

2021 SUSPENSION

Tires and Wheels - Canyon, Colorado

SPECIFICATIONS

TIRE AND WHEEL SPECIFICATIONS

Inflation Pressure At Full Load

Tires	Wheel	Front		Rear	
		kPa	psi	kPa	psi
P265/70R16 (RPO Code QJJ)	16X7.0J (Steel RPO Code RS2)	240	35	240	35
P265/70R16 (RPO Code QJJ)	16X7.0J (Alloy RPO Code RS1)	240	35	240	35
P255/65R17 (RPO Code QHR)	17x8.0J (Alloy RPO Code Q5W)	240	35	240	35
P255/65R17 (RPO Code QHE)	17x8.0J (Alloy RPO Code R1U)	240	35	240	35
P255/65R17 (RPO Code QHR)	17x8.0J (Alloy RPO Code Q5U)	240	35	240	35
P255/65R17 (RPO Code QHE)	17x8.0J (Alloy RPO Code R28)	240	35	240	35
P265/60R18 (RPO Code QIA)	18x8.5J (Alloy RPO Code PZX)	240	35	240	35
P265/60R18 (RPO Code QIA)	18x8.5J (Alloy RPO Code RT5)	240	35	240	35

FASTENER SPECIFICATIONS

Single Use Non-Threaded Fasteners/Components

NOTE: <i>All fasteners/components listed in this table MUST BE DISCARDED and replaced with NEW after removal.</i>
Application
Spare Wheel Hoist Lock Cylinder Case Retainer

Reusable Threaded Fastener Tightening Specifications

NOTE: <i>All fasteners listed in this table can be reused after removal.</i>	
Application	Specification
	Metric (English)
Spare Wheel Carrier Hanger Bolt	50 N.m (37 lb ft)
Wheel Nut	190 N.m (140 lb ft)

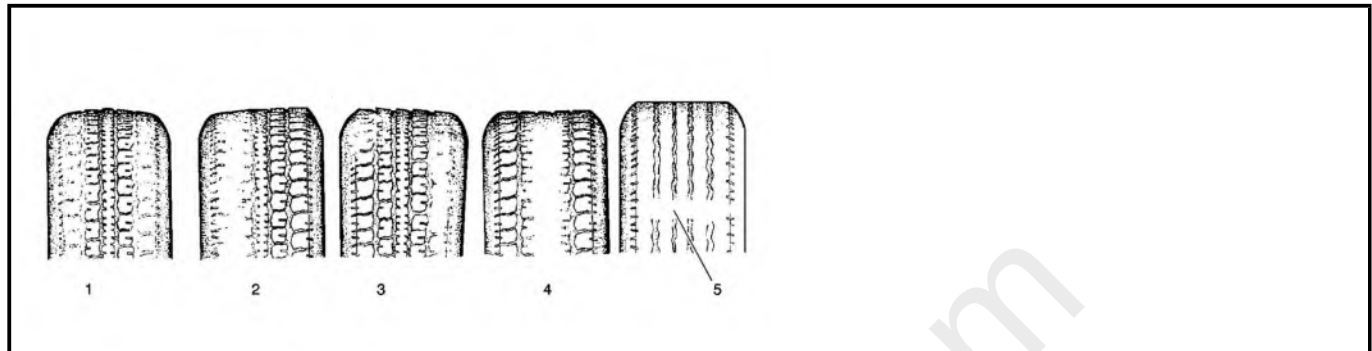
ADHESIVES, FLUIDS, LUBRICANTS, AND SEALERS

Application	Type of Material	GM Part Number	Canadian Part Number
Aluminum Wheel	Adhesive/Sealant	12378478	88900041
Aluminum Wheel	3MB® General Purpose Cleaner	08984	-
Wheel	Mounting Lubricant	12345884	88863415
Wheel to Hub	Lubricant	1051344	993037

DIAGNOSTIC INFORMATION AND PROCEDURES

TIRE DIAGNOSIS - IRREGULAR OR PREMATURE WEAR

Tire Wear

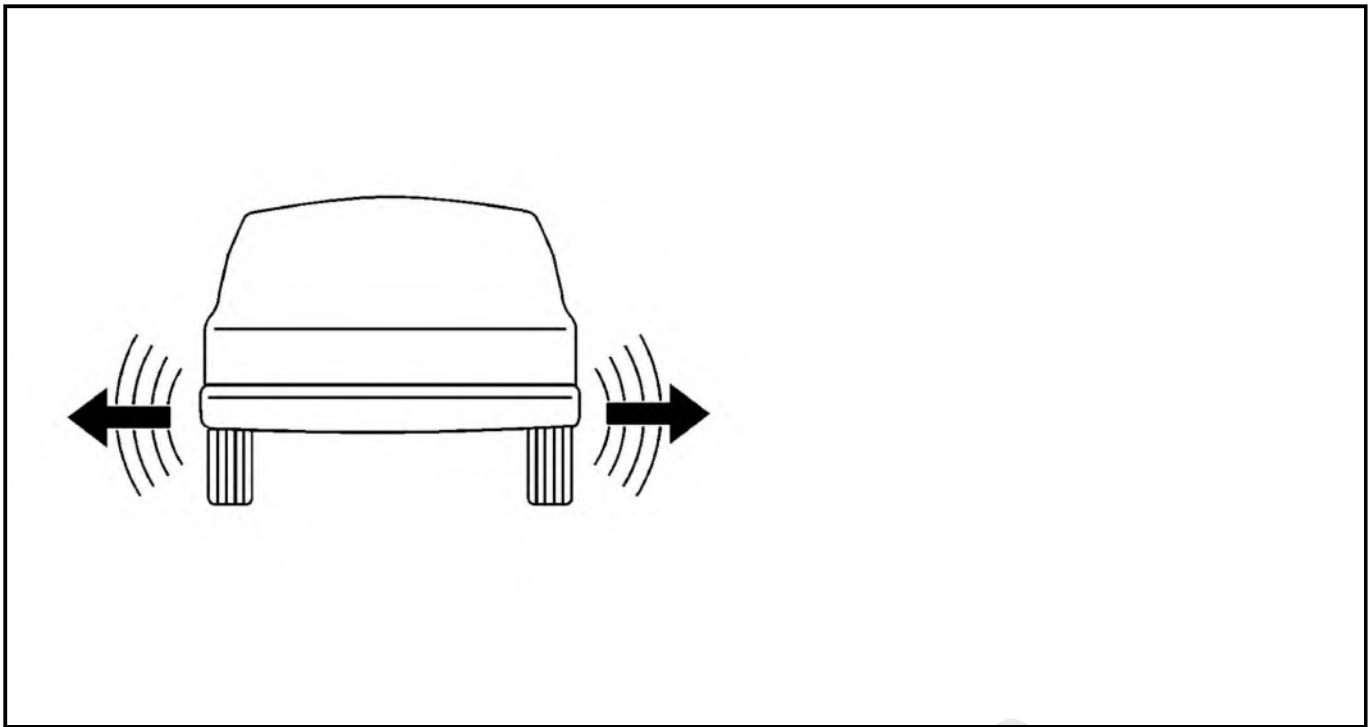


Callout	Component Name
1	Under-Inflation, Hard Cornering, Lack of Regular Rotation
2	Incorrect Wheel Alignment, Hard Cornering, Lack of Regular Rotation
3	Incorrect Wheel Alignment
4	Over-Inflation, Heavy Acceleration, Lack of Regular Rotation
5	Normal Wear to the Wear Indicator

Inspection Procedure

1. Inspect the front tire wear.
2. Inspect the rear tire wear.
3. Rotate the tires if any of the following conditions exist:
 - The amount of time or mileage since the last tire rotation matches the maintenance schedule.
 - The outer tread blocks are worn more than the middle tread blocks (1).
 - The outer tread blocks are worn more than the inner tread blocks (2).
 - The middle tread blocks are worn more than the outer tread blocks (4).
4. Measure the wheel alignment if any of the following conditions exist:
 - The tread blocks have feathered edges (3).
 - The outer tread blocks are worn more than the inner tread blocks (2).
 - The inner tread blocks are worn more than the outer tread blocks (2).
5. Inspect the struts or the shock absorbers if the tire tread exhibits a cupped appearance (3).

TIRE DIAGNOSIS - WADDLE COMPLAINT



Tire waddle is a side to side movement at the front of the vehicle and/or the rear of the vehicle. Tire waddle can be caused by the following conditions:

- A steel belt not being straight within the tire
- Excessive lateral runout of the tire
- Excessive lateral runout of the wheel

The tire waddle is most noticeable at a low speed of about 8 - 48 km/h (5 - 30 mph). Tire waddle may appear as ride roughness at 80 - 113 km/h (50 - 70 mph). Tire waddle may appear as a vibration at 80 - 113 km/h (50 - 70 mph).

