Agenda

- Introduction to FCCC
- Chassis Family
- Ownership Experience
- Let’s Drive!
- Chassis Care
- Part Numbers
- Engines: 2007 & 2010 Emissions Overview
Introduction to FCCC
Our Heritage

Everything at Freightliner Custom Chassis (FCCC) begins with our heritage. As a Daimler company and sister company to Mercedes Benz, FCCC is backed by a global organization with hundreds of years of engineering excellence.

From the toughness of Western Star Severe Duty, to the over-the-road durability of Freightliner, to the maneuverability and performance of Mercedes-Benz, Freightliner Custom Chassis brings best-in-class features and support from the Daimler Group family.
About FCCC

FCCC serves as a market leader in four distinct industries, delivering highly-customized, premium chassis to the RV, Delivery Truck, Commercial Bus and School Bus markets.

Located in Gaffney, South Carolina, FCCC employs over 650 employees in our manufacturing, customer support and retail facilities.

At FCCC, we recognize that our goal of building market-leading chassis cannot be realized without a thorough understanding of — and response to — our customers’ needs. We’re proud to say we’re Driven by You.
Of all industries served, FCCC puts more resources and focus on RV than any other, which has led to a market share of over 76% in Class A Diesel.

FCCC doesn’t take its leadership position lightly. An active member of the industry association (RVIA), FCCC has played key roles in axle weight rating legislation and training service professionals across the country. Additionally, FCCC provides more owner training than all other chassis OEMs combined.

RVs built on Freightliner chassis feature performance and handling that rise above the competition, and our owner support programs — which include 24/7 Direct, Freightliner and FCOC, the largest owner’s club in the industry — are second to none.

Nearly all OEMs utilize FCCC, yet we highly customize each and every chassis to the specifications of the brand, model and respective floorplans. No manufacturers get the same chassis!

FCCC’s legacy of engineering excellence drives our ability to meet the unique specifications of OEMs, as well as our ability to introduce industry-first chassis features including front and rear independent front suspensions and hybrid-electric power.
Industries Served

Beyond RV, FCCC delivers premium chassis to 3 other demanding vocational markets…

**Walk-in Van**
- Created for customers who use trucks in their everyday work
- Built for increased productivity and efficiency in daily operations
- Medium-duty, heavy-duty and alternate power chassis available
- We build your wife’s favorite brown truck! The UPS delivery truck.

**Commercial Bus**
- Designed for customers in the commercial bus industry, whose buses are their business
- Constructed to be durable, reliable, comfortable and safe
- Deliver incredible maneuverability, superior braking, optimum power and maximum durability

**School Bus**
- When it comes to children and safety, there’s no such thing as good enough
- Engineered to be more maneuverable, with increased braking power and responsiveness
- Available exclusively through Thomas Built Buses, our sister company and subsidiary of Daimler Trucks North America LLC, to ensure the highest overall quality
XC: Industry Leader

It all starts with the XC, the RV industry's most popular diesel chassis.

Freightliner's XC Chassis is the first choice of more motorhome manufacturers than any other chassis. Manufacturers appreciate the customer-valued features of the chassis, as well as the way Freightliner works side by side with them to ensure that the body and chassis are seamlessly integrated. This partnership means more satisfied owners and fewer problems.

For nearly 20 years, the XC has been continuously refined to be the most innovative, best performing, most supported chassis in the industry. Rigorous durability and dyno testing ensure that every chassis that leaves FCCC is ready for any road ahead.
Premium Appointments

Why do we reiterate the benefits of FCCC features during this presentation?

We don’t want you to forget the important reasons to make sure your next coach is on a Freightliner, too.

- Greater horsepower and torque with Cummins and Detroit engines
- 55- to 60-degree wheel cuts – industry leading for I-beam and independent suspensions
- Disc Brakes for better heat dissipation, shorter stopping distances and longer brake life. With proper braking, the brakes on a Freightliner should last over 100,000 miles.
- V-Ride and UltraSteer
XCS Straight Rail

**Total GVWR:** 26,850 – 47,000 lbs.

**Total GCWR:** 43,000 – 65,000 lbs.

**Standard Engine:** Cummins ISB

**Front Suspension:** Neway AS 120 Air

**Rear Suspension:** Neway ADL Air, V-Ride Rear Suspension System

**V-Ride** is the first-ever single axle suspension rated at 24,000 lbs. That means you can carry more gear, equip your interior with more premium amenities and count on a comfortable, confident driving experience.
XCR Raised Rail

**Total GVWR:** 26,850 – 47,000 lbs.

**Total GCWR:** 43,000 – 65,000 lbs.

**Standard Engine:** Cummins ISB, Optional ISL (ISC, 2013 Model Year & Prior)

**Front Suspension:** Neway AS 120 Air; Optional IFS

**Rear Suspension:** Neway ADL Air; V-Ride Rear Suspension System, Optional Tag
XCL Lowered Rail

<table>
<thead>
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<th>Advantage:</th>
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<tr>
<td>Lowering the rails provides a lower center of gravity and moves the rails underneath the basement</td>
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<table>
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<tr>
<th>Benefit:</th>
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<tr>
<td>The lowered center of gravity allows for greater coach stability, while moving the rails below the basement allows for unobstructed pass-through in the basement and increased storage</td>
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</table>

**XCL Lowered Rail**

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XCM Modular Rail

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Rear Suspension: Neway ADL Air, V-Ride Rear Suspension, System, Optional Tag
Formed Rail

Only FCCC has a solid, one-piece, formed frame rail.

The formed rail holds the engine at a lowered position, allowing for a flat-floor rear bedroom/bathroom and a lower center of gravity for better ride and handling. A lowered engine position also provides a better drive line angle for a quieter, smoother drive.

Our competition tries to lower the engine, but they can’t do it with one formed piece because they are not backed by the buying power and influence of Daimler. In order to deliver a lowered frame rail, they either weld or bolt multiple pieces together, resulting in a weaker, less durable vehicle.
SL: Superior Luxury

The SL chassis has quickly become FCCC’s fastest growing market segment.
Innovations

Geared exclusively for RV performance, FCCC has rolled out more innovations in ride and handling than any other manufacturer.

The **V-Ride™ Rear Suspension System**, rated up to 24,000 lbs., is built for premium motorhomes and allows for more luxury amenities, additional cargo capacity and superior roll stability.

