

ALTA GAS LIMITED PARTNERSHIP

Clear Hills Gas Plant

LSD: 07-33-90-12-W6M

OPERATION & MAINTENANCE MANUAL

Project # : 11957

Manufactured

By

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PROCESS DESCRIPTION - REFRIGERATION COMPRESSOR

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1. INTRODUCTION & GENERAL DESCRIPTION

This natural gas dewpoint control package was designed and packaged by Toromont Energy Systems of Calgary for Gobustan Operating Company. The capacity of the system is 15 MMSCFD natural gas.

This reciprocating compressor unit is an integrated system consisting of the following major sub systems:

- a) Gas Processing
- b) Refrigerant Compression
- c) Fuel Gas / Condensate
- d) Glycol System
- e) Deethanizer tower

All piping, vessels, electrical components and controls are built to the applicable standards and codes.

MANUAL OVERVIEW

This manual contains a process overview, operating instructions and instructions for lubrication and maintenance. A copy of this manual should always be accessible for reference to the plant operators. Should any questions arise concerning this manual please contact Toromont Energy Systems.

Also contained in this manual is a description of the major operating systems. This includes an outline of the design of the package, and therefore the performance characteristics. Care must be taken to ensure that the system is checked for malfunctions and corrected when necessary.

Please refer to the appropriate section for a description of each system.

OPERATION

Operating techniques that are discussed in this manual are basic instructions. The field operators will gain the skills and knowledge particular to each package.

For the initial start up of the package, the system must be tested and verified by trained personnel familiar with the testing procedures for new units. All components that make up this package must be checked and verified to be safe and operating within normal parameters. Please contact Toromont Energy Systems to schedule this service.

MAINTENANCE

The maintenance schedule is set out in this manual as well as the individual component manuals. It may be subject to variations depending on the service of the particular unit.

Under extreme operating conditions such as high or low operating temperatures or particularly wet gas, the routine maintenance schedule may have to be increased.

Routine compressor oil sampling and analysis is critical to ensure that the compressor is properly lubricated. Should the oil samples indicate a trend that the oil is being contaminated or is breaking down, the frequency of oil sampling and analysis must be increased.

Maintenance of a service log as outlined in the maintenance section of this manual is critical for maintaining a permanent record of the unit's performance.

Also included in this manual are the Manufacturer's Manuals for each of the major mechanical components. This includes the compressor, the driver, instrumentation and valves. Refer to these individual manuals for routine maintenance of each of the devices. This is required to ensure that each piece of equipment or each device is properly checked and maintained.

INDIVIDUAL MANUALS

This manual contains the individual manuals for each of the components and/or instruments.

Reference to these manuals will provide such information as routine maintenance, operating instructions (including instrumentation calibration where applicable), parts lists etc for the individual components.

USE OF THIS MANUAL

The descriptions contained within this manual will include generic information which is common to most refrigeration packages. Reference to the P&I drawings and the Instrumentation Bill Of Materials, both contained within this manual, will be necessary to establish those items that are included with this package. If in doubt, please contact Toromont Energy Systems for clarification.

For general overviews of the system operation and design, refer to the appropriate section of this manual. For information specific to any device or instrument, refer to the appropriate manufacturer's manual also contained within this manual.

GENERAL NOTES

This manual has been prepared to familiarize the owner and serviceman with unit operational procedures. Your authorized Manufacturer Representative should be consulted for expert guidance.

- As the equipment may contain natural gas or propane insure it has been fully purged with nitrogen prior to commencing work. Follow proper safety procedures when working on equipment which contains explosive and/or poisonous gases.

- The local code classification for all electrical control systems or end devices does vary between units. Refer to the project drawings for electrical design parameters used.

PROCESS DESCRIPTION - REFRIGERATION COMPRESSOR

WARRANTY

The Company warrants only to the original purchaser that the apparatus delivered hereunder (the "apparatus") shall conform to the plans and specification given in connection with the sale of the apparatus for 12 months from the date it is first operated or 18 months from the date it is first shipped to the purchaser, whichever is earliest. This warranty does not cover equipment and accessories furnished by third parties which are warranted only to the extent of the third parties' warranty to the Company.

