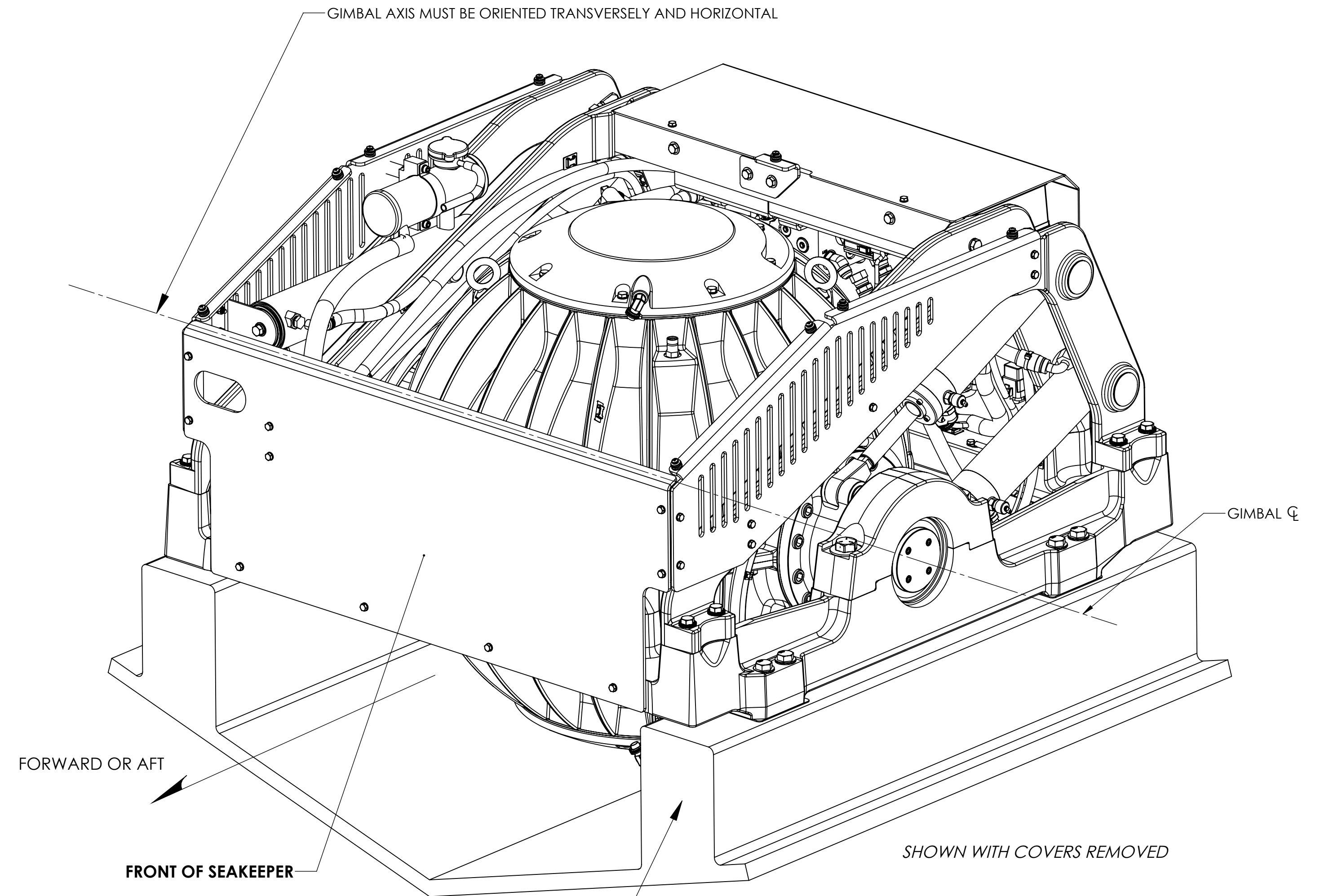
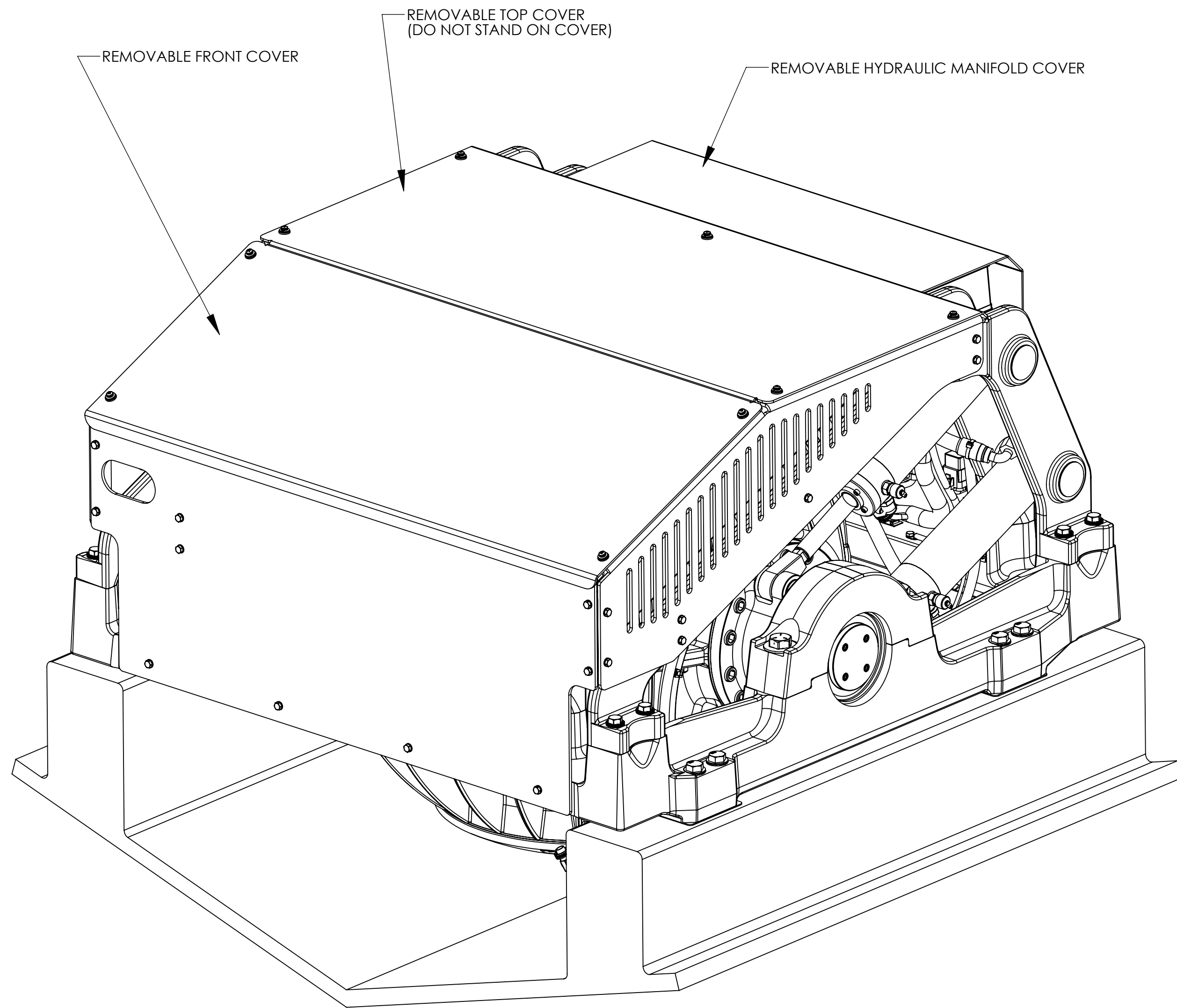


NOTES:

