

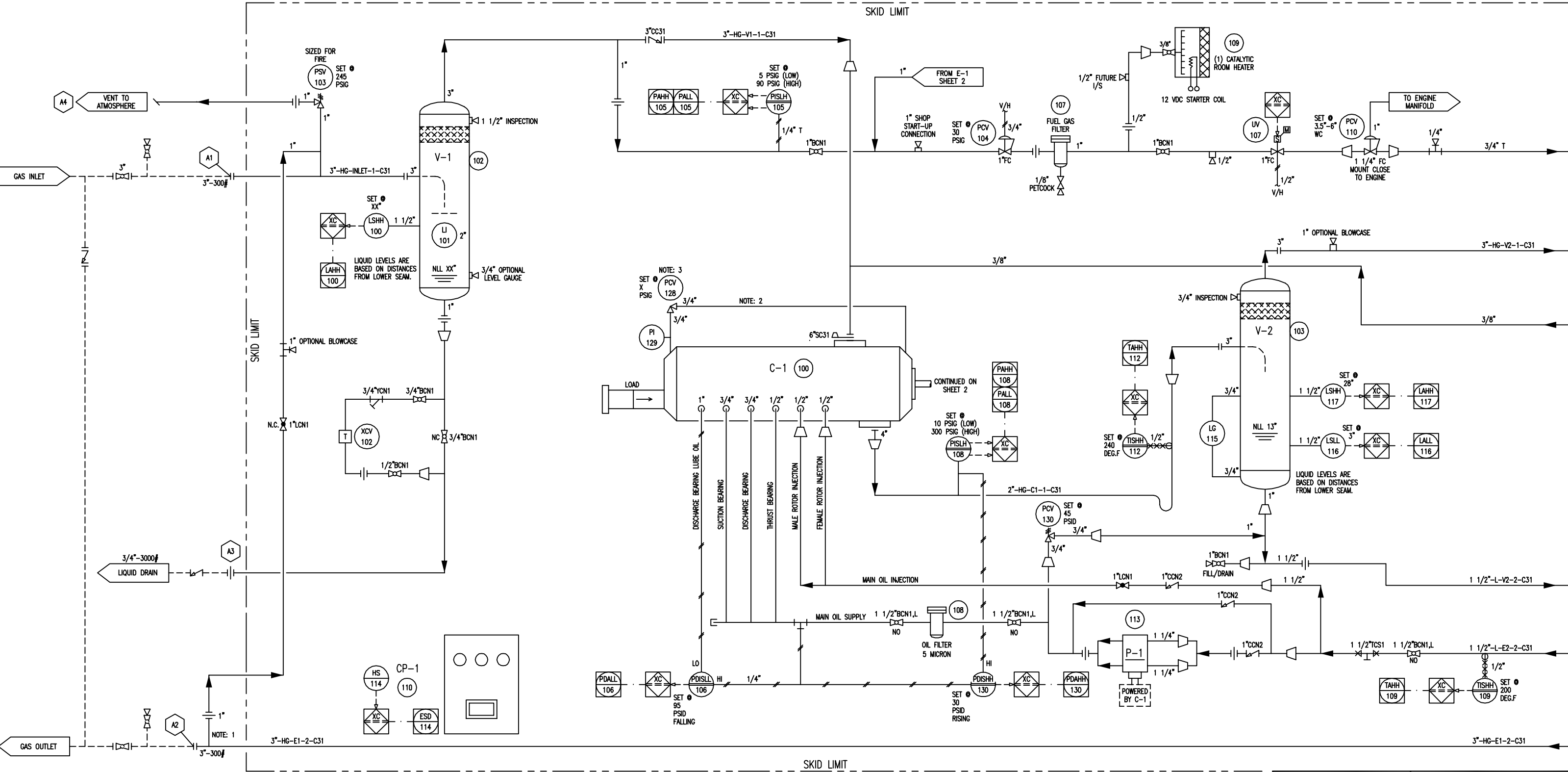
CP-1
CONTROL PANEL
 TYPE: MURPHYMATIC CONTROL PANEL
 MODEL: TTDJr-IGN-T
 IGNITION POWERED

V-1
SUCTION SCRUBBER
 SIZE: 16" O.D. X 48" S/S
 M.A.W.P.: 400 PSIG @ 250 DEG.F
 M.D.M.T.: -20 DEG.F @ 400 PSIG
 C.A.: 0.0625"
 WEIGHT: 485 LBS.

