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# ARBOC

rolls out the Spirit of Liberty





With prototypes complete, the rear engine Spirit of Liberty is well into the production prove-out phase of the program.

# Major changes liberate passengers

## ARBOC Specialty Vehicles readies the Spirit of Liberty for 2014 deliveries

By David Hubbard

The long awaited rear engine Spirit of Liberty bus from ARBOC Specialty Vehicles, Middlebury, IN, is well into the production prove-out phase of its program. With prototypes complete, a full cadre of testing is progressing to assure a robust and reliable product for all customers. Compliance to not only FMVSS, FTA (Altoona), but criteria established by industry partners Freightliner Custom Chassis (FCCC), Modine, Cummins and others assure that the final product will fully meet customer expectations.

With its bent for innovative engineering and manufacturing, the company has continued to refine this concept since its preproduction showings at a number of expos and trade shows since 2012. Beginning where minimum American with Disabilities Act (ADA) requirements leave off, ARBOC debuted

its basic multi-patented low-floor concept in 2008 with its Spirit of Mobility cutaway to provide Random Access — easy and equal access for all passengers including those requiring walkers, wheelchairs and scooters.

“With the Spirit of Liberty, we have successfully met our own challenge to develop a rear-wheel drive, low-floor pusher bus,” says ARBOC co-founder James Bartel. “The Liberty bus features the same easy entry ramp and has a continuous flat floor from front to rear.”

“We designed the Liberty model with the future in mind,” he adds. “The open low-floor passenger area with no steps, the oversize wheelchair positions and the incorporation of weight reducing technology address key operator concerns and will continue to be requirements for at least the next decade.”

Achieving the proprietary low floor throughout the Liberty

required the development and manufacture of a unique chassis that would not separate the passengers from the driver in a split-level configuration. Bartel says that any standard chassis would not work, nor would conventional construction and manufacturing methods.

The solution in this case features a one-piece structural composite floor with molded in-seat attachments and chassis mounting that weighs in at 800 pounds, which reduces the overall GVW by more than 2,000 pounds. This structural floor is bonded and bolted to the Freightliner chassis built expressly to the ARBOC design and specifications.

“This is an ARBOC product with an exclusive Freightliner chassis build that does not extend to other OEMs,” says Don Roberts, ARBOC president and CEO. “This is an absolute first for Freightliner Custom Chassis Corporation.”

“This has been an ideal partnership to date, as we work closely together to provide ARBOC a dedicated, uniquely designed and purpose-built low-floor chassis for its customers,” says Tony Sippel, director of sales and marketing for FCCC. “Instead of a modified existing chassis with limited options and capabilities, ARBOC and its customers get a custom chassis for their unique applications, one that offers streamlined service and warranty coverage. It will offer a wealth of very exciting features for their customers.”

ARBOC selected Freightliner to give Liberty operators access to warranted aftermarket service and parts through the expansive network of Freightliner service facilities.

“We would not be able to provide this service benefit on our own,” says Roberts. “As a labeled Freightliner chassis, maintenance and warranty will be much easier for our customers throughout North America.”

With a curb weight of 16,500 pounds or less and a GVW of 25,900 pounds, the Liberty is roughly 10,000 pounds lighter than competitive models. As such, ARBOC expects the bus to comply with 2016 federal fuel economy standards using a Cummins 240 HP ISB diesel engine coupled with the Allison B220 six-speed transmission. Federal studies have shown that every 1000 pounds GVW saves equals a 2.5 to 3 percent gain in fuel economy.

“This indicates a plus-20 percent fuel economy gain for



Open low-floor passenger area with no steps, oversize wheelchair positions and weight-reducing technology address key operator concerns.

the Liberty,” Bartel says. “This number is significant when compared to the 12- to 18-percent fuel economy gain versus current hybrid buses.”

The body will utilize the proven manufacturing processes and techniques developed on the current Spirit of Mobility product line, providing a basis for cost-effectiveness. Roberts says the Liberty will accommodate up to 37 passengers, 14 standees and the driver with significant margin for added options and content.

All passengers enter on a 34-inch wide, 1:6 ramp by either Ricon or Braun. The low floor slopes two degrees front to back with theater seating with no step over the rear axle and a clear 39-inch pass between the wheel wells.

With wheelchairs and scooters becoming larger and heavier, ARBOC says the ADA standard wheelchair space of 48 inches is not adequate. Therefore the Liberty provides standard 54- to 60-inch spaces and up to six positions with the latest Q'Straint securement devices without intruding on the next row of passengers.

Roberts says theater seating is a trademark feature in all configurations of every ARBOC vehicle.

“Every passenger enjoys a forward view through the



The open low-floor passenger area with no steps and oversize wheelchair positions will accommodate up to 37 passengers, 14 standees and the driver with significant margin for added options and content.





## ARBOC

continued

windshield, but perimeter seating is available if desired," he says.

The rear doors to the engine compartment are butterfly-style for safe access. The right-hand door opens curbside to expose all the routine service and maintenance points. The front doors open in the same manner to allow easy access for routine maintenance. The left-hand streetside door remains shut except for specific inspections and repairs. The engine shuts off automatically anytime the compartment opens.

In addition to the tight turning radius within the overall bus dimensions, drivers of the Spirit of Liberty can also enjoy a broad open view through the front-wedge, asymmetric windshield. Together, the overhead Velvac mirrors and the shaped windshield minimize blindspot issues and blockage from the pillar on the driver's side.

The company believes the Spirit of Liberty gives the market, for the first time, a cost-effective, fuel-efficient low-floor rear diesel bus. ARBOC says it will take the Spirit of Liberty on a demo tour starting in June, visiting its major dealers and transit agencies throughout the U.S. and Canada. ARBOC expects deliveries to begin in the first quarter of 2014. **BR**

The asymmetric windshield minimizes blindspot and blockage from the column from the driver's seat.

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