

COMPLIANCE NOTE:
 IDEX Corporation and its subsidiaries are controlled by the U.S. Government and authorized for export only to the country of ultimate destination for use in the defense program or non-defense program.
 If the country of ultimate destination is not the United States, the recipient must obtain an export license from the U.S. Government or its authorized representative. If the recipient is a U.S. citizen or resident, the recipient must obtain a license from the U.S. Government or its authorized representative. If the recipient is a foreign citizen or resident, the recipient must obtain a license from the U.S. Government or its authorized representative. IDEX Corporation and its subsidiaries are not responsible for the recipient's compliance with the U.S. Government's export control regulations. These drawings are unclassified and copy without individual property of IDEX and its subsidiaries. They may not be reproduced or modified without the express written permission of IDEX Corp.

SHIM INSTALLATION PROCEDURES:

STEP 1: ENSURE PARKING BRAKE IS ON. DRAIN GEARBOX OIL.

STEP 2: SHIFT GEARBOX TO "PUMP" POSITION IF NOT DONE SO ALREADY. DISCONNECT THE DRIVELINE SHAFT FROM THE PUMP GEARBOX TAIL SHAFT ASSEMBLY.

STEP 3: REMOVE THE (4) 7/16" BOLTS (HALE P/N 018-1812-25-0)

STEP 4: REMOVE THE TAIL SHAFT ASSEMBLY FROM THE PUMP GEARBOX HOUSING. COMPLETELY REMOVE THE GASKET FROM THE REAR BEARING CAP. CLEAN THE SURFACE OF THE REAR BEARING CAP AND THE GEARBOX SURFACE.

STEP 5: RE-INSTALL THE TAIL SHAFT ASSEMBLY TO THE GEARBOX HOUSING WITHOUT A GASKET OR SHIMS AND TORQUE THE (4) 7/16" BOLTS TO 30 FT/LBS IN THE PATTERN SHOWN IN FIGURE 1.

STEP 6: USING A FEELER GAUGE, MEASURE THE GAP BETWEEN THE BEARING CAP AND THE FACE OF THE GEARBOX HOUSING. THE GAP SHOULD BE TAKEN BETWEEN TWO BOLTS ON MULTIPLE SIDES OF THE BEARING CAP. NOTE THE LARGEST READING YOU RECORD.

STEP 7: REMOVE THE TAIL SHAFT AND CLEAN THE THREADS IN THE GEARBOX HOUSING AND THE REAR BEARING CAP TO REMOVE ANY LOCTITE RESIDUE. CLEAN THE GEARBOX HOUSING THREADS WITH THE PRIMER PROVIDED.

STEP 8: SEE THE CHART IN FIGURE 2 TO DETERMINE THE CORRECT SHIM STACK TO BE USED, BASED ON THE MEASUREMENT YOU RECORDED IN STEP 6.

