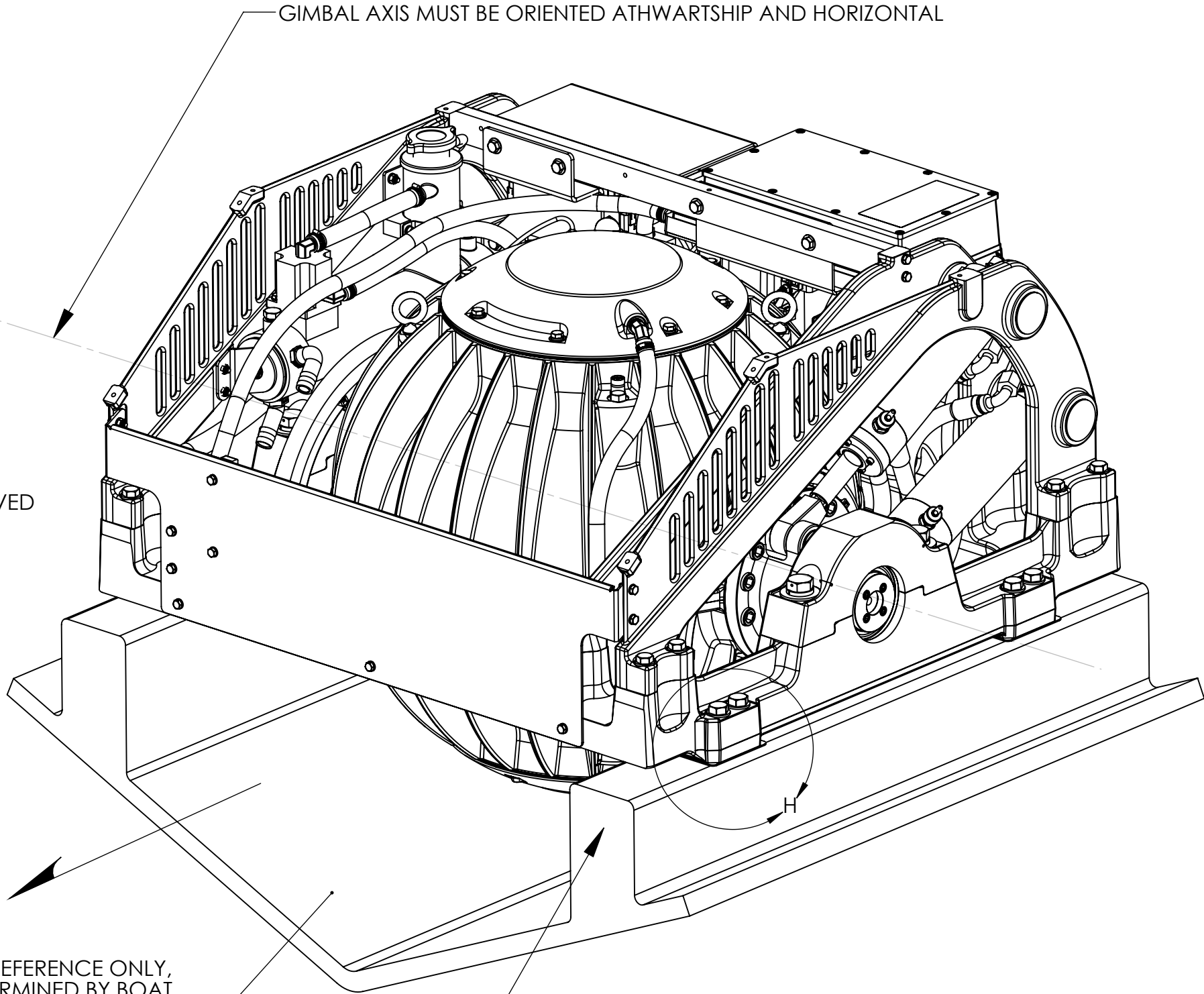
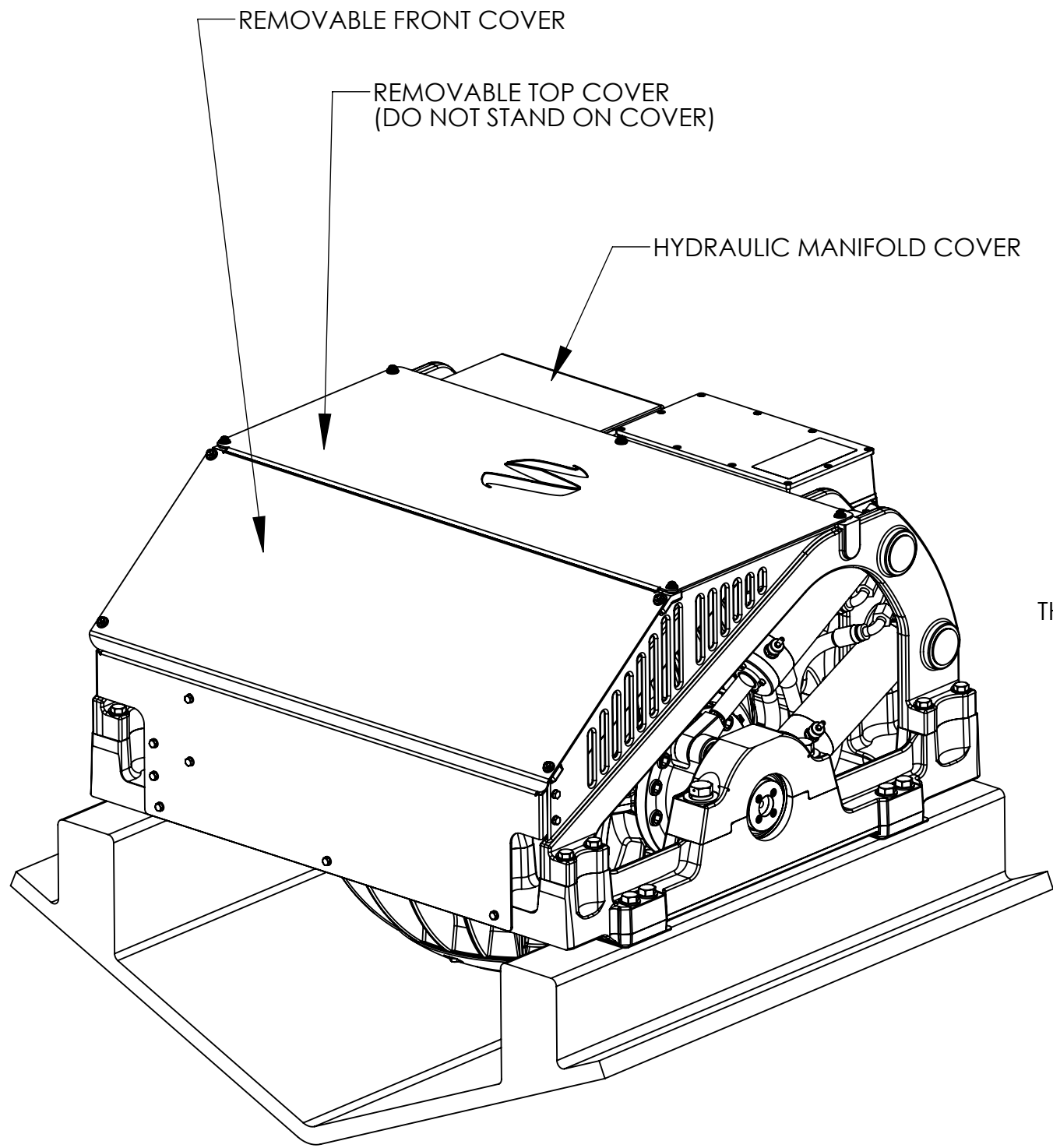