**UltraSteer** is the first line of tag axles that are fully integrated and precision-tuned to react to turns and maneuvers of the coach.
- Increased Maneuverability
- Improved Ride & Handling
- Elimination of tire scrub

**UltraSteer B-Series** – Straight beam tag axle, wide track suspension arms – flexible floorplan options for OEMs

**UltraSteer I-Series** – Independent suspension on the tag axle for overall ride quality and stability; comparable weight capacity and turning angle to B-Series
**NOTE:** All warranties are completely transferable at no cost.

*For a Freightliner warrantable failure, towing/roadside assistance is fully reimbursed to the nearest company-authorized repair location. For a warrantable repair in a vehicle down situation, call 1-800-FTL-HELP (385-4357).*

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Coverage Period</th>
<th>Miles</th>
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<tbody>
<tr>
<td><strong>ENGINE</strong></td>
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<tr>
<td>Cummins</td>
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<td>5 Years</td>
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<tr>
<td>Detroit</td>
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<td>5 Years</td>
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<td><strong>TRANSMISSION</strong></td>
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<tr>
<td>Allison MH Series</td>
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<td>5 Years</td>
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<td><strong>COMPONENTS</strong></td>
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<td>Chassis</td>
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<td>3 Years</td>
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<td>Drive Train</td>
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<td>Suspension</td>
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<td>3 Years</td>
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<tr>
<td>Frame Rails &amp; Cross Members</td>
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<td>5 Years</td>
<td>100,000</td>
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<tr>
<td><strong>COVERAGE</strong></td>
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<tr>
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<td></td>
<td>3 Years</td>
<td>50,000</td>
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Ownership Experience
24/7 Direct – Your first call for all things service related.

Whether you are blazing a new trail or trailing a wagon train, help is never far away.

These folks aren’t just the fastest draw in town. After an average hold time of about 30 seconds, you’ll find yourself on the phone with a FCCC service professional (our employee) with an average of 19 years’ experience. If for some reason your cell phone drops the call, or you hang up, a technician will call you back by the end of the day.

Their goal is to get you back to enjoying your RV adventure. In many cases, if you’re willing to try a few things, our technicians can get you back on the road. If not, they’ll send out a technician who can. And if all else fails, they’ll send a tow vehicle.

24/7 Direct has no expiration date. It does not expire with your chassis warranties. If you have a question, we are always here to answer it.
If you require chassis service in your hometown, please call:

**FREIGHTLINER CUSTOM CHASSIS CORPORATION**
1-800-FTL-HELP (800-385-4357)
*(Please have your VIN# ready)*

If for any reason this is not possible, or if you would like to call the manufacturers direct, you can contact them at the following telephone numbers:

**CUMMINS ENGINE COMPANY**
1-800-DIESELS (1-800-343-7357)

**DETROIT (DD13 or MBE)**
1-800-445-1980

**ALLISON TRANSMISSIONS**
1-800-524-2303

**MICHELIN TIRE**
1-800-TIRE-HELP (1-800-847-3435)

**GOODYEAR TIRE**
1-800-321-2136
24/7 Direct Owner Card

Each new owner receives a welcome kit featuring a personalized USB card that is loaded with valuable information.

Highlights include “Knowing Your Chassis” as well as PDF files and links to a wide range of resources:

- Dealer Directory
- Access Freightliner
- Service & Operators Manuals
- Warranty Registration and Manuals
- Links to component manufacturers’ websites
- Interactive Service Log
- And much more

It’s all about improving the ownership experience. After all, whether you’re an OEM, a dealer or an RV owner, we’re proud to say we’re “Driven by You.”
Dealer Service Locations

Largest Diesel Chassis Support Network

Oasis Dealer
Freightliner Dealer

Over 450 Dealers
Over 90 Oasis Dealers
Additionally, the Freightliner Oasis Network has more than 90 locations that can service chassis and engine at a one-stop shop. At any FCCC service location, customers receive the ultimate in care and reliable service. Everything you need to know about your chassis is always available online at www.AccessFreightliner.com.
24/7 Direct App

The 24/7 Direct app from Freightliner Custom Chassis Corporation provides owners of RVs built on a Freightliner Custom Chassis on-demand customer support any time, anywhere. Find dealers based on your current location or ZIP code and receive directions, maps, service hours, parts & service agreements, special services and contact information. You can also call or email FCCC’s 24/7 factory direct support for fast, reliable customer service for your chassis.
Why Freightliner Service?

Speaking of a large network…

Say Spartan, PowerGlide and FCCC owners enter a Freightliner service facility with the same issue. Who gets serviced faster? Why?

With the Freightliner VIN number, your service writer can get right to work. They can see your serial numbers, warranty history, recalls, part numbers and part locations within the Freightliner system; they are working the moment you give them the VIN number.

Without a Freightliner VIN, your service writer will be tied to a phone looking for answers from a non-Freightliner manufacturer. Hopefully it’s not after hours!

It’s not that our dealers don’t want to offer you great service because you don’t have a Freightliner; if they don’t have a VIN number, they just can’t.
Camp Freightliner

Topics:
• Air brake system
• Electrical system
• Maintenance intervals
• Weight distribution
• Vehicle storage guidelines
• Much, much more!

To enroll:
• Phone: 864-206-8267
• Email: CampFreightliner@Daimler.com

*Subject to change
FCCC SERVICE & TRAINING CENTER
103 Campus Drive
Gaffney, SC 29341
Call 855-253-0421 for an appointment

Payment Methods: Master Card, Visa, Discover & Personal Checks

To prepare your coach for service:
1. Please dump Black & Grey water tanks.
2. Take out personal items that you may need during the service.
3. Remove or contain pets left in coach.
4. Unlock or leave keys for Battery, Engine & Generator compartments as applicable to your service.
5. Remove bicycle racks, ladders, etc. from rear of coach if service includes engine access. Remember to lower the satellite dish and/or antenna.
6. Please put slide outs in, raise jacks, and unplug coach from electric box.
Freightliner Chassis Owners Club (FCOC)

- Over 4,000 members nationwide
- First year’s membership is FREE
- $15 per year or $70 for 5 years*
- Two exclusive FCOC rallies each year
- Quarterly newsletter

Dues are only $15 per year or $71 for 5 years*

Check us out at FCOCRV.org

*Subject to change
**Freightliner Chassis Owners Club (FCOC) cont.**

- Eligible for the Chrysler Affiliate Rewards Program
  - Vehicles for purchase 1% below factory invoice*
- Members receive a 5% discount* on parts and labor at the Factory Service Center in Gaffney, SC
- Members receive a 10% discount* on posted labor rates and back counter parts sales at participating Oasis dealerships
- Sign up at FCCC rally booth or FCOCRVOrg

*Subject to change*
4UZ Apparel

- 4UZ – first 3 digits of FCCC RV Chassis VIN numbers
- 4UZ apparel line launched in 2015
  - Focuses on the RV lifestyle
  - T-shirts, hats, jackets, etc.
- 4UZRV.com
Social Media

Facebook: RV Road Trippers

Twitter: @DriveFCCC

YouTube Channel: Freightliner Custom Chassis
Website


“Built on Freightliner” page offers one-click access to coach and chassis specifications forms, both current and archived.

