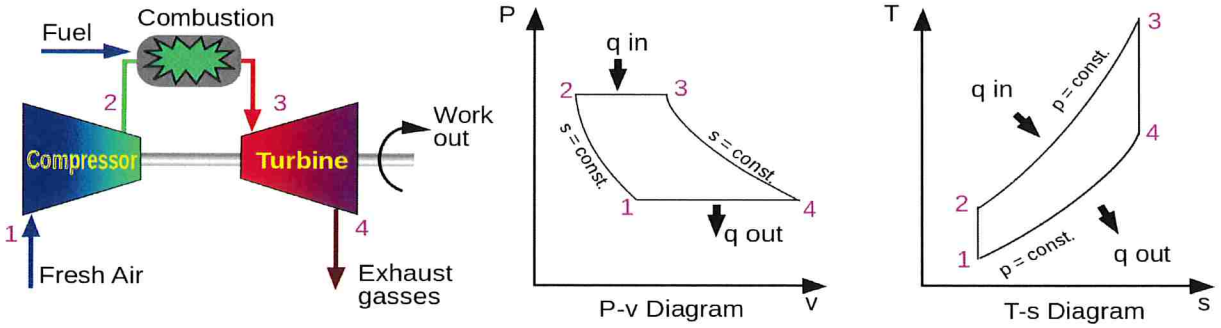
Turbine Engine

The gas turbine generates heat which is converted into mechanical energy through a thermodynamic process called the **Brayton cycle** (Compression-Combustion-Expansion-Exhaust). Basically, a continuous flow of compressed air from the compressor section, continuous combustion within the combustor assembly, and continuous power output from the turbine assembly.



The idealized Brayton cycle where P = pressure, V = volume, T = temperature, S = entropy, and Q = the heat added to or rejected by the system.

The actual gas-turbine cycle is different from the ideal Brayton cycle since there are irreversibility. Hence, in an actual gas-turbine cycle, the compressor consumes more work and the turbine produces less work than that of the ideal Brayton cycle.

Mitsue Centaur 4702 SoloNox Water Flood Pump

The turbomachinery covered in this customized training course is an industrial gas turbine engine and a water pump mounted on a steel base frame, with various support systems.

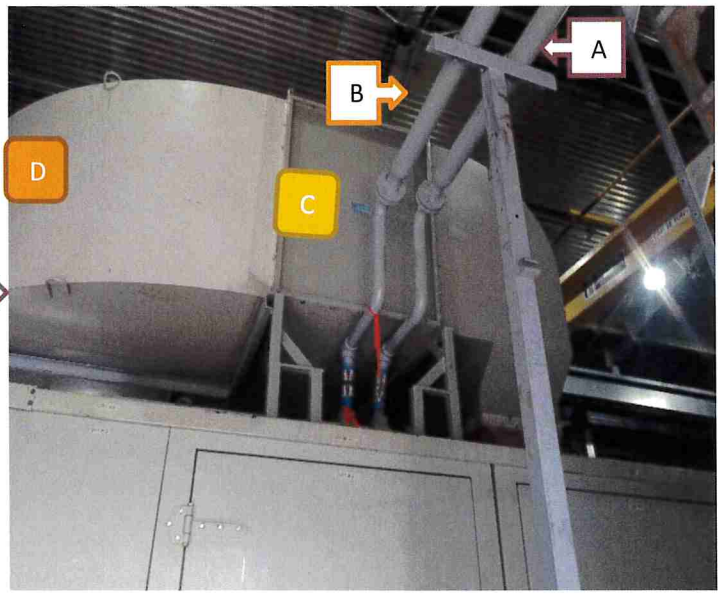
A: The turbine engine air inlet system components (air filters, ducting, and silencer).
The self-cleaning Huff & Puff uses compressed air pulses fired in the reverse direction through each row of element in sequence to dislodge the dust particles until the differential pressure across the filter returns to pre-set lower level.
The air filter is positioned to avoid intake of vapors or exhaust from the turbine or other installed equipment.
B: Enclosure cooling air intake.

A: Lube oil line to air/oil cooler.

B: Lube oil line from ai/oil cooler.

C: Silencer, turbine air intake system.

D: Ducting, turbine air intake system.



A: Enclosure ventilation exhaust air ducting.

B: Enclosure ventilation air intake ducting.