- NOTES:
- 1) SEE REFERENCES 1 THROUGH 5 FOR RELATED INSTALLATION MANUAL AND ELECTRICAL / ELECTRONIC AND COOLING CIRCUIT DRAWINGS.
  - 2) GYRO ASSEMBLY WEIGHT WITH FLUIDS = 1,210 LBS. (549 Kg)
  - 3) RAW WATER COOLING REQUIREMENT IS 15 LPM (4 GPM) MINIMUM AND 30 LPM (8 GPM) MAXIMUM CONTINUOUS FLOW. PROVIDED 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 4) 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 # 90237 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	0174		RELEASED FOR PRODUCTION	03/03/2014	RSK
2		SHT 5	REVISED SECTION K-K ON SHEET 5, REMOVED TAPPED INSERT BAR IN STRUCTURE REFERENCE	10/10/2014	RSK
3	0272	SHT 2	REVISED REAR VIEW ON SHEET 2, RE-DIMENSIONED HOSE CLEARANCE AREA	1/28/2015	RSK
4	0323		SEAKEEPER BRANDING CHANGE	5/18/2015	SAC
5	466		ADDED 7HD TO TITLE BLOCK DESCRIPTION	12/7/2016	BRD



REF.	DWG. NO.	DWG. TITLE
1	90251	SEAKEEPER 9 GYRO COOLING WATER SCHEMATIC
2	90257	SEAKEEPER 9 GYRO CABLE BLOCK DIAGRAM
3	90337	OPERATOR DISPLAY ENVELOPE & MOUNTING DETAILS
4	90237	SEAKEEPER 9 GYRO INSTALLATION FIXTURE KIT
5	90222	SEAKEEPER 9 GYRO INSTALLATION MANUAL

- SHEET 2 - GYRO FOUNDATION DIMENSIONS.**
- SHEET 3 - RECOMMENDED CLEARANCES TO HULL STRUCTURE.**
- SHEET 4 - RECOMMENDED LIFTING POINTS.**
- SHEET 5 - GYRO LOADS FOR HULL STRUCTURE DESIGN.**