Also register for Camp Freightliner online (among many other great features).

FreightlinerChassis.com will be redesigned in 2015, so check in for new content and a more customized owner experience.
AccessFreightliner.com

To register, click on VEHICLE OWNERS/FLEET PROGRAM in the APPLICATIONS box under REGISTER FOR ACCESS.

Visit AccessFreightliner.com for service literature including:

Technical Manuals:
• Drivers Manual
• Maintenance Manual
• Workshop Service Manual

Bulletins:
• Service Bulletins
• Parts / Technical Bulletins
• Email Subscriptions

AccessFreightliner/ServicePro:
• View your coach’s Warranty Coverage

AccessFreightliner/PartsPro:
• View your coach’s parts
• Installation Guide

Call 800-FTL-HELP to walk through access and set-up of AccessFreightliner account. Please have your VIN ready.
Let’s Drive!
Ride & Handling

- What is the easiest way to:
  - Improve Your Ride?
  - Decrease Your Tire Wear?
  - Improve Your Road Handling?
  - Improve Your Braking?

ANSWER
Tire Care

The most important factor in maximizing the life of your tires is maintaining proper inflation pressure. An under-inflated tire will build up excessive heat that may go beyond the prescribed limits of endurance of the rubber and the radial cords. Over-inflation will reduce the tire’s footprint on the road, reducing the traction, braking capacity and handling of your vehicle. An over-inflated tire will also cause a harsh ride and uneven tire wear while being more susceptible to impact damage.

Keep in mind that the pressure rating on the side wall of your tire is the *maximum* pressure for that tire. This is not necessarily the *correct* pressure for the tires when installed on your vehicle. Maintaining the correct tire pressure for *your vehicle’s loaded weight* is extremely important and must be a part of regular vehicle maintenance.
Tire Care cont.

To determine the correct air pressure for your tires, load your motorhome as you would normally travel, including water and fuel. Go to a truck scale, found at most truck stops, and weigh each wheel position independently, with driver and passenger or passengers in the vehicle as described in the Michelin Recreational Vehicle Tire Guide or Goodyear Recreational Tire and Care Guide to determine the correct air pressure for the weight on each wheel position. Then use the charts in the guide and adjust the pressure accordingly when the tires are cool or have not been driven for more than one mile.

**Cold inflation pressure is the inflation pressure of tires before the vehicle is driven and the tires warmed up. Cold Inflation Pressures Shown: Never reduce the air pressure in a hot tire.**

**REMEMBER: For control of your motorhome, it’s critical that the tire pressure be the same on both sides of the axle!**

* For a copy of the Goodyear Recreational Tire and Care Guide, call 1-800-321-2136.
Weight Distribution

Weight distribution is very important to handling. Too much weight on one side of the vehicle, or in the rear compared to the front axle, can adversely affect the handling characteristics of the vehicle and, in some cases, result in overloading the tires or axle components.

Tips

- Keep front to rear weight balance as close to equal percentages of each axle weight rating as possible. (Example: Front GAWR = 12,350 lbs. / 80% = 9,880 lbs.; Rear GAWR = 20,000 lbs. / 80% = 16,000 lbs.)
  - Provides the best handling characteristics of the vehicle
  - Light on the front axle and heavy on the rear axle = wandering and porpoising or continued bouncing of the front of the coach after hitting a bump in the road
  - Small percentage differences may be okay
- Know what your vehicle weighs to determine the best location for your belongings
  - Simply because you can fit everything in one compartment for easy access does not make this your best option
- Maintain as much of an equal balance as possible when loading your equipment, food and other supplies into the vehicle
Transmission

- For normal driving and best fuel economy
  - Select “D” and “Mode On”
- For performance
  - Select “Mode Off”
  - For mountain driving, select lower gears to maintain 2000+ engine RPM
- For hill climbing on hot days
  - Keep RPMs high to cool engine

Shift Selector 2000MH

Transmission

Pushbutton Selector

- Range Selected
- Fault Indicator For SBW Related Problems, Not Transmission Problems
- Forward Gear Up & Down Shift
- Gear Indicator
- Mode on Indicator (LED)
Transmission cont.
Transmission Prognostics

Prognostics are available for 2010 EPA chassis with a build date after August 2011.

<table>
<thead>
<tr>
<th>READOUT</th>
<th>MEANING</th>
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<tbody>
<tr>
<td>TRANS OIL LIFE</td>
<td>Transmission Oil Life Poor</td>
</tr>
<tr>
<td>TRANS OIL FILTER</td>
<td>Transmission Oil Filter Restriction Switch Clogged</td>
</tr>
<tr>
<td>TRANS SERVICE</td>
<td>Transmission Needs Service</td>
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</table>
### Transmission Prognostics cont.

Accessing Prognostic via the 3000 Shifter

<table>
<thead>
<tr>
<th>UP/DOWN ARROWS</th>
<th>MODE ID</th>
<th>READOUT</th>
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<tbody>
<tr>
<td>1st Press</td>
<td>Oil Level Sensor</td>
<td>OL</td>
</tr>
<tr>
<td>2nd Press</td>
<td>Oil Life Monitor</td>
<td>OM</td>
</tr>
<tr>
<td>3rd Press</td>
<td>Filter Life Monitor</td>
<td>FM</td>
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<tr>
<td>4th Press</td>
<td>Trans Health Monitor</td>
<td>TM</td>
</tr>
<tr>
<td>5th Press</td>
<td>Diagnostic Codes</td>
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</table>
Air System Locator

1. Air Compressor
2. Teflon Line (Supply)
3. Air Dryer
4. Air Lines
5. Air Tanks

6. Front Air Suspension
7. Rear Air Suspension
8. Front Leveling Valve(s)
9. Rear Leveling Valve(s)
10. Drain Lanyards
Air Dryer location "STD", optional locations may have been selected by OEMs
Air System

All air and fuel lines are located on the right-side frame rail, while all electrical lines are located on the left-side frame rail.