A: Turbine engine lube oil tank vent line

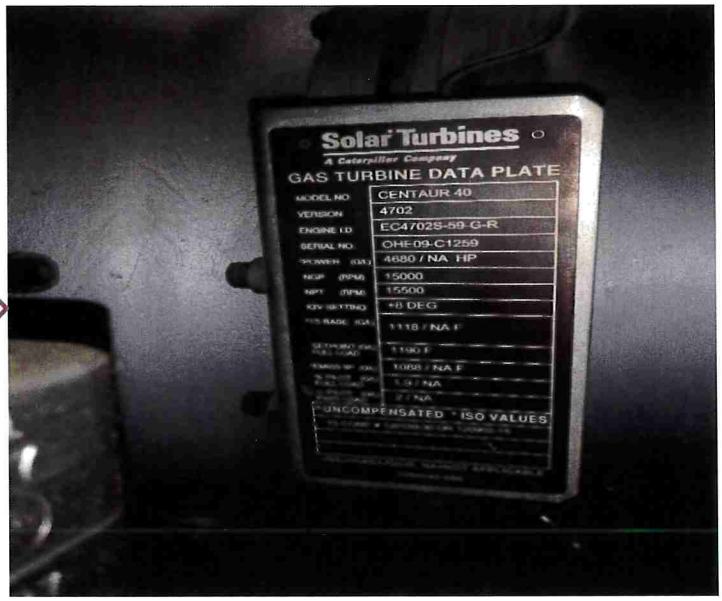
B: Enclosure ventilation air exit.

Turbine exhaust system, pressure loss should not exceed 6 inches of water; additional back pressure results in a decrease of available horsepower.

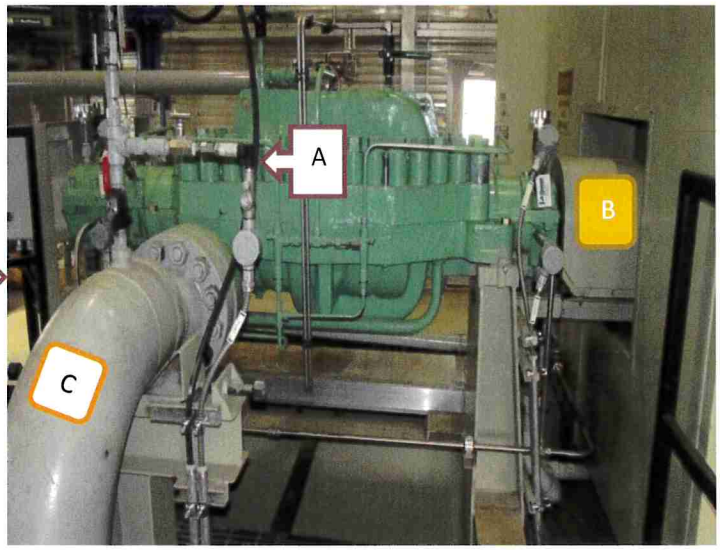
Exhaust noise attenuation is obtained by the use of a silencer in conjunction with ducting, also supported independently so it doesn't impose loads on the engine exhaust connections.

The exhaust expansion bellow provides a flexible connection for thermal expansion.

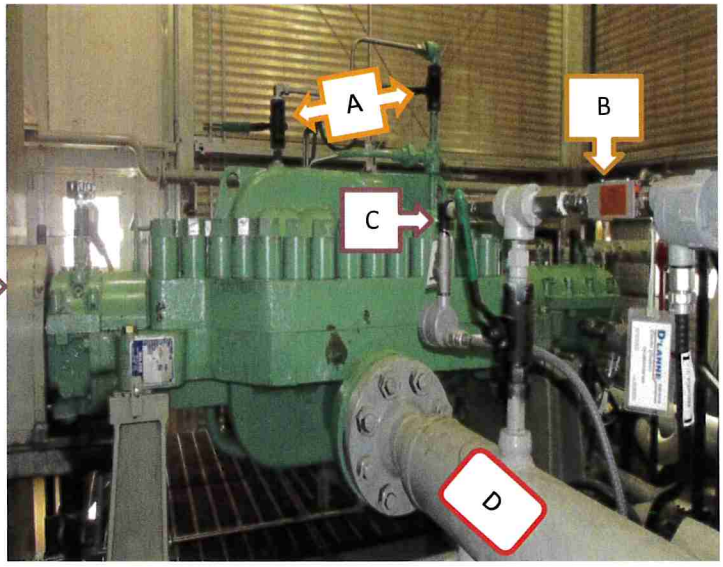
Turbine engine data tag



A: Suction pressure transmitter, used by the PLC to sense the suction pressure (PT301).
B: Coupling guard cover, RGB to Pump.
C: Pump Suction line.
Note:
Observe pressure drop across suction screen, some drop is normal, even when the screen is clean. Watch for an increase in pressure drop, indicating debris accumulation (clean screen above 5 psid of pressure drop).



