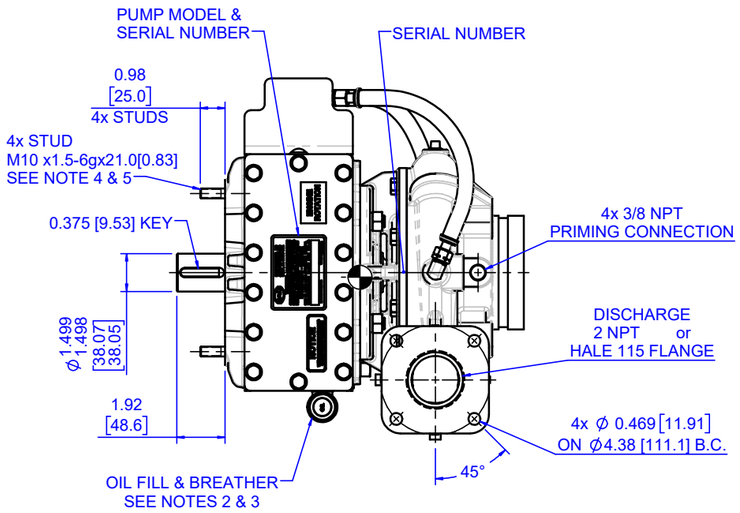
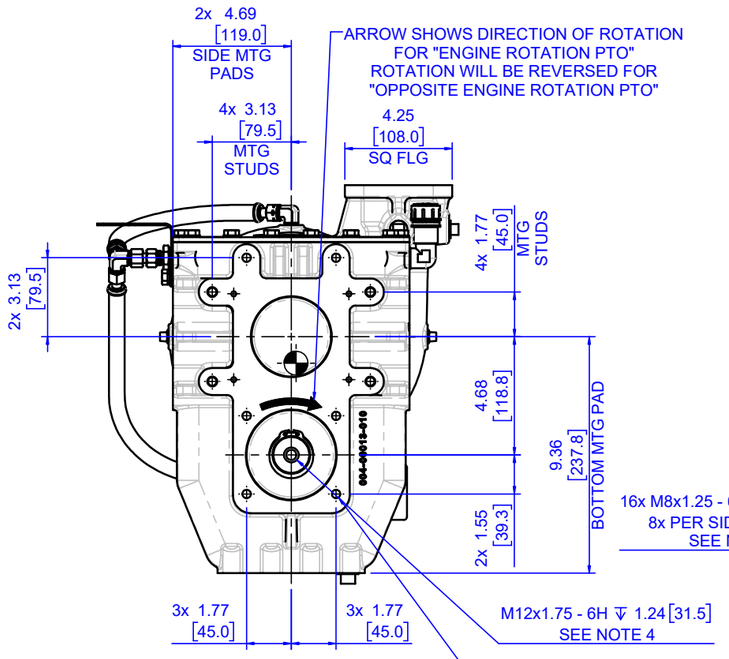
IF IN DOUBT ASK

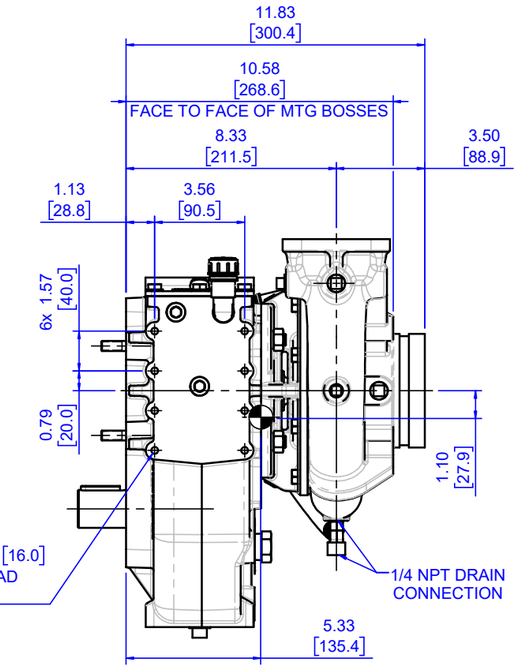
HALE CBP FLEX SERIES PUMP

GEARBOX POSITION - VERTICAL, DISCHARGE POSITION - 1,
ENGINE ROTATION AND OPTIONAL GEARBOX COOLER SHOWN

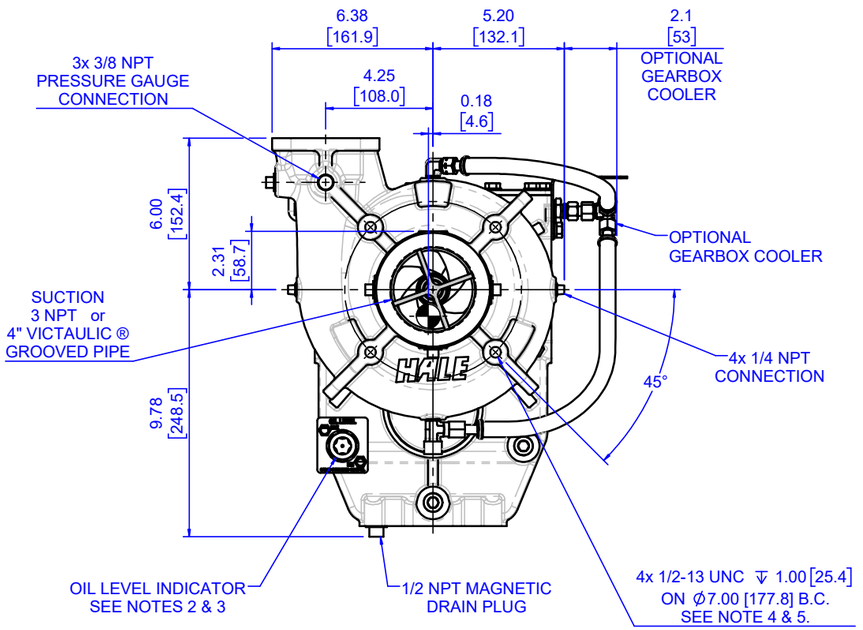
NOTES:
1. PRIMING SYSTEM, DISCHARGE & SUCTION VALVES, PRESSURE RELIEF VALVES & CONTROLLERS AND THERMAL RELIEF VALVES ARE AVAILABLE.
2. USE SAE 50 LONG-LIFE SYNTHETIC MANUAL TRANSMISSION FLUID MEETING ONE OR MORE OF THE FOLLOWING SPECIFICATIONS.
   - API MT-1
   - EATON PS-164 Rev. 7
   - MACK TO-A Plus
   - MERITOR 0-81
   - NAVISTAR / INTERNATIONAL TMS 6816
   - ROCKWELL / EATON / FULLER CD-50 (PS-081)
   - ZF FreedomLine
3. FILL GEARBOX UNTIL OIL LEVEL INDICATOR WINDOW IS 1/2 TO 3/4 FULL. APPROXIMATE OIL CAPACITY IS 1.5 QUART [1.4 LITER].
4. ALL METRIC FASTENERS TO HAVE A MINIMUM PROPERTY CLASS 8.8. ALL SAE FASTENERS TO HAVE A MINIMUM GRADE 5 SPECIFICATION.
5. PUMP ASSEMBLY MOUNTING:
   1. MOUNTING SHOULD BE FROM BOTH VOLUTE AND GEARBOX.
   2. PUMP MOUNTING SUPPORT SHOULD BE VIA THE PUMP VOLUTE MOUNTING HOLES (3 MIN.).
   3. GEARBOX MOUNTING SUPPORT SHOULD BE FROM THE STUDS PROVIDED (3 MIN.).
   4. CONSIDERATION MUST BE TAKEN NOT TO TRANSMIT LOADS OR TWISTING MOMENTS TO OR THROUGH PUMP ASSEMBLY FROM CHASSIS, FRAME, BODY WORK, SUCTION AND DISCHARGE PIPING CONNECTIONS.