C-1
GAS COMPRESSOR
 ARIEL: MODEL 208-N
 OPERATING SPEED: 900 TO 1800 RPM
 SUCTION PRESSURE: 5-90 PSIG
 DISCHARGE PRESSURE: 10-300 PSIG
 MAX. DISCHARGE PRESSURE: 348 PSIA
 MAX. DISCHARGE TEMPERATURE: 250 DEG.F
 FLOW: SEE CURVES
 WEIGHT: 1195 LBS

P-1
COMPRESSOR OIL PUMP
 MAKE: ARIEL
 MODEL: P20-1.5
 FLOW: 16.5 USGPM

V-2
PRIMARY OIL SEPARATOR
 SIZE: 12 3/4" O.D. X 48" S/S
 M.A.W.P.: 400 PSIG @ 250 DEG.F
 M.D.M.T.: -20 DEG.F @ 400 PSIG
 C.A.: 0.0625"
 WEIGHT: 360 LBS.
 ELEMENT: (1) RSC-03682



NOTE 1 TAKE CONNECTION FROM THE TOP OF PIPE
 NOTE 2 GAS BALANCE LINE SUPPLIED WITH COMPRESSOR
 NOTE 3 CONSULT TOROMONT

SKID GENERAL NOTES:

- ELECTRICAL CLASSIFICATION: CLASS 1, DIV. 2, GROUP D
- FIRE AND GAS DETECTION: BY CUSTOMER AS REQUIRED.
- MINIMUM DESIGN AMBIENT TEMPERATURE: 50 DEG.F
- MAXIMUM DESIGN AMBIENT TEMPERATURE: 90 DEG.F
- SITE ELEVATION: 2500 FT.
- ATMOSPHERIC PRESSURE: 13.4 PSIA
- COMPRESSOR OIL TYPE: SS-150
- ENGINE OIL TYPE: ESSO G40, OR EQUAL
- ENGINE GLYCOL CHARGE: 50 / 50 EGYL

