

Statement of Work  
USCGC HEALY (WAGB 20)  
Science Winch Groom & Repairs Winter 2004  
InterOcean  
DTCG85-00-D-66P381

INTENT: Conduct a groom of Science Winch system aboard USCGC HEALY in accordance with section C-5.1 of the contract and the additional repairs as outlined below. HEALY will be located at Pier 37 in Seattle, WA during the period of performance 17 Feb-05 Mar 2004.

Additional Repairs:

1. Conduct a standard annual groom in accordance with Polar Class Icebreaker Grooming Contract section C-5.1. Also ensure all motor re-alignments meet Vulcan Coupling Specs.
2. Align 0.680" sheave in accordance with USCG Icebreaker Support Contract DTCG85-00-D-66P381 reference CFR No: DO026-001.
3. Clean, inspect and calibrate all four instrumented sheaves (including line tension load cells) and associated display units (MD TOTCOs).
4. Modify the under the flight deck sheaves to permit un-reeving of the winch wires with termination fittings attached in accordance with InterOcean Spring 2003 Groom for HEALY (WAGB 20) report recommendation.
5. Perform on board operational testing of all science winches during HEALY's shakedown cruise 22-26 March 2004. Point of embarkation is Seattle, WA, debarkation is Victoria, BC.

2. Stored Measurement :

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Machine.....TC.....Company.....Healy.....  
 Left Machine.....Right Machine.....  
 Operator.....Steve Ho.....Date.....2/19/04.....Time.....09:00.....

OPTALIGN Ser.-No. -189.3 PRUFTECHNIK AG, ISMANING

Use the sensor clock positions for sign convention.  
 Clockwise is looking into the laser emitter.

Dimensions -----

Distance Laser-Prism		+005.8	inch
Distance Laser-FrontFoot		+017.0	inch
Distance Front-BackFoot		+036.0	inch
Distance Coupling-Prism		+004.0	inch
Coupling Diameter		+010.0	inch

Coupling Targets -----

Offset	vertical	+ = MTBM high	+000.0	1/1000inch
Offset	horizontal	+ = MTBM toward 3:00	+000.0	1/1000inch
Gap	vertical	+ = open at 12:00	+000.0	1/1000inch
Gap	horizontal	+ = open at 3:00	+000.0	1/1000inch

Thermal Growth -----

Front foot	vertical	+ = grows upward	+000.0	1/1000inch
Back foot	vertical	+ = grows upward	+000.0	1/1000inch
Front foot	horizontal	+ = grows toward 3:00	+000.0	1/1000inch
Back foot	horizontal	+ = grows toward 3:00	+000.0	1/1000inch

Measured Alignment Conditions at Coupling -----

Offset	vertical	+ = MTBM high	+000.5	1/1000inch
Offset	horizontal	+ = MTBM toward 3:00	+011.0	1/1000inch
Gap	vertical	+ = open at 12:00	-009.7	1/1000inch
Gap	horizontal	+ = open at 3:00	+015.5	1/1000inch

Required Corrections -----

Front foot		+ = raise	-015.5	1/1000inch
Back foot		+ = raise	-050.0	1/1000inch
Front foot		+ = move toward 3:00 Gap	+012.5	1/1000inch
Back foot		+ = move toward 3:00 Gap	+068.5	1/1000inch

1. Stored Measurement :  
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Machine.....*OW7-322*.....Company.....*Healy*.....  
 Left Machine.....Right Machine.....  
 Operator.....*Steve Ho*.....Date.....*2/19/04*.....Time.....*0900*.....

OPTALIGN Ser.-No. -189.3 PRUFTECHNIK AG, ISMANING

Use the sensor clock positions for sign convention.  
 Clockwise is looking into the laser emitter.

