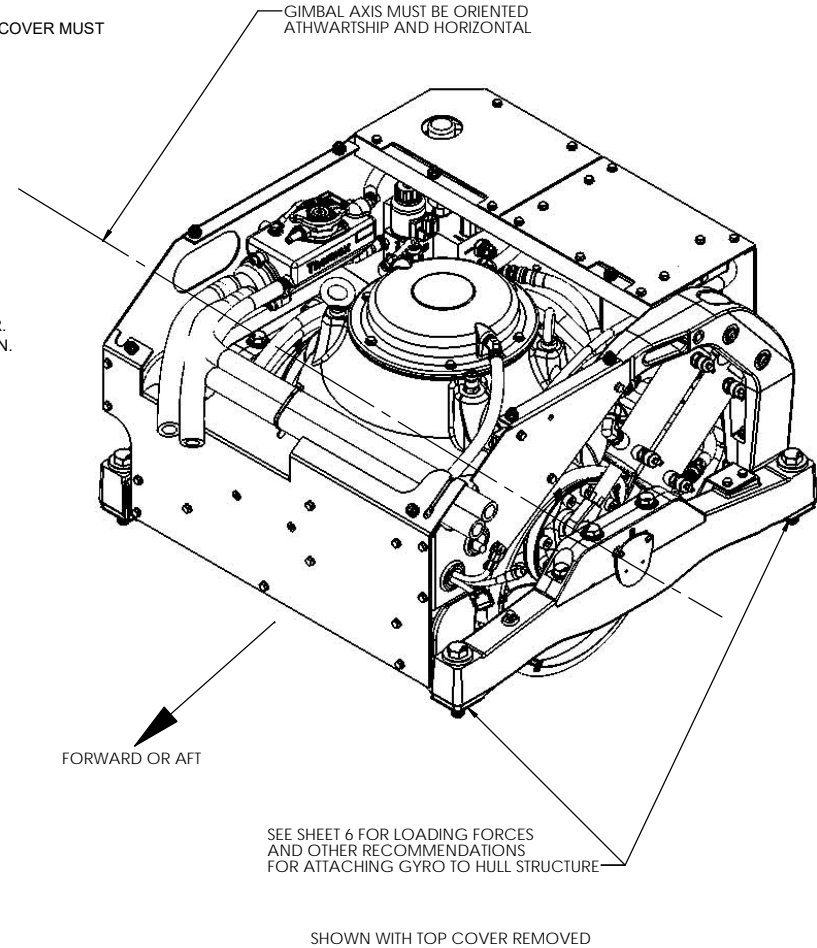
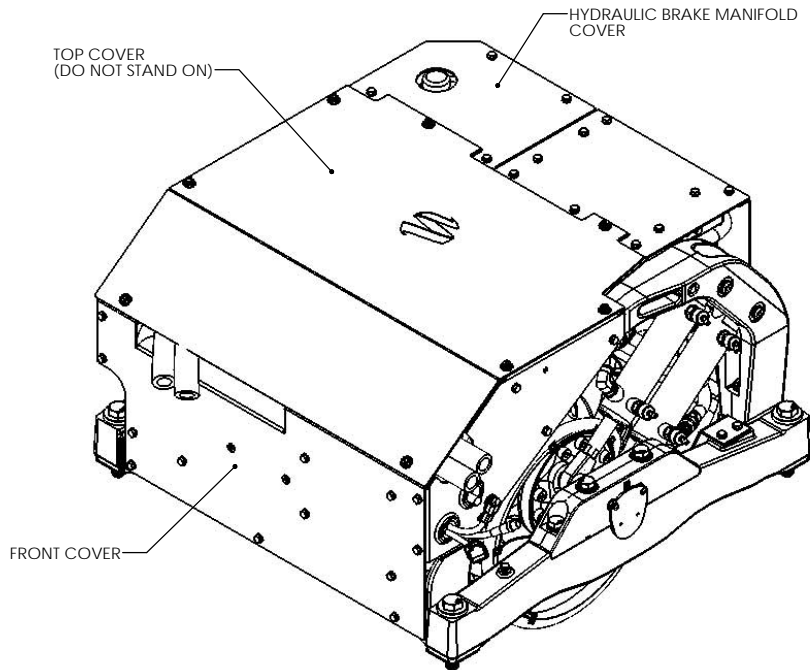


