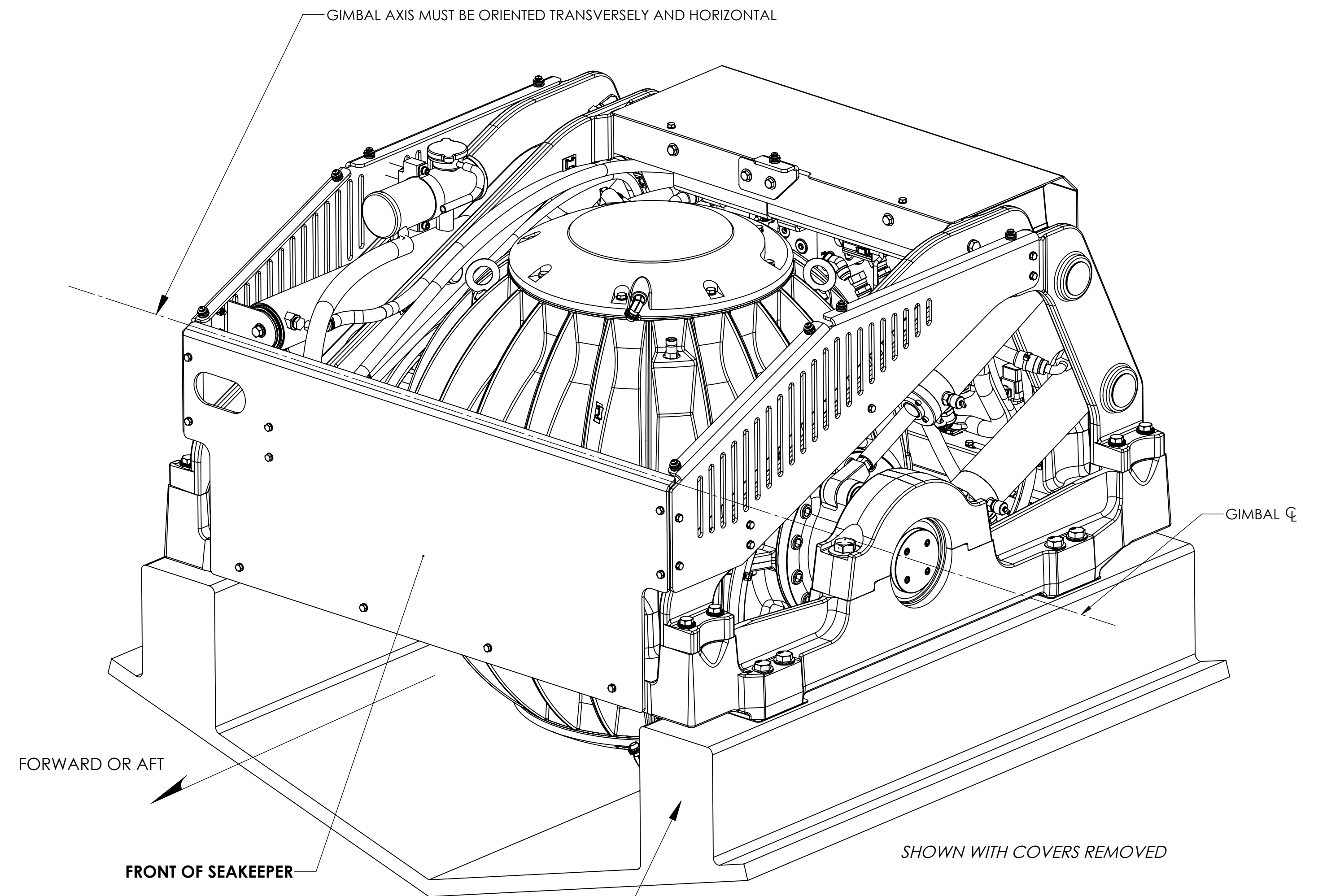
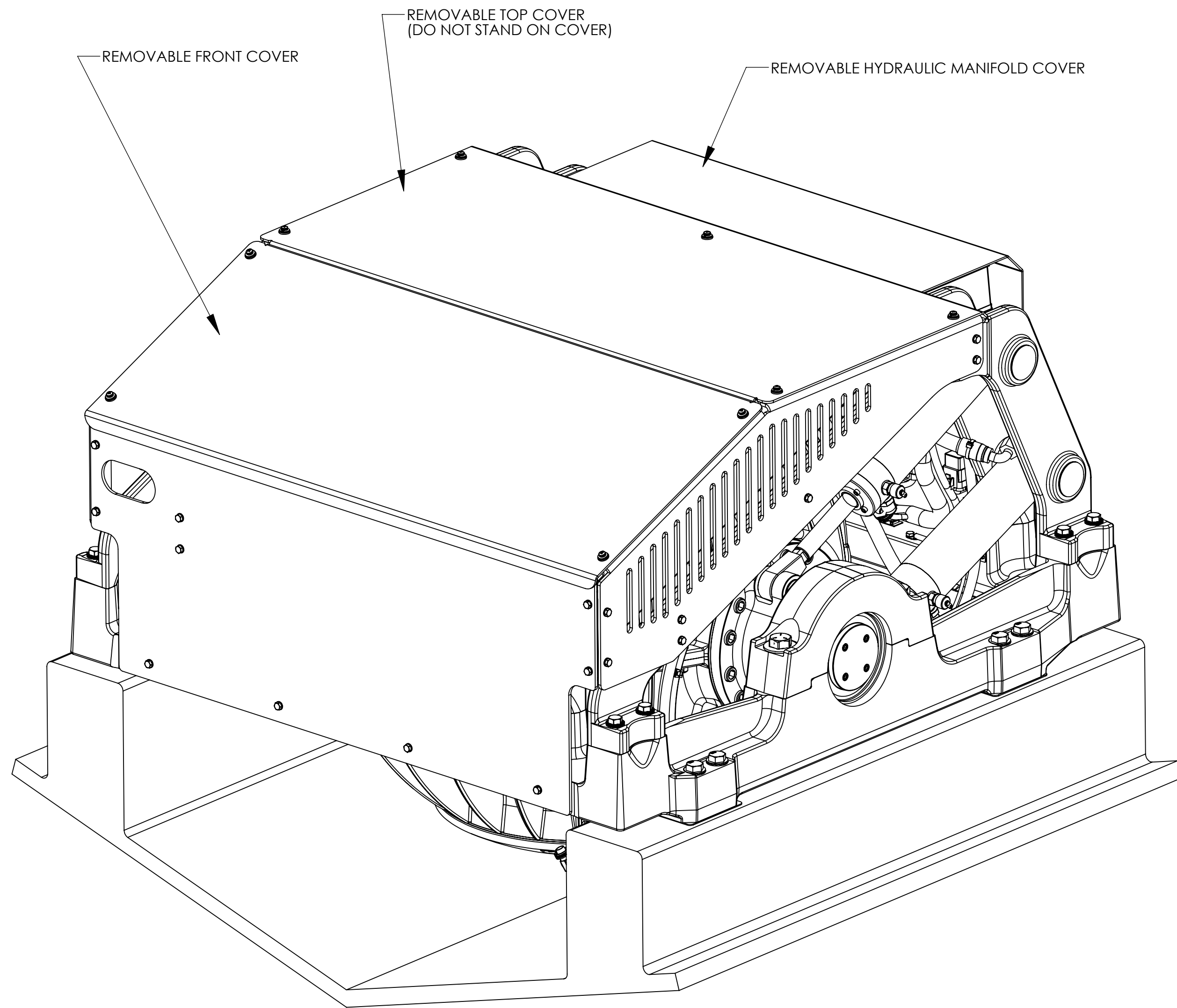