- 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

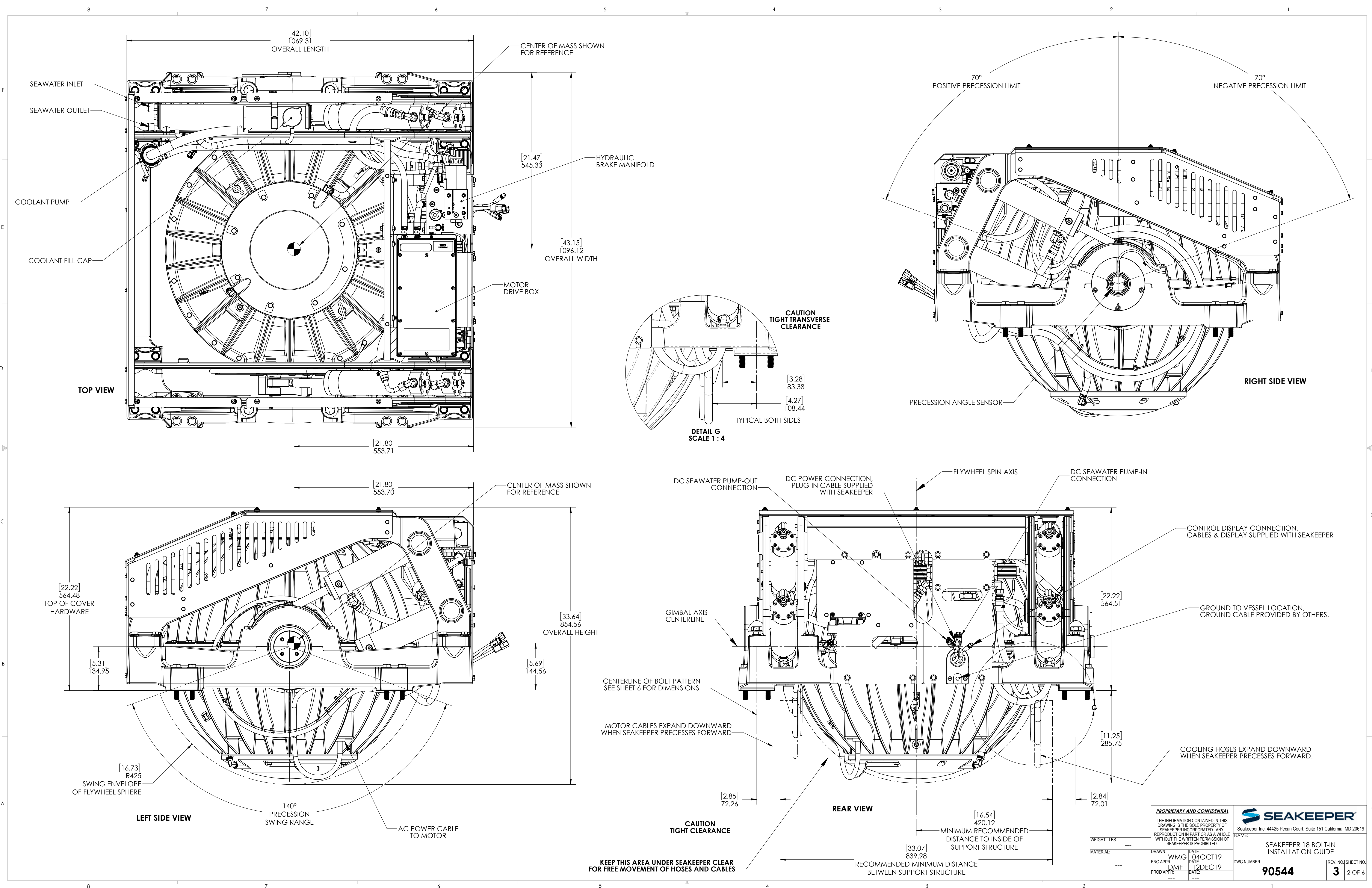


THIS HULL STRUCTURE SHOWN FOR VISUAL REFERENCE ONLY. ACTUAL STRUCTURE DESIGN TO BE DETERMINED BY BOAT MANUFACTURER OR SEAKEEPER INSTALLER. **SEE NOTE 6.** SEE SHEET 6 FOR LOADING FORCES AND OTHER RECOMMENDATIONS FOR ATTACHING SEAKEEPER TO HULL STRUCTURE.

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	
MATERIAL: ---	ENG APPR: DMF DATE: 12DEC19	DWG NUMBER: 90544	REV. NO. / SHEET NO. 3 / 1 OF 6
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SEAKEEPER
Seakeeper Inc. 44425 Pecan Court, Suite 151 California, MD 20619

NAME: _____
DRAWN: WMG 04OCT19
ENG APPR: DMF 12DEC19
DATE: _____
DATE: _____

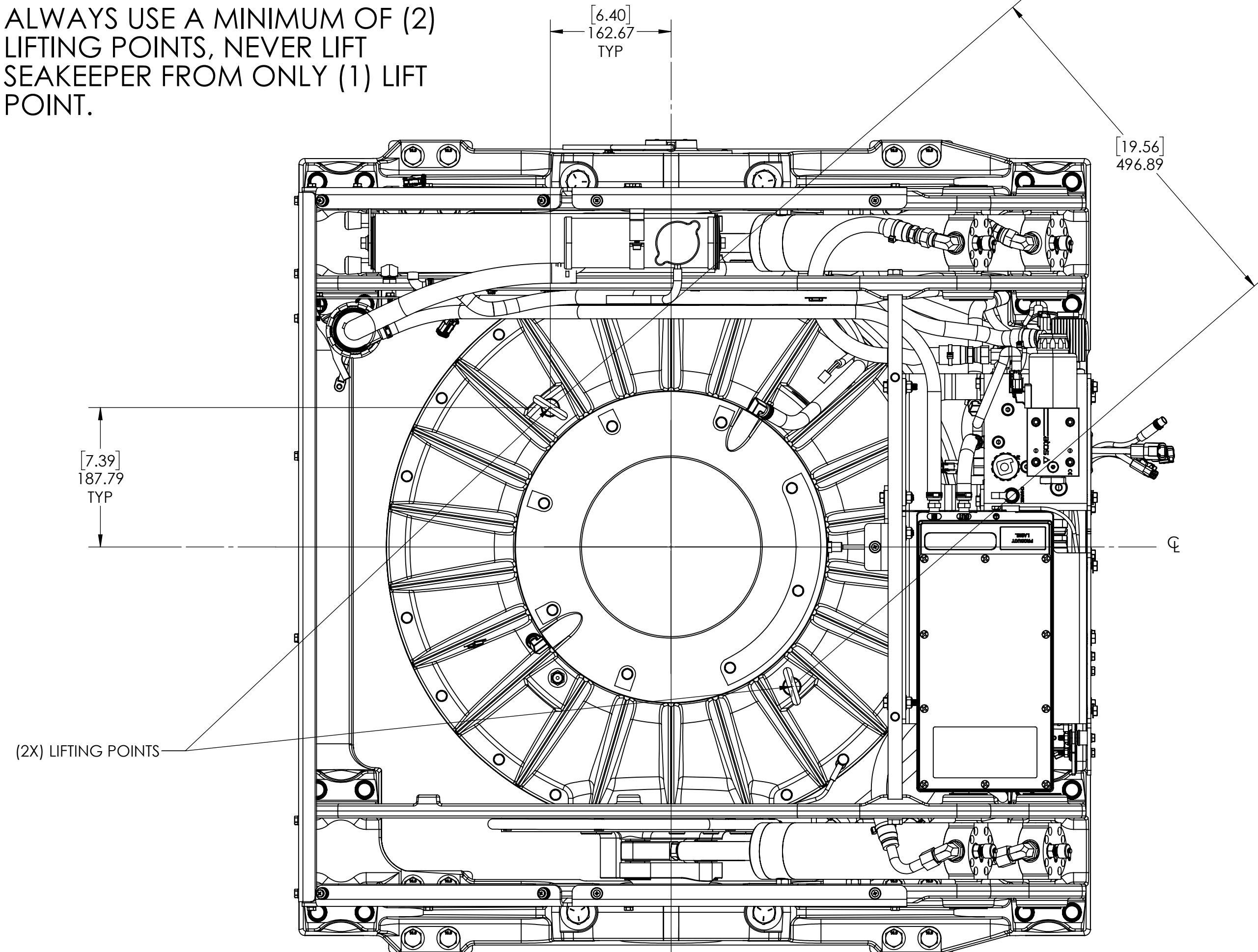
SEAKEEPER 18 BOLT-IN INSTALLATION GUIDE
DWG NUMBER: **90544**
REV. NO. SHEET NO.: **3** 2 OF 6

