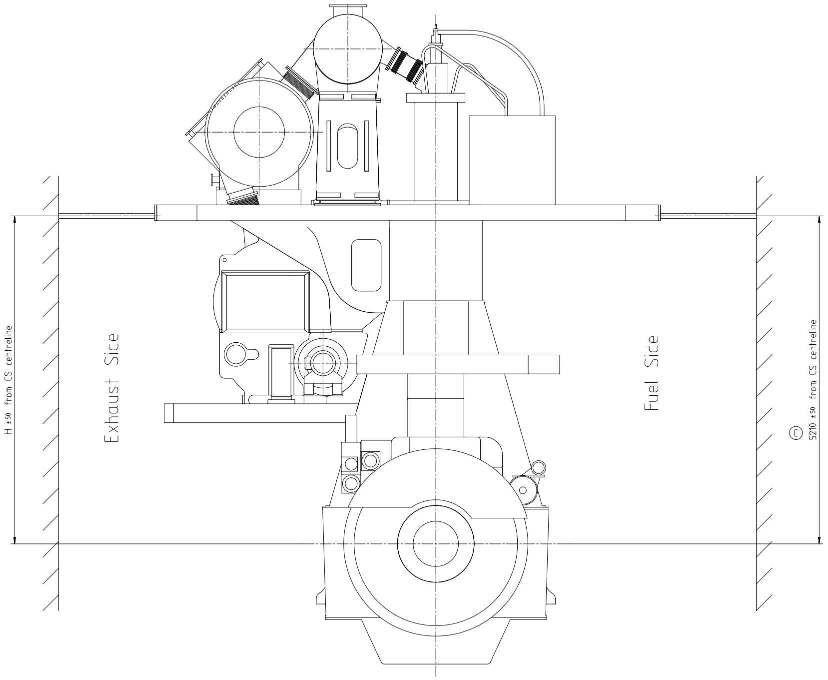
Prod.	X52DF							
Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Approved / Activity Code	E	C
A	sde101	mhu019	02.09.2022	CNAA002408	Drawing Updated		4	3
-	dki021	mhu019	17.07.2018		-		-	-

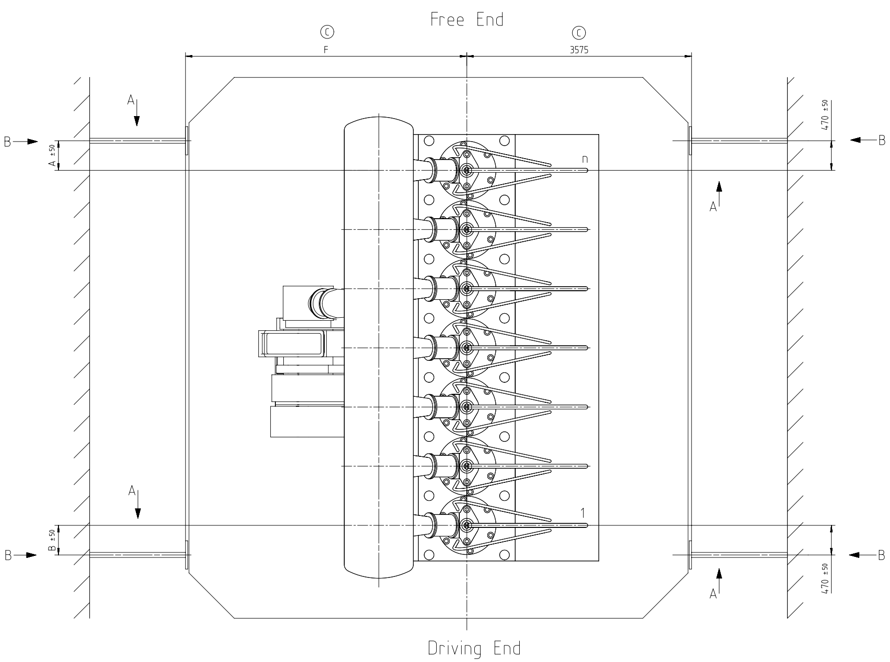
WIN GD Winterthur Gas & Diesel

ENGINE STAYS

Dimension	FS, LEFT
Scale	1:30
NX	
Units	[mm] [kg]
Basic Material	
Net Weight	0.001
Main Design	
Design Group	9715
Q-Code	XXXXX
Standard	WDS
Qty per	
A0	
Item ID	PAAD294661
Drawing Page/s	1/1

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





Remark:
The Engine outline view is drawn for a 7 cylinder with 1 TC. However, the specification of the stays attachment points in relation to the foremost/aft cylinder is vaild for all cylinder numbers and TC configulation. TC specific stay positions are provided in the table on right hand side.

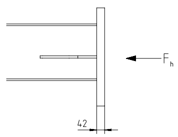
Position of stay attachment points on platform side

No. of Cyl.	Turbocharger type	A	B	F	H
5	1 x A170-L	ON REQUEST			
	1 x A265-L				
	1 x MET66MB				
6	1 x A175-L	ON REQUEST			
	1 x A265-L				
	1 x A270-L				
	1 x MET66MB				
7	1 x A175-L	ON REQUEST			
	1 x A270-L	470	470	4475	5210
	1 x MET60MB	470	470	4475	5210
	1 x MET66MB	470	470	4475	5210
	1 x MET71MB	ON REQUEST			
	2 x A165-L				
	2 x MET48MB				
8	2 x A165-L	ON REQUEST			
	2 x MET53MB				

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

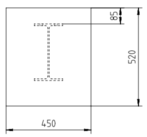
View A

SCALE 1:10



VIEW B

SCALE 1:10



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 satys supplier's specification

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

- The selected stays must have makers' acceptance for both side engine installation.
- 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.

Max. permissible force in lateral direction	F_h	(kN)	± 320
Stiffness	k	(N/m)	0.5×10^9
Permissible vertical stays displacement	Def_v	(mm)	± 50
Permissible horizontal stays displacement	Def_h	(mm)	± 50
Permissible angular stays displacement	Def_a	(°)	2

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	E	C
C	sde101	mhu019	02.09.2022	CNAA002408	Drawing Updated	4	3
B	sde101	mhu019	12.11.2020	EAAD095177	Legacy information. See corresponding ChangeNotice	4	3
A	dki021	mhu019	08.10.2018	EAAD089852	Legacy information. See corresponding ChangeNotice	4	-
-	dki021	mhu019	17.07.2018		-	-	-

Prod. X52DF

WIN GD Winterthur Gas & Diesel

ENGINE STAYS

Dimension BS, LEFT

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

Main Design | Design Group 9715 | Q-Code XXXXX | Standard WDS

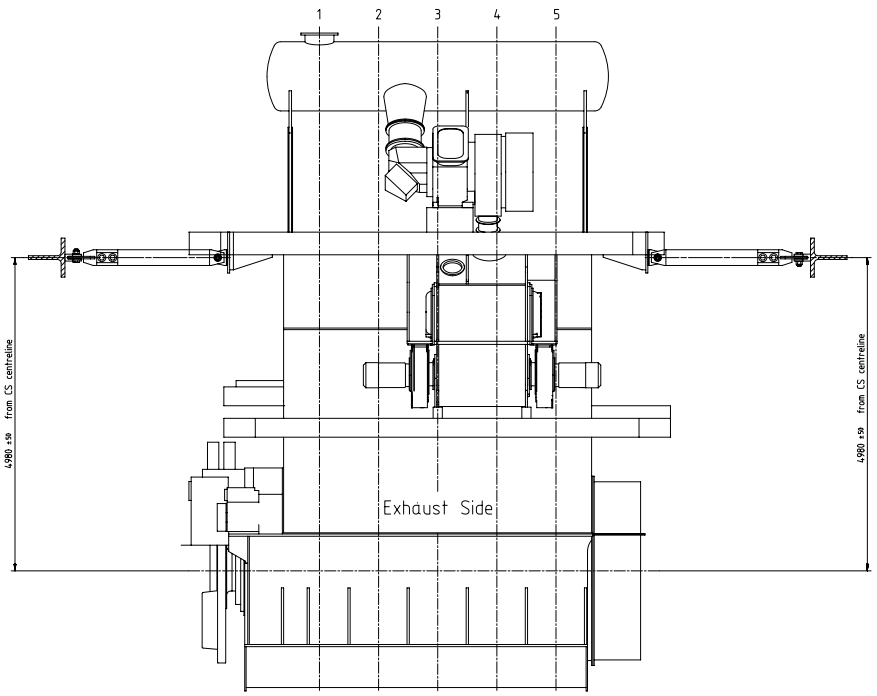
Qty per | A0 | Item ID PAAD294782 | Drawing Page/s 1/1

