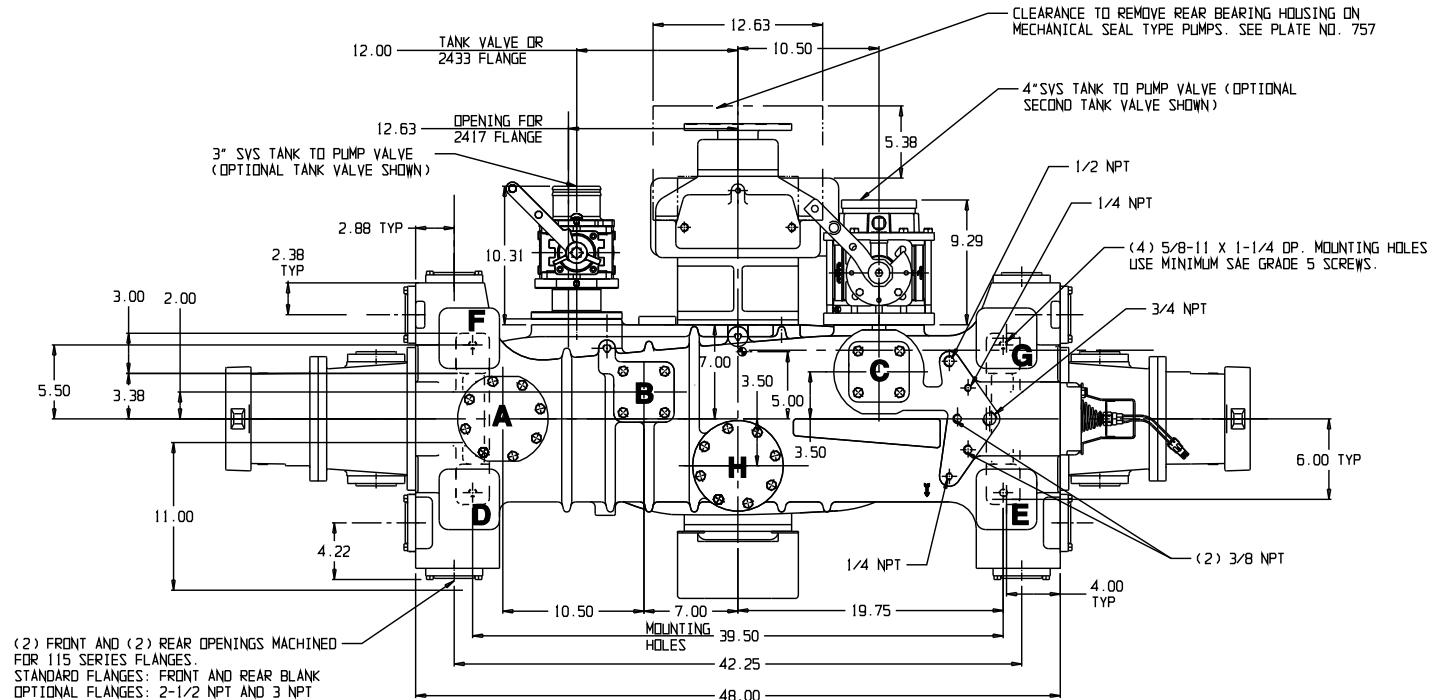


OPTIONAL DISCHARGE FLANGES		STD. CAST HOLE
STANDARD	OPTIONAL	
A	BLANK 2-1/2, 3 & 4 NPT	4
B	BLANK 1-1/4, 2, 2-1/2 & 3 NPT	3
C	BLANK 2-1/2, 3 & 4 NPT	3
D	2-1/2 & 3 NPT	CAST SOLID
E	2-1/2 & 3 NPT	CAST SOLID
F	2-1/2 & 3 NPT	CAST SOLID
G	2-1/2 & 3 NPT	CAST SOLID
H	BLANK 2-1/2, 3 & 4 NPT	3