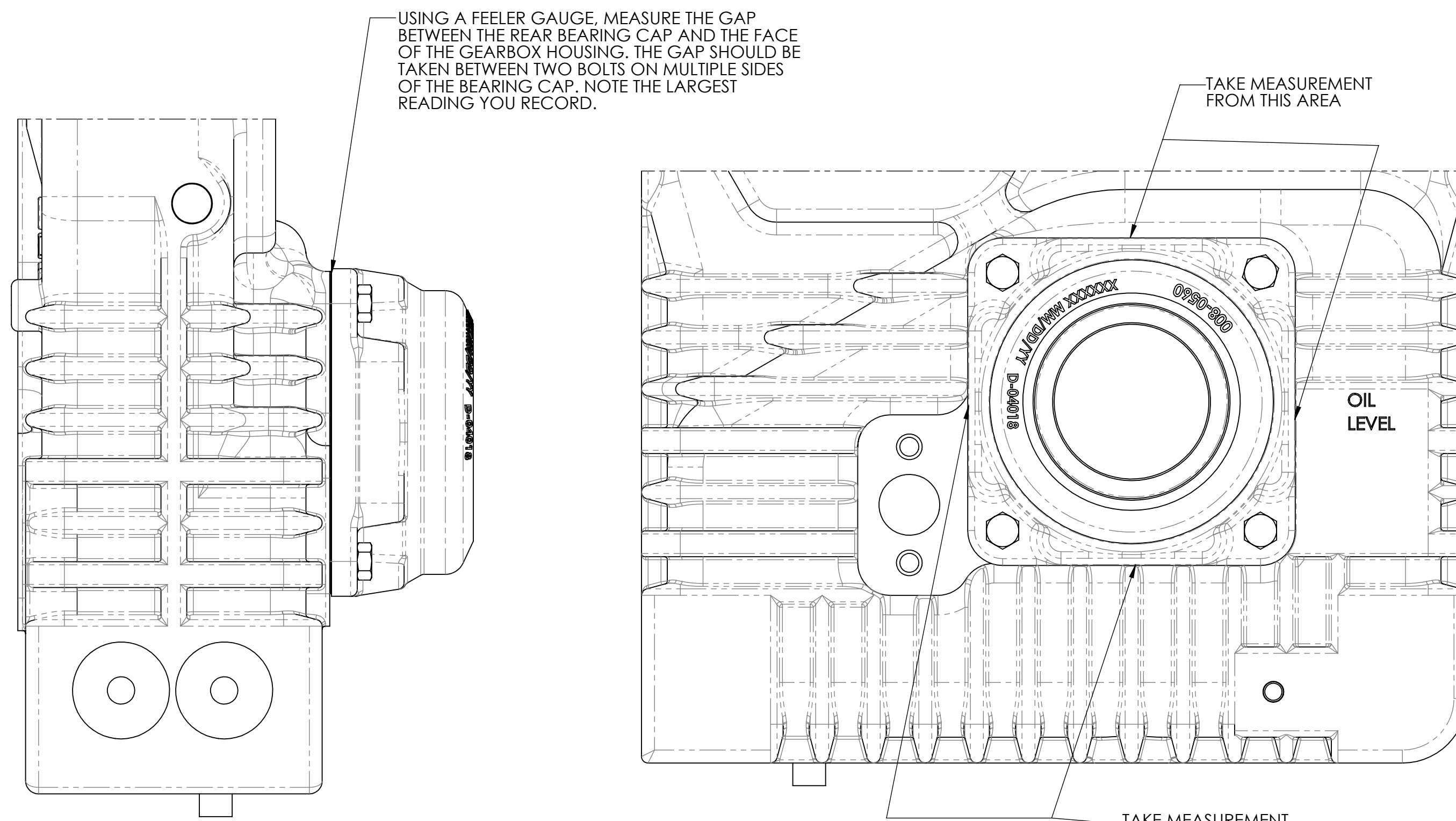
STEP 9: INSTALL THE TAIL SHAFT ASSEMBLY WITH THE NEW GASKET AND SHIMS. GREASE THE NEW GASKET SUPPLIED BY HALE PRODUCTS THEN POSITION THE GASKET AND SHIM STACK USING (2) BOLTS TO ALIGN COMPONENTS TO THE REAR BEARING HOUSING. BE CAREFUL NOT TO GET GREASE ON THE BOLT THREADS AS IT MAY INTERFERE WITH THE THREAD ADHESIVE AFTER INSTALLATION.

STEP 10: INSTALL TAIL SHAFT ASSEMBLY TO GEARBOX HOUSING. APPLY LOCTITE TO THE THREADS OF THE NEW 7/16" BOLTS AND TORQUE TO 30 FT/LBS IN THE PATTERN SHOWN IN FIGURE 1. REPEAT THE PATTERN UNTIL THE BOLTS ARE TORQUED TO 65 FT/LBS.

STEP 11: USE GEARBOX OIL TO FLUSH RESIDUAL PRIMER FROM STEP 7. REPLACE THE MAGNETIC DRAIN PLUG IN THE BOTTOM OF THE GEARBOX.

STEP 12: REFILL GEARBOX WITH GEAR OIL TO OIL LEVEL PLUG ON THE GEARBOX HOUSING USING APPROXIMATELY (4) QUARTS OF SAE EP-90, 80W-90 API GL-5, OR 75W-80 SYNTHETIC OIL AND REPLACE THE FILL PLUG.

STEP 13: RE-INSTALL OR RECONNECT ALL DRIVELINE COMPONENTS PER OEM SPECIFICATIONS.