- NOTES:
- 1) SEE REFERENCES 1 THROUGH 5 FOR RELATED INSTALLATION MANUAL AND ELECTRICAL / ELECTRONIC AND COOLING CIRCUIT DRAWINGS.
 - 2) GYRO ASSEMBLY WEIGHT = 550LBS (250KG)
 - 3) RAW WATER COOLING REQUIREMENT IS 7.6 LPM (2 GPM) MINIMUM AND 22.7 LPM (6 GPM) MAXIMUM CONTINUOUS FLOW. PROVIDED CONNECTIONS ARE 19mm (3/4" INCH) HOSE BARB. USE OF RAW WATER STRAINER IS REQUIRED.
 - 4) TWO LIFTING EYES ARE PROVIDED ON THE TOP OF THE GYRO SPHERE FOR USE WITH A CHAIN/SPREADER BAR (SEE SHEET 3) TOP COVER MUST BE REMOVED TO ACCESS LIFTING EYES.
 - 5) COVERS ARE PROVIDED TO PREVENT PERSONNEL OR EQUIPMENT ENTANGLEMENT WHILE GYRO IS IN OPERATION. THESE COVERS ARE NOT TO BE STOOD ON OR TO HAVE ANYTHING STORED ON TOP OF. SEAKEEPER RECOMMENDS THE COVERS TO ALWAYS BE IN PLACE DURING OPERATION.
