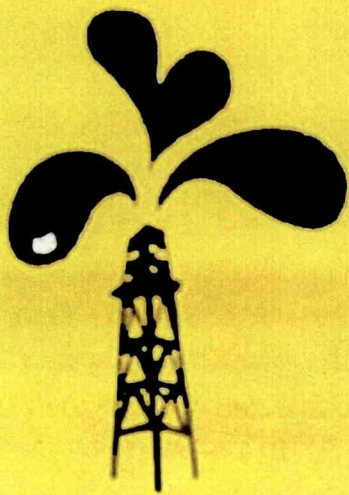
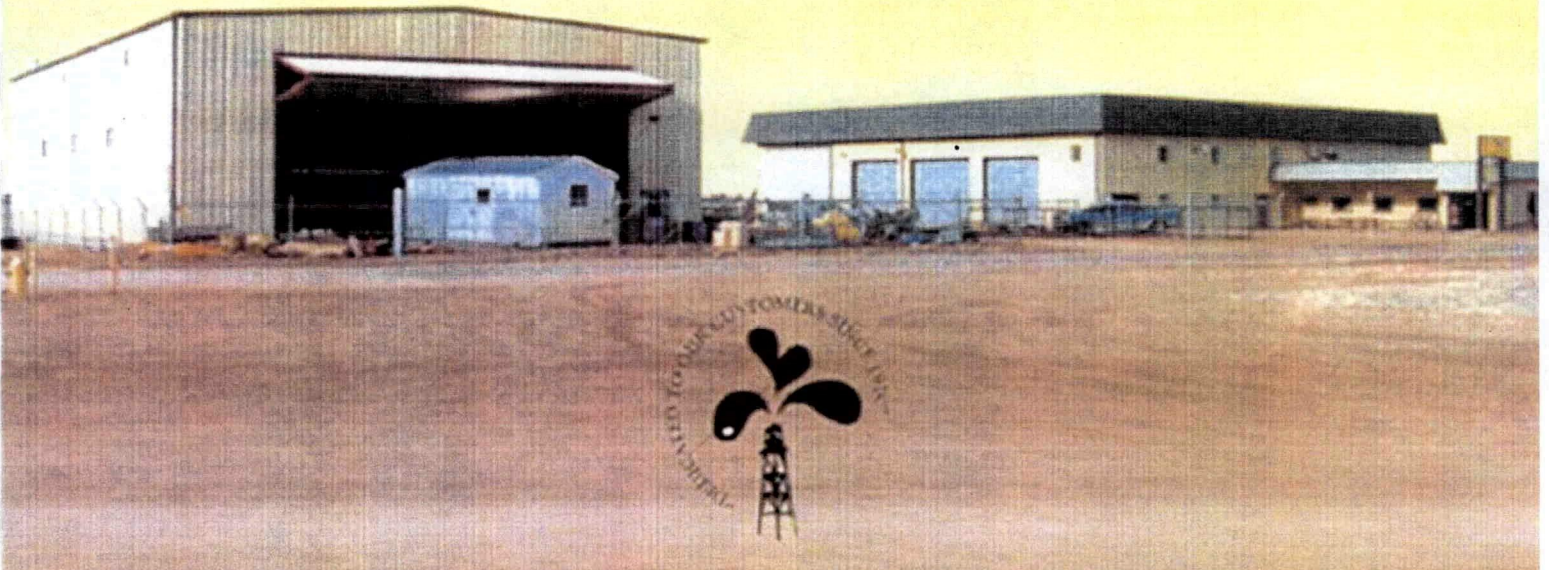


62048309



WATERFLOOD
WSS SERVICE &
ALES
LTD. TM

**HUSKY OIL
OPERATIONS
G.D. SSQ COMPRESSOR
CATERPILLER G3306
JOB #1028**



1

Flooded Screw Compressor

- Gardner Denver SSQ
- Aeon Lubrication Oil
- Spare Parts List

2

Driver

- Caterpillar G3306NA
- Altronic Ignition
- Tubrostart T30-I Air Starter

3

Control Panel

- F.W. Murphy Panel
- LCDT/SHD30/45 Series/A25 Series
- Versa Valve/67CF Regulator

4

Cooler

- ACE Model J2A
- AMOT Model B Thermostatic
- EL-150-K1

5

Oil Coalescing Vessel

- Betties RPC Actuator
- Taylor Relief Valves
- L1200 Level Switch
- Kimray Gas Regulator