NOTES:

- 1) SEE REFERENCES 1 THROUGH 7 FOR RELATED INSTALLATION MANUAL AND ELECTRICAL / ELECTRONIC AND COOLING CIRCUIT DRAWINGS.
- 2) SEAKEEPER 18 ASSEMBLY WEIGHT = 2,460 LBS. ( 1,115.8 Kg ) / ESTIMATED WEIGHT
- 3) RAW WATER COOLING REQUIREMENT IS BETWEEN 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 SEAKEEPER SPHERE FOR USE WITH A 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 SEAKEEPER 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) SEAKEEPER IS RECOMMENDED TO BE INSTALLED AFT OF AMIDSHIP TO MINIMIZE VERTICAL HIGH ACCELERATION LOADING DUE TO HULL/WAVE IMPACTS DURING OPERATION AT HIGH SPEED OR IN LARGE WAVES. SEAKEEPER DOES NOT NEED TO BE MOUNTED ON CENTERLINE. SEAKEEPER SUPPORT STRUCTURE MUST BE PARALLEL TO VESSEL WATERLINE.
- 7) SEAKEEPER MAY BE INSTALLED FACING FORWARD OR AFT AS SHOWN. SEAKEEPER ORIENTATION SHOULD BE SELECTED TO PROVIDE THE MOST ACCESSABILITY FOR FUTURE SERVICE AND MAINTENANCE. INSTALLATION, START-UP, AND OPERATION IS THE SAME REGARDLESS OF SEAKEEPER ORIENTATION.
- 8) WHEN INSTALLING, SEAKEEPER RECOMMENDS USING INATALLATION TEMPLATE, #90282. THIS FIXTURE WILL PROPERLY SPACE AND LOCATE HOLES TO BE DRILLED IN HULL STRUCTURE FOR BOLT-IN OF SEAKEEPER FOUNDATION.

REV NO.	ECN NO.	ZONE	DESCRIPTION	DATE	APPRVD.
1	0757	---	INITIAL RELEASE	12/12/2019	WMG
2	0844	SHT5, F5 SHT5, C4	UPDATED "SEAKEEPER RECOMMENDS USING A THREAD LOCKING COMPOUND SUCH AS ANTI-SEIZE" TO "APPLY A MODERATE COAT OF MARINE ANTI-SEIZE ON ALL BOLTS"	8/19/2020	WMG
3	0803		UPDATED OVERALL WEIGHT AND REFERENCES ON SHT 1, ADDED SHT 5 IN-FIELD BRG REPLACEMENT CLEARANCES, ADDED BOLT-IN KIT DETAILS ON SHT 6.	6/4/2021	EMS



THIS HULL STRUCTURE SHOWN FOR VISUAL REFERENCE ONLY. ACTUAL STRUCTURE DESIGN TO BE DETERMINED BY BOAT MANUFACTURER OR SEAKEEPER INSTALLER. **SEE NOTE 6.** SEE SHEET 6 FOR LOADING FORCES AND OTHER RECOMMENDATIONS FOR ATTACHING SEAKEEPER TO HULL STRUCTURE.

REF.	DWG. NO.	DWG. TITLE
1	90540	SEAKEEPER 16/18 COOLING WATER SCHEMATIC
2	90679	SEAKEEPER 18 CABLE BLOCK DIAGRAM
3	90438	OPERATOR DISPLAY ENVELOPE AND MOUNTING DETAILS
4	90282	SEAKEEPER 16/18 INSTALLATION FIXTURE KIT
5	90672	SEAKEEPER 18 INSTALLATION MANUAL
6	90548	SEAKEEPER 16/18 BOLT-IN KIT
7	90648	SEAKEEPER 16/18 THRU-BOLT KIT

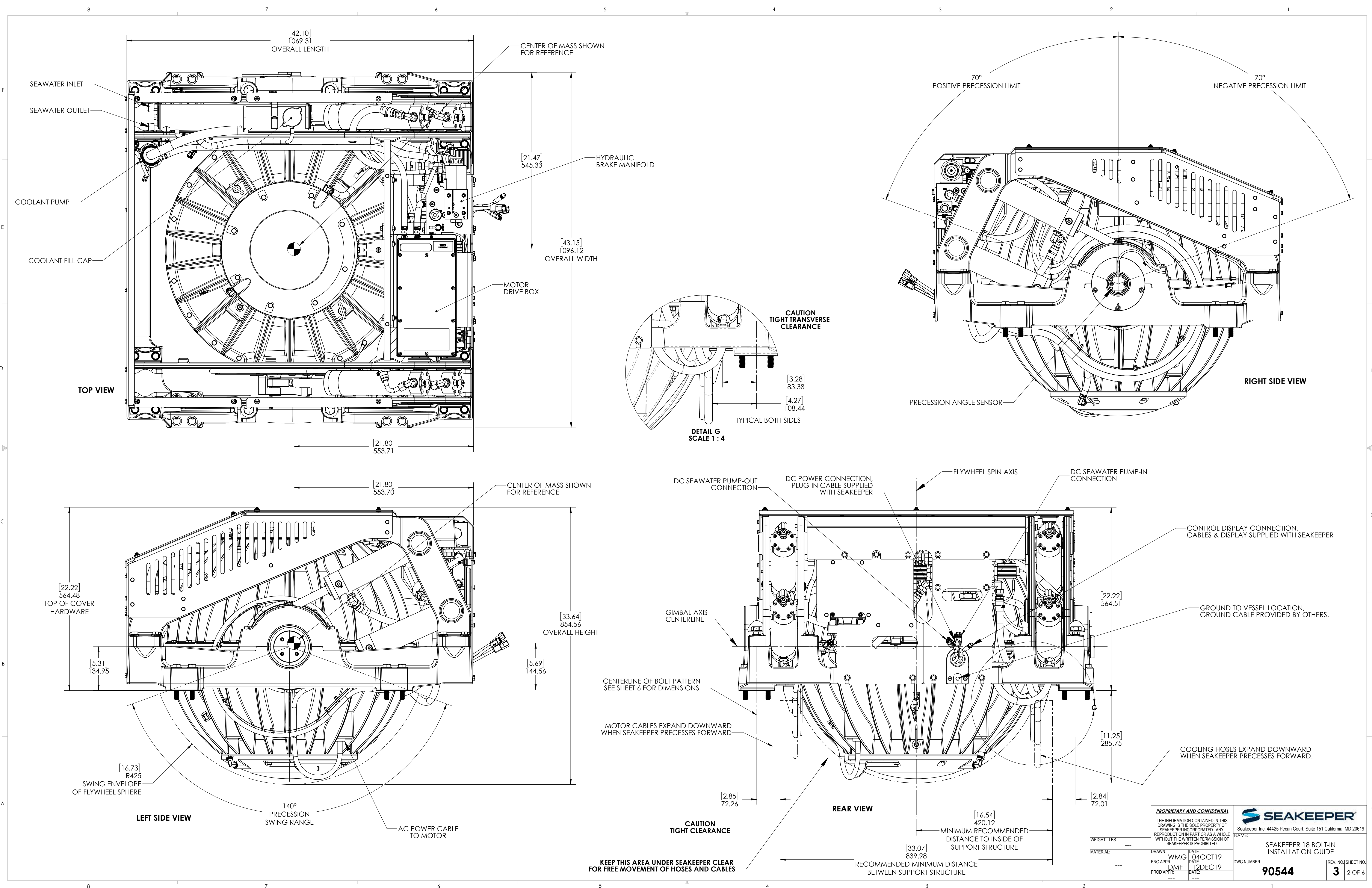
- SHEET 2 - SEAKEEPER FOUNDATION DIMENSIONS.
- SHEET 3 - RECOMMENDED LIFTING POINTS.
- SHEET 4 - RECOMMENDED CLEARANCES TO HULL STRUCTURE.
- SHEET 5 - SERVICE CLEARANCES FOR IN-FIELD BEARING REPLACEMENT.
- SHEET 6 - SEAKEEPER LOADS FOR HULL STRUCTURE DESIGN & MOUNTING DETAILS.

