



# WH01S Wheel

**Uniform  
Procedures For  
Collision Repair  
UPCR**

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v.4.0



## 1. Description

This procedure describes replacement and inspection requirements for a welded steel wheel.



## 2. Purpose

The purpose of this procedure is to provide industry-accepted requirements for performing high-quality repair of welded steel wheels. This procedure is intended for use by professionals who are qualified through training and experience.



## 3. Referenced Documents

The following documents are considered part of this procedure by reference.

### 3.1 Procedures

BR11 Brakes  
CP01S Corrosion Protection  
HM01 Hazardous Materials  
PS01 Personnel Safety

### 3.2 Other Information

Equipment-specific information  
Recycled parts information  
Vehicle-specific repair information



## 4. Equipment And Material Requirements

### 4.1 Equipment

The use of this equipment is included in this procedure:

- tire changer
- wheel balancer
- dial indicator



## 5. Damage Analysis

### 5.1 General Damage

Inspect a steel wheel for these conditions:

- visible damage
- corrosion
- damage to mounting fasteners or hardware
- fasteners that will not stay torqued
- damaged mounting locations
- excessive radial, or lateral runout
- air leaking through the welds
- improper previous repairs
- damaged finish, if applicable

Damaged wheels usually must be replaced. Vehicle makers generally allow only removal of minor surface corrosion imperfections and refinishing repairs. Follow the vehicle maker's repair and replacement recommendations.



## 6. Personnel Safety

### 6.1 General Safety

General safety information is in **PS01**.

### 6.2 Brake Fluid And Brake Dust Safety

Brake fluid and brake dust safety information is in **BR11**.

**(cont'd)**



## 6. Personnel Safety (cont'd)

### 6.3 Acid Wheel Cleaner Safety

Wear the following to prevent injury when working with acid-based wheel cleaners:

- acid-resistant (neoprene) gloves
- safety glasses
- approved vapor respirator



## 7. Environmental Safety

Follow all use and disposal requirements of acid-based wheel cleaners.

Hazardous material safety information is in **HM01**.



## 8. Vehicle Protection

### 8.1 Wheel And Related Parts

To protect the wheel and related parts from damage:

- Properly support the vehicle.
- Do not repair a wheel by hammering, heating, or welding.
- Do not use fastener coatings unless specified by the vehicle maker.
- Apply penetrating lubricant sparingly, and only to the hub, if required for removing tight wheels. Do not allow penetrating lubricant to contact the lug fasteners or studs, or brake parts.
- Do not use excessive heat to remove tight wheels.
- Torque wheel lug nuts in a cross-pattern sequence, to the vehicle or wheel maker's recommendations.
- Use tire-changing equipment to mount or dismount tires. Do not use hand tools.
- Do not mix different sizes or types of wheels and tires on the same vehicle.

### 8.2 Acid-Based Wheel Cleaners

To protect the wheel and adjacent parts from damage by acid-based wheel cleaners:

- Do not apply an acid-based wheel cleaner when the wheel is hot.
- Do not allow acid-based wheel cleaner to get on any surface other than the wheel.
- Rinse the wheel thoroughly after using a wheel cleaner.

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## 8. Vehicle Protection (cont'd)

Use only a non-acid cleaner on painted and polished wheels.

### 8.3 Brake And Tire Performance

Note: Some vehicles have unique wheels, wheel covers, or tires for each side of the vehicle. Make sure that the proper parts are installed at each location on the vehicle, to ensure proper brake cooling and tire traction.



## 9. Repair Procedure

### 9.1 Wheel Runout Check

To perform a wheel lateral and radial runout check:

1. Remove any trim rings, wheel covers, etc.
2. Mount the wheel on the vehicle or a wheel balancer. If on the vehicle, properly lift and support the vehicle so the wheel can turn freely.
3. Position a dial indicator on a rigid fixture.
4. For a lateral runout check, position the indicator point horizontally against the side of the wheel rim flange. For a radial runout check, position the indicator point vertically against the tire-mounting surface of the wheel rim flange.
5. Slowly rotate the wheel one full revolution while observing the dial indicator.
6. Rotate the wheel to the position where the lowest dial indicator reading was obtained.
7. Zero out the dial indicator.
8. Slowly rotate the wheel one full revolution while observing the dial indicator.
9. Record the highest dial indicator reading. Disregard any indicator readings caused by welds, paint runs, scratches, etc.
10. Perform lateral and radial runout checks on both the inboard and outboard sides of the wheel.
11. Compare each reading to the vehicle maker's runout specification for steel wheels. If the runout is greater than the specification, the wheel must be replaced. Vehicle maker specifications range from 0.3–2.5 mm (0.0005–0.1") for lateral runout and 0.3–1.5 mm (0.0005–0.06") for radial runout.

### 9.2 Wheel Removal

To remove a wheel:

1. Properly lift and support the vehicle.
2. Remove the wheel cover, if equipped.

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## 9. Repair Procedure (cont'd)

Note: Some vehicles have wheel covers that are held in place by the wheel lugs. For this design the lug nuts must be removed before removing the wheel cover.

- 3. Remove the wheel lug fasteners. Plan to replace damaged fasteners with replacement fasteners that are the same grade, size, and type as the original fasteners.
- 4. Remove the wheel from the vehicle.

### 9.3 Wheel Installation

To install a replacement wheel:

- 1. Clean the lug fasteners and mounting surfaces.
- 2. Remove any surface corrosion on the replacement wheel.
- 3. Inspect the wheel for lateral and radial runout. See 9.1.
- 4. Remove the wheel from the vehicle, if applicable. See 9.2.
- 5. Inspect the lug nuts and stud bolt threads for damage. Replace any damaged nuts or studs.
- 6. For wheels requiring a finish, apply corrosion-resistant primer and refinish as required to restore the appearance.
- 7. Install the tire on the replacement wheel.
- 8. Balance the wheel and tire assembly.
- 9. Position the wheel and tire assembly on the vehicle.
- 10. Torque the wheel lug nuts in a cross-pattern sequence, to the vehicle maker's recommendations.
- 11. Inspect the tire for lateral and radial runout. Follow the vehicle maker's recommendations. Note: If the tire is twisted or out-of-round, it may have to be shaved (milled) or replaced.
- 12. Install the wheel cover.
- 13. Lower the vehicle.
- 14. Road-test the vehicle to check for vibration at various speeds.



## 10. Use Of Recycled (Salvage) Parts

### 10.1 Salvage Parts Requirements

Use only salvage wheels that exactly duplicate the original part for these specifications:

- load capacity
- diameter
- rim width
- rim-to-mounting-surface offset
- brake clearance
- mounting fastener configuration

**(cont'd)**



## 10. Use Of Recycled (Salvage) Parts (cont'd)

Do not use salvage wheels having any of these defects:

- visible damage
- damaged mounting locations
- corrosion that has caused pitting
- damaged mounting fasteners or hardware
- improper previous repairs
- radial or lateral runout out of specification

Check the vehicle maker's warranty as it relates to the use of salvage parts.



## 11. Inspection And Testing

### 11.1 Replaced Wheel Inspection

Inspect a replaced wheel for these conditions:

- proper tire inflation
- proper installation of wheel weights, trim rings, etc.
- proper wheel, tire, and wheel cover for the location on the vehicle
- proper installation of all fasteners, including the vehicle maker's torquing recommendations
- proper finish application, if applicable

Road-test the vehicle to check for vibration at various speeds.

Correct any defects.