



National Bus Trader

The Magazine of Bus Equipment for the United States and Canada

Volume XXXVII, No. 10

September, 2014

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MCI's Reliability Rally

Introducing Another Round of Improvements on the J and D Models



The star of the MCI Reliability Rally events was the new J4500 model with its new ZF axles and Bendix air disc brakes. Seeing a coach on a lift in the center of the Chicagoland Speedway in Joliet, Illinois was obviously a unique experience. However, this arrangement allowed coach owners to have a good look at the components from below.

by Larry Plachno

Spring and summer of 2014 witnessed several MCI Reliability Rally events at various locations around the country. Starting with the Texas Motor Speedway in Fort Worth on April 30, subsequent events were scheduled at the Chicago Motor Speedway in Joliet, Illinois on May 22; then to the Gillette Stadium in Foxborough, Massachusetts on June 4; the Sands Resort & Casino in Bethlehem, Pennsylvania, on June 11, the Atlanta Motor Speedway in Hampton, Georgia on June 26 and finally AT&T Park in San Francisco on July 8.

"The rallies reflect our Reliability Driven culture to provide our customers with the highest-quality coaches with the lowest total operational costs. We want to showcase the product enhancements in way that can be

touch, felt and experienced," said Brent Maitland, vice president of marketing and product planning for MCI.

In addition to some serious upgrades to the popular J4500 model in recent years, MCI was again offering a round of improvements. This time some of the upgrades also applied to MCI's D-Series coaches. While there were other improvements, the two major new features were a move to ZF axles and Bendix air disc brakes.

After diving into some of the technical aspects and talking with people from both ZF and Bendix, our feeling is that the main reason for this change to ZF axles and the Bendix® ADB22X™ air disc brake is that they are simply built better. When you go

through the technical design on both products, you are left with the impression that the engineers simply figured out what could be improved from the past and then worked on it.

Design and Testing

As you might expect with conservative MCI, this decision was not made quickly and involved a great deal of thought and testing. Maitland said that the initial work on new axles and suspension actually started in 2007-2008. The MCI coaches already have ZF steering hence ZF was already established as a quality supplier. Many would say that the ZF axles were a logical choice because they have been proven both in the United States and elsewhere in bus applications.

MCI, ZF and Bendix worked together to come up with a balanced system. Their goal was to provide both reliability as well as fuel economy and reduced cost of operation. As a result, several coaches with the new equipment were put through some rugged paces at the Bosch Proving Grounds in New Carlisle, Indiana. A portion of the test facility simulates various types of road surfaces and conditions. In tests with cruise control set at 65 miles per hour, the MCI showed 6.6 percent better fuel economy than a coach

from another manufacturer with similar equipment.

In spite of the fact that the ZF axles and Bendix air disc brakes had already proven themselves in heavy-duty vehicles around the world and at the Bosch Proving Grounds, MCI tested the new systems in actual operation. Nine pilot coaches with the ZF axles and Bendix brakes were put into actual field tests with larger operators around the country.

Here, the new J4500 puts on a demonstration and shows off its impressive turning radius. The new turning radius of slightly less than 41 feet is less than the length of the coach. Those of us who had a chance to ride on board during this demonstration were impressed.



The advantages of putting the new J4500 on a lift are obvious. Here, the coach owners take advantage of the situation to get a good look at the new ZF axles and Bendix air disc brakes while standing up. Stertil-Koni provided the lift for this.



ZF Axles

MCI previously offered Meritor axles but moved to the proven and increasingly popular ZF axles following several other coaches. However, it should be noted that different axles are standard equipment on each model. The J4500 model will now have an independent front suspension and an independent tag axle as standard equipment. The D models, considered more of a "bread and butter" offering, will have a solid beam front axle and standard tag with an optional passive tag.

The J4500 will now come with the RL 80 E Independent Front Suspension and the RL 80 E Independent Tag. ZF started with independent front suspensions back in 1992. These axles are designed specifically for coaches and are manufactured in Gainesville, Georgia.

One of the major advantages of the ZF RL180 independent front suspension is that it incorporates a high wheel cut for a better turning radius. It also separates steering forces from axle load forces. This axle offers low maintenance costs because of wishbones with maintenance-free rubber-metal bearings at the axle/vehicle mounting points.

Another advantage of the independent front suspension is that it provides a smoother ride over bumps. It also offers a better ride in crosswinds. Turning radius is reduced from a 47-foot turning radius to a 40-foot and 11-inch turning radius. It also raises and lowers faster.

MCI's D models will now have the ZF RL 80 E solid beam front axle and a RL 80 E tag axle. Features include common brake rotors and unitized bearings that come with lifetime grease.

