



TRUXX SERIES HHP GAS FIRED CNG DECOMPRESSION SYSTEM
TEST QA SHEET

Work Order#:	<u>111569</u>	Job Number:	<u>42624E</u>
Model:	<u>TRUXX 21GH</u>	Serial Number:	<u>3140005627</u>
Year Built:	<u>2014</u>	Type of Service:	<u>CNG Decompression</u>
Part Number:	<u>10191-42624</u>	Options:	<u>N/A</u>

Drawing references:

Assembly Drawing	<u>JP14094A</u>	REV.:	<u>A</u>
Equipment Drawing:	<u>JP14426C</u> <i>SP14510L</i>	REV.:	<u>A</u>
P&ID Drawing:	<u>JP14192P</u>	REV.:	<u>D</u>
One Line Drawing	<u>JP14378E</u>	REV.:	<u>A</u>
Electrical Drawing:	<u>JP14305E</u>	REV.:	<u>A</u>
<i>ELECTRICAL DRAWING</i>	<i>SP14550E</i>		

1. Analog Tests (Use functional QA/program QA for appropriate alarms)

A. Pressure transmitters:

Use nitrogen, air or other pressurized gas with the 2-way valve on pressure transmitters to test the device. Test at three points approximately 25%, 50% and 100% of full scale each. If the discrepancy exceeds 2% notify engineering.

DO NOT EXCEED ALARM HH 4400 PSIG

- PT-111, JTM LANE 1 HIGH PRESSURE PT

<p>Scaling</p> <p>Zero: <u>0 psi</u></p> <p>Full Scale: <u>5000 psi</u></p> <p>Alarms</p> <p>HH: <u>3950</u> L: <u>NA</u></p> <p>H: <u>3900</u> LL: <u>NA</u></p>	<p>Alarms Message</p> <p>HH: <input checked="" type="checkbox"/> <input checked="" type="checkbox"/></p> <p>H: <input checked="" type="checkbox"/> <input checked="" type="checkbox"/></p> <p>L: <input type="checkbox"/> <input type="checkbox"/></p> <p>LL: <input type="checkbox"/> <input type="checkbox"/></p>	<p>Scaling test: record HMI readout</p> <p>Bottle gauge <u>1200</u> <u>2500</u> <u>3974</u></p> <p>Process screen <u>1210</u> <u>2500</u> <u>3974</u></p>
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- PT-121, JTM LANE 2 HIGH PRESSURE PT

<p>Scaling</p> <p>Zero: <u>0 psi</u></p> <p>Full Scale: <u>5000 psi</u></p> <p>Alarms</p> <p>HH: <u>3950</u> L: <u>NA</u></p> <p>H: <u>3900</u> LL: <u>NA</u></p>	<p>Alarms Message</p> <p>HH: <input checked="" type="checkbox"/> <input checked="" type="checkbox"/></p> <p>H: <input checked="" type="checkbox"/> <input checked="" type="checkbox"/></p> <p>L: <input type="checkbox"/> <input type="checkbox"/></p> <p>LL: <input type="checkbox"/> <input type="checkbox"/></p>	<p>Scaling test: record HMI readout</p> <p>Bottle gauge <u>1200</u> <u>2500</u> <u>3950</u></p> <p>Process screen <u>1202</u> <u>2509</u> <u>3950</u></p>
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INSPECTION/TESTING BY:

Benjamin Y. Wang

DATE:

03/19/15



TRUXX SERIES ELECTRIC CNG DECOMPRESSION SYSTEM
TEST QA SHEET

- PT-510, OUTLET GAS PRESSURE PT

Scaling	
Zero:	<u>0 psi</u>
Full Scale:	<u>300 psi</u>
Alarms	
HH: <u>90 psi</u>	L: <u>30 psi</u>
H: <u>75 psi</u>	LL: <u>NA</u>

Alarms	Message	Scaling test: record HMI readout
HH: <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
H: <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Bottle gauge <u>30</u> <u>75</u> <u>90</u>
L: <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	USED SHOP AIR TO SET OFF ALARMS SET POINTS
LL: <input type="checkbox"/> na	<input type="checkbox"/> na	Process screen <u>30</u> <u>75</u> <u>90</u>

SET

INSPECTION/TESTING BY:

Bryan...