WEIGHT - LBS: ---
MATERIAL: ---

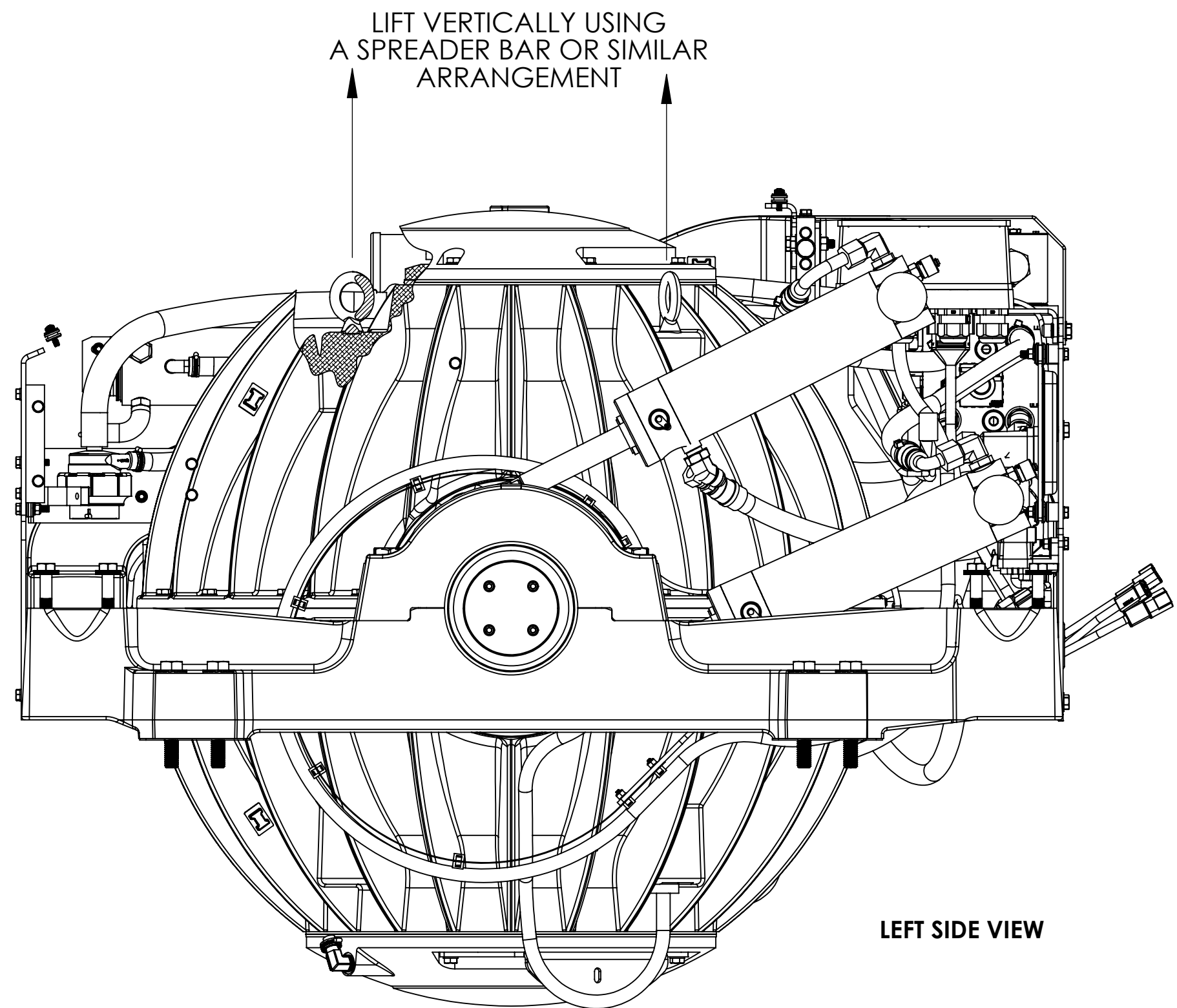
KEEP THIS AREA UNDER SEAKEEPER CLEAR FOR FREE MOVEMENT OF HOSES AND CABLES

LIFTING DETAILS AND DIMENSIONS

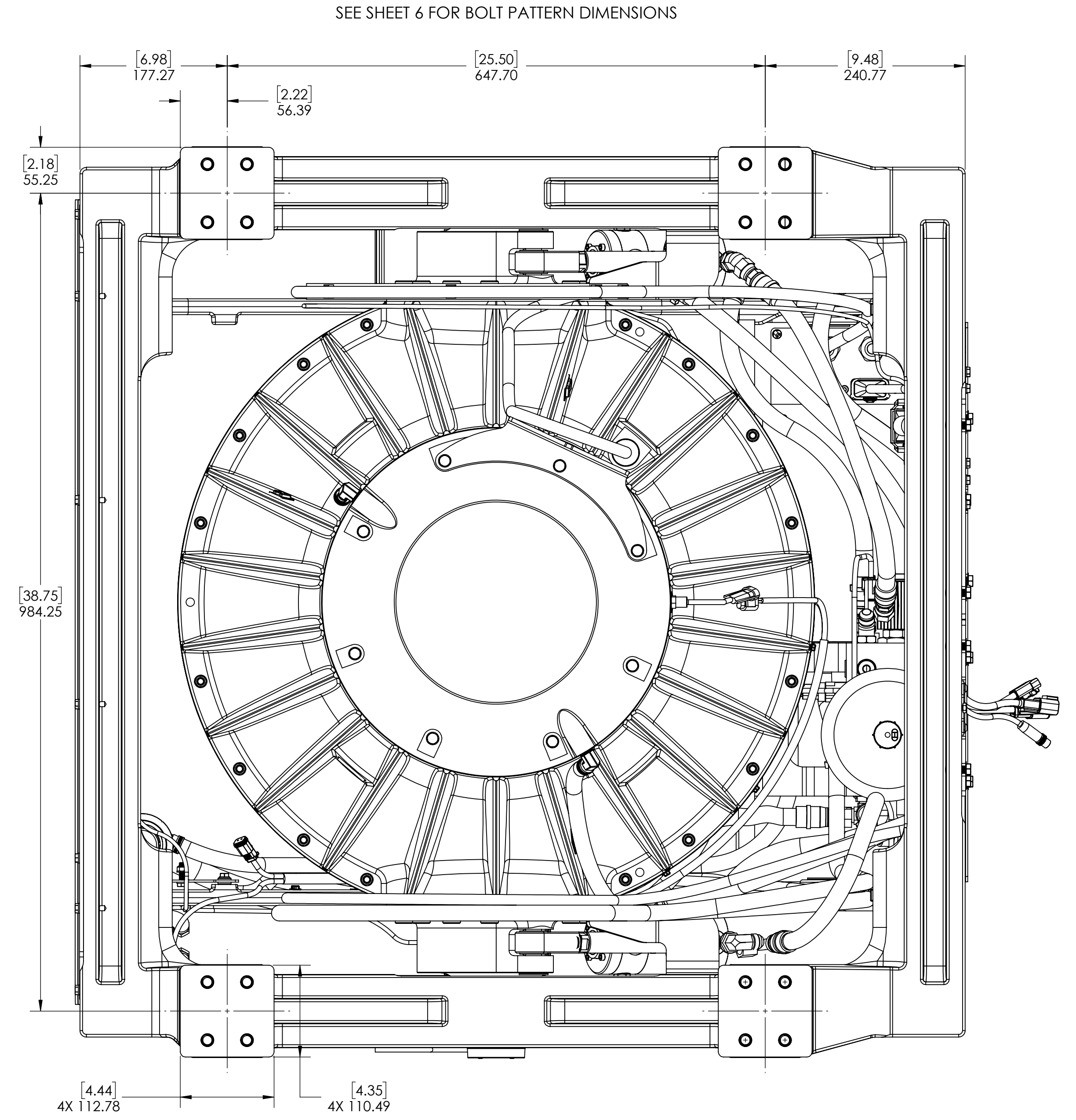
CAUTION : ALWAYS USE A MINIMUM OF (2) LIFTING POINTS, NEVER LIFT SEAKEEPER FROM ONLY (1) LIFT POINT.