DETAIL - BOTTOM MOUNTING PAD



OPTIONS AND ACCESSORIES

OPTION	DRAWING NUMBER
ESP PRIMING PUMP	PL821
PVG PRIMING VALVE	PL480
SPV PRIMING VALVE	PL828
PUMP SHIFT INDICATOR LIGHTS	PL825
GEARBOX POSITIONS	FSG-PL-01482, SHT 2
DISCHARGE POSITIONS	FSG-PL-01482, SHT 2
FLEX SERIES GEARBOX ASSEMBLY	FSG-PL-01481

INPUT SHAFT - INERTIA WITH PUMPED WATER

CALCULATIONS FOR INPUT SHAFT DO NOT INCLUDE MATING DRIVE FLANGE, DRIVE COUPLING, YOKES, OR DRIVELINE. CUSTOMER OR SUPPLIER MUST PROVIDE MASS MOMENTS OF INERTIA FOR ADDITIONAL DRIVELINE COMPONENTS

PUMP MODEL	INERTIA (UNITS)	
	(LB-FT^2)	(kg-m^2)
CBP-37F	3.391	0.1429
CBP-29F	2.243	0.0945
CBP-26F	1.872	0.0789
CBP-23F	1.582	0.0666
CBP-19F	1.157	0.0488
CBP-16F	0.943	0.0397
CBP-13F	0.685	0.0288
CBP-11F	0.570	0.0240

GEAR RATIOS & PUMP MODELS

PUMP MODEL	GEAR RATIO
CBP*-37F	3.74
CBP*-29F	2.91
CBP*-26F	2.60
CBP*-23F	2.33
CBP*-19F	1.90
CBP*-16F	1.64
CBP*-13F	1.31
CBP*-11F	1.14

PROJECTION:

COMPLIANCE NOTE:
ECCN 7568 These items are controlled by the U.S. Government and authorized for export only to the country of ultimate destination for use by the ultimate consignee or end-user(s) herein identified. They may not be resold, transferred, or otherwise disposed of, to any other country or to any other person within the destination country without authorization through the U.S. Government or as otherwise authorized by U.S. law and regulations the term "authorized" includes exports, reexports and transfers (in-country) designated under No License Required (NLR). These drawings are trademarked and copy written (intellectual property of IDEX and it subsidiaries, and may not be reproduced or replicated without the express written permission of IDEX corp.

PUMP WEIGHT (DRY):
IRON VERSION: 90 LBS [41 kg]
BRONZE VERSION: 93 LBS [43 kg]

REPRESENTS CENTER OF GRAVITY

* THE HALE TYPE CBP PUMP IS AVAILABLE IN 250 GPM AND 1000 L/min NFPA RATINGS. THE COMPLETE PUMP MODEL NUMBER IS FORMED AS FOLLOWS:

FOR EXAMPLE, A CBP PUMP IS REQUIRED TO HAVE A 250 GPM RATING WITH A 2.33 GEAR RATIO. THE PUMP MODEL NUMBER WOULD BE AS SHOWN:

CBP 25-23 F
PUMP MODEL | RATED CAPACITY | PUMP RATIO | GEARBOX TYPE

MAXIMUM INPUT RPM

WARNING
EXCEEDING THESE LIMITS OR FAILURE TO FOLLOW THE RECOMMENDATIONS OUTLINED ON THIS DRAWING COULD DAMAGE THE PUMP AND RESULT IN PERSONAL INJURY.

PUMP MODEL	MAX GEARBOX INPUT RPM	PUMP MODEL	MAX GEARBOX INPUT RPM
CBP-37F	2210	CBP-19F	4340
CBP-29F	2840	CBP-16F	5020
CBP-26F	3180	CBP-13F	6320
CBP-23F	3540	CBP-11F	6720**

SEE HALE TORQUE LIMIT CHART F-72 FOR ADDITIONAL DATA.
MAXIMUM ALLOWABLE HYDRODYNAMIC PRESSURE: 400 PSIG; **340 PSIG
MAXIMUM ALLOWABLE HYDROSTATIC PRESSURE: 500 PSIG

INSTALLATION

REVISIONS						
ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
	A		INITIAL RELEASE	TAM	08DEC2017	DLM
	B		DRAWING TITLE WAS "PUMP ASSEMBLY, CBP-N SERIES", UPDATED ALL GEARBOX NOTATIONS FROM -N TO -F	TAM	31JAN2017	DLM
4564	C		RELEASED TO PRODUCTION	DWS	27SEP2018	DLM

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: ±0.25°
SURFACE TEXTURE IN µm Ra
REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

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FSG OF IDEX CORPORATION

HALE GODIVA Class 1

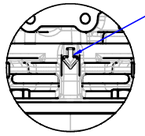
MATERIAL
MADE FROM
FINISH
PROJECT

TITLE: Pump Assembly, CBP Flex Series

DRAWN	TAM	SIZE	DRAWING NUMBER
APPROVED	MAL	D	FSG-PL-01482
DATE	24MAY2017	SCALE 1:3	REV C
			SHEET 1 OF 6

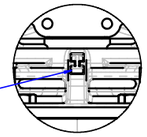
IF IN DOUBT ASK

PROJECTION:



THE CAST "ARROW" ON PUMP HEAD TO POINT UP FOR ALL GEARBOX POSITIONS, EXCEPT INVERTED POSITION.

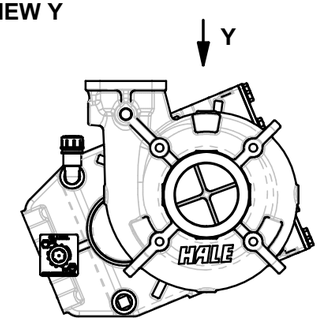
THE CAST "I" ON PUMP HEAD TO POINT UP FOR INVERTED GEARBOX POSITION.