REV.	DESCRIPTION	DATE	BY	APPR.
1A	REMOVED BLOWCASE	SEP 18/03	TM	
1	ISSUED FOR CONSTRUCTION	JUL 25/03	GWS	

PERMIT TO PRACTICE STAMP

ENGINEER STAMP



TITLE: P & I FLOW DIAGRAM

FOR: APACHE CANADA
 90 HP WELLHEAD
 BOOSTER UNIT
 ARIEL 208 N COMPRESSOR

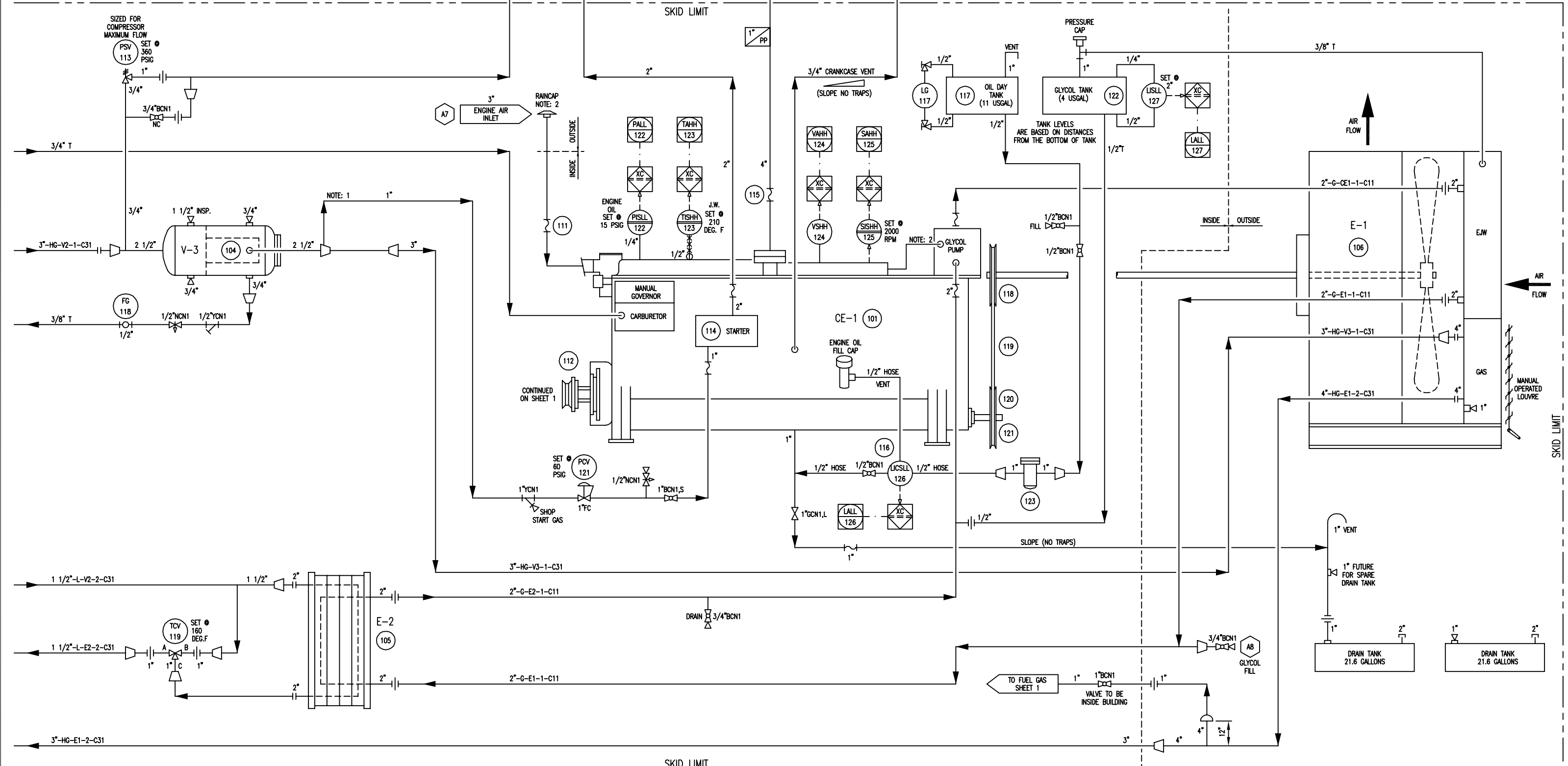
DATE: JULY 23/03
 SCALE: N/A
 W.O. No: 11251101
 DWG. No: 11251-101
 SHEET No: 1 OF 3

V-3
SECONDARY OIL SEPARATOR
 CHIL-CON: MODEL COSM-070-T
 SIZE: 12 3/4" O.D. X 36 3/8" O.A.L.
 M.A.W.P.: 400 PSIG @ 400 DEG.F
 M.D.M.T.: -20 DEG.F @ 400 PSIG
 C.A.: 0.0625"
 WEIGHT: 250 LBS.
 ELEMENT: (1) RSC-03682

E-2
OIL COOLER
 MODEL: VIEX VX20-FN1-75
 PLATES: 31
 M.A.W.P. OIL SIDE: 400 PSIG @ 250 DEG.F
 M.A.W.P. GLYCOL SIDE: 400 PSIG @ 250 DEG.F
 DESIGN DUTY: 180803 BTU/HR
 SURFACE AREA: 62.4 FT2
 WEIGHT: 745 LBS OPERATING

CE-1
COMPRESSOR ENGINE
 CATERPILLAR MODEL 3304NA
 90 HP @ 1800 RPM
 NO. OF CYLINDERS: 4
 BORE & STROKE: 4.75" & 6.00"
 DISPLACEMENT: 425 CUBIC INCHES
 CARBURATION: NATURALLY ASPIRATED
 SPEED: 900 TO 1800 RPM
 WEIGHT: 1630 LBS.