 - 6) THE GYRO MUST BE INSTALLED AFT OF AMIDSHIP TO MINIMIZE HIGH ACCELERATION LOADING DUE TO HULL/WAVE IMPACTS DURING OPERATION AT HIGH SPEED OR IN LARGE WAVES. GYRO DOES NOT NEED TO BE MOUNTED ON CENTERLINE OF KEEL. GYRO SUPPORT STRUCTURE MUST BE PARALLEL TO VESSEL WATERLINE.
 - 7) GYRO MAY BE INSTALLED FACING FORWARD OR AFT AS SHOWN. GYRO ORIENTATION SHOULD BE SELECTED TO PROVIDE THE MOST ACCESSABILITY FOR FUTURE SERVICE AND MAINTENANCE. INSTALLATION, START-UP, AND OPERATION IS THE SAME REGARDLESS OF GYRO ORIENTATION.
 - 8) WHEN INSTALLING GYRO SEAKEEPER RECOMMENDS USING A BOLT HOLE LOCATION FIXTURE #90362 AVAILABLE FROM SEAKEEPER. THIS FIXTURE WILL PROPERLY SPACE AND LOCATE HOLES TO BE DRILLED IN HULL STRUCTURE FOR BOLT-IN OF GYRO FOUNDATION. SEE REFERENCE 5 FOR DETAILS OF INSTALLATION PROCESS.

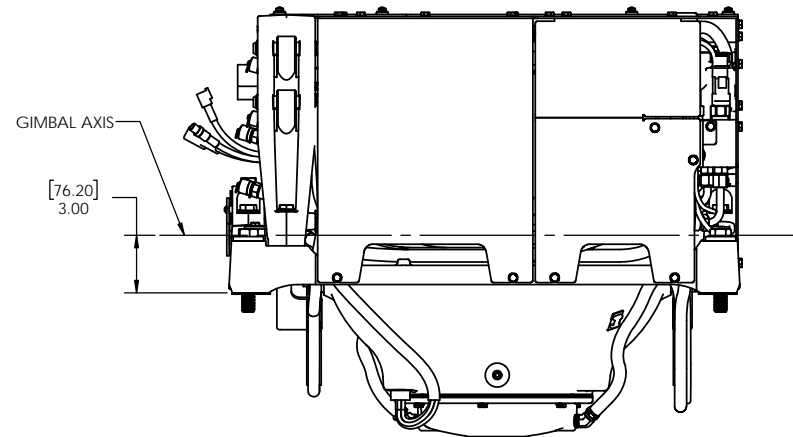
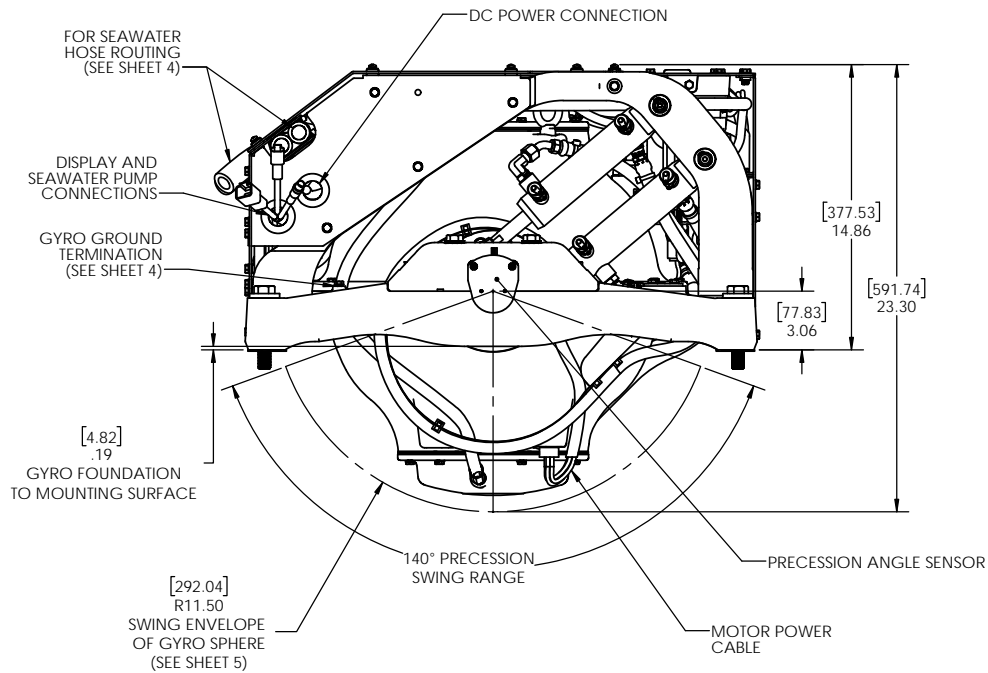
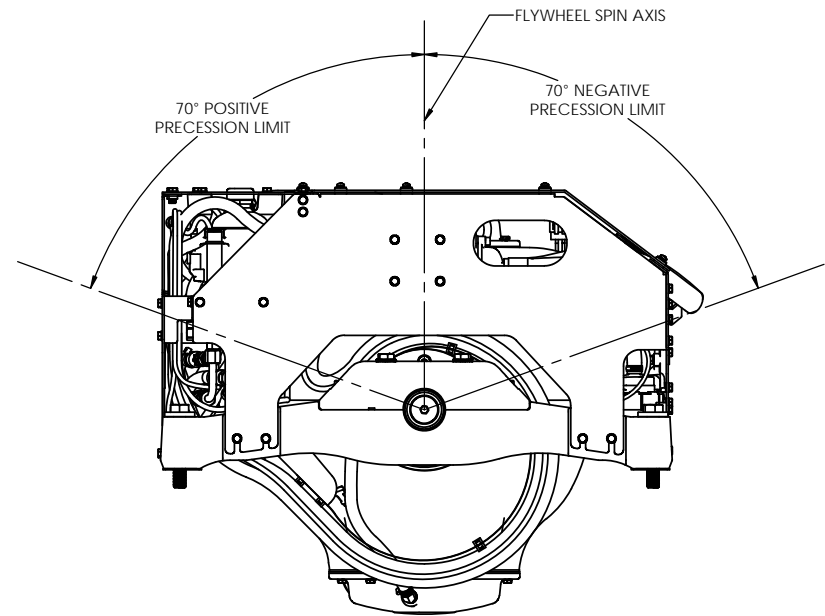
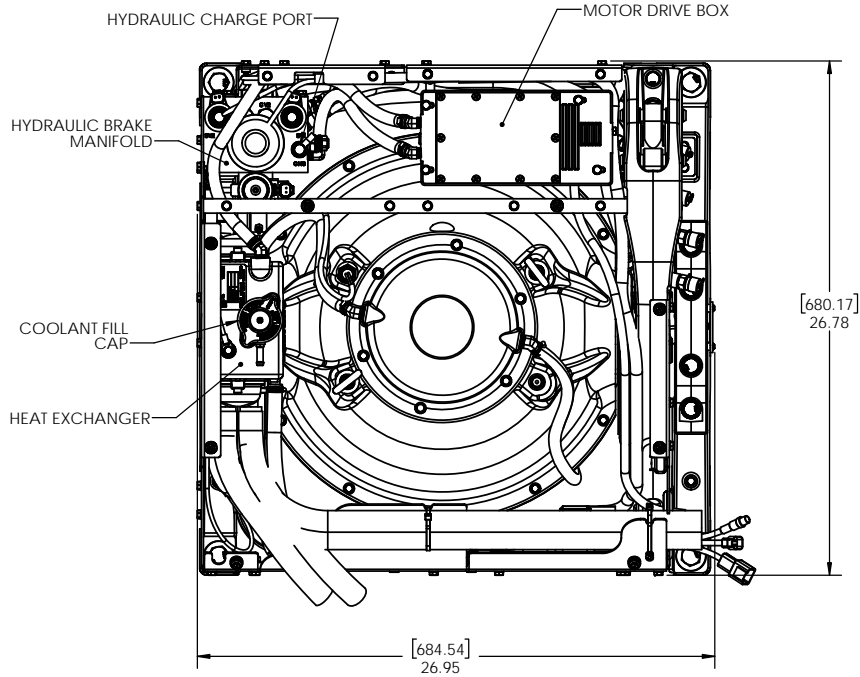
REV NO.	ECN NO.	ZONE	DESCRIPTION	DATE	APPRVD.
1			RELEASED FOR PRODUCTION	6/3/2016	NT