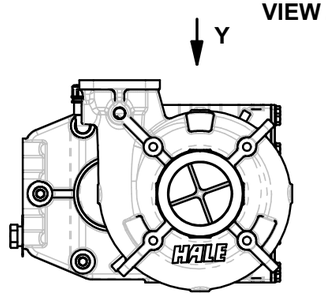
VIEW Y

VIEW Z

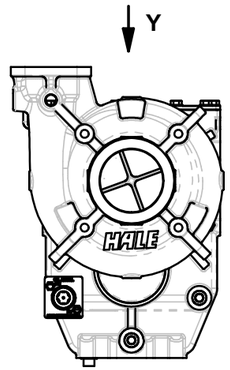
GEARBOX POSITIONS



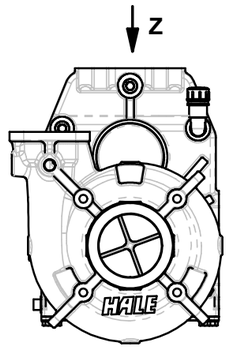
HORIZONTAL LH - 22.5°
(NOT AVAILABLE WITH ENGINE MOUNT)



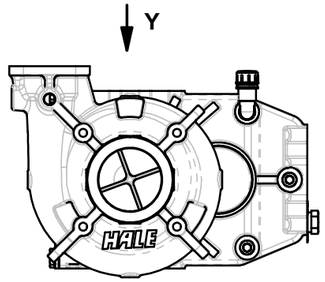
HORIZONTAL LH



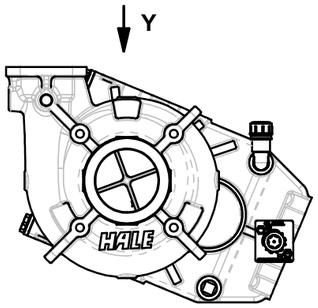
VERTICAL
(PUMP OVER INPUT)



INVERTED
(INPUT OVER PUMP)



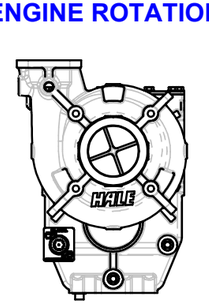
HORIZONTAL RH



HORIZONTAL RH - 22.5°
(NOT AVAILABLE WITH ENGINE MOUNT)

DISCHARGE POSITIONS

ENGINE ROTATION (ER)



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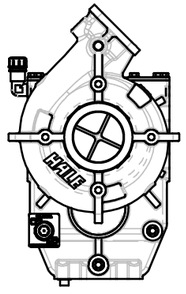

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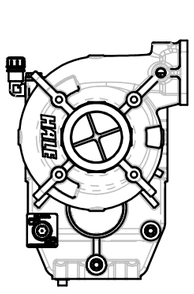

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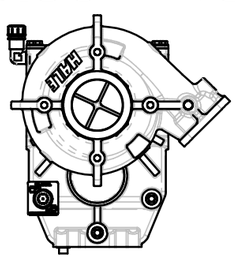

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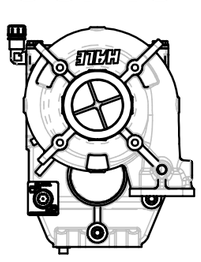

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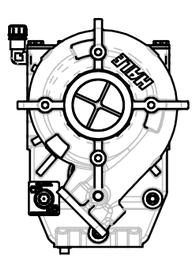

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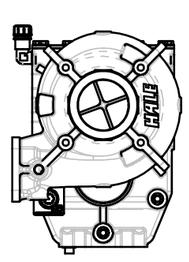

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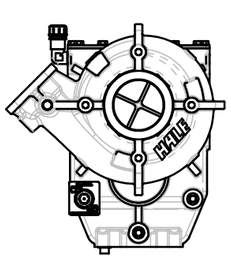
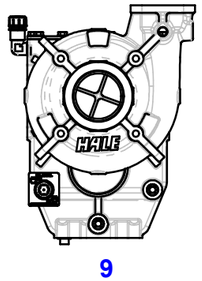


8

OPPOSITE ENGINE ROTATION (OER)



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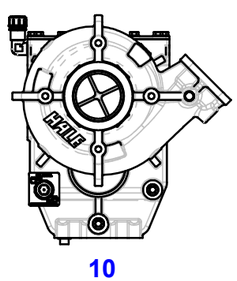

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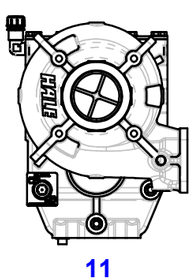

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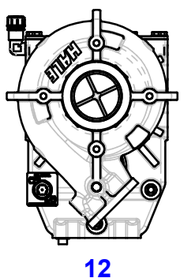

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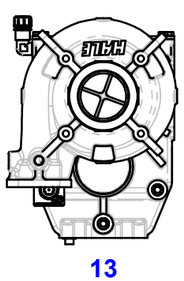

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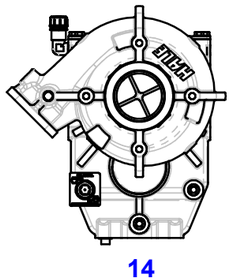

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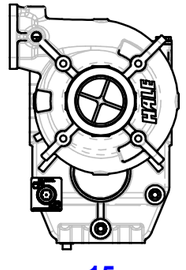

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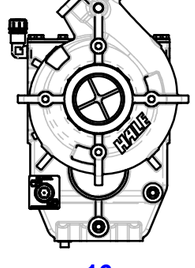

16

DISCHARGE AND GEARBOX POSITIONS

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: ±0.25°
SURFACE TEXTURE IN µm Ra
REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

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FSG OF IDEX CORPORATION

MATERIAL

MADE FROM

FINISH

PROJECT

HALE GODIVA Class1

TITLE: Pump Assembly, CBP Flex Series

DRAWN	TAM	SIZE D	DRAWING NUMBER FSG-PL-01482
APPROVED	MAL	SCALE 1:3	REV C
DATE	24MAY2017		SHEET 2 OF 6

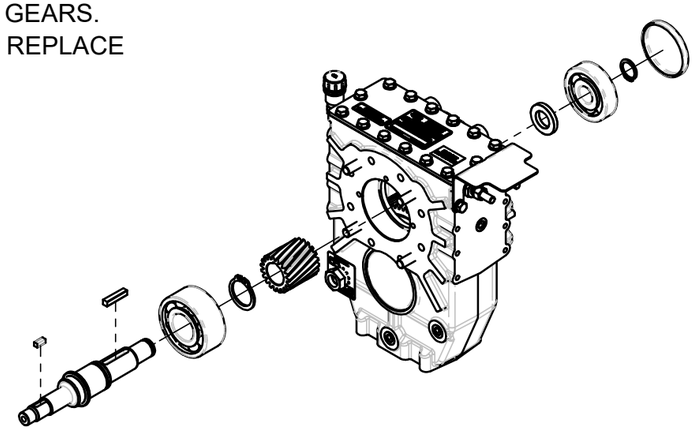
IF IN DOUBT ASK

PROJECTION:

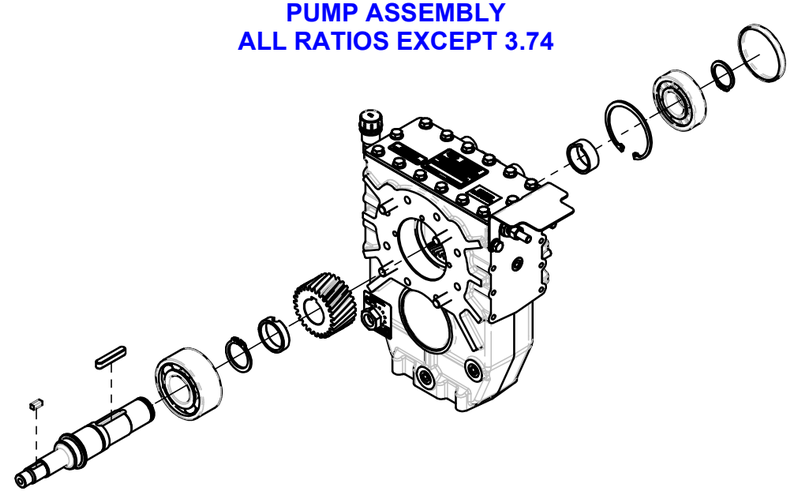
NOTE:

1. LEVEL 1 REPAIR KIT PROVIDES EVERYTHING NEEDED TO CHANGE SEALS.
2. LEVEL 2 REPAIR KIT PROVIDES LEVEL 1 AND ITEMS NEEDED FOR BEARINGS.
3. LEVEL 3 REPAIR KIT PROVIDES LEVEL 1 & 2 AND ITEMS TO REPLACE GEARS.
4. IMPELLER RENEW KIT PROVIDES LEVEL 1 REPAIR KIT AND ITEMS TO REPLACE IMPELLER.

PUMP ASSEMBLY
3.74 RATIOS

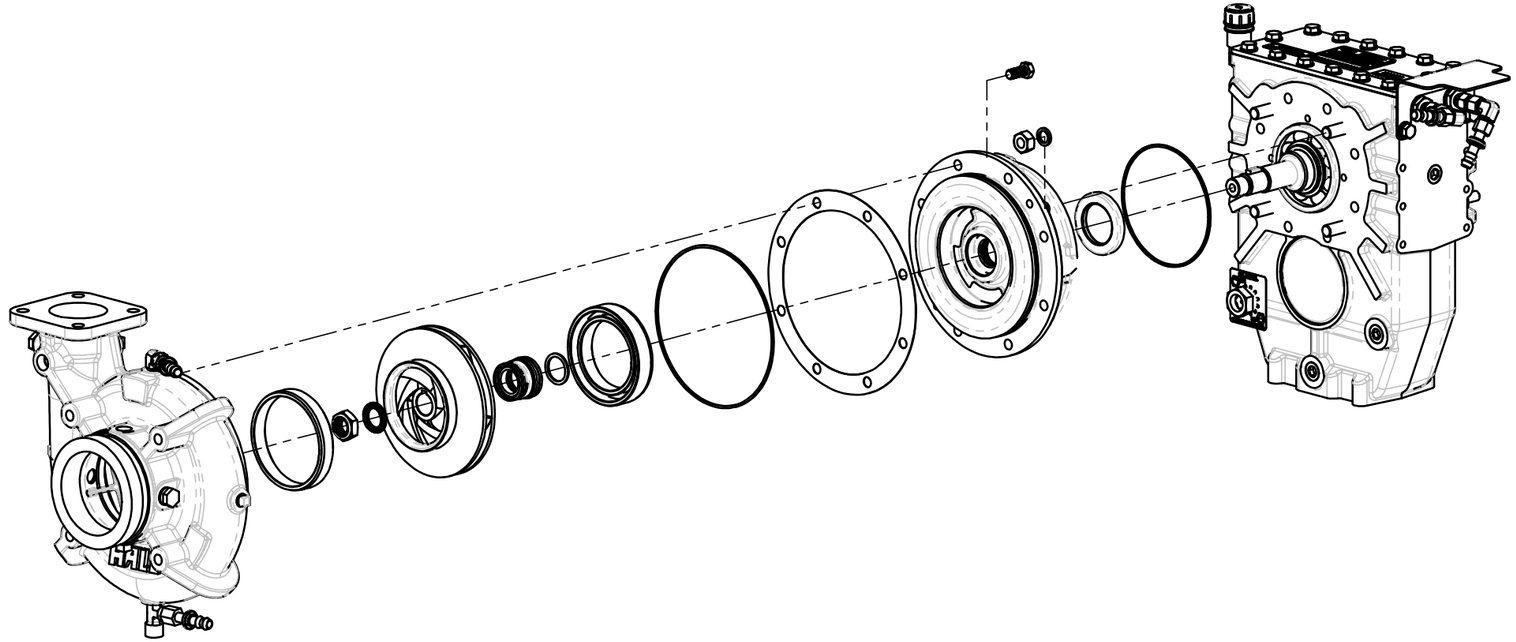


PUMP ASSEMBLY
ALL RATIOS EXCEPT 3.74



REPAIR KIT PART NUMBERS				
RATIO NAME	GEAR RATIO	LEVEL 1 REPAIR KIT P/N	LEVEL 2 REPAIR KIT P/N	LEVEL 3 REPAIR KIT P/N
-37F	3.74	546-00067-100	546-00067-237	546-00067-337
-29F	2.91		546-00067-200	546-00067-329
-26F	2.60			546-00067-326
-23F	2.33			546-00067-323
-19F	1.90			546-00067-319
-16F	1.64			546-00067-316
-13F	1.31			546-00067-313
-11F	1.14			546-00067-311

IMPELLER RENEW KIT PART NUMBERS	
DESCRIPTION	PART NUMBER
IMPELLER RENEW KIT (OER)	516-00026-023
IMPELLER RENEW KIT (ER)	516-00026-024



REPAIR PART KITS IDENTIFICATION

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: ±0.25°
SURFACE TEXTURE IN µm Ra
REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

