Service Bulletin

Mazda North American Operations
Irvine, CA 92618-2922

Subject:	Bulletin No: 04-004/14
BRAKE NOISE, JUDDER AND DRAGGING DIAGNOSIS AND SERVICING	Last Issued: 05/20/2014

BULLETIN NOTE

- This bulletin supersedes the previous bulletin, 04-004/13 issued 11/11/2013, 04-007/11 issued 10/17/11, and 04-006/09 issued 06/02/09. The APPLICABLE MODEL(S)/VINS and REPAIR PROCEDURE have been revised.
- Changes are noted below in Red beside the change bar.

APPLICABLE MODEL(S)/VINS

2011-2014 Mazda2	2003-2015 Mazda6	2007-2014 CX-9
2004-2014 Mazda3	2013-2015 CX-5	2006-2015 MX-5
2006-2014 Mazda5	2007-2012 CX-7	2004-2011 RX-8

DESCRIPTION

Some vehicles exhibit brake related concerns such as brake noise, brake judder or brake dragging. If you encounter a customer complaint for any one of these symptoms, refer to the following information to understand why symptoms may occur, and to better assist the customer in resolving their specific brake concern.

REPAIR PROCEDURE

BRAKE NOISE

There are various types of brake noise and many different conditions that can cause noise. Frictional co-efficient between brake pads and rotors varies depending on pad material, temperature, humidity, braking force, etc. During braking, the brake pads are pressed with great force against the brake rotor. This generates friction to bring the vehicle to a stop.

- If the brake pads are of a soft compound, a larger amount of brake dust will appear on the wheels and the pads will wear more rapidly, but there will be less chance of brake noise.
- If the brake pads are of a hard compound (as used in high-performance applications), less brake dust will appear, the pads will last longer, and braking performance will be improved. However, the drawback is that brake noise can occur more easily than with softer compounds.

Finding a balanced compound with the qualities of both hard and soft compounds is difficult.

If you encounter a customer complaint for brake noise, first determine which wheel the noise is located at and repair the cause of the noise. After the repair is complete, explain to the customer that it is very difficult to completely eliminate brake noise from any vehicle, and that the noise could return with increased time and mileage.

Groan Or Squeak Noise:
- If the noise is a groan or squeak while the brakes are applied, refinish the brake pads (providing they have adequate thickness) using sandpaper (grit #80) or replace the brake pads with new parts.

Brake Dragging Noise:
- If the noise is due to brake dragging, check the caliper and sliders to ensure they are not seized. Rebuild or replace the caliper and sliders as necessary.

Rattle Or Clunk Noise:
- If a rattle or clunk noise is present, replace the brake pad shims/mounting hardware or replace the pads after inspecting the fit of all parts and determining the cause of the excessive clearance.

When performing a repair requiring refinishing or replacement of the brake pads, lightly sand (use grit #80) the brake rotors to remove old pad material. In most cases, brake rotor replacement is not necessary to remedy a brake noise condition.

NOTE:
- Apply locally sourced CRC Disc Brake Quiet (P/N 05016) to the pad backing plates before each of the above repairs.
- Do not use grinding wheels or air power tools.

BRAKE JUDDER

Brake judder (or warping) is caused by uneven thickness (run-out) of the brake rotor. During braking, the clearance between the pads and rotor becomes wider and narrower. This causes force onto the pads and may create a vibration. Vibration is transferred through the brake hydraulic system and/or suspension and can be felt by the customer through the brake pedal, vehicle floor and/or steering wheel. Even micron-size unevenness may cause brake judder. Brake judder is more noticeable when slowing from a higher speed.

In most cases when brake judder is diagnosed, the rotors can be machined using an on-car lathe and the pads can be refinished using sandpaper to restore braking performance.

NOTE: DO NOT use an off-car lathe for warranty repair.