REF.	DWG. NO.	DWG. TITLE
1	90376	SEAKEEPER 3 GYRO COOLING WATER SCHEMATIC
2	90377	SEAKEEPER 3 CABLE BLOCK DIAGRAM
3	90231	OPERATOR DISPLAY ENVELOPE & MOUNTING DETAILS
4	90362	SEAKEEPER 3 GYRO INSTALLATION FIXTURE
5	90378	SEAKEEPER 3 GYRO INSTALLATION MANUAL

- SHEET 2: GYRO ENVELOPE DIMENSIONS**
SHEET 3: LIFTING DETAILS, SERVICE CLEARANCES, AND BOLT PATTERN
SHEET 4: SEAWATER HOSE CONNECTIONS
SHEET 5: RECOMMENDED HULL STRUCTURES/MOUNTING
SHEET 6: GYROSCOPIC LOADS FOR HULL STRUCTURE DESIGN

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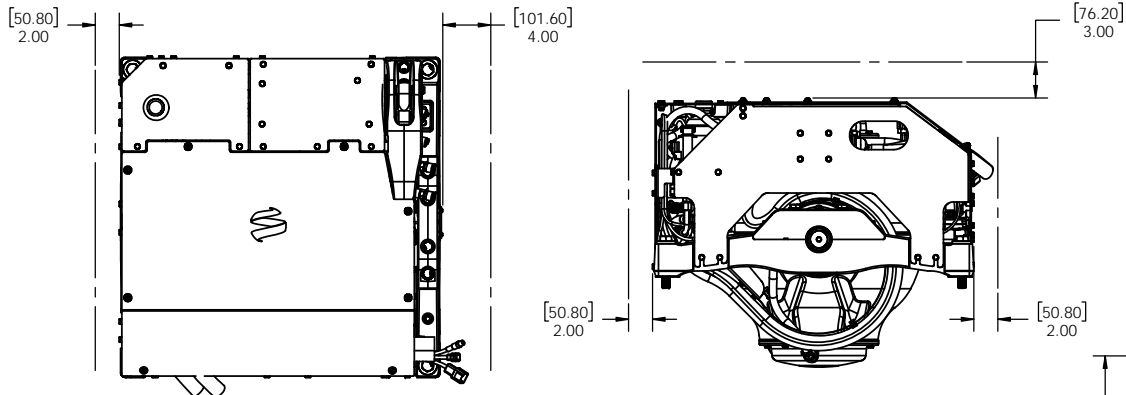
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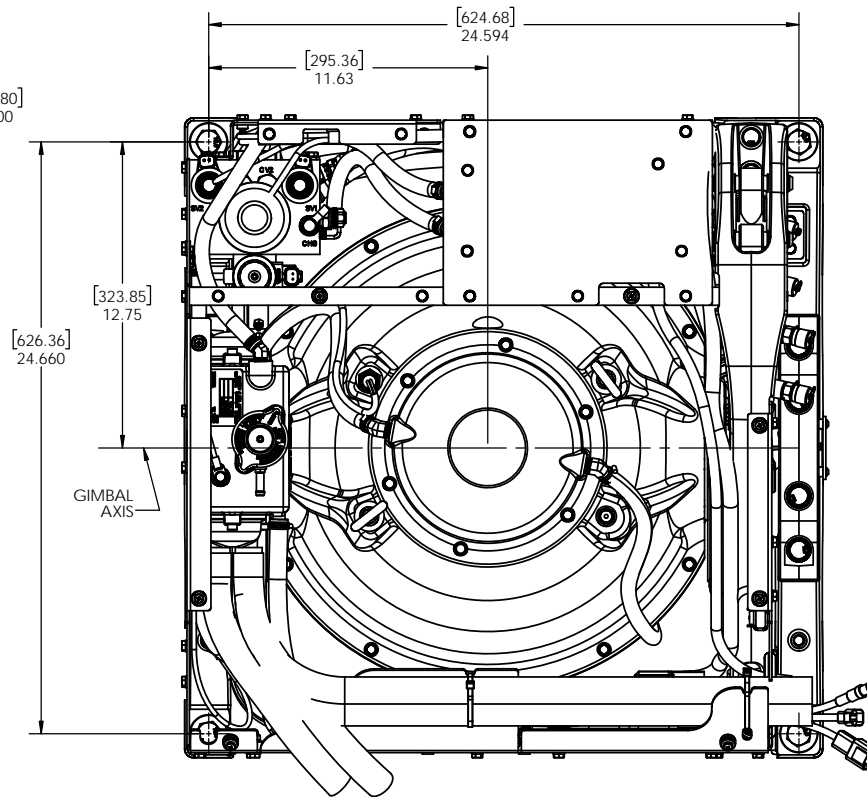
VIEWS SHOWING REQUIRED CLEARANCES AROUND GYRO FOR USE OF HAND TOOLS, EASE OF MAINTENANCE, INSTALLATION AND PROPER OPERATION.



MOUNTING BOLT PATTERN/DETAILS

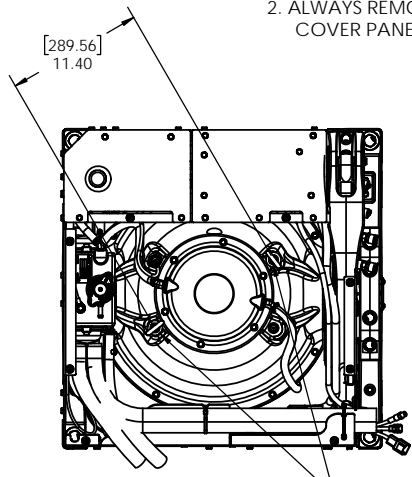
IF SIDE ACCESS IS NOT AVAILABLE TO THE MOUNTING BOLTS; THE MANIFOLD, TOP, AND FACE COVER PANELS MAY BE REMOVED. AN INSTALLATION FIXTURE IS AVAILABLE TO TRANSFER THE SEAKEEPER 3 BOLT PATTERN ON TO THE HULL STRUCTURE. (SEAKEEPER 3 INSTALLATION FIXTURE KIT P/N: 90362)

SEE SHEET 5 FOR HULL STRUCTURE CLEARANCE REQUIREMENTS



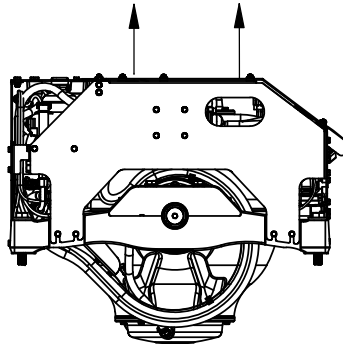
LIFTING DETAILS AND DIMENSIONS

- CAUTION:
1. ALWAYS USE A MINIMUM OF (2) LIFTING POINTS, NEVER LIFT THE GYRO FROM ONLY 1 LIFT POINT
 2. ALWAYS REMOVE THE TOP AND FACE COVER PANELS BEFORE LIFTING GYRO



LIFTING POINTS QTY (2)