DATE:

03/18/15



TRUXX SERIES HHP GAS FIRED CNG DECOMPRESSION SYSTEM
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B. Temperature transmitters:

Use a cold waterbath, hot waterbath and a thermometer.

Remove TC probe from process and insert into each and record results below.

If the discrepancy exceeds 2% notify engineering.

- TT-201 INLET TEMPERATURE TT

Scaling Zero: <u>-100°F</u> Full Scale: <u>250°F</u>		Alarms HH: <input type="checkbox"/> na H: <input type="checkbox"/> na L: <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> LL: <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>			Message Ambient Cold water Hot water Thermometer Process screen			<input type="checkbox"/> na <input type="checkbox"/> na <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>			<u>66°F</u> <u>33.4°F</u> <u>199°F</u> <u>67°F</u> <u>33°F</u> <u>199°F</u>		
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Alarms:
 HH: NA L: -60°F
 H: NA LL: -65°F
AMT

SCREEN READS TT-310 ?

- TT-301 WATERBATH TEMPERATURE TT

Scaling Zero: <u>-100°F</u> Full Scale: <u>250°F</u>		Alarms HH: <input type="checkbox"/> na H: <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> L: <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> LL: <input type="checkbox"/> na			Message Ambient Cold water Hot water Thermometer Process screen			<input type="checkbox"/> na <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> na			<u>62.4°F</u> <u>32.4°F</u> <u>208°F</u> <u>64°F</u> <u>34°F</u> <u>208°F</u>		
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Alarms:
 HH: NA L: 140°F
 H: 195°F LL: NA

- TT-510 OUTLET TEMPERATURE TT

Scaling Zero: <u>-100°F</u> Full Scale: <u>250°F</u>		Alarms HH: <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> H: <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> L: <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> LL: <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>			Message Ambient Cold water Hot water Thermometer Process screen			<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>			<u>67°F</u> <u>33°F</u> <u>195°F</u> <u>66°F</u> <u>33°F</u> <u>195°F</u>		
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Alarms:
 HH: 100°F L: 15°F
 H: 85°F LL: 0

INSPECTION/TESTING BY:

[Signature]

DATE:

03/18/15



TRUXX SERIES HHP GAS FIRED CNG DECOMPRESSION SYSTEM
TEST QA SHEET

C: Flow Meter

Verify Zero. During live test take 2 sample points and record display values at specified locations

- FT-601, FLOW METER

Scaling	
Zero:	<u>NA</u>
Full Scale:	<u>NA</u>
Alarms:	
HH: <u>NA</u>	L: <u>NA</u>
H: <u>NA</u>	LL: <u>NA</u>

Alarms	Message	Scaling test: record HMI readout		
HH: <u>na</u>	<u>na</u>	Zero	Sample 1	Sample 2
		Display	<u>NA</u>	<u>NA</u>
H: <u>na</u>	<u>na</u>	Process screen	<u>NA</u>	<u>NA</u>
L: <u>na</u>	<u>na</u>	Trend screen	<u>NA</u>	<u>NA</u>
LL: <u>na</u>	<u>na</u>			



TRUXX SERIES HHP GAS FIRED CNG DECOMPRESSION SYSTEM
TEST QA SHEET

- AT-750 LEL

Scaling	
Zero (4 mA):	<u>0%</u>
Span (20 mA):	<u>100%</u>
HH: <u>40%</u>	L: <u>NA</u>
H: <u>20%</u>	LL: <u>NA</u>