STEP 6

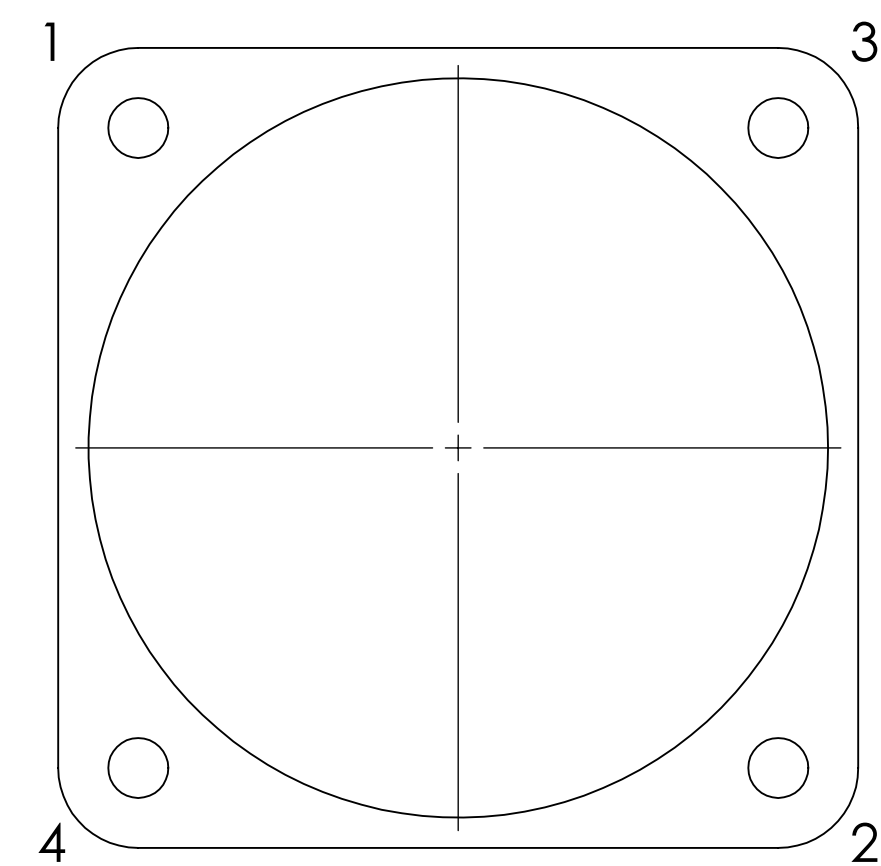