Color-Coded Air Lines
- Reduced downtime
- Ease of maintenance
- Reduced repair cost
Air System cont.

Freightliner chassis are equipped, as standard equipment, with a heated automatic moisture ejector on the wet tank in addition to one built into the air dryer. This eliminates the need to climb under the coach to drain air and water from the tanks daily. However, you must pull all three drain lanyards for 10 to 15 seconds every 6 months to drain moisture. A fine mist is normal due to condensation. If a large amount of moisture is present it should be completely drained and the air dryer serviced. Moisture in the braking system can cause brake system failure and is not covered by the manufacturer warranty.
Air System cont.

Freightliner chassis air brake systems are equipped with an air dryer to remove the condensed moisture from compressed air. The air dryer (Pure Air seen below) is equipped with a spin-on desiccant cartridge that is scheduled to be changed every 18 months. Inside this is a coalescing filter that should also be changed every 18 months. The dryer is located behind the rear axle on the right hand frame rail, or between the frame rails on later models. **Chassis built on or after 11/28/03 have a PURest Dryer with a scheduled change interval of 36 months.**
Air System cont.

Again, the air dryer is located just behind the rear axle, or if you have tag, just behind tag.
Air System cont.

FCCC provides automatic moisture ejectors on the wet tank that work along with the air dryer to eliminate moisture from the system, eliminating the need to drain tanks daily. Additionally, FCCC provides Outboard Manual Drain Cables that should be pulled every 6 months to help drain any moisture that has built up in the tanks.
Air System cont.

**FCCC's Air Suspension Provides:**
- 10.5" to 12.5" diameter air springs with minimum 85 psi
- 13% - 25% more cubic inches of air volume
- With IFS, 1/2" hose between ping tanks and air spring increases volume, allowing for lower operating pressure and softer ride
- Ping tanks allow for a higher volume of air for an overall softer ride
- Ping tanks support suspension while the secondary tank feeds air brakes
- 55-60 degree wheel cut
Air System cont.

The manifold is usually located toward the front of the coach (i.e. firewall, front compartment). The location depends on the coach manufacturer.

**WARNING:** Air tanks should be bled of all pressure any time there is work done on the air system.
Brakes

The rear brakes on the Freightliner chassis are also used as the parking brakes. This gives you the holding power of two large drum brakes to keep your coach from rolling, even when fully loaded on a 20% grade.

A loss in air pressure will not result in an immediate loss of brakes. If a leak develops in the air system while driving (at approximately 60 to 65 PSI), you will be alerted by a light on the instrument panel and an audible alarm. As you apply the brakes, the air supply holding the brakes in the released position will gradually be depleted. When fully depleted (approximately 40 PSI to 45 PSI), the rear brakes will set. This gives you plenty of time to pull over to the side of the road.

**NOTE:** The rear brakes have dual chambers, one for the service brakes and one for the park brake. The service brakes are air applied and spring released. The park brake is spring applied and air released.

The brakes are equipped with automatic slack adjusters that eliminate the need to manually adjust your brakes. Each time you step on the brake pedal, if adjustment is needed, the adjusters take up the slack. That’s all there is to it.
Brakes cont.

Standard front air disc brakes have been shown to dramatically decrease stopping distances under normal and emergency conditions, as well as minimize brake fade when multiples brake applications are required—in increasing overall brake life.
Brakes cont.

**CAUTION:** Do not use any of these supplemental braking systems on wet roads or in slippery conditions.
Brakes cont.

**CAUTION:** *Do not use any of these supplemental braking systems on wet roads or in slippery conditions.*
Brakes cont.

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Brakes cont.

CAUTION: Do not use any of these supplemental braking systems on wet roads or in slippery conditions.
SmartWheel Switch Panels

A. Left Switch Panel
(1) Cruise ON/OFF
(2) Cruise SET/CANCEL/RESUME – used to set cruise control speed, accelerate while in cruise control, temporarily disengage cruise control, or resume cruise speed
(3) Headlight Interrupt

B. Right Switch Panel
(4) Marker Lamp Interrupt
(5) Wiper Wash/Wiper OFF/Wiper Variable
(6) Wiper HI/LOW

- Cruise Control
  - Coast - If you hold down the SET button, the coach cruise control will temporarily disengage, slowing cruise speed. Once the desired cruise speed has been reached, release the SET button to continue the new cruising speed.
  - Maximum cruise control speed varies according to vehicle
LCD Information Center

When you turn the ignition switch on, the first screen will show:
• Freightliner Custom Chassis (in the day screen and night screen)
• All icons will flash on and off

Information available:
• Trip Computer
• Real Time Clock
• Odometer and Trip Odometers
• Engine and Chassis Parameters
• Alarms and Warning Messages
• Diagnostics
• Pre-Trip Checklist
LCD Information Center – Display Information

(1) After Freightliner Custom Chassis is displayed, the second screen will show any warnings.

(2) The pre-trip check list will come on next. (The user can check everything off by scrolling down on the joy stick or by left clicking to the next screen)

(3) Next is the travel screen. (The user can set eight viewable categories, three of which can be viewed while driving. By scrolling down the user can check 5 other screens. These can be set in any order the user wants)

(4) Setup Screen. (Scroll down to highlight one of the categories and right click and hold to right for 5 seconds)

(5) Category Select List. (Scroll down to the category desired and right click to the category you want on the travel screen then left click. Repeat process until you have the 8 categories you want.)

(6) To get to Setup, Maintenance, Diagnostics screen. (Go into the travel screen and with nothing highlighted right click and hold for five seconds)

(7) Not only can the user set the time and date, they can also change items on the checklist or even add something new to the checklist.

Whenever the user wants to clear today, leg, trip mileage or fuel economy, all they have to do is highlight it, left click, and follow instructions on the screen to zero them out.
LCD Information Center cont.