The original purchaser's exclusive remedy under this warranty is the repair of any part or parts of the apparatus, which in the Company's judgment did not conform to the said plans and specifications when shipped. This warranty shall be void unless said nonconformance is discovered before the expiration of this warranty and the Company is notified in writing and the nonconforming part delivered to the Company's factory, all delivery and return delivery transportation charges prepaid, within 30 days of such discovery. Repairs shall be made at the Company's factory without charge except for transportation. No allowances will be granted for repairs or alterations made by the original purchaser without the Company's written consent. In lieu of the foregoing remedy, the Company may, at its option, redesign, redevelop and/or replace the full purchase price thereof.

In the event that the Company in accordance with the express warranty and liability provisions contained herein shall be required to send an employee, agent or officer to any location other than the factory of the Company to observe, discover, assist, test, replace or repair the apparatus herein, the Company shall be entitled to charge to the original purchaser the travel expenses, any subsistence allowances and/or labour and service costs of the aforesaid employee, agent or officer.

In no event shall the Company be liable for any special, consequential, incidental, or indirect damages, or for any loss of use of or any damages to any installation, operation, or service into which the compressor and engine or parts thereof may be put, or for interest, work stoppage, impairment of other goods, loss by reason of shutdown or non operation, increased expenses of operation, cost of replacement power or equipment, claims of Company for service interruption, whether or not such loss or damage is based on contract, warranty, negligence, indemnity, strict liability, or otherwise.

Except as to the Company's liability respecting any performance guarantees specifically given in connection with the sale of the apparatus, the Company's liability arising out of the manufacture, sale or use of the apparatus shall under no circumstances exceed the cost of repairing or replacing defective parts as indicated herein and shall be limited in duration of this warranty.

The warranty and the Company's obligation hereunder are expressly in lieu of all other warranties, including but not limited to the implied warranties of merchantability, description and fitness for a particular purpose. All warranties which exceed aforementioned obligations are hereby disclaimed by the Company and excluded from this warranty.

In order to keep this warranty in effect, the original purchaser must have the apparatus maintained and serviced properly in accordance with the Company's instruction upon purchase.

It is expressly agreed and understood that this warranty will not cover any defect, damage or deterioration due to normal use, wear and tear and exposure or any damage or defects due to misuse, abuse, alteration, negligence, accident, flood, fire or acts of God or further damage or defects due to the repair of the apparatus by someone other than an authorized employee, agent or officer of the Company.

It is further understood and agreed that this warranty will not be applicable to any apparatus operated by the original purchaser which in the opinion of the Company constitutes or constituted unusual or hazardous operating condition.

TPS has no liability in respect to mechanical or acoustical related vibration except where the equipment was manufactured in accordance with an independent mechanical and acoustical study purchased by or on behalf of the customer. Where vibration/pulsation occurs in the absence of a formal study, TPS will supply at no charge to the customer, FOB the TPS's nearest branch, one set of sized orifice plates engineered in accordance with standard industry practice. All costs associated with the installation of the orifice plates would be to the customer. Reciprocating compressor valve failures due to operation outside of the valves design parameters will not be considered for warranty.

2. PROCESS DESIGN

Gas Processing

The inlet to the processing plant comes from the inlet compressor usually after 2 to 3 stages of compression. Pressures are generally between 2700 kpag and 9600 kpag depending on the inlet compression and where on the inlet compression system the gas is removed for processing.

The gas is then cooled on the tube side of the Gas/Gas exchanger (E101A/B). This is accomplished by flowing the cold gas from the top of the low temperature separator through the shell side of the Gas/Gas exchanger. The Gas/Gas exchanger is equipped with glycol injection into the gas stream to prevent the water phase from freezing.

After the gas to gas exchanger the gas is then cooled to its coldest point in the tube side of the gas chiller (E102). The cooling medium for the gas chiller is provided by a closed loop propane refrigeration system.