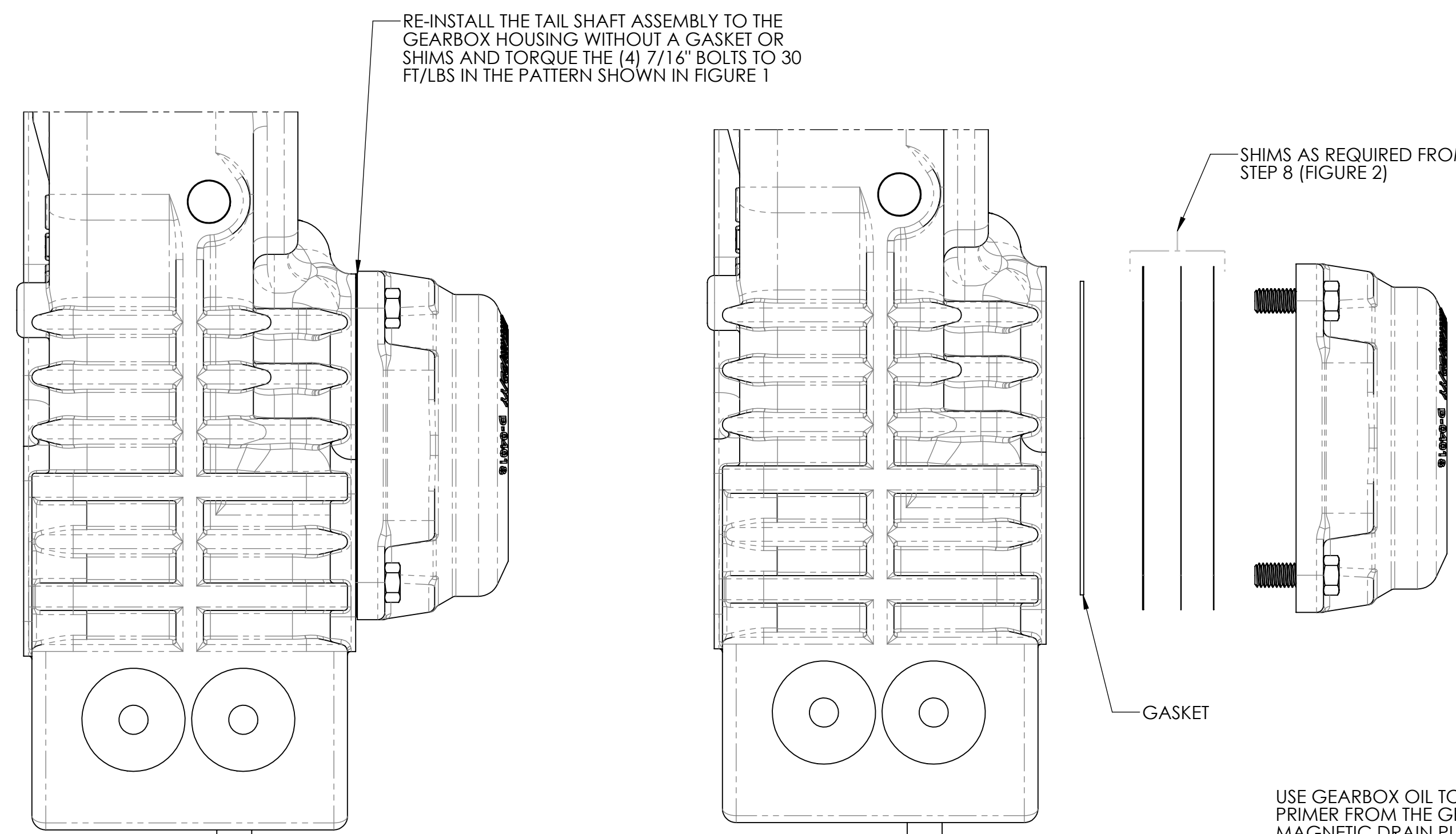
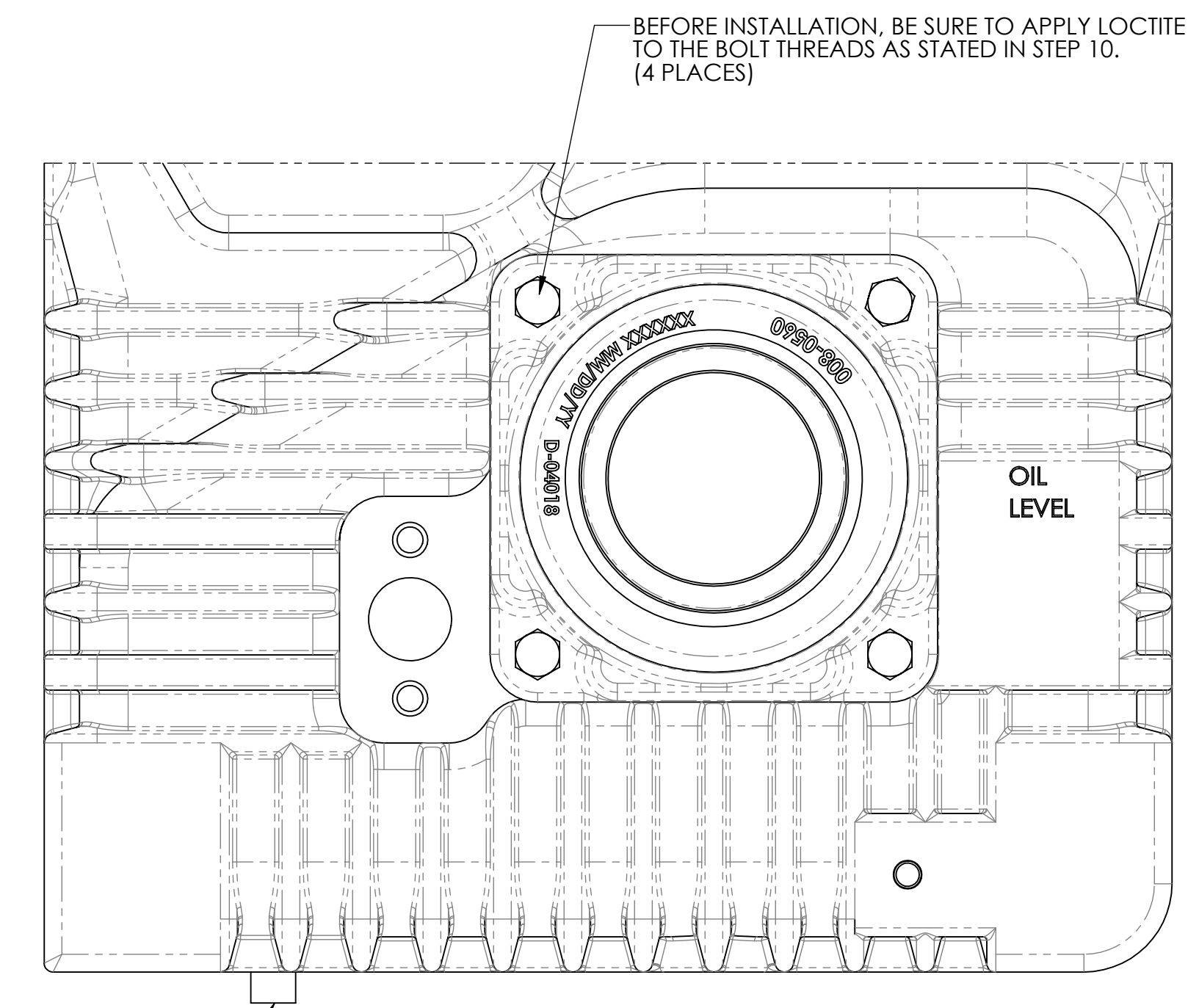