Inspection Procedure

1. Raise and support the vehicle with safety stands. [Lifting and Jacking the Vehicle](#)

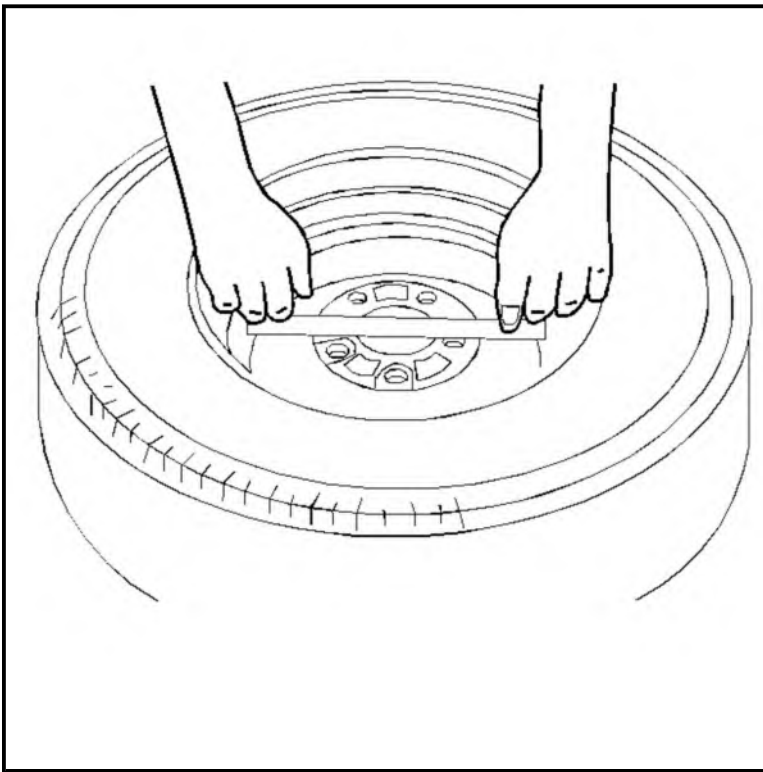
WARNING: Wear gloves when inspecting the tires in order to prevent personal injury from steel belts sticking through the tire.

2. Perform the following preliminary inspection:
 1. Mark the tire with a crayon in order to note the start and the stop position.
 2. Rotate each tire and wheel by hand.
 3. Inspect the tire for bulges or bent wheels. Replace as necessary.
3. Use tire substitution in order to identify the faulty tire. Perform the following steps for a tire substitution check:
 1. Use a comparable tire in order to replace each tire, one at a time.
 2. Test drive the vehicle.
 3. If the problem is tire or wheel related, you will eliminate the problem when you remove the faulty tire from the vehicle.

WHEEL MOUNTING SURFACE CHECK

Replace any wheels that are bent or dented, or have excessive lateral or radial runout. Wheels with runout greater than specified may cause objectionable vibrations.

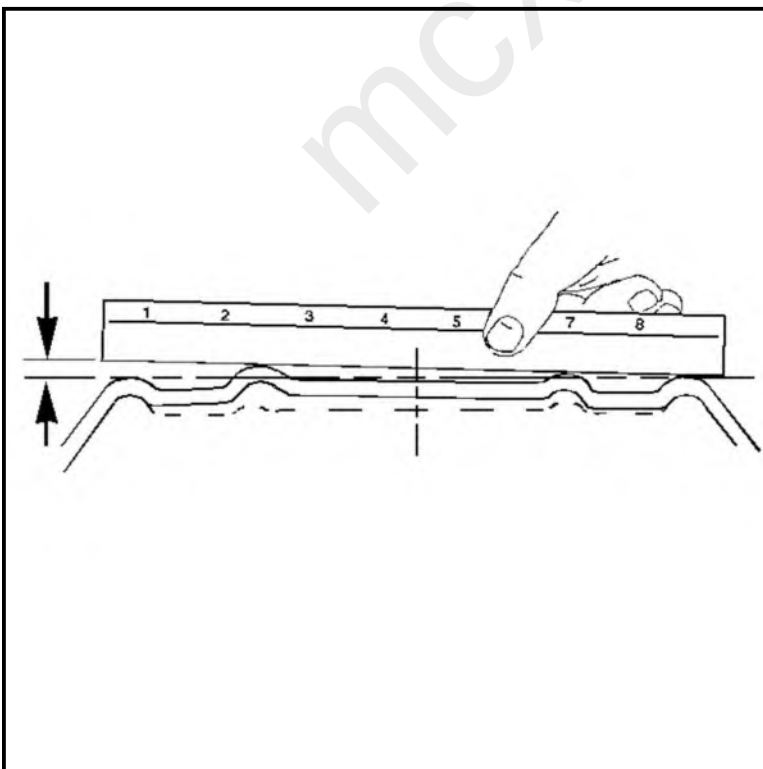
1. Thoroughly clean the wheel mounting surface with a clean shop towel and denatured alcohol, or equivalent.



2. Use a straight edge 203 - 229 mm (8 - 9 in) long. Place the straight edge on the wheel inboard mounting surface. Try to rock the straight edge up and down within the mounting surface.
3. For aluminum flat-mount wheels, repeat the procedure in step 2 on at least 3 - 4 different positions on the inboard mounting surface.

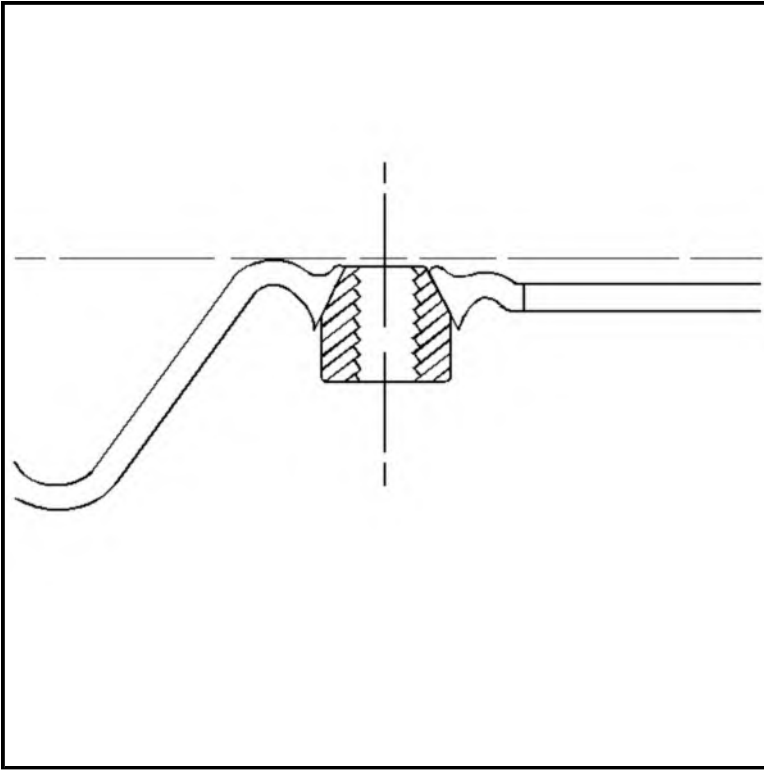
If you can rock the straight edge, the mounting surface is bent and you must replace the wheel.

4. Inspect the mounting wheel/nut holes for damage caused from over-torquing the wheel/nuts. Inspect for collapsed wheel/nut bosses. Inspect for cracked wheel bosses.
5. For steel wheels, repeat the procedure in step 2 on at least 3 - 4 different positions on the inboard mounting surface.



- The outer mounting ring is designed to be raised slightly above the inner mounting ring.
- If you can rock the straight edge, the mounting surface is bent and you must replace the wheel.

6. Inspect the mounting wheel/nut holes for damage caused from over-torquing the wheel/nuts. Inspect for collapsed wheel/nut bosses. Inspect for cracked wheel bosses.



CAUTION: The use of non-GM original equipment wheels may cause:

- Damage to the wheel bearing, the wheel fasteners and the wheel
- Tire damage caused by the modified clearance to the adjacent vehicle components
- Adverse vehicle steering stability caused by the modified scrub radius
- Damage to the vehicle caused by the modified ground clearance
- Speedometer and odometer inaccuracy

NOTE:

- Replacement wheels must be equivalent to the original equipment wheels in the following ways:
 - The load capacity
 - The wheel diameter
 - The rim width
 - The wheel offset
 - The mounting configuration
- A wheel of the incorrect size or type may affect the following conditions:
 - Wheel and hub-bearing life
 - Brake cooling
 - Speedometer/odometer calibration
 - Vehicle ground clearance
 - Tire clearance to the body and the chassis

7. Replace the wheel if the wheel is bent.

8. Replace the wheel if the wheel/nut boss area is cracked.

Identify steel wheels with a 2 or 3 - letter code stamped into the rim near the valve stem. Aluminum wheels have the code, the part number, and the manufacturer identification cast into the back side of the wheel.