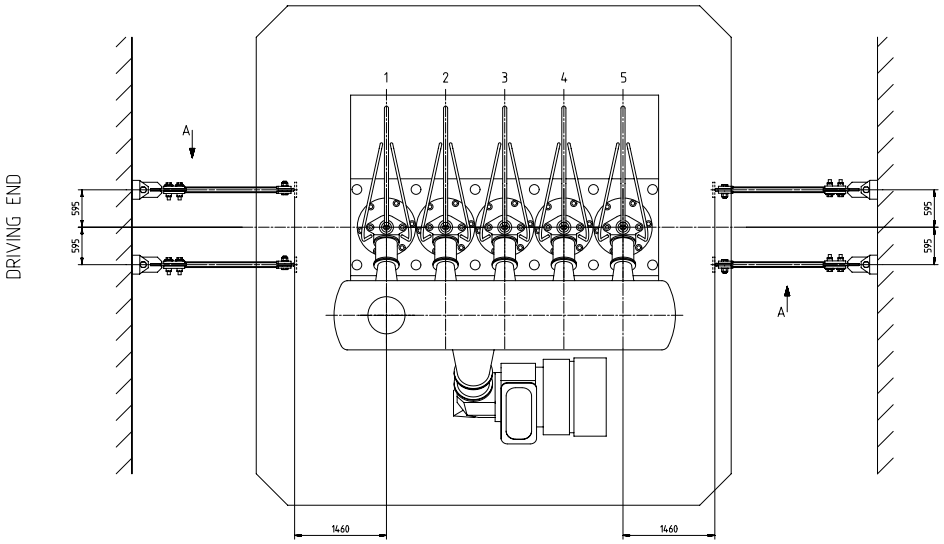
SURFACE PROTECTION SEE GROUP 0344

TOLERANCING PRINCIPLE ISO8015

GENERAL TOLERANCES ACCORDING TO ISO2768-mK

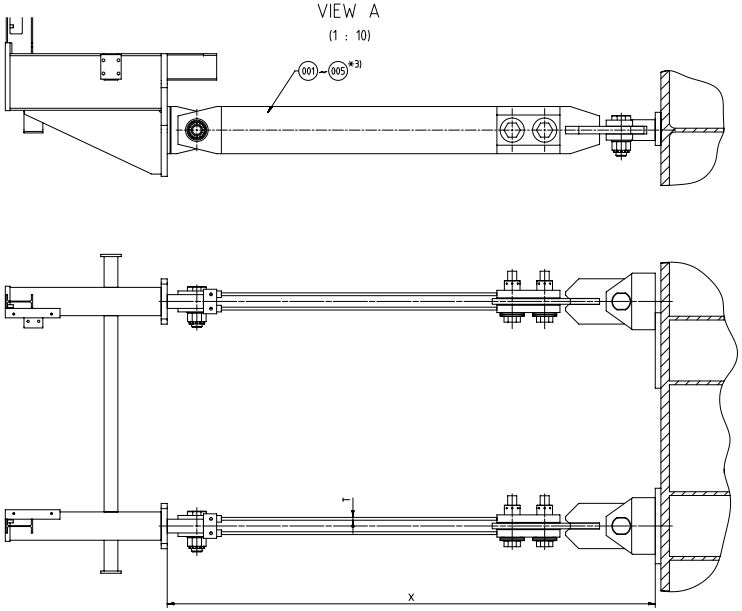
Application of longitudinal stays *1)





VIEW A

(1 : 10)



Specification for application of stays according to WinGD design

Stays of friction type *1)
- Transmission of tensile and compressive forces.
- Attached on engine driving end (DE) or free end (FE).

Requirements for ship side attachment point

Max. force acting on ship's hull *2)	$Fh_{max.}$	(kN)	90
Minimum stiffness	$k_{min.}$	(N/m)	0.8 x 10^9
Permissible deflection per 100 kN	$Def_{max.}$	(mm)	0.125

*1) Stays of friction type must be only installed in longitudinal direction. As an alternative also stays of hydraulic type can be applied.

*2) Relevant engine forces resulting from lateral moments of X/H-type at R1 rating are considered. The provided value represents the transmitted force per stay (2 pcs per side) which has to be considered for the layout of the attachment points on ship hull side.

Pos. No. *3)	Material ID	X (mm)	T (mm)
001	PAAD046700	2000 - 2280	15
002	PAAD046701	2281 - 2560	20
003	PAAD046702	2561 - 2840	25
004	PAAD046703	2841 - 3120	30
005	PAAD046704	3121 - 3400	35

X defines the clear width between engine attachment points and ship side (to be determined by shipyard)

X min. = 2000 mm
X max. = 3400 mm

*3) Depending on the requirement either the stay execution of Pos. 001, 002, 003, 004 or Pos. 005 has to be selected.

Pos	Qty	Number	Designation	Number	Drawn date	Number	Drawn date	Number	Drawn date
1	006	107.246.429.500	ASSEMBLY INSTRUCTIONS	107.246.429					0,001
2	005	PAAD046704	ENGINE STAYS/ FRICTION TYPE	DAAD018242					417
2	004	PAAD046703	ENGINE STAYS/ FRICTION TYPE	DAAD018242					387
2	003	PAAD046702	ENGINE STAYS/ FRICTION TYPE	DAAD018242					359
2	002	PAAD046701	ENGINE STAYS/ FRICTION TYPE	DAAD018242					330
2	001	PAAD046700	ENGINE STAYS/ FRICTION TYPE	DAAD018242					302

QTY	SEQ NO.	Material ID	Material Name / Dimension, Qu.	Standard or Drawing	Basic Material Material Standard	Weight GR.NET
					D-Code XXXXX	Main Drv.
					Standard ISO, JIS	

Proj. Number / Drawn date | Number / Drawn date | Number / Drawn date | Number / Drawn date

WinGD Winterthur Gas & Diesel

Product 5X52DF (STD or LEFT)

ENGINE STAYS
Stays locations DE or FE
Motorabstuetzung

Units	mm kg	NX	Basic Material		Net Weight 3599
Made	08.05.2018	dki021 DH.Kim	Scale 1:30	Size A0	Page 1/1
Chkd	17.07.2018	wwa008 Wang	Design Group 9715	Drawing No. DAAD100387	Material ID PAAD294622
Appd	17.07.2018	mtu019 Haug			Rev. –

SURFACE PROTECTION SEE GROUP 9344
TOLERANCING PRINCIPLE ISO8015
GENERAL TOLERANCES ACCORDING TO ISO2768-mK

WinGD Winterthur Gas & Diesel – Confidential

Friction type stays according to WinGD design

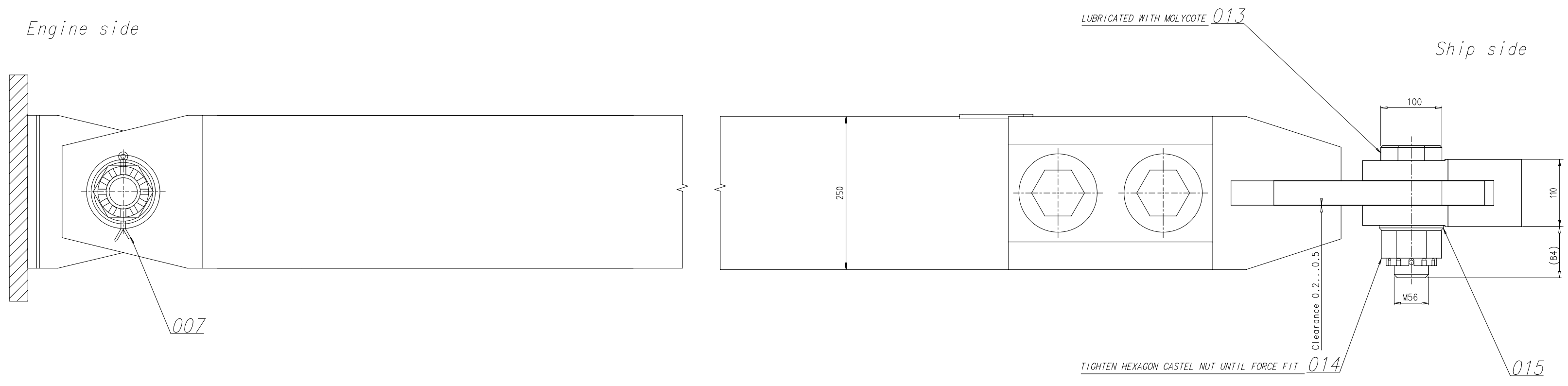
ONLY to be installed
in longitudinal direction on
engine driving end or free end

Please consult WinGD directly in case you have a specific question or need support.

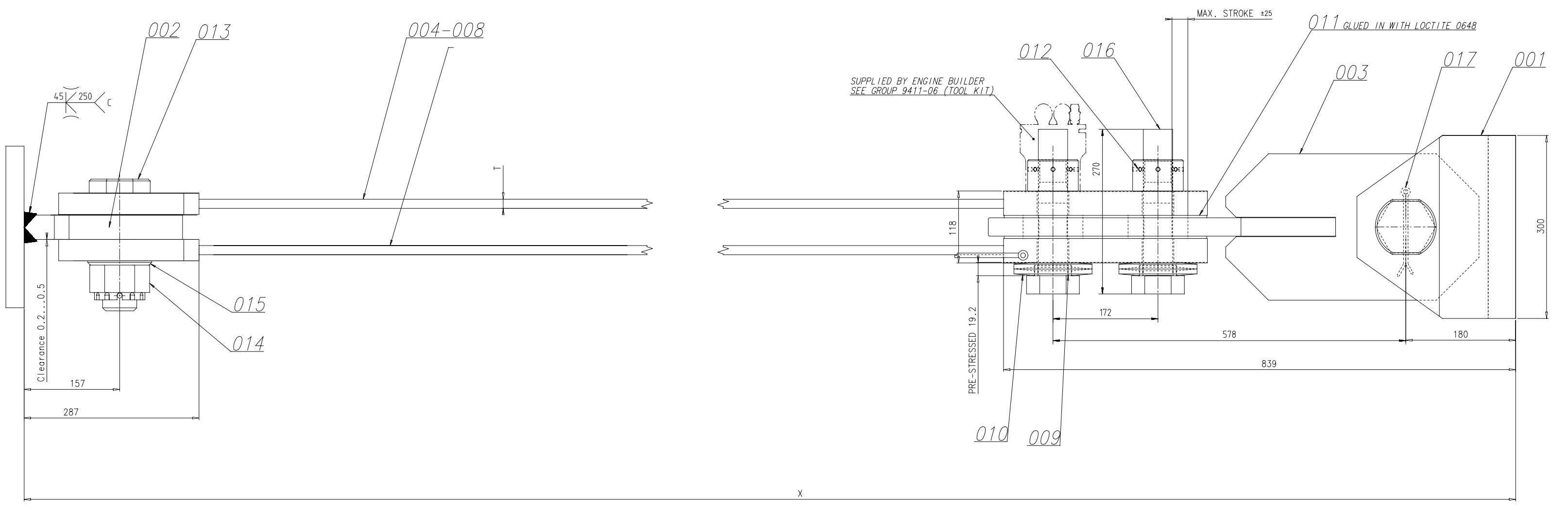
Winterthur Gas & Diesel Ltd.
Winterthur Gas & Diesel AG.
Winterthur Gas & Diesel S.A.