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WEIGHT - LBS: ---	DRAWN: WMG	DATE: 04OCT19	SEAKEEPER 18 BOLT-IN INSTALLATION GUIDE	REV. NO.   SHEET NO. <b>3</b>   1 OF 6
MATERIAL: ---	ENG APPR: DMF	DATE: 12DEC19		
	PROD APPR: ---	DATE: ---		

DWG NUMBER: **90544**



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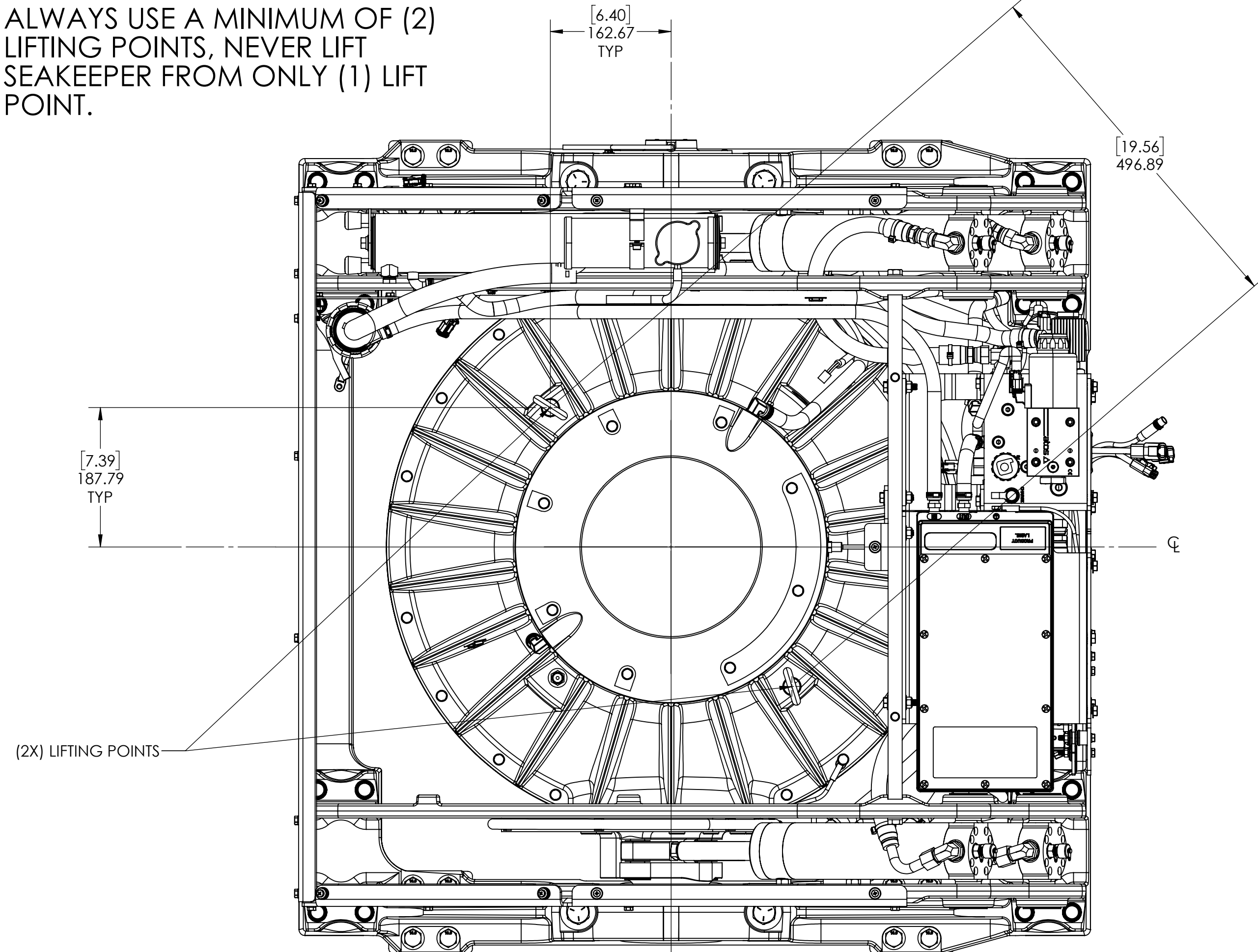
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ENG APPR: DMF DATE: 12DEC19  
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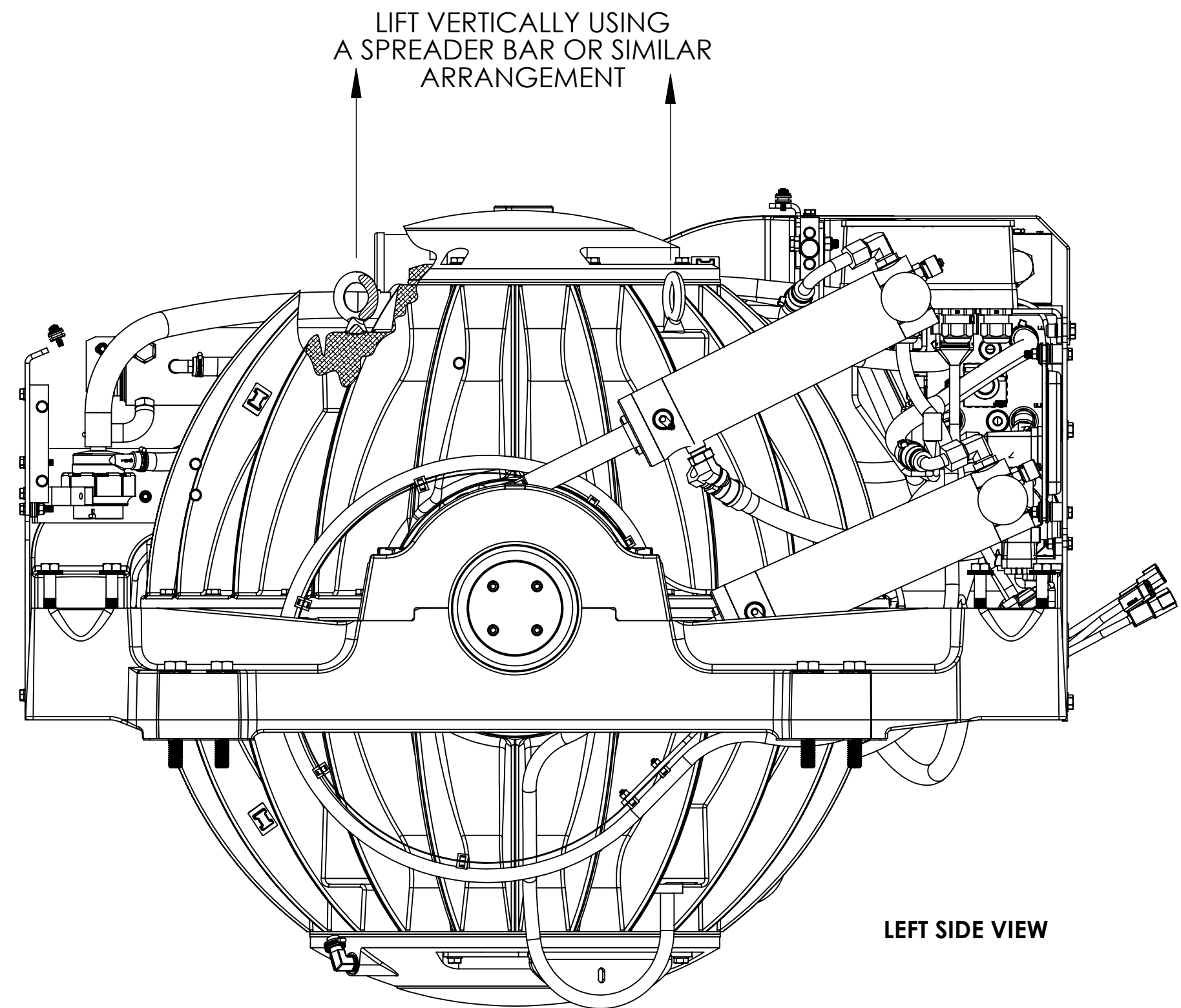
DWG NUMBER: 90544  
REV. NO. SHEET NO.: 3 2 OF 6