RADIAL TIRE LEAD/PULL CORRECTION

Step	Action	Yes	No
DEFINITION: Lead/pull is the deviation of the vehicle from a straight path on a level road with no pressure on the steering wheel.			
1	Did you perform the Vehicle Leads/Pull diagnostic table?	Go to Step 2	Go to Vehicle Leads/Pulls
2	Road test the vehicle to verify the complaint. Select a smooth level surface to perform the test. Does the condition exist?	Go to Step 3	System OK
3	1. Cross-switch the front tire/wheel assemblies. Refer to Tire and Wheel Removal and Installation . 2. Road test the vehicle on a smooth level surface. Does the vehicle still lead/pull?	Go to Step 4	System OK
4	Does the vehicle lead/pull in the opposite direction?	Go to Step 5	Go to Wheel Alignment Measurement
5	1. Cross-switch the left front tire/wheel assembly with the left rear tire/wheel assembly. Refer to Tire and Wheel Removal and Installation . 2. Road test the vehicle on a smooth level surface. Does the vehicle still lead/pull?	Go to Step 6	Go to Step 7
6	1. Cross-switch the right front tire/wheel assembly with the right rear tire/wheel assembly. Refer to Tire and Wheel Removal and Installation . 2. Road test the vehicle on a smooth level surface. Does the vehicle still lead/pull?	Go to Wheel Alignment Measurement	Go to Step 8
7	Replace the left rear tire. Refer to Tire Dismounting and Mounting . Is the repair complete?	Go to Step 9	-
8	Replace the right rear tire. Refer to Tire Dismounting and Mounting . Is the repair complete?	Go to Step 9	-
9	Verify proper vehicle operation. Does the original condition still exist?	Go to Step 1	System OK

REPAIR INSTRUCTIONS

TIRE AND WHEEL REMOVAL AND INSTALLATION

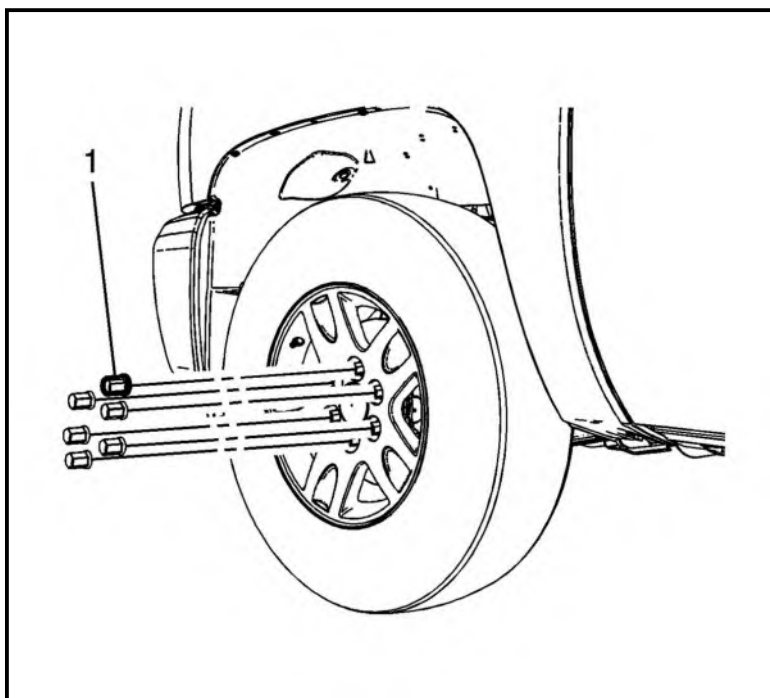
Special Tools

- CH-41013 Rotor Resurfacing Kit
- CH-42450-A Wheel Hub Resurfacing Kit

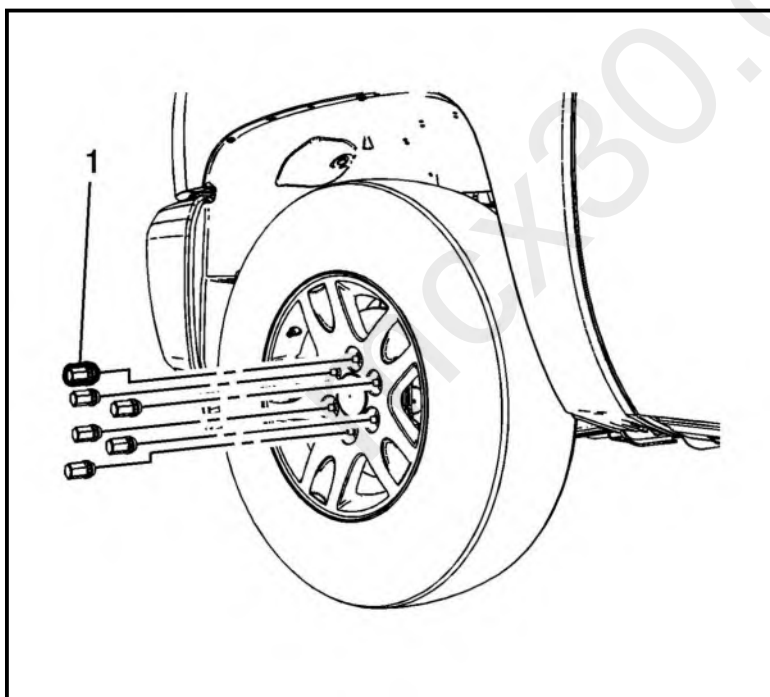
For equivalent regional tools, refer to [Special Tools](#).

Removal Procedure

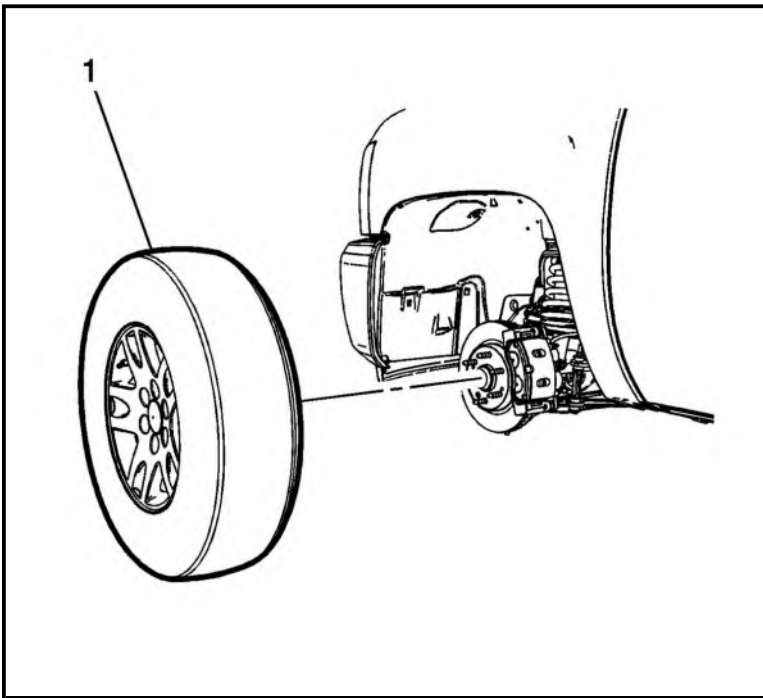
1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#) .
2. Remove the wheel center cap, if equipped.
3. Remove the wheel nut caps (1), if equipped.



4. Remove the wheel nuts (1).



5. Remove the tire and wheel assembly (1).



WARNING: If penetrating oil gets on the vertical surfaces between the wheel and the rotor or drum it could cause the wheel to work loose as the vehicle is driven, resulting in loss of control and an injury accident.

CAUTION: Removing the wheel may be difficult because of foreign materials or a tight fit between the wheel and the hub/rotor. Slightly tap the tire side wall with a rubber mallet in order to remove the wheel. Failure to follow these instructions may result in damage to the wheel.

CAUTION: Never use heat to loosen a tight wheel bolt or nut. This can shorten the life of wheel and damage wheel bearings.

6. If the tire and wheel assembly is difficult to remove or cannot be removed, perform the following steps:
 - Hand install the wheel nuts.
 - Loosen the wheel nuts 2 complete turns.
 - Lower the vehicle.
 - Rock the vehicle from side to side.
 - Repeat the procedure if necessary.
7. When the tire and wheel assembly loosens, raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
8. Remove the wheel nuts.
9. Remove the tire and wheel assembly.