6

Inlet Separator Vessel

- Norriseal 1001A
- DV850/L1200 Level Switch
- Fisher Actuator 4160R/1051
- Taylor Relief Valve

7

Fuel Gas Scrubber Vessel

- Fisher Type 627 Regulator

8

Natural Gas Heater

Cata - Dyne WX18X24

9

Prints

10

Miscellaneous

- Brochures

WATERFLOOD SERVICE & SALES LTD
JOB INFO
ENGINEERING PACKAGE CONTROL

DATE: 01/31/03
REV#: 0

CUSTOMER: Husky Oil
CONTACT: Chad Bodnar
L.S.D: 06-34-050-27W3M Northminster
AFE / PO#: 4500096887
WSS JOB#: 1028
WSS ENG: Carmon Lindquist

PH#: 306-825-1198
FAX#: 306-825-1159
DATE REQUIRED: Mar. 28/03
PACKAGE E9#: 6438
COMPRESSOR E9#: NR

PACKAGE DESIGN

SUCTION PRESSURE: 1 - 50 PSI
DISCHARGE PRESSURE: 250 PSI

FLOW: 0.30-2.25 MMSCFD
GAS: Sweet Natural Gas

PACKAGE DATA

LENGTH: 26.5' **WIDTH:** 11.5' **HEIGHT:** 12'
SKID TYPE: Complete
PIPING COLOR: Navy Gray **BUILDING COLOR:** Galvanized/ White
SKID COLOR: Navy Gray **SURFACE PREP:** Sand Blast

SCREW MAKE: Gardner Denver
SCREW MODEL: SSQBG
SERIAL#: S143190
INLET VALVE: YES
COUPLING: Ringfedder Flywheel Coupling

OIL FILTER: P171276
OIL TYPE: AOEN-NG-HS10
OIL PUMP: YES
MAX. DISCHARGE: 250 PSI
MIN/MAX RPM: 616 2695

DRIVER TYPE: CAT G3306TA
HP RATING: 205 HP
SERIAL #: G6X00273
OIL FILTER: 1R0716
OIL TYPE: Chevron HDA40

CLASS: Class. 1 Div. 2
MAX RPM: 1800
ARRANGEMENT#: 222-9039
AIR FILTER PRI: 6I2501
AIR FILTER SEC: 6I2502

VESSEL	FUEL	OIL	INLET
MODEL: 100TIS		1200TOS	1200TIS
SERIAL #: 02103201		02103202	02103203
CRN #: OH5535.23		R2176.2	A4258.32
FILTER: RFG12		EAU80110	N/A

COOLER

MAKE: ACE
MODEL: J4D
FAN SHEAVE: 2TB18.4
FAN BUSHING: BUQ2.188
BELTS: BEB116

SERIAL #: 03016
CRN #: A4926.3/A4927.3
IDLER SHEAVE: 2TB7.4
IDLER BUSHING: BUQ1.938
FAN TYPE: ADJUSTABLE

PANEL

PANEL MAKE: MURPHY
PANEL MODEL: TTDJ

PANEL #: 50-30-3740

ACCESSORIES

SCAVENGER OIL FILTER: P171276
ENGINE GAS STARTER: TDI LOW PRESSURE
INLET CONTROLL VALVE: V100 FISHER
FUEL GAS REGULATOR: FISHER 627
DIS. GAS METER: N/A
BLOW CASE: YES
AUX. ENGINE OIL FILTER: DE2011

ENGINE GAS REGULATOR: FISHER 627
BYPASS REGULATOR: FISHER 299H
HEATER: 2 - CISCAN
THERMOSTAT VALVE: AMOT 2BHCT
ENGINE GAS METER: ROOTS METER
ENVIRO VENT FILTER: 88467A

WATERFLOOD SERVICE & SALES LTD
PACKAGE DATA SHEET
ENGINEERING PACKAGE CONTROL

DATE: 01/31/03
REV#: 0

CUSTOMER: Husky Oil
CONTACT: Chad Bodnar
L.S.D: 06-34-050-27W3M Northminster
AFE / PO#: 4500096887
PH#: 306-825-1198
FAX#: 306-825-1159
DATE REQUIRED: Mar. 28/03
WSS JOB#: 1028
WSS ENG: Carmon Lindquist
PACKAGE E9#: 6438
COMPRESSOR E9#: NR

PACKAGE DESIGN

SUCTION PRESSURE: 1 - 50 psi
DISCHARGE PRESSURE: 250 psi
FLOW: 0.30-2.25 MMSCFD
GAS: Sweet Natural Gas