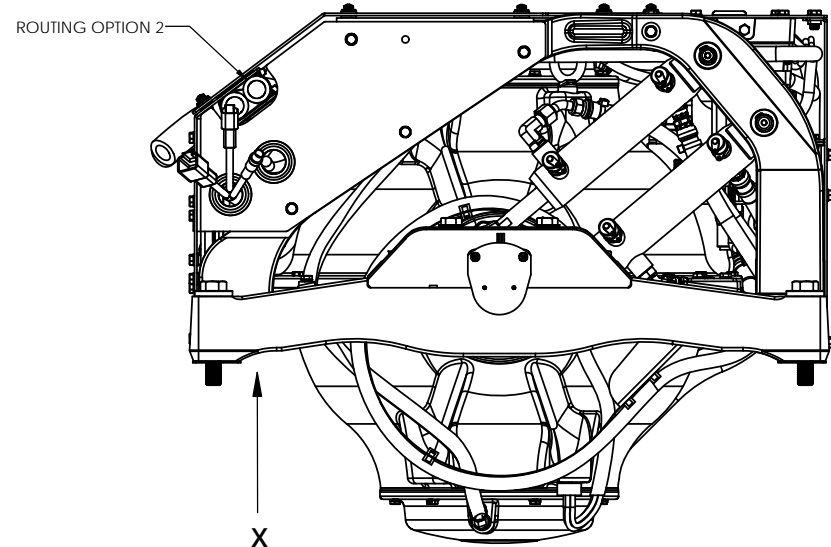
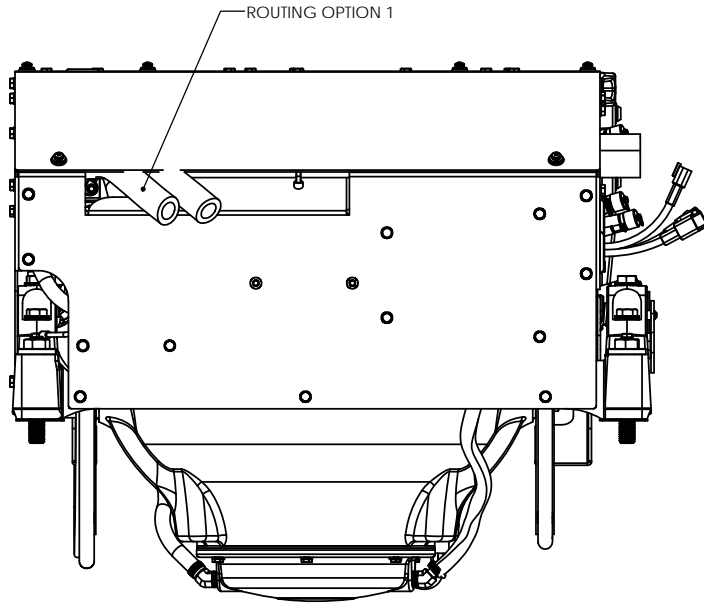
LIFT VERTICALLY USING A SPREADER BAR OR SIMILAR ARRANGEMENT



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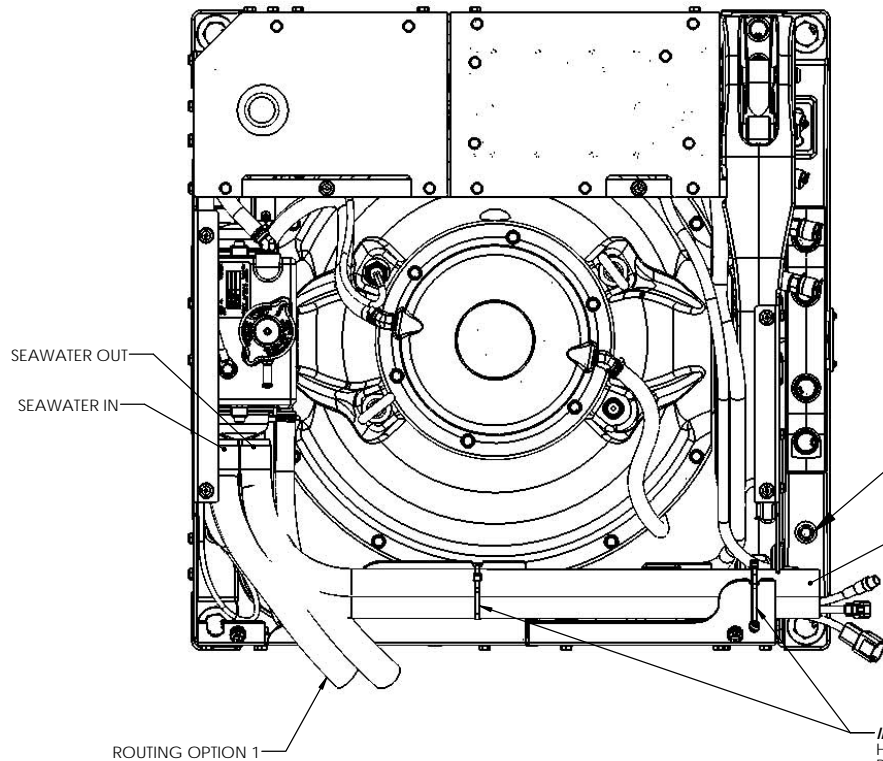
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X
DO NOT
ROUTE SEAWATER HOSES
FROM BOTTOM

- NOTES:
- 1) SEAWATER HOSE CONNECTIONS ARE 3/4 INCH HOSE BARB FITTINGS.
 - 2) THERE ARE 2 HOSE ROUTING OPTIONS RECCOMENDED. USE THE ROUTING THAT WORKS BEST FOR EACH INSTALLATION.
 - 3) DO NOT ROUTE HOSES UP FROM BOTTOM, FROM UNDERNEATH GYRO FOUNDATION.