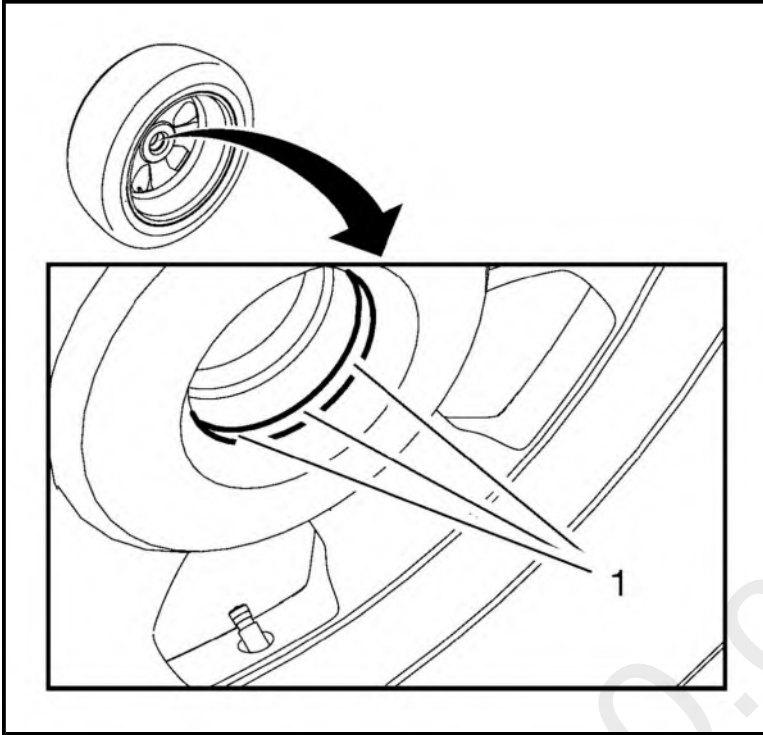
Installation Procedure

WARNING: Before installing the wheels, remove any buildup of corrosion on the wheel mounting surface and brake drum or disc mounting surface. Installing wheels with poor metal-to-metal contact at the mounting surfaces can cause wheel nuts to loosen. This can cause a wheel to come off when the vehicle is moving, causing loss of control and possibly personal injury.

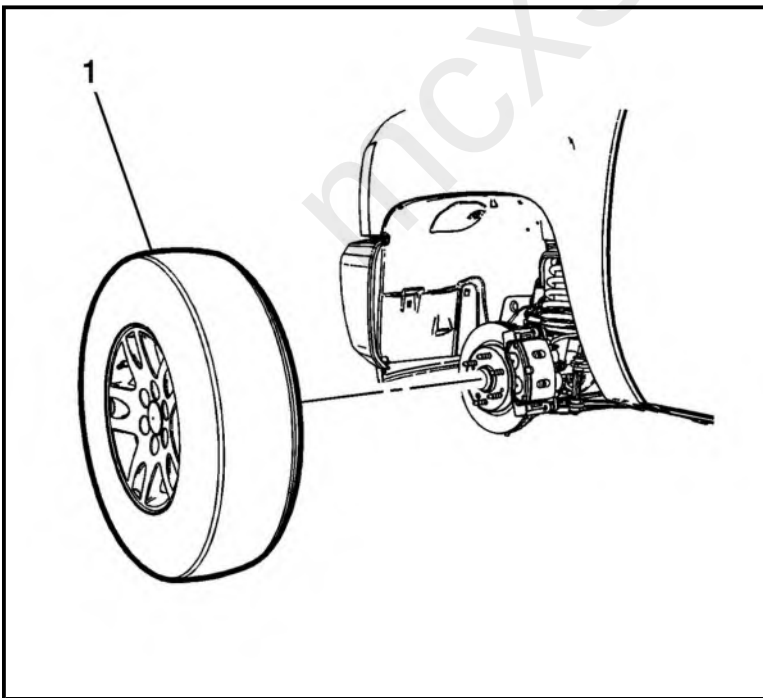
NOTE: Do not use power grinding tools to clean the brake rotor or drum to wheel mating surfaces.

1. Using a wire brush or wire wheel, clean the wheel to brake rotor or drum mating surface.
2. Using the **CH-41013** Rotor Resurfacing Kit, clean the rotor or drum to wheel contact area.

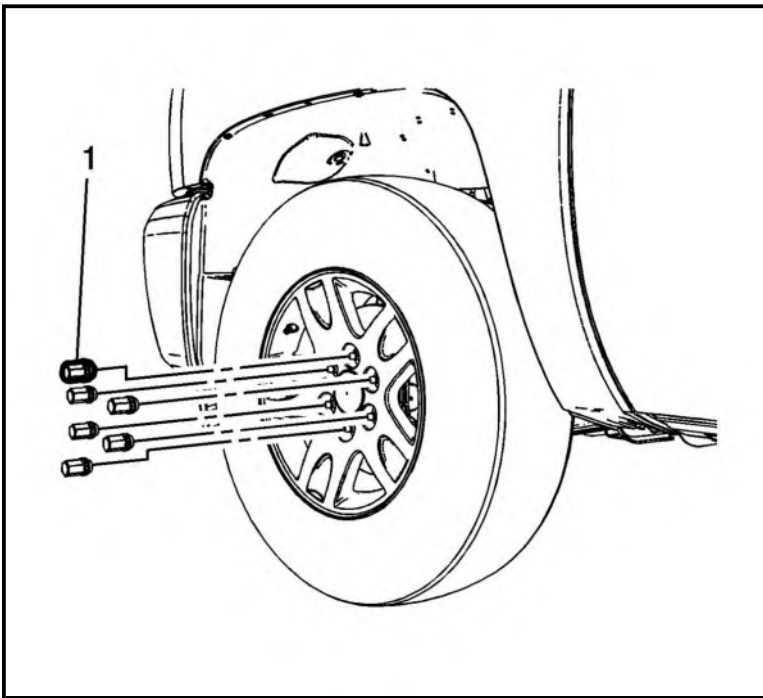
3. Using the **CH-42450-A** Wheel Hub Resurfacing Kit, clean the surfaces around the wheel studs.
4. Clean the threads of the wheel studs.
5. After cleaning all of the wheel and brake rotor or drum contact areas, use brake cleaner or denatured alcohol to remove any dirt and debris from the wheel nuts and the brake rotor or drum.
6. Inspect and clean the contact areas of the wheel. Refer to [Wheel Mounting Surface Check](#).
7. Apply a small amount of lubricant to the inner diameter of the wheel hub pilot hole (1) where it contacts the wheel hub flange. Refer to [Adhesives, Fluids, Lubricants, and Sealers](#).



8. Install the tire and wheel assembly (1).



9. Hand install the wheel nuts (1).



WARNING: Never grease or lubricate wheel nuts, studs and mounting surfaces. Wheel nuts, studs, and mounting surfaces must be clean and dry. Tightening the lubricated parts can cause damage to the wheel studs. This can cause a wheel to come off when the vehicle is moving, causing loss of control and possibly personal injury.

10. Using a torque wrench and the appropriate socket, alternately and evenly tighten the wheel nuts to 190 N.m (140 lb ft) in the sequence illustrated.