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FSG OF IDEX CORPORATION

MATERIAL

MADE FROM

FINISH

PROJECT

HALE GODIVA Class 1

TITLE: Pump Assembly, CBP Flex Series

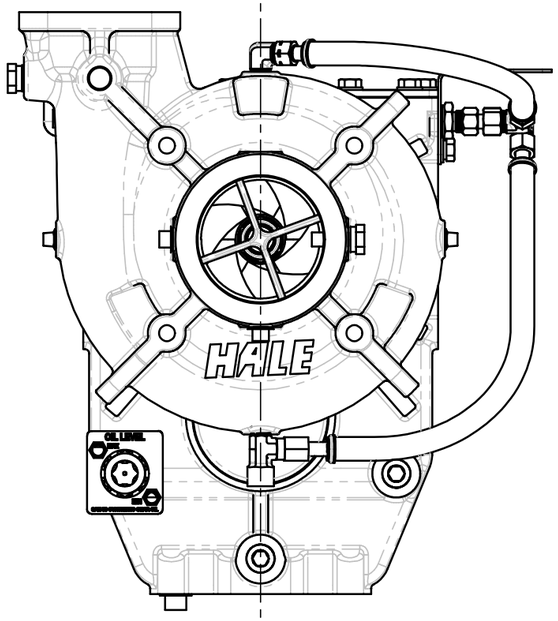
DRAWN	TAM	SIZE	DRAWING NUMBER
APPROVED	MAL	D	FSG-PL-01482
DATE	24MAY2017	SCALE 1:3	REV C
			SHEET 3 OF 6

IF IN DOUBT ASK

PROJECTION:

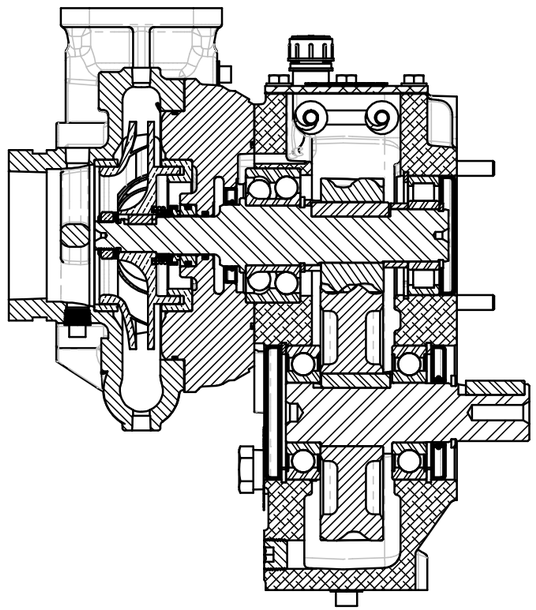
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	001-0200-00-0	CBP-320RD BODY-VOLUTE (ENG ROT) (SHOWN)	1
	001-0190-00-0	CBP-320LD BODY-VOLUTE (OPP ENG ROT)	
	001-0200-01-0	CBP-320RD BODY-VOLUTE (ENG ROT), BRONZE	
	001-0190-01-0	CBP-320LD BODY-VOLUTE (OPP ENG ROT), BRONZE	
2	321-0070-00-0	RING, CLEARANCE	1
3	110-2711-11-0	NUT, 3/4-16 NYLON LOCK STNL JAM	1
4	097-90031-999	WASHER, NORD-LOCK 3/4" SS	1
5	016-0240-00-0	CBP-16R-6 IMPELLER (ENG ROT) (SHOWN)	1
	016-0230-00-0	CBP-16L-6 IMPELLER (OPP ENG ROT)	
6	296-5050-08-0	MECHANICAL SEAL HP100/75	1
7	040-00214-010	O-RING, AS568-214, TEFLON	1
8	321-00013-000	RING, REAR, WRAP AROUND, CBP-F	1
9	040-1640-00-0	O-RING, AS568-164, NITRILE	1
10	046-0350-00-0	GASKET VOLUTE BODYFZ-W323	1
11	002-00018-001	HEAD, PUMP, CBP-F	1
	002-00018-003	HEAD, PUMP, CBP-F, BRONZE	
12	018-1607-25-0	CSW HH 3/8-16x0.88 GR8, IRON PUMP	8
	018-1607-12-0	CSW HH 3/8-16x0.88 SS, BRONZE PUMP	
13	MS35/10	NUT, FULL M12	4
14	MS29/8	WASHER, SPRING SQ M12	4
15	101-0900-00-0	ENGINE ROTATION DECAL	1
	101-0900-01-0	OPPOSITE ENGINE ROTATION DECAL	
16	082-3028-00-0	FITTING 3/8 HOSE BARB x 3/8 TUBE	4
17	082-0318-02-0	ELBOW, 3/8 COMP X 3/8 COMP, 90 DEG (SHOWN)	2
	082-3071-02-0	TEE, 3/8 CPRSN UNION (NOT SHOWN)	
18	FSG-PL-01481	HALE FLEX SERIES GEARBOX	1
19	040-1580-00-0	O-RING, AS568-158, NITRILE	1
20	296-00019-000	SEAL, OIL, VITON	1
21	217-0201-00-0	1/4 NPT SQUARE HEAD STEEL PLUG, IRON PUMP	4
	217-0201-01-0	1/4 NPT SQUARED HEAD BRASS PLUG, BRONZE PUMP	
22	340-0490-00-0	HOSE, COOLER, CBP, RETURN, QTY. 3.5 FT	1
23	217-0301-00-0	PLUG-3/8 NPT SQUARE HEAD, IRON PUMP	7
	217-0301-01-0	PLUG-3/8 NPT SQUARE HED, BRONZE PUMP	
24	029-0110-00-0	ANODE OPTION	2
25	082-0207-02-0	TEE, 3/8 COMP X 1/4 MPT X 1/4 FPT	1
26	082-0203-02-0	ELBOW 1/4 NPT x 3/8 COMPRESSION - 90°	1