Schützenstrasse 3
PO Box 414, CH-8401
Winterthur, Switzerland

Tel. +41 (0)52 264 8844
Fax +41 (0)52 264 8866



Material ID	X (mm)	T (mm)
PAAD046700	2000-2280	15
PAAD046701	2281-2560	20
PAAD046702	2561-2840	25
PAAD046703	2841-3120	30
PAAD046704	3121-3400	35



NOTE:

X= CLEAR WIDTH BETWEEN ENGINE AND SHIP SIDE; TO BE DETERMINED BY SHIPYARD (SEE MAIN DRAWING)

Quantity 417	Quantity 387	Quantity 359	Quantity 330	Quantity 302	SEQ NO	Material ID	Material Name / Dimension, Occ	Standard or Drawing	Basic Material / Material Standard	Weight GR./NET
2	2	2	2	2	017	015.509.017.503	SPLIT PIN 8x100	ISO 1234	Steel Zn-plated	0,04
2	2	2	2	2	016	015.151.024.781	HEXAGON HEAD BOLT M48x240	ISO 4014	8.8	4,29
2	2	2	2	2	015	015.500.102.330	WASHER 58	DIN 125-1	Steel blank	0,425
2	2	2	2	2	014	015.201.304.610	CASTLE NUT M56	Acc. WinGD	C45E;S45C	1,63
2	2	2	2	2	013	PAAD026437	BOLT	DAAD012368	C45E S45C	7,17
2	2	2	2	2	012	107.345.876.008	ROUND NUT M48	107.345.876	W-FA-42CrMo-QT	1,42
2	2	2	2	2	011	PAAD902269	SHIM 4THICK	DAAD902593		2,3
4	4	4	4	4	010	107.246.311.001	DISC SPRING 125 X 61 X 8	107.246.311		0,55
2	2	2	2	2	009	107.246.316.001	RING 60 x 50 x 17	107.246.316	RSt 37-2	0,12
2	-	-	-	-	008	PAAD902262	ENGINE STAYS	DAAD902592		137
-	2	-	-	-	007	PAAD902268	ENGINE STAYS	DAAD902592		122
-	-	2	-	-	006	PAAD902257	ENGINE STAYS	DAAD902592		108
-	-	-	2	-	005	PAAD902247	ENGINE STAYS	DAAD902592		93,8
-	-	-	-	2	004	PAAD902252	ENGINE STAYS	DAAD902592		79,6
1	1	1	1	1	003	PAAD902231	CLAMPING PART	DAAD902576		54,9
1	1	1	1	1	002	PAAD026436	SUPPORT	DAAD012141	W-FU-355-J0	15,6
1	1	1	1	1	001	PAAD026295	SUPPORT	DAAD012142	W-FU-235-J0	35,4

Net Weight (417 / 387 / 359 / 330 / 302)

Material ID: PAAD046704, PAAD046703, PAAD046702, PAAD046701, PAAD046700

Free space for lic.

Q-Code: XXXXX
Standard: ISO; JIS
Main Drw.

Modif.	Number	Drawn date
A	EAAD086524	19.04.2016
B	EAAD095725	18.01.2021

Approved

WIN GD Winterthur Gas & Diesel

Product: W-2S

ENGINE STAYS/ FRICTION TYPE

Motorenabstuetzung mit Reibbelag

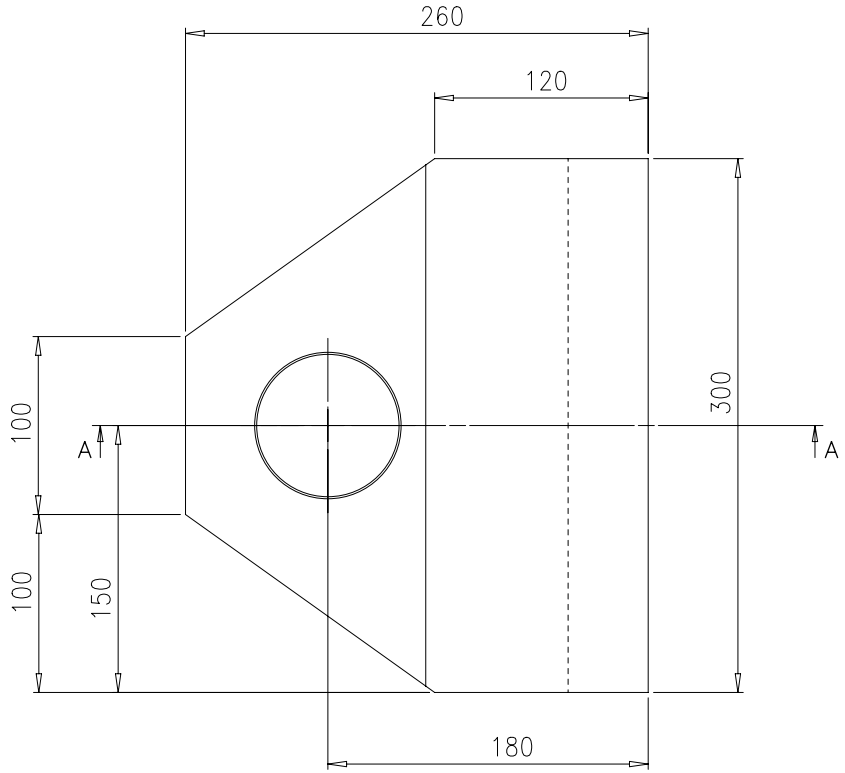
Units: mm kg | NX | Basic Material | Net Weight

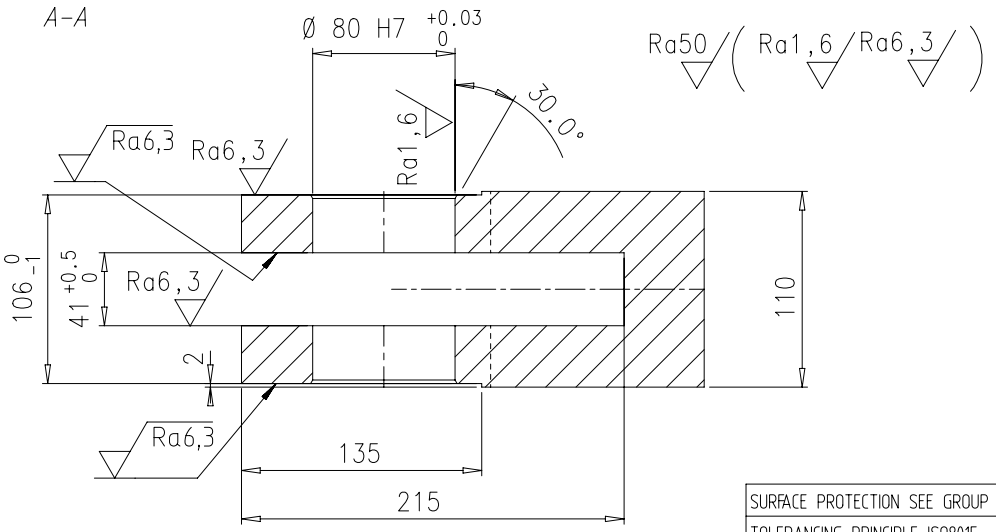
SURFACE PROTECTION SEE GROUP 0344
TOLERANCING PRINCIPLE ISO8015
GENERAL TOLERANCES ACCORDING TO ISO2768-mK

Made: 10.06.2011 sfe006 Feuerstein
Chkd: 11.07.2011 wwr001 Wroblewski
Appd: 11.07.2011 dst009 Strödecke

Scale: 1:3 | Size: A0 | Page: 1/1 | Material ID
Design Group: 9715
Drawing ID: DAAD018242 | Rev. B

PD - PRODUCTION DRAWING - Confidential





Free space for lic.									Q-Code XXXXX		Main Drw.
									Standard ISO; JIS		
Modif.	A	EAAD095725	28.04.2021	B	EAAD096559	29.04.2021					
		Number	Drawn date		Number	Drawn date		Number	Drawn date		Number	Drawn date

WIN GD Winterthur Gas & Diesel

Product W-2S

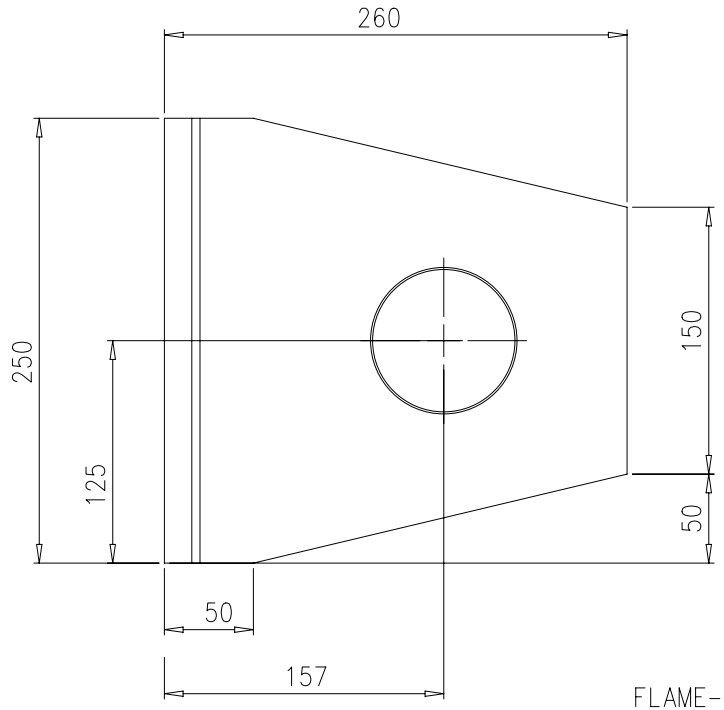
SUPPORT
TO ENGINE STAYS, FRICTION
SUPPORT
zu Motorabstuetzung