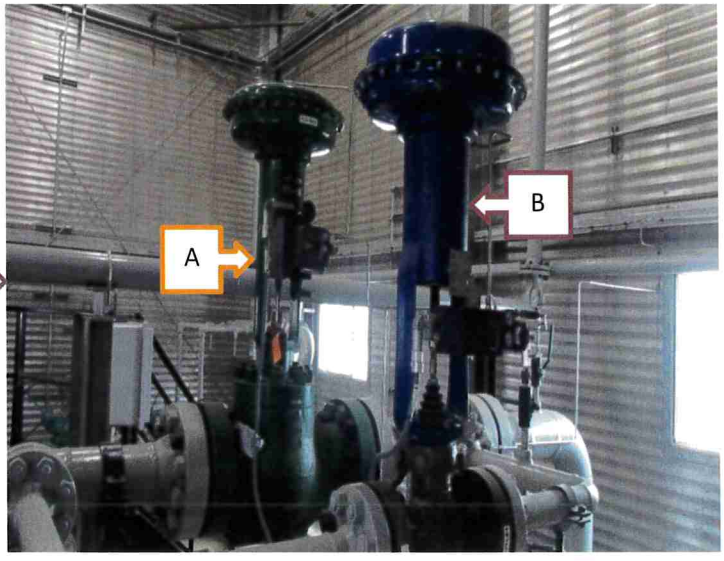
A: Pump purge valves, bleed air lock prior to start the unit.
B: Discharge pressure switch.
C: Discharge pressure transmitter, used by the PLC to sense the discharge pressure (PT302).
D: Pump Discharge line
Note:
Bleed air from seal circulation piping, prevent damage caused by absence of liquid.
Thermal shock can damage the pump, warm the pump up by circulating a small amount of product.



Discharge Valve Pressure Control
A: Large Valve, PY-9800. Set to 50% open on start-up, then transfer to automatic control.

B: Small valve, PY-9801. This valve has a pressure offset which allows it to modulate before the larger PY-9800 begins to open.

Note: Both valves will be used during startup to maintain a minimum discharge pressure while the pump is ramping up to full speed.



BINGHAM INTERNATIONAL

P 980

SERIAL No. 4B624

PUMP TYPE MSD

SIZE 4 x 6 x 10-1/2 B
6 STAGE

B C D E

IDENTIFICATION

USER	CHEVRON CANADA RESOURCES LTD.
LOCATION	SLAVE LAKE, ALBERTA
PURCHASER	CHEVRON CANADA RESOURCES LTD.
P.O. NO.	A-22562
ITEM NO.	--

SPECIFICATIONS

SERVICE	HIGH PRESSURE WATER INJECTION		
PUMPAGE	DEARATED FILTERED FRESH WATER	@	5-15° C
		sp gr	1.0
CAPACITY.	8180 M^3/DAY	**HEAD**	1812 M
		SPEED	6000 rpm

EQUIPMENT

STUFFINGBOX ☐ PACKED ■ MECHANICAL SEAL ☐ PACKINGLESS

VENDOR	J. CRANE
TYPE	8B1-RS, CODE: XF1 $0_{15}0$ (C-20)

BEARINGS

VENDOR	BINGHAM
TYPE	KINGSBURY JHJ-5 W/3" SLEEVE
	THRUST

DRIVER MOTOR/GEAR

(**VENDOR**	TOSHIBA		
(**FRAME NO.**	TIKE	**hp**	3100
(**VENDOR**	LUFKIN		
(**FRAME NO.**	N1804 C	RATIO	3.4/1
		HP	8202

COUPLING

· GEAR	(**VENDOR**	METASTREAM		
	(**TYPE**	TSJS	**SIZE**	0750
- GEAR	(VENDOR	METASTREAM	SIZE	2035
	(TYPE	TLCW		

(* INDICATES SUPPLIED BY CUSTOMER)