Dimensions -----

Distance Laser-Prism		+006.0	inch
Distance Laser-FrontFoot		+014.0	inch
Distance Front-BackFoot		+013.8	inch
Distance Coupling-Prism		+003.0	inch
Coupling Diameter		+010.0	inch

Coupling Targets -----

Offset	vertical	+ = MTBM high	+000.0	1/1000inch
Offset	horizontal	+ = MTBM toward 3:00	+000.0	1/1000inch
Gap	vertical	+ = open at 12:00	+000.0	1/1000inch
Gap	horizontal	+ = open at 3:00	+000.0	1/1000inch

Thermal Growth -----

Front foot	vertical	+ = grows upward	+000.0	1/1000inch
Back foot	vertical	+ = grows upward	+000.0	1/1000inch
Front foot	horizontal	+ = grows toward 3:00	+000.0	1/1000inch
Back foot	horizontal	+ = grows toward 3:00	+000.0	1/1000inch

Measured Alignment Conditions at Coupling -----

Offset	vertical	+ = MTBM high	+007.3	1/1000inch
Offset	horizontal	+ = MTBM toward 3:00	+007.3	1/1000inch
Gap	vertical	+ = open at 12:00	-014.7	1/1000inch
Gap	horizontal	+ = open at 3:00	-089.5	1/1000inch

Required Corrections -----

Front foot		+ = raise	-023.5	1/1000inch
Back foot		+ = raise	-044.0	1/1000inch
Front foot		+ = move toward 3:00 Gap	-105.5	1/1000inch
Back foot		+ = move toward 3:00 Gap	-229.0	1/1000inch

2. Stored Measurement :  
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Machine..... *OW 1.322* ..... Company..... *Healy* .....  
 Left Machine..... Right Machine.....  
 Operator... *Steve Ho* ..... Date... *2/19/04* ..... Time... *0930* .....

OPTALIGN Ser.-No. -189.3 PRUFTECHNIK AG, ISMANING

Use the sensor clock positions for sign convention.  
 Clockwise is looking into the laser emitter.

*Realign motor to bring within specs.*

Dimensions -----

Distance Laser-Prism		+006.0	inch
Distance Laser-FrontFoot		+014.0	inch
Distance Front-BackFoot		+013.8	inch
Distance Coupling-Prism		+004.0	inch
Coupling Diameter		+010.0	inch

Coupling Targets -----

Offset	vertical	+ = MTBM high	+000.0	1/1000inch
Offset	horizontal	+ = MTBM toward 3:00	+000.0	1/1000inch
Gap	vertical	+ = open at 12:00	+000.0	1/1000inch
Gap	horizontal	+ = open at 3:00	+000.0	1/1000inch

Thermal Growth -----

Front foot	vertical	+ = grows upward	+000.0	1/1000inch
Back foot	vertical	+ = grows upward	+000.0	1/1000inch
Front foot	horizontal	+ = grows toward 3:00	+000.0	1/1000inch
Back foot	horizontal	+ = grows toward 3:00	+000.0	1/1000inch

Measured Alignment Conditions at Coupling -----

Offset	vertical	+ = MTBM high	-006.1	1/1000inch
Offset	horizontal	+ = MTBM toward 3:00	+001.7	1/1000inch
Gap	vertical	+ = open at 12:00	-036.0	1/1000inch
Gap	horizontal	+ = open at 3:00	-027.5	1/1000inch

Required Corrections -----

Front foot		+ = raise	-037.0	1/1000inch
Back foot		+ = raise	-086.5	1/1000inch
Front foot		+ = move toward 3:00 Gap	-035.0	1/1000inch
Back foot		+ = move toward 3:00 Gap	-073.0	1/1000inch

4. Stored Measurement :

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Machine..... *OW 2 3/8* ..... Company..... *Healy* .....

Left Machine..... Right Machine.....

Operator..... *Steve Ho* ..... Date... *2/19/04* ... Time.. *09.30* .....

OPTALIGN Ser.-No. -189.3 PRUFTECHNIK AG, ISMANING

Use the sensor clock positions for sign convention.  
Clockwise is looking into the laser emitter.