Units mm kg	NX		Basic Material W-FU-235-J0			Net Weight 35,4
Made 17.12.2010 mhu019 M.Hug			Scale 1:3	Size A3	Page 1/1	Material ID PAAD026295
Chkd 19.01.2011 sfe006 Feuerstein			Design Group 9715	Drawing ID DAAD012142		Rev. B
Appd 19.01.2011 dst009 Strödecke						

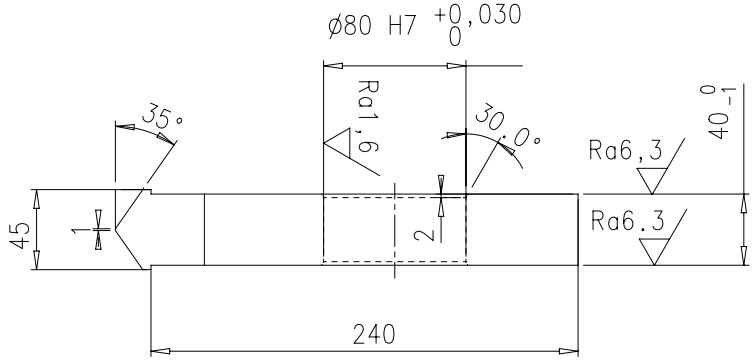
SURFACE PROTECTION SEE GROUP 0344
TOLERANCING PRINCIPLE ISO8015
GENERAL TOLERANCES ACCORDING TO ISO2768-mK

Approved

PD - PRODUCTION DRAWING - Confidential



Ra50 FLAME-CUT (Ra1,6 / Ra6,3 /)



Free space for lic.								Q-Code XXXXX		Main Drw.	
								Standard ISO; JIS			
Modif.	A	EAAD095725	28.04.2021	B	EAAD096559	29.04.2021					
		Number	Drawn date		Number	Drawn date		Number	Drawn date	Number	Drawn date

WIN GD Winterthur Gas & Diesel

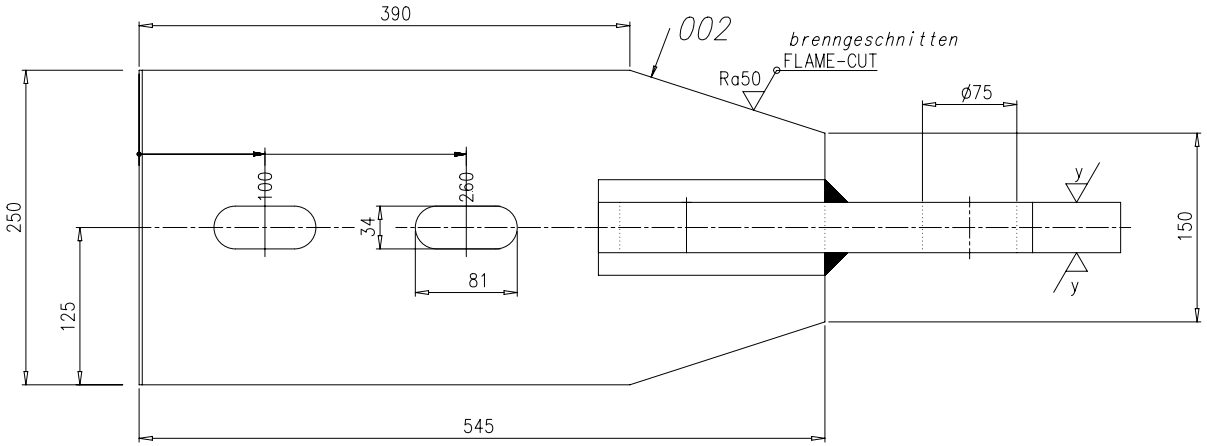
Product W-2S

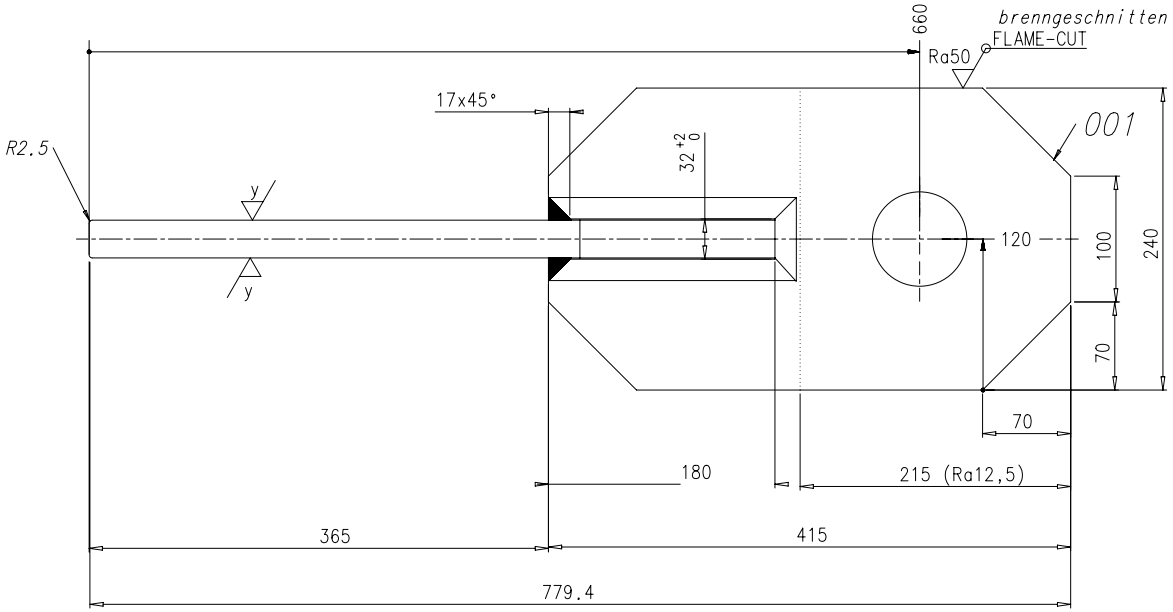
SUPPORT
TO ENGINE STAYS, FRICTION
Support
zu Motorabstuetzung

Units mm kg	NX		Basic Material W-FU-355-J0			Net Weight 15,6
SURFACE PROTECTION SEE GROUP 0344	Made	20.12.2010 mhu019 M.Hug	Scale 1:3	Size A3	Page 1/1	Material ID PAAD026436
TOLERANCING PRINCIPLE ISO8015	Chkd	19.01.2011 sfe006 Feuerstein	Design Group 9715	Drawing ID DAAD012141		Rev. B
GENERAL TOLERANCES ACCORDING TO ISO2768-mK	Appd	19.01.2011 dst009 Strödecke				

Approved

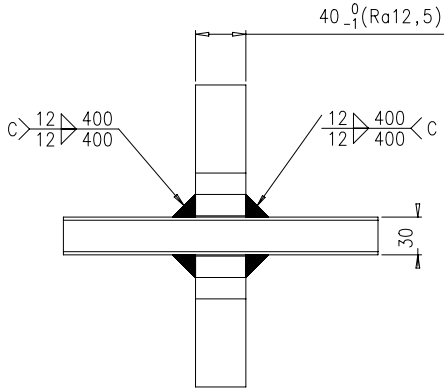
PD - PRODUCTION DRAWING - Confidential





RA50 (√)

y = Ra12.5 SANDBLASTED BEFORE WELDING



1	002	PAAD027199	PLATE	DAAD012457	W-FU-355-J0	26,9
1	001	PAAD027091	PLATE	DAAD012457	W-FU-235-J0	37,7
QTY	SEQ NO	Material ID	Material Name / Dimension, Occ	Standard or Drawing	Basic Material / Material Standard	Weight GR./NET

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	EAAD082648	12.07.2011	B EAAD095725	28.04.2021	C EAAD096559	29.04.2021		