It is not necessary to replace the rotors and pads unless:
- Excessive unevenness (run-out) of the rotors is present that cannot be remedied by resurfacing without exceeding the minimum thickness of the rotor.
- Excessive heat damage to the rotor (may include heat cracking).
- Excessive heat damage to the pads.

When you encounter a customer complaint for brake judder, discuss the customer's driving and vehicle storage habits. Identify which wheel is causing the judder and visually inspect the rotors and pads to identify the cause.

NOTE: Refer to MS3 online service information or Workshop Manual section 04-50 for lateral run-out, minimum rotor, and minimum pad thickness specifications for the subject vehicle.

Rust:
- If rust on the rotors and/or brake pads is identified as the cause of the unevenness, measure the lateral run-out and machine the rotors using an on-car lathe; refinish the pads with sandpaper (grit #80).
- If machining the rotors does not correct the brake judder, replace the rotors.

Excessive Heat Damage:

- If the rotors have excessive heat damage or cracking, replace them.

  NOTE: Signs of rotor heat damage include blue spots or hard spots.

- If the rotors do not have excessive heat damage or cracking, measure the lateral run-out and machine the rotors using an on-car lathe. If machining the rotors does not correct the brake judder, replace the rotors.
- If the brake pads are heat damaged, replace them.

  NOTE: Signs of brake pad heat damage include shiny surfaces or backing plate paint flaking.

- If the brake pads are not heat damaged, refinish them with sandpaper (grit #80).

Brake Pad Dragging:

A dragging brake pad will cause excessive heat and may warp the rotors. This may result in brake judder. Perform the inspection and repair for “Excessive Heat Damage”.

NOTE: During rotor replacement, ensure the hub is free from any foreign substances that may prevent the rotor from fitting flush against the hub. A rotor that does not fit flush against the hub may experience a repeat brake judder.

BRAKE DRAGGING

This procedure will assist in finding the cause and appropriate repair for the brake dragging.

Inspection:

1. Safely raise the vehicle on a hoist.
2. Determine which wheel the brake dragging is occurring from.
3. Remove the wheel, then rotate the brake rotor by hand to confirm the brake dragging.
4. Loosen, but do not remove the two (2) bolts securing the caliper to the bracket.
5. With the brake pads still installed, remove the bottom bolt and rotate the caliper upwards.
6. Rotate the rotor by hand again and confirm if brake dragging is still present.
   - If the brake dragging is still present, check for the following:
     - Brake pads seized in the mounting support/hardware.
     - Contact between the brake rotor and other components.
     - A seized wheel bearing.
     - Brake booster push rod out of adjustment.
   - If the brake dragging is not present, check for the following:
     - A seized or slow to return caliper piston.
     - A seized caliper slide pin(s).
     - Lateral run-out of the rotor exceeds specification.

Inspection Results & Repair:

- If seized brake pads are found, clean the mounting support/hardware and brake pads before reinstalling.
- If contact between the brake rotor and other components is found, repair as necessary.
- If a seized wheel bearing is found, replace it according to MS3 online service information or the appropriate Workshop Manual.
- If the brake booster push rod is out of adjustment, readjust according to MS3 online service information or the appropriate Workshop Manual.
- If a problem is found with the caliper piston return, check for the possibility of water entry due to caliper piston boot breakage or poor sealing, etc. Review the vehicle's maintenance and repair history before deciding on whether to rebuild or replace the caliper.
- If seized caliper slide pin(s) are found, remove the pins. Clean and lubricate the pins, then reinstall.
- If a brake rotor run-out problem is found, machine the rotors using an on-car lathe and refinish the brake pads using sandpaper (grit #80).

NOTE: DO NOT use an off-car lathe for warranty repair.

WHEEL AND TIRE INSTALLATION

NOTE: DO NOT use air powered tools to install wheels. Using power tools to tighten wheel nuts may cause repeat brake failure.

When installing the wheels and tires, tighten the wheel nuts using a torque wrench. Wheel nut tightening torque can be found on MS3 online or Workshop Manual (section 04-10 GENERAL PROCEDURES (BRAKE)).