WEIGHT - LBS : ---

MATERIAL: ---

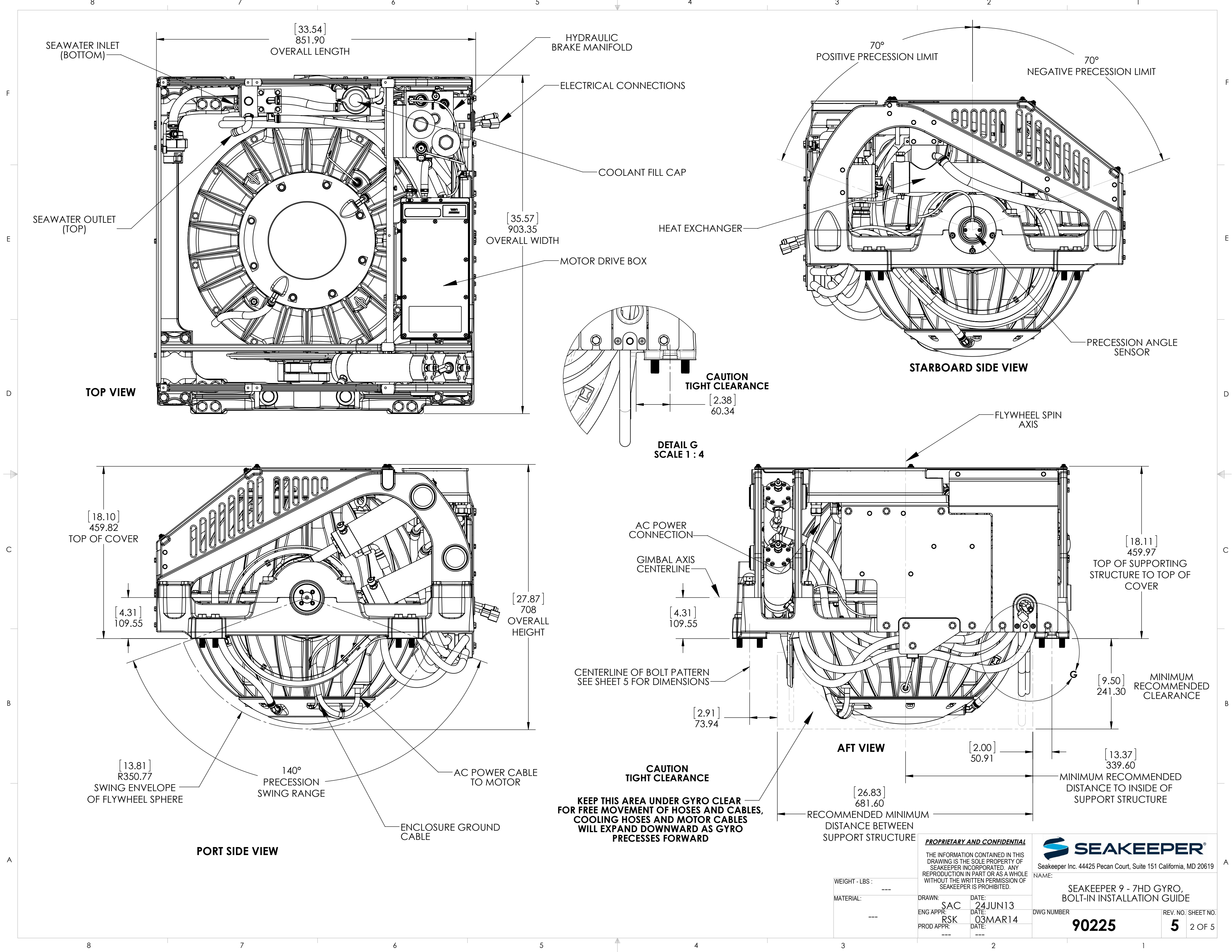
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DATE: 03MAR14  
DATE: ---