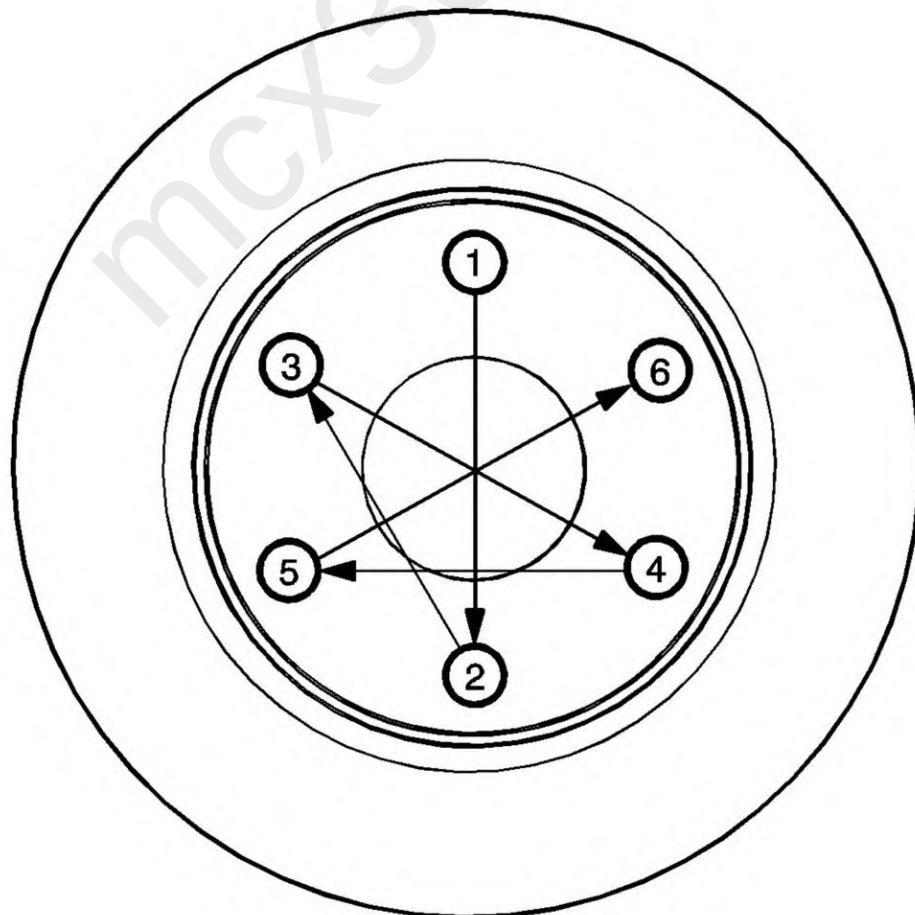


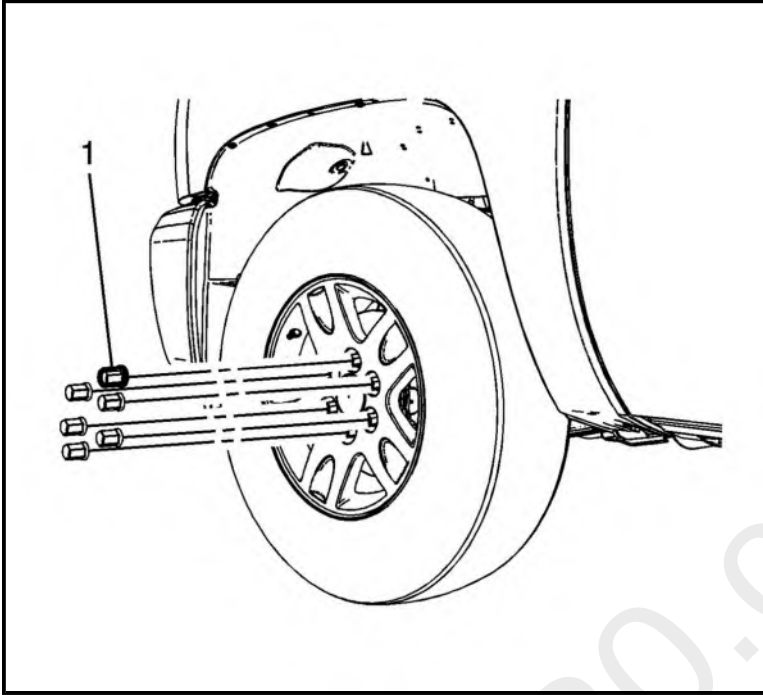
Fig. 1: Wheel Bolts Or Nuts Tightening Sequence

Courtesy of GENERAL MOTORS COMPANY

CAUTION: Improperly tightened wheel bolts or nuts can lead to brake pulsation and rotor damage. In order to avoid expensive brake repairs, evenly tighten the wheel bolts or nuts to the proper torque specification.

CAUTION: Refer to [Fastener Caution](#) .

11. Install the wheel nut caps (1), if equipped.



12. Install the wheel center cap, if equipped.

TIRE REPAIR

WARNING:

- Tire changing can be dangerous and should be done by trained professionals using proper tools and procedures. Always read and understand any manufacturer's warnings contained in their customers literature or molded into the tire sidewall.
- Serious eye and ear injury may result from not wearing adequate eye and ear protection while repairing tires.
- NEVER inflate beyond 275 kPa (40 pounds) pressure to seat beads.
- NEVER stand, lean or reach over the assembly during inflation.

WARNING:

To avoid serious personal injury, do not stand over tire when inflating. The bead may break when the bead snaps over the safety hump. Do not exceed 275 kPa (40 psi) pressure when inflating any tire if beads are not seated. If 275 kPa (40 psi) pressure will not seat the beads, deflate, relubricate the beads and reinflate. Over inflation may cause the bead to break and cause serious personal injury.

WARNING:

Approved safety glasses and gloves should be worn when performing this procedure to reduce the chance of personal injury.

WARNING:

Wear gloves when inspecting the tires in order to prevent personal injury from steel belts sticking through the tire.

NOTE:

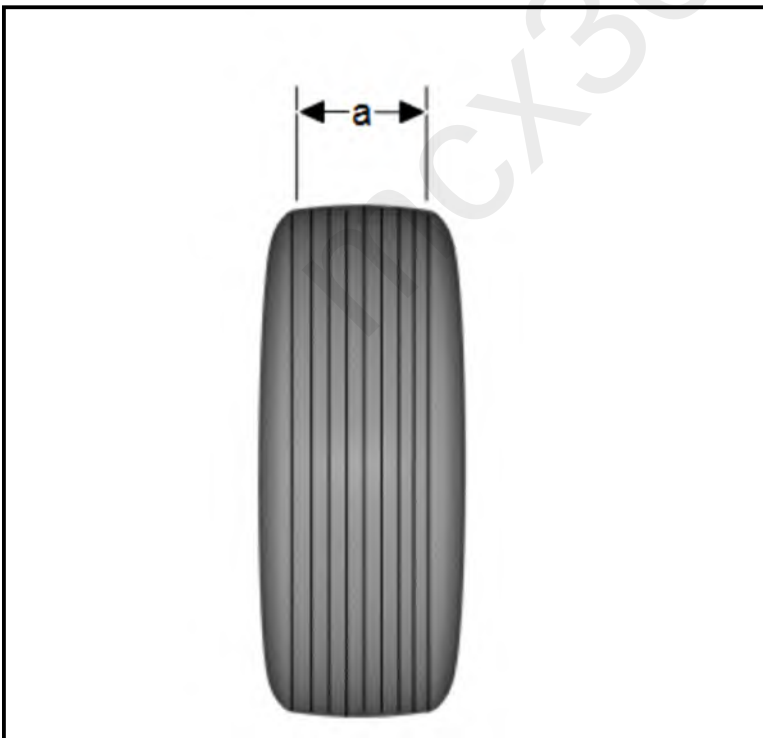
- For Run Flat Tire Repairs, refer to the manufacturer's recommended repair procedure.
- NEVER repair tires worn to the tread indicators 1.6 mm (2/32 in) remaining depth.
- NEVER repair tires with a tread puncture larger than 6 mm (0.25 in).
- NEVER substitute an inner tube for a permissible or non-permissible repair.
- NEVER perform an outside-in tire repair (plug only, on the wheel).
- Every tire must be removed from the wheel for proper inspection and repair.
- Regardless of the type of repair used, the repair must seal the inner liner and fill the injury.
- Consult with repair material supplier/manufacturer for repair unit application procedures and repair tools/repair material recommendations.

Three basic steps for tire puncture repair:

1. Remove the tire from the wheel for inspection and repair.
2. Fill the injury (puncture) to keep moisture out.
3. Seal the inner liner with a repair unit to prevent air loss.

External Inspection

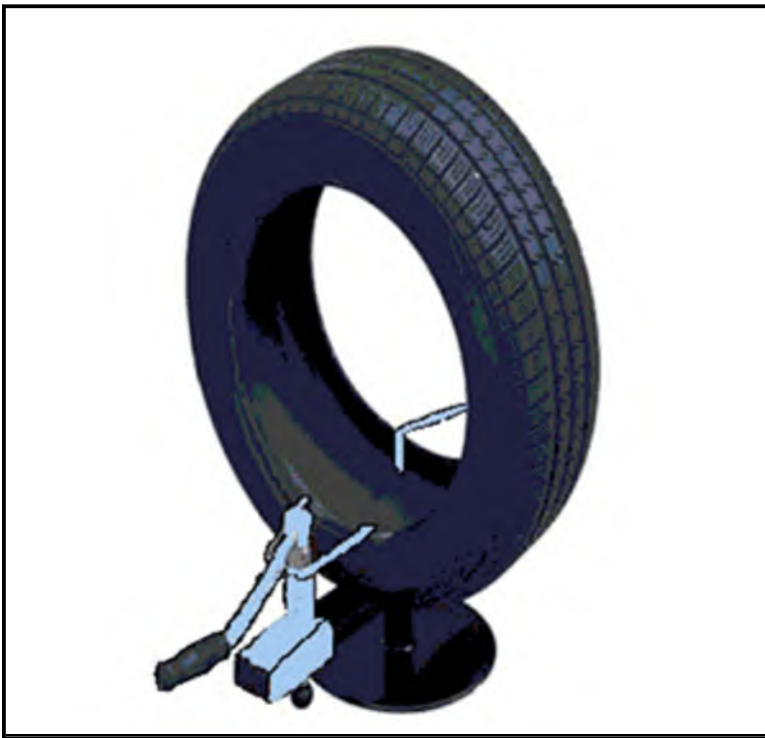
1. Raise and support the vehicle. [Lifting and Jacking the Vehicle](#)
2. Remove the tire and wheel assembly. [Tire and Wheel Removal and Installation](#)
3. Prior to dismounting, inspect the tire surface, the valve stem and the wheel for the source of the leak by using a water and soap solution. Mark the injured area with a tire crayon.
4. Repairs are limited to the tread area only as shown in repairable area (a).



Punctures that fall outside of the repairable area (a) must not be repaired. The tire must be replaced.