Approved

WIN GD Winterthur Gas & Diesel

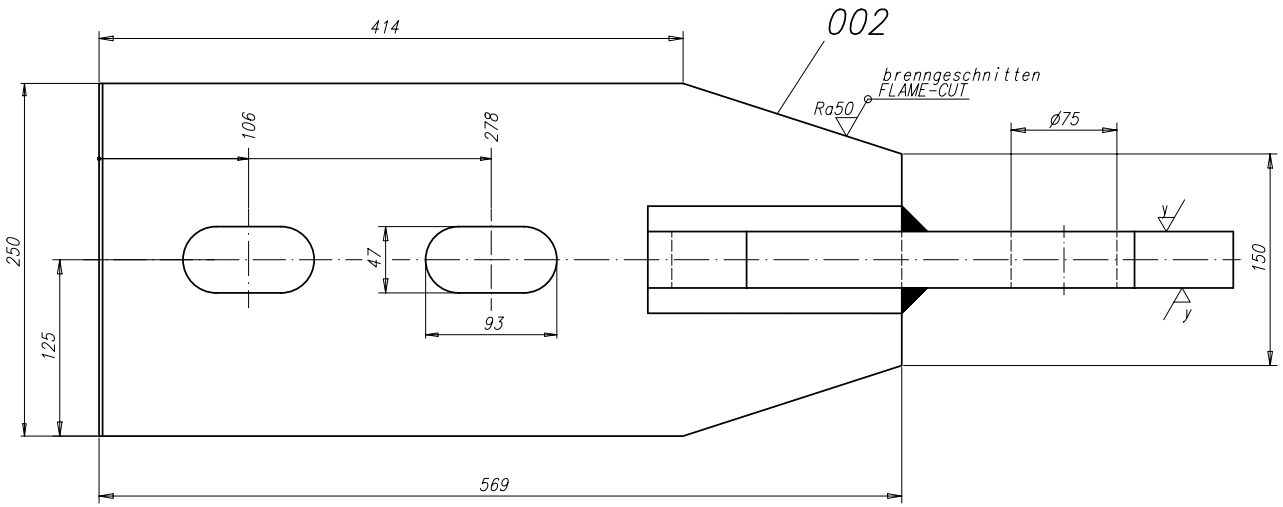
Product W-2S

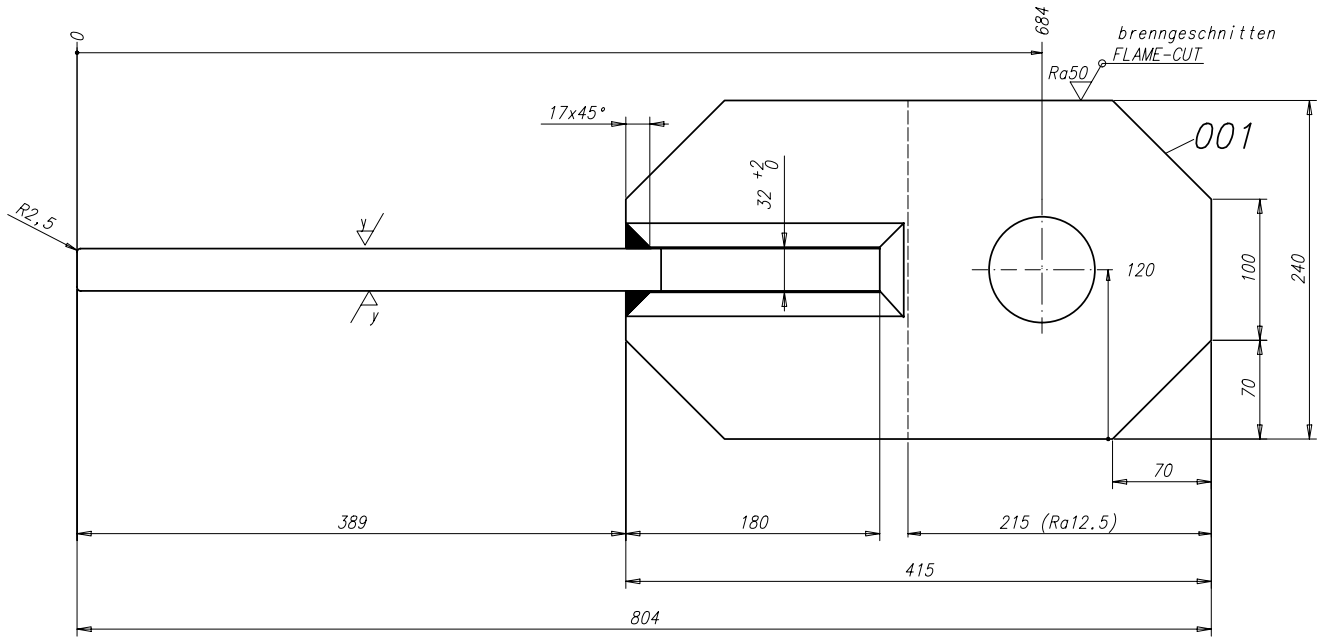
CLAMPING PART
WELDED, TO ENGINE STAYS
Klemmteil
geschweisst, zu Motorabstuetzung

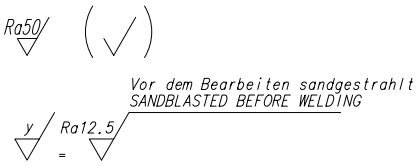
Units mm kg | NX | Basic Material | Net Weight 64,6

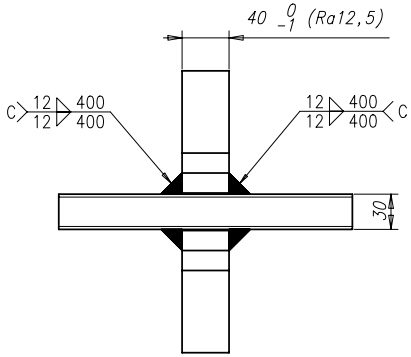
SURFACE PROTECTION SEE GROUP 0344	Made	22.12.2010 mhu019 M.Hug	Scale 1:1	Size A2	Page 1/1	Material ID PAAD027261
TOLERANCING PRINCIPLE ISO8015	Chkd	19.01.2011 sfe006 Feuerstein	Design Group 9715	Drawing ID DAAD012457		Rev. C
GENERAL TOLERANCES ACCORDING TO ISO2768-mK	Appd	19.01.2011 dst009 Strödecke				

PD - PRODUCTION DRAWING - Confidential









QTY	SEQ NO	Material ID	Material Name	Dimension/Occ.Dimension	Standard or Drawing	Basic Material Material Standard	Weight GR./NET
1	002	PAAD902229	PLATE	30 THICK	DAAD902577	S235JRG2 SS400	30.1
1	001	PAAD902253	PLATE	40 THICK	DAAD902577	S355J2G3 SM520C	24.7

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

Modif: | Number | Drawn date | Number | Drawn date | Number | Drawn date | Number | Drawn date

WIN GD Winterthur Gas & Diesel | Product W-2S

CLAMPING PART
WELDED, TO ENGINE STAYS
Klemmteil
geschweisst, zu Motorabstuetzung

Units mm kg | IDE | Basic Material | Net Weight 55.0

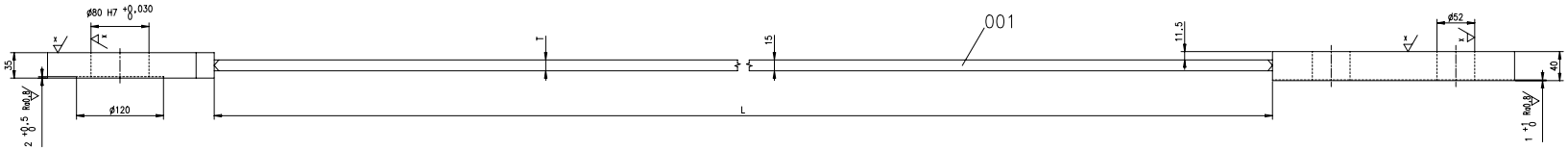
SURFACE PROTECTION SEE GROUP 0344	Made	31.05.2011 Pradip Soman	Scale 1:3	Size A2	Page 1/1	Material ID PAAD902230	
TOLERANCING PRINCIPLE ISO8015	Chkd	07.07.2011 mhu019 Hug	Design Group 9715				
GENERAL TOLERANCES ACCORDING TO ISO2768-mK	Appd	07.07.2011 dsl009 Stroedecke		Drawing ID DAAD902577			Rev. –

DID - DIMENSIONAL DRAWING - Confidential

bearbeitet nach dem Schweissen
MACHINED AFTER WELDING

Ra1.7

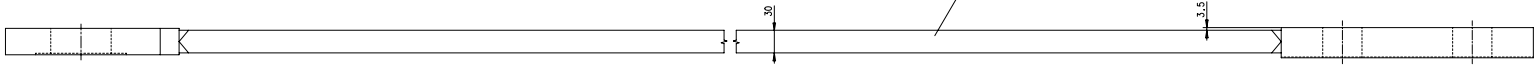
PAAD902252



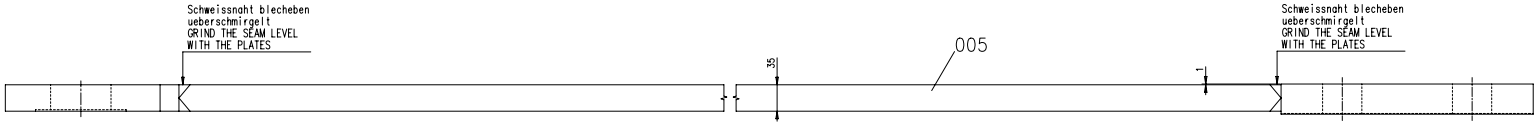
PAAD902247

PAAD902257

PAAD902268



PAAD902262



MATERIAL ID	DIMENSIONS IN MM		
	X	T	L
PAAD902252	2000-2280	15	X - 1126
PAAD902247	2281-2560	20	
PAAD902257	2561-2840	25	
PAAD902268	2841-3120	30	
PAAD902262	3121-3400	35	

Fuer Mass X siehe H-Zeichnung
FOR MEASURE X SEE MAIN DRAWING

Net Weight 137	122	108	93,8	79,6	Pos.	Material ID	Material Name	Dimension, Qty	Drawing or Drawing	Basic Material Material Standard	Weight GR/NET
1	-	-	-	-	005	PAAD902259	ENGINE STAYS		DAAD902591		137
-	1	-	-	-	004	PAAD902264	ENGINE STAYS		DAAD902591		122
-	-	1	-	-	003	PAAD902254	ENGINE STAYS		DAAD902591		108
-	-	-	1	-	002	PAAD902242	ENGINE STAYS		DAAD902591		93,8
-	-	-	-	1	001	PAAD902249	ENGINE STAYS		DAAD902591		79,6

Quantity

PAAD902262	PAAD902268	PAAD902257	PAAD902254	PAAD902247	PAAD902252
Material ID					Spr. Nr. Name

Mod.	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number	Drawn date
A	AAAD895725	28.04.2021	B AAAD896559	29.04.2021				

Q-Code XXXXX
Standard ISO, JIS
Main Drw.

