

Freightliner Custom Chassis Corporation

Filling a Need for Higher Quality Mid-Size Buses

by Larry Plachno



The Freightliner Custom Chassis Corporation facility in Gaffney, South Carolina covers a total area of 74 acres and includes 283,000 square feet under roof. More than 20,000 chassis are built annually, and more than 600 people are employed at this facility. What makes these FCCC chassis so remarkable is that they are taking the industry to new levels of quality in the area of body-on-chassis buses. FCCC.

While Freightliner Custom Chassis Corporation (FCCC) can claim many achievements, perhaps the most important is that it has filled a need for quality mid-size buses in recent years. Among other things, FCCC has vindicated me in my prediction many years ago that higher quality body-on-chassis buses would soon become available on the United States and Canadian market.

One of the more interesting trends in the U.S. and Canadian bus industry in recent decades has been the increasing gap between the vans and small cutaway buses on the low end and the full-size integral coaches on the high end. Between World War II and the 90s, the length of most new integral tour and charter coaches moved from 35 feet to 40 feet to 45 feet. Coach manufacturers typically discontinued offering shorter lengths because there were no cus-

tomers, thus increasing this gap in bus sizes. On this side of the Atlantic, bus operators saw little or no advantage in buying shorter integral coaches. The primary difference between a 40- and 45-foot coach is only five feet of steel and glass. Hence, the selling price difference between the two sizes was minimal while operating costs were virtually the same.

Things are different in Europe where coach manufacturers often offer their integral models in different lengths. The advantage to the operator is not necessarily in the original purchase price but in the ongoing operating cost – due in large part to the higher price of fuel in Europe.

In addition, Europe had developed body-on-chassis buses into a fine art. Jonckheere built some body-on-chassis charter and tour buses that were not only difficult to tell from

integral coaches but also matched them in amenities. Even Australia had their remarkable GM-Dennings. The United States and Canada needed someone to step in and fill this gap. Since the traditional low price of fuel in the United States and Canada minimized the incentive for shorter integral coaches, it was obvious that the solution to filling this gap was in the area of higher quality and more sophisticated body-on-chassis buses. Hence, my prediction that this would take place. Freightliner's development of higher quality and more sophisticated chassis became the key to filling this need.

FCCC History

While the Freightliner name is normally associated with on-highway trucks, the story behind Freightliner Custom Chassis Corporation involves buses from beginning to end.

The FCCC motto, "Driven by You," is proudly displayed at the Gaffney facility. The saying is appropriate since FCCC works very closely with their customers to provide the chassis they need. FCCC.



Hundreds of completed chassis of different types are parked at the FCCC facility in Gaffney waiting for shipment to customers. FCCC provides several different chassis for a variety of applications. FCCC.



The Fageol brothers were ahead of their time. They founded Fageol Motors in 1916 in Oakland, California. In 1921, they were the first company in the United States to build a bus from the ground up, instead of putting a body on a truck chassis. For many years the Fageol buses were highly regarded in the bus industry. Fageol also built trucks which were also highly regarded.

The Fageol brothers moved to Kent, Ohio in 1927 and founded the Twin Coach Company to build buses. Due to the depression, the Fageol company went into receivership in 1932. A. Peterman, a Tacoma, Washington plywood manufacturer and lumber entrepreneur, purchased the Fageol factory in 1938. At first Peterman built trucks for his own use but in 1939 he began to sell his remarkable trucks to the public. They became known as Peterbilts.

Consolidated Freightways was already a major trucking company in the late '30s and used the early roads in those pre-interstate days. One of their major problems was in finding a truck powerful enough to climb the steep grades found in the mountains of the Western states. What Consolidated Freightways did was to reconstruct Fageol trucks in their maintenance facility in Salt Lake City. These trucks became known as "Freightliners."

Following World War II, Consolidated Freightways began to sell their trucks to other companies. For many years they were sold through the White Motor Company. In 1974, Freightliner began selling its own trucks. When deregulation arrived, Consolidated Freightways elected to concentrate on trucking and sold its truck manufacturing business and the Freightliner brand to Daimler-

Benz. In retrospect, this may have been the wrong move since Consolidated Freightways was a victim of deregulation and discontinued its carrier business on Labor Day weekend of 2002 while the truck manufacturing business has flourished under Daimler.