FIGURE 1



STEP 5

STEP 9







STEPS 10, 11, & 12

048-1580-XX-0 SHIM TABLE		
PART NO.	DESCRIPTION	COLOR
048-1580-05-0	SHIM, .005" THICK	BLUE
048-1580-07-0	SHIM, .007" THICK	CLEAR
048-1580-20-0	SHIM, .020" THICK	YELLOW

FEELER GAUGE READING	SHIMS TO BE USED
.020" TO .025"	(3) CLEAR (.0075" THK EA.)
.025" TO .030"	(1) CLEAR (.0075" THK) (1) YELLOW (.020" THK)
.030" TO .035"	(1) BLUE (.005" THK) (1) CLEAR (.0075" THK) (1) YELLOW (.020" THK)
.035" TO .040"	(2) BLUE (.005" THK) (1) CLEAR (.0075" THK) (1) YELLOW (.020" THK)
.040" TO .045"	(2) YELLOW (.020" THK EA.)

FIGURE 2

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCHES DIMENSIONS: X: ±0.04 X.X: ±0.02 X.XX: ±0.01 X.XXX: ±0.005 ANGLES: ±1° SURFACE TEXTURE IN µin Ra REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX		 MATERIAL MADE FROM FINISH PROJECT		   TITLE HALE TYPE "G" SERIES GEARBOX	
DRAWN: DPL APPROVED: JSJr DATE: 16JUL1999		SIZE: D SCALE: 1:2 DRAWING NUMBER: PL914		REV: P SHEET: 2 OF 3	

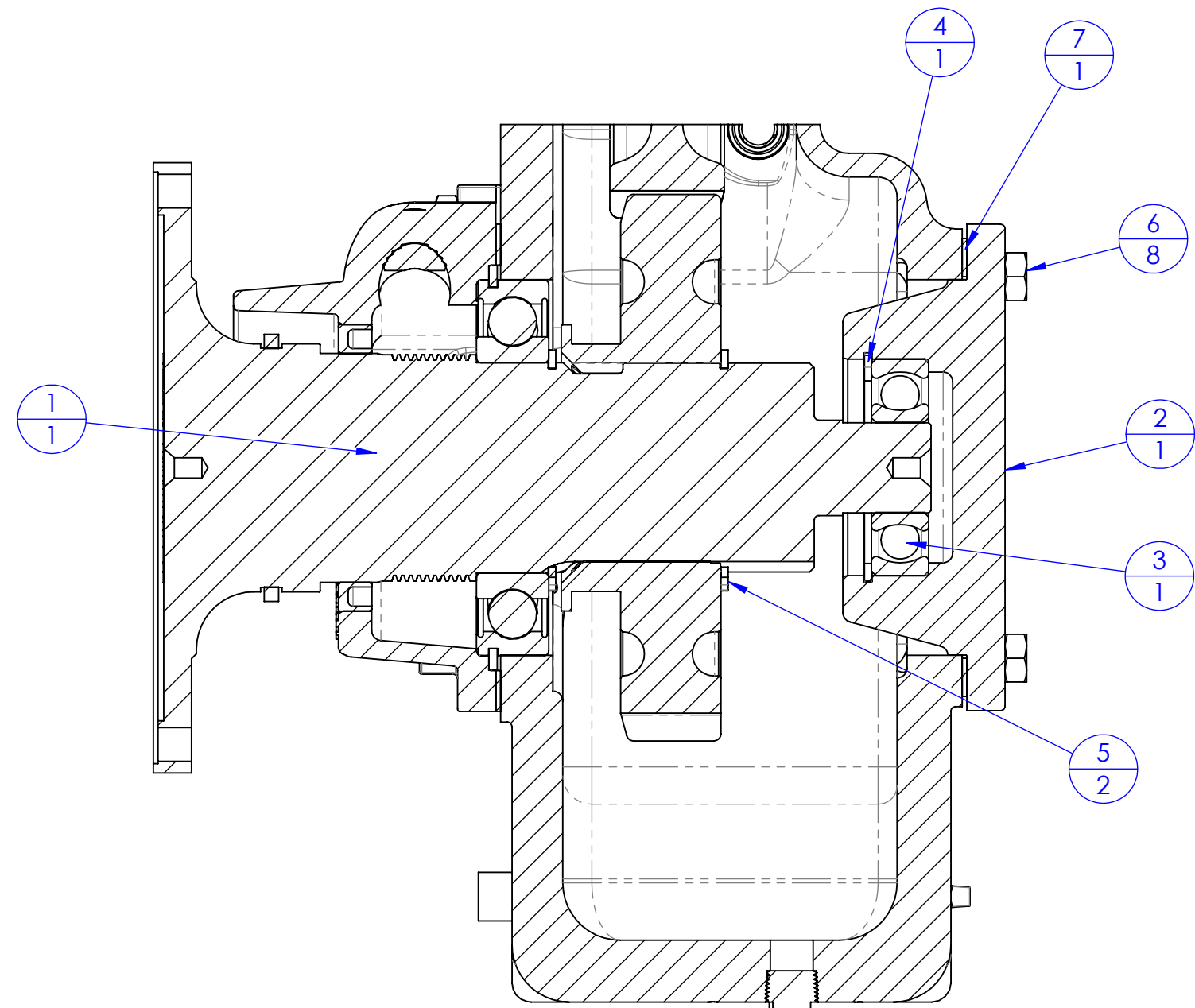
REVISIONS					
ECN	REV.	ZONE	CHANGED FROM	BY	DATE
-	-	See Sheet1	See Sheet1	-	-