E-1
GLYCOL COOLER/AFTERCOOLER
 TYPE: AIR-X-HEMPHILL
 MODEL: 42 VI
 GLYCOL COIL: 14 PSIG @ 300 DEG.F
 AFTERCOOLER COIL: 400 PSIG @ 300 DEG.F
 M.D.M.T.: -20 DEG.F @ 400 PSIG
 FAN: 9 BLADES 42" DIA.
 FAN SPEED: 1100 RPM
 FAN HP: 5.0 HP
 TOTAL AIR FLOW: 17361 SCFM
 WEIGHT: 2500 LBS OPERATING



NOTE 1
 START GAS CONNECTION FROM TOP OF PIPE

NOTE 2
 SUPPLIED WITH ENGINE

REV.	DESCRIPTION	DATE	BY	APPR.
1A	REMOVED BLOWCASE	SEP 18/03	TM	
1	ISSUED FOR CONSTRUCTION	JUL 25/03	GWS	

PERMIT TO PRACTICE STAMP

ENGINEER STAMP

DRAWN BY: STOCK
 DATE: JULY 23/03
 CHKD. BY: STOCK
 SCALE: N/A
 APPR. BY: STOCK
 W.O. No: 11251101

TOROMONT TOROMONT PROCESS SYSTEMS

TITLE: P & I FLOW DIAGRAM

FOR: APACHE CANADA
 90 HP WELLHEAD
 BOOSTER UNIT
 ARIEL 208 N COMPRESSOR

DWG. No: 11251-101
 SHEET No: 2 OF 3
 REV: 1A

LINE IDENTIFICATION

A-B-CD-E-FGH-I,J

VALVE IDENTIFICATION

A"BCDE,F

VALVES

(MODIFIER)

INSTRUMENT IDENTIFICATION GENERAL REFERENCE (ISA - S5.1)

- A :** NOMINAL LINE SIZE IN INCHES
- B :** FLUID
 C CARBON DIOXIDE
 CW COOLING WATER
 G GLYCOL
 HG HYDROCARBON GAS
 IA INSTR. AIR SUPPLY
 IG INSTR. GAS SUPPLY
 L LUBE OIL (COMPRESSOR)
- C :** EQUIPMENT TYPE
 B BLOWER/FAN
 C COMPRESSOR
 E EXCHANGER
 F FILTER
 H HEATER
 P PUMP
 S OIL SKIMMER
 T TANK
 V PRESSURE VESSEL
- MODIFIER**
 E ENGINE
 M MOTOR

- A :** NOMINAL VALVE SIZE IN INCHES
- B :** TYPE
 A ANGLE GLOBE
 B BALL
 C CHECK
 G GATE
 L GLOBE
 M MANIFOLD
 N NEEDLE
 P PLUG
 S START-UP STRAINER
 T TEE STRAINER
 Y Y-STRAINER
 U BUTTERFLY
- C :** BODY MATERIAL
 B BRONZE
 C CARBON STEEL
 I CAST IRON
 L LOW TEMP. CARBON STEEL
 S STAINLESS STEEL
- D :** END CONNECTIONS
 1 FLANGED 150#
 3 FLANGED 300#
 6 FLANGED 600#
 9 FLANGED 900#
 B BUTT WELD
 C SW BY NPT
 F NPT BY FLANGE (MANIFOLD)
 N NPT (THREADED)
 M NPT MALE BY NPT FEMALE
 S SW (SOCKETWELD)
 T TUBE (SWAGELOCK)
- E :** IDENTIFIER - NUMBER USED TO SPECIFY VALVE REFER TO VALVE DATA SHEETS
- F :** MODIFIER
 C CHAIN OPERATOR
 E EXTENDED BONNET
 G GEAR OPERATOR
 L LOCKING DEVICE
 N NACE TRIM
 O OXYGEN SERVICE/CLEANING
 P FULL PORT DESIGN
 R RTJ FLANGED
 S SPRING HANDLE (CLOSE)
 X SPECIAL SPECIFICATIONS