# LIFTING DETAILS AND DIMENSIONS

**CAUTION :** ALWAYS USE A MINIMUM OF (2) LIFTING POINTS, NEVER LIFT SEAKEEPER FROM ONLY (1) LIFT POINT.

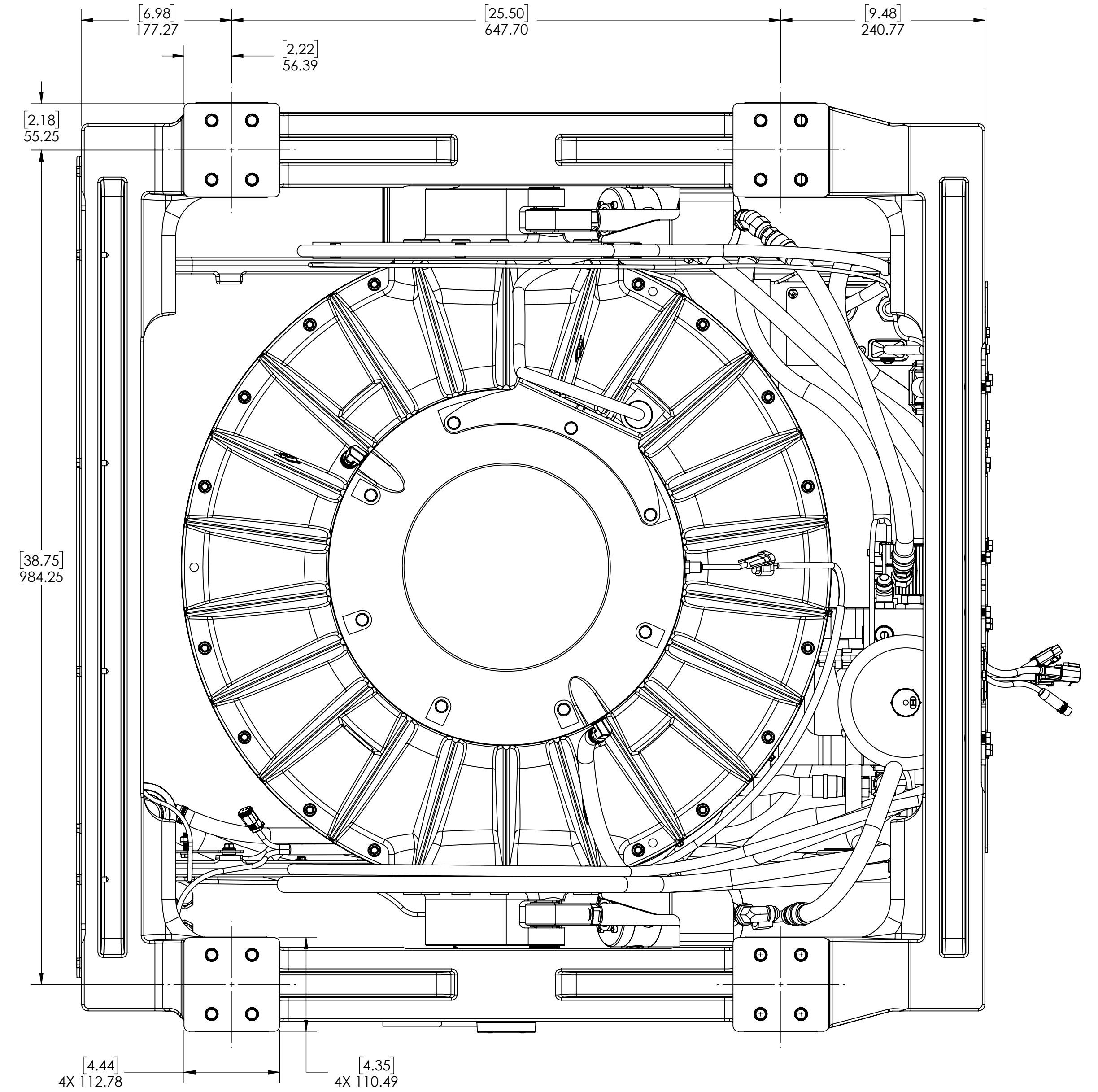


TOP VIEW



LEFT SIDE VIEW

SEE SHEET 6 FOR BOLT PATTERN DIMENSIONS



BOTTOM VIEW

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MATERIAL: ---

DRAWN: WMG 04OCT19

ENG APPR: DMF 12DEC19

PROD APPR: ---

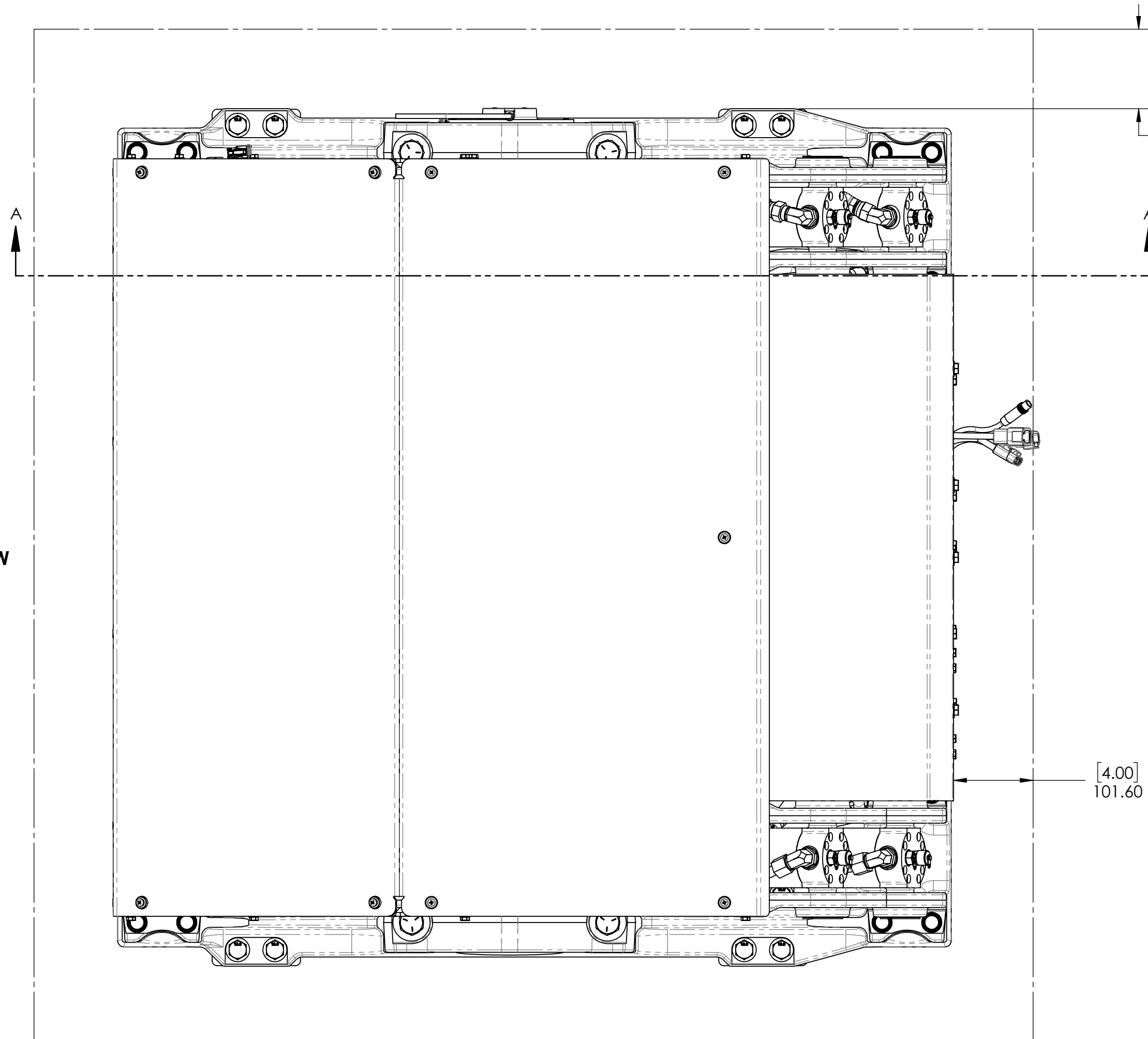
SEAKEEPER 18 BOLT-IN INSTALLATION GUIDE

DWG NUMBER: 90544

REV. NO. SHEET NO. 3 3 OF 6

8 7 6 5 4 3 2 1

TOP VIEW



HULL STRUCTURE  
SIMULATION  
FOR REFERENCE ONLY

[1.00]  
25.40  
MINIMUM RECOMMENDED  
DISTANCE FROM SEAKEEPER FRAME  
TO ANY TRANSVERSE BEAM

SECTION A-A

[1.00]  
25.40  
MINIMUM RECOMMENDED  