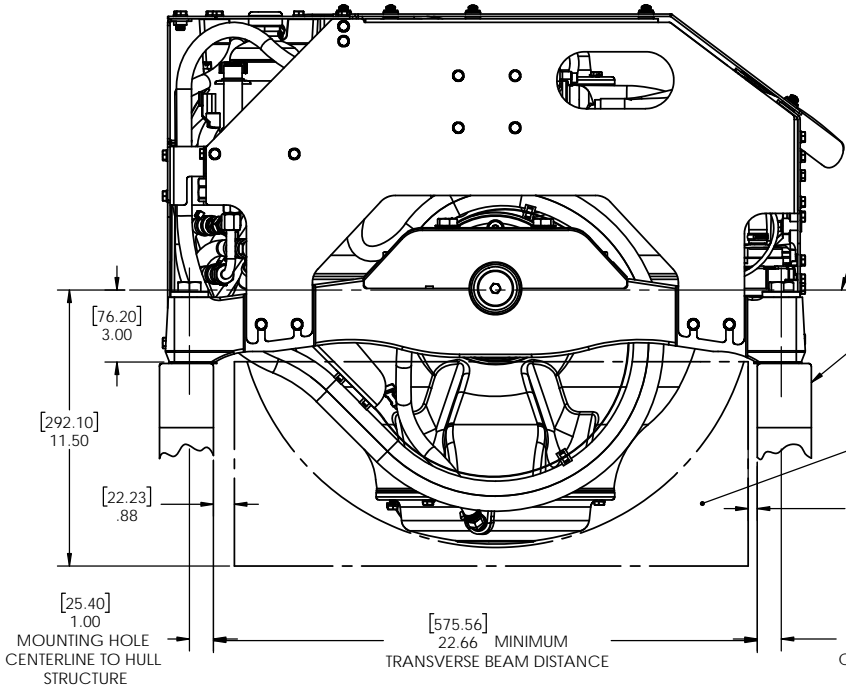
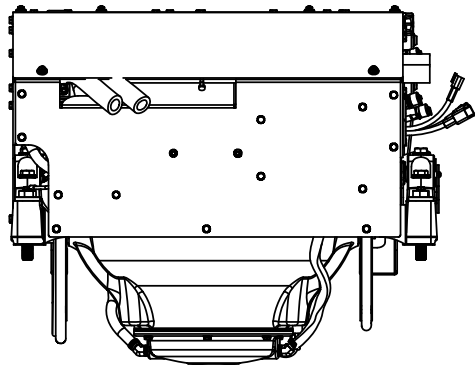
NOTE
M6-1.0 GROUND TERMINATION POINT.
INSTALLER IS RESPONSIBLE TO PROPERLY
GROUND GYRO TO VESSEL.

IMPORTANT! - USE WIRE TIES TO SECURE
HOSES TO FRONT PANEL WHEN USING
ROUTING OPTION 2.
ROUTE HOSES AS SHOWN.

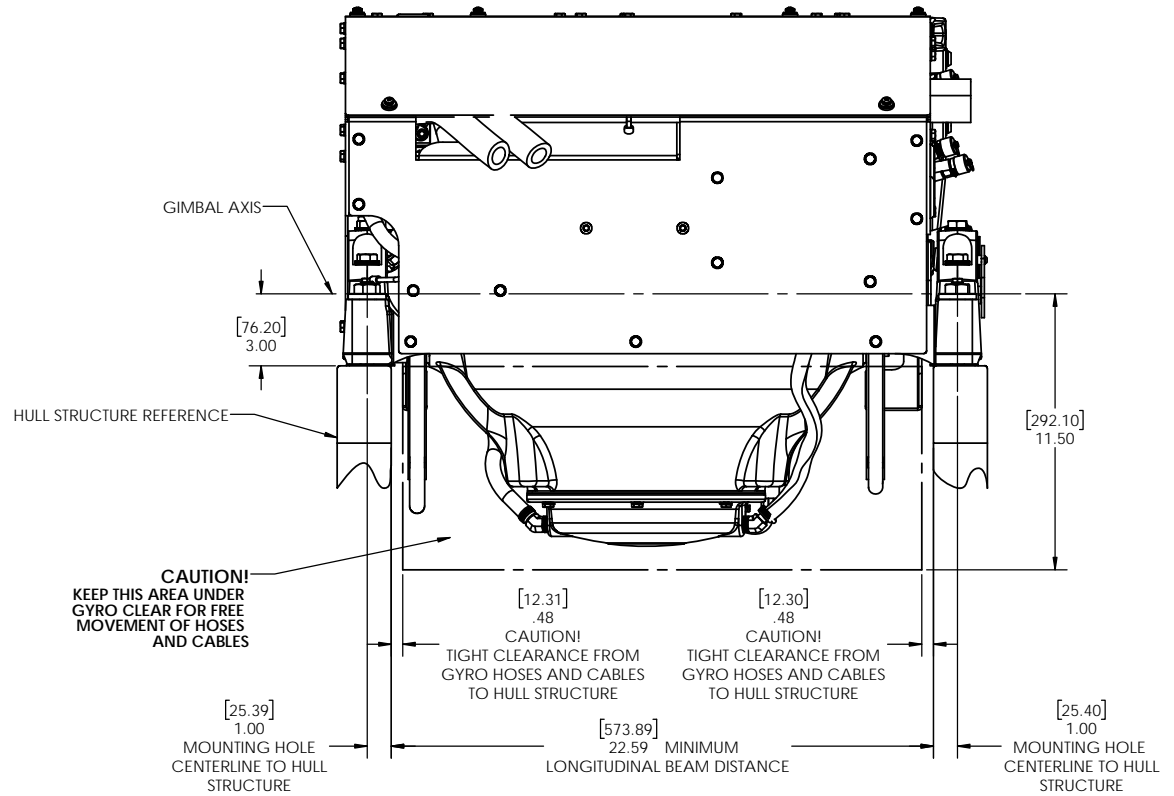
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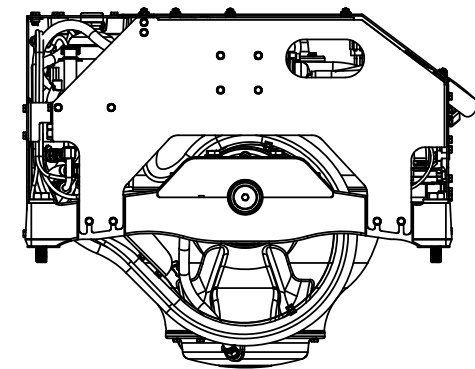
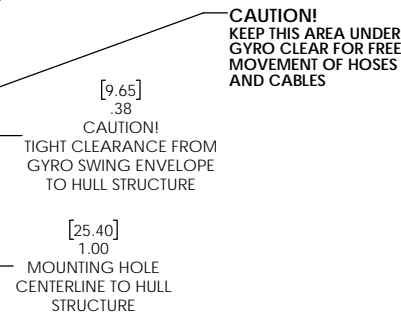
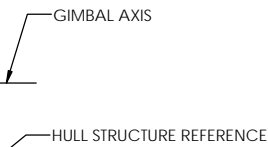
OPTION 1: TRANSVERSE BEAM INSTALLATION