Check Engine Indicator
The amber check engine indicator light (CHECK ENGINE legend) illuminates when certain faults are detected. If a critical engine condition exists (for example, low oil pressure or high coolant temperature), the check engine light will illuminate to alert the driver to correct the condition as soon as possible. If the condition gets worse, the stop engine warning light will illuminate. See the Cummins Operation and Maintenance Manual for more information.

High Exhaust System Temperature (HEST) Lamp
The high exhaust system temperature light alerts the operator of high exhaust temperature during the regen process when the speed is below 5 mph (8 km/h), or during a manual regen. The HEST lamp does not signify the need for any kind of vehicle or engine service; it only alerts the vehicle operator to high exhaust temperatures.

*IMPORTANT: Make sure the engine exhaust pipe outlet is not directed at any person, or at any surface or material that will melt, burn, or explode.*
**Stop Engine Warning**
The red stop engine (STOP) warning light illuminates if a malfunction that could cause engine damage occurs. In most cases, the check engine light will illuminate before the stop engine warning light. When the stop engine warning light illuminates, immediately park the vehicle in a safe location and shut down the engine. Continued operation with the stop engine warning illuminated will lead to automatic engine shutdown and possible engine damage.

**Dash Driver Display Screen**
The LBCU’s interactive graphical display communicates real-time information about the status and performance of the vehicle to the driver.

**Malfunction Indicator Lamp**
The Malfunction Indicator Lamp (MIL) indicates an engine emissions-related fault, including, but not limited to, the aftertreatment system. See the engine operation manual for details.

**ABS Indicator**
The ABS indicator illuminates when a problem is detected with the anti-lock braking system.
LCD Information Center cont.

**Check Transmission**
The check transmission warning light will come on during vehicle operation (not during start-up) if the ECU (electronic control unit) has signaled a diagnostic code indicating malfunctions in transmission operation. If this light stays on continuously during operation, have the transmission serviced as soon as possible.

**Cruise-On Indicator**
A green indicator illuminates when the cruise control is on.

**Engine Brake Engaged Indicator**
A green engine brake indicator illuminates when the engine brake is applied.
LCD Information Center cont.

Left-Turn Signal Arrow
The green left-turn signal indicator light flashes on and off when the outside turn signals are flashing.

Diesel Particulate Filter (DPF) Lamp
A solid yellow Diesel Particulate Filter (DPF) lamp indicates that a manual regen is required soon. **Action:** Bring vehicle to highway speed to allow for an automatic regen or perform a parked regen.

A blinking yellow (DPF) lamp indicates that a manual regen is required immediately, or an engine derate may occur. **Action:** Bring vehicle to highway speed to allow for an automatic regen or perform a parked regen as soon as possible. Contact 1-800-FTL-HELP for further assistance.

Shift Inhibit Indicator Lamp
The yellow shift inhibit indicator illuminates when the transmission ECU is prohibiting shifting.

Headlight High-Beam Indicator Lamp
The blue high-beam indicator light illuminates when the headlights are on high beam.
**LCD Information Center cont.**

**Parking Brake Indicator**
The red parking brake light indicates when the parking brake is activated and the ignition switch is in the ON position.

**Low Air Pressure Indicator**
The red low air warning light normally illuminates when the air pressure in the air tanks falls below 65 psi (448 kPa). The light will normally come on when the engine is first started, but goes off when the air pressure in the air tanks reaches approximately 65 to 76 psi (448 to 524 kPa).

**Wait to Start Indicator**
The yellow wait-to-start indicator light illuminates when the intake heater is active. Wait until the indicator light goes off to start the engine.

**Right-Turn Signal Arrow**
The green right-turn signal indicator light flashes on and off when the outside turn signals are flashing.
Designed in collaboration with Mercedes-Benz, part of Daimler group, OptiView is inspired by the current S-Class dash to meet the expectations of luxury automotive drivers.

Features:
- Fully integrated gauges with engine information, warning lights and more
- Bluetooth mobile connectivity – iOS and Android compatible to provide hands-free phone use and Smart Wheel controls
- Easy-to-read interface with anti-glare display, bright graphics, and clear fonts, colors and menu structure
- 360-degree camera system capability
- Touch screen radio controls
- Multimedia system
Comfortable Ride

- TRW Infinitely Adjustable Tilt & Telescoping Steering Column
- Optional Comfort Drive (see notes)

On Select Models

- Self-straightening wheel
- Self-adjusting pull compensation
- Reduces driver fatigue
- Adjustable resistance and responsiveness
- Handles like a car
Confident Handling

One misconception about diesel coaches is that they are more difficult to drive. Diesel is, in fact, easier to drive than gas, and Freightliner is easier to handle than other diesels. If you don’t think so, it’s time to drive an FCCC today.

Gas coaches can really beat a driver up as the steering wheel pops back on forth on uneven surfaces like pot holes, highway cracks, and railroad tracks. This is not the case with a Freightliner Custom Chassis. Diesel is easier to drive because of better technology, like the bell crank.
Confident Handling

Competitor

Without bell crank, competitive chassis are subject to Bump Steer

FCCC

FCCC has NONE Diesel is Easy!
Chassis Care
Scheduled Maintenance

- 6,000 miles or 6 months initial maintenance
- After your initial 6-month maintenance, the recommendation is service every 12 months
- Generator Service
- Maintenance schedule available at FreightlinerChassis.com or in your maintenance manual
Scheduled Maintenance

One very important area of regular, scheduled maintenance is the lubrication of various points on the chassis steering, braking and suspension systems. The above chart points out these locations. The lubrication intervals and lubricant specifications are listed in your owners manual and on the attached pages for your particular chassis.

