# TECHLINE

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## Tech*Fact* - **Tier 4i Engine Speed**

The throttle adjustment on Tier 4i engines (P/N 26-00128-XX) used in both 69UG and 69RG model generator units is preset at the engine manufacturer to the proper RPMs, and a TIR (Transport Internationaux Routiers)-approved tamper-resistant assembly is used to prevent the throttle from being adjusted.

These settings are specific to the genset, optimizing horsepower while meeting U.S. EPA, California Air Resource Board (CARB) and EU requirements.

The Tier 4i engine manual governor system was replaced with an electronically controlled speed regulation governor system. This system is made up of an engine speed sensor and an electronic control module. The electronic control module is preprogrammed with the desired engine speed (1800 RPM), providing a more constant engine speed, resulting in a more constant voltage output by the generator. This type of speed control eliminates any need to adjust the engine throttle speed adjustment screws.

Any attempt to adjust the throttle speed may alter the emission output from the engine and would negate the certification of the engine.
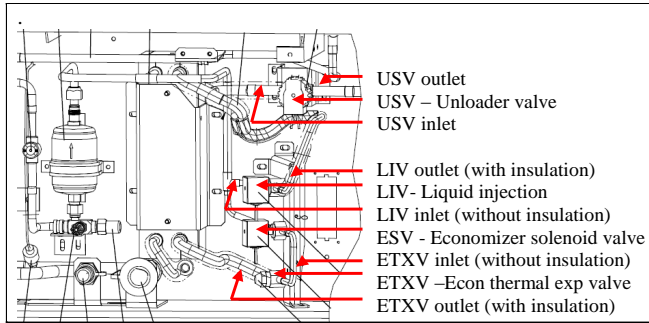
**Tier 4i Engine**



Engine
Throttle
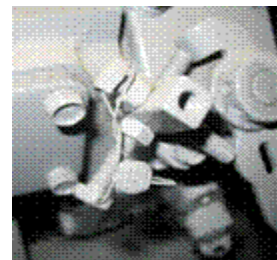
**Tech***FAQ* – **When running pretrip testing P6-6 on the EliteLINE® model unit, how can you tell which valve is faulty?**

- USV = Un loader Solenoid Valve
- LIV = Liquid Injection Valve
- ESV = Economizer Solenoid Valve
- ETXV = Economizer Thermal Expansion Valve



**The following procedure is used for P6-6:**

Prior to troubleshooting, check to ensure that the software and configuration numbers are current and correct, and then re-run the test. If the test fails, proceed as follows:

**1.** Install manifold gauges: suction pressure gauge (blue) to low side access valve and discharge pressure gauge (red) to high side access valve.

**2.** Turn on unit and select code 41, which allows for manual control of the valves.

**3**. Press the "ENTER" key to select time "tIM." Select up to five minutes using the arrow keys.

## Unloader Solenoid Coil and Valve

**4.** Press "ENTER" key until CAP for capacity is on the left display. Using the arrow keys, set the right display to "STANDARD" and press "ENTER." Run the unit for 30 seconds to normalize the unit.

**5.** Press the arrow key until "UNLOADED" is displayed and press "ENTER."

Does the USV coil energize? Check wire connected to USV with a clamp on amp meter. If a current value appears on the amp meter, USV solenoid coil is working. If no current is noted, check for voltage at controller TP1 (22-24 VAC). If voltage is present, then the USV coil or wiring is

faulty. Check wiring then change USV coil. If no voltage, the controller is faulty. Change the controller.

If current is present, check that the discharge pressure goes down and suction pressure goes up. If the suction pressure goes up, USV is functioning. If not, the USV is faulty. Change the valve.

## Economizer Solenoid Valve / ETXV

**6.** To check the ESV and ETXV, set CAP to "ECONOMIZED" and press "ENTER."

Does the ESV coil energize? Check wire to ESV with clamp on amp meter. If a current value appears on amp meter, the ESV solenoid coil is working. If no current is present, check the voltage at TP7 (22-24 VAC). If no voltage is present, change the controller. If voltage is present, check the wiring connection. If good, change the solenoid coil. If the ESV outlet and the ETXV inlet gets warmer, then the ESV valve is working. If not, change the valve.

Does the outlet from ETXV get cold? If the outlet from ETXV gets cold, the ETXV is functioning. If not, change the ETXV.

## Liquid Injection Valve

**7.** To check the liquid injection valve, return to CAP selection and arrow to "AUTO" and press "ENTER."

**8.** Press "ENTER" key again until LIV displays. Using the arrow keys, set to "CLOSE" (energized) and press "ENTER."

Does the LIV coil energize? Check wire to LIV with clamp on amp meter. If current value appears on amp meter, the LIV solenoid coil is working. If no current is present, check for voltage at controller TP6 (22-24 VAC). If no voltage is present, change the controller. If voltage is present, check the wiring connection. If good, change the solenoid coil.