DISTANCE FROM SEAKEEPER FRAME  
TO ANY TRANSVERSE BEAM

[4.00]  
101.60  
MINIMUM RECOMMENDED  
DISTANCE FOR TOOL CLEARANCE

6mm HEX HEAD  
SCREWS

LEFT SIDE VIEW

8mm HEX HEAD  
SCREWS

[4.00]  
101.60  
MINIMUM RECOMMENDED  
DISTANCE FOR TOOL CLEARANCE

[12.00]  
305  
SERVICE  
ACCESS

[34.22]  
869

HYDRAULIC BRAKE MANIFOLD  
MUST BE ACCESSIBLE.  
(REAR UTILITY COVER SHOWN REMOVED)

REAR VIEW

**VIEWS SHOWING RECOMMENDED CLEARANCE AROUND SEAKEEPER  
FOR USE OF HAND TOOLS, EASE OF MAINTENANCE, INSTALLATION  
AND PROPER OPERATION.**

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SEAKEEPER 18 BOLT-IN  
INSTALLATION GUIDE

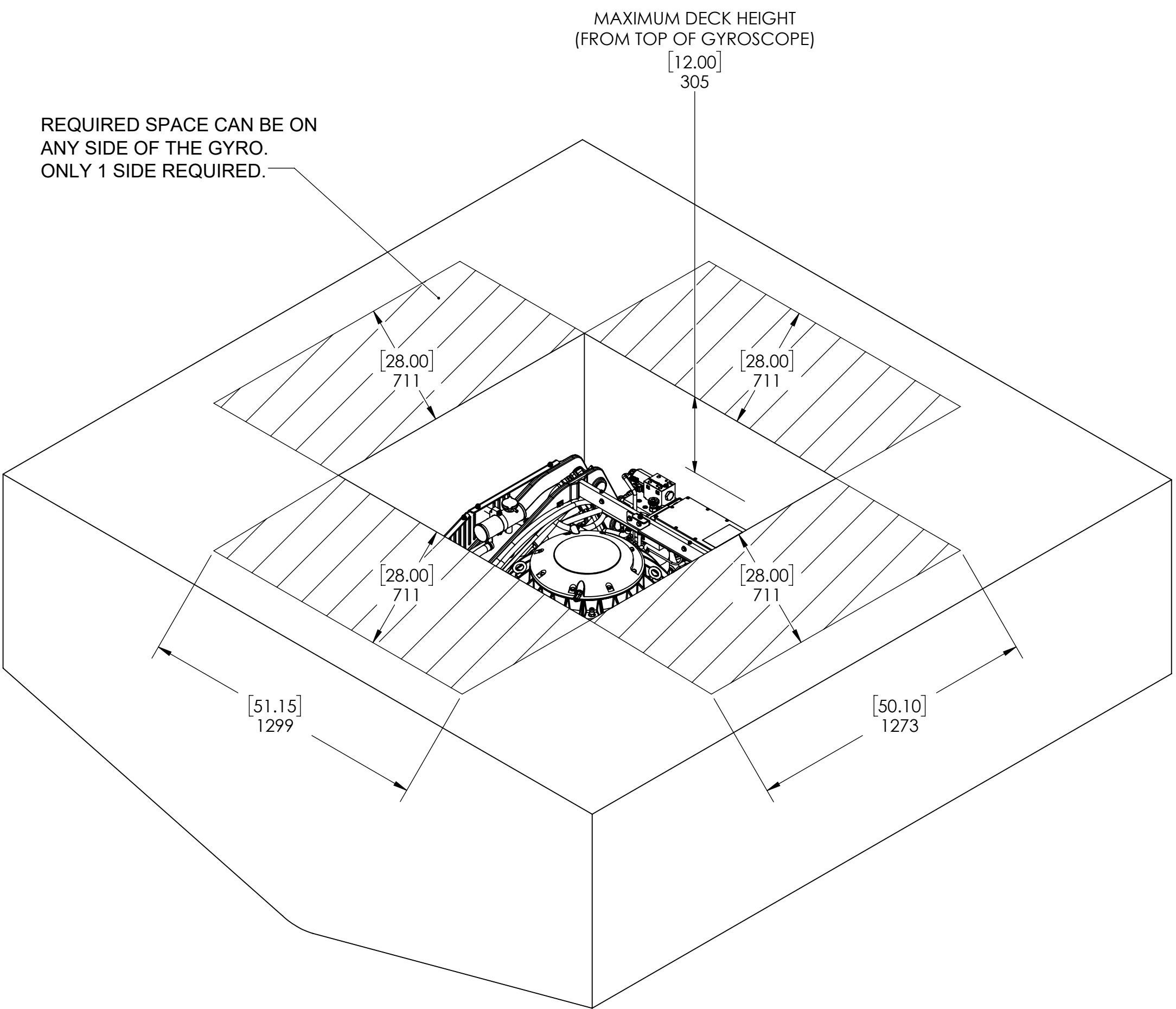
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8 7 6 5 4 3 2 1