Lubrication does not have to be performed by an authorized service dealer, but the dates and mileage of lubrication and general service should be recorded for future reference.
###Scheduled Maintenance

####Lubrication Points

<table>
<thead>
<tr>
<th>No.</th>
<th>Text Ref. No.</th>
<th>Components</th>
<th>Remarks</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>46-05</td>
<td>Steering Gear</td>
<td>One Grease Fitting</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>46-04</td>
<td>Steering Shaft</td>
<td>Three grease fittings; lubricate both universal joints and the slip joint spline</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>46-01</td>
<td>Drag Link &amp; Bell Crank</td>
<td>Two grease fittings per drag link; one on each end, and one on bell crank housing</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>33-01</td>
<td>Knuckle Pins</td>
<td>Two grease fittings; one on top and one on bottom of knuckle pin. Lubricate both sides of axle.</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>42-05</td>
<td>Automatic Slack Adjusters</td>
<td>One Grease Fitting; Lubricate both sides of front and rear axle</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>33-04</td>
<td>Grease Lubricated Wheel Bearings, Front Axle</td>
<td>Inspect, repack and adjust inner and outer bearings on both sides of front axle</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>42-04</td>
<td>Brake Camshaft Bracket</td>
<td>One grease fitting; Pump in grease until it appears at the slack adjuster end of the bracket. Lubricate both sides of the front and rear axles.</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>33-02</td>
<td>Tie Rod</td>
<td>One grease fitting; one on each end of tie rod</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>35-01</td>
<td>Rear Axle</td>
<td>Check fluid level; add fluid if low (35-02)</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>35-02</td>
<td></td>
<td>Change fluid when required (35-01)</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>41-01</td>
<td>Driv shaft</td>
<td>Three grease fittings; lubricate both universal joints &amp; slip joint spline</td>
<td>3</td>
</tr>
<tr>
<td>12</td>
<td>26-02</td>
<td>Automatic Transmission</td>
<td>Change fluid when required (35-01)</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>Caterpillar Fan Drive Pulley</td>
<td>One grease fitting; on top of fan drive pulley on Engines built prior to 1/03/03</td>
<td>1</td>
</tr>
</tbody>
</table>

**Note:** 3126E Serial # HEP15357 & above, and all C7’s, and all side radiator NO Grease fitting.

<table>
<thead>
<tr>
<th>No.</th>
<th>Text Ref. No.</th>
<th>Components</th>
<th>Remarks</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td></td>
<td>Pacbrake Exhaust brake</td>
<td>Lubricate the five points indicated</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>32-04</td>
<td>Neway Ind. Front Susp.</td>
<td>Two grease fittings; One on top &amp; bottom of knuckle post, lubricate both side of suspension</td>
<td>4</td>
</tr>
<tr>
<td>15</td>
<td>ZF Ind. Front Susp.</td>
<td></td>
<td>Four grease fittings; one on top and bottom steering knuckle, and one on top and bottom control arm. Lubricate both sides of suspension.</td>
<td>8</td>
</tr>
</tbody>
</table>
## Scheduled Maintenance

**Filters and Fluids**

<table>
<thead>
<tr>
<th>Oil and filter change</th>
<th>Engine fuel filter change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cat 3126 &amp; 3126B Ser # Prefix 1WM &amp; 7AS 19 Qt Pan 9,000 mi or 1 yr which ever occurs 1st.</td>
<td>9,000 miles or 1 year which ever occurs first.</td>
</tr>
<tr>
<td>Cat 3126B &amp;E &amp; C7 Ser # Prefix 7AS, 8YL, 9SZ CKM 22 Qt Pan 11,000 mi or 1 yr which ever occurs 1st.</td>
<td>11,000 miles or 1 year which ever occurs first.</td>
</tr>
<tr>
<td>Cat C7 Ser # SAP02740 &amp; up Built after 3/14/05 19 Qt Pan 11,000 mi or 1 yr which ever occurs 1st.</td>
<td>11,000 miles or 1 year which ever occurs first.</td>
</tr>
<tr>
<td>B5.9L&amp;C8.3L 6,000mi or 6 mo which ever occurs 1st.</td>
<td>12,000 miles or 6 months which ever occurs first.</td>
</tr>
<tr>
<td>ISB, ISC &amp; EPA07 15,000 mi or 1 yr which ever occurs 1st DD13, ISX 12, ISX 15</td>
<td>15,000 miles or 1 year which ever occurs first. ISB02 Fuel Strainer 12,000 mi or 1 yr which occurs 1st</td>
</tr>
<tr>
<td>ISL &amp; EPA07 18,000 mi or 1 yr which ever occurs 1st.</td>
<td>18,000 miles or 1 year which ever occurs first.</td>
</tr>
<tr>
<td>Cum ISM 7,000 mi or 6 mo which ever occurs fist.</td>
<td>7,000 miles or 6 months which ever occurs first.</td>
</tr>
<tr>
<td>MBE 900 15,000 mi or 1 yr which ever occurs first</td>
<td>15,000 mi or 1yr which ever occurs first</td>
</tr>
</tbody>
</table>

### Recommended Fluid Types

<table>
<thead>
<tr>
<th>Engine Oil</th>
<th>Transmission Fluid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caterpillar, Cummins &amp; MBE Engines Outside air temperature between +5 F &amp; +122 F SAE 15W-40 CI-4, CH-4, CG-4 or CF-4 Cum EPA07CJ-4/S</td>
<td>MT643, MD3060, 1000/2000 Series, 3000/4000MH Dexron III or TransSynd 2000MH TransSynd</td>
</tr>
<tr>
<td>Rear Axle Differential &amp; Front Wheel, Oil Lubricated Wheel Bearings SAE 80-90W Gear Lubricant</td>
<td>Rear Radiator Dextron III Side Radiator 15W40 CI-4</td>
</tr>
<tr>
<td>Front Axle Spindle Pins, Tie Rods, Drag Link, Intermediate Steering Shaft &amp; Gear Multi-Purpose Grease NLGI Grade 1 or 2</td>
<td>Front &amp; Rear Wheel Bearings, Brake Camshafts, Auto Slack Adjusters &amp; Universal Joints Multi-Purpose Grease NLGI Grade 1 or 2</td>
</tr>
<tr>
<td>Brake Caliper Slides (Hydraulic Brakes) Aeroshell Grade 5 (ES-1246) Grease</td>
<td>Pac Brake Synthetic Lube or Synco Super Lube</td>
</tr>
</tbody>
</table>
Pre-Trip Inspection

Please take some time, if you have not already done so, to read through the operator’s manual provided with your chassis.

Familiarization with this book and your chassis is the best possible way to ensure that you can safely operate your vehicle and extend its useful life.

Prior to starting your vehicle each day, there are a few things that should be checked. Taking the time to follow these recommendations could mean the difference between having a wonderful vacation and spending your time on the side of the road or in the lobby of a repair shop.

- **Check the tires for proper inflation pressure and possible damage.** Don't forget to check the inner duals. Refer to the air pressure charts in the beginning of this handout for proper inflation pressures.

- **Look for fluid leaks under the motorhome.** (The simple act of tightening a hose clamp could prevent a serious problem.)
Pre-Trip Inspection cont.