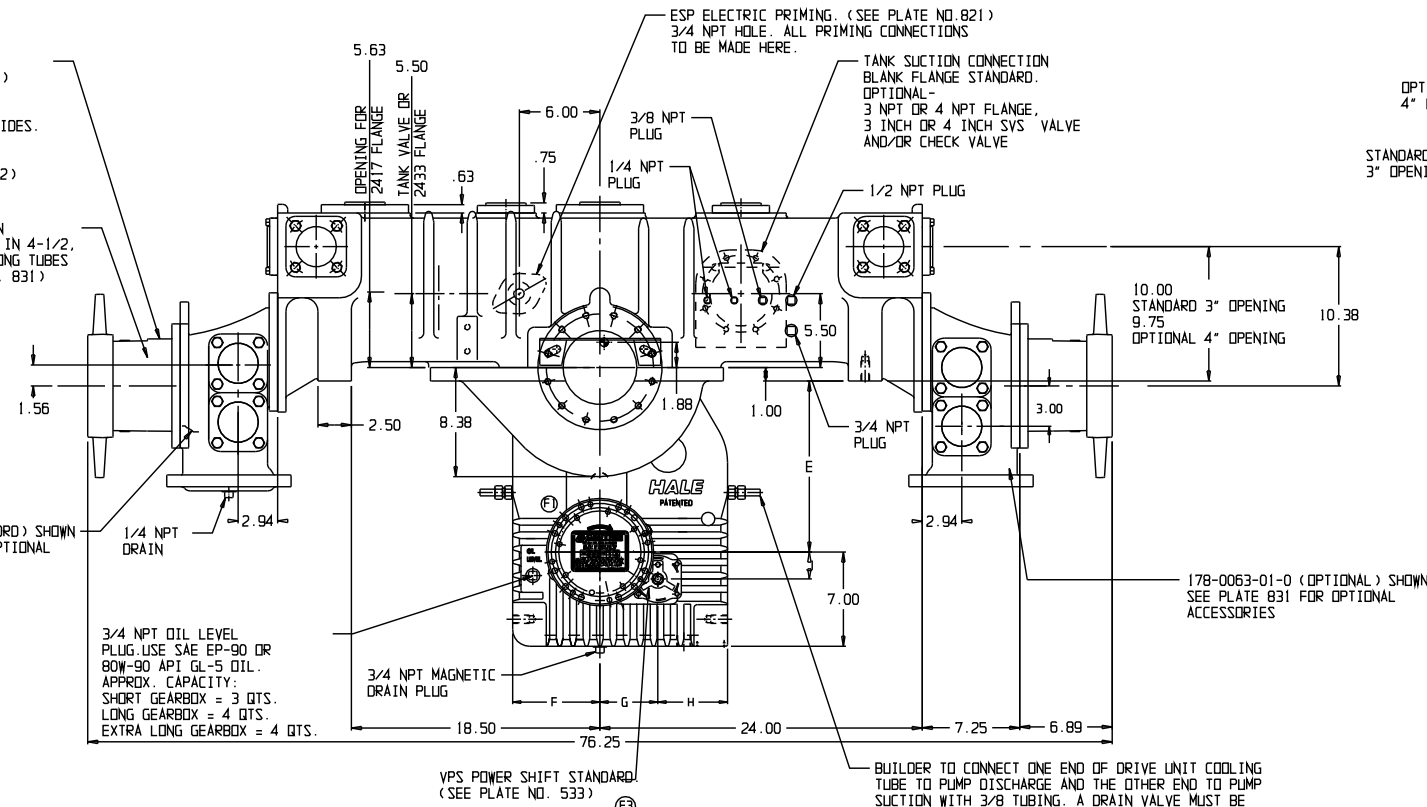
- NOTES**
- REFER TO HALE PUMP/ENGINE COMBINATION LIST TO SELECT PROPER RATIO TO MATCH PUMP WITH ENGINE.
 - WEIGHT OF STANDARD QMAX 1500 G.P.M. PUMP AS SHOWN LESS PRIMING PUMP. = 1275 LBS.
 - = CENTER OF GRAVITY.
 - IMPELLER SHAFT SEAL - MECHANICAL SEAL OR PACKING AVAILABLE.
 - APPLY LOCTITE # 246 HIGH TEMPERATURE THREAD LOCKER OR EQUIVALENT TO SCREW THREADS AND TORQUE SCREWS PER HALE ENGINEERING STANDARD ES018-002.
 - UNLESS OTHERWISE INDICATED FASTENERS ARE GRADE 5 ZINC PLATED STEEL.
 - FOR PUMP COOLING, AN ADDITIONAL 3/8" LINE SHOULD BE INSTALLED BETWEEN THE PUMP DISCHARGE AND BOOSTER TANK. THIS COOLING LINE SHOULD BE CONTROLLED BY A PANEL MOUNTED BALL VALVE AND A CHECK VALVE (HALE P/N: 038-1550-00-0 OR EQUIV.) SHOULD BE INSTALLED IN THE BOOSTER TANK END OF THE COOLING LINE.