OPTION 2: LONGITUDINAL BEAM INSTALLATION



CAUTION!
KEEP THIS AREA UNDER GYRO CLEAR FOR FREE MOVEMENT OF HOSES AND CABLES



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GYRO LOADS FOR HULL STRUCTURE DESIGN :

THE GYRO IS MOUNTED IN A RIGID FOUNDATION FRAME WHICH INCORPORATES SEMI-ELASTIC ANTI-VIBRATION ISOLATORS ENCASING THE GIMBAL BEARINGS THAT DAMPEN VIBRATIONS THAT COULD TRANSMIT INTO THE HULL STRUCTURE.

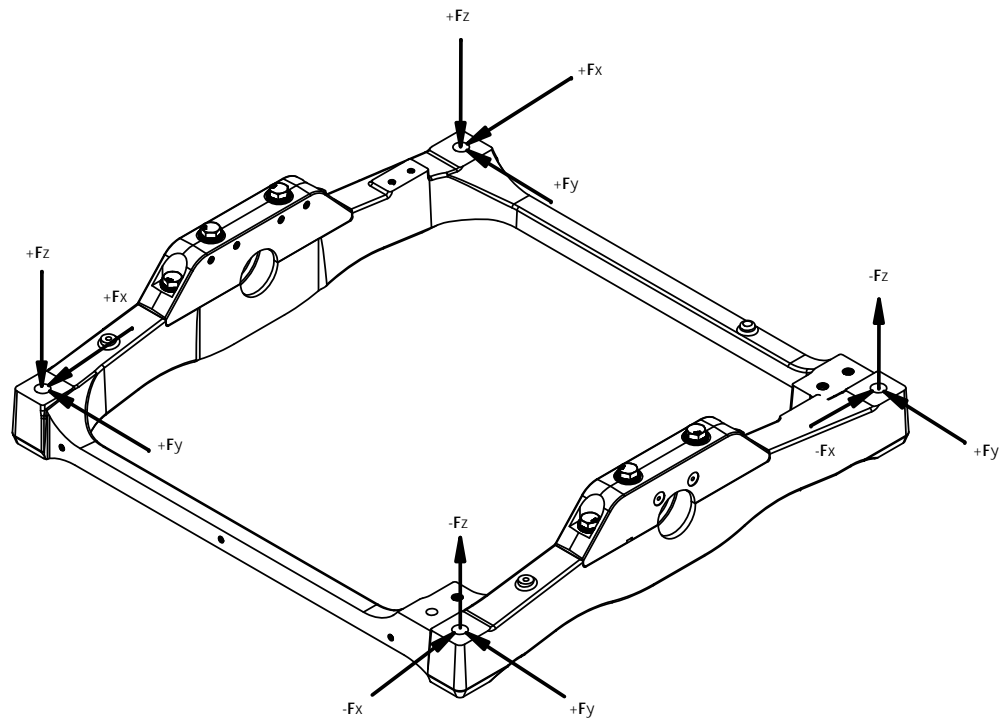
IF THE GYRO FOUNDATION IS BOLTED TO A NON-ALUMINUM, METAL HULL STRUCTURE AN ISOLATION GASKET MUST BE USED BETWEEN THE ALUMINUM FRAME AND THE HULL STRUCTURE SURFACE. SEAKEEPER ISOLATION GASKETS ARE INCLUDED IN THE SEAKEEPER 3 BOLT-IN KIT P/N: 90375. THE BOLTING SURFACE OF THE HULL STRUCTURE MUST BE FLAT SO THAT THE 4 CONTACT POINTS OF THE GYRO FRAME ARE TOUCHING THE HULL STRUCTURE SIMULTANEOUSLY WITH NO NOTICEABLE ROCKING. THE BOAT BUILDER OR GYRO INSTALLER IS RESPONSIBLE TO DESIGN AND BUILD A HULL STRUCTURE THAT WILL ENSURE A FLAT BOLT SURFACE AS TO AVOID ANY INDUCED STRESSES INTO THE FRAME CASTING ONCE BOLTED DOWN. SEAKEEPER RECOMMENDS A SURFACE FLATNESS WITHIN 1.5 MILLIMETERS.