Internal Inspection

1. Dismount the tire from the wheel. [Tire Dismounting and Mounting](#)
2. Place the tire in an appropriate, well-lighted tire spreader.



3. Spread the beads and mark the puncture with a tire crayon.
4. Inspect the inner tire for any signs of unrepairable damage. Replace the tire if necessary.
5. Remove the puncturing object, noting the direction of the penetration.
6. Probe the injury with a blunt awl in order to determine the extent and direction of the injury.
7. Remove any loose foreign material from the injury.
8. Punctures exceeding 6 mm (0.25 in) should not be repaired.

Cleaning

1. Inspect the tire pressure indicator sensor for damage due to driving on an underinflated/deflated tire and the sensor porthole for debris. If the sensor is damaged or the debris cannot be cleared from the porthole, the sensor must be replaced. [Tire Pressure Indicator Sensor Replacement](#)

NOTE: Refer to information on the tire sealant Material Safety Data Sheet and follow guidelines for handling and disposal.

2. If a tire sealant product was used/found within the tire, and the tire is repairable, use a mild dish soap, clean water and shop cloths to remove the sealant residue.
3. If a confirmed GM approved tire sealant product has been used/found within the tire, use a mild dish soap, clean water and shop cloths to remove the sealant residue from the tire pressure indicator sensor.
4. If a tire sealant product has been used/found within the tire, and it cannot be confirmed that a GM Approved product was used, replace the tire pressure indicator sensor. [Tire Pressure Indicator Sensor Replacement](#)
5. Clean the area around the puncture thoroughly in accordance with the manufacturer instructions provided with the repair kit being used. This step serves to remove dirt, mold and/or debris to ensure proper adhesion.

Repairing the Injury

1. Prepare the injury in accordance with the manufacturer instructions provided with the repair kit being used.
2. Patch the injury in accordance with the manufacturer instructions provided with the repair kit being used.

Final Inspection

1. Mount the tire to the wheel. [Tire Dismounting and Mounting](#)
2. After mounting and inflating the tire, check both beads, the repair and the valve stem with a water and soap solution in order to detect leaks.
3. If the tire continues to lose air, the tire must be dismounted and inspected again.

4. Balance the tire and wheel assembly. [Tire and Wheel Assembly Balancing - Off Vehicle](#)
5. Install the tire and wheel assembly. [Tire and Wheel Removal and Installation](#)
6. Remove the support and lower the vehicle.

For additional tire puncture repair information, contact:

U.S. Tire Manufacturers Association

1400 K Street, N.W., Suite 900

Washington

DC

20005-2403

Telephone: 202-682-4800

E-mail: info@ustires.org

Website: <https://www.ustires.org/>

TIRE DISMOUNTING AND MOUNTING

Removal Procedure

WARNING: Approved safety glasses and gloves should be worn when performing this procedure to reduce the chance of personal injury.

CAUTION: Use a tire changing machine in order to dismount tires. Do not use hand tools or tire irons alone in order to remove the tire from the wheel. Damage to the tire beads or the wheel rim could result.

CAUTION: Do not scratch or damage the clear coating on aluminum wheels with the tire changing equipment. Scratching the clear coating could cause the aluminum wheel to corrode and the clear coating to peel from the wheel.

CAUTION: Damage to either the tire bead or the wheel mounting holes can result from the use of improper wheel attachment or tire mounting procedures. It takes up to 70 seconds for all of the air to completely exhaust from a large tire. Failure to follow the proper procedures could cause the tire changer to put enough force on the tire to bend the wheel at the mounting surface. Such damage may result in vibration and/or shimmy, and under severe usage lead to wheel cracking.

1. Raise and support the vehicle. [Lifting and Jacking the Vehicle](#)
2. Remove the tire and wheel assembly. [Tire and Wheel Removal and Installation](#)
3. Remove the valve core and release the air pressure.
4. Deflate the tire completely.

NOTE: Rim-clamp touchless tire changers are recommended.

5. Use the tire changing machine to remove the tire from the wheel following the manufacturer specific directions for the tire changing machine being used.
6. When separating the tire bead from the wheel, do not allow the bead breaker to contact the valve stem/TPM sensor as they will be damaged.

CAUTION: Failure to position valve stem in proper position while dismounting and mounting the tire may result in the TPM sensor to become damaged.

7. Position the tire machine removal head to the outer tire bead so as it will operate without contacting the valve stem/TPM sensor.
8. Using the tire changing machine, remove the outer tire bead from the wheel.
9. Position the tire machine removal head to the outer tire bead so as it will operate without contacting the valve stem/TPM sensor.
10. Using the tire changing machine, remove the inner tire bead from the wheel and remove the tire.

WARNING: Approved safety glasses and gloves should be worn when performing this procedure to reduce the chance of personal injury.

NOTE: Refer to information on the tire sealant Material Safety Data Sheet and follow guidelines for handling and disposal.

11. If a tire sealant product was used/found within the tire, and the tire is repairable, use a mild dish soap, clean water and shop cloths to remove the sealant residue.
12. If a confirmed GM approved tire sealant product has been used/found within the tire, use a mild dish soap, clean water and shop cloths to remove the sealant residue from the tire pressure indicator sensor.
13. If a tire sealant product was used/found within the tire, and it cannot be confirmed that a GM approved product was used, replace the tire pressure indicator sensor. [Tire Pressure Indicator Sensor Replacement](#)
14. Use medium coarseness steel wool to remove any rubber or corrosion from the wheel bead seats.
15. Inspect the tire and wheel for any damage, replace as necessary.

Installation Procedure

WARNING: Approved safety glasses and gloves should be worn when performing this procedure to reduce the chance of personal injury.

CAUTION: When mounting the tires, use an approved tire mounting lubricant. DO NOT use silicon or corrosive base compounds to lubricate the tire bead and the wheel rim. A silicon base compound can cause the tire to slip on the rim. A corrosive type compound can cause tire or rim deterioration.

1. Apply mounting lubricant to the tire bead and the wheel. [Adhesives, Fluids, Lubricants, and Sealers](#)

NOTE: Rim-clamp touchless tire changers are recommended.

2. Use the tire changing machine to install the tire to the wheel following the manufacturer specific directions for the tire changing machine being used.
3. Place the inner tire bead onto the wheel.

CAUTION: Failure to position valve stem in proper position while dismounting and mounting the tire may result in the TPM sensor to become damaged.

4. Position the tire machine installation head to the inner tire bead so as it will operate without contacting the valve stem/TPM sensor.
5. Using the tire changing machine, install the inner tire bead to the wheel.
6. Position the tire machine installation head to the outer tire bead so as it will operate without contacting the valve stem/TPM sensor.
7. Using the tire changing machine, install the outer tire bead to the wheel.

WARNING: To avoid serious personal injury, do not stand over tire when inflating. The bead may break when the bead snaps over the safety hump. Do not exceed 275 kPa (40 psi) pressure when inflating any tire if beads are not seated. If 275 kPa (40 psi) pressure will not seat the beads, deflate, relubricate the beads and reinflate. Overinflation may cause the bead to break and cause serious personal injury.

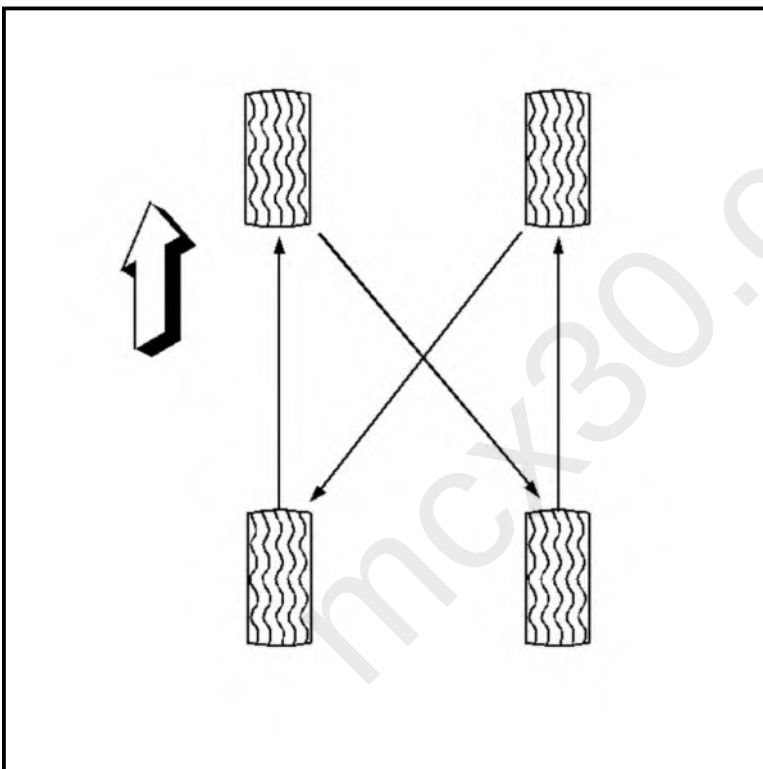
8. Some run flat tires may require more than 275 kPa (40 psi) to seat the bead. In such a case, a tire safety cage (1) must be used. Consult the tire manufacturer for its individual repair policy.
9. Inflate the tire until it passes the bead humps. Be sure that the valve core is not installed at this time.
10. Install the valve core to the valve core stem.
11. Inflate the tire to the specified pressure as stated on the tire placard.
12. Balance the tire and wheel assembly. [Tire and Wheel Balancing](#)
13. Install the tire and wheel assembly. [Tire and Wheel Removal and Installation](#)
14. Remove the support and lower the vehicle.

