

MATERIAL SCHEDULE

SERVICE	SIZE	PIPE	COMPONENTS			GASKETS	VALVES		BOLTING		REMARKS
			TAKEDOWN JOINTS	FITTINGS	FLEX CONNECT		BODY	TRIM	BOLTS/STUDS	NUTS/WASHERS	
HYDRAULIC OIL SERVICE PIPING MAWP: 750 PSIG MAWT: 150°F	ALL	STAINLESS STEEL TUBING, TYPE 316L, ASTM A213 WALL THICKNESS VARIES STAINLESS STEEL PIPE, TYPE 316L, ASTM A312	FLANGE SOCKET WELD, WELD NECK OR SLIP ON, 316L STAINLESS STEEL, ASTM SA182, ANSI B16.11 UNION GROUND JOINT, SOCKET WELD CARBON STEEL, ASTM A105, MSS-SP-83	SOCKET WELD STAINLESS STEEL, TYPE 316L, ASTM A182, ANSI B16.11 BUTTWELD STAINLESS STEEL, ASTM A403, ANSI B16.9, MSS SP-43 COMPRESSION TYPE 316 STAINLESS STEEL, ASTM A276, ASTM A479, ASTM A182	FLEX HOSE MEETING SAE J1942 AND J1475 FOR HYDRAULIC SERVICE SEE NOTE 9	GARLOCK STYLE 3000	GATE FLANGED CARBON STEEL, ASTM A216 GR WCB OR ASTM A105 ANSI B16.34 BALL THREADED, CARBON STEEL, ASTM A105, ASTM A181, OR ASTM A216 GR WCB CHECK THREADED, CARBON STEEL, ASTM A105, ASTM A181, OR ASTM A216 GR WCB	GATE CRES STEM, DISC AND SEAT BALL CHROME PLATED BALL, RPTFE OR VITON SEATS CHECK CRES DISC	CARBON STEEL ANSI B18.2.1 HEX-HEAD CARBON STEEL ASTM A563 GR A ANSI B18.2.2		

SYMBOLS LIST

	TUBING		HYDRAULIC CYLINDER
	GATE VALVE		RELIEF VALVE
	BALL VALVE		CROSS PORT RELIEF VALVE
	BALL VALVE WITH THREADED PLUG		CROSS PORT RELIEF VALVE
	REDUCER		CROSS PORT RELIEF VALVE
	FLEXIBLE CONNECTION		CROSS PORT RELIEF VALVE
	HYDRAULIC CHECK VALVE		FILTER/STRAINER
	FLOW DIRECTION ARROW		FLOW CONTROL VALVE
	HYDRAULIC PUMP		
	LEVEL		

EQUIPMENT LIST (HYDRAULIC)

ITEM #	QTY	SERVICE	TYPE	MODEL	CAPACITY	DRIVE	NOTES
1	2	STEERING HYDRAULIC PUMP	GEAR, SAE A 2 BOLT MOUNT	-	.36 CU IN./REV	MAIN ENGINE GEAR	-
2	2	STEERING CYLINDER	UNBALANCED, ABS TYPE APPROVED	-	1-1/2" BORE, #5/8" ROD, 10" STROKE	-	-
3	2	STEERING RESERVIOR	RESERVIOR, STEEL	-	30 GALLON	-	W/ LOW LEVEL SWITCH, SIGHT/TEMPERATURE GAGE,
4	2	STEERING CONTROL	24 VOLT DC SOLENOID BASE DIRECTIONAL CONTROL VALVE	-	6 GPM	-	OPEN CENTER
5	2	RELIEF VALVE	1500 PSI, 3/4" NPT	-	10 GPM	-	-
6	1	CROSS PORT RELIEF VALVE	1500 PSI, 7/8"-14	-	10 GPM	-	-
7	2	SUCTION STRAINER	1" FPT	-	-	-	INTERNAL RESERVIOR MOUNT
8	2	RETURN FILTER & HEAD ASSEMBLY	10 MICRON, 5 5 PSI BYPASS	-	16 GPM	-	-
9	2	FLOW CONTROL VLAVE	3/4" FPT	-	20 GPM	-	-

EQUIPMENT LIST (STEERING COMPONENTS)