TOP VIEW



LEFT SIDE VIEW



BOTTOM VIEW

SEE SHEET 6 FOR BOLT PATTERN DIMENSIONS

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WEIGHT - LBS. ---

MATERIAL: ---

DRAWN: WMG 04OCT19

ENG APPR: DMF 12DEC19

PROD APPR: ---

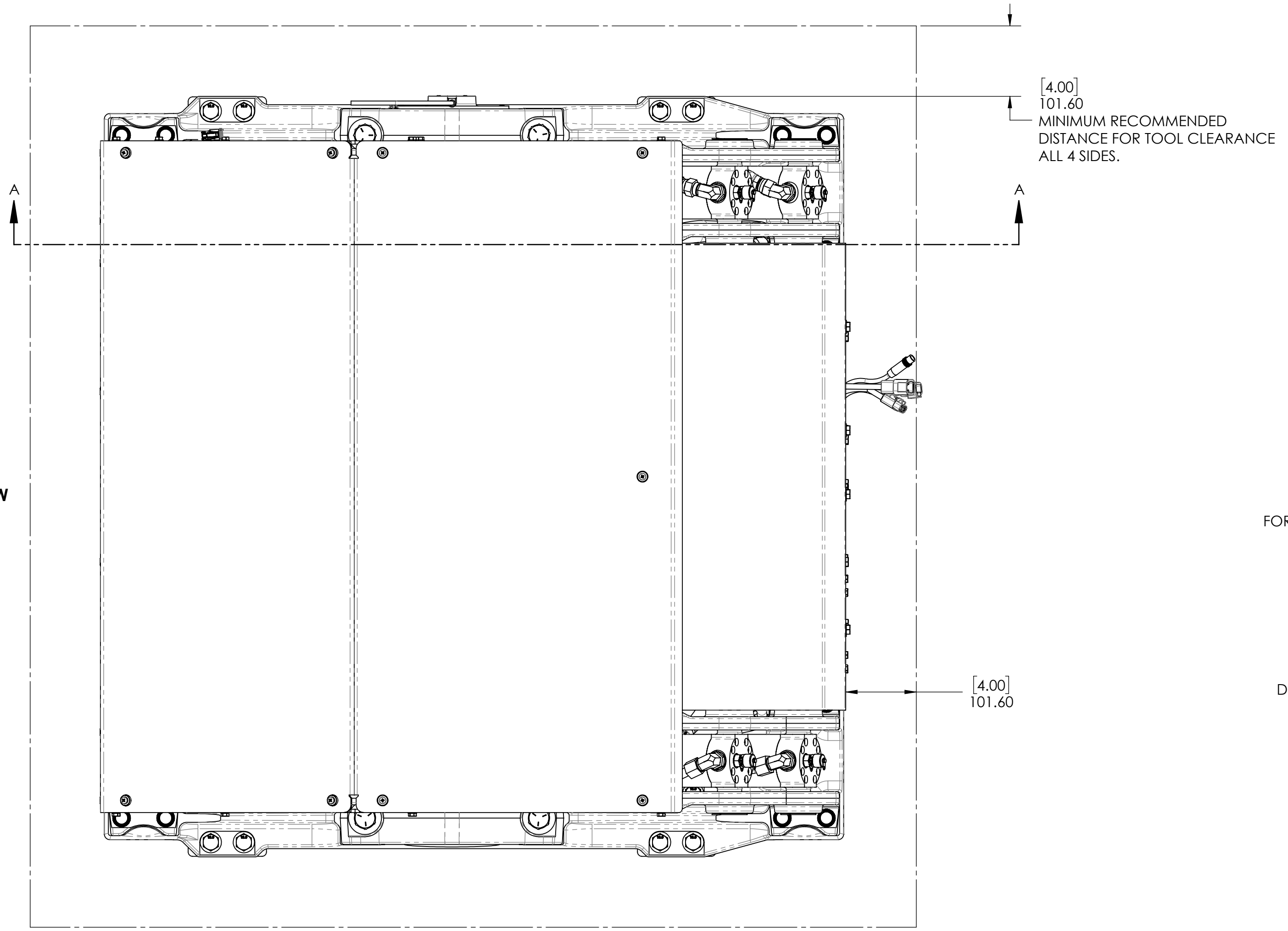
SEAKEEPER 18 BOLT-IN
INSTALLATION GUIDE

DWG NUMBER
90544

REV. NO. SHEET NO.
3 3 OF 6

8 7 6 5 4 3 2 1

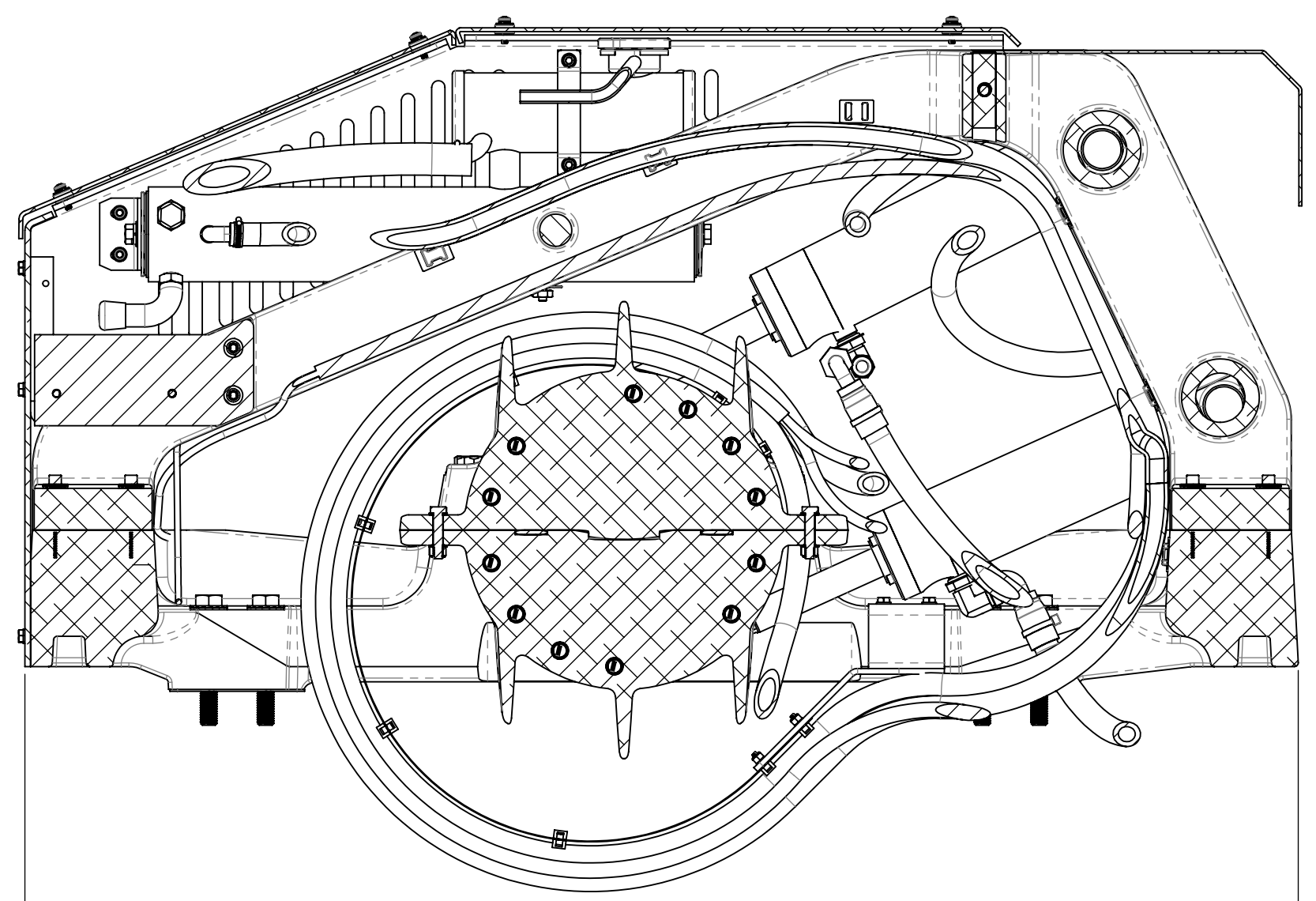
TOP VIEW



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