Since its acquisition by Daimler, Freightliner has had several connections with buses. In 1989, Freightliner acquired a plant in Cleveland, North Carolina (near Statesville), that previously built M.A.N. buses. Freightliner used the plant to build a new line of medium-duty trucks called the Business Class that proved to be very successful.

In 1998, Freightliner acquired Thomas Built Buses in High Point, North Carolina. In addition to producing all classes of school bus bodies, Thomas also manufactures forward control chassis.

More important to this story was a partnership with Oshkosh Truck (now Oshkosh Corporation) that led to the acquisition of Oshkosh Custom Chassis, which is now Freightliner Custom Chassis Corporation in Gaffney, South Carolina. At that time the facility was building chassis and chassis components for walk-in vans, diesel recreational vehicles, conventional school buses and shuttle buses. In following years, FCCC developed their impressive line of chassis for mid-size buses.

Bus Chassis Products

The Gaffney facility is located near Interstate 85 and approximately 55 miles southwest of Charlotte, North Carolina. With a total area of 74 acres, the site includes 283,000 square feet under roof with three produc-

tion lines. Approximately 600 people are employed at the facility that has the capacity to produce more than 20,000 chassis each year.

FCCC produces four different types of chassis for various bus applications. These include the medium-duty front engine S2 chassis, the hybrid-electric MB-HEV chassis, the straight-rail front engine MB chassis and the rear engine raised-rail XB chassis. In one way or another, all four of them have "raised the bar" on chassis quality over what was available even a few years ago.

S2-Series Chassis

FCCC's S2-Series chassis is popular for public transportation, resort and hotel shuttles, local tours and many special transportation needs. It is designed for medium-duty applications with front diesel power and is the only Freightliner commercial bus chassis to come standard with a hood in front. The wheelbase varies from 158 to 279 inches and the GVWR ranges from a low of 19,500 pounds to a high of 33,000 pounds.

A wide range of engines is available in the S2. The standard engine is a 190 horsepower Mercedes-Benz 7.2 liter diesel but larger 210, 230 and 250 horsepower versions are also available. Optional are a range of Cummins 6.7 liter engines from 200 to 260 horsepower. Regular equipment includes an Allison 2100 PTS automatic transmission while upgrades are available to the 2200, 2500 or 3000 Allison PTS.

Hydraulic disc brakes are standard equipment but Meritor air brakes are optional. Standard equipment includes a multiplex electrical system with an electrical drop for ADA wiring. Noteworthy features include R22.5 "big bus" tires, a 55-degree wheel cut, tilt/telescopic steering wheel, standard cruise control, programmable high idle, and optional high-output alternators.

The Freightliner S2 chassis is typically used on upscale buses with a front hood in what is generally known as a "cutaway" design. Bus manufacturers currently using the S2 chassis are Champion Coach and General Coach. One of the best-known buses built on the S2 chassis is the M1235 sold by ABC companies.

Alternate Fuel Chassis

Freightliner Custom Chassis Corporation began developing alternative fuel vehicles in 2002. Their newest development in this area is the MB-HEV hybrid-electric chassis that was featured at the 2008 Bus Con convention in Chicago. It uses an internal combustion diesel engine and an electric motor driven by lithium-ion batteries. The result is an up to 40 percent improvement in fuel economy.

The MB-HEV model has a Cummins ISB 6.7-liter engine and an Eaton transmission with an automated clutch. In addition to the

Among the upscale mid-size buses offered in recent years is the Apollo from Glaval Bus Corp. Built on a FCCC MB-55 chassis, the Apollo offers a significant step up from the traditional cutaway styling. FCCC.





The Supreme Trolley is built on an FCCC MB-55 chassis and is sold by Specialty Vehicles. The MB-55 chassis is popular for various specialized applications including trolley-themed buses. FCCC.