The drive axle will be a ZF A 132. It comes in different axle ratios so you can lean more towards economy of operation if you would like. At the MCI event the service staff mentioned that you should take the shafts out if you want to tow the coach.

The Bendix ADB22X

One of the interesting comments that came up at MCI's Reliability Rally is that MCI coaches already have several Bendix products and systems as standard equipment. Both the MCI J and D models have a Bendix AD-1S[®] air dryer as standard equipment. Bendix also supplies the SmarTire[®] tire pressure and temperature monitoring system. I have one on my coach and am delighted with it. In addition, Bendix provides valves, their anti-lock braking system and their electronic stability program. Noteworthy is the Bendix[®] Wingman[®] active cruise with braking that radar technology to detect vehicles and objects in the front of the coach.



Coach owners and industry suppliers boarded the J4500 for a demonstration ride to show the new Bendix brakes and Wingman system. Here, Rich Young, MCI's professional demo driver, explains how the Wingman system works with cruise control on or off.



A car driven by Brent Maitland slowed down in front of the J4500. It was detected by the Wingman radar on the front bumper of the coach. First, it reduced throttle, then applied the Jake brake and finally applied the foundation brakes to maintain a safe distance.

We went through some of the technical engineering on the ADB22X disc brake and discovered that many of its advantages are based on the fact that it is built better. For example, Bendix uses a two-pin design instead of four pins between the caliper and the carrier. This helps keep them parallel and enables them to slide freely. At the same time, Bendix has a dual piston system instead of a single piston. This provides a more even distribution of force pressing the pads against the rotor.

Bendix designed this brake with a mono block caliper design rather than two-piece. The friction couple is also improved with a special pad composition that optimizes brake performance and lining life.

An interesting feature of the disc brakes is that they practically eliminate the brake fade associated with drum brakes. With the old drum brakes, there was a chance of heating the drums with extensive brake usage on a long downhill run. When heated, the drum expands and thus you lose brake capability with the brake shoes. However, with disc brakes, the rotor expands into the brake pads when it gets hot. Thus your braking actually stays constant.

Bendix was among the first to manufacture air disc brakes in North America with the operation of a state-of-the-art production facility, which began in 2005. It offers passenger car-like braking control, easier serviceability and the safety of adaptive

cruise control. Brent Danielson, MCI's product planning engineer said: "The Bendix is a more robust, lighter-weight system for more payload capacity and a lower cost of operation, with improved tire wear and fewer parts to be replaced."

He went on to say that: "Service requires replacing bearings rather than the entire hub, and there is one common rotor part rather than two. The Bendix system also offers adaptive cruise control that detects a coach's position behind other vehicles and automatically reduces the throttle or applies the brakes to maintain safe following distances."

Bendix notes that since 2009, annual production levels have increased more than fivefold due to the growing popularity of air disc brakes in North America. In late 2013 the Bendix ADB22X air disc brake surpassed the 500,000-unit production milestone. In moving to the Bendix ADB22X brake, MCI was able to eliminate the rear sway bar, customize and standardize parts and extend the rotor and brake pad life. It is capable of stopping a coach 42 feet shorter than today's drum brakes from 60 miles per hour and 100 feet shorter from 70 miles per hour.

Other features include the ability to replace a pad in 15 minutes, improved side-to-side brake consistency, a sealed design that no longer requires a periodic lube and an advanced friction material that significantly reduces brake fade. I did find out that the Bendix people worked with the ZF and MCI people to modify their product slightly to work with the new axles. This gives the new coach owners the best possible alternative.

Bendix® Wingman® ACB – Active Cruise with Braking

A major feature of the new Bendix braking system is Wingman Active Cruise Brak-

In addition to the J4500, MCI also had a Setra S 417 on display. It was equipped with the center door, lower level restroom and the rear lounge area. It also went out for demo drives showing turning and braking.





Attendees had a great opportunity to speak with several industry suppliers. Here I see Jim Sylvester and Rick Palmer from Stertil-Koni and Lee Steinberg from Advantage Funding.



As suppliers of the new components, both ZF and Bendix had booths. Staff from both companies provided information seminars talking about their products on the new MCI.

ing, which functions when cruise control is on and speed is set. This system reduces throttle, engages engine retarder and will apply foundation brakes to help the driver maintain a set following distance behind a forward vehicle.

Alerts, both audible and visual, are always available, whether cruise control is engaged or not. Drivers may receive a Following Distance Alert, to let them know when they are getting too close to a forward vehicle. Impact Alerts warn the driver that a collision with the forward vehicle is likely and they should address the situation immediately. Finally, Stationary Object Alerts provide up to a 3.0 second

alert when a metallic object may be blocking the lane of travel.