A , B



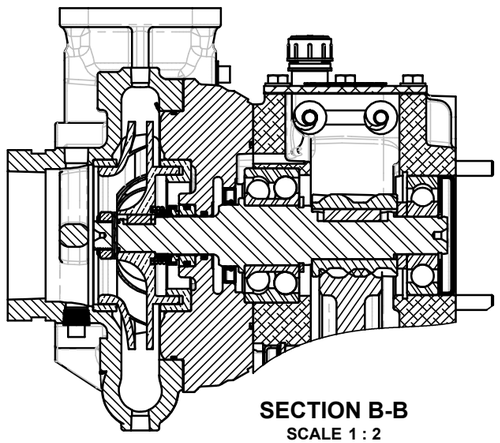
A , B

PUMP ASSEMBLY
ALL RATIOS EXCEPT 3.74

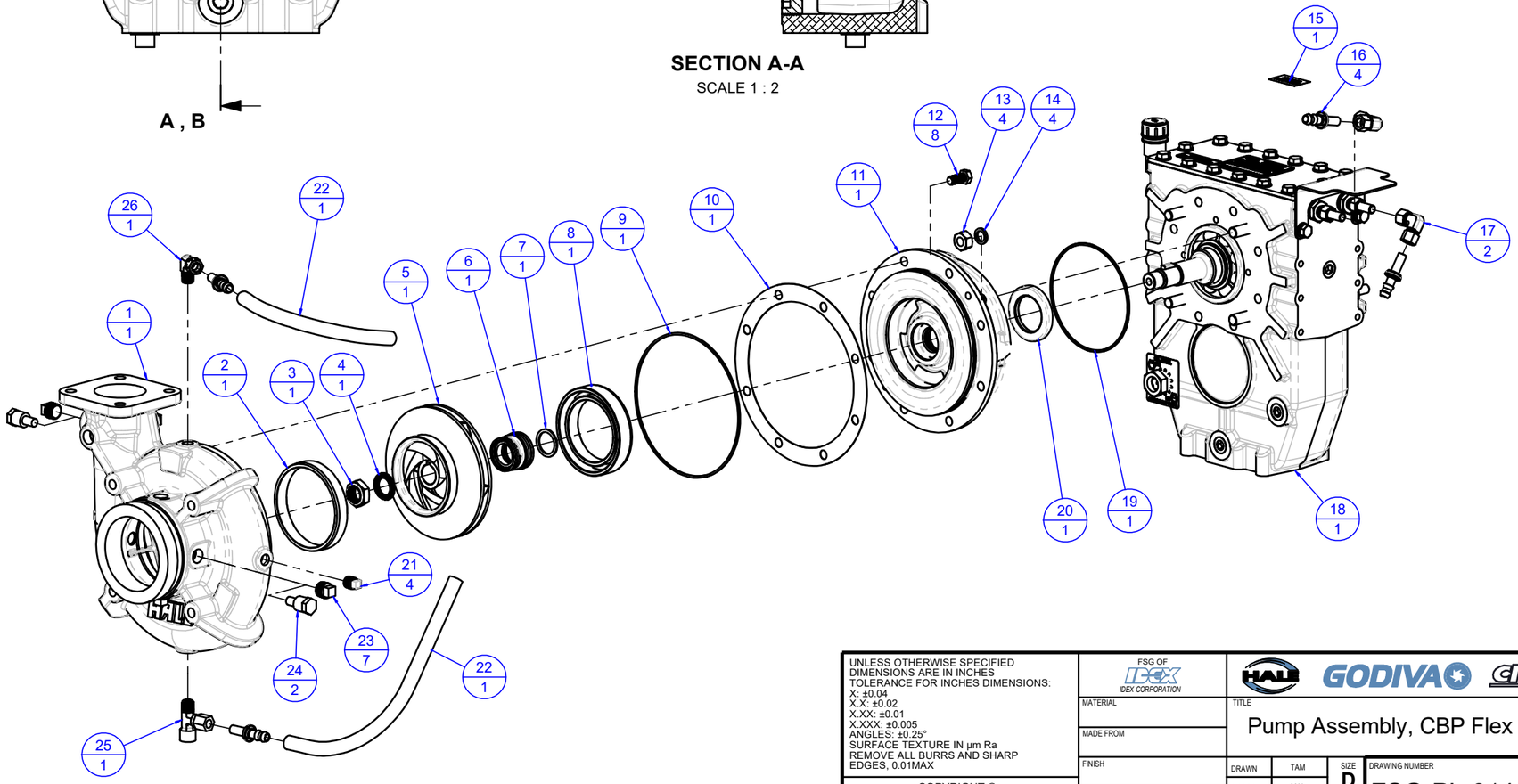


SECTION A-A
SCALE 1 : 2

PUMP ASSEMBLY
3.74 RATIOS



SECTION B-B
SCALE 1 : 2



PARTS IDENTIFICATION
PUMP HEAD GROUP

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: ±0.25°
SURFACE TEXTURE IN µm Ra
REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

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FSG OF IDEX CORPORATION

MATERIAL

MADE FROM

FINISH

PROJECT

HALE GODIVA Class1

TITLE: Pump Assembly, CBP Flex Series

DRAWN	TAM	SIZE	DRAWING NUMBER
APPROVED	MAL	D	FSG-PL-01482
DATE	24MAY2017	SCALE 1:3	REV C
			SHEET 4 OF 6

IF IN DOUBT ASK

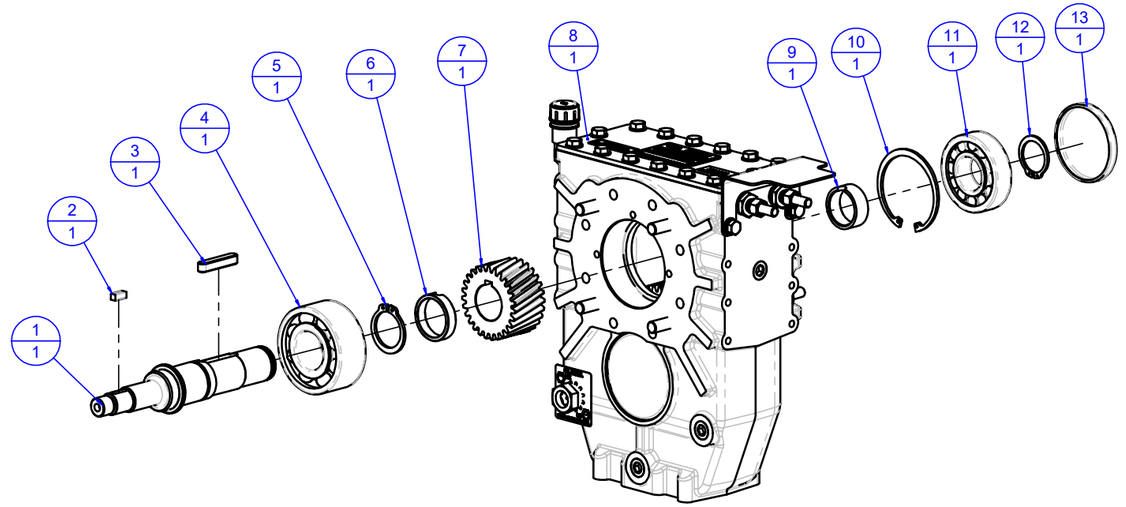
PROJECTION:

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	037-00027-000	SHAFT, PUMP, CBP-F	1
	037-00027-001	SHAFT, PUMP, CBP-F, 3.74 RATIO	
2	017-0500-00-0	CBP IMPELLER KEY	1
3	017-00015-000	KEY, 3/8 x 3/8 x 2.07, RE	1
4	250-00010	BEARING, 5308CS, ANGULAR CONTACT, DBL ROW	1
5	077-1560-05-0	RETAINING RING	1
6	159-00059-000	SPACER, GEAR	1
7	SEE TABLE	GEAR, PUMP	1
8	FSG-PL-01481	HALE FLEX SERIES GEARBOX	1
9	159-2250-00-0	SPACER, GEARBOX, BORG	1
10	077-3150-00-0	RETAINING RING	1
11	250-8307-00-0	ROLLER BEARING (SKF RN307ECP)	1
12	077-1370-05-0	RETAINING RING	1
13	217-1300-00-0	ENDCAP, 80X10EC	1
14	017-0210-00-0	KEY, DRIVE SHAFT, P75-95X	1
15	159-00053-000	SPACER, GEAR, 3.74 RATIO	1
16	250-00013-000	BEARING, BALL, 405S	1
17	077-0980-05-0	78S98, RETAINING RING	1

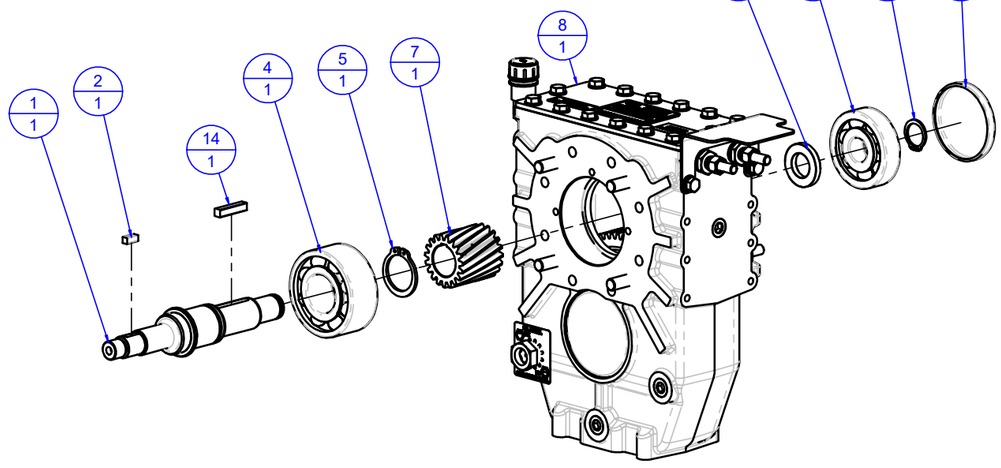
ITEM 7 TABLE
PUMP GEAR PART NUMBER

RATIO NAME	GEAR RATIO	PUMP GEAR P/N (GEAR TEETH)	MATING GEAR P/N (GEAR TEETH)
-37F	3.74	031-1880-00-0 (19T)	031-00012-000 (71T)
-29F	2.91	031-2190-00-0 (23T)	031-2260-00-0 (67T)
-26F	2.60	031-2200-00-0 (25T)	031-2270-00-0 (65T)
-23F	2.33	031-2210-00-0 (27T)	031-2280-00-0 (63T)
-19F	1.90	031-2220-00-0 (31T)	031-2290-00-0 (59T)
-16F	1.64	031-2230-00-0 (34T)	031-2300-00-0 (56T)
-13F	1.31	031-2240-00-0 (39T)	031-2310-00-0 (51T)
-11F	1.14	031-2250-00-0 (42T)	031-2320-00-0 (48T)

PUMP ASSEMBLY
ALL RATIOS EXCEPT 3.74



PUMP ASSEMBLY
3.74 RATIOS



PARTS IDENTIFICATION
PUMP SHAFT GROUP

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: ±0.25°
SURFACE TEXTURE IN µm Ra
REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

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HALE GODIVA Class 1

TITLE: Pump Assembly, CBP Flex Series

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APPROVED	MAL	D	FSG-PL-01482
DATE	24MAY2017	SCALE 1:3	REV C
			SHEET 5 OF 6