VALVE CONNECTIONS

- THREADED
 WELDED (BUTT OR SOCKET)
 THREADED BY WELDED
 FLANGED

- D :** EQUIPMENT NUMBER: 1 TO 999 SEQUENTIAL NUMBERS
- E :** LINE NUMBER: 1 TO 9 SEQUENTIAL NUMBERS FROM EQUIPMENT
- FGH :** PIPING SPECIFICATION
F : MATERIAL GROUP
 C CARBON STEEL
 L LOW TEMP. CARBON STEEL
 S STAINLESS STEEL
G : ANSI 16.5 FLANGE CLASS
 1 150# 9 900#
 3 300# 15 1500#
 6 600# 25 2500#
H : LINE MATERIAL SPECIFICATION REFERENCE: 1 TO 9 SEQUENTIAL NUMBERS

- III :** MODIFIER / GENERAL
 H PLUS THICKNESS IN INCHES (HOT INSULATION)
 C PLUS THICKNESS IN INCHES (COLD INSULATION)
 PP PLUS THICKNESS IN INCHES (PERSONAL PROTECTION)
 HT PLUS THICKNESS IN INCHES (HEAT TRACING)
 ST STEAM TRACING
 GT GLYCOL TRACING
 ET ELECTRICAL TRACING
- EXAMPLE:** 3"-HG-V1-2-C11-HT1", ET
 3" - LINE SIZE
 HG - HYDROCARBON GAS
 V1 - VESSEL
 2 - SECOND LINE FROM VESSEL
 C11 - CARBON STEEL LINE
 1 150# ANSI FLANGE RATING
 1 LINE MATERIAL SPECIFICATION REFERENCE
 HT1" - HEAT TRACING INSULATION 1" THICK
 ET - ELECTRIC TRACING

CONTROL VALVES

- POSITIONER DIAPHRAGM CONTROL VALVE
 OUTLET PRESSURE REGULATOR (SELF-CONTAINED)
 INLET PRESSURE REGULATOR (SELF-CONTAINED)
 PRESSURE DIFFERENTIAL CONTROL VALVE (SELF-CONTAINED)
 TWO-WAY SOLENOID VALVE
 THREE-WAY SOLENOID VALVE
 MOTOR ACTUATOR
 HYDRAULIC / PNEUMATIC PISTON OPERATED
 VALVE W/ BLEED
 VALVE W/ PLUG
 PRESSURE SAFETY/RELIEF VALVE
 DESIGNATES ORIFICE LETTER (SIZE)

MISCELLANEOUS

- FLEXIBLE CONNECTION
 SPECTACLE BLIND (LINE OPEN)
 SPECTACLE BLIND (LINE CLOSED)
 FLOW GLASS
 RUPTURE DISC FOR PRESSURE RELIEF
 RUPTURE DISC FOR VACUUM RELIEF
 VORTEX BREAKER
 DIAPHRAM SEAL
 CONTINUOUS LIQUID DRAINER OR STEAM TRAP
 SKID TIE-POINTS
 OPEN DRAIN
 THICKNESS INSULATION - (C) COLD (H) HOT (HT) HEAT TRACING (PP) PERSONAL PROTECTION
 ELECTRIC HEAT TRACE
 STEAM OR GLYCOL HEAT TRACE

LINE CODE

- PRIMARY PROCESS LINE
 SECONDARY PROCESS LINE
 INSTRUMENT PROCESS LINE (TUBING "T")
 BY OTHERS
 SKID LIMIT
 PNEUMATIC SIGNAL
 ELECTRIC SIGNAL
 CAPILLARY TUBING
 INSTRUMENT SYSTEM LINK (ELECTRONIC MEMORY SHARING)

