

**Wheels:** An e-mail from Jim says, “I have an 1988 Mazda B2200 (p/u). It has normal brakes (front disc/rear drum, no ABS) and when the vehicle is cold soaked to -20°F or so, on the first stop the brake pedal is rock solid. It will barely move at all. After several gingerly stops with great force on the pedal, It “breaks loose” and then works fine. I’ve had it happen on two different master cylinders. The vacuum booster checks out IAW in the Mazda service manual. It’s not getting wet around the pedal and freezing, so I’m at a loss. The other technicians at my work are just as confused as I am. Any ideas?”

**Halderman:** This is a tough one, but it has to be the vacuum booster freezing and then thawing allowing the brakes to operate normally. I think moisture in the intake manifold could be rising when the engine is turned off and then this moisture freezes. The check valve could also be stuck or frozen keeping engine vacuum from reaching the booster. The check valve should have kept at least two brake applications worth of vacuum in the booster. Maybe the check valve is freezing, which would release the stored vacuum. This would cause a very hard pedal until the engine resupplied vacuum to the booster. If the booster is “charged” with vacuum, will it hold this vacuum overnight? If not, then you have a booster problem (leaking vacuum).