ITEM #	QTY	DESCRIPTION	NOTES
10	4	RUDDER ASSEMBLY	-
11	2	TILLER ASSEMBY, OUTBOARD	-
12	2	TILLER ASSEMBY, INBOARD	-
13	1	JOCKEY BAR	-
14	1	RUDDER TUBE ASSEMBLY	-
15	2	5/8" X 3-1/2" CLEVIS PIN (CYLINDER)	-
16	4	1" X 3-1/2" CLEVIS PIN ASSEMBLY (JOCKEY BAR)	-
17	4	2-1/4" COMPOSITE UPPER RUDDER BEARING	PART OF ITEM 14
18	4	2-3/16" ID X 5" OD X 1/2" THICK NYLON THRUST WASHER	-

EQUIPMENT LIST (ELECTRICAL CONTROL)

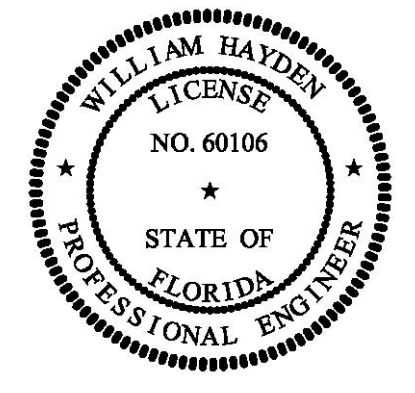
ITEM #	QTY	DESCRIPTION	NOTES
20	2	JOG LEVER, NON FOLLUP UP	-
21	2	CONTROL LEVER, FULL FOLLOW UP	-
22	1	SELECTOR SWITCH, PORT AND STARBOARD PUMP	-
23	1	ALARM PANEL, STEERING CONTROL	-
24	1	SELECTOR SWITCH, JOG LEVER/ FULL FOLLO UP CONTROL LEVER	-
25	1	RUDDER ANGLE INDICATOR, MASTER	-
26	1	JUNCTION BOX, STEERING SYSTEM	-
27	1	AMPLIFIER, FULL FOLLOW UP	-
28	2	LEVEL SWITCH, HYDRAULIC RESERVIOR	-
29	1	PRESSURE SWITCH, HYDRAULIC	-
30	1	JUNCTION BOX, LIMIT SWITCH	-
31	1	RUDDER FEEDBACK UNIT, 2 POT, 4 SWITCH	-

GENERAL NOTES

- MATERIAL AND WORKMANSHIP SHALL CONFORM TO U.S. COAST GUARD REQUIREMENTS FOR SUBCHAPTER M VESSELS.
- THIS DRAWING IS DIAGRAMMATIC AND DOES NOT REPRESENT A COMPLETE DETAILED DESIGN. EQUIPMENT LAYOUT IN A GIVEN AREA IS APPROXIMATE. THE CONTRACTOR SHALL DEVELOP A DETAILED DESIGN THAT PROVIDES A FULLY FUNCTIONAL ARRANGEMENT SUITABLE FOR INSTALLATION, TAKING INTO ACCOUNT ALL NECESSARY SYSTEM INTERFACES AND INTERFERENCES. DIMENSIONS SHALL BE VERIFIED FROM THE SHIP AND MANUFACTURERS' CERTIFIED DRAWINGS AS APPROPRIATE.
- PIPING SHALL BE RUN AS DIRECTLY AS PRACTICABLE WITH A MINIMUM NUMBER OF BENDS AND FITTINGS AND WITH SUFFICIENT TAKE DOWN JOINTS TO PROVIDE FOR REMOVAL, INSPECTION, SERVICING, AND REPLACEMENT OF PIPING, VALVES, FITTINGS, AND EQUIPMENT.
- AVOID POCKETS IN THE PIPE LINES. BOSSES AND VALVES OR SCREWED PLUGS SHALL BE FITTED TO ENABLE COMPLETE DRAINING OF PIPES WHERE POCKETS DO OCCUR.
- THE PIPING SYSTEM SHALL BE PRESSURE TESTED, CLEANED, AND FLUSHED PRIOR TO BEING PLACED IN SERVICE. PER MANUFACTURER'S TEST PIPING TO 3000 PSI.
- PIPING SHALL BE ADEQUATELY SUPPORTED BY HANGERS IN ACCORDANCE WITH ASTM F708. HANGERS SHALL BE ATTACHED TO THE TO THE BASIC SHIP STRUCTURE. HANGERS SHALL NOT BE ATTACHED BY WELDING DIRECTLY TO PIPES. HANGERS SUPPORTING TUBING SHALL UTILIZE A RESILIENT NONMETALLIC LINER BETWEEN THE TUBING AND STEEL HANGER.
- INSTALL RUDDER ANGLE INDICATOR IN PILOT HOUSE OVERHEAD.
- HYDRAULIC RESERVIORS TO HAVE FILLER/BREATHER, LEVEL/TEMPERATURE GAGE AND LOW LEVEL ALARM SWITCH.
- INSTALL RUDDER BEARINGS PER MANUFACTURER'S RECOMMENDATIONS.
- CABLE SIZES AND # OF CONDUCTORS PER MANUFACTURER'S SPECIFICATIONS.