TIRE ROTATION

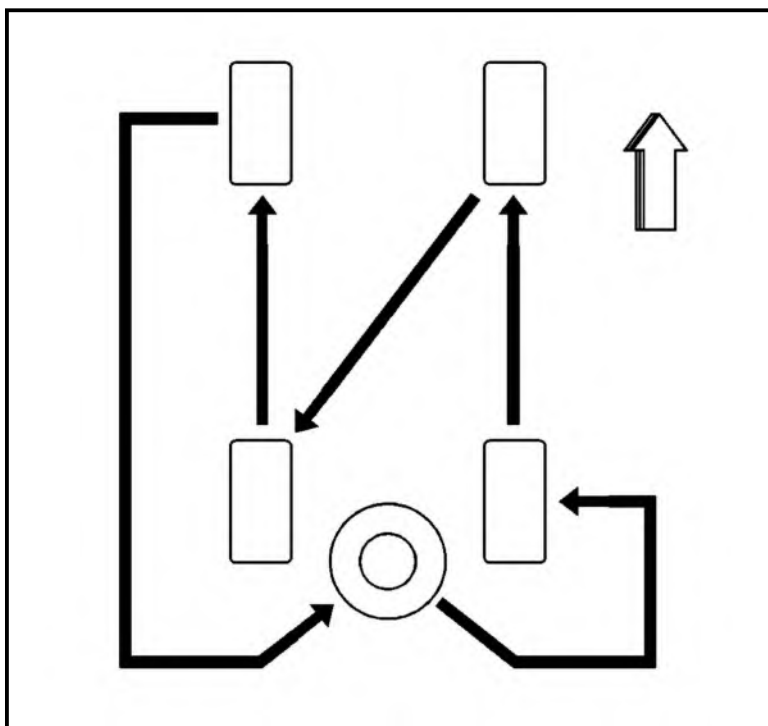
In order to equalize wear, rotate the tires at the specified intervals. Also, rotate the tire and wheel assembly whenever you notice uneven tire wear.

Radial tires tend to wear faster in the shoulder area, particularly in front positions, due to design. Radial tires in non-drive locations may develop an irregular wear pattern that can generate tire noise. This especially makes regular tire rotation necessary.

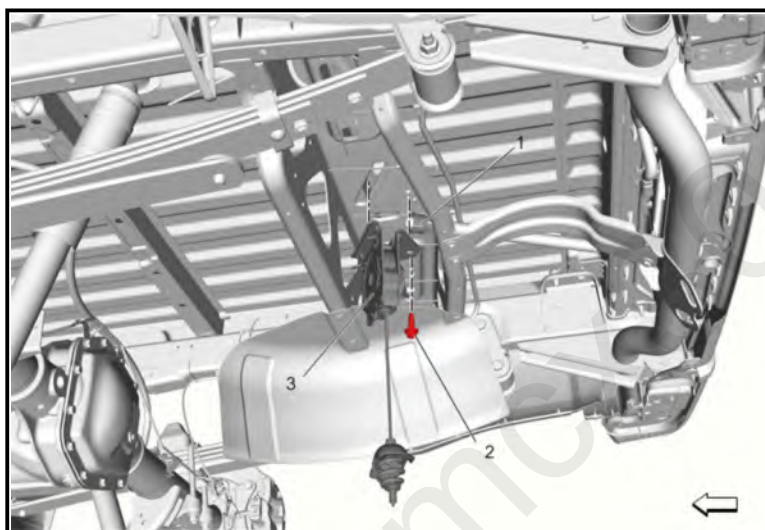
- For vehicles with single rear wheels (4 tires), rotate the tires as shown.



- For vehicles with single rear wheels (5 tires), rotate the tires as shown.



SPARE WHEEL CARRIER HANGER REPLACEMENT

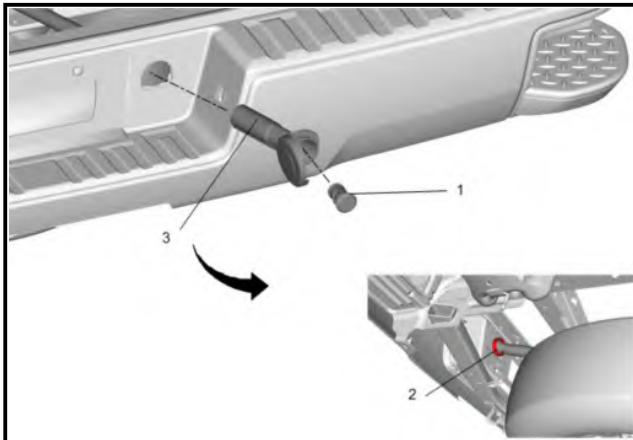


NOTE: Callouts in the following chart represent components shown in graphic above.

Callout	Component Name
Preliminary Procedure 1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle . 2. Remove the spare tire.	
1	Spare Wheel Guide Tube Retainer Procedure Using the appropriate tool disengage the spare wheel guide tube retainer locking tabs from the hanger and slide the retainer rearward toward the rear bumper.
2	Spare Wheel Carrier Hanger Bolt CAUTION: Refer to Fastener Caution .

Callout	Component Name
	Tighten 50 N.m (37 lb ft)
3	Spare Wheel Carrier Hanger

SPARE WHEEL HOIST LOCK CYLINDER REPLACEMENT



NOTE: Callouts in the following chart represent components shown in graphic above.

Callout	Component Name
Preliminary Procedure	
1. Raise and support the vehicle. Lifting and Jacking the Vehicle	
1	Spare Wheel Hoist Lock Cylinder Procedure If replacing the spare wheel hoist lock cylinder, coding will be necessary. Spare Wheel Hoist Lock Cylinder Coding
2	Spare Wheel Hoist Lock Cylinder Case Retainer [2x] Procedure NOTE: The spare wheel hoist lock cylinder case retainers are one-time use only. Using an appropriate tool, remove and DISCARD the 2 spare wheel hoist lock cylinder case retainers.
3	Spare Wheel Hoist Lock Cylinder Case

TIRE AND WHEEL BALANCING

WARNING: Failure to adhere to the following precautions before tire balancing can result in personal injury or damage to components:

- Clean away any dirt or deposits from the inside of the wheels.
- Remove any stones from the tread.

- **Wear eye protection.**
- **Use coated weights on aluminum wheels.**

Tire and Wheel Assembly Balancer Calibration

Tire and wheel balancers can drift out of calibration over time, or can become inaccurate as a result of heavy use. There will likely not be any visual evidence that a calibration problem exists. If a balancer is not calibrated within specifications, and a tire and wheel assembly is balanced on that machine, the assembly may actually be imbalanced.

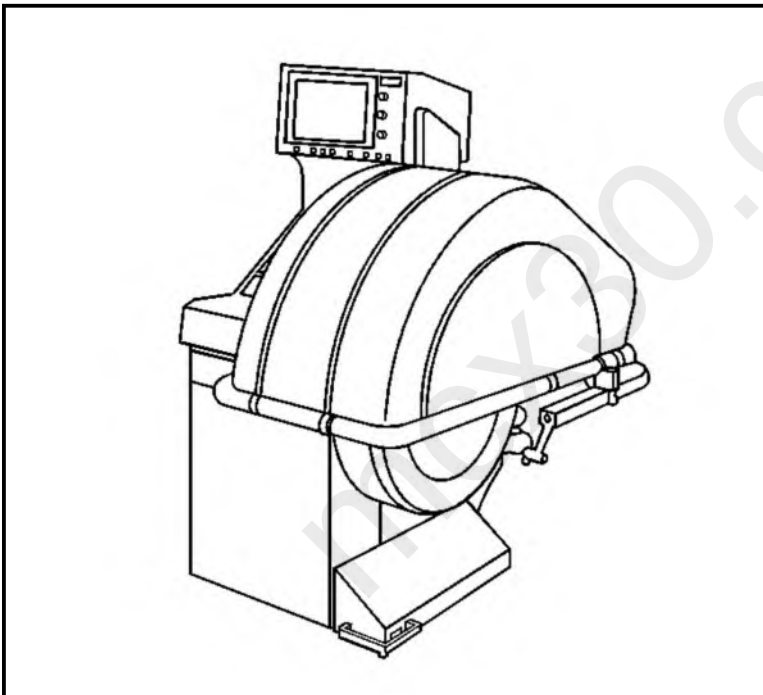
Tire and wheel assembly balancer calibration should be checked approximately every 2 weeks, if the machine is used frequently, and/or whenever the balance readings are questionable.