NAME: SEAKEEPER 9 - 7HD GYRO, BOLT-IN INSTALLATION GUIDE  
DWG NUMBER: 90225  
REV. NO.: 5  
SHEET NO.: 1 OF 5



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WEIGHT - LBS : ---

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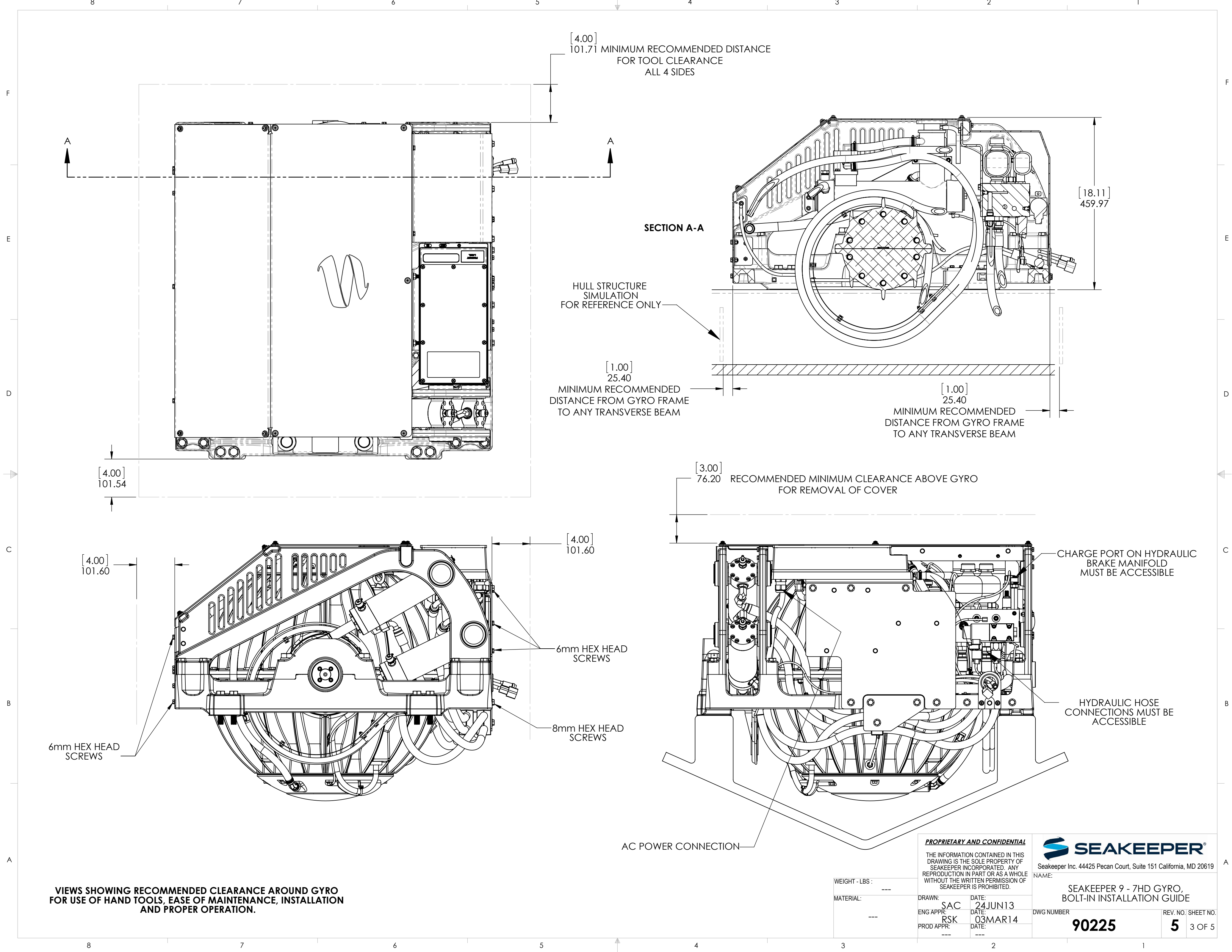