GENERAL NOTES

- DESCRIPTION
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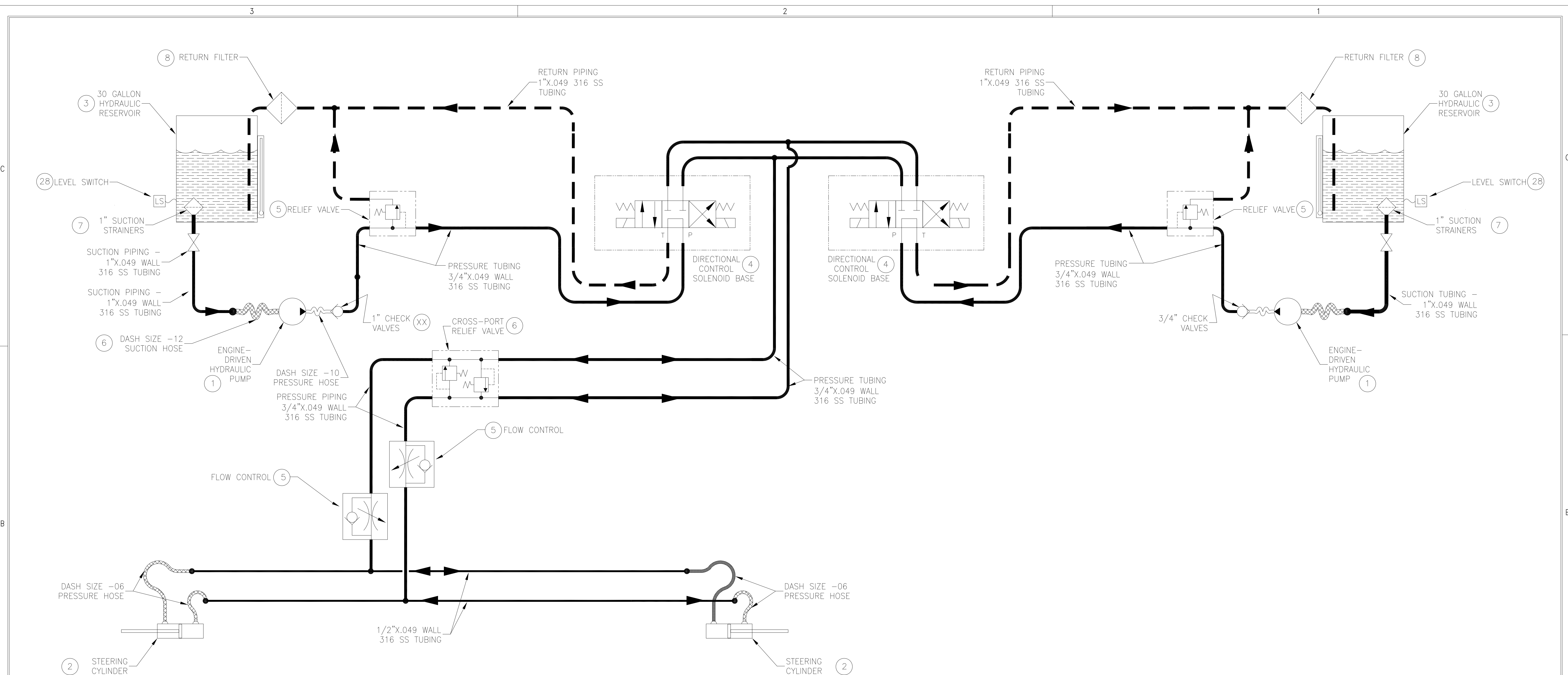
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 Fax: (904) 399-1522
 info@dejongandlebel.com