THE GYRO GENERATES PITCH MOMENTS, ROLL MOMENTS, YAW MOMENTS, AND VERTICAL AND HORIZONTAL FORCES - THE MAGNITUDE OF WHICH IS CONTROLLED BY THE GYRO'S ACTIVE BRAKE SYSTEM. THESE GYRO GENERATED FORCES AND MOMENTS RESULT IN LOADS BEING APPLIED AT THE FOUR POINTS WHERE THE GYRO FRAME BOLTS TO THE TOP FACE OF THE HULL STRUCTURE. THE RESULTANT FORCES AT THESE POINTS ARE ILLUSTRATED ON THE ADJACENT FIGURE AND THE VALUES TO BE USED FOR HULL STRUCTURE DESIGN ARE SUMMARIZED BELOW:

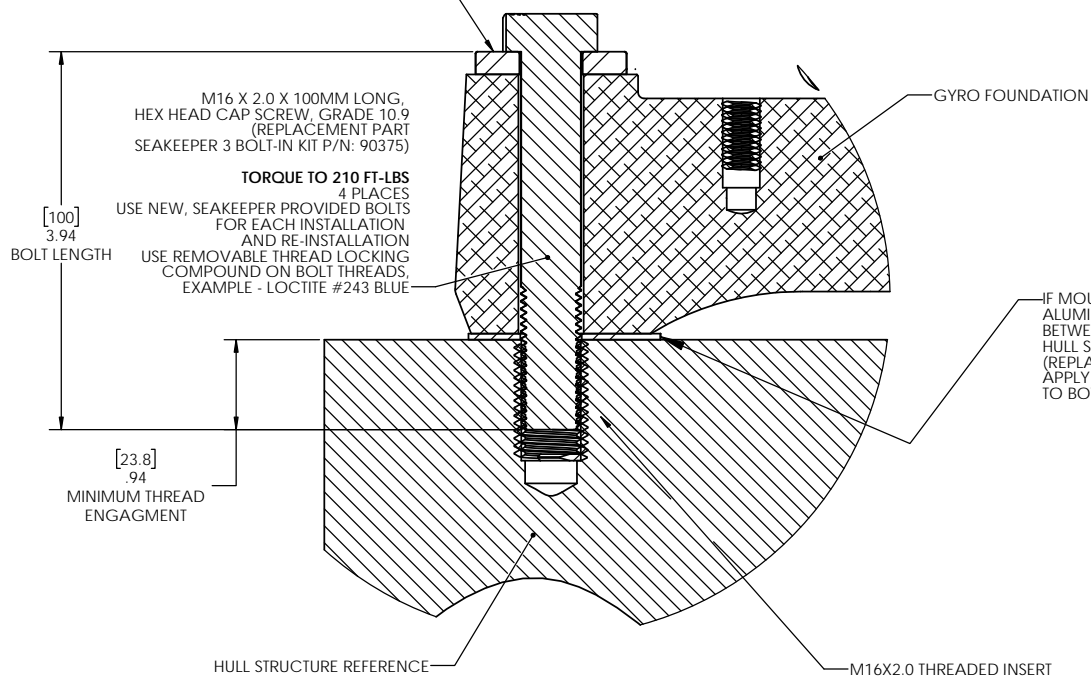
VERTICAL FORCE (Fz) = 1,934 lbs (8.60 kN)
 LONGITUDINAL FORCE (Fx) = 1,224 lbs (5.44 kN)
 LATERAL FORCE (Fy) = 150 lbs (0.67 kN)

THESE FORCES SHOULD BE CONSIDERED TO BE ACTING SIMULTANEOUSLY, FULLY REVERSING IN BOTH DIRECTIONS, AND WILL REPEAT AN INFINITE NUMBER OF TIMES. THESE FORCES DO NOT INCLUDE VESSEL MOTION ACCELERATIONS OR VERTICAL SLAM LOADS WHICH CAN BE HIGH FOR HIGHER SPEED VESSELS.

THE BOAT BUILDER OR THE GYRO INSTALLER IS RESPONSIBLE FOR DESIGNING THE HULL STRUCTURE TO WHICH THE GYRO IS ATTACHED TO ACCOMMODATE THE ABOVE FORCES AND MOMENTS PLUS A REASONABLE FACTOR OF SAFETY. SEAKEEPER SUGGESTS A SAFETY FACTOR OF 3.0 (YIELDING A SAFETY MARGIN OF 2.0) THIS FACTOR OF SAFETY MAY NEED TO BE INCREASED DEPENDING ON THE OPERATIONAL PROFILE OF THE VESSEL IN WHICH THE GYRO IS TO BE INSTALLED.



AN OVERSIZED FLAT WASHER MUST BE USED WHEN MOUNTING THE SEAKEEPER 3 (REPLACEMENT PART SEAKEEPER 3 BOLT-IN KIT P/N: 90375)



M16 X 2.0 X 100MM LONG, HEX HEAD CAP SCREW, GRADE 10.9 (REPLACEMENT PART SEAKEEPER 3 BOLT-IN KIT P/N: 90375)

TORQUE TO 210 FT-LBS

4 PLACES USE NEW, SEAKEEPER PROVIDED BOLTS FOR EACH INSTALLATION AND RE-INSTALLATION USE REMOVABLE THREAD LOCKING COMPOUND ON BOLT THREADS, EXAMPLE - LOCTITE #243 BLUE

IF MOUNTING GYRO TO A METAL SURFACE OTHER THAN ALUMINUM, AN ISOLATION GASKET MUST BE USED BETWEEN THE GYRO'S FRAME AND THE HULL STRUCTURE TO PREVENT GALVANIC CORROSION. (REPLACEMENT PART SEAKEEPER 3 BOLT IN-KIT P/N: 90375) APPLY A FILM OF MARINE GRADE, POLY-SULFIDE SEALANT TO BOTH SIDES.

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