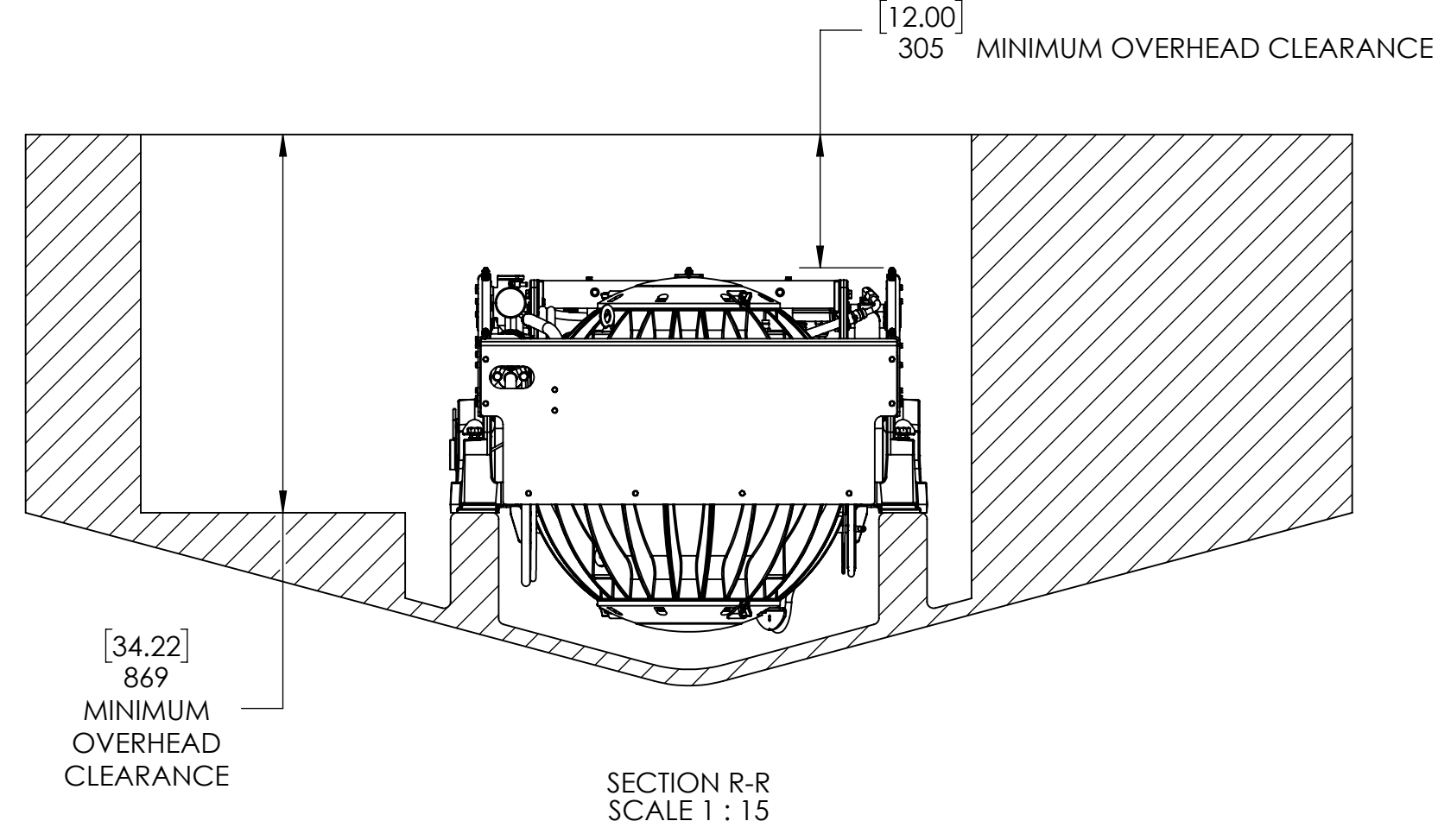
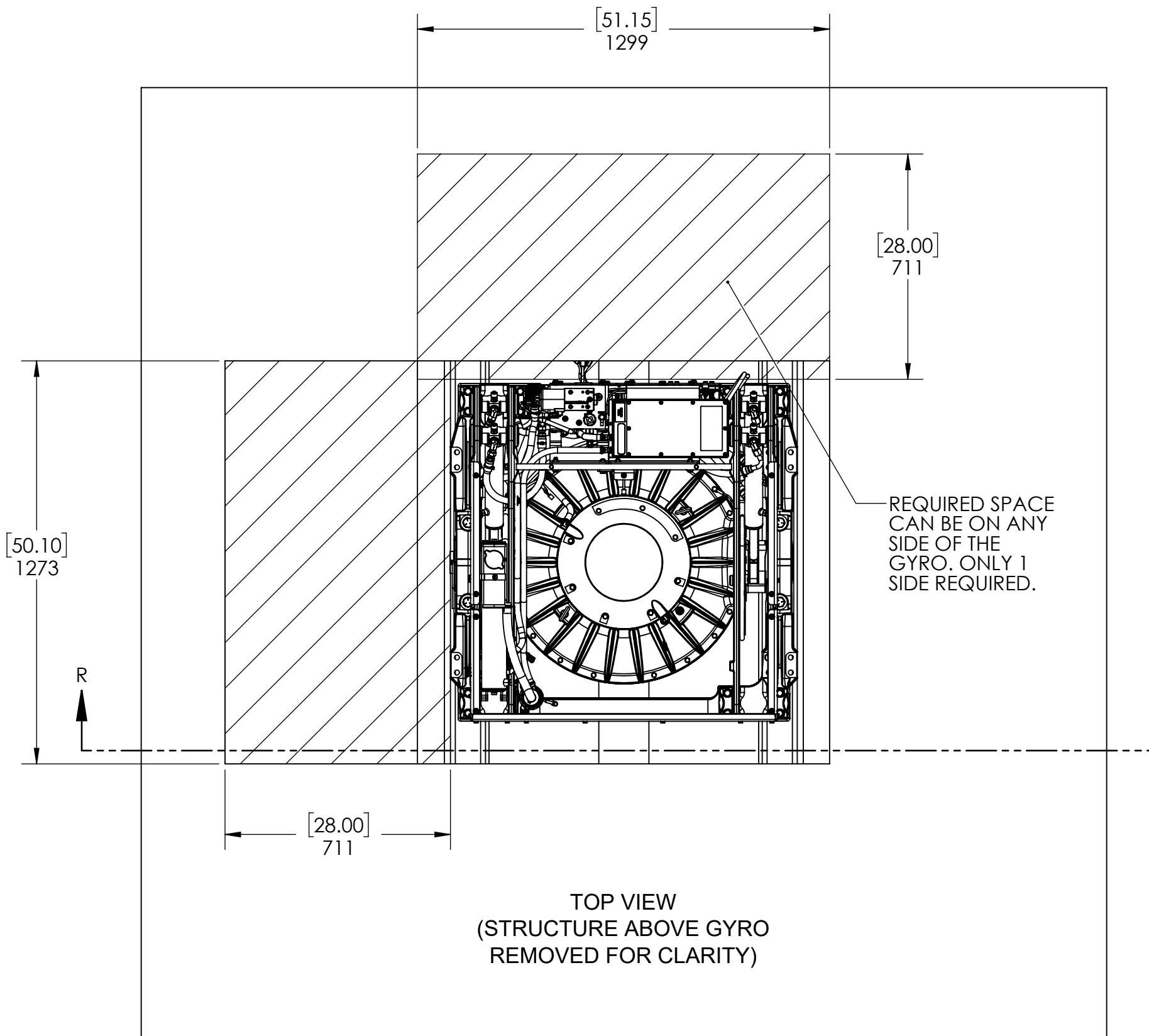
# SERVICE CLEARANCES FOR IN-FIELD BEARING REPLACEMENT

## NOTIONAL INSTALLATION WITH OVERHEAD ACCESS

INSTALLATIONS WITH MINIMAL SERVICE ACCESS FOR ROUTINE MAINTENANCE AROUND ALL 4 SIDES OF GYRO AS SHOWN ON SHEET 4 REQUIRE OVERHEAD ACCESS AND DECK SPACE ON ONE OF THE FOUR SIDES OF THE GYRO AS SHOWN BELOW.