PACKAGE DATA

SPARE PARTS LIST: 11/01/02

LENGTH: 26.5' **WIDTH:** 11.5' **HEIGHT:** 12'
SKID TYPE: Complete **TOP MOUNT:** 0
PIPING COLOR: Navy Gray **BUILDING COLOR:** Galvanized/ White
SKID COLOR: Navy Gray **SURFACE PREP:** Sand Blast

SCREW MAKE: Gardner Denver **OIL FILTER:** P171276
SCREW MODEL: SSQBG **OIL TYPE:** AOEN-NG-HS10
SERIAL#: S143190 **OIL PUMP:** YES
INLET VALVE: YES **SAE HOUSING:** 250
COUPLING: Ringfedder Flywheel C

DRIVER TYPE: CAT G3306TA **CLASS:** Class. 1 Div. 2
HP RATING: 205 HP **MAX RPM:** 1800
SERIAL #: G6X00273 **ARRANGEMENT#:** 222-9039
FILTER: 1R0716 **AIR FILTER PRI:** 6I2501
AIR FILTER SEC: 6I2502

VESSEL	FUEL	OIL	INLET
MODEL: 100TIS		1200TOS	1200TIS
SERIAL#: 02103201		02103202	02103203
CRN#: OH5535.23		R2176.2	A4258.32
SIGHT GLASS: JEGANSON		Penberthy Sight	JEGANSON
DUMP VALVE: NO		NO	DV150
DUMP OP.: NO		NO	1001A
DEMISTER: 6" 316SS		NO	6" 316SS
FILTER: RFG12		EAU80110	NO

COOLER

MAKE: ACE **SERIAL #:** 03016
MODEL: J4D **CRN#** A4926.3/A4927.3
FAN SHEAVE: 2TB18.4 **IDLER SHEAVE:** 2TB7.4
FAN BUSHING: BUQ2.188 **IDLER BUSHING:** BUQ1.938
BELTS: BEB116 **FAN TYPE:** ADJUSTABLE
HOT BOX: YES **EXPANSION TANK:** YES

PANEL

PANEL MAKE: MURPHY **PANEL #:** 50-30-3740
PANEL MODEL: TTDJ

ACCESSORIES

SCAVENGER OIL FILTER: P171276 **ENGINE GAS REGULATOR:** FISHER 627
ENGINE GAS STARTER: TDI LOW PRESSURE **BYPASS REGULATOR:** FISHER 299H
INLET CONTROLL VALVE: V100 FISHER **HEATER:** 2 - CISCAN
FUEL GAS REGULATOR: FISHER 627 **THERMOSTAT VALVE:** AMOT 2BHCT
DIS. GAS METER: N/A **ENGINE GAS METER:** ROOTS METER
BLOW CASE: YES **ENVIRO VENT FILTER:** 88467A

WATERFLOOD SERVICE & SALES LTD.

FLOODED SCREW COMPRESSOR PACKAGE

WSS JOB#: 1028

DATE: 01/31/03

QTY	PART#	DESCRIPTION	PRICE (EA)	ORDER	SHIPPED	RETURNED
GARDNER DENVER SSQ FLOODED SCREW COMPRESSOR						
5G	28H139	5G PAIL SCREW COMPRESSOR OIL	\$ 143.85			
55G	28H131	55G DRUM SCREW COMPRESSOR OIL	\$ 1,212.65			
2	P171276	MAIN OIL FILTER	\$ 128.15			
1	RFG12	FUEL GAS VESSEL/INLET SEPERATOR	\$ 39.15			
1	P171276	MAIN OIL FILTER	\$ 128.15			
1	EAU80110	1200T OIL COALESING FILTER	\$ 1,561.81			
1	1200TGSSQ	OIL COALESING FILTER GASKET	\$ 35.70			
CATERPILLAR G3306TA NATURAL GAS ENGINE						
3	IR0716	OIL FILTER	\$ 33.25			
3	133-1247	VALVE COVER GASKETS	\$ 67.36			
2	6I2501	AIR FILTER -PRIMARY ELEMENT	\$ 60.90			
2	6I2502	AIR FILTER-SECONDARY ELEMENT	\$ 60.04			
6	4W2256	SPARK PLUGS	\$ 73.64			
3	107-2400	IGNITION COILS (TRANSFORMERS)	\$ 464.18			
6	KOS1	CAT OIL SAMPLE KIT	\$ 22.40			
6	CSBK4	OIL SAMPLE BOTTLE	\$ -			
6	3500A	OIL SAMPLE HOSE	\$ 11.20			
1	DE2011	AUX. OIL FILTER	\$ 144.20			
1	88467A	ECOVENT FILTER	\$ 58.91			
COOLER						
2	BEB116	GOOD YEAR SHEAVE BELTS	\$ 22.62			

Please feel free to contact our area sales representative or service co-ordinator at the phone numbers listed below for further information on parts and or pricing or to look over our preventative maintenance program.