(2) FRONT AND (2) REAR OPENINGS MACHINED FOR 115 SERIES FLANGES. STANDARD FLANGES: FRONT AND REAR BLANK. OPTIONAL FLANGES: 2-1/2 NPT AND 3 NPT

OPTIONAL MIV MASTER INTAKE VALVE (NOT SHOWN) AVAILABLE FOR MOUNTING BETWEEN THE SUCTION TUBE AND MIV SUCTION TUBE EXTENSION ON LEFT, RIGHT OR BOTH SIDES. ALSO AVAILABLE ON FRONT, REAR AND BOTTOM FLANGED OPENINGS. (SEE PLATE NOS. 814, 815, 841 & 842)

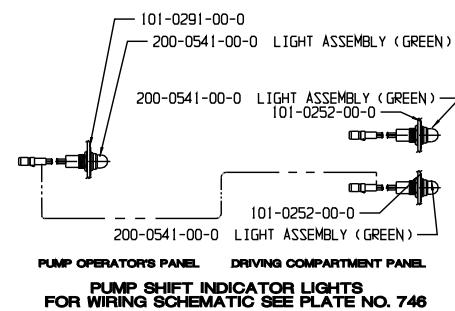
STANDARD LENGTH SUCTION TUBES SHOWN. AVAILABLE IN 4-1/2, 5 AND 6 NS. THREAD. 9\"/>



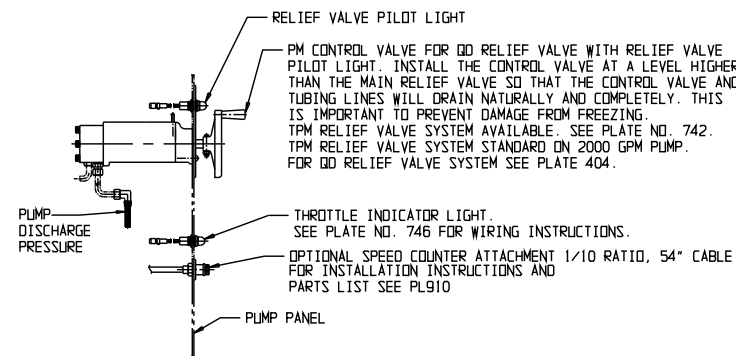
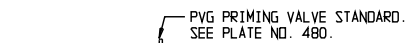
3/4 NPT OIL LEVEL PLUG. USE SAE EP-90 OR 80W-90 API GL-5 OIL. APPROX. CAPACITY: SHORT GEARBOX = 3 QTS. LONG GEARBOX = 4 QTS. EXTRA LONG GEARBOX = 4 QTS.