## NOTIONAL INSTALLATION WITHOUT OVERHEAD ACCESS



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PROD APPR: --- DATE: ---

DWG NUMBER: **90544**

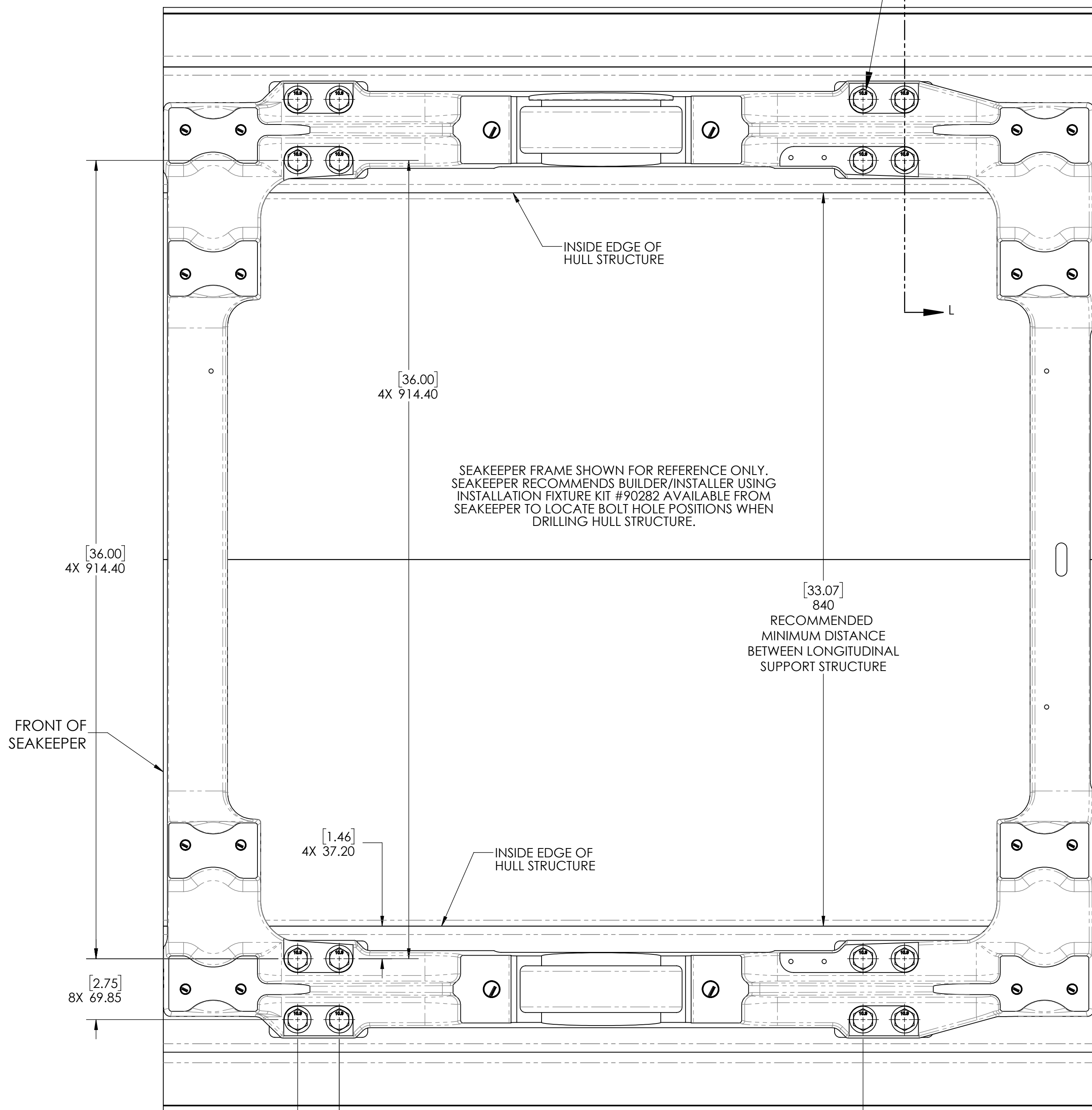
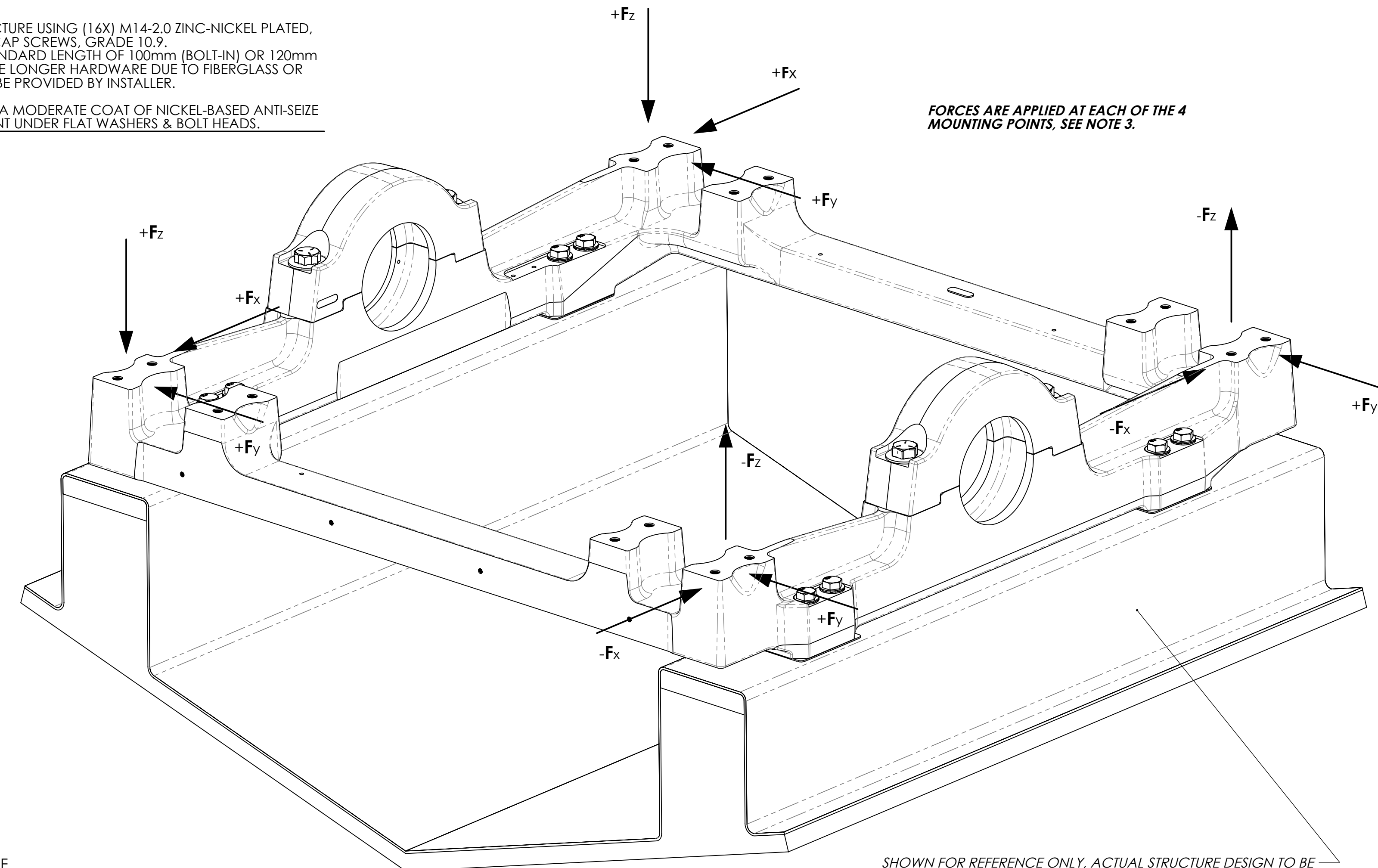
REV. NO. | SHEET NO.: **3** | 5 OF 6