Extra parts not listed above can be added below.

QTY	PART#	DESCRIPTION	PRICE (EA)	ORDER	SHIPPED	RETURNED


Sales Representative: Norm Mack (Estevan) Office (306)634-7212 Cell (306)421-1201
Jim Bedford (Lloydminster) Office (780)875-7638 Cell (306)821-0209
Jeff Rich (Edmonton) Office (780)465-2333 Cell (780)499-1173
Niel Hoiium (Taber) Office (403)223-9529 Cell (403)308-9520

TERMS: GST & PST EXTRA WHERE APPLICABLE
PAYMENT NET 30 DAYS
PRICES IN EFFECT FOR 60 DAYS


WATERFLOOD SERVICE & SALES LTD
JOB TAGS
ENGINEERING PACKAGE CONTROL

CUSTOMER: Husky Oil	WSS JOB#: 1028
CONTACT: Chad Bodnar	WSS ENG: Carmon Lindquist
L.S.D: 06-34-050-27W3M N	PACKAGE E9#: 6438
AFE / PO#: 4500096887	PUMP E9#: NR

JOB PIPING TAG - EXHIBIT # 6C

FABRICATED BY:	SERIAL # / JOB
 WATERFLOOD SERVICE & SALES LTD. BOX 1490 ESTEVAN, SK	1028
	DATE
	01/31/03

JOB PUMP TAG

 WATERFLOOD SERVICE & SALES LTD.	ESTEVAN, SASK	
	(306) 634-7212	
MODEL:	SSQBG	SER#: S143190
DESCRIPTION:	Gardner Denver SSQBG	
MAX PSIG:	250	MIN RPM: 616 MAX RPM: 2695
DRIVER:	CAT G3306TA	MAX RPM: 1800 SER#: G6X00273
JOB#	1028	JOB DATE: 31-Jan-03
CONSULT MANUAL PRIOR TO OPERATION		



**GARDNER DENVER
SSQG
OIL FLOODED SCREW
COMPRESSOR PACKAGE
OPERATIONS MANUAL**

Table Of Contents

Getting Started	page 3
Starting Procedures	page 4
Operating Conditions	page 7
Alarms and Shutdowns	page 8
Product Warranty	page 9
Service Outlets	page 10

Getting Started

Waterflood Service and Sales is pleased with your decision to purchase or rent our Gardner Denver SSQG 240 HP Oil Flooded Screw Compressor Package. This complete unit is well built, rugged and reliable and can suit various needs within the gas compression side of the oil field industry.

This complete package being set up with rental purposes in mind has the capabilities of having varies gas and fuel sources. You have the option of using inlet gas to run all instrumentation and fuel the engine, or using a supplies from various optional sources. A Murphy Telematic Control Panel will operate the skid and alarms on various conditions to protect the package. A Tattletale recorder will allow you to easily trouble shoot any problems that might arise.

Things that you should be aware of:

1. The control panel requires 60 PSI of gas pressure to operate. The panel operates off the same supply gas as the engine.
2. The CAT 3306TA is not rated for more than 10 PPM H₂S Fuel Gas.
3. This package puts out a large volume of heat so be aware the piping is very hot, and can burn unprotected skin.

Before starting up the package please ensure that all fluids levels are within their operating range. If you require assistance with this please contact our service outlets listed on page 10 of this manual.

For Shipping purposes all valves within the package will closed. Based upon your site conditions, the following starting procedures will outline which valves you require to open.

Starting Procedures

Since the operating conditions vary for each site, it is required that you set the bypass make up gas regulator and both suction and discharge pressure switches to match your operating conditions. Please contact your Waterflood Representative for correct operating conditions and settings.