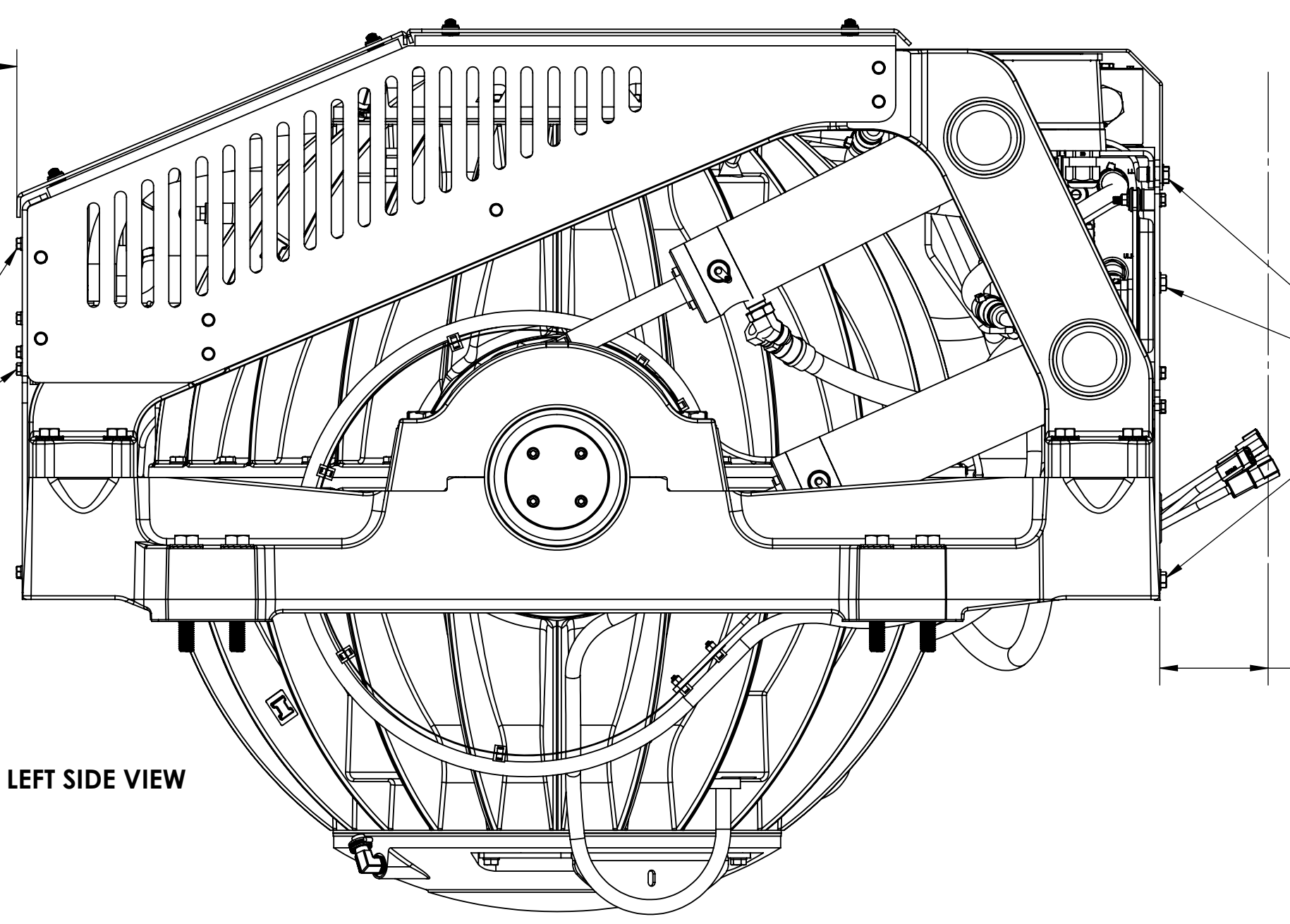
[4.00]
101.60
MINIMUM RECOMMENDED
DISTANCE FOR TOOL CLEARANCE

6mm HEX HEAD
SCREWS

8mm HEX HEAD
SCREWS

[4.00]
101.60
MINIMUM RECOMMENDED
DISTANCE FOR TOOL CLEARANCE

LEFT SIDE VIEW

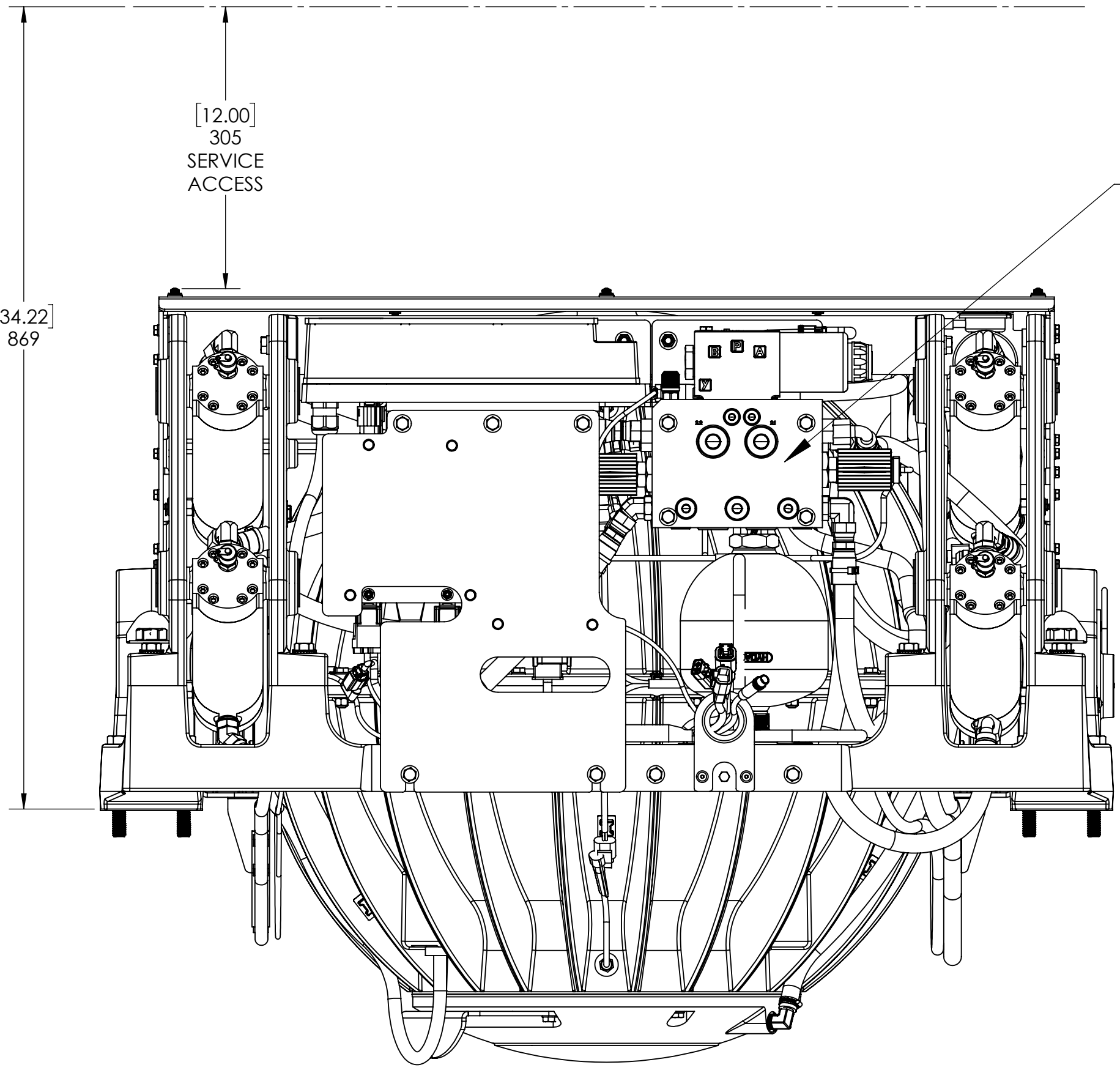


[12.00]
305
SERVICE
ACCESS

[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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NAME: _____
WEIGHT - LBS: ---
MATERIAL: ---
DRAWN: EMS DATE: 19MAY2021
ENG APPR: --- DATE: ---
PROD APPR: --- DATE: ---