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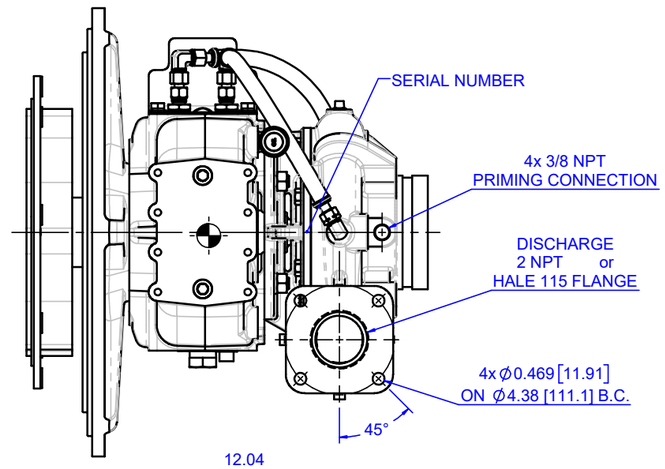
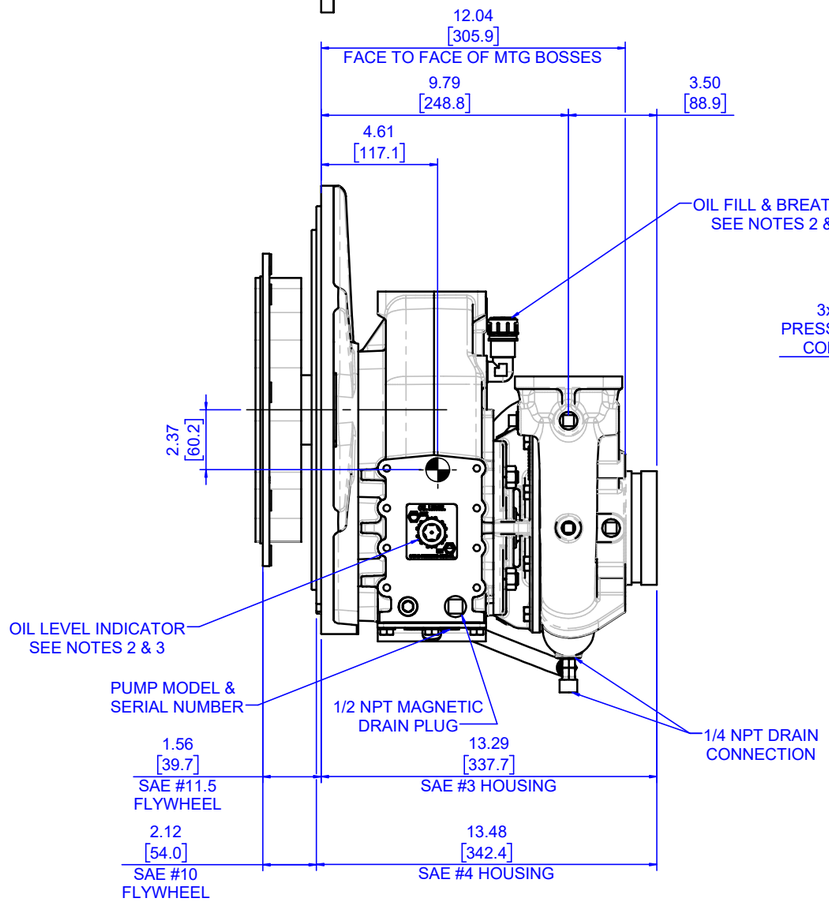
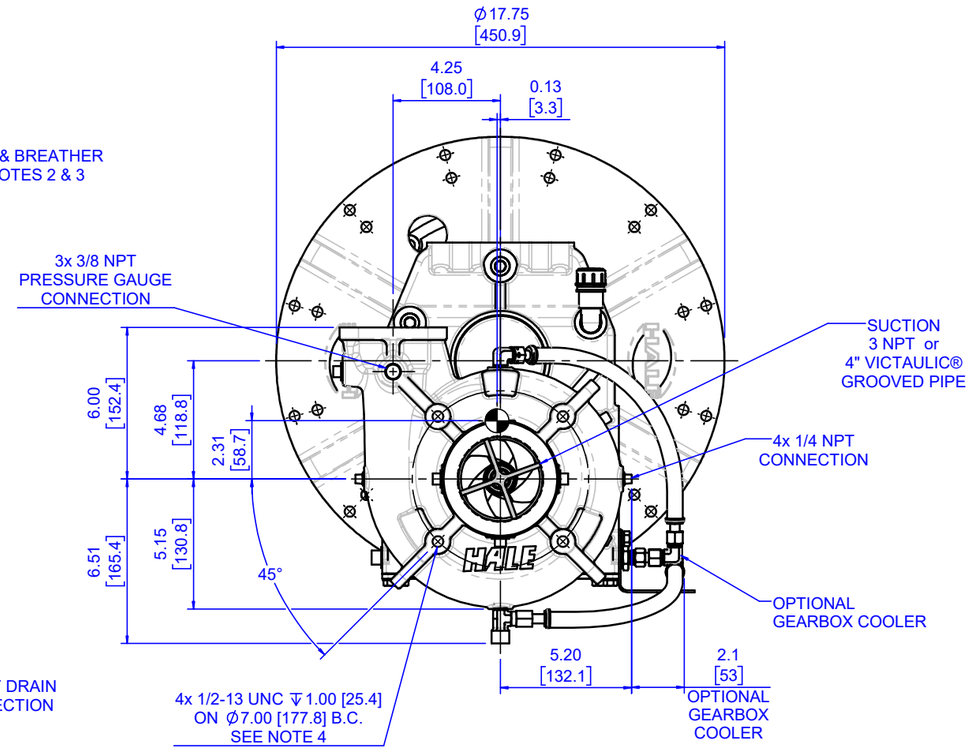
HALE FLEX SERIES CBPM PUMP

GEARBOX POSITION - INVERTED, DISCHARGE POSITION - 1,
ENGINE ROTATION AND OPTIONAL GEARBOX COOLER SHOWN

NOTES:
1. PRIMING SYSTEM, DISCHARGE & SUCTION VALVES, PRESSURE RELIEF VALVES & CONTROLLERS AND THERMAL RELIEF VALVES ARE AVAILABLE.
2. USE SAE 50 LONG-LIFE SYNTHETIC MANUAL TRANSMISSION FLUID MEETING ONE OR MORE OF THE FOLLOWING SPECIFICATIONS.
   - API MT-1
   - EATON PS-164 Rev. 7
   - MACK TO-A Plus
   - MERITOR 0-81
   - NAVISTAR / INTERNATIONAL TMS 6816
   - ROCKWELL / EATON / FULLER CD-50 (PS-081)
   - ZF FreedomLine
3. FILL GEARBOX UNTIL OIL LEVEL INDICATOR WINDOW IS 1/2 TO 3/4 FULL. APPROXIMATE OIL CAPACITY IS 1.5 QUART [1.4 LITER].
4. ALL METRIC FASTENERS USED TO HAVE A MINIMUM PROPERTY CLASS 8.8. ALL SAE FASTENERS USED TO HAVE A MINIMUM GRADE 5.







OPTIONS AND ACCESSORIES

OPTION	DRAWING NUMBER
ESP PRIMING PUMP	PL821
PVG PRIMING VALVE	PL480
SPV PRIMING VALVE	PL828
GEARBOX POSITIONS	FSG-PL-01482, SHT 2
DISCHARGE POSITIONS (1 - 9)	FSG-PL-01482, SHT 2
DRIVE COUPLING - ENG DRIVE	FSG-PL-01481, SHT 4
N GEARBOX ASSEMBLY	FSG-PL-01481

GEAR RATIOS & PUMP MODELS

PUMP MODEL	GEAR RATIO
CBPM*-37F	3.74
CBPM*-29F	2.91
CBPM*-26F	2.60
CBPM*-23F	2.33
CBPM*-19F	1.90
CBPM*-16F	1.64
CBPM*-13F	1.31
CBPM*-11F	1.14

PROJECTION:

PUMP WEIGHT (DRY):
IRON VERSION: 135 LBS [61 kg]
BRONZE VERSION: 138 LBS [63 kg]

REPRESENTS CENTER OF GRAVITY

* THE HALE TYPE CBPM PUMP IS AVAILABLE IN 250 GPM AND 1000 L/min NFPA RATINGS. THE COMPLETE PUMP MODEL NUMBER IS FORMED AS FOLLOWS:

FOR EXAMPLE, A CBPM PUMP IS REQUIRED TO HAVE A 250 GPM RATING WITH A 2.33 GEAR RATIO. THE PUMP MODEL NUMBER WOULD BE AS SHOWN:

CBPM 25-23 F
PUMP MODEL | RATED CAPACITY | PUMP RATIO | GEARBOX TYPE

MAXIMUM ENGINE RPM

WARNING
EXCEEDING THESE LIMITS OR FAILURE TO FOLLOW THE RECOMMENDATIONS OUTLINED ON THIS DRAWING COULD DAMAGE THE PUMP AND RESULT IN PERSONAL INJURY.

MAXIMUM ALLOWABLE ENGINE SPEED: 4000 RPM (DRIVE CPLNG)
MAXIMUM ALLOWABLE HYDRODYNAMIC PRESSURE: 400 PSIG
MAXIMUM ALLOWABLE HYDROSTATIC PRESSURE: 500 PSIG

ENGINE MOUNT INSTALLATION

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: ±0.25°
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DRAWN	TAM	SIZE	DRAWING NUMBER / REV
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