Getting Fuel Gas, Instrument Gas, Start Air/Gas Supply To The System Using:

A – System Suction Or Discharge Gas Pressure Exceeding 60 PSI

1. Blind off optional fuel gas connection on outside of building
2. Blind off auxiliary start gas connection on outside of building
3. Open 4" Manual Inlet Valve
4. Open 2" Manual Bypass Valves
5. Open 1" Manual Fuel Gas Supply Valves
6. Open 2" Manual Start Gas Isolation Valve
7. Open 1" Manual Fuel Gas Valve
8. Open 2" Manual Clean Oil Return Isolation Valve
9. Open 2" Manual Glycol Isolation Valves
10. Open 3" Manual Gas Discharge Isolation Valve
11. Open 1" Manual blow down Valve

You should now have 60 PSI gas pressure to the fuel gas vessel which will supply fuel gas, instrumentation gas and start gas to the starter. The package is now ready to start. Proceed to Starting the System on page 6. If system gas pressure is below 60 PSI for initial start proceed to step 12.

12. Connect a propane source to auxiliary gas connection on outside of building.
13. Close 1" Manual Fuel Gas Supply Valve
14. Open 1" Manual Aux. Fuel Gas Supply Valve
15. Open propane source to supply gas pressure to the system.
16. Once initial start is done and engine is running step 13 & 14 need to be reversed and propane source disconnected.

*****Warning – Make Sure Not To Mix Gas And Air When Using Auxiliary Start Air.**

You can also start unit with optional air if require, but will require an additional spool piece to accomplish this. Please contact your Waterflood local representative for more information.

17. Connect optional air to Aux. Start gas connection
18. Close 2" Manual Start Gas Isolation Valve
19. Open 2" Manual Aux. Start Gas Isolation Valve

Starting Procedures Cont'd

Getting Fuel Gas, Instrument Gas, Start Air/Gas Supply To The System Using:

B – Auxiliary Gas Source Exceeding 60 PSI

1. Blind off auxiliary start gas connection on outside of building
2. Open 4" Manual Inlet Valve
3. Open 2" Manual Bypass Valve
4. Open 1" Manual Optional Fuel Gas Valve
5. Open 2" Manual Start Gas Isolation Valve
6. Open 1" Manual Fuel Gas Valve
7. Open 2" Manual Clean Oil Return Isolation Valve
8. Open 2" Manual Glycol Isolation Valves
9. Open 3" Manual Gas Discharge Isolation Valve

You should now be ready to start the engine. The Instrument panel should have 60 PSI gas pressure and the engine should now have a fuel supply as well. Proceed to Starting the System.

Once the system has started you have the option to use the compressed gas from the discharge line to run the unit. To do this:

Connect optional air to Aux. Start gas connection

11. Close 2" Manual Start Gas Isolation Valve
12. Open 2" Manual Aux. Start Gas Isolation Valve

Once the system has started you have the option to use the compressed gas from the discharge line to run the unit. To do this:

13. Close 1" Manual Optional Fuel Gas Valve
14. Open 1" Manual System Fuel Gas Valve

*****Warning – Do Not Mix Gas And Air When Using Auxiliary Start Air.**

Starting Procedures Cont'd

Starting Procedures Cont'd

Starting the System after Initial Start-up

Step 1

Manually reset the Murphy panel pneumatics located on the side of the panel and the Murphy Panel Tattletale Recorder by pressing the reset button. Display alarm should read 00 if an alarm is present trouble shoot the system.

Step 2

From the Murphy Instrumentation Panel pull out the button marked Blow Down Valve to automatically close the blow down valve. Make sure the manual blow down valve is open. This will stop the system from venting gas to atmosphere.

Step 3

From the Murphy Instrumentation Panel pull the button marked Inlet Suction Control Valve to automatically open it. This will allow gas into the inlet scrubber and to the compressor at a maximum of 50 PSI.

Step 4

From the Murphy Instrumentation Panel press and hold the button marked Start to automatically turn over the engine. As soon as the engine starts release the button.

Step 5

Allow the engine and compressor to warm up sufficiently and monitor the engine oil pressure to ensure it is between 25 –60 psi. At the Murphy Instrumentation Panel pull the button marked Bypass Valve to automatically close the valve and begin compressing gas.

Step 6

Check the needle valve on the scavenger line to ensure that it is removing oil from filter base. You should see a steady stream or drops falling through the sight glass depending on the amount of oil settled in the filter base

Note: Before Starting close valve on Roots Meter & open Bypass Valve.

