CARB Compliance Solutions
Options for meeting the California Air Resources Board requirements for Transport Refrigeration Units.
CARB – Are You Ready?

The California Air Resource Board (CARB) has passed a series of regulations called the Airborne Toxic Control Measure (ATCM) that will affect owners/operators of transport refrigeration units (TRUs) which operate in California.

- Compliance is required by December 31, 2008 for 2001 and older engine model year transport refrigeration units
- Thermo King offers a variety of options to help your business comply with CARB regulations, including new units and Tier 4i engine kits.

The TRU ATCM will require in-use TRU and TRU genset engines that operate in California to meet in-use performance standards that vary by horsepower range. These standards can be met by:

- Using an engine that meets the required engine certification standard
- Equipping the engine with the required level of verified diesel emission control strategy
- Using an Alternative Technology

Understanding the CARB TRU regulation

**CARB Requirements**

CARB is targeting 7 year old Transport Refrigeration Units for particulate emissions reduction.


Compliance is based on engine model year and occurs 7 years after the model year.

**Example:** 2002 engine model year equipment must meet LETRU standards by December 31, 2009.

**Example:** 2003 engine model year equipment must meet ULETRU standards by December 31, 2010

**Determining model year for CARB compliance:**

The manufacture year of the TRU unit can be used if it and the engine model year differ by no more than one year. Example: A 2008 model year TRU with a 2007 engine is effectively a 2008 for CARB compliance.

When the engine model year is newer than the TRU model year, the engine year is used for CARB compliance. Example: A 2008 TRU with a 2009 engine is effectively a 2009 unit for CARB compliance.

(See TRU Advisory 08-01R on CARB’s website for full details.)

**Key Definitions**

- **CARB** California Air Resources Board
- **TRU** Transport Refrigeration Unit
- **ATCM** Airborne Toxic Control Measure
- **VDECS** Verified Diesel Emissions Control System
- **PM** Particulate Matter is soot from the diesel exhaust
- **LETRU** Low Emission Transport Refrigeration Unit
- **ULETRU** Ultra-Low Emission Transport Refrigeration Unit
- **VDECS** Approved methods for complying with ATCM for reducing diesel emissions

CARB posts complete regulation, updates, FAQ, and other information at this website: [http://www.arb.ca.gov/diesel/tru.htm](http://www.arb.ca.gov/diesel/tru.htm)
An alternative strategy for complying with the CARB regulations is to use electric standby at facilities where 3 or more refrigeration units operate. An electric standby equipped reefer can make short duration stops without plugging in when two or less TRUs are present at a time and the delivery stop is 30 minutes or less. This is a good option for truck fleets making deliveries to convenience stores and restaurants. See CARB regulation and FAQ for more information on electric standby record keeping and operation requirements.

Finance your new equipment with Thermo King and Ingersoll Rand Financial Services offer very competitive financing solutions for all types of customers — from owner/operators to the largest fleets in North America. You can choose from a wide range of smart, flexible financing products to fit your unique and changing business needs. Programs include lease and loan financing for refrigeration units with trailers or trucks. For fleet customers, we also offer a Cold Air Lease Program for refrigeration units alone.

Benefits of Financing through Ingersoll Rand Financial Services
- Improved Cash Flow
- Flexibility
- Full Range of Financing Vehicles
- Operating Income is easier to Forecast
- Convenience of One-Stop Shopping
- Competitively Priced Financing
- Balance Sheet Benefits
- Professional Service

Cold Air Lease Program
A transportation fleet’s needs can be complex. Sometimes, keeping the same reefer and trailer together for the fleet’s trade cycle is less than optimum. Thermo King and Ingersoll Rand Financial Services can help you meet your complex needs, helping you control your expenses and extend the life of your trailers by offering financing solutions for the refrigeration units only.