DRAWN: SAC DATE: 24JUN13

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DWG NUMBER 90225

REV. NO. SHEET NO. 5 2 OF 5



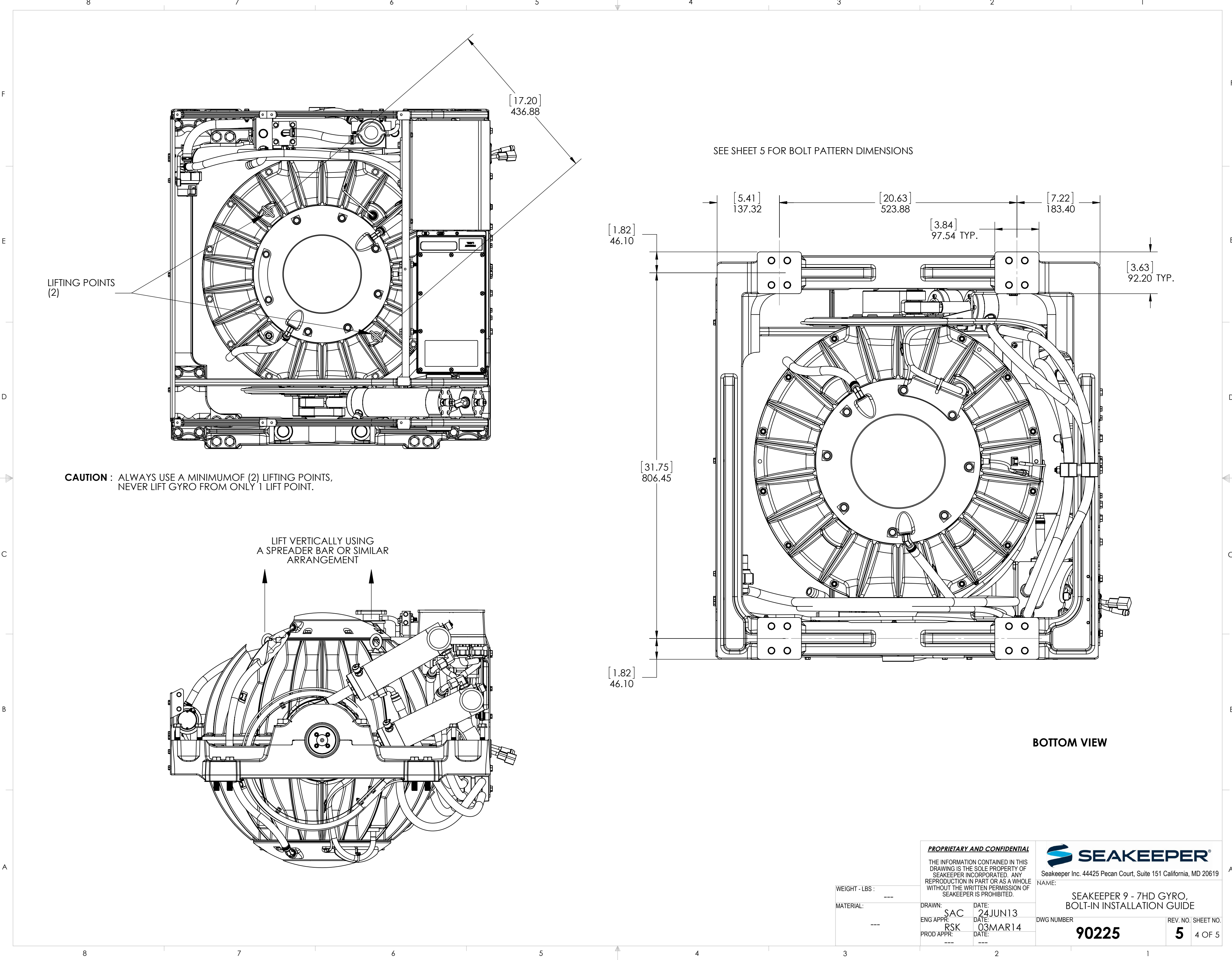
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DATE: 24JUN13  
DATE: 03MAR14  
DATE: ---

