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# **Workhorse® Technical Report**

*From the Workhorse Technical Team*

Note: This is the second in a series of Workhorse® Technical Reports with information that Workhorse considers most important in helping motor home owners avoid potential problems and maximize the economy, safety and enjoyment of their driving experience. We are seeking the help of the RV media in addressing these topics of concern, either by publishing the reports or by using them as the genesis for an article on the subject. This particular report addresses a number of RVer questions surrounding a recent Workhorse recall concerning a Bosch brake defect. If you'd like more information, a copy of a previous technical report, or to speak with a Workhorse source in more detail about a topic, please contact Mike Knaack at 574-294-8844/mknaack@taigmarks.com.

## **What you need to know about the Workhorse Bosch brake recall**

In May 2009 Workhorse mailed an "interim notice" to alert affected Workhorse owners of a defect in certain Bosch brake caliper assemblies used on Workhorse W20, W21 and W22 motor home chassis models. Pending an approved recall remedy for the problem, the interim notice described the authorized interim repair procedure, at no cost to the customer, for those brake problems related to the defect. However, brake repairs related to typical wear and tear or other issues are still the financial responsibility of the customer. As with any recall, misunderstandings about the defect and about who is responsible for what often arise. This article will briefly explain the nature of the problem and how owners and technicians can determine whether a brake problem is related to the defect or not.

### **Warning signs**

The problem is usually noticed as a sudden seizing or locking up of the brakes. It also typically appears in motor homes five years old and older that have not been driven for extended periods of time.

Signs of the problem may include:

- A distinct brake burning smell.
- Having to apply more engine power to overcome an unaccounted for slowing of the vehicle commonly associated with brake drag.
- An ABS light that is continually on.

- Smoke coming from the wheel end.
- A soft or spongy feel when applying the brakes.

Owners of the affected chassis models who experience any of the signs indicated above should have their brakes inspected at an authorized Workhorse service center. The inspection is at their expense; however, if the problem is related to the Bosch defect, Workhorse will provide an interim repair at no cost to the chassis owner.

### **Caliper assembly at fault**

The defect is related to the Bosch 2 X 66 mm brake caliper assembly. Each caliper contains two pistons that are made of a phenolic material that technicians will recognize as similar to Bakelite. If the motor home is not driven for extended periods of time (typically six months or longer), the phenolic material may absorb and retain moisture from the atmosphere, which may result in an increase in the piston diameter. Motor homes operated more frequently are not likely to experience any problem because the heat generated during braking under normal conditions inhibits the absorption and retention of moisture in the phenolic material.

The piston clearances in the caliper are fairly small — the specified clearance of a new phenolic piston is .004 to .008 of an inch. Measurements of certain phenolic pistons taken from motor homes that have been in service for several years have shown an increase in diameter of up to .0035 inches.

The caliper piston is designed for some expansion due to normal heat absorption during braking. During normal operation, the internal piston caliper seal pulls the piston back into the caliper bore when the brakes are released. However, if the phenolic piston expands due to moisture absorption and heat, the seal may not be able to pull the piston back (called “binding”), which may result in the brake pad dragging on the rotor.

This can be hard for a technician to diagnose because if the brake pad drags as above and then the motor home is parked for a period of time (as short as 20 minutes), the piston may cool and decrease in diameter, releasing the piston from its binding condition.

### **What technicians will look for, what is covered**

Diagnostic signs of the defect include:

- Piston dust seals/boots that are cracked or appear discolored (white powder markings).
- Front wheel seals that show signs of damage.
- Front spindle caps that show signs of heat damage or leaking.
- Heat damaged ABS sensors and wheel speed sensors; ABS sensors that have stopped functioning at various speeds and may have intermittent loss of function and associated fault codes.

Rotors with radial cracks are NOT considered recall related damage unless there is other evidence of damage. Such cracks are typical of “riding” the brakes downhill, absence of a tow

car brake system and continued hard braking. If the cracks are severe enough to merit replacement, it would be at the owner's expense.

Rotor colors also vary from vehicle to vehicle, and some discoloration and transfer of brake pad material along with brake pad wear is normal. However, if the rotor exhibits significant transfer of brake pad material, that may be related to the Bosch defect. Similarly, if the brake pads show a rough and damaged surface associated with significant material transfer, it would be considered defect related damage. Replacement of both rotors and pads in this case would be covered by the interim repair procedure.

**Affected owners will be contacted**

Again, Workhorse will notify all affected owners with instructions when the recall remedy is available. In the meantime, affected owners of W20, W21 and W22 Workhorse chassis should simply be aware of the warning signs noted above and have their brakes inspected just as they normally would should any question arise about their functioning.