	FIRST LETTER	SUCCEEDING LETTERS	PRIMARY ELEMENT	INDICATOR	RECORDER	CONTROLLER			TRANS-MITTER	CONTROL		CONTROL VALVE OR REGULATOR	SELF-ACTIVATED VALVE	RELAY OR CONVERTER
						BLIND	INDICATING	RECORDING		SWITCH	ALARM			
A	ANALYSIS	ALARM	AE	AI	AR	AC	AIC	ARC	AT	AS()	AA()	AV		AY
B	BURNER FLAME	USER'S CHOICE	BE	BI	BR	BC			BT	BS()	BA()	BV		BY
C	CONDUCTIVITY	CONTROL (CLOSE)	CE	CI	CR	CC	CIC	CRC	CT	CS()	CA()	CV		CY
D	DENSITY OR MASS (DIFFERENTIAL)		DE	DI	DR	DC	DIC	DRC	DT	DS()	DA()	DV		DY
E	VOLTAGE	PRIMARY ELEMENT	EE	EI	ER	EC	EIC	ERC	ET	ES()	EA()	EV		EY
F	FLOW (RATIO OR FRACTION)	SHUTDOWN FIRST OUT	FE	FI	FR	FC	FIC	FRC	FT	FS()	FA()	FV	FCV	FY
G	GAUGING	GLASS	GE	GI	GR	GC	GIC	GRC	GT	GS()	GA()	GV		
H	HAND	(HIGH)				HC	HIC	HRC	HT	HS()		HV	HCV	HY
I	CURRENT	INDICATE	IE	II	IR	IC	IIC	IRC	IT	IS()	IA()			IY
J	POWER (SCAN)		JE	JI	JR	JC	JIC	JRC	JT	JS()	JA()			JY
K	TIME	CONTROL STATION		KI	KR	KC	KIC	KRC	KT	KS()	KA()			KY
L	LEVEL	LIGHT (LOW)	LE	LI	LR	LC	LIC	LRC	LT	LS()	LA()	LV	LCV	LY
M	MOISTURE, HUMIDITY	(MIDDLE OR INTERMEDIATE)	ME	MI	MR	MC	MIC	MRC	MT	MS()	MA()	MV		MY
N	USER'S CHOICE													
O	POINT	ORIFICE (OPEN)												
P	PRESSURE OR VACUUM	POINT	PE	PI	PR	PC	PIC	PRC	PT	PS()	PA()	PV	PCV	PY
Q	QUANTITY OR EVENT (INTEGRATE/TOTALIZE)			QI	QR	QC	QIC	QRC	QT	QS()	QA()	QV		QY
R	RADIOACTIVITY	RECORD OR PRINT	RE	RI	RR	RC	RIC	RRC	RT	RS()	RA()			RY
S	SPEED OR FREQUENCY	SWITCH		SI	SR	SC	SIC	SRC	ST	SS()	SA()			SY
T	TEMPERATURE	TRANSMIT	TE	TI	TR	TC	TIC	TRC	TT	TS()	TA()	TV	TCV	TY
U	MULTI-VARIABLE	MULTIFUNCTION		UI	UR	UC	UIC	URC				UV		UY
V	VIBRATION	VALVE OR DAMPER	VE	VI	VR	VC	VIC	VRC	VT	VS()	VA()	VV		VY
W	WEIGHT OR FORCE	WELL	WE	WI	WR	WC	WIC	WRC	WT	WS()	WA()	WV		WY
X	UNCLASSIFIED	UNCLASSIFIED (DIAGNOSTIC)	XE	XI	XR	XC	XIC	XRC	XT	XS()	XA()	XV		XY
Y	USER'S CHOICE	RELAY OR COMPUTE												YY
Z	POSITION	DRIVE OR ACTUATE	ZE	ZI	ZR	ZC	ZIC	ZRC	ZT	ZS()	ZA()			ZY

INSTRUMENTS

- THERMOWELL (THREADED)
 THERMOWELL (WELDED)
 LOCAL MOUNTED
 LOCAL PANEL MOUNTED
 MOUNTED BEHIND OR IN LOCAL PANEL
 MAIN PANEL MOUNTED
 MOUNTED BEHIND OR IN MAIN PANEL
 MAN / MACHINE INTERFACE IN MAIN PANEL
 PILOT LIGHT
 * COLOUR- (A) AMBER (G) GREEN (R) RED (B) BLUE (O) ORANGE (W) WHITE
- RELAY OR CONVERTER
 * FOR INPUT/OUTPUT SEQUENCES
 DESIGNATION: SIGNAL:
 E VOLTAGE
 H HYDRAULIC
 I CURRENT (ELECTRICAL)
 O ELECTROMAGNETIC OR SONIC
 P PNEUMATIC
 R RESISTANCE (ELECTRICAL)
- PROGRAMMABLE LOGIC CONTROLLER (PLC)
 XC REPRESENTS GENERAL LOGIC
 X/Y - X = PLC NUMBER Y = PLC RACK NUMBER
 THE ABOVE IDENTIFICATION NUMBER WILL BE USED TO REFERENCE THE CONTROL PANELS.
- INTERLOCK
 ELECTRICAL (HARD WIRE) INTERLOCK