Alarms	Message	Scaling test: record HMI readout		
HH: <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Simulator <u>melect 2</u>		
H: <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>0%</u> 4 mA	<u>50%</u> 12 mA	<u>100%</u> 20 mA
L: <input type="checkbox"/> na	<input type="checkbox"/> na	Main screen <u>0</u>	<u>50</u>	<u>100 ADL</u>
LL: <input type="checkbox"/> na	<input type="checkbox"/> na	Process screen <u>0</u>	<u>50</u>	<u>100</u>
		Trend screen	N/A	N/A

COUNTS



TRUXX SERIES HHP GAS FIRED CNG DECOMPRESSION SYSTEM
TEST QA SHEET

- | | <u>INITIAL</u> |
|--|------------------------------|
| 2. ESD Test: | |
| - HS-111 triggers ESD, flags on PLC and dumps instrument gas | <input type="checkbox"/> LW |
| - HS-121 triggers ESD, flags on PLC and dumps instrument gas | <input type="checkbox"/> LW |
| 3. Bump test gas detector: HMI readout: <input type="text" value="55"/> (should be 50%) | <input type="checkbox"/> LW |
| 4. Verify when 20% LEL fan turns on. | <input type="checkbox"/> LW |
| 5. Verify when 40% LEL and above fan stays on, all other equipment shuts down. | <input type="checkbox"/> LW |
| 6. Set HMI Clock | <input type="checkbox"/> N/A |
| 7. Verify Roxtec has been installed per manufacturers suggestions. | <input type="checkbox"/> LW |

INSPECTION/TESTING BY:

DATE:

Program/Testing:

Date:

Supervisor:

Date:

Final Approval:

Date:

**TRUXX SERIES HHP GAS FIRED CNG DECOMPRESSION SYSTEM
BURNER QA SHEET**

Work Order#: 111569 Job Number: 42624E
 Model: TRUXX 21GH Serial Number: 3140005627
 Year Built: 2014 Type of Service: CNG HEAT & DECOMPRESSION
 Options: N/A Part Number: 10191-42624

Electrical Specifications:
 Equipment Drawing: JP14214A REV.: AC
 Electrical Drawing: JP14305E REV.: AD
 Electrical Power: 24 VAC 1.0 Amps 60 Hz.
Electrical Drawing - JP14550E REV: C

FAB NO.: National Board #: N/A
 Burner Model #: SOLARFLO X-88 -61 ORF Burner Serial #: N/A

Gas Train Type:

1. Burner safety check (no water in tank):
 - Check operation of Water Level Float Switch with Ohm meter. Switch should close when float is raised, open when lowered.
 - Check schematics to switch on breakers and install fuses necessary for burner operation
 - Set the waterbath setpoint below ambient and press the start button. Verify burner safety circuit latches.
 - Trip the following burner safeties and verify safety relays unlatches and verify alarm annunciate on HMI.
 - ~ High Water Temperature
 - ~ Low Water Level

AA
AA
AA
AA

Checks Completed By: MILES ANTHE

2. Inspect fab for foreign material in water side
3. Verify Calibration of Test Equipment. 30
4. Gas Regulator: Spring 1st Stage - 627: 35-80#

AA
AA

Inlet Header Assembly Completed By: MILES ANTHE
 Gas Train Assembly Completed By: MILES ANTHE

5. Leak test burner gas train assembly with shop air @ operating pressure. Use a soap solution.
 Checks Completed By: MILES ANTHE
 Leak Test Completed By: MILES ANTHE

6. Connect CNG trailer inlet after all nitrogen pressure tests are signed off.
7. Verify leak-free operation with soap and water solution.
 Tests Completed By: MILES ANTHE
 Co Completed By: Jordan Russell

8. Verify that burner tips are 61 orifice. AA

**TRUXX SERIES HHP GAS FIRED CNG DECOMPRESSION SYSTEM
BURNER QA SHEET**

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 Year Built: 2014 Type of Service: CNG HEAT & DECOMPRESSION
 Options: N/A Part Number: 10191-42624

Electrical Specifications:

Equipment Drawing: JP14214A REV.: A
 Electrical Drawing: JP14305E REV.: A
 Electrical Power: 24 VAC 1.0 Amps 60 Hz.