SEAKEEPER 18 BOLT-IN INSTALLATION GUIDE

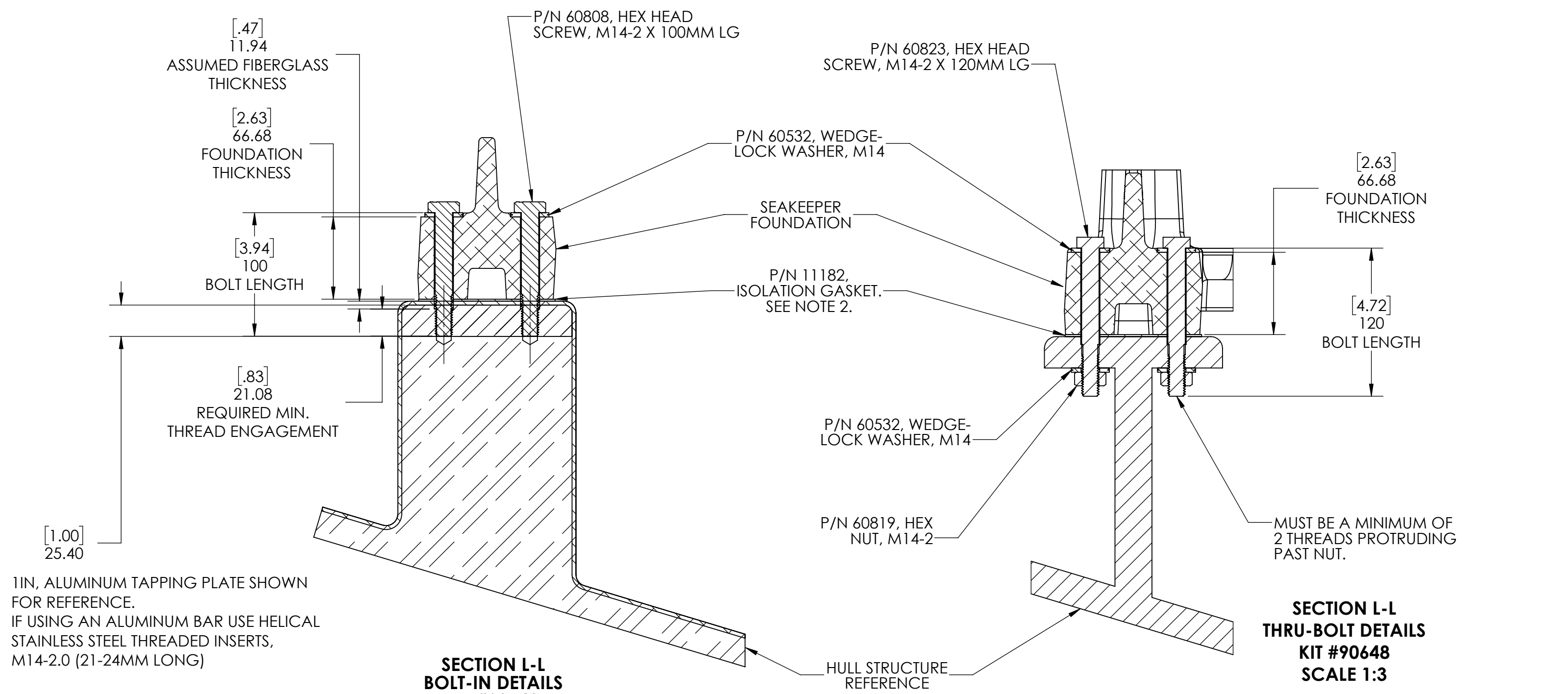
**SEAKEEPER LOADS FOR HULL STRUCTURE DESIGN :**

- (1) THE SEAKEEPER 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 SEAKEEPER 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 SEAKEEPER FRAME. APPLY A THIN FILM OF MARINE GRADE, POLY-SULFIDE SEALANT TO BOTH SIDES. THE BOLTING SURFACE OF THE HULL STRUCTURE MUST BE FLAT SO THAT THE 4 CONTACT POINTS OF THE SEAKEEPER FRAME ARE TOUCHING THE HULL STRUCTURE SIMULTANEOUSLY WITH NO NOTICEABLE ROCKING. THE BOAT BUILDER OR SEAKEEPER 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 SEAKEEPER GENERATES PITCH MOMENTS, ROLL MOMENTS, YAW MOMENTS, AND VERTICAL, LATERAL AND LONGITUDINAL FORCES - THE MAGNITUDE OF WHICH IS CONTROLLED BY THE SEAKEEPER'S ACTIVE BRAKE SYSTEM. THESE GENERATED FORCES AND MOMENTS RESULT IN LOADS BEING APPLIED AT THE FOUR POINTS WHERE THE SEAKEEPER 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) = 5,965 LBS. (26.53 kN) - (APPLIED AT EACH OF THE 4 MOUNTING POINTS.)  
 LONGITUDINAL FORCE (Fx) = 3,409 LBS. (15.16 kN) - (APPLIED AT EACH OF THE 4 MOUNTING POINTS.)  
 LATERAL FORCE (Fy) = 500 LBS. (2.22 kN) - (APPLIED AT EACH OF THE 4 MOUNTING POINTS.)  
  
 THESE FORCES SHOULD BE CONSIDERED TO BE ACTING SIMULTANEOUSLY, FULLY REVERSING, AND WILL REPEAT AN INFINITE NUMBER OF TIMES.
- (4) THE RESPONSIBLE PARTY FOR DESIGNING THE SUPPORTING STRUCTURE (BOAT BUILDER OR HIRED SUB-CONTRACTOR) MUST ACCOMMODATE THE ABOVE FORCES PLUS A REASONABLE FACTOR OF SAFETY. SEAKEEPER RECOMMENDS A MINIMUM SAFETY FACTOR OF 3.0 (YIELDING A SAFETY MARGIN OF 2.0).

THE SEAKEEPER FRAME IS BOLTED TO HULL STRUCTURE USING (16X) M14-2.0 ZINC-NICKEL PLATED, ALLOY STEEL, HEX HEAD CAP SCREWS, GRADE 10.9. SEAKEEPER PROVIDES THIS HARDWARE AT A STANDARD LENGTH OF 100mm (BOLT-IN) OR 120mm (THRU-BOLT). ANY APPLICATIONS THAT REQUIRE LONGER HARDWARE DUE TO FIBERGLASS OR FLANGE THICKNESS, MUST BE PROVIDED BY INSTALLER.  
  
**TORQUE BOLTS TO 100 FT/LBS. [135.6 Nm].** APPLY A MODERATE COAT OF NICKEL-BASED ANTI-SEIZE ON BOLT THREADS AND MARINE SEALANT UNDER FLAT WASHERS & BOLT HEADS.



SHOWN FOR REFERENCE ONLY. ACTUAL STRUCTURE DESIGN TO BE DETERMINED BY BOAT MANUFACTURER OR SEAKEEPER INSTALLER. SUPPORT STRUCTURE MUST BE PARALLEL WITH WATERLINE. SEE NOTE 4.



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PROD APPR: ---	---	---	REV. NO. SHEET NO. 3 6 OF 6