Fluid from the chiller enters the low temperature separator (V101) in three phases. Residue gas from the separator is passed through the shell side of the gas/gas exchanger before being sent to the sales gas pipeline. The water/glycol mixture is collected in the boot and heated by a hot glycol coil. The water/glycol mixture then goes to the Glycol Regenerator. Condensate is collected behind the weir and controlled through a level controller. From the LTS the condensate is sent to the condensate treating system.

Condensate Treating System

The condensate from the low temperature separator is first sent through the propane sub-cooler. This uses the cold condensate to cool the propane for extra refrigeration. It also uses the warm propane to heat the condensate and help to remove natural gas from the condensate.

From the propane sub-cooler (E-103) the pressure is then lowered across the LTS level control valve LV-217, and then the warmed low pressure condensate is sent to the de-ethanizer tower (V103). The liquid condensate runs down the tower while hot natural gas runs up the tower. The final effect is that hot natural gas comes off the top of the tower and liquid condensate with the gas removed comes off the bottom of the tower.

The Pressure on the tower is controlled using PV-313, which controls the flow of the outlet gas. The gas from there is usually returned to the first stage of compression so that it can be re-injected into the system.

PROCESS DESCRIPTION - REFRIGERATION COMPRESSOR

The treated condensate is then cooled through E-105 to 43 deg C. Then returned to the building for metering and sent to an off skid tank.

Refrigeration

A closed loop propane refrigeration system is used to cool the gas in the gas chiller. The compression is accomplished using a Mycom P8WB (C101) reciprocating compressor driven by a Caterpillar 3306taw engine (CD101) running at 203 HP @ 1800 rpm

The refrigerant gas discharges from the compressor and passes through the oil separator to remove any compressor oil from the system. The gas is then condensed in the finned tube air exchanger (E106) at a temperature of 43 °C and collected in the refrigerant receiver (V105).

After leaving the receiver, the propane is precooled as it passes through the shell side of the propane subcooler. Liquids leaving the low temperature separator are used in the tube side. The propane is then expanded across a control valve to get it to the proper temperature and pressure before entering the gas chiller. The vaporized propane exiting the chiller goes back to the compressor suction completing the refrigeration system.

Fuel Gas / Condensate System

Fuel gas can be brought in from 2 separate sources.

- a.) There is an off skid fuel gas connection which comes from pipeline sales gas
- b.) Fuel gas can be brought back from the sales gas connection at the outlet of the gas to gas exchanger by opening a ball valve.

The fuel gas is cleaned in the fuel gas scrubber (V106) and then sent to 5 separate users.

- a.) Natural gas Engine Driver CD-101
- b.) H-102 A/B/C Building Catadyne Heaters
- c.) H-101 Regenerator
- d.) V-106 flash tank Pressure Make up
- e.) Off skid users including inlet compression

As well as the above as some gas is fed directly from the V-106 flash tank to the H-101 Regenerator. This is done in an effort to avoid flaring and to conserve the flash gas and the pressure make up gas in the flash tank.

Glycol System

Glycol is injected into the gas stream in the tube side of the Gas/Gas Exchanger and Gas Chiller by high pressure piston pumps (PD101A/B) to prevent the water phase from freezing. The water / glycol mixture is collected in the boot of the low temp separator. The water/glycol mixture is then heated before it reaches the glycol flash tank where the hydrocarbon vapour is flashed from the glycol. The glycol then passes through filters on its way to the glycol regenerator (H101) where the water is boiled out of the glycol. The glycol then goes back to the injection pumps completing the loop.

A separate Glycol loop is provided for Stabilizer Reboiler. Hot Glycol is taken directly from the regenerator H101. The glycol is then run through a glycol circulation pump P-102 and then fed to the reboiler for the purpose of maintaining the heat and boiling off hydrocarbon gasses out of the condensate.

Glycol is also fed from the reboiler for emergency glycol heat tracing. This is done using a gas operated pump P-103. This is only required when the rest of the plant is down and this pump should be left off for normal operation.