**9.** Press arrow key to select "OPEn" (de-energized) and press "ENTER." Does the LIV outlet get cold? If LIV outlet gets cold, LIV is functioning. If not, LIV may be faulty. Change the LIV.

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## Feature Article - TechLine Historical Reference

The following is a directory of frequently referenced TechLine articles. **To access articles, go to:** www.container.carrier.com and then click on Literature.

### I. Container

| a.  Articles of Introduction | Qtr/Yr |
|---|---|
| ACT | 3rd 2007 |
| Analyzer | 4th 2003 |
| ASC | 3rd 2007 |
| DataBank | 4th 2004 |
| Dual Temp Unit | 3rd 2006 |
| e-AutoFresh™ | 1st 2008 |
| eAutoFresh $CO_2$ Sensor Zero | 1st 2009 |
| EBS | 2nd 2003 |
| EliteLINE (HARP, Stepper adaptor) | 1st 2006 |
| EliteLINE | 4th 2001 |
| LED Display | 4th 2003 |
| LVPS | 1st 2004 |
| ML3 | 1st 2004 |
| Naturefresh | 2nd 2002 |
| PC card adapter | 3rd 2005 |
| PrimeLINE® | 3rd 2007 |
| QUEST | 1st 2008 |
| ThinLINE® (HARP) | 3rd 2005 |
| USDA and Cargo Probes | 1st 2009 |

| b.  Alarms, Codes & Auto PTI | |
|---|---|
| AL#06 Enhancement | 3rd 2008 |
| AL#15 LOC | 4th 2004 |
| AL#50 VPS | 2nd 2003 |
| AL#53 Battery Pack (deactivate AL#53) | 3rd2007 |
| All alarms defined to date | 1st 2009 |
| All alarms defined to date | 3rd 2005 |
| CD#16 Unit Runtime, comp reset | 3rd 2008 |
| CD#27 (auto defrost added) | 1st 2004 |
| CD#43,44,45 conf var reassignment | 1st 2004 |
| CD#45 LVPS calibration | 1st 2005 |
| CD#49 (# of Days to last PT) | 4th 2004 |
| P#5-10,11,12 | 1st 2008 |

| c.  Compressors | |
|---|---|
| Oil Check Procedure | $3^{rd}$ 2006 |
| Recip (Icing) | 1st 2004 |
| Scroll ROC | 3rd 2005 |
| Scroll (Troubleshoot) | 4th 2004 |
| Scroll Start up Logic | 2nd 2003 |
| Scroll part # history | 3rd 2006 |

| d.  Contactors | |
|---|---|
| Pozi-drive | 3rd 2006 |
| Replacement | 2nd 2002 |

| e.  Heaters | |
|---|---|
| Heater Megohm Reading | 1st 2008 |
| Heater Megohm Reading | 3rd 2006 |

| f.  Motors | |
|---|---|
| 3 Phase Motors | 3rd 2006 |
| Evap Evaluation | 3rd 2006 |
| Evap plug adapter | 4th 2003 |
| Evap fan blades (removal) | 2nd 2003 |

| g.  Refrigeration | |
|---|---|
| Condenser Coil (coil 3/8 vs 7mm) | 4th 2004 |
| DPRV test procedure | 1st 2005 |
| ESV check | 1st 2004 |
| Electronic Expansion Valve TS | 1st 2009 |
| LIV PrimeLINE | 3rd 2008 |
| VPS | 2nd 2003 |

| h.  Software | |
|---|---|
| DataLine (Acronyms) | 3rd 2008 |
| DataLine (Omni drive vs. Vista) | 3rd 2008 |
| ID (Program from keypad) | 1st 2008 |
| LED (Controller status) | 3rd 2007 |
| PCMCIA cards (Format) | 4th 2004 |
| Pretrip Startup | 1st 2008 |
| Probe Check Logic | 3rd 2008 |
| RTC (Program from keypad) | 1st 2008 |
| Unit startup (Id, software version) | 3rd 2007 |

### II. Controlled Atmosphere

| | |
|---|---|
| $CO_2$ sensor (Troubleshoot) | 3rd 2005 |
| Spare Parts | 2nd 2002 |