The 3035RE from ABC Companies is built by GCA. It uses an FCCC XB-R raised rail chassis and offers numerous big coach features including a restroom and underfloor luggage compartments. NBT.

use of regenerative braking to recharge the lithium ion batteries, the hybrid has a sophisticated energy-management system that selects the most efficient mode of operation – diesel, electric or both. FCCC will begin accepting orders for the MB-HEV chassis in the fourth quarter of 2009.

FCCC also offers chassis powered by compressed natural gas (CNG). This offers a significant reduction in emissions. A Cummins ISB B Gas Plus engine is used for power which offers an excellent balance between low-end acceleration and high-end torque.

MB-55

Freightliner's MB-55 chassis model is a front engine straight-rail chassis that is very versatile and can be used for numerous applications from light- and medium-duty commercial transit to airport and hotel shuttle service. It is available with a GVWR from 19,500 to 30,000 pounds and wheelbases from 158 to 300 inches. The MB-55 is popular with flat-front buses with a front engine.

The standard engine is a 200 horsepower Cummins 6.7 liter ISB but upgrades are available to 220 or 240 horsepower. Noteworthy is the fact that a 195 horsepower Cummins 5.9 B Compressed Natural Gas (CNG) engine is available as well as a Cummins ISB 5.9 engine that runs on Liquid Propane (LP). The Allison 2200 PTS automatic transmission is standard equipment although several options are available.

Bosch hydraulic disc brakes are standard but Meritor axles with air brakes are optionally available. An air suspension is also available. Service points including hydraulic oil, coolant reservoir, transmissions fill, engine fill, dipsticks and the air cleaner indicator are clustered in one area to make customer servicing more convenient. Noteworthy features include a 50-degree wheel cut, optional full-size 22.5 wheels, and a tilt/telescopic steering wheel.

The MB-55 chassis could be considered Freightliner's most popular because it is used by more customers than any of the other chassis. It is typically used on upscale flat front, front engine mid-size buses. Bus manufacturers using the MB-55 include Champion Coach, Glaval Bus Corp., Startrans Bus and Supreme, ElDorado National, Spanish Transportation, Trolley Enterprises, Molly Trolley, Cable Car Concepts, Hometown Trolley, and Classic Trolley. As you can tell, the MB-55 is often used for trolley-themed buses.

XB Series

To some extent, the XB-Series chassis is the flagship of the FCCC product line. Offered in both straight-rail and raised-rail configurations, the XB chassis is a diesel

pusher that offers some amazing features and can be used on buses with a high quality "big bus" appearance. The XB-S straight-rail chassis is available with a GVWR from 26,000 to 32,000 pounds while the XB-R raised-rail chassis has a higher GVWR range from 26,000 to 37,600 pounds. This has become the chassis of choice for the higher quality buses in this product range.

The XB-Series chassis is powered by a Cummins 6.7-liter electronic diesel engine that is mounted in the rear. Six different options are available starting from a base of 200 horsepower and 520 pound-feet of torque to a high end with 300 horsepower and 620 pound-feet of torque. An Allison 2100 PTS transmission is standard while

The MB-55 chassis may be considered the most popular at FCCC because it is ordered by more customers than any other FCCC chassis. It is a front engine, straight-rail chassis that can be used for numerous applications including upscale flat-front buses and trolley-themed buses. The standard engine is a 200 horsepower Cummins ISB, although increased power or CNG engine is also available.





The XB-R is a straight-rail chassis with a rear engine and numerous quality features. It is typically used for the highest quality mid-size buses with a big coach appearance and amenities. FCCC.



The Caio G3400 mates a body from Brazil with an XB-R chassis. What results is a mid-size rear-engine bus with a big coach appearance and numerous big coach features. FCCC.

both the Allison B300 and 3000 PTS transmissions are optional. All are automatic with a push button shifter. Engine braking is provided through the Cummins VG Turbo, a variable geometry turbocharger that increases safety while reducing regular service brake usage.