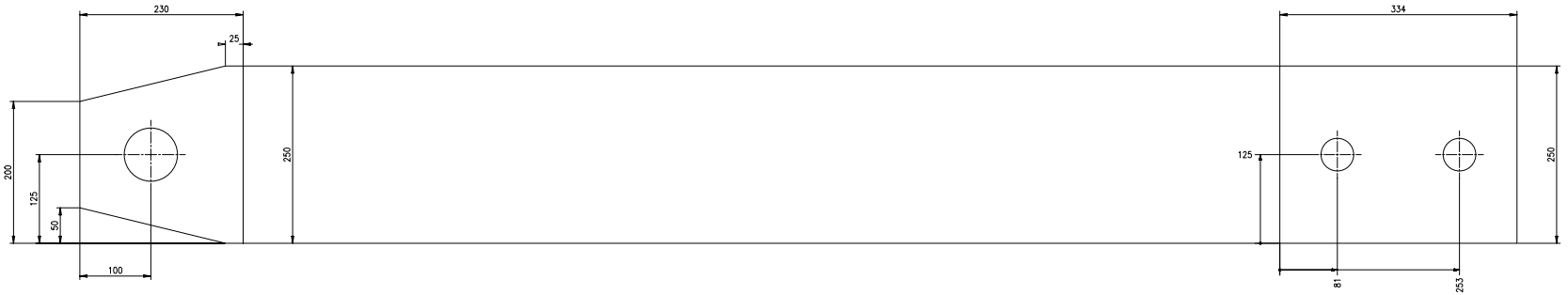
WINGD Winterthur Gas & Diesel

Product W-2S

ENGINE STAYS
MACHINED, TO ENGINE STAYS
Motorabstuetzung
bearbeitet zu motorabstuzung

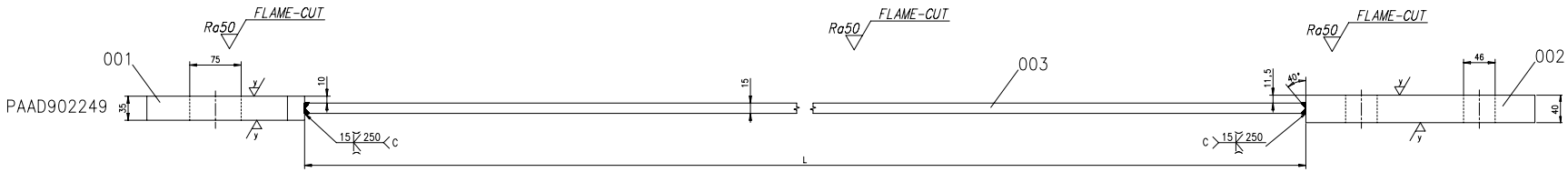
Units	mm kg	NX	Basic Material	Net Weight
Made	01.06.2011 Pradip Saman		Scale 1:3	Size A0	Page 1/1	Material ID
Chkd	07.07.2011 wwr001 Wroblewski		Design Group	
Appd	07.07.2011 ds009 Skrobacka		Drawing ID 9715 DAAD902592	Rev. B

SURFACE PROTECTION SEE GROUP 9744
TOLERANCING PRINCIPLE ISO8015
GENERAL TOLERANCES ACCORDING TO ISO2768-mK



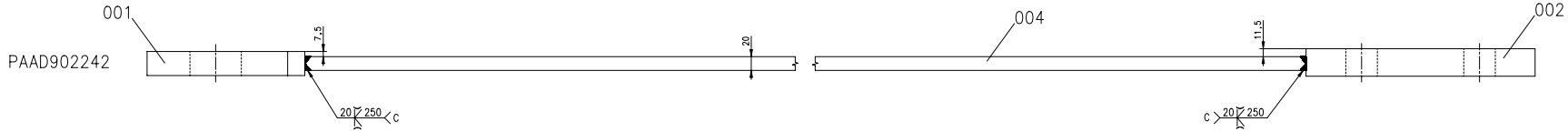
SANDBLASTED BEFORE WELDING

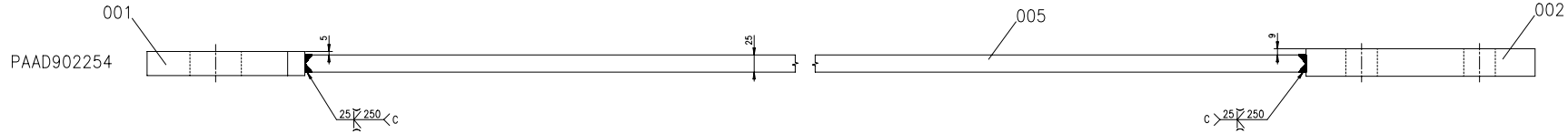
Ra12.5

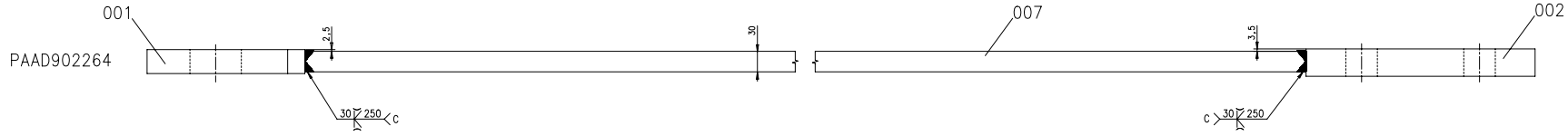


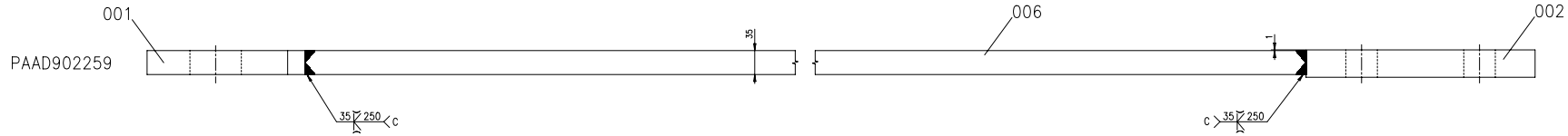
MATERIAL ID	DIMENSIONS IN MM		
	X	T	L
PAAD902249	2000-2280	15	X - 1126
PAAD902242	2281-2560	20	
PAAD902254	2561-2840	25	
PAAD902264	2841-3120	30	
PAAD902259	3121-3400	35	

Fuer Mass X siehe H-Zeichnung
FOR MEASURE X SEE MAIN DRAWING









Net Weight 197	122	108	93,8	79,6						
1	-	-	-	-	007	PAAD902251	PLATE 30THICK	DAAD902591	W-FU-235-JR	85,4
-	1	-	-	-	006	PAAD902250	PLATE 35Thick	DAAD902591	W-FU-235-JR	99,6
-	-	1	-	-	005	PAAD902248	PLATE 25THICK	DAAD902591	W-FU-235-JR	71,2
-	-	-	1	-	004	PAAD902244	PLATE 20THICK	DAAD902591	W-FU-235-JR	56,9
-	-	-	-	1	003	PAAD902246	PLATE 15THICK	DAAD902591	W-FU-235-JR	42,7
1	1	1	1	1	002	PAAD902245	PLATE 40THICK	DAAD902591	W-FU-235-JR	25,2
1	1	1	1	1	001	PAAD902243	PLATE 35THICK	DAAD902591	W-FU-235-JR	11,8
Quantity					BOM NO	Material ID	Material Name	Drawing# or Dimension, Etc	Basic Material Material Standard	Weight GR/MET

PAAD902259	PAAD902264	PAAD902254	PAAD902249	Name Rpt. No.
Material ID				

G-Code XXXXX
Standard ISO, JIS
Main Drw.

Mod	A DAAD895725	28.04.2021	B DAAD896559	29.04.2021				
	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number	Drawn date

WIN GD Winterthur Gas & Diesel

Product W-25

ENGINE STAYS
WELDED, TO ENGINE STAYS
Motorabstuetzung
geschweisst, zu Motarabstuetzung

Units	mm kg	NX	Basic Material	Net Weight
Mode	01.06.2011 Pradip Saman		Scale 1:3	Size A0 Page 1/1 Material ID
Chkd	07.07.2011 wwr001 Wroblewski		Design Group	
Appd	07.07.2011 dst009 Stoldecke		Drawing ID 9715	DAAD902591 Rev. B

SURFACE PROTECTION SEE GROUP 9344
TOLERANCING PRINCIPLE ISO8015
GENERAL TOLERANCES ACCORDING TO ISO2768-mK

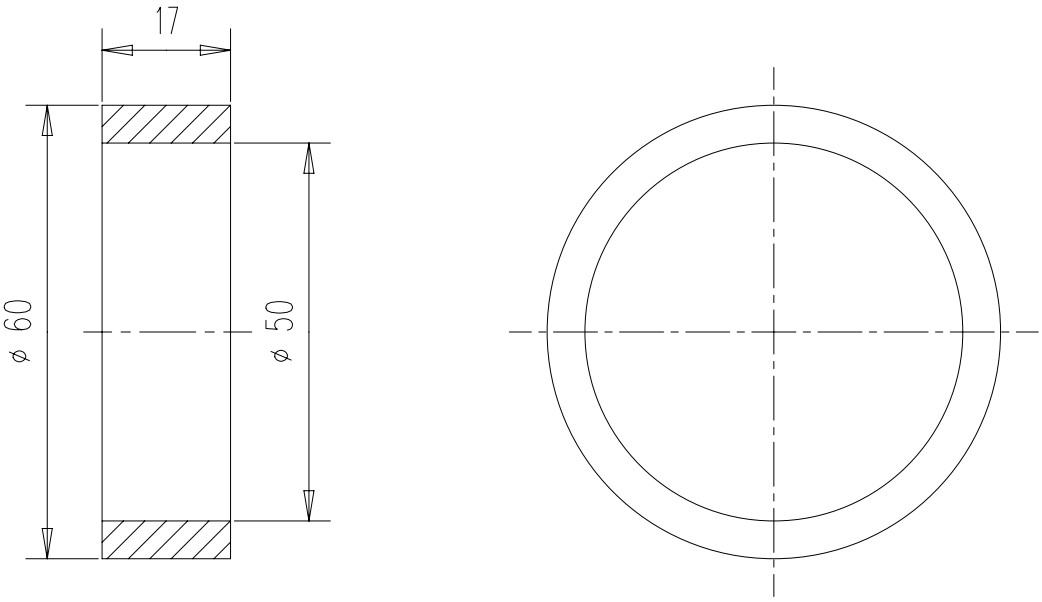
SURFACE PROTECTION SEE GROUP 0344

TOLERANCING PRINCIPLE ISO8015

GENERAL TOLERANCES ACCORDING TO ISO2768-mK

Ra12,5

SHARP EDGES REMOVED



Approved

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	EAAD083026	25.07.2011						
B	EAAD095725	28.04.2021						
C	EAAD096559	29.04.2021						