### III. Genset

| | |
|---|---|
| Annual Inspection | 4th 2004 |
| Biodiesel fuels | 3rd 2006 |
| Dual Speed | 3rd 2008 |
| Engine Serial # | 3rd 2005 |
| Generator (Bearing O-ring) | 1st 2002 |
| Low Coolant Sensor | $3^{rd}$ 2007 |
| Poly V-belt | $1^{st}$ 2006 |
| Tier 4i Engine | $1^{st}$ 2008 |
| Oil filter selection | 1st 2004 |
| Oil filter (Extended Life) | 4th 2003 |
| Oil Filter Positioning | 2nd 2003 |

### IV.  Controlled Atmosphere

| | |
|---|---|
| Warranty History | 1st 2006 |
| Warranty Lookup | 1st 2004 |

## Tech*FAQ* – 2010 Training

Listed are the planned training schools for the first half of 2010. These schools are subject to a minimum requirement of 12 students to avoid cancellation. Please check to ensure the class has met this requirement prior to confirming your travel reservations.

| TRAINING SCHEDULE DRAFT - 2010 - Container | | |
|---|---|---|
| **JANUARY** | **Program** | **Location** |
| 13 - 15 | 3-Day Container Product Update | Santo Domingo, DR |
| 18 - 22 | 1-Week Container | Santa Marta, Columbia |
| 25 - 29 | 1-Week Container | Houston, TX |
| | | |
| **FEBRUARY** | | |
| 1 - 5 | 1-Week Container | Seattle, WA |
| | | |
| **MARCH** | | |
| 1 - 5 | 1-Week Container | Savannah, GA |
| 8 - 10 | 3-Day Container Product Update | Norfolk, VA |
| 22 - 24 | 3-Day Container Product Update | Long Beach, CA |
| 25 - 26 | 2-Day Gen Set | Long Beach, CA |
| | | |
| **APRIL** | | |
| 6 - 8 | 3-Day Container Product Update | Middle East |
| 11 -15 | 1-Week Container | Middle East |
| 12 - 16 | 1-Week Container | Valparaiso, Chile |
| | | |
| **MAY** | | |
| 10 - 14 | 1-Week Container | Ho Chi Minh City, Vietnam |
| 12 - 14 | 3-Day Container Product Update | Genoa or Leghorn, Italy |
| 18 - 20 | 3-Day Container Product Update | Hamburg, Germany |
| 17 - 21 | 1-Week Container | Qingdao, China |
| 24 - 26 | 3-Day Container Product Update | Aarhus, Denmark |
| 24 - 26 | 3-Day Container Product Update | Lima, Peru |
| 27 - 28 | 2-Day Gen Set | Lima, Peru |

For additional information or status of any of the schools visit the Carrier Transicold Training Web site at http://www.container.carrier.com

## Tech*Fact* – **Software Release Update**

> Scroll (ML2i/ML3) – 5346
> Reciprocating Unit (ML2i / ML3) – 5146
> Reciprocating Unit (ML2) – 1207
> Controlled Atmosphere – 3113
> DataLine – 1.9
> DataBank – 0512

Software can be downloaded from Transcentral within the Carrier Transicold Website at http://www.container.carrier.com.
DataLine can only be upgraded from the site if you have an original installed copy.

Prior to upgrading a unit, you should always receive permission from the end user.

## Tech*FAQ* – **DataCorder Storage**

Often questions arise about the veracity of data recorded and stored in the Carrier MicroLink DataCorder. The following points should be noted:

The DataCorder records and stores data in a proprietary format within the controller such that data can only be written to the DataCorder by the unit controller. The data sensors that are recorded are, as a minimum, the primary supply and return temperatures of the unit, alarm occurrences, operating mode, and system change events such as defrost.

This proprietary format ensures that data is protected during and after the download from the DataCorder. The DataCorder can only be downloaded using Carrier DataLine or another licensed program. The download file is automatically saved as **"container number.dcx".** It is the dcx format that protects the file. Any attempt to write to this download file while in its proprietary format will result in a 'Data Corrupt' error and the file will not open and cannot be read. It will then be necessary to obtain a new download of the unit if this occurs. To ensure that data has not been changed at any time, only downloads that are still in the proprietary *.dcx format should be accepted. In any other format, text or Excel formats for example, there is no way to ensure that the data has not been altered. These *.dcx files can be read using the Carrier DataLine software.

Data is not deleted from the DataCorder at the time of download but is retained until the memory is full, at which time the oldest data is overwritten and new data is written into memory. At a minimum, two years of data is held by a DataCorder, but this can be longer, dependent on the operating time of the unit and the number of alarms and events recorded.

In summary, the data in the DataCorder can only be written by the controller. The actual sensors recorded are determined by the configuration of the controller, and the data format is proprietary to ensure that attempts to change the data are minimized and can be identified should they occur.

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