See your Thermo King dealer for more information on new truck refrigeration units with Electric Standby.
CARB-Compliant Reman Engines for Carrier® Trailer Applications

✓ A cost-competitive alternative for your CARB compliance needs
✓ Remanufactured with CARB-approved “match set” parts, resulting in a Tier II-compliant engine
✓ Approved for use in California through 2014
✓ 2-year warranty
✓ Backed by the nationwide Thermo King dealer network

<table>
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<tr>
<th>Part #s</th>
<th>Models</th>
<th>Engine Type</th>
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<tbody>
<tr>
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<td>Extra XT, Ultra XT, Ultra XTC, Genesis TM900/TM1000, Smart Air</td>
<td>134DI</td>
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<td>P-26-00119-02CRM</td>
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Tier 4i Engine Retrofit Kits

**Product Characteristics**

**Installation:** Engine installation typically requires 10-12 hours. Most kits are complete with all parts required outside of routine shop supplies. Some kits require software chip or drive plate change.

**Operation:** Operates normally

**Service:** Normal engine service guidelines apply

**Available for these applications**

SB, SB III, SB III King of the Road, SB 100, SB 190, SB 200 / 300 / 400, SB Classic, Super II, Super II, Super II 190

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**Engine Retrofit Kits**

**Part Numbers**

| Tier 4i Engine (2200 RPM) | 1010363 |
| Tier 4i Engine (2600 RPM SB-300) | 1010348 |

**Install Kit**

| SB | 100397 |
| Super II | 100398 |

**Coupler**

| Large Shaft Compressor | 772506 |
| Small Shaft Compressor | 772358 |

**Software**

Must use the right version for the controller

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<th>Controller</th>
<th>Required Software</th>
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<td>TGVI</td>
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**Note:** MPIV with V03xx software and 8 relay board use shunt relay kit 40104.

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**Upgrade to EMI-3000**

Extended Maintenance Interval Filters

**Engine Retrofit Kits**

Come equipped with EMI-3000 oil filters. Upgrade your fuel and air filters for maximum benefits!

- Reduces maintenance costs
- Reduces clean up and disposal costs
- Reduces environmental impact with less spillage and less waste
- Extends engine life

**EMI-3000 Fuel Filter**

100325

**EMI-3000 Air Filter**

119299
What is your CARB Compliance Schedule

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<tr>
<th>In-use Compliance Year</th>
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**L** = **LETRU** Low Emission Transport Refrigeration Unit

**U** = **ULETRU** Ultra-Low Emission Transport Refrigeration Unit

*<25 hp engines only, >25 hp engines do not require upgrades for 2013 model year.

## Compliance Method and Recommendations

### Compliance Method

<table>
<thead>
<tr>
<th>Engine: Retrofit TRU with a new engine</th>
<th>Ideal solution to achieve compliance while reducing maintenance costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity: Use electric standby to eliminate diesel engine operation at a facility</td>
<td>Appropriate for units originally equipped with electric standby, must equip facility with plugs for each unit</td>
</tr>
<tr>
<td>New Equipment: Purchase new equipment</td>
<td>New units are EPA compliant. CARB regulation requires upgrades to units 7 or more years old</td>
</tr>
<tr>
<td>Fleet Management: Maintain 7 year trade cycle</td>
<td>Keeps equipment in compliance without upgrades, retrofits, or fuel changes</td>
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<tr>
<td>Fleet Management: Move affected equipment out of California</td>
<td>May be possible for national companies with routes or operations that do not require travel to California</td>
</tr>
<tr>
<td>Alternative Fuels: Use B100, CNG, Fuel Cells, or other CARB approved fuels</td>
<td>Difficult to use because of additional service requirements, record keeping, and availability of fuels</td>
</tr>
</tbody>
</table>

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*Engine Model Year*
Engine Identification

CARB regulations are based on engine model year. Below are model identification photos for Tier I and Tier II models. Pre-Tier engines (1998 and older) did not have sticker identification.

**Tier I**
Tier I engines have stickers generally installed on the unit frame rail and valve cover.

2000 Tier I Isuzu
2003 Tier I Yanmar

**Tier II**
Tier II engines have stickers installed on the front of the oil pan and valve cover.

Tier II Yanmar sticker location
2007 Tier II Yanmar

Expert Service and Support are as close as this sign.

Enjoy the support of the Thermo King Dealer Network.

Over 200 factory-authorized service centers nationwide—find one nearby at www.thermoking.com
Providing equipment and services to manage controlled-temperature environments for food and other temperature-sensitive products, our Climate Control Technologies sector encompasses both transport and stationary refrigeration solutions. Our product brands include Thermo King®, a world leader in transport temperature control systems, and Hussmann®, a manufacturer of refrigeration and food merchandising equipment.