It is important to note that The Bendix Wingman Advanced system does not replace the need for safe drivers. No commercial vehicle safety technology replaces the most important safety components of all – a skilled, alert, professional driver exercising safe driving habits, as well as continuous, comprehensive driver training.

Other Improvements

While the new ZF axles and Bendix air disc brakes are the primary improvements in the new J4500, there are a few other items

worth mentioning. The most noteworthy of these might be MCI's new dynamic suspension system. The new system is more efficient, and technically more economical, because it requires less air and refills faster. Both front and rear rise are standard.

Another noteworthy feature is the new parcel racks in the J model. These hang down less and hence open up the aisle. There are also new passenger comfort modules with air-flow and reading light controls above the seats.

Both the J and D models feature the Cummins ISX 12 engine. MCI has been working with Cummins to improve fuel economy. Today's engine has a new Engine Control Module (ECM) and offers two percent better fuel economy over 2012. On board diagnostics continually monitor performance. The new engine warranty extends for two years with unlimited miles.

MCI Reliability Rallies

As already mentioned, MCI held several Reliability Rally events around the country to showcase these improvements. We attended the one at the Chicagoland Speedway in Joliet but we were told that the activities were very similar at all of them.

The events typically ran from 9 a.m. to 3 p.m. Those who arrived early were rewarded with a breakfast awaiting them. The morning then started out with an opportunity to meet with several industry suppliers who had tables and displays around the room. While ZF and Bendix were prominent, other suppliers we noted included Cummins, Amaya, Allison, Stertil-Koni, Advantage Funding and the Hamsar LED headlight people.

I took advantage of the situation to talk to the Bendix people about their SmarTire system and temperatures on tires. We

The Reliability Rally events were well organized with a morning seminar and educational session, a nice lunch at noon and an afternoon of inspecting buses and taking test drives. Here, your editor's camera captures a somewhat candid shot of some of the MCI staff near the J4500 on the Stertil-Koni lift. That is Pat Plodzzen with a smile standing next to Alice Lemon.



recently came west out of Tallahassee on Interstate 10 on a hot summer day and I was concerned about the temperature of the hottest tire on my coach. The Bendix people told me that the hot tire warning is not set to go off until the tire gets above 180 degrees. That was comfortably above where I normally get concerned.

As the morning wore on, we were treated to a series of information seminars presented by Maitland from MCI as well as the experts from ZF, Bendix and Cummins. The ZF people covered the advantages of the new ZF

axles and even some maintenance insights. Staff from Bendix mentioned the various components they supply on MCI coaches and presented information on their air disc brake system. Cummins also had the opportunity to talk about their new engine with increased fuel economy and on-board diagnostics.

MCI and the sponsors graciously offered a lunch. Afternoon activities were primarily outside. Coaches on display included a new Setra S 417 showing the center door and club corner seating at the

rear. There were also a few pre-owned coaches for sale. I counted an E4500, two D4505 coaches and a J4500. Interestingly, the oldest of them, the 2004 E4500, already had a sold sign on it.

MCI had some of the pilot coaches with the new improvements on display. One was raised up on a Stertil-Koni lift. For much of the afternoon, a crowd could be seen taking advantage of the view to get a close look at the new axles and brakes from the bottom up.

One of the more interesting options in the afternoon was a chance to ride on one of the newly equipped J4500 coaches while it demonstrated the Bendix Wingman Active Cruise Braking. Maitland from MCI drove an automobile around the speedway ahead of the coach. As his car slowed down, it came closer to the front of the coach and was detected by the Wingman radar. The system automatically reduced throttle and then applied the retarder and the brakes on the coach to maintain a safe following distance.

Again, no safety system can replace the need for skilled, alert, professional drivers exercising safe driving habits, as well as continuous, comprehensive driver training.

We were also offered an opportunity to ride in the Setra S 417 coach. One of the more impressive parts of that ride was the ability of the Setra to turn in a relatively short radius. Those who were interested were given a chance to ride a pace car around the speedway track at speed. The event ended with a drawing for prizes that included MCI branded clothing and special seats at an event at the Chicagoland Speedway later in the year.

While several pilot coaches with the new axles and brakes are already in service as test units, the first regular production coaches are expected on the road in August or September. For more information, ask your MCI representative. □

There were four pre-owned coaches on display at the MCI Reliability Rally at the Chicagoland Speedway in Joliet, Illinois. Here, you can see the "sold" sign on the 2004 E4500. To the right was a D4505, a J4500 and another D4505.



The afternoon activities were primarily outside. In this scene, the J4500 is up on a lift so coach owners can view the ZF axles and Bendix brakes. Adjacent, the Setra S 417 is preparing to board passengers for another demo ride around the Speedway track.



From the
September, 2014
issue of
National Bus Trader
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