Dimensions -----

Distance Laser-Prism		+007.0	inch
Distance Laser-FrontFoot		+014.0	inch
Distance Front-BackFoot		+013.8	inch
Distance Coupling-Prism		+004.0	inch
Coupling Diameter		+010.0	inch

Coupling Targets -----

Offset	vertical	+ = MTBM high	+000.0	1/1000inch
Offset	horizontal	+ = MTBM toward 3:00	+000.0	1/1000inch
Gap	vertical	+ = open at 12:00	+000.0	1/1000inch
Gap	horizontal	+ = open at 3:00	+000.0	1/1000inch

Thermal Growth -----

Front foot	vertical	+ = grows upward	+000.0	1/1000inch
Back foot	vertical	+ = grows upward	+000.0	1/1000inch
Front foot	horizontal	+ = grows toward 3:00	+000.0	1/1000inch
Back foot	horizontal	+ = grows toward 3:00	+000.0	1/1000inch

Measured Alignment Conditions at Coupling -----

Offset	vertical	+ = MTBM high	-035.2	1/1000inch
Offset	horizontal	+ = MTBM toward 3:00	-002.7	1/1000inch
Gap	vertical	+ = open at 12:00	+030.5	1/1000inch
Gap	horizontal	+ = open at 3:00	-004.0	1/1000inch

Required Corrections -----

Front foot		+ = raise	+069.0	1/1000inch
Back foot		+ = raise	+111.5	1/1000inch
Front foot		+ = move toward 3:00 Gap	-002.0	1/1000inch
Back foot		+ = move toward 3:00 Gap	-007.5	1/1000inch

New Coupling Keys  
New set screws (doubled)

1. Stored Measurement :

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Machine..... *QW2 3/8"* ..... Company..... *Healy* .....

Left Machine..... Right Machine.....

Operator..... *Steve Ho* ..... Date..... *2-24-04* ..... Time..... *10:35* .....

OPTALIGN Ser.-No. -189.3 PRUFTECHNIK AG, ISMANING

Use the sensor clock positions for sign convention.  
Clockwise is looking into the laser emitter.

Dimensions -----

Distance Laser-Prism	+006.5	inch
Distance Laser-FrontFoot	+015.0	inch
Distance Front-BackFoot	+014.0	inch
Distance Coupling-Prism	+004.0	inch
Coupling Diameter	+010.0	inch

Coupling Targets -----

Offset	vertical	+ = MTBM high	+000.0	1/1000inch
Offset	horizontal	+ = MTBM toward 3:00	+000.0	1/1000inch
Gap	vertical	+ = open at 12:00	+000.0	1/1000inch
Gap	horizontal	+ = open at 3:00	+000.0	1/1000inch

Thermal Growth -----

Front foot	vertical	+ = grows upward	+000.0	1/1000inch
Back foot	vertical	+ = grows upward	+000.0	1/1000inch
Front foot	horizontal	+ = grows toward 3:00	+000.0	1/1000inch
Back foot	horizontal	+ = grows toward 3:00	+000.0	1/1000inch

Measured Alignment Conditions at Coupling -----

Offset	vertical	+ = MTBM high	-037.7	1/1000inch
Offset	horizontal	+ = MTBM toward 3:00	-005.3	1/1000inch
Gap	vertical	+ = open at 12:00	-045.3	1/1000inch
Gap	horizontal	+ = open at 3:00	-006.4	1/1000inch

Required Corrections -----

Front foot	+ = raise	-019.0	1/1000inch
Back foot	+ = raise	-082.5	1/1000inch
Front foot	+ = move toward 3:00 Gap	-003.0	1/1000inch
Back foot	+ = move toward 3:00 Gap	-011.5	1/1000inch