Gas Processing Components

GAS / GAS EXCHANGER (E101A/B)

The gas/gas exchanger utilizes gas/gas heat transfer in a shell and tube exchanger. This serves two purposes. The first is to reduce the actual refrigeration load by cooling gas entering the system. The second is to warm the gas from the chiller to sales gas specifications.

GAS CHILLER (E102)

The gas chiller uses the vapourization of liquid propane to cool the gas leaving the gas/gas exchanger to below the required dewpoint.

LOW TEMP SEPARATOR (V101)

The low temp separator (LTS) is used to separate the liquid and vapour hydrocarbons. Separation is accomplished by reducing the vapour velocity, which enables liquid droplets to settle out due to gravity. Liquid hydrocarbons and glycol are separated by gravity setting. Liquid hydrocarbons collect and spill over the weir into a reservoir where the level can be controlled. Glycol collects in the boot where the level is controlled.

Refrigeration Components

COMPRESSOR (C101)

The Mycom P8WB is a multicylinder reciprocating compressor designed for this application. A 300 W oil heater is used to preheat the oil before starting. The oil system is a closed loop with a reservoir located at the bottom of the crankcase chamber. An oil pump and oil cooler are supplied with the compressor. The oil cooler is a shell and tube type head exchanger in which the refrigerant from the liquid receiver passes through the shell side providing the cooling medium.

PROPANE REFRIGERANT CONDENSER (E106)

The condenser is a finned tube air exchanger that is used to condense the propane vapour from the compressor. The condenser is a separate coil in part of the same structure as the condensate cooler and is serviced by the single fan. The condenser coil has it's own set of split automated and manual louvers.

PROPANE LIQUID RECEIVER (V105)

The liquid receiver is used to store liquid from the condenser. It provides a liquid inventory to protect against system fluctuations and maintain a liquid seal between the high and low pressure sides of the system. The liquid level should not be allowed to drop below 25% or exceed 90% of the receiver capacity. The receiver is equipped with a hot gas bypass which is controlled by a pressure control valve (PCV-508) set to maintain a minimum pressure of 945 KPAG within the receiver.

Fuel Gas / Condensate Components

PROPANE SUBCOOLER (E103)

This exchanger serves the same basic purpose as the gas/gas exchanger. Condensate from the LTS is on the tube side and liquid propane from the receiver is on the shell side. It reduces the refrigeration load and increases the temperature of the hydrocarbon liquids before they enter the flash vessel.

DE-ETHANIZER COLUMN (V103)

The column is used to remove natural gas from the condensate. The top of the tower is filled with packing to make a difficult path for the liquid condensate. Warmed low-pressure condensate from the propane sub-cooler flows down the tower, while hot natural gas flows up the tower removing the natural gas from the condensate.

CONDENSATE COOLER (E105)

The condensate cooler is a finned tube air exchanger that is used to cool the hydrocarbon liquid from the tower and produce the condensate product for storage. The cooler is a separate coil in part of the same structure as the propane condenser and is serviced by the single fan. The cooler coil has it's own set of manual louvers.

Glycol System Components

GLYCOL FLASH VESSEL (V106)

Warmed low pressure glycol is introduced into the Glycol flash tank. Any natural gas held in the glycol can then flash off before the natural gas is sent to the tank. This allows the trapped natural gas to either go to flare or to be re-used rather than going to atmosphere.

GLYCOL REGENERATOR (H101)

The glycol regenerator is a 146 kW unit used to remove the excess water from the glycol picked up in the gas/gas exchanger and gas chiller. The glycol bath is heated to 135 °C which boils the water out of the glycol.

PROCESS DESCRIPTION - REFRIGERATION COMPRESSOR

Control System

This system summary is provided as a general overview. For detailed control configuration information, refer to the panel manufacturer data books.

The compressor unit malfunction protection is based on An Altronic DE-2500 control panel. This is a shutdown and monitoring system with the ability to perform a number of logic functions for the control of engine or motor driven compressor units.