Operating Conditions

The Gardner Denver SSQG-99B Rotary Screw Compressor with the 4.6 Variable Inlet (VI) Controller is capable of compressing gas with a minimum suction pressure of 0 PSI to a maximum discharge pressure of 175 PSI discharge with a flow rate of 0.25 MMCFD to 2.00 MMCFD. *(Please contact Waterflood Head Office with your setup requirements)*

Normal Operating Conditions:

Engine Jacket Water	160 – 210 °F
Engine Oil Pressure.....	25 - 80 PSI
Engine Fuel Gas Pressure.....	12 - 18 PSI
Instrument Gas Pressure.....	60 PSI
Compressor Return Oil Temp.....	180°F
Maximum Inlet Pressure.....	50 PSI
Maximum Discharge Pressure.....	175 PSI
Maximum Engine RPM.....	1800 RPM

Fluid / Filter Change Schedule:

Engine Oil Initial Start up	50 Hours
Engine Oil	750 Hours(or by sample)
Engine Glycol	2 Years
Engine Air filter	As Required
Engine Oil Filter.....	At Every Oil Change
Engine Aux. Oil Filter.....	At Every Oil Change
Engine Crank Case Vent Filter	At 1.5 " of water-positive pressure (7 1/2" on manometer)
Fuel Gas vessel Filter	1 Year(or 8 PSI Diff.)
Compressor Oil	4000 Hours(or by sample)
Compressor Oil Filter	1000 Hours(or 12 PSI Diff)
Scavenger Oil Filter.....	6 Months
Oil Coalescing Filter	12 PSI Differential

System Fluids:

Compressor Oil	AEON-NG-HS10 (200 litres)**
Engine Oil.....	Chevron HDAX40 (28 litres)
Engine Jacket Water	50/50 Glycol (80 litres)

System Filters:

Engine Oil Filter.....	IR0716
Engine Aux. Oil Filter.....	DE2011
Engine Crank Case Vent Filter	88467A
Engine Air Filter Primary.....	6I-2501
Engine Air Filter Secondary.....	6I-2502
Fuel Gas Vessel Filter	RFG-12
Coalescing Oil Filter	EAU80110**
Compressor Oil Filter	P171276
Scavenger Oil Filter.....	P171276

** Supplied Exclusively By Waterflood Service & Sales Ltd.

Alarms and Shutdowns

The **MURPHY TELEMATIC CONTROL PANEL** will alarm and shutdown on the following conditions:

1. Hi-Low Suction Gas Pressure.
2. Hi-Low Discharge Gas-Oil Pressure – 170 PSI
3. Hi Discharge Gas Temperature - Set At 220 °F
4. Return Oil Filter High Differential Pressure - Set At 15PSI
5. Hi Return Oil Inlet Temperature - Set At 190 °F
6. Low Compressor Oil Pressure - Set At 80 PSI
7. Low Engine Oil Pressure - Set At 15 PSI
8. Hi Engine Jacket Water Temperature - Set At 220 °F
9. Low Engine Coolant Level
10. Low Engine Oil Level
11. High Coalescing Filter Differential Pressure - Set At 15 PSI
12. High Engine-Compressor Vibration
13. High Liquid Level Shutdown in Inlet Scrubber
14. Low Liquid Level Shutdown in Oil Coalescing Vessel
15. High Level Shutdown in Fuel Gas Scrubber.
16. Loss of Ignition Power
17. Manual Shutdown
18. Sales Gas Temperature - Set At 220 °F
19. Building Low Temperature - Set At 0 °F

On alarm the panel will reset. All pneumatic valves will fail to safe positions which will vent system gas and shut in the inlet gas automatically.

The Tattletale in the panel will clearly show where a problem was and will allow easy trouble shooting. To restart the package press **RESET** on the panel annunciator to clear all alarms then refer to the starting procedure to restart the package.

20. System ByPass at 1 PSI

Product Warranty

ENGINE

- Refer to CATERPILLAR Engine Manual.

COMPRESSOR

- Refer to Gardner Denver Service & Operation Manual.

ALL OTHER PACKAGE PARTS

- Manufactures warrantee.

PACKAGE

- Waterflood 12 month workmanship warrantee.

Service Outlets

Waterflood Service and Sales
Estevan, SK
Phone: 306-634-7212
Fax: 306-634-7212

Waterflood Service and Sales
Edmonton, AB
Phone: 780-465-2333
Fax: 780-465-3900

Waterflood Service and Sales
Lloydminster, AB
Phone: 780-875-7638
Fax: 780-875-6108

Waterflood Service and Sales
Taber, AB
Phone: 403-223-9529
Fax: 403-223-2569