SEAKEEPER 18 BOLT-IN
INSTALLATION GUIDE

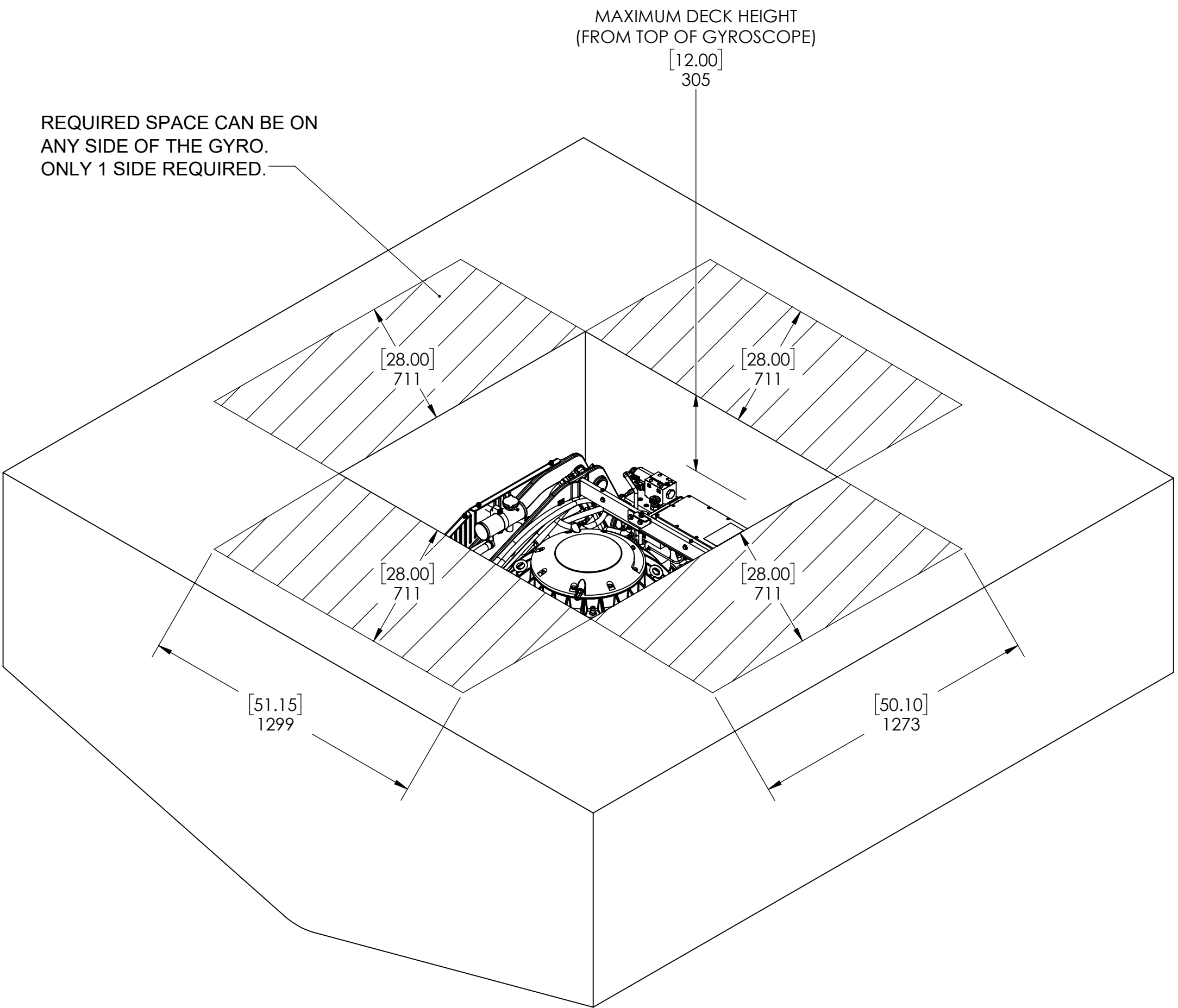
DWG NUMBER: **90544** REV. NO. SHEET NO.: **3** 4 OF 6

8 7 6 5 4 3 2 1

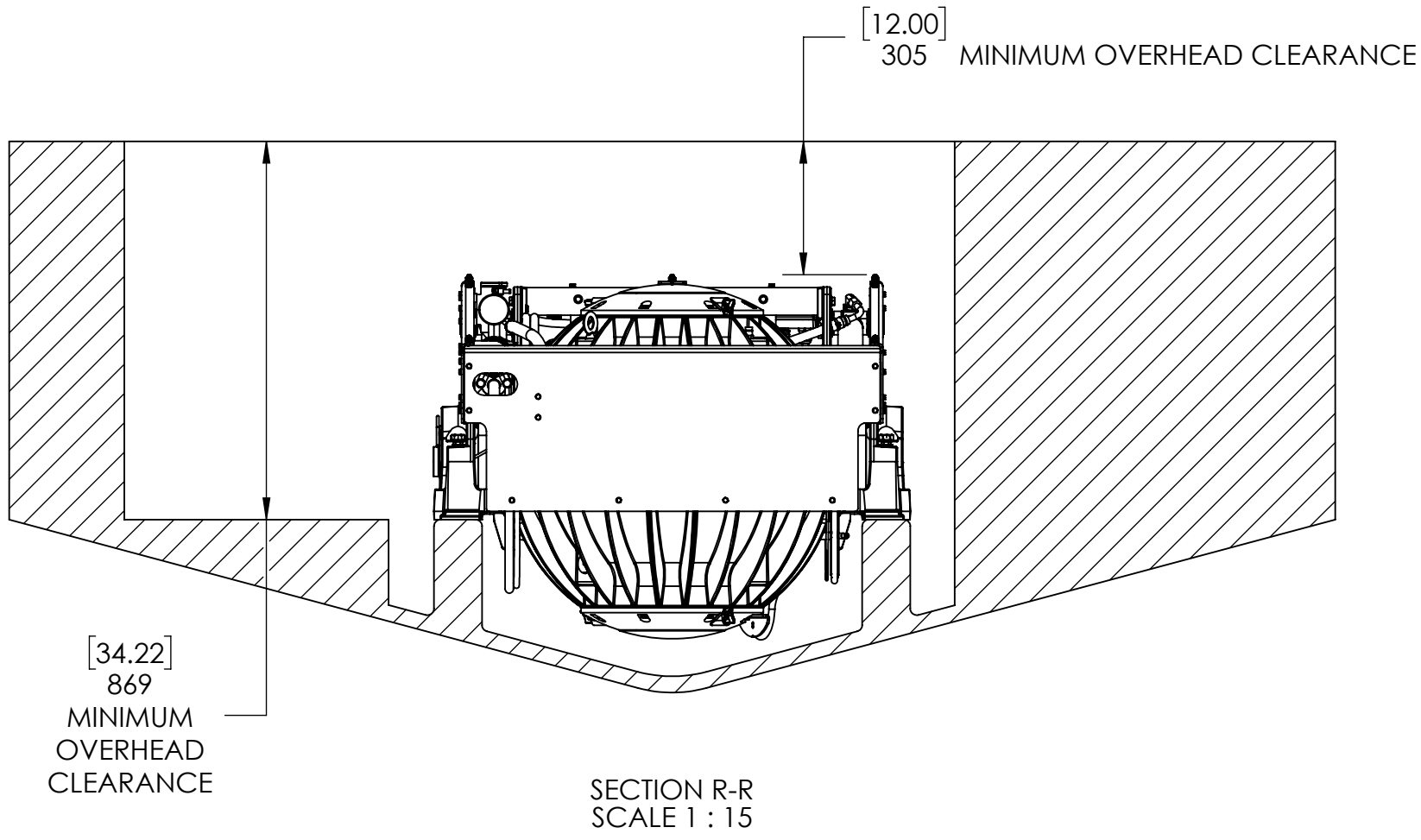
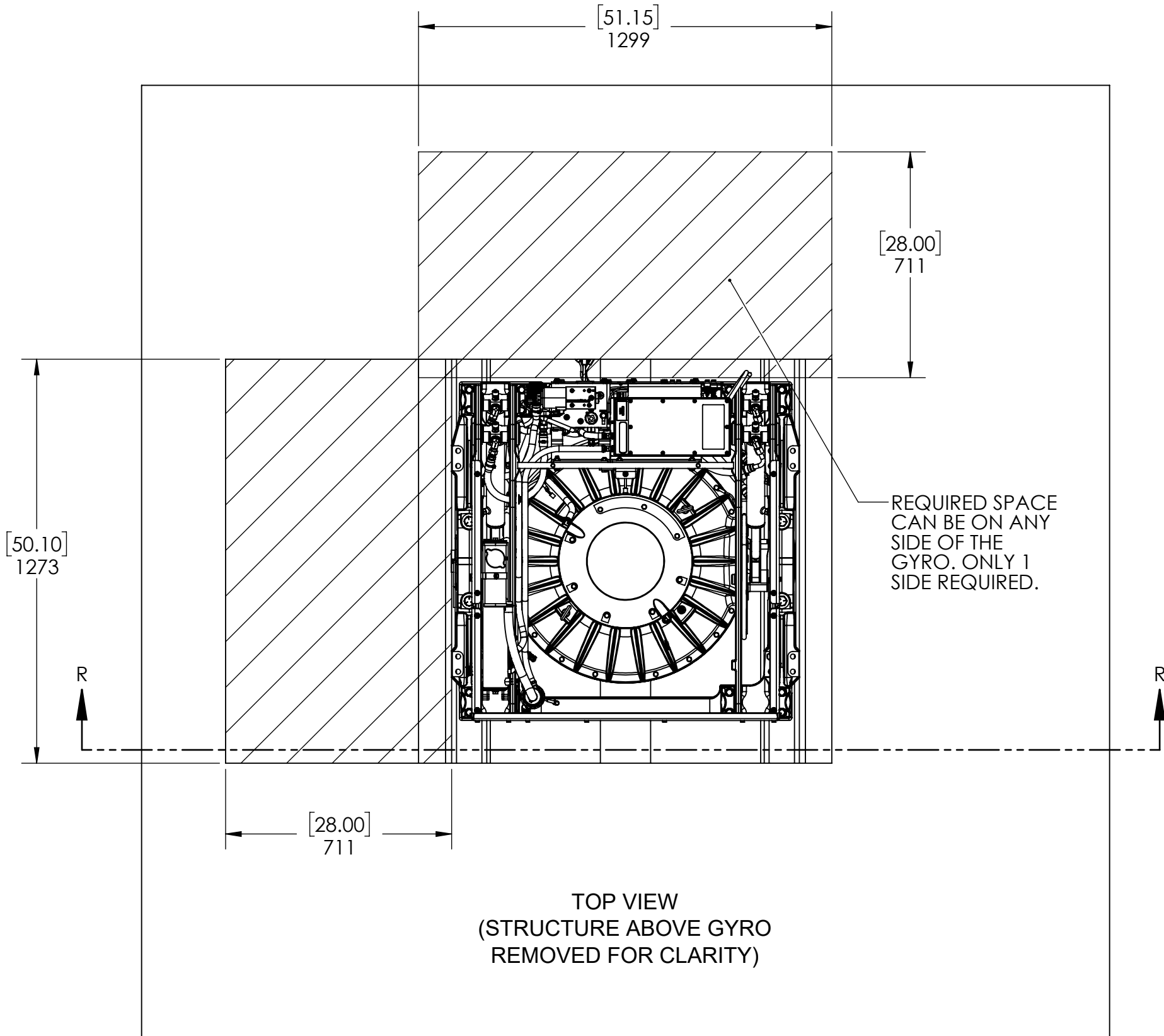
SERVICE CLEARANCES FOR IN-FIELD BEARING REPLACEMENT