Digital Inputs

The control system provides a maximum of 16 discrete intrinsically safe inputs such as shutdown switches for pressure, temperature, and vibration. These inputs can be programmed to monitor normally open or normally closed switch action so as to provide fail safe operation.

Analog Inputs

The control system provides a maximum of 15 analog inputs such as transmitters and thermocouples. These inputs can be programmed to monitor, shutdown, control, or can have some sort of logic associated with them. Analog inputs can be configured as digital inputs if required. This has been done for several digital inputs which require logic beyond shutdown or alarm.

Digital Outputs

The system provides a maximum of 12 digital outputs (4 solid-state relay, 8 discrete) for auxiliary control functions.

Analog Outputs

The system provides 2 analog outputs for control. These can be controlled using internal PID loops as controlled in the panel. At this time only one of the outputs are used (TV-317 is controlled from this panel).

Shutdowns

All control systems are equipped with a number of shutdowns or inputs to protect the equipment from damage. In general a shutdown function consists of sensor and indicator. The sensor measures the condition of a point in the system and the indicator, indicates the condition of that point. These shutdown/input functions are divided into classes as follows:

Class "A"

- Shutdowns must be clear prior to any output function being enabled.
- There is no bypass time delay provided on these shutdowns.

Class "B"

- Shutdowns will be bypassed for the "B" bypass timer setpoint value/period.
- The individual shutdown will be armed once the initial timer period has elapsed.
- The output functions will be disabled if all "B" inputs are not cleared by the end of the time period

- Shutdowns will be bypassed until they have cleared. Therefore a "C" shutdown must clear/reset once prior to being enabled or armed.
- The driver can be started without the "C" shutdowns cleared.

Shutdown Summary Sheet

Equipment	Shutdown/Alarm	Class
Compressor	Emergency shutdown	A
Gas Chiller (E-102)	High liquid level (LSHH-209)	A
Low Temp Separator (V-101)	High liquid level (LSH-216)	Alarm only
Fuel Gas Scrubber (V-102)	High liquid level (LSHH-306)	A
De-ethanizer Tower	High Liquid Level (LSH-321)	Alarm Only
Compressor (C-101)	Lo diff. oil press. (PDSL-409)	B
Compressor (C-101)	Lo Suct. Press. (PALL-401)	B
Compressor (C-101)	Hi Disch. Press. (PAHH-428)	A
Compressor (C-101)	Hi diff. Press. (PDAH-420)	A
Compressor (C-101)	Hi Disch Temp. (TAHH-427)	A
Compressor (C-101)	Hi Oil Temp. (TAHH-425)	A
Compressor (C-101)	Hi Vibration (VAHH-421)	A
Condenser (E105)	Hi Vibration (VAHH-507)	A
Glycol Flash Tank (V106)	High liquid level (LSHH-606)	A
Glycol Injct. Pumps (P101A/B)	Low injct. press. (PSLL-610)	B
Glycol Regenerator (H-101)	Low liquid level (LSLL-715A)	A
Regen Surge Tank (H-101)	Low liquid level (LSLL-715B)	A
Glycol Regenerator (H-101)	Regen shutdown	B
Engine (CD-101)	Lo Oil Press. (PSLL-806)	B
Engine (CD-101)	Hi Vibration (VAHH-807)	A
Engine (CD-101)	Hi Manifold Temp (TAHH-809)	A
Engine (CD-101)	Hi JW Temp (TAHH-810)	A
Engine (CD-101)	Lo Oil Level (LALL-814)	A
Engine (CD-101)	Lo JW Level (LALL-815)	A
Engine (CD-101)	Lo AW Level (LALL-816)	A

Shutdowns included vary. Refer to control system drawings for specific design details.

Start Permissive Control

Prior to the compressor starting the following permissives must be enabled:

- 1) All class "A" shutdowns must be cleared.

If all other start permissives are satisfied the Pull to start button beside the engine can be used to manually crank/start the engine.

Capacity Control

The output capacity of the reciprocating compressor can be controlled by adjusting the unloading mechanism for the suction valve of the compressor. The capacity control system has both a manual and an automatic mode.