YPS POWER SHIFT STANDARD (SEE PLATE NO. 533)

BUILDER TO CONNECT ONE END OF DRIVE UNIT COOLING TUBE TO PUMP DISCHARGE AND THE OTHER END TO PUMP SUCTION WITH 3/8\"/>



PUMP OPERATOR'S PANEL DRIVING COMPARTMENT PANEL
PUMP SHIFT INDICATOR LIGHTS FOR WIRING SCHEMATIC SEE PLATE NO. 746



PUMP MODEL	GEAR RATIO	GEARBOX TYPE **	DIMENSIONS					
			E	F	G	H	J	
QMAX*-28	2.83	EXTRA LONG GEARBOX ONLY (X)	14.56					
QMAX*-25	2.55		14.75					
QMAX*-23	2.32		14.90	6.50	5.44	4.06	1.84	
QMAX*-21	2.13		15.06					
QMAX*-19	1.96		15.25					
QMAX*-23	2.28		LONG (L)	12.38		4.31	5.18	2.00
			SHORT (S)	10.50		4.75	2.75	.38
QMAX*-21	2.05		LONG (L)	12.56		4.31	5.18	2.00
			SHORT (S)	10.68		4.75	2.75	.38
QMAX*-19	1.86		LONG (L)	12.75	6.50	4.31	5.18	2.00
		SHORT (S)	10.88		4.75	2.75	.38	
QMAX*-17	1.71	LONG (L)	12.94		4.31	5.18	2.00	
		SHORT (S)	11.06		4.75	2.75	.38	
QMAX*-15	1.58	LONG (L)	13.13		4.31	5.18	2.00	
		SHORT (S)	11.25		4.75	2.75	.38	

* RATED CAPACITY 1000, 1250, 1500, 1750, 2000 AND 2250 GPM ** THE SHORT (S) GEARBOX IS STANDARD AND WILL BE SUPPLIED UNLESS OTHERWISE SPECIFIED.

EXAMPLE: THE MODEL NUMBER FOR A 1500 GPM RATED PUMP WITH A 2.28 GEAR RATIO AND A SHORT GEARBOX WOULD BE QMAX1500-23S.

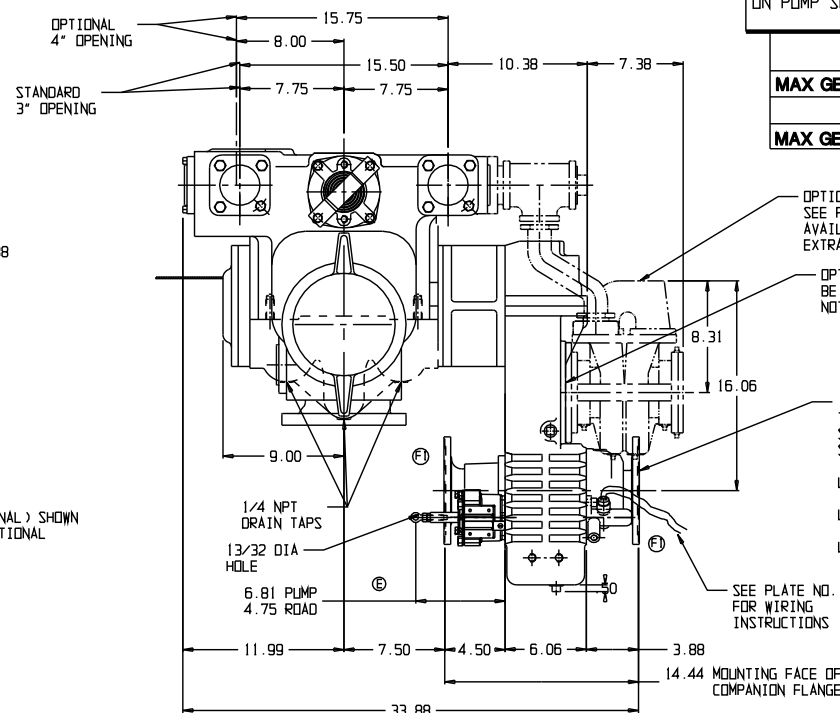
DRIVE LINE RECOMMENDATIONS

APPARATUS BUILDER SUPPLIED DRIVELINES SHALL BE OF APPROPRIATE SIZE TO MATCH THE CHASSIS AND PUMP REQUIREMENTS WITH INDIVIDUAL JOINT CANCELLATION AND PHASING BEFORE AND AFTER THE PUMP. DRIVE SHAFT BALANCE (INCLUDING YOKES) SHALL NOT EXCEED THE RECOMMENDED LIMIT OF EITHER THE DRIVE SHAFT OR CHASSIS TRANSMISSION MANUFACTURER'S SPECIFICATIONS. DRIVE SHAFT FULL RANGE OPERATING SPEEDS SHALL NOT EXCEED 42% OF ITS CRITICAL SPEED.