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DWG NUMBER: 90225  
REV. NO.: 5  
SHEET NO.: 3 OF 5



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NAME:

SEAKEEPER 9 - 7HD GYRO,  
BOLT-IN INSTALLATION GUIDE

DWG NUMBER

90225

REV. NO. SHEET NO.

5 4 OF 5

WEIGHT - LBS :

MATERIAL:

DRAWN:

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GYRO LOADS FOR HULL STRUCTURE DESIGN :

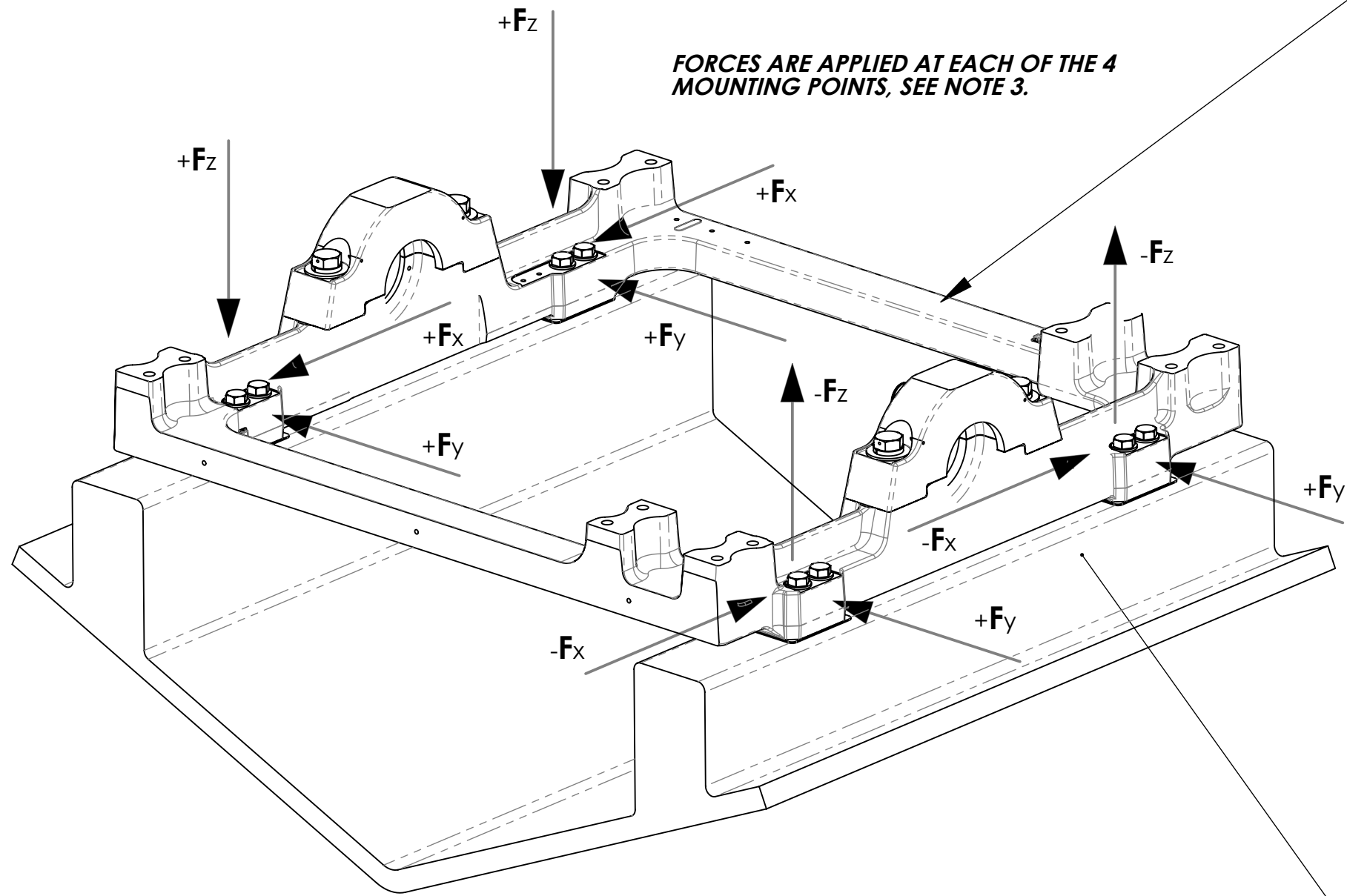
- (1) THE GYRO IS MOUNTED IN A RIGID FOUNDATION FRAME WHICH INCORPORATES SEMI-ELASTIC ANTI-VIBRATION ISOLATORS ENCASING THE GIMBAL BEARINGS THAT DAMPEN VIBRATIONS THAT COULD TRANSMIT INTO THE HULL STRUCTURE.
- (2) THE GYRO FOUNDATION FRAME IS BOLTED DIRECTLY TO THE HULL STRUCTURE. BE SURE TO USE THE FURNISHED ISOLATION GASKETS IF HULL STRUCTURE MATERIAL IS A DIS-SIMILAR METAL AS THE GYRO FRAME. 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.
- (3) 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) = 3,842 LBS. (17.09 kN) - (**APPLIED AT EACH OF THE 4 MOUNTING POINTS.**)  
LONGITUDINAL FORCE (Fx) = 2,280 LBS. (10.14 kN) - (**APPLIED AT EACH OF THE 4 MOUNTING POINTS.**)  
LATERAL FORCE (Fy) = 303 lbs. (1.348 kN) - (**APPLIED AT EACH OF THE 4 MOUNTING POINTS.**)