AUTOMATIC MODE

The automatic control system can include the following sensor/controller components:

- Suction Pressure
- Unloader Mechanism Position

With rising suction pressure, the compressor is unloaded by forcing the suction valves open at all times which unloads the piston. Three of the unloading mechanisms are automatically controlled, while the 4th is always closed. With low suction pressure, the compressor is loaded.

MANUAL MODE

For manual operation the unloader valve on the compressor can be manually opened and closed to unload the compressor.

Pre-Start-up Checklist

The following is an outline of procedures to be followed prior to the unit initial start-up.

PRESSURE TESTING and PURGING

When all the appropriate lines have been connected to the unit it should be pneumatically leak tested with air or nitrogen.

- The unit has been thoroughly pressure tested prior to shipment.
- Leaks can occur due to transit and other items that may cause the piping strain.

NOTE: As the equipment contains explosive fluids insure it has been *fully purged* with nitrogen prior to commencing work. Follow proper safety procedures when working on equipment which contains explosive and/or poisonous gas.

COMPRESSOR DRIVER SHAFT ALIGNMENT & COMMISSIONING

The compressor shaft drive couplings have been aligned prior to shipment. The alignment may change due to items such as:

- Deflection while loading and unloading.
- Transit.
- Settling of the main skid base on its support.

Therefore the final alignment must be done on site prior to commissioning.

The direct drive shaft couplings are to be given a hot alignment and all belt drive systems are to be checked within the first 8 hour running period. At that point all hold down bolting should once again be checked and dowels can be installed if required.

The belt drive system was aligned and tightened before shipment. A final check of the tension on all belts is required before starting the unit. The belts on the fin-fan cooler are tightened by shifting the idler under the belt guard. The belts on the engine are tightened by an idler mounted on the main structural beams.

The air cooler fan unit should be checked for correct direction of rotation and the belts checked for excess vibration, belt slip, noise and sufficient air flow.

COMPRESSOR CRANKCASE OIL

The compressor crankcase must be filled to the proper level with the required oil. Only after this can the oil heater be activated and the oil allowed to warm up.

ENGINE CRANKCASE OIL

The engine oil tank T-101 must be filled to the proper level with the required oil. The level controller will then maintain the correct oil level in the engine

UNIT STARTUP INSTRUCTIONS - REFRIGERANT COMPRESSOR

□ CONTROL SYSTEM

The control system logic must be checked at start-up.

- Insure all electrical seals have be poured prior to commissioning the unit.
- All system trip switches, etc. must be pre-set and tested for logic and function prior to start-up.
- Insure that all functions of the control panel, end device settings and actions have been tested prior to commissioning.

□ GLYCOL

Prior to commissioning the compressor unit cooling glycol must be installed.

- Insure that 85 weight percent ethylene glycol is used in the system.
- Open all appropriate valves in the glycol loop. The glycol can then be pumped into the system until a level has been established in the glycol storage tank.
- There is a high possibility that air will be trapped in the system. Therefore a procedure of initially running the pump while maintaining a level in the storage tank shall be followed until the storage tank level remains constant.
- Both the pump discharge pressure and noise shall be monitored during this time. If the pump is pumping then there will be a rise in the pump discharge pressure. If no pressure rise is noted then there is a possibility that the pump is vapour locked and the air shall be removed to prevent pump damage.
- If the pump makes excess noise it will probably due to cavitation. This is caused be air in the system. The noise level is to be monitored and it should disappear once a steady glycol flow has been established.

□ DEHYDRATION

The removal of moisture is necessary for a refrigeration system prior to the addition of the refrigerant. Residual moisture will cause ice to form in areas that operate below the water freezing point. This will cause a number of adverse effects.

After the system has been checked for leaks the removal procedure can be started. All low points are to be blown to remove water.

The removal of the residual moisture can be removed by either of the following methods:

- Purge system with warm dry air or nitrogen.
- Use a vacuum pump which can reduce the system pressure to a very low level.