WIN GD Winterthur Gas & Diesel

Product W-2S

RING
TO ENGINE STAYS, FRICTION TYPE
Ring

Units mm kg	NX		Basic Material W-FU-235-JR			Net Weight 0,12
Made 08.09.1998 S. Sylianou		Scale 1:1	Size A4	Page 1/1	Material ID 107.246.316.001	
Chkd		Design Group 9715	Drawing ID 107.246.316			Rev. C
Appd 08.09.1998 WCH001 Service User						

ASD - ASSEMBLY DRAWING - Internal

001 DISC SPRING

MATERIAL	50 Cr V 4
MODULUS OF ELASTICITY	E = 2,06 x 10^5 N/mm2
OPERATING TEMPERATURE	-50...+200 °C
SURFACE PROTECTION	PHOSPHATED AND OILED (RUST PREVENTING OIL)

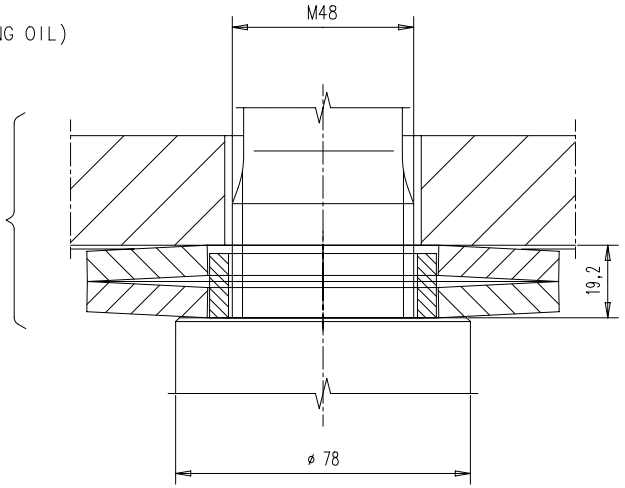
FOR ASSEMBLY OF THE DISC SPRING PACKET SEE SKETCH

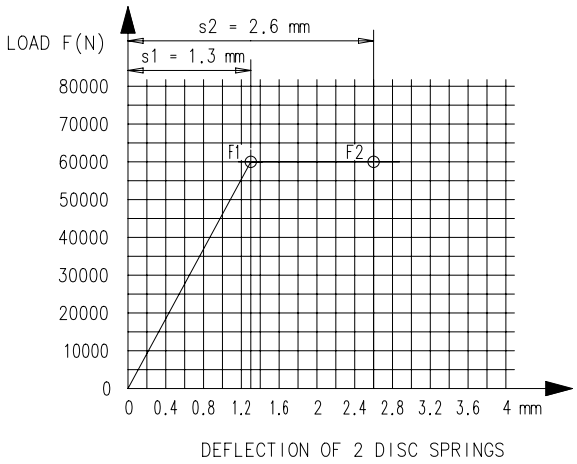
F1 = 60000 N BY DEFLECTION s1 = 1.3 mm OF 1 DISC

F2 = F1 BY DEFLECTION s2 = 2.6 mm OF 2 DISCS

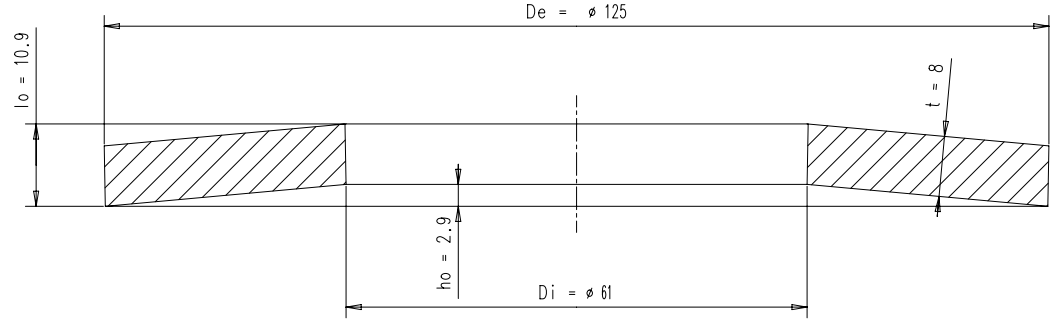
$\frac{ho}{s} = 0.50$

$s = \frac{ho}{0.50}$





DEFLECTION OF 2 DISC SPRINGS



SUPPLIER: URS INGOLD
P.O. Box 180
Oelestrasse 7
CH-3800 Interlaken

Approved

Free space for lic.

Q-Code XQXXX

Standard ISO; JIS

Main Drw.

Modif.	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number	Drawn date
A	7-29.688	25.10.2004	B EAAD083026	25.07.2011	C EAAD095725	28.04.2021	D EAAD096559	29.04.2021

WIN GD Winterthur Gas & Diesel

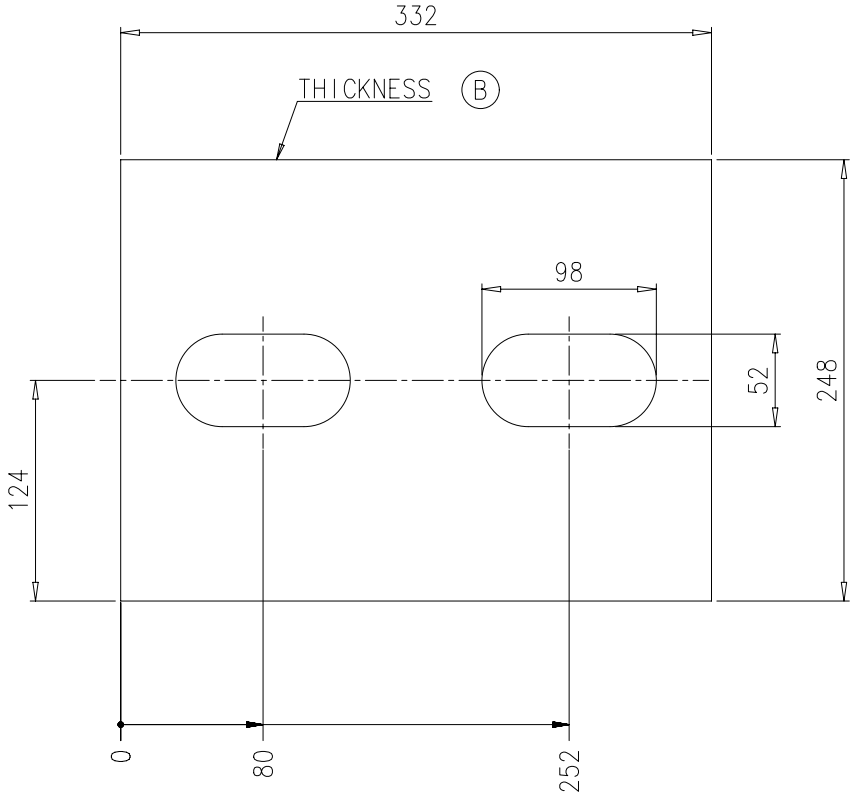
Product W-2S

DISC SPRING
TO ENGINE STAYS, FRICTION TYPE
Tellerfeder

Units mm kg | NX | Basic Material | Net Weight 0,55

SURFACE PROTECTION SEE GROUP 0344	Made 08.09.1998 S. Natali	Scale -	Size A2	Page 1/1	Material ID 107.246.311.001
TOLERANCING PRINCIPLE ISO8015	Chkd	Design Group 9715	Drawing ID 107.246.311		Rev. D
GENERAL TOLERANCES ACCORDING TO ISO2768-mK	Appd 08.09.1998 WCH001 Service User				

DID - DIMENSIONAL DRAWING - Confidential



B

SPECIFICATION:

TECHNICAL DATA: AVERAGE COEFFICIENT OF FRICTION DRY: μ = 0,42
MAX. PERMISSIBLE SURFACE PRESSURE: p= 250N/cm²

MATERIAL: ASBESTOS FREE FRICTION MATERIAL,
ALSO SUITABLE FOR USING IN OIL.

Free space for lic.												Q-Code XXXXX	Main Drw.
												Standard ISO; JIS	
Modif.	A	EAAD095725	28.04.2021	B	EAAD096559	29.04.2021							
		Number	Drawn date		Number	Drawn date		Number	Drawn date		Number	Drawn date	

WIN GD Winterthur Gas & Diesel

Product W-2S

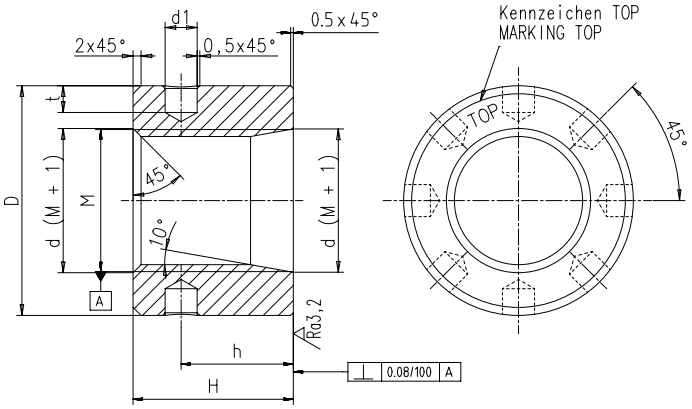
SHIM
TO ENGINE STAYS, FRICTION
Beilage
zu Motorabstutzung

Units mm kg	NX	Basic Material	Net Weight 2,3

SURFACE PROTECTION SEE GROUP 0344	Made 31.05.2011 Pradip Soman	Scale 1:3	Size A3	Page 1/1	Material ID PAAD902269	
TOLERANCING PRINCIPLE ISO8015	Chkd 07.07.2011 mhu019 Hug	Design Group 9715	Drawing ID DAAD902593			Rev. B
GENERAL TOLERANCES ACCORDING TO ISO2768-mK	Appd 07.07.2011 dst009 Ströcke					