Title: 45'-6" x 20'-0" x 6'-6" NCDOT PUSHBOAT

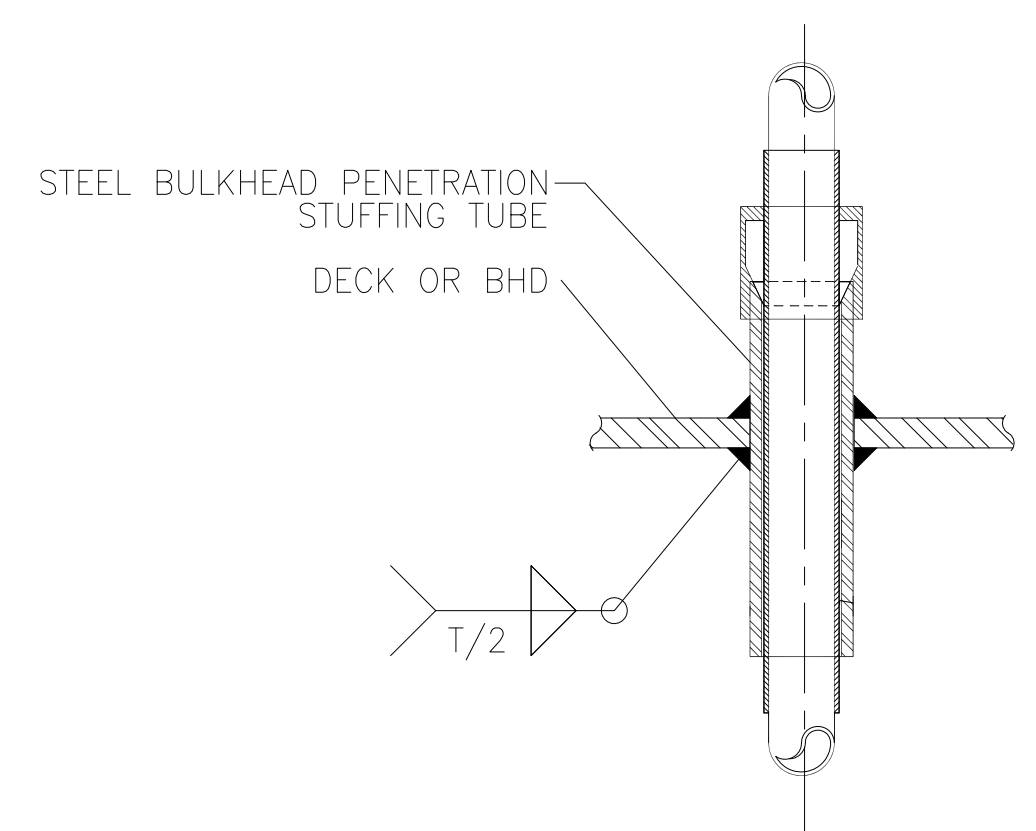
STEERING SYSTEM

Dwg. No. 17-1393-253 Alt. No. 0
 Sh. 1 of 5

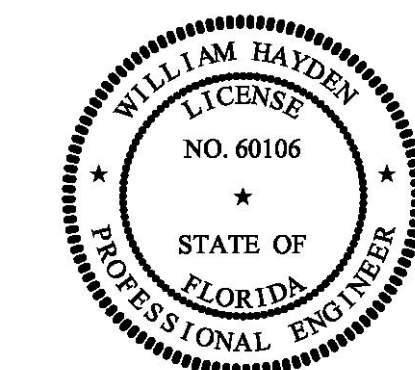
Drawn By: JAH Date: NOVEMBER 5, 2018
 Checked By: Date: NONE
 App'd By: Scale: NONE
 ABS App'l: USCG App'l:



STEERING SYSTEM HYDRUALIC DIAGRAM



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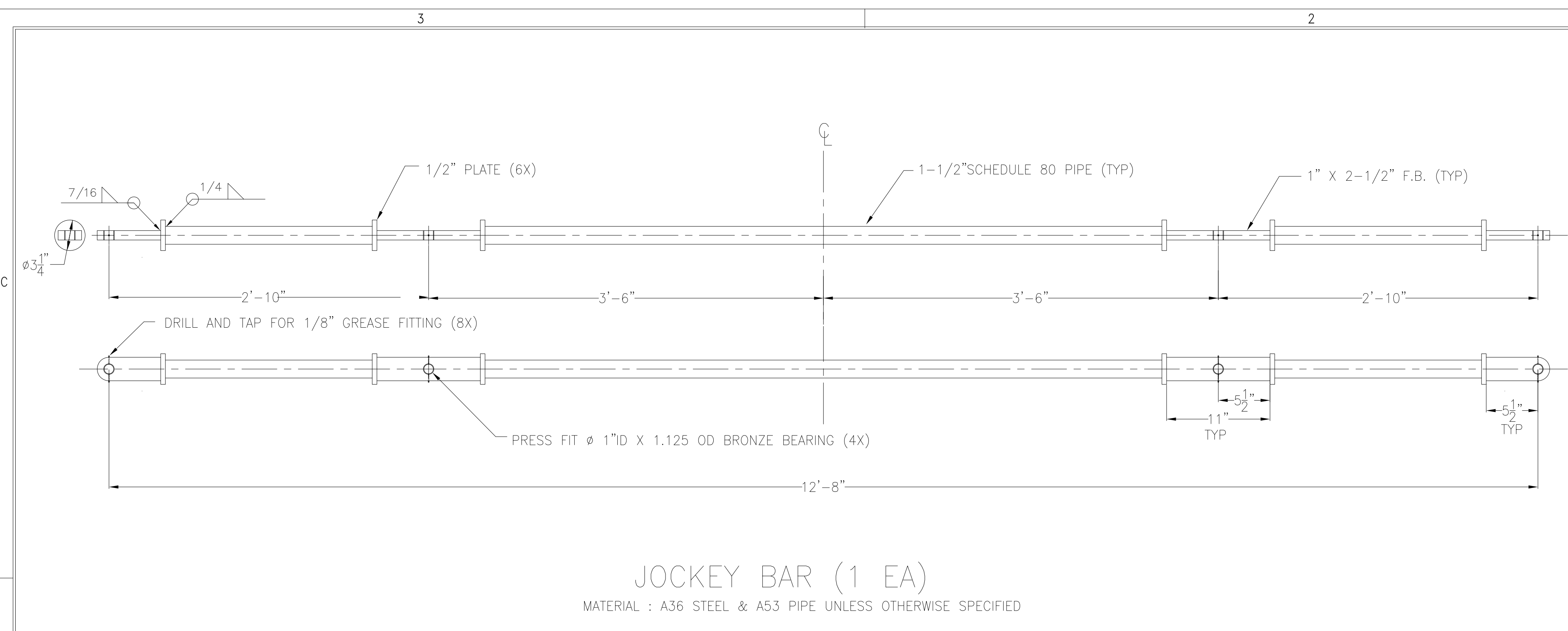
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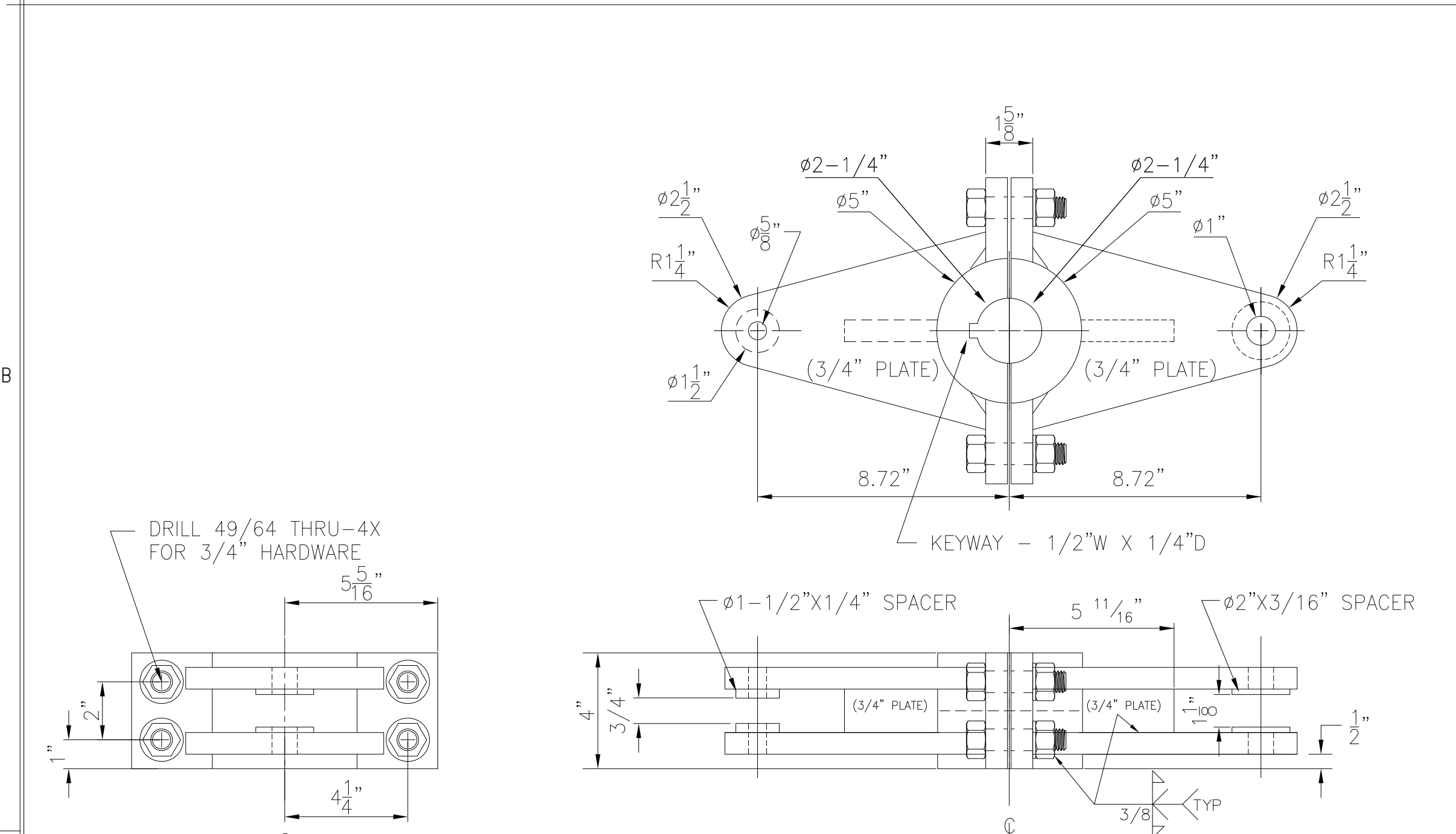
STEERING SYSTEM