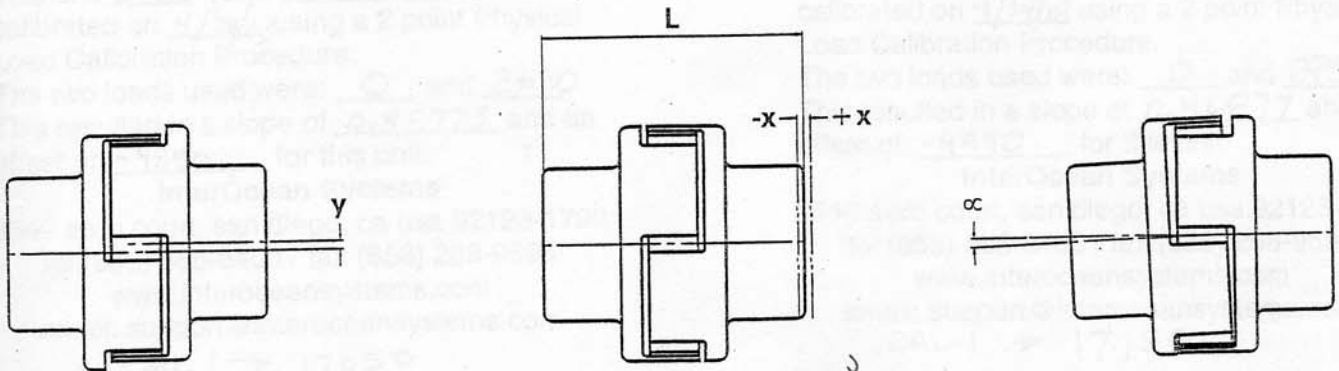
# FLEXOMAX-GS

# INSTALLATION

## INSTALLATION NOTE:

**WARNING:** Occupational Safety and Health Administration Standard 1910.219 requires guards, casings, covers, or other protective devices for mechanical power transmission apparatus. It is the sole responsibility of the customer, user and/or installer of the equipment for procuring, installing and maintaining such protective devices.

## Flexomax-GS Alignment Limits



Size	30	50	70	85	100	125	145	170	200	230	260	300	360	400
Displacement														
Radial Y [in]	0.008	0.020	0.031	0.031	0.031	0.039	0.039	0.039	0.059	0.059	0.059	0.071	0.071	0.071
Axial X [in]	0.020	0.047	0.060	0.079	0.098	0.118	0.118	0.138	0.157	0.177	0.197	0.197	0.197	0.197
Angular α (°)	2.0	2.0	2.0	2.0	2.0	1.5	1.5	1.5	1.5	1.0	1.0	1.0	1.0	1.0

INSTALLED ON  
OW

INSTALLED ON T/C

This unit OW 1 (S/N: .322) was calibrated on 2/24 using a 2 point Physical Load Calibration Procedure.

The two loads used were: 0 and 2800. This resulted in a slope of .46664 and an offset of -4960 for this unit.

### InterOcean Systems

3540 aero court, san diego, ca usa 92123-1799  
tel (858) 565-8400 / fax (858) 268-9695  
www.interoceansystems.com  
email: support@interoceansystems.com  
CAL 1 = 17360

This unit OW 2 (S/N: 3/8) was calibrated on 02/24 using a 2 point Physical Load Calibration Procedure.

The two loads used were: 0 and 2430. This resulted in a slope of .48150 and an offset of -17540 for this unit.

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CAL 1 = 17540

This unit TC 1 (S/N: 1680) was calibrated on 2/24 using a 2 point Physical Load Calibration Procedure.

The two loads used were: 1000 and 8000. This resulted in a slope of 142276 and an offset of -14870 for this unit.

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CAL 1 49050

This unit TC 2 (S/N: 9/16) was calibrated on 2/24 using a 2 point Physical Load Calibration Procedure.

The two loads used were: 1000 and 9050. This resulted in a slope of 1.38944 and an offset of -14210 for this unit.

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CAL 1 52850