9. Simulate burner flame failure by powering up the unit without natural gas (Turn pilot valve off).
10. Set High Temperature Switch: 93.3 Deg. C, 200 Deg. F 10°F differ.
11. Set burner on setpoint: 165 Deg. F
 Set burner off setpoint: 175 Deg. F
 Verify smooth operation between setpoints.
 Tests Completed By: Miles ANTIE
12. Use Combustion analyzer and fill out the following sheet while the water temperature is between 180-190F.
 Tests Completed By: Larry Hansen 160-175

AA
 AA
 AA
 AA

RA

**TRUXX SERIES HHP GAS FIRED CNG DECOMPRESSION SYSTEM
BURNER QA SHEET**

Work Order#: 111569 Job Number: 42624E
 Model: TRUXX 21GH Serial Number: 3140005627
 Year Built: 2014 Type of Service: CNG HEAT & DECOMPRESSION
 Options: N/A Part Number: 10191-42624

Electrical Specifications:

Equipment Drawing: JP14214A *JP14510* REV.: A
 Electrical Drawing: JP14305E REV.: A
 Electrical Power: 24 VAC 1.0 Amps 60 Hz.

ROOM TEMP.: _____ Deg. F
 Burner Model: SOLARFLO X-88 -61 ORF
 High Fire Burner Setting: 0.390 MMBTU/HR
 Burner Head Pressure: 5.5 Inch W.C.

USE PF ONLY IF MEASURING IN PSI		TEST: WRITE FINAL READINGS IN ADDITION TO STAPLING COPIES TO QA SHEET	
<i>Take Temp at 160 F</i>			
1.	1ST STAGE REGULATOR: <u>30</u> <u>80</u> PSI		
1A.	2ND STAGE REGULATOR /GAUGE SETTING: <u>5.5</u> Inch w.c.	<u>3.5</u>	
2.	BURNER HEAD PRESSURE	<u>3</u>	
3.	EFFICIENCY (70% MIN.)	<u>72.3</u>	
4.	STACK TEMPERATURE DEG. F. (GROSS) (320°F - 550°F)	<u>546</u>	
5.	O2% (6.5% - 3.8%)	<u>10.1</u>	
6.	CO (less than 30 PPM)	<u>0</u>	
7.	CO2% (9.5% - 11.2%)	<u>6.2</u>	
8.	EXCESS AIR %	<u>78.3</u>	
9.	WATERBATH TEMPERATURE (180 DEG. F. - 190 DEG. F.)	<u>160</u>	
10.	NOISE LEVEL / TYPE	<u>1</u>	

NOISE TYPE DESCRIPTIONS:

- | | |
|--------------------|--|
| 1 QUIET, NO RUMBLE | 3 HEAVY RUMBLE (NOT ACCEPTABLE) |
| 2 LIGHT RUMBLE | 4 EXCESSIVE VIBRATION, RUMBLE (NOT ACCEPTABLE) |

REMARKS: _____

Tests Completed By: *Randy Williams*



**TRUXX SERIES HHP GAS FIRED CNG DECOMPRESSION SYSTEM
MECHANICAL QA SHEET**

Work Order#: 111569
 Model: TRUXX 21GH
 Year Built: 2014
 Part Number: 10191-42624

Job Number: 42624E
 Serial Number: 3140005627
 Type of Service: CNG Decompression

Drawing references:

Assembly Drawing	<u>JP14094A</u>	REV.: <u>A C</u>
Equipment Drawing:	<u>JP14426C</u> <i>SP14510C</i>	REV.: <u>A C</u>
P&ID Drawing:	<u>JP14192P</u>	REV.: <u>D E</u>
One Line Drawing	<u>JP14378E</u>	REV.: <u>A</u>
Electrical Drawing: <i>ELECTRICAL DRAWING</i>	<u>JP14305E</u> <i>SP14550E</i>	REV.: <u>A D</u> <u>C</u>

Electrical Specifications:

Electrical Power:	<u>24</u> VDC		
Electrical Power:	<u>120</u> VAC	<u>1</u> Phase	<u>60</u> Hz.
	<u>20</u> Amps		
	<u>24</u> VAC	<u>1</u> Phase	<u>60</u> Hz.