To remove water by use of a vacuum pump the system pressure must be lowered to a point where the water boiling point temperature is below the ambient temperature. The method of dehydration by vacuum pump is an industry standard practice and that procedure shall be followed.

VISUALLY INSPECT UNIT BEFORE STARTING. PRIOR TO STARTING, WALK AROUND THE COMPRESSOR PACKAGE AND VISUALLY INSPECT THE UNIT FOR LOOSE OR BROKEN COMPONENTS, TOOLS, OPEN VALVES, MISSING EQUIPMENT ETC.

FINAL CHECK

The refrigerant must only be installed in the system once the leak test, dehydration and air removal have been completed.

REFRIGERANT

UNIT STARTUP INSTRUCTIONS - REFRIGERANT COMPRESSOR

Initial Starting

This outline for system initial start-up and running operation is based upon all pre-commissioning procedures being completed, oil and glycol added, all controls being pre-set and control panel logic and functions tested.

Check list

Prior to bumping the driver for rotation insure the following has been done:

1. All equipment is clear of loose items.
2. All bearings are properly lubricated.
3. Check equipment and driver hold down bolts to insure they are aligned / tight.

The driver can now be bumped for rotation and checked for excess noise.

Check that the following items prior to start-up:

1. All valves are in their correct operating position.
2. Compressor crankcase has been filled with oil, heating coil is operating and the oil is warm.
3. Glycol system is charged and pumps are operating properly.
4. All pressure and level controls are in the proper operating position.
5. Prelube compressor.

STARTING

Pull the Start button. The compressor will automatically load until the desired suction pressure is obtained. Ensure all of the following items have been checked:

1. Lube oil pressure and temperature.
2. Glycol temperature.
3. Compressor vibration.
4. Compressor suction and discharge temperature and pressure.
5. Shaft seals.
6. All operating pressures and temperatures.

The system operation should be monitored for a period of time until the system has stabilized. Once the complete system operation and stability has been assured, the unit can be shutdown and restarted as required.

Restart On Shutdown

In the event of a shutdown, the shutdown cause must be corrected prior to restart.

COMPRESSOR / OPERATING LOG SHEET - REFRIGERATION COMPRESSOR

UNIT LOCATION		COMP TYPE	
DATE			
TIME			
HOUR			
AMBIENT TEMP (IN/OUT)	/	/	/
COMPRESSOR	UNITS		
	SUCTION PRESSURE		
	SUCTION TEMPERATURE		
	DISCHARGE PRESSURE		
	DISCHARGE TEMPERATURE		
	OIL PRESSURE		
	OIL TEMPERATURE		
	OIL FILTER PRESS. DROP		
	RECEIVER PRESSURE		
	% LOAD		
SEAL LEAKAGE (DROP/MIN)			
CONTROLS	CAPACITY CONTR SET PT		
COMPRESSOR CRANKCASE	OIL ADDED		
	OIL LEVEL (% OF GLASS)		
	STRAINER PRESSURE DROP		
DRIVER	SPEED		
	OIL PRESSURE		
	OIL TEMPERATURE		
	MANIFOLD TEMPERATURE		
	MANIFOLD PRESSURE		
JW TEMPERATURE			
REMARKS			

TOROMONT PROCESS SYSTEMS rev. 1.0

{ DATE V }

Filename: 11957 OM Rev 0.DOC
Directory: P:\11957 Alta Gas 12-15mmscf Gas Plant - Clear
PrairieManual
Template: C:\Documents and Settings\billard\Application
Data\Microsoft\Templates\Normal.dot
Title: PROCESS DESCRIPTION
Subject: Brent Chopik
Author: Brent Chopik
Keywords:
Comments:
Creation Date: 12/30/2005 7:15 AM
Change Number: 2
Last Saved On: 12/30/2005 7:15 AM
Last Saved By: Brent Millard
Total Editing Time: 172 Minutes
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As of Last Complete Printing
Number of Pages: 21
Number of Words: 4,902 (approx.)
Number of Characters: 27,947 (approx.)