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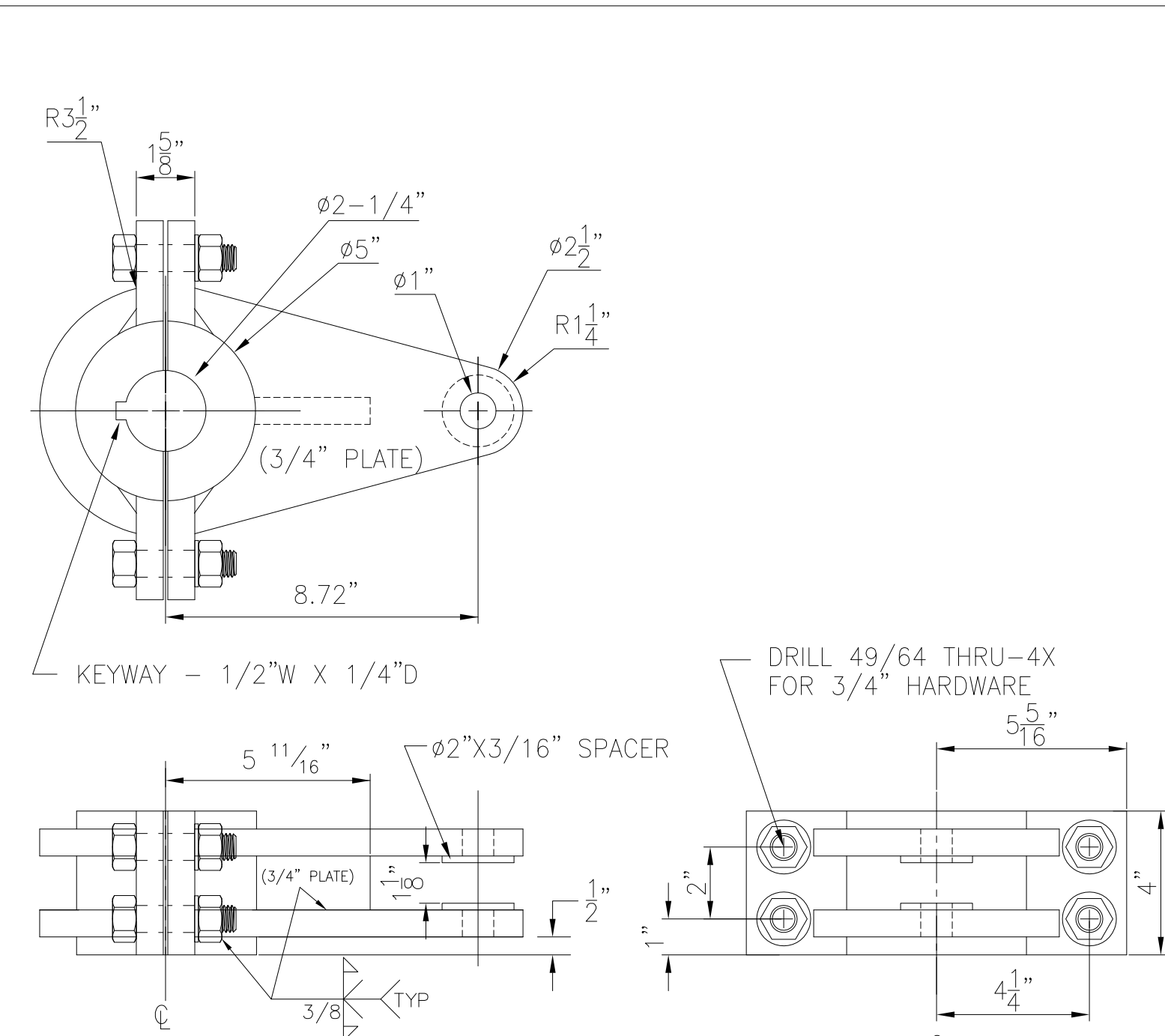
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 Checked By: _____ Date: _____
 App'd By: _____ Scale: NONE
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JOCKEY BAR (1 EA)
 MATERIAL : A36 STEEL & A53 PIPE UNLESS OTHERWISE SPECIFIED