Operation checks - mechanical/electrical:

- | | INITIAL |
|--|------------|
| 1. Check that all compression fittings are made by Parker. | <u>AA</u> |
| 2. Check tube engagement and tightness. "Torque seal" all fittings across nut and bolt threads after all checks are complete. | <u>AA</u> |
| 3. Verify all flange gaskets installed. Verify all bolt torque values. "Torque seal" all nut and bolt threads after all checks are complete. | <u>AA</u> |
| 4. Check outlet valve is level and centered in penetration | <u>AA</u> |
| *5. Check electrical drawing to ensure all instrumentation is wired properly. | <u>SJE</u> |
| *6. Check assembly drawing to ensure all components and instrumentation are installed properly. | <u>AA</u> |

*Changes must be approved by the project engineer and captured by updated drawings or redlined drawings (signed and dated)

INSPECTION/TESTING BY: UNRESTABLE DATE: 1-10-15



TRUXX SERIES HHP GAS FIRED CNG DECOMPRESSION SYSTEM
MECHANICAL QA SHEET

Mechanical- pressure test

INITIAL

1. Check calibration of test equipment Date Due: 6-6-15

AT

2. JTM pressure test

- Test with appropriate isolation and pneumatic valves open. Ensure that line valves are in the open or partially open position.

High Pressure, Process

Design pressure: 3600 psig.

Identify high pressure piping isolation valves and relief.

Step leak test with Nitrogen at 100psig, 500psig, 1,000psig, 2000psig and 3000psig pressure.

Increase pressure to 3900 psig, examine for leakage for min. 10 min.

MAWP: 4000 psig Final Test Pressure: 3900 psig

TEST REGULATOR SYSTEM SN: 13800F34

Pass / Fail Status: PASS

INSPECTION/TESTING BY: MILES ANNE DATE: 1-16-15
3-11-15



TRUXX SERIES HHP GAS FIRED CNG DECOMPRESSION SYSTEM
MECHANICAL QA SHEET

Low Pressure, Process

Design Pressure: 250 psig.

Leak test at 250 psig.

Increase pressure to 250 psig, then reduce to design pressure and examine for leakage for min. 10 min

MAWP: Final Test Pressure:

TEST REGULATOR SYSTEM SN:

Pass / Fail Status:

INSPECTION/TESTING BY: DATE:

Low Pressure, Instrumentation

Design Pressure: 60 psig.

Leak test with shop air. Set regulator to 60 psi.

Examine for leakage for min. 10 min

MAWP: Final Test Pressure:

Gauge SN: Pass / Fail Status:

INSPECTION/TESTING BY: DATE:



TRUXX SERIES HHP GAS FIRED CNG DECOMPRESSION SYSTEM
MECHANICAL QA SHEET

Mechanical Setpoints

INITIAL

CAUTION: USE SHOP AIR FOR SETTING HIGH PRESSURE CONTROL VALVE SET POINTS.

1. Set HP Instrument gas regulator, PCV-701 to 40 PSIG.
 - Remove adjustment knob once completed. Re-verify set point.
 - Wrap, label and place in onboard toolbox.
2. Set monitor PCV, PCV-410B, to 70 PSIG. (Downstream control valve)
3. Set regulating PCV, PCV-410A, to 50 PSIG. (Upstream control valve)
4. Set burner gas first stage regulator, PCV-721, to 60 PSIG.
5. Set low process temperature controller, TPC-511, to 40 F (with reversing pilot).
 - Ensure that reversing pilot spring is completely compressed.
6. Set high process temperature controller, TPC-510, to 60 F.
7. Calibrate flow switch, FS-001, to signal out at a rate 100% higher than normal bleed rate from pilots.
8. Set room thermostat to 80 F.

AA
NA
NA

AA

AA

AA

AA
M

AA

AA

CSO PSL
3/17/15

AA