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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WEIGHT - LBS:	---	NAME:	---
MATERIAL:	---	SEAKEEPER 18 BOLT-IN INSTALLATION GUIDE	---
DRAWN:	EMS	DATE:	19MAY2021
ENG APPR:	---	DATE:	---
PROD APPR:	---	DATE:	---
		DWG NUMBER:	90544
		REV. NO. SHEET NO.:	3 5 OF 6

SEAKEEPER LOADS FOR HULL STRUCTURE DESIGN :

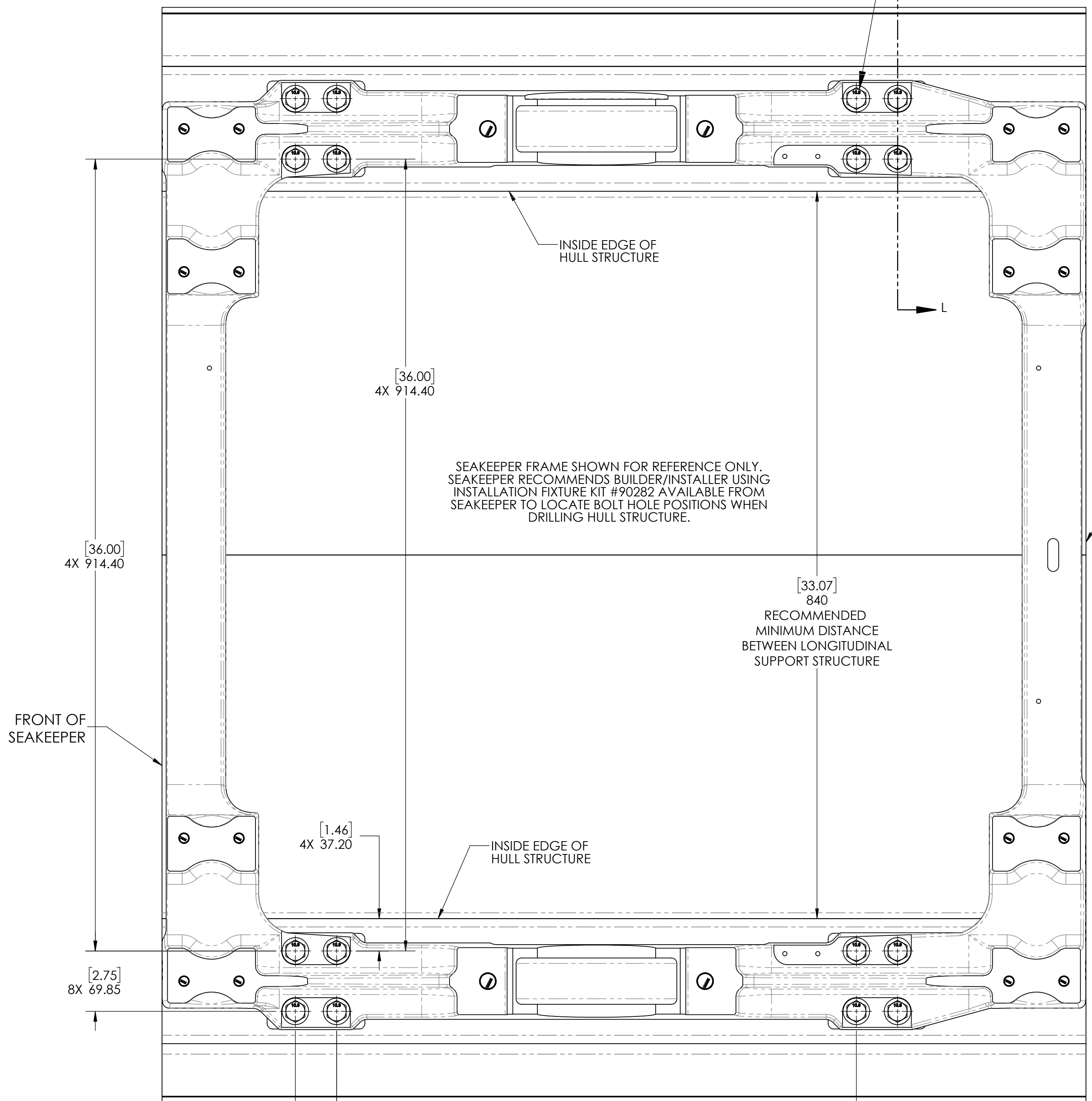
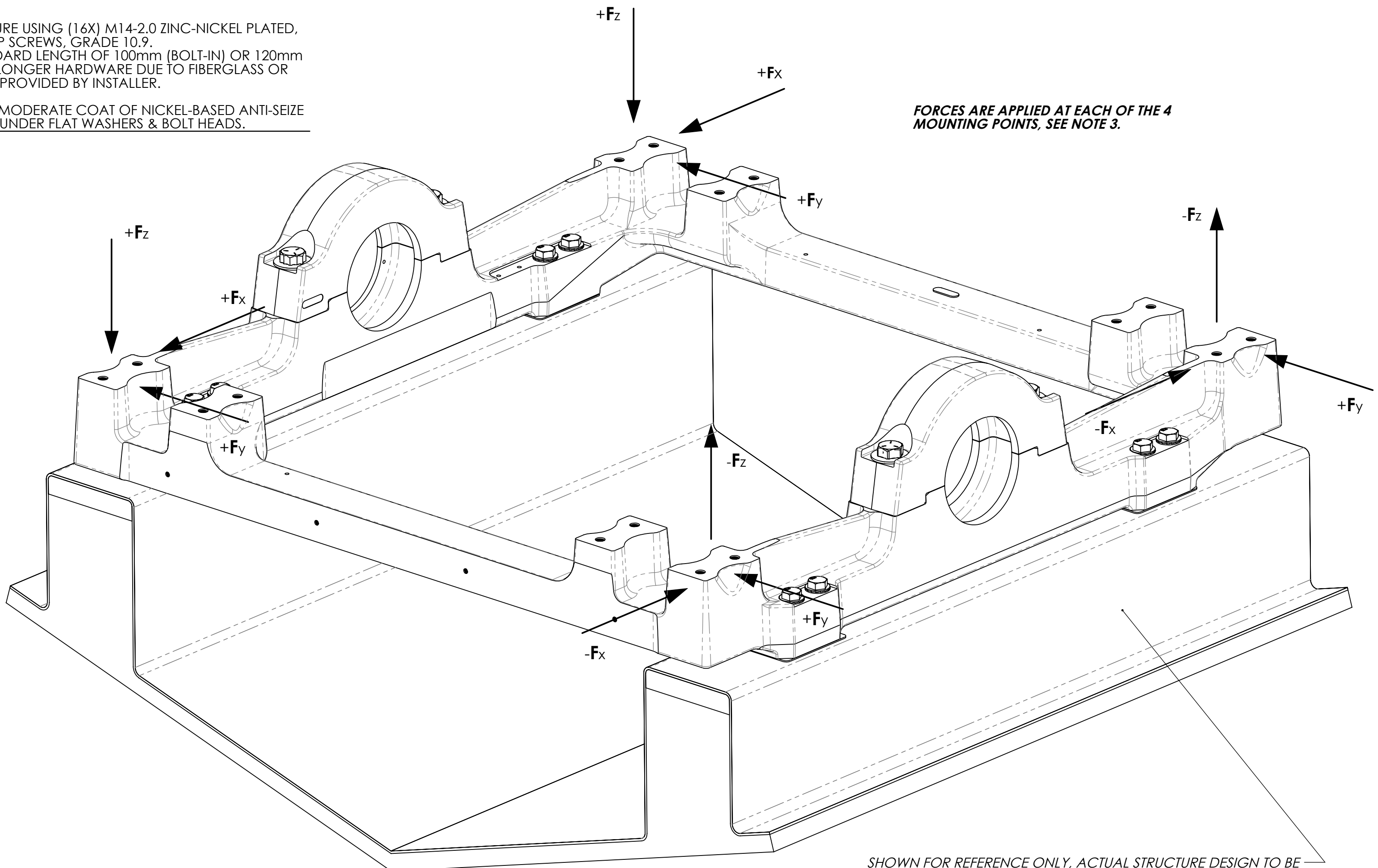
- (1) THE SEAKEEPER IS MOUNTED IN A RIGID FOUNDATION FRAME WHICH INCORPORATES SEMI-ELASTIC ANTI-VIBRATION ISOLATORS ENCASING THE GIMBAL BEARINGS THAT DAMPEN VIBRATIONS THAT COULD TRANSMIT INTO THE HULL STRUCTURE.
- (2) THE SEAKEEPER FOUNDATION FRAME IS BOLTED DIRECTLY TO THE HULL STRUCTURE. BE SURE TO 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.)