- (C) -CLOSE (O) -OPEN
 (H) -HIGH ALARM (L) -LOW ALARM
 (HH) -HIGH SHUTDOWN (LL) -LOW SHUTDOWN
 (XX) -DIAGNOSTIC SHUTDOWN (USED TO INDICATE THE DIAGNOSTIC CHECK REQ'D ON THE ANALOG INPUT)

ABBREVIATIONS

- AOUT AUTOMATIC OUTPUT
 CA CORROSION ALLOWANCE
 CHO CHAIN OPERATED
 CUST CUSTOMER
 DIR DIRECT ACTING
 DB DEADBAND
 Δ DELTA (DIFFERENTIAL)
 ESD EMERGENCY SHUTDOWN
 FC FAIL CLOSED
 FO FAIL OPEN
 FLP FAIL LAST POSITION
 GAIN GAIN
 HI HIGH
 HS HAND SWITCH
 HTR HEATER
 I/A INSTRUMENT AIR SUPPLY
 I/G INSTRUMENT GAS SUPPLY
 I/O INPUT / OUPUT
 LB/HR POUNDS PER HOUR
 FT3/DAY CUBIC FEET PER DAY
 FT3/HR CUBIC FEET PER HOUR
 FT3/MIN CUBIC FEET PER MINUTE
 LC LOCKED CLOSED
 LO LOCKED OPEN
 MAX MAXIMUM
- MAWP MAXIMUM ALLOWABLE WORKING PRESSURE
 MDMT MINIMUM DESIGN METAL TEMPERATURE
 MIN MINIMUM
 MCC MOTOR CONTROL CENTER
 MOUT MANUAL OUTPUT
 MS MOTOR STARTER
 NC NORMALLY CLOSED
 NLL NORMAL LIQUID LEVEL
 NO NORMALLY OPEN
 MMI MAN / MACHINE INTERFACE
 PB PUSH BUTTON
 PL PILOT LIGHT
 PLC PROGRAMMABLE LOGIC CONTROLLER
 REV REVERSE ACTING
 RST RESET (INTEGRAL)
 SCR SILICON CONTROLLED RECTIFIER
 S/F SEAM TO FACE OF FLANGE
 SP SETPOINT
 SPC CALCULATED SETPOINT
 SS SELECTOR SWITCH
 S/S SEAM TO SEAM
 T/T TANGENT TO TANGENT
 TS/TS TUBESHEET TO TUBESHEET
 T/L TUBE LENGTH
 V/H VENT HEADER

GENERAL NOTES

- TUBING TO BE 304SS, SEAMLESS, 0.035" WALL THICKNESS, CADMIUM PLATED CARBON STEEL FITTINGS WITH STAINLESS STEEL FERRULES.
- ALL TEMPERATURE INSTRUMENTS TO BE PROVIDED WITH A THERMOWELL.

REV.				DESCRIPTION	DATE	BY	APPR.	PERMIT TO PRACTICE STAMP	ENGINEER STAMP		TITLE: P & I FLOW DIAGRAM LEGEND FOR: APACHE CANADA 90 HP WELLHEAD BOOSTER UNIT ARIEL 208 N COMPRESSOR
1A	REMOVED BLOWCASE	SEP 18/03	TM							DRAWN BY: STOCK DATE: JULY 23/03 CHKO. BY: STOCK SCALE: N/A APPR. BY: STOCK W.O. No: 11251101	DWG. No: 11251-101 SHEET No: 3 OF 3 REV: 1A
1	ISSUED FOR CONSTRUCTION	JUL 25/03	GWS							CUST. PO No:	