Tire and Wheel Assembly Balancer Calibration Test

NOTE: If the balancer fails any of the steps in this calibration test, the balancer should be calibrated according to the manufacturer's instructions. If the balancer cannot be calibrated, contact the manufacturer for assistance.

Inspect the calibration of the tire and wheel assembly balancer according to the manufacturer's recommendations, or perform the following test.

1. Spin the balancer without a wheel or any of the adapters on the shaft.



2. Inspect the balancer readings.

Specification

Zero within 7 g (1/4 oz)

3. If the balancer is within the specification range, balance a tire and wheel assembly - that is within radial and lateral runout tolerances - to ZERO, using the same balancer.
4. After the tire and wheel assembly has been balanced, add an 85 g (3 oz) test weight to the wheel at any location.
5. Spin the tire and wheel assembly again. Note the readings.
 - In the static and dynamic modes, the balancer should call for 85 g (3 oz) of weight, 180 degrees opposite the test weight.
 - In the dynamic mode, the weight should be called for on the flange of the wheel opposite the test weight.

6. With the assembly imbalanced to 85 g (3 oz), cycle the balancer 5 times.
7. Inspect the balancer readings:

Specification

Maximum variation: 7 g (1/4 oz)

8. Index the tire and wheel assembly on the balancer shaft, 90 degrees from the previous location.
9. Cycle the balancer with the assembly at the new location.
10. Inspect the balancer readings:

Specification

Maximum variation: 7 g (1/4 oz)

11. Repeat steps 8 through 10 until the tire and wheel assembly has been cycled and checked at each of the 4 locations on the balancer shaft.

Tire and Wheel Assembly Balancing Guidelines

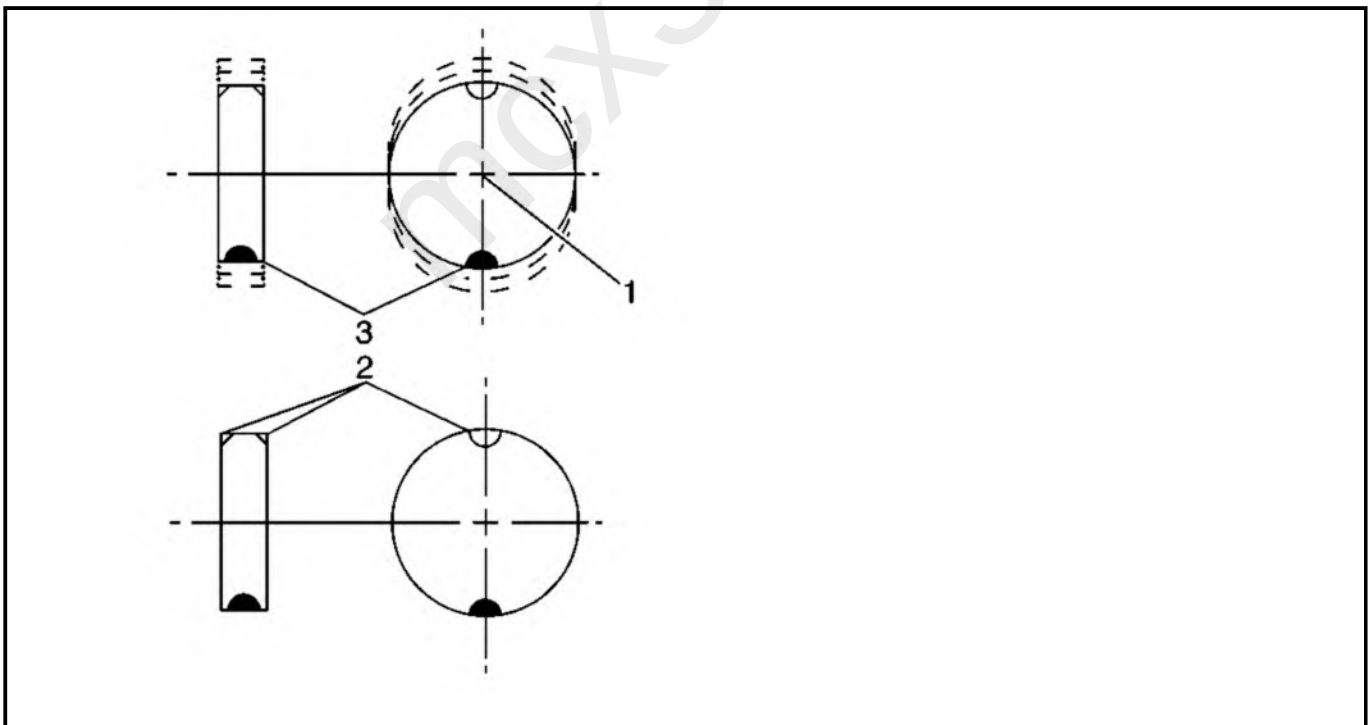
NOTE: Tire and wheel assemblies which exhibit excessive runout can produce vibrations even if the assemblies are balanced.

It is strongly recommended that the tire and wheel assembly runout be measured and corrected if necessary BEFORE the assemblies are balanced.

If the runout of the tire and wheel assemblies has not yet been measured, refer to [Tire and Wheel Assembly Runout Measurement - Off Vehicle](#) before proceeding.

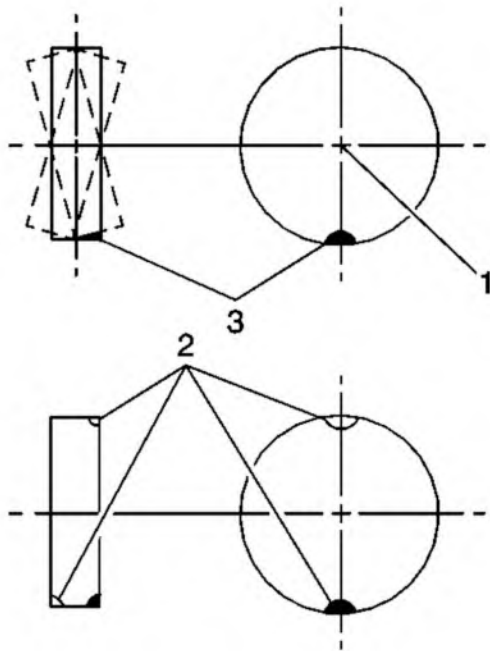
There are 2 types of tire and wheel balance:

Static Balance



Static balance is the equal distribution of weight around the wheel circumference. The wheel balance weights (2) are positioned on the wheel in order to offset the effects of a heavy spot (3). Wheels that have static imbalance can produce a bouncing action called tramp.

Dynamic Balance



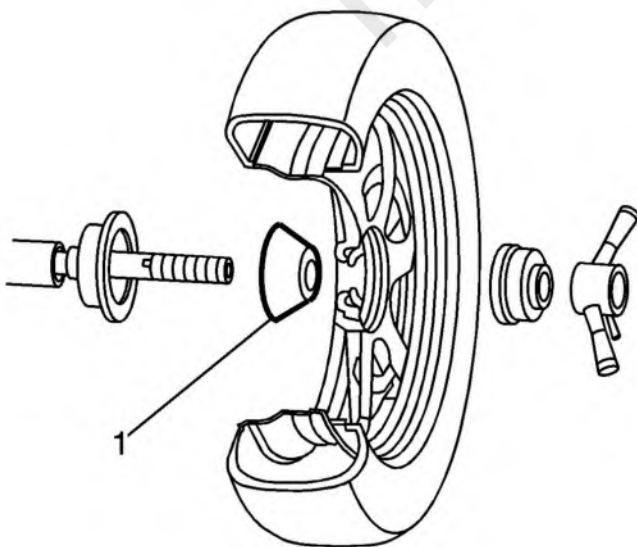
Dynamic balance is the equal distribution of weight on each side of the tire and wheel assembly centerline. The wheel balance weights (2) are positioned on the wheel in order to offset the effects of a heavy spot (3). Wheels that have dynamic imbalance have a tendency to move from side to side and can cause an action called shimmy.

Most off-vehicle balancers are capable of checking both types of balance simultaneously.

As a general rule, most vehicles are more sensitive to static imbalance than to dynamic imbalance. However, vehicles equipped with low profile, wide tread path, high performance tires and wheels are susceptible to small amounts of dynamic imbalance. As little as 14-21 g (1/2 - 3/4 oz) imbalance is capable of inducing a vibration in some vehicle models.

Balancing Procedure

NOTE: When balancing tire and wheel assemblies, use a known good, recently calibrated, off-vehicle, two-plane dynamic balancer set to the finest balance mode available.



NOTE:

Carefully follow the wheel balancer manufacturers's instructions for proper mounting of the center cone (1).