Special features include options on both the front and rear axles. Air suspension is standard including an optional ZF independent front suspension on the XB-S chassis. Meritor® WABCO® ABS air brakes are standard equipment although Bendix® air disc front brakes are optionally available on the XB-R chassis. All of the XB-Series chassis use heavy-duty 50,000-psi high strength steel frame rails with double dogbone crossmembers in high stress areas. The rear section of the chassis is lowered for the engine.

The FCCC XB-S is a straight-rail chassis that shares several features with the XB-R. It is particularly popular with rear-engine trolley-themed buses including the Molly Trolley and Hometown Trolley. FCCC.

There are several areas where the Freightliner XB chassis has significantly raised the bar on quality. The engine compartment is purpose-built to make maintenance easier with the dipstick and fluid containers more accessible. Drivers like the tilt/telescopic steering wheel that is controlled by a foot-lever release. In addition, drivers also like the full dashboard instrument cluster that includes an electronic speedometer and fuel gauge as well as electronic oil pressure and coolant temperature gauges. Included in the instrument cluster is a driver's message center that provides information or warnings on systems and components.

The XB-S straight-rail chassis has been popular with trolley-themed buses. Manu-

facturers currently using this chassis include Molly Trolley and Hometown Trolley.

In comparison, the XB-R raised-rail chassis is typically used for the highest quality buses with a big coach appearance and amenities. Current users of the XB-R chassis include ABC Companies and Champion Coach, Stallion, CAIO and SBM Inc. (Craftsmen Limo).

Success Stories

Several of the bus manufacturers have had substantial success with Freightliner chassis. Here are a few who were willing to share their experiences with us.

One of the pioneers in this area is ABC Companies. ABC had sold the 40- and 45-foot Van Hool coaches for years. By 2000, their customers were looking for a higher quality mid-size bus that would be compatible with the big Van Hool coaches. Due to costs, ABC elected to go with a body-on-chassis product but were disappointed in that existing products on the market did not have their desired level of quality. What resulted is that ABC elected to use the Freightliner FB65 chassis and have General Coach America build a bus to their higher quality specifications. The resulting model became known as the ABC M1035, a very high quality cutaway bus. It offered disc brakes as well as the largest windshield and longest wheelbase in its class.

When Freightliner replaced the FB65 chassis with their updated S2 chassis, ABC and General Coach America upgraded their bus to the new model M1235. Noteworthy changes included improvements in ride quality and a new automotive dash.

Based on the success of the M1235, ABC customers began asking for a flat-front, mid-sized 35-foot coach that could run with the big Van Hool coaches. Once more ABC was





The FCCC XB-R chassis is shown at the start of the General Coach America assembly line at their plant in Imlay City, Michigan. CGA builds the 3035RE bus for ABC Companies. NBT.



Further down the GCA assembly line at Imlay City, we see the web frame body structure of the 3035RE taking shape. GCA also builds a cutaway type bus for ABC using an FCCC chassis. NBT.

faced with finding a chassis that met their quality requirements. Louis Hotard from ABC said: "The raised rail XB-R chassis from Freightliner Custom Chassis Corporation offered the best choice. The flexibility of the XB-R chassis made this product look and feel much like a full-size motorcoach in a 35-foot package."

What followed were several trips to the factory where input from the ABC staff and customers resulted in a highly customized product with relocated air tanks, and modified engine compartment accessories. Freightliner's raised-rail chassis design also allowed for one of the largest under-floor, pass-through luggage compartments on the market. Known as the 3035RE, this

new 35-foot flat front rear engine bus was also built by General Coach America and was an immediate success. Many operators feel that it is a smaller version of the big coaches because of its appearance, ride and amenities.

Louis Hotard went on to say: "Another main item offered to ABC customers was the factory support of the Freightliner Custom Chassis Corporation in Gaffney, South Carolina. As this plant does not build trucks, ABC customers enjoy direct access to FCCC service departments through ABC Customer Care, or directly if that is their choice. By not having to rely on truck dealers for factory support, service issues can be resolved in a timely manner."