WARNING

EXCEEDING THESE LIMITS OR FAILURE TO FOLLOW THE RECOMMENDATIONS OUTLINED ON THIS DRAWING COULD DAMAGE THE GEARBOX AND RESULT IN PERSONAL INJURY. QMAX MIDSHIP MAXIMUM PUMP PRESSURE (HYDROSTATIC & HYDRODYNAMIC) = 600 PSI 2HP HIGH PRESSURE PUMP MAXIMUM PUMP PRESSURE WHERE HYDROSTATIC = 600 PSI 1 & HYDRODYNAMIC = 400 PSI. MAXIMUM POWER INPUT FOR PUMPING = 450 HP. MAXIMUM TORQUE ON PUMP SHAFT = 2300 LBS-FT. MAXIMUM GEARBOX SHAFT TORQUE (ROAD) = 16,000 LBS-FT

PUMP MODEL	QMAX*-28 L S	QMAX*-21 L S	QMAX*-19 L S	QMAX*-17 L S	QMAX*-15 L S
MAX GEARBOX INPUT RPM	2280	2530	2780	3030	3280
PUMP MODEL	QMAX*-28X	QMAX*-25X	QMAX*-23X	QMAX*-21X	QMAX*-19X
MAX GEARBOX INPUT RPM	1840	2040	2230	2430	2650



OPTIONAL HP AND 2HP SERIES PUMPS SEE PLATE NOS. 704 AND 705. AVAILABLE ON LONG GEARBOX AND EXTRA LONG GEARBOX ONLY.

OPTIONAL - ESP PRIMING PUMP CAN BE MOUNTED ON GEAR BOX. NOT AVAILABLE IF HP OR 2HP IS USED.

STANDARD FLANGES THE HALE COMBINATION FLANGES ARE SIZED FOR SPICER 1600, 1700 AND 1800 SERIES FLANGES. 1600 SERIES WITH 6-5/8 DIA FEMALE PILOT, USE (8) 3/8 DIA SAE GRADE 8 SCREWS. 1700 SERIES WITH 7-3/4 DIA FEMALE PILOT, USE (8) 3/8 DIA SAE GRADE 8 SCREWS. 1800 SERIES WITH 7-3/4 DIA FEMALE PILOT, USE (12) 7/16 DIA SAE GRADE 8 SCREWS.

SEE PLATE NO. 746 FOR WIRING INSTRUCTIONS

ECO NO	REV	CHANGED FROM	BY	DATE	APVD	ECO NO	REV	CHANGED FROM	BY	DATE	APVD
1040	E	DIMENSION CHANGE	DRS	12-7-10	PRW	98-49	A	RELEASE FOR PRODUCTION	MD	4-1-98	RET
1110	F1	SPLINE CROSS SECTION ELIMINATED	CTG	1-24-12	JRP	99-121	B	UPDATE DRAWING	DPL	6-15-99	RET
1110	F2	COOLANT TUBE PLUMBING NOTES	CTG	1-24-12	JRP	00-441	C	UPDATED DRAWING	DJK	4-10-00	MAL
1110	F3	YPS UNIT CHANGED TO STANDARD	CTG	1-24-12	JRP	0303	D	UPDATED TO CURRENT PRODUCTION	DEH	01-25-06	MAL

HALE PRODUCTS, INC.
A Unit of IDEX Corporation
Conshohocken, PA 19428 USA

DATE 2-16-98
SCALE: .20