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Vibration Isolation Calculator & Application Documentation **IsoFlex-VibCal-V9(0808)**

Date:	15-Oct-12	Reference: Ph /Email	Initials: CE
Customer:	Generic	Special Requirements:	
Vessel:	Commercial Vessel		
Engine:	Cat C18 ACERT		
Gearbox:	ZF500		

Mount Selection Criteria: **1. Minimum Vibration Isolation @ Idle = 80%**
2. Maximum engine movement due to Thrust Load = 3.0mm

Engine + Gearbox Weight [kg] =	2500
Number of **MOUNTS** - FRONT=	2
Number of **MOUNTS** - REAR=	2
Approx Axial Load per **MOUNT** - FRONT [kg]=	600
Approx Axial Load per **MOUNT** - REAR [kg]=	650

Engine HP =	1100		
Gearbox Reduction =	1.91		
Propeller Blades =	4	<- Enter	
Vessel Type:	Planning Hull		
			Approx Bollard Pull
Approx Propeller Thrust Load [Kg]=	3,886		5495
Approx Thrust Load/MOUNT [kg]=	972		1374
Engine Thrust Load deflection [mm]* =	1.8		

Engine Mount Selection: **FRONT:** M125XHD-24S-75
& **REAR:** MD125HD-24DS-75

* See Thrust Load Vs Deflection graph for selected mounts

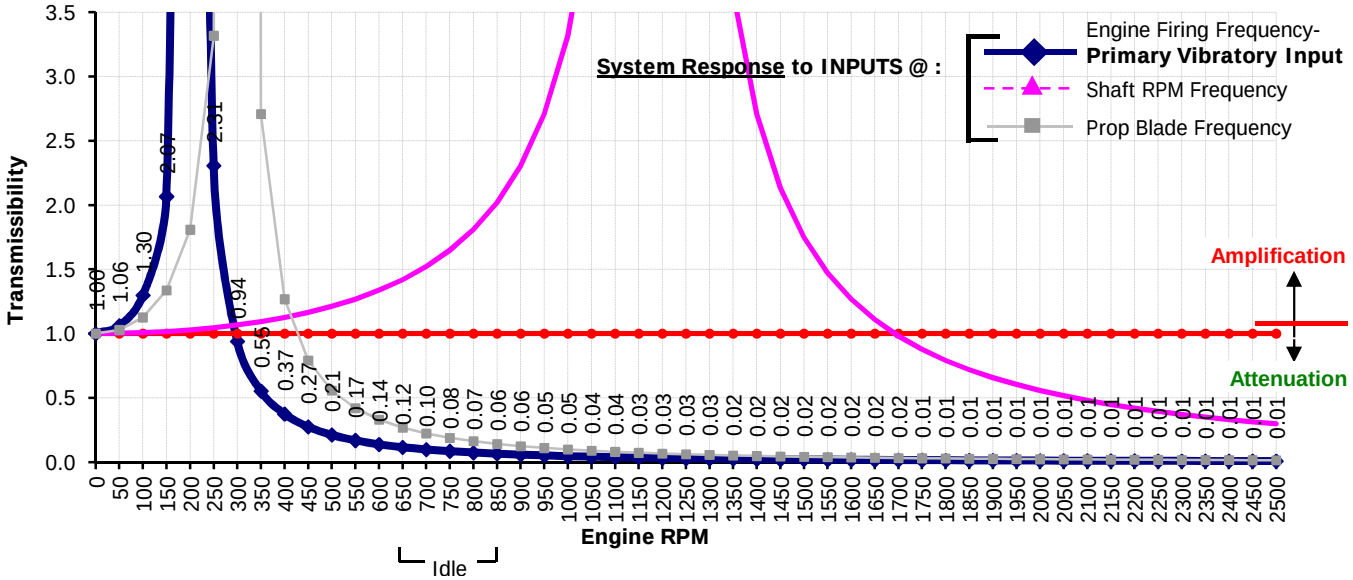
Output Torque [Nm]= 6,508
Coupling Model: IFC8100

> ***Static Axial Deflection per Mount [mm] =**	2.3	<- Enter
Engine Idle Speed [RPM] =	650	<- Enter
Number of Cylinders =	6	<- Enter

Calculated Results:

Engine Firing Frequency @ Idle(4-stroke engines): fe [Hz] =	32.5	**(fe/fn) Ratio=** 3.11
Approx Natural Frequency of Engine/Mount System: fn [Hz] =	10.4	
Approx Vibration Transmissibility @ Idle =	0.12	
Approx Vibration Isolation @ Idle (%) =	88	critical to be above 1.414

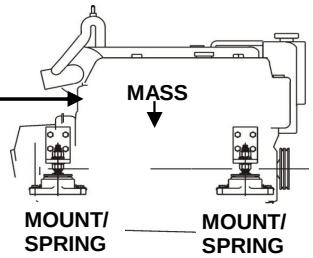
Vibration Transmissibilty v RPM graph for the 'Static Axial Deflection' entered above.



Graph shows the dynamic response of the 'Mass/Spring' system to the engine firing frequency input.

SUMMARY

Engine + Gearbox weight [kg]= 2500
Engine Mounts: FRONT: M125XHD-24S-75
& REAR: MD125HD-24DS-75
Axial Deflection per Mount [mm] = 2.3
Approx Natural Frequency of 'Mass/Spring' System fn [Hz]= 10.4



Response to primary vibratory internal inputs into the Mass/Spring system

RPM where engine firing frequency corresponds to the Natural Frequency of the 'Spring/Mass' system = 209
Critical Engine RPM below which Vibration Amplification will occur= 295
Engine RPM @ Idle = 650
Number of Cylinders = 6
Approx Vibration Isolation @ Idle = 88%

Gearbox Reduction= 1.91

Response to external inputs into the Mass/Spring system

Critical **RPM** for **shaft misalignment= 1196** → [ie: where shaft rpm corresponds to **fn**]
and/or out-of-balance ie: **10.4 Hz**