The 3035RE was designed by ABC Companies to operate in commercial coach fleets alongside big coaches. As a result, it has both a big coach appearance as well as numerous big coach features for both passengers, drivers and service technicians. GCA builds the 3035RE for ABC Companies at their facility in Imlay City, Michigan using an FCCC XB-R chassis. NBT.



In 2005, Stallion Bus was looking for a high-quality chassis to mate with their new 38-passenger midsize bus body. John Gore from Stallion said that they came up with a "very short list." He went on to say: "Stallion needed a reliable, proven chassis from a manufacturer with a deep understanding of the transportation industry, a very strong power train, parts distribution second to none, and a nationwide service program. The solution seemed obvious in choosing Freightliner Custom Chassis Corporation."

What transpired is that Stallion's engineers worked with the FCCC engineers at Freightliner's Gaffney plant to design a custom chassis for its Stallion 938 model – a 38 passenger, mid-size bus. The first Stallion 938 rolled out of Stallion's Corona, California facility in late 2006 with a Freightliner XB-R chassis underneath it.

Stallion delivered 68 new buses over the next two years. John Gore acknowledges the impact of the Freightliner chassis: "With customer satisfaction at an all time high, Stallion's choice of the FCCC chassis has proven to be the most reliable product in the midsize market today." John goes on to mention that in 2008, the 938 went through a 12-year/500,000 mile "Altoona test" conducted by the Bus Testing and Research Center at Pennsylvania State University. The 938 was subsequently approved for FTA funds to federal, state and local governments.

Stallion's success with the 938 and requests from customers prompted the development of a shorter 30-foot, rear engine bus. The new bus will be introduced in mid-2009 and will also use a FCCC chassis.

John Gore gives a lot of credit to the Freightliner chassis: "The FCCC XB-R chassis is second to none in its ability to provide

a smooth, stable foundation which definitely makes the difference in overall customer satisfaction with the ride, durability and versatility usually reserved for the larger over the road monocoque coaches. Its uniquely short-turning radius also allows for the coach to be driven in tight conditions usually reserved for smaller front engine products."

Brent Phillips from BusWest credits much of their decision to take on and sell the Caio bus line to its Freightliner chassis. It was noted that Caio in Brazil works closely with Mercedes-Benz, a sister company to Freightliner. FCCC sent engineering staff to Brazil to work directly with Caio body engineers to develop and then validate the integration of the XB-R chassis with Caio's G3400 body.

Phillips says that: "Unique to the Caio is the fact that the upper C-channels of the XB-R chassis are effectively replaced by the body super-structure of the G3400. The result was a more tightly integrated body and chassis, reduced weight, improved strength and not the least, increased baggage capacity. We were very impressed by FCCC's involvement in this process and the certification of the final design."

"Freightliner customer support and warranty systems are second to none in North America" continues Phillips. "FCCC has the infrastructure and systems of Freightliner Corporate systems (parts, warehousing, fulfillment, technical support, online documentation, field service, etc.) with customized training and requirements for FCCC dealers. Through the BusWest parent company, Velocity Vehicle Group (Los Angeles



The versatility of the FCCC staff and products can be seen in the XB-R chassis used on the Caio bus. Upper C-channels on the XB-R chassis are effectively replaced by the body super-structure on the Caio G3400. This provides several advantages including increased baggage capacity. The folks from Caio were so impressed with their baggage capacity that they showed it off at the UMA Motorcoach Expo in Orlando in January of 2009. NBT.

les Freightliner), we are able to completely warranty and service the Caio product roof to rubber."

Based on these and other success stories, it is obvious that Freightliner Custom Chassis Corporation has raised the bar on midsize bus chassis and moved the industry into a new era of higher quality midsize buses. Due in large part to the Freightliner chassis, today's bus operators can now add higher

quality body-on-chassis buses to their fleets. Clearly, this is a major step forward for the bus industry and its passengers. □

Stallion looked for a higher quality chassis to mate with its bus body from China. They selected the FCCC XB-R raised rail chassis. Stallion has been so pleased with the chassis that they put it on display in their area at the UMA Motorcoach Expo in Orlando in January of 2009. NBT.



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