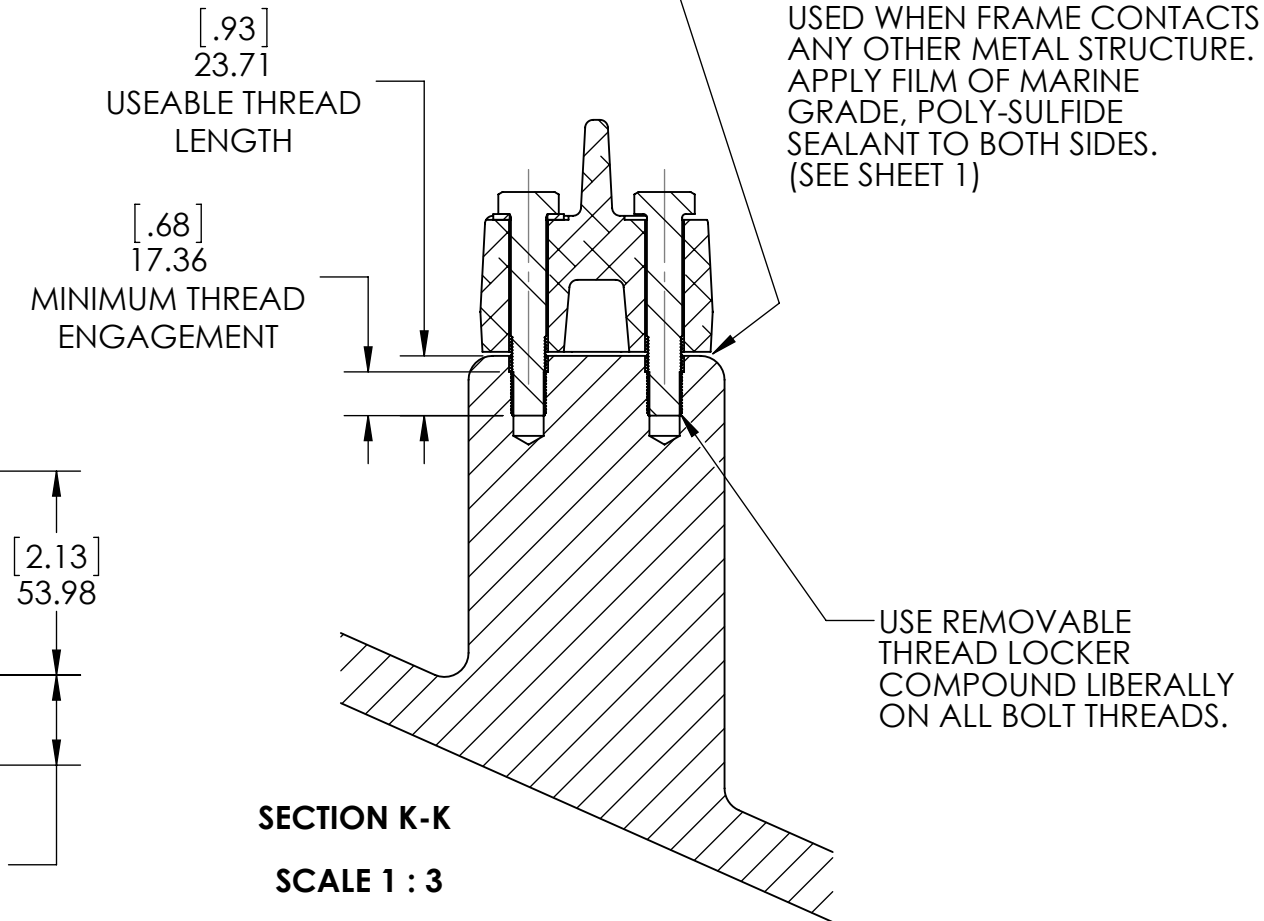
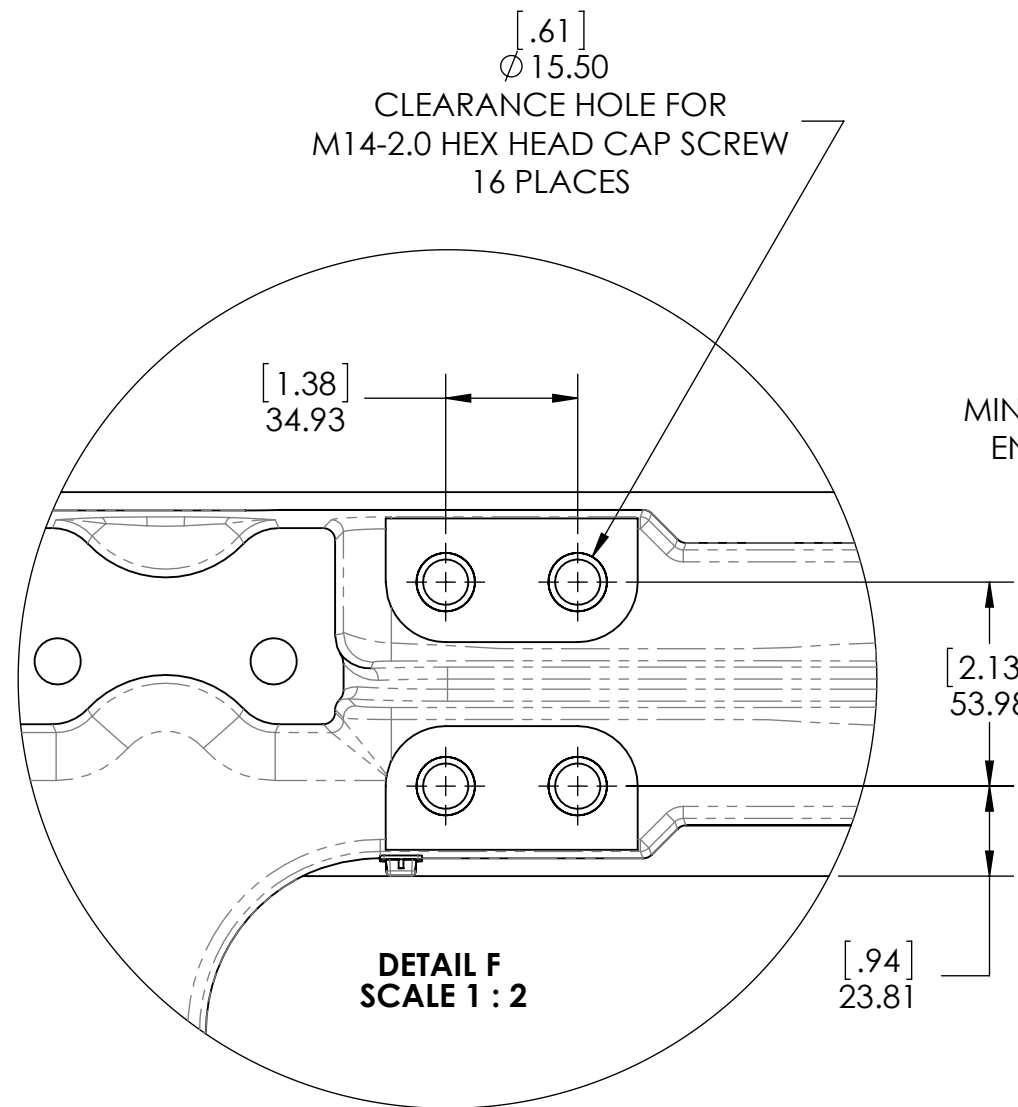
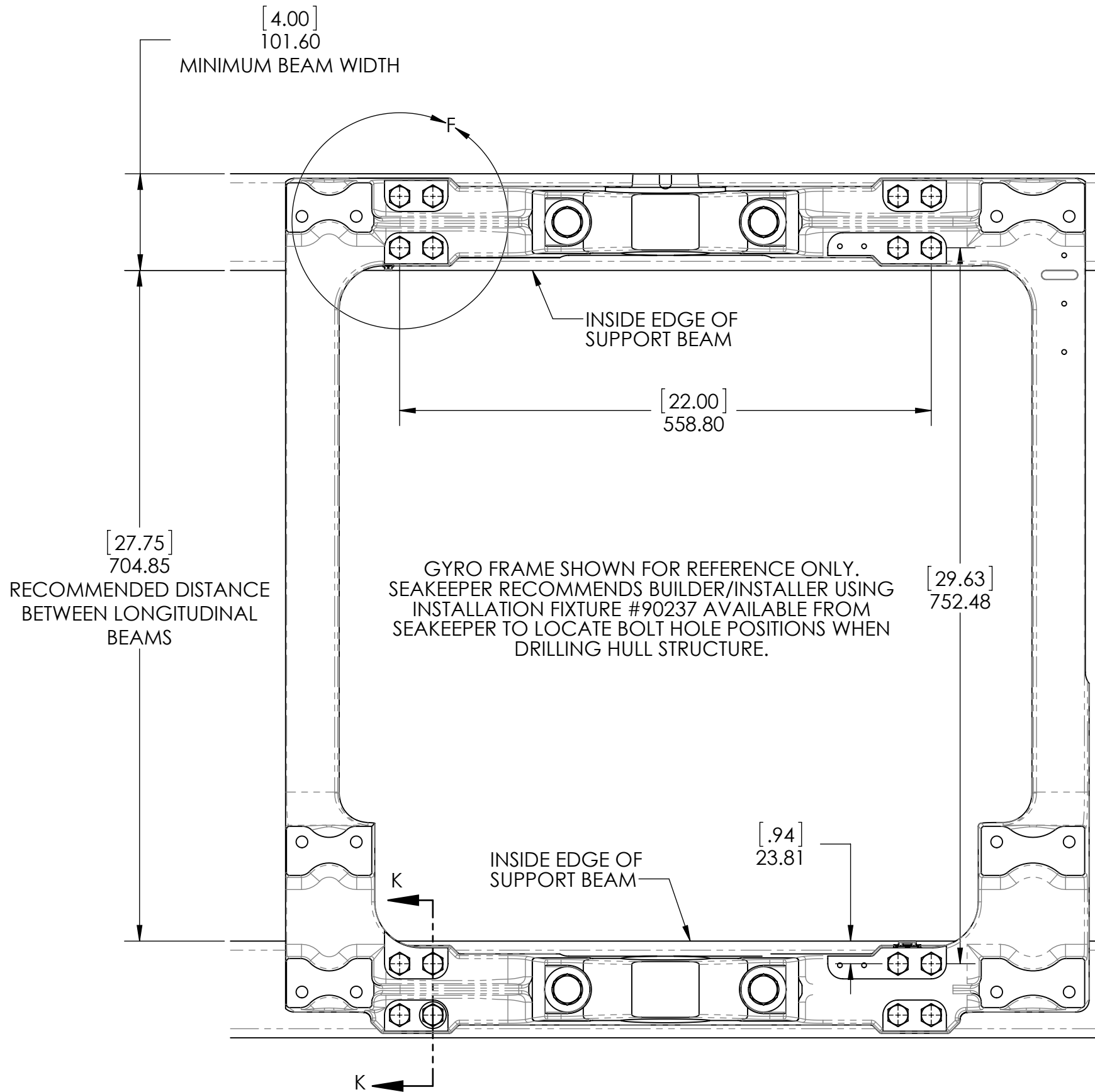
THESE FORCES SHOULD BE CONSIDERED TO BE ACTING SIMULTANEOUSLY, FULLY REVERSING IN BOTH DIRECTIONS, AND WILL REPEAT AN INFINITE NUMBER OF TIMES.

- (4) 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)

THE GYRO FRAME IS BOLTED TO HULL STRUCTURE USING M14-2.0 ZINC PLATED, ALLOY STEEL, HEX HEAD CAP SCREWS, GRADE 8.8, 16 PLACES. SEAKEEPER PROVIDES THIS HARDWARE AT A STANDARD LENGTH OF 80mm FOR MOST FIBERGLASS HULL APPLICATIONS. ANY OTHER APPLICATIONS THAT REQUIRE LONGER HARDWARE DUE TO FIBERGLASS THICKNESS, MUST BE PROVIDED BY INSTALLER. **RECOMMENDED TORQUE VALUE** = 100 FT/LBS (135.6 Nm) USING REMOVEABLE THREAD LOCKER ON BOLT THREADS AND MARINE SEALANT UNDER FLAT WASHERS.



SHOWN FOR REFERENCE ONLY, ACTUAL STRUCTURE DESIGN TO BE DETERMINED BY BOAT MANUFACTURER OR GYRO INSTALLER. **SUPPORT STRUCTURE MUST BE PARALLEL WITH WATERLINE.** SEE NOTE 6, SHEET 1



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DWG NUMBER 90225 REV. NO. SHEET NO. 5 5 OF 5

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