✓ Check the coolant level in the reservoir. Add a 50/50 mix of coolant and water if needed. This reservoir is located at the rear of your vehicle. Be careful not to confuse it with the hydraulic fluid reservoir – they look very much alike.

✓ Check SCA (supplemental coolant additive) and freeze point every 6 months or 25,000 miles. Recharge as required.

WARNING: If the water temp in your engine is greater than 120 degrees, DO NOT REMOVE THE RADIATOR CAP. You could be severely burned!
NOTE: If you have trouble getting Alliance Brand Coolant ALAWS3, Detroit Diesel Brand Powercool 50/50 pre-mixed is the same coolant (Part # 23528203). Fleetcharge coolant is also the same and sold through some PEP BOYS, NAPA, and Tractor Supply under Fleetcharge FCA053. You can contact Fleetcharge at 1-800-323-8755 for info on retailers.
Pre-Trip Inspection cont.

✔ Check transmission fluid level. Add fluid if needed.

✔ Check your engine oil level. Add oil if needed.

✔ Check the engine compartment for squirrels, cats, etc. They like the warmth of the engine compartment, but make a real mess if caught in the belts.

✔ Check the hydraulic fluid in the hydraulic reservoir. Add fluid if needed.
Pre-Trip Inspection cont.

*Check hydraulic steering fluid* – Real-estate for labels and stickers on these tanks is limited, so they can be hard to find at times. *Take care to make sure you are filling in the proper tank!*

Preventive Maintenance – Bendix HydroMax
Every three months, 25,000 miles or 900 operating hours (whichever occurs first):
1. Check the brake fluid level of the master cylinder reservoir. Replenish if necessary.
2. Check the Hydro-Max exterior and all connecting lines for fluid leakage. Remove grime from the exterior of the Hydro Max.
3. Check for loose or disconnected electrical connections and damaged wiring.
4. Check the vehicle brake warning system. Compare the reaction of warning lights and buzzers to the vehicle’s handbook.

All others: Check Hydraulic fluid every 6 month.
Pre-Trip Inspection cont.

✓ Check fuel and water separator

If your water and fuel lights come on, what does that mean?

It means that your fuel/water separator has collected enough water in it to touch the sensor. You will need to go back to your fuel/water separator, open up a nozzle, drain 1 tablespoon of fluid and close it up.

**WARNING:** Do not attempt to drain your fuel/water separator, as this will cause your engine to lose fuel prime.
Pre-Trip Inspection cont.

✓ Check air filter restriction indicator

Based on the date on the air cleaner itself, the engine air cleaner element should be changed *every two years* or when the air inlet restriction indicator reaches 25 inches of vacuum, whichever occurs first.
Towing Guidelines:

- Always tow from the front
- Remove the drive shaft
- Release the brakes / Air up suspension
- Lifting by tires is preferred
- When in doubt…1-800-FTL-HELP

Refer to your owners manual and Towing Guidelines included on 24/7 flash card for additional detail and instructions. And it’s always best to call 1-800-385-4357!
If you go to a dealer and give them your old part number, these numbers will be superseded with the updated part number.

