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Daniel Galindo, a master mechanic leader, works in one of his places of business—the engine compartment of a Metro Liner.



Photos by Ned Racine

Metro Liners Challenge Mechanics with High-Tech Sophistication

- Laptops and schematics become primary tools, not wrenches
- [See also:](#) Are You Master Mechanic Material? Evaluations Set for February 2008

By NED RACINE

(Dec. 7, 2007) Sleek, modern and roomy, Metro's 60-foot articulated buses have been invaluable in moving passengers along the agency's most crowded lines. They have also presented quite a learning curve for the mechanics who keep them running.

Take Daniel Galindo and Rommel Vargas. Galindo, a master mechanic leader, and Vargas, a master mechanic, service the 60-foot buses—also known as Metro Liners—for Arthur Winston Division 5. No strangers to buses, Vargas began working on them in 1989; Galindo began in 1990. Even so, the 60-foot articulated buses surprised them.

"Even the engine itself is saturated with sensors and control valves," Galindo said. Vargas remembers that early in his experience with the



Rommel Vargas, a master mechanic, points out components of the Metro Liner's undercarriage. For Vargas, learning to service the Metro Liners centered on understanding the software controlling them.

buses, he traced an electrical problem and wondered how he would spot it in such a large vehicle.

If Vargas and Galindo do not wax poetic about the Metro Liners' passenger capacity and pleasing appearance, it is because their focus turns to those components—such as the computer aided braking system and the 24 fuel tanks—that keep the 76 60-foot articulated buses at Division 5 running.

Learning where things are

"Like any new bus, it's just learning where things are, how they react and the symptoms," Vargas said, sounding like a bus physician. "If you get a certain kind of symptom, you kind of know where to look."

An onsite warranty mechanic helps them diagnose the symptoms, as do their contacts at NABI, the bus manufacturer, and Vehicle Technology staff. On the day we spoke, Cummins, the engine manufacturer, was onsite upgrading the articulated bus engines.

Surprisingly, not all of the bus divisions face identical challenges in maintaining the Metro Liner, according to Galindo. "It all depends on what type of streets they drive them on. We have the problem of wire shaking."

In the early days of operating Metro Liners, Vargas remembers Division 5 mechanics facing electrical problems because the data cable would ground out, giving the vehicle a nervous breakdown.

Hearing Vargas refer to a data cable, one wonders if the Metro Liner is a bus or a computer? As Galindo and Vargas found out, it's both.



Alex DiNuzzo, Division 5 maintenance manager praises master mechanics Daniel Galindo and Rommel Vargas for tackling the new technologies found in Division 5's 60-foot articulated buses.

Training meant understanding software

For Vargas, learning to service the Metro Liners centered on understanding the software controlling them. "The whole bus is controlled by a computer. Everything is related."

"Our heavy tools, we hardly ever touch them," Vargas said. "It's all voltmeter, laptops. . . that is basically our troubleshooting. There's a lot of information in [the bus], but you have to know how to get it out."

What happens if the Metro Liner's computers don't play well together?

"Each computer sees a signal from a different computer," Vargas said. "So if it doesn't see the signal" the computer may nap. "Sometimes the first thing you do is grab a laptop and your schematics."

Galindo explains that "a certain logic has to be met." If it is not being met, he examines a vehicle's hard wiring and components to diagnose the problem.

Alex Di Nuzzo, Division 5 maintenance manager, began working on buses in 1980. He praises Galindo and Vargas for tackling the new technologies. "I know a lot of these guys read manuals on their own; they'll do research on their own."

Old buses easier to troubleshoot

Di Nuzzo is amazed how different the older buses were. "It was easier to troubleshoot. In those days, if the electrical system was not at 100 percent, the bus would still run. But now if the electrical system is not charging correctly, it's going to create a lot more problems."

This month the 60-foot articulated buses will have been at Division 5 for two years. Galindo and Vargas have become Metro Liner experts, perhaps even more than the technicians who built them.

"We see [the buses] day in and day out," Vargas said. "They probably just

test them, but we see the results of what happens to them."

Neither Galindo nor Vargas complain about the technological wrinkles they continually face. "It's also our playground," Galindo insisted. "That's why we became mechanics, because we like tinkering around. So when we get new technology, it's like a new toy for us."

"The transmission is a new generation," Vargas said with excitement. "The engine is also something new. The new [articulated buses] are coming with a new [input/output] system. It's nice because we're staying on the cutting edge...."

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