Approved

DID - DIMENSIONAL DRAWING - Confidential



POS.	M	D	d	H	h	d1	t
001	M27	47	28	29	20	$6\ ^{+0.2}_{0}$	7
002	M30	52	31	33	23	$6\ ^{+0.2}_{0}$	7
003	M33	57	34	36	25	$6\ ^{+0.2}_{0}$	7
004	M36	62	37	39	27	$6\ ^{+0.2}_{0}$	7
005	M39	67	40	42	29	$6\ ^{+0.2}_{0}$	7
006	M42	73	43	46	32	$6\ ^{+0.2}_{0}$	7
007	M45	78	46	49	34	$6\ ^{+0.2}_{0}$	7
008	M48	83	49	52	36	$6\ ^{+0.2}_{0}$	7
009	M52	90	53	56	39	$6\ ^{+0.2}_{0}$	7
010	M56	97	57	61	43	$9.5\ ^{+0.2}_{0}$	10
011	M60	104	61	65	46	$9.5\ ^{+0.2}_{0}$	10
012	M64	110	65	70	49	$9.5\ ^{+0.2}_{0}$	10
013	M68	117	69	74	52	$9.5\ ^{+0.2}_{0}$	10
014	M72	124	73	78	55	$9.5\ ^{+0.2}_{0}$	10
015	M76	131	77	82	57	$9.5\ ^{+0.2}_{0}$	10
016	M80	138	81	87	61	$14\ ^{+0.2}_{0}$	15
017	M85	146	86	92	64	$14\ ^{+0.2}_{0}$	15
018	M90	155	91	98	69	$14\ ^{+0.2}_{0}$	15
019	M95	164	96	103	72	$14\ ^{+0.2}_{0}$	15
020	M100	172	101	108	76	$14\ ^{+0.2}_{0}$	15

Ra6,3 (Ra3,2)

MATERIAL:	W-FA-42CrMo-QT (D)
D >40 – ≤100	vergütet Rm = 900–1100 N/mm² HEAT TREATED
D >100 – ≤160	vergütet Rm = 800–950 N/mm² HEAT TREATED
D >160 – ≤250	vergütet Rm = 750–900 N/mm² HEAT TREATED

QTY	SEQ NO	Material ID	Material Name / Dimension, Occ	Standard or Drawing	Basic Material / Material Standard	Weight GR./NET
1	020	107.345.876.020	ROUND NUT M100	107.345.876	W-FA-42CrMo-QT	13,2
1	019	107.345.876.019	ROUND NUT M95	107.345.876	W-FA-42CrMo-QT	11,4
1	018	107.345.876.018	ROUND NUT M90	107.345.876	W-FA-42CrMo-QT	9,7
1	017	107.345.876.017	ROUND NUT M85	107.345.876	W-FA-42CrMo-QT	8,1
1	016	107.345.876.016	ROUND NUT M80	107.345.876	W-FA-42CrMo-QT	6,8
1	015	107.345.876.015	ROUND NUT M76	107.345.876	W-FA-42CrMo-QT	5,9
1	014	107.345.876.014	ROUND NUT M72	107.345.876	W-FA-42CrMo-QT	5,0
1	013	107.345.876.013	ROUND NUT M68	107.345.876	W-FA-42CrMo-QT	4,2
1	012	107.345.876.012	ROUND NUT M64	107.345.876	W-FA-42CrMo-QT	3,5
1	011	107.345.876.011	ROUND NUT M60	107.345.876	W-FA-42CrMo-QT	2,9
1	010	107.345.876.010	ROUND NUT M56	107.345.876	W-FA-42CrMo-QT	2,36
1	009	107.345.876.009	ROUND NUT M52	107.345.876	W-FA-42CrMo-QT	1,86
1	008	107.345.876.008	ROUND NUT M48	107.345.876	W-FA-42CrMo-QT	1,42
1	007	107.345.876.007	ROUND NUT M45	107.345.876	W-FA-42CrMo-QT	1,2
1	006	107.345.876.006	ROUND NUT M42	107.345.876	W-FA-42CrMo-QT	0,96
1	005	107.345.876.005	ROUND NUT M39	107.345.876	W-FA-42CrMo-QT	0,79
1	004	107.345.876.004	ROUND NUT M36	107.345.876	W-FA-42CrMo-QT	0,63
1	003	107.345.876.003	ROUND NUT M33	107.345.876	W-FA-42CrMo-QT	0,49
1	002	107.345.876.002	ROUND NUT M30	107.345.876	W-FA-42CrMo-QT	0,37
1	001	107.345.876.001	ROUND NUT M27	107.345.876	W-FA-42CrMo-QT	0,25

Free space for Mc. | Q-Code XQXXX | Main Drw.
Standard ISO; JIS

Modif.	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number	Drawn date
	A EAAD700017	13.01.2011	B EAAD084319	06.02.2013	C EAAD087822	28.07.2017	D EAAD095725	18.01.2021

WINGD Winterthur Gas & Diesel

Product W-2S

ROUND NUT

Rundmutter

Units mm kg NX | Basic Material | Net Weight

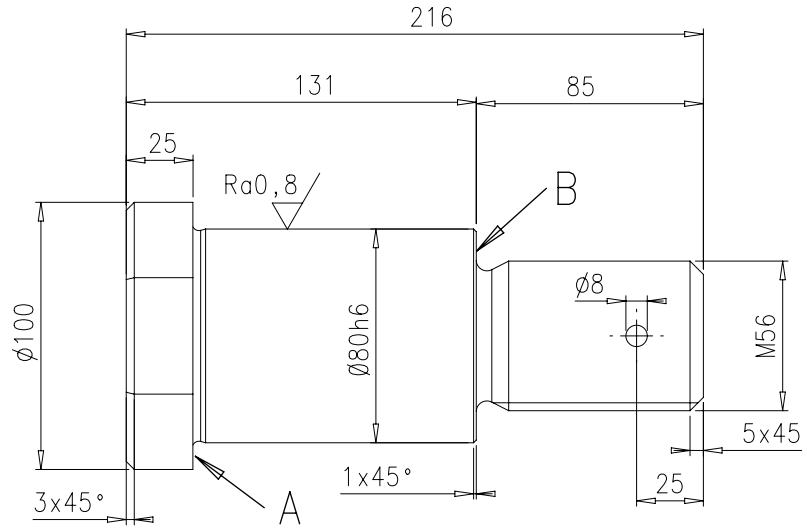
SURFACE PROTECTION SEE GROUP 0344
TOLERANCING PRINCIPLE ISO8015
GENERAL TOLERANCES ACCORDING TO ISO2768-mK

Made 19.08.2004 pne001 P.Neracher
Chkd
Appd 20.08.2004 PNE001 Neracher

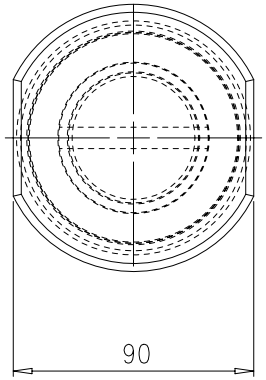
Scale 1:1 | Size A1 | Page 1/1 | Material ID
Design Group 3306
Drawing ID 107.345.876 | Rev. D

Approved

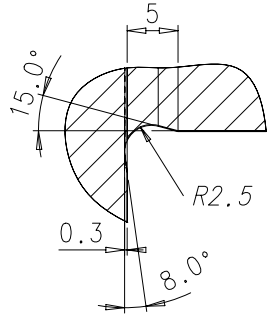
3D - DIMENSIONAL DRAWING - confidential



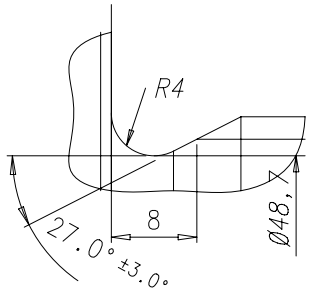
Ra3,2 NORMALIIZED, SHARP EDGES REMOVED, BURNSHED



A M2:1



B M2:1



Free space for lic.								Q-Code XXXXX		Main Drw.	
								Standard ISO; JIS			
Modif.	A	EAAD095725	28.04.2021	B	EAAD096559	29.04.2021					
		Number	Drawn date		Number	Drawn date		Number	Drawn date	Number	Drawn date

WIN GD Winterthur Gas & Diesel

Product W-2S

BOLT
TO ENGINE STAYS, FRICTION
Bolzen
zu Motorabstutzung

Units mm kg	NX		Basic Material W-FU-325-N		Net Weight 7.17
SURFACE PROTECTION SEE GROUP 0344	Made	16.12.2010 mhu019 M.Hug	Scale 1:2	Size A3 / Page 1/1	Material ID PAAD026437
TOLERANCING PRINCIPLE ISO8015	Chkd	19.01.2011 sfe006 Feuerstein	Design Group 9715	Drawing ID DAAD012368	Rev. B
GENERAL TOLERANCES ACCORDING TO ISO2768-mK	Appd	19.01.2011 dst009 Strödecke			

Approved

PD - PRODUCTION DRAWING - Confidential

MIDS - WinGD X52DF - Engine Stays (DG9715)

TRACK CHANGES

DATE	SUBJECT	DESCRIPTION
2018-07-19	DRAWING SET	First web upload
2018-10-05	DAAD103409 DAAD100390 DAAD100398 DAAD100444 DAAD100451	Main drg and assembly drgs – new revision
2019-07-17	DAAD100390 DAAD100398	Assembly drgs – new revision
2020-11-25	DAAD103409 DAAD100390 DAAD100398 DAAD100444 DAAD100451 107.345.876	Main and systems drgs – new revision
2021-05-19	DAAD018242 DAAD012142 DAAD012141 DAAD012457 DAAD902591 DAAD902592 107.246.316 107.246.311 DAAD902593 107.345.876 DAAD012368_	Stays assembly part drgs – new revision
2022-09-29	PAAD294628 PAAD294642 PAAD294648 PAAD294661 PAAD294763 PAAD294782	Detail drawings – new revision

DISCLAIMER