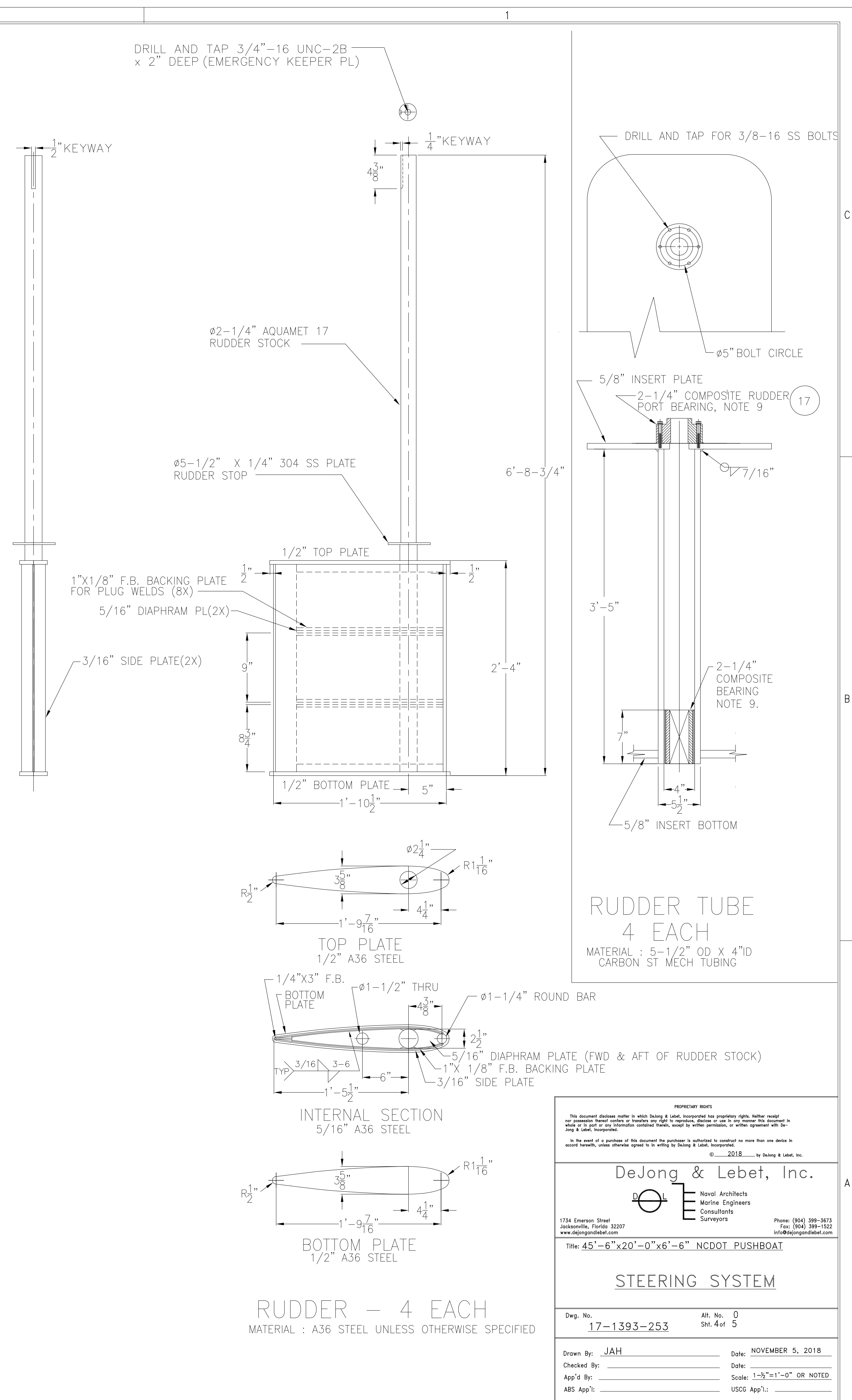
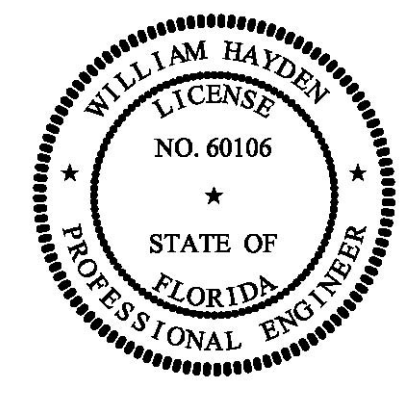
OUTBOARD TILLERS - 2 EACH
 MATERIAL : A36 STEEL UNLESS OTHERWISE SPECIFIED
 SCALE: 3" = 1'-0"



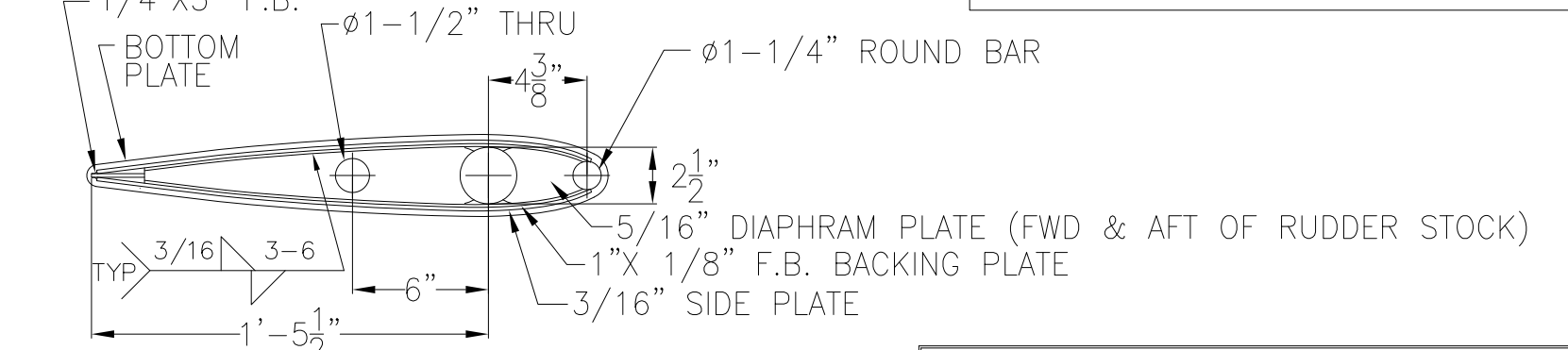
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STEERING SYSTEM COMPONENTS

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RUDDER TUBE
 4 EACH
 MATERIAL : 5-1/2" OD X 4" ID
 CARBON ST MECH TUBING



INTERNAL SECTION
 5/16" A36 STEEL

TOP PLATE
 1/2" A36 STEEL

BOTTOM PLATE
 1/2" A36 STEEL

RUDDER - 4 EACH
 MATERIAL : A36 STEEL UNLESS OTHERWISE SPECIFIED

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