<table>
<thead>
<tr>
<th>Part Description</th>
<th>Manufacturer</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine Oil Filter</td>
<td>Fleetguard</td>
<td>LF 3349</td>
</tr>
<tr>
<td>Cummins B5.9L</td>
<td>Fleetguard</td>
<td>LF 3000</td>
</tr>
<tr>
<td>Cummins C8.3L, ISC, ISL, ISM</td>
<td>Fleetguard</td>
<td>LF 9009</td>
</tr>
<tr>
<td>Cummins ISB</td>
<td>Fleetguard</td>
<td>LF 3970</td>
</tr>
<tr>
<td>Cummins ISB 02</td>
<td>Fleetguard</td>
<td>LF 3729</td>
</tr>
<tr>
<td>Caterpillar 3126, 3126B, 3126E &amp; C7</td>
<td>Caterpillar</td>
<td>1R-1807</td>
</tr>
<tr>
<td>MBE 926 (Cartridge)</td>
<td>Detroit Diesel</td>
<td>DDE0001801709</td>
</tr>
<tr>
<td>MBE 926 (Centrifugal)</td>
<td>Detroit Diesel</td>
<td>DDE9061810086</td>
</tr>
<tr>
<td>Air Cleaner Element</td>
<td>Farr</td>
<td>End Inlet 114810-003</td>
</tr>
<tr>
<td>Cum B5.9L;ISB; Cat 3126, 3126B&amp;E, C7, MBE</td>
<td>Farr</td>
<td>Side Inlet 114880-003</td>
</tr>
<tr>
<td>Fred</td>
<td></td>
<td>114810 007</td>
</tr>
<tr>
<td>Cummins ISC &amp; ISL</td>
<td>Farr</td>
<td>Side Inlet 062891 001</td>
</tr>
<tr>
<td>Cummins ISM</td>
<td>Farr</td>
<td>Side Inlet 062891-002</td>
</tr>
<tr>
<td>Fuel Filter (Engine Mounted)</td>
<td>Fleetguard</td>
<td>FF 5052</td>
</tr>
<tr>
<td>Cummins B5.9L &amp; C8.3L</td>
<td>Fleetguard</td>
<td>Spin-On FS 19519</td>
</tr>
<tr>
<td>Cummins ISB</td>
<td>Fleetguard</td>
<td>Top Load FS 19579E</td>
</tr>
<tr>
<td>Cummins ISB Element</td>
<td>Fleetguard</td>
<td>RAI-025RAC10</td>
</tr>
<tr>
<td>Cummins ISB 02 In Line Strainer</td>
<td>Fleetguard</td>
<td>Spin On FS 1022</td>
</tr>
<tr>
<td>Cummins ISL</td>
<td>Fleetguard</td>
<td>Spin On FS 1003</td>
</tr>
<tr>
<td>Cummins ISL (Used after Jan 2005)</td>
<td>Fleetguard</td>
<td></td>
</tr>
<tr>
<td>Caterpillar C7 (Secondary - Engine Mtd.)</td>
<td>Caterpillar</td>
<td>Spin On 1R-0751</td>
</tr>
<tr>
<td>Caterpillar (Fuel/Water Sep) 2 Mic</td>
<td>Alliance</td>
<td>ABP-32FRT03</td>
</tr>
<tr>
<td>Caterpillar C7(Fuel/Water Sep) 30 Mic</td>
<td>Alliance</td>
<td>ABP-S3226FL02</td>
</tr>
<tr>
<td>Cummins ISB 02 FWS Remote</td>
<td>Fleetguard</td>
<td>Spin On FS19596</td>
</tr>
<tr>
<td>Fuel/Water Separator - Remote Mtd (5.9 ISB)</td>
<td>Fleetguard</td>
<td>FS 1242</td>
</tr>
<tr>
<td>Fuel/Water Separator - Remote Mtd 30 Mic (C7)</td>
<td>Alliance</td>
<td>ABP-32FRT01</td>
</tr>
<tr>
<td>MBE (Fuel Filter)</td>
<td>Detroit Diesel</td>
<td>DDE 0000901351</td>
</tr>
<tr>
<td>MBE (Fuel Filter)</td>
<td>Detroit Diesel</td>
<td>DDE 0000901551</td>
</tr>
<tr>
<td>MBE (Fuel Water Separator)</td>
<td>Detroit Diesel</td>
<td>ABP N122 R50418</td>
</tr>
<tr>
<td>MBE (Fuel Water Separator, Bowl)</td>
<td>Detroit Diesel</td>
<td>RAI RR 30063</td>
</tr>
<tr>
<td>SCA Coolant Filter 8 to 20 Gallons</td>
<td>Fleetguard</td>
<td>FG WF2071</td>
</tr>
<tr>
<td>SCA Liquid 1 Pint Bottle</td>
<td>Penray</td>
<td>PIC 3000 16</td>
</tr>
<tr>
<td>Coolant Test Strips</td>
<td>Fleetguard</td>
<td>FG CC2602B</td>
</tr>
<tr>
<td>SCA Pre Charged Antifreeze 1 Gallon</td>
<td>Alliance</td>
<td>OWI ALA003</td>
</tr>
<tr>
<td>Cooling System</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transmission Filter</td>
<td>Allison</td>
<td>Spin On 29539579</td>
</tr>
<tr>
<td>Allison 1000, 2000 &amp; 2000MH</td>
<td>Allison</td>
<td>Internal 29545776</td>
</tr>
<tr>
<td>Allison MD3060,3000MH,HD4060,4000MH</td>
<td>Allison</td>
<td>Internal 29545779</td>
</tr>
<tr>
<td>Allison 3000MH &amp; 4000MH Deep Sump</td>
<td>Fleetguard</td>
<td>Spin On LF3342</td>
</tr>
<tr>
<td>Allison MT643 (Remote Mounted)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air Dryer Filter</td>
<td>Haldex</td>
<td>Kit# DG6026</td>
</tr>
<tr>
<td>Midland or Haldex Pure Air Plus</td>
<td>Haldex</td>
<td>Kit# DG6050</td>
</tr>
<tr>
<td>Haldex PURest Filter Kit</td>
<td>Haldex</td>
<td>Kit# DA331115</td>
</tr>
<tr>
<td>Haldex PURest Purge Valve Kit</td>
<td>Haldex</td>
<td></td>
</tr>
<tr>
<td>VC &amp; VCL Chassis</td>
<td>Chicago Rawhide</td>
<td>T224</td>
</tr>
<tr>
<td>Hydraulic Filter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In Line (Rear Radiator w/TRW Gear) 25 Mic</td>
<td>Freightliner</td>
<td>14-16028-000</td>
</tr>
<tr>
<td>Metal Tank (Side Radiator Only)</td>
<td>Fleetguard</td>
<td>87972A</td>
</tr>
<tr>
<td>Plastic Tank (Side Radiator Only)</td>
<td>Vickers</td>
<td>V0191B1R05</td>
</tr>
</tbody>
</table>
Reference Section
Important contact numbers / websites

- Freightliner Custom Chassis Corporation
  - 1-800-FTL-HELP (800-385-4357)
    - www.freightlinerchassis.com
    - www.fcccrv.org
    - www.fcocrv.org
    - www.accessfreightliner.com (please have chassis VIN number)
- Caterpillar engines - 1-877-777-3126
- Cummins engines - 1-800-DIESELS (1-800-343-7357)
- Detroit Diesel engines - 1-800-445-1980
- Allison transmissions - 1-800-524-2303
- Michelin tires - 1-800-TIRE-HELP (1-800-847-3435)
- Goodyear tires - 1-800-321-2136
- www.chrysleraffiliates.com or 1-888-444-4321
  - Must be an FCOC member


Engines:
2007 & 2010 Emissions Overview
Engines: 2007 to 2010
Freightliner Chassis

Exhaust leaves the engine with the pollutants NOx and PM.

Particulate Matter (PM) is trapped in the Diesel Particulate Filter (DPF).

DEF injected into the exhaust stream.

DEF solution 'hydrolyzes' into ammonia gas (NH3) which mixes with the exhaust.

Ammonia (NH3) and Nitrogen Oxides (NOx) react in the catalyst to form Nitrogen and Water.
Fuel & Oil Regulation

**Major Design Changes – Fuel and Oil**
All 2007 emission engines (industry wide)

**Fuel**: 500 ppm to 15 ppm sulfur
- 15 ppm, also referred to as ULSD (Ultra Low Sulfur Diesel) required to meet new emissions regulation

**Oil**: API CI-4 to CJ-4
- CJ-4 has a lower ash content to maximize DPF maintenance interval

---

**Fuel & Oil**

CJ-4 oil is backwards compatible for engines older than 2007.
DEF Tank

FCCC’s premium reputation is earned through even the smallest details – including the DEF Tank.

- DEF = Diesel Exhaust Fluid
  ✓ A solution of 32.5% automotive-grade urea and 67.5% purified water used in the SCR process.

FCCC DEF tanks are supported by a pressed steel structural bracket and engineered into the chassis design—mounted directly to the frame. This protects the tank from road debris and maintains overall structural integrity.

Competitor tanks are hung off the chassis as an add-on to the original design: not a CAD-designed component integrated into the structure like the FCCC DEF.
DEF Range

- DEF Driving Range?
  - Approximately 300mpg of DEF
  - 13 gallons will take you from LA to well into the Atlantic Ocean
  - Each gallon of DEF saves 2.5 gallons of Diesel Fuel over an '07 EPA
  - DEF National Average Cost: $2.79