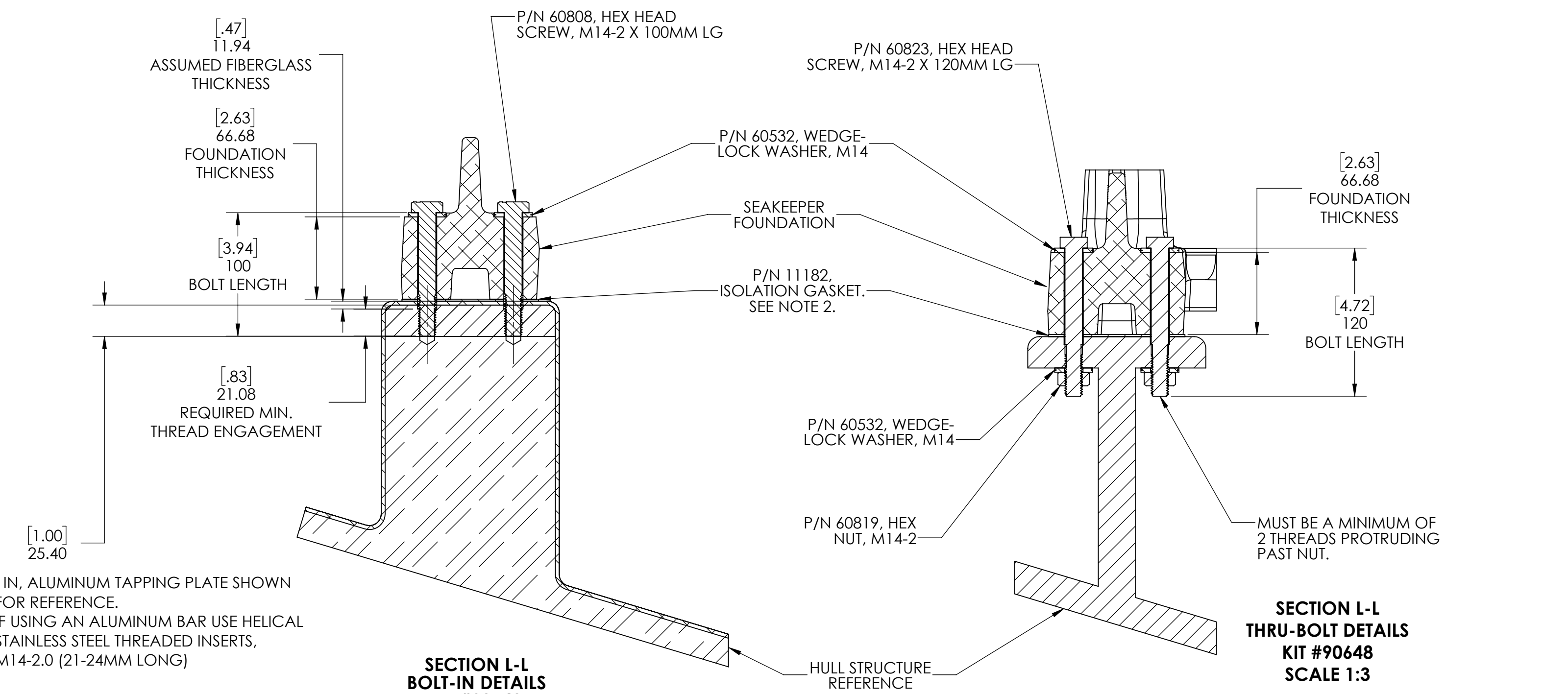
 THESE FORCES SHOULD BE CONSIDERED TO BE ACTING SIMULTANEOUSLY, FULLY REVERSING , AND WILL REPEAT AN INFINITE NUMBER OF TIMES.
- (4) THE RESPONSIBLE PARTY FOR DESIGNING THE SUPPORTING STRUCTURE (BOAT BUILDER OR HIRED SUB-CONTRACTOR) MUST ACCOMMODATE THE ABOVE FORCES PLUS A REASONABLE FACTOR OF SAFETY. 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.



1IN. ALUMINUM TAPPING PLATE SHOWN FOR REFERENCE. IF USING AN ALUMINUM BAR USE HELICAL STAINLESS STEEL THREADED INSERTS, M14-2.0 (21-24MM LONG)

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