OPTIONAL SPEED COUNTER DETAILS
(FOR INSTALLATION INSTRUCTIONS AND PARTS LIST, SEE PL910)

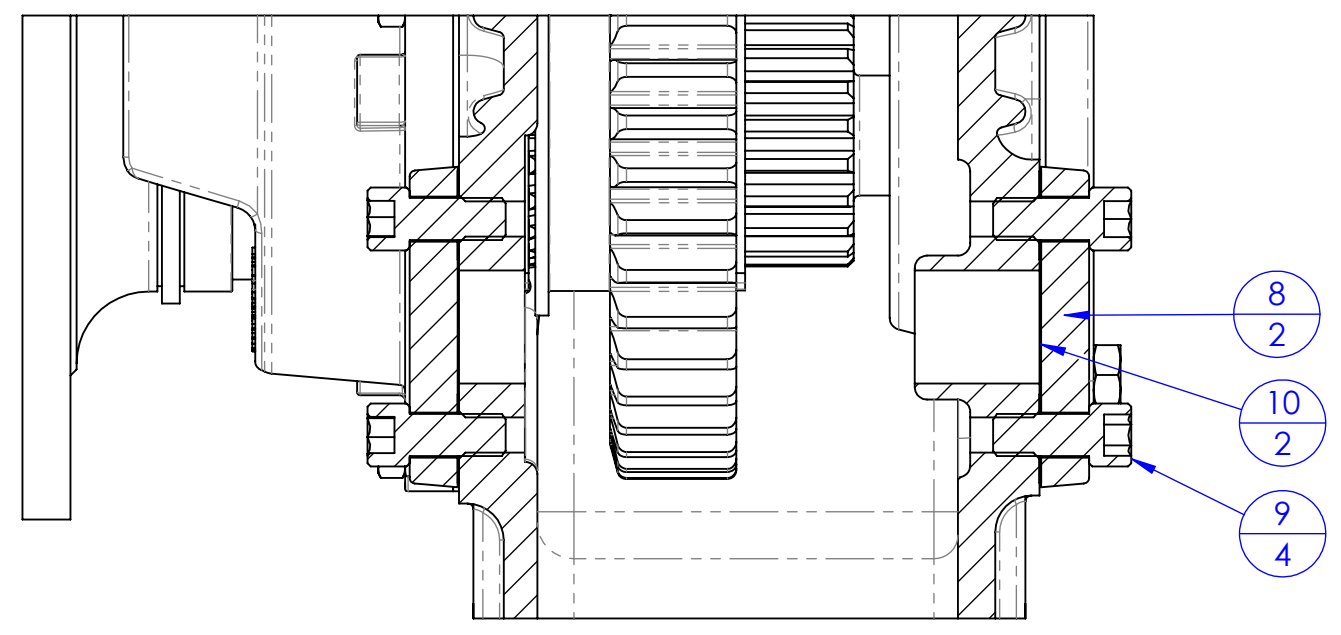
PTO DRIVE OPTION
(REAR OUTPUT SHAFT BLANKED-OFF)

- NOTES:
1. TO CONFORM TO NFPA 1901, THE APPARATUS MANUFACTURER MUST INSTALL INDICATOR LIGHTS FOR PUMP AND ROLL OPERATION PER HALE PL746.
2. APPARATUS MANUFACTURER TO FURNISH SPEED COUNTER ADAPTER PER P.T.O. RATIO. 1"-20 THREADED CONNECTION.

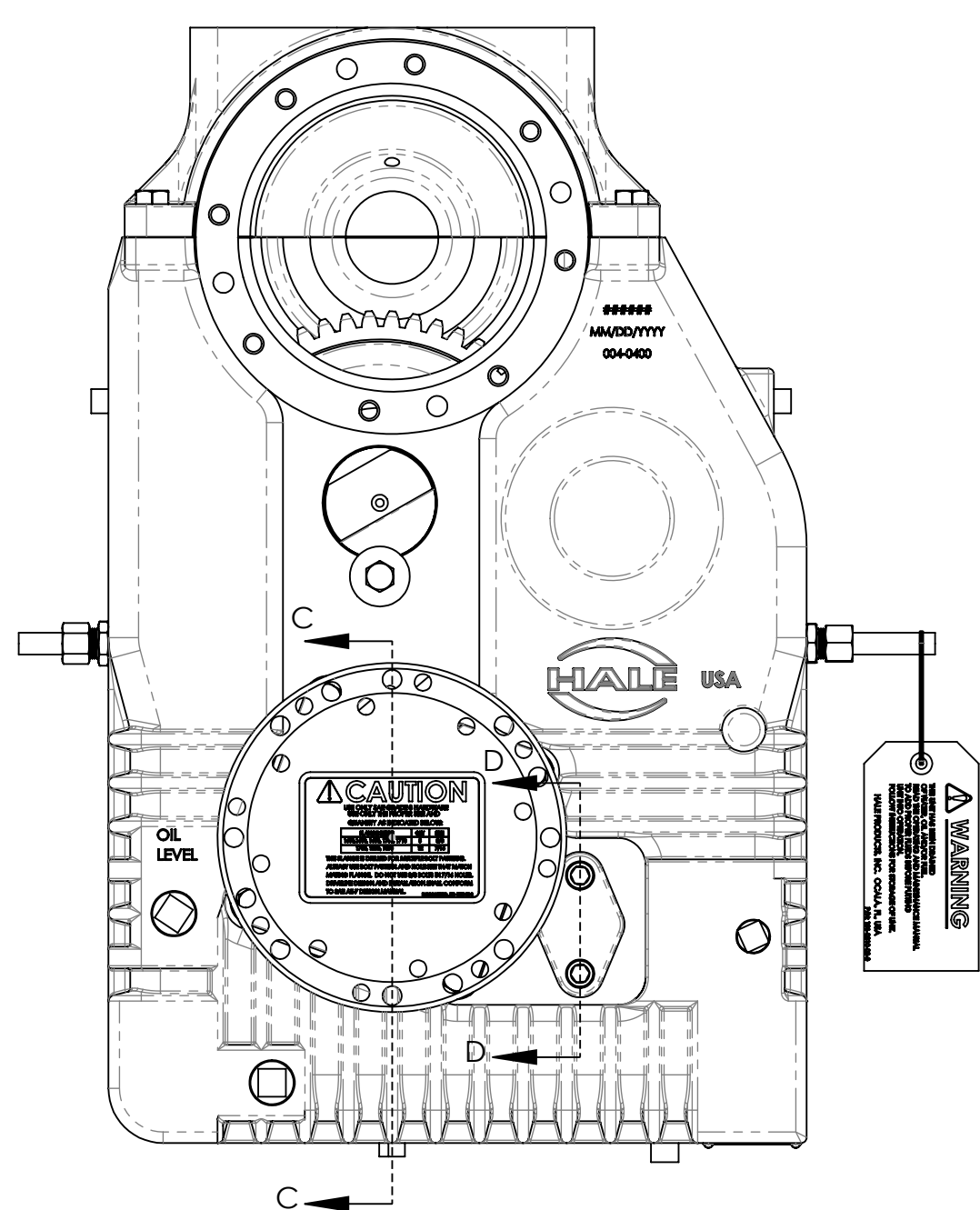
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	537-1740-01-0	SLIDING GEAR SHAFT	1
2	044-1120-00-0	BEARING COVER	1
3	250-0306-20-0	306W BEARING	1
4	077-2810-00-0	RETAINING RING	1
5	077-2750-01-0	5100-275 RETAINING RING	2
6	018-1812-25-0	SCREW, 7/16-14 X 1.25, GR8	8
7	046-5130-00-0	GEARBOX BEARING COVER GASKET	1
8	115-0091-01-0	GEARSHIFT SHAFT FLANGE	2
9	018-1810-08-0	SCREW 7/16-14 X 1.00 SOC HD CAP	4
10	046-5060-00-0	GASKET QL-W429	2



SECTION C-C
SCALE 1:2



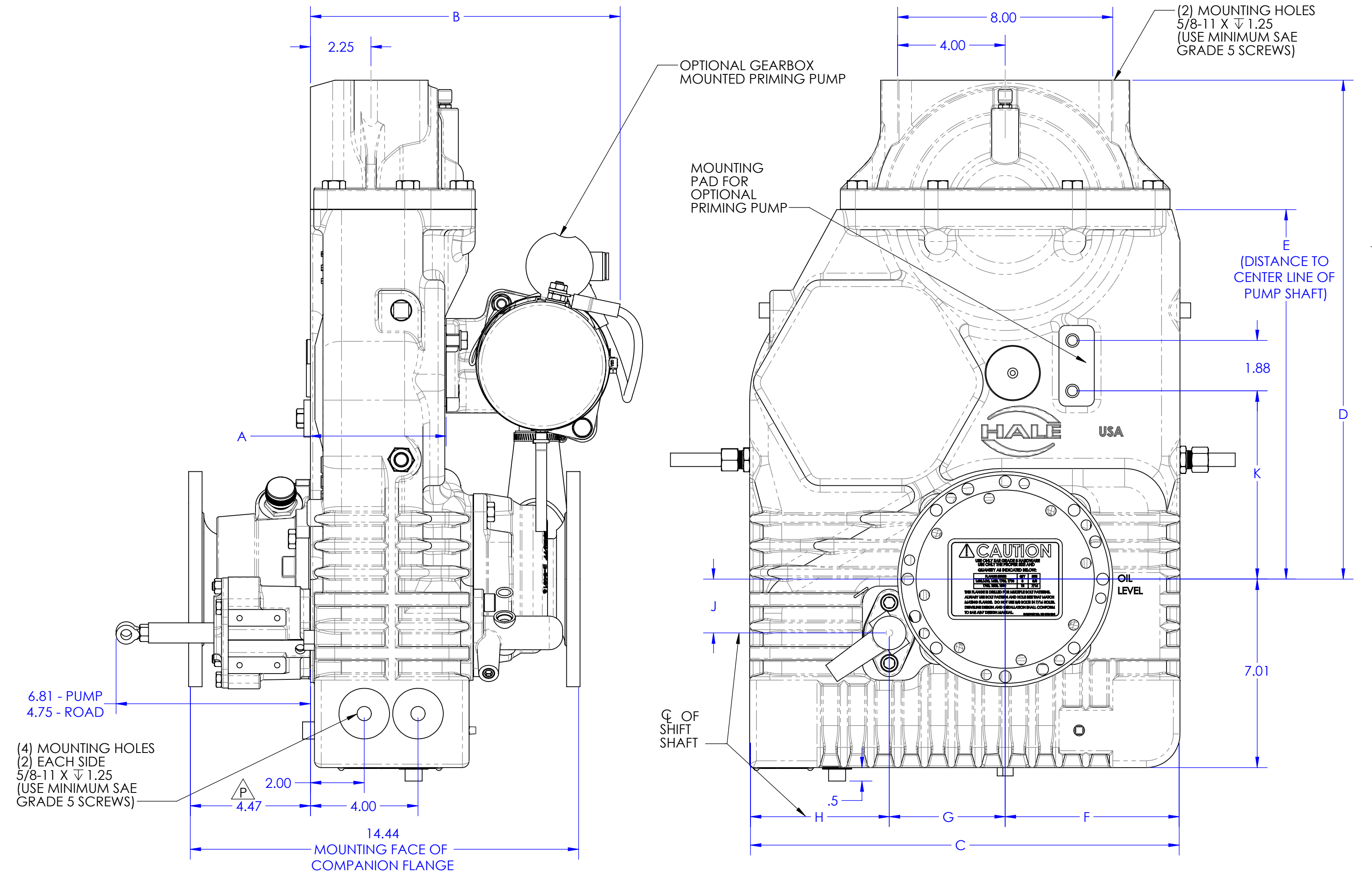
SECTION D-D
SCALE 1:2



GEARBOX MODEL	GEAR RATIO	A	B	C	D	E	F	G	H	J	K
XG	2.83					15.56					
	2.55					15.75					
	2.32	5.06	12.63	16.00	20.72	15.90	6.50	5.44	4.06	1.84	9.16
	1.96					16.25					
LG	2.28					13.38					
	2.05					13.56					
	1.86	5.06	12.63	16.00	18.56	13.75	6.50	4.31	5.19	2.00	7.00
	1.71					13.94					
SG	1.58					14.13					
	2.28					11.50					
	2.05					11.68					
	1.86	6.06	13.63	14.00	16.75	11.88	6.50	4.75	2.75	.38	6.75
	1.71					12.06					
	1.58					12.25					

**STANDARD FLANGES
(THE HALE COMBINATION
FLANGES ARE SIZED FOR
SPICER 1600, 1700, AND 1800
SERIES FLANGES)**

SERIES	FEMALE PILOT	HARDWARE (SAE GRADE 8 BOLTS)
1600	6-5/8"	(8) 3/8"
1700	7-3/4"	(8) 3/8"
1800	7-3/4"	(12) 7/16"



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCHES DIMENSIONS:
X: ±0.04
X.X: ±0.02
X.XX: ±0.01
X.XXX: ±0.005
ANGLES: ±1°
SURFACE TEXTURE IN µin Ra
REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

FSG OF IDEX CORPORATION		HALE GODIVA Class1	
MATERIAL	TITLE HALE TYPE "G" SERIES GEARBOX		
MADE FROM	DRAWN DPL	SIZE D	DRAWING NUMBER PL914
FINISH	APPROVED JSJr	SCALE 1:3	REV P
PROJECT	DATE 16JUL1999		SHEET 3 OF 3

REVISIONS					
ECN	REV.	ZONE	CHANGED FROM	BY	DATE
-	-	See Sheet1	See Sheet1	-	-

PROJECTION:

COMPLIANCE NOTE:
15 CFR 738 These items are controlled by the U.S. Government and authorized for export only to the country of ultimate destination for which the ultimate consignee or end-user(s) is/are identified. They may not be re-exported, transferred, or otherwise disposed of to any other country or to any person other than the ultimate consignee or end-user(s), unless the export hereunder is authorized by the U.S. Government or otherwise authorized by U.S. Export Regulations. The terms "ultimate consignee" and "end-user(s)" include persons, entities and organizations (including those located in the United States). These items are unclassified and copy within intellectual property of IDEX and its subsidiaries, and may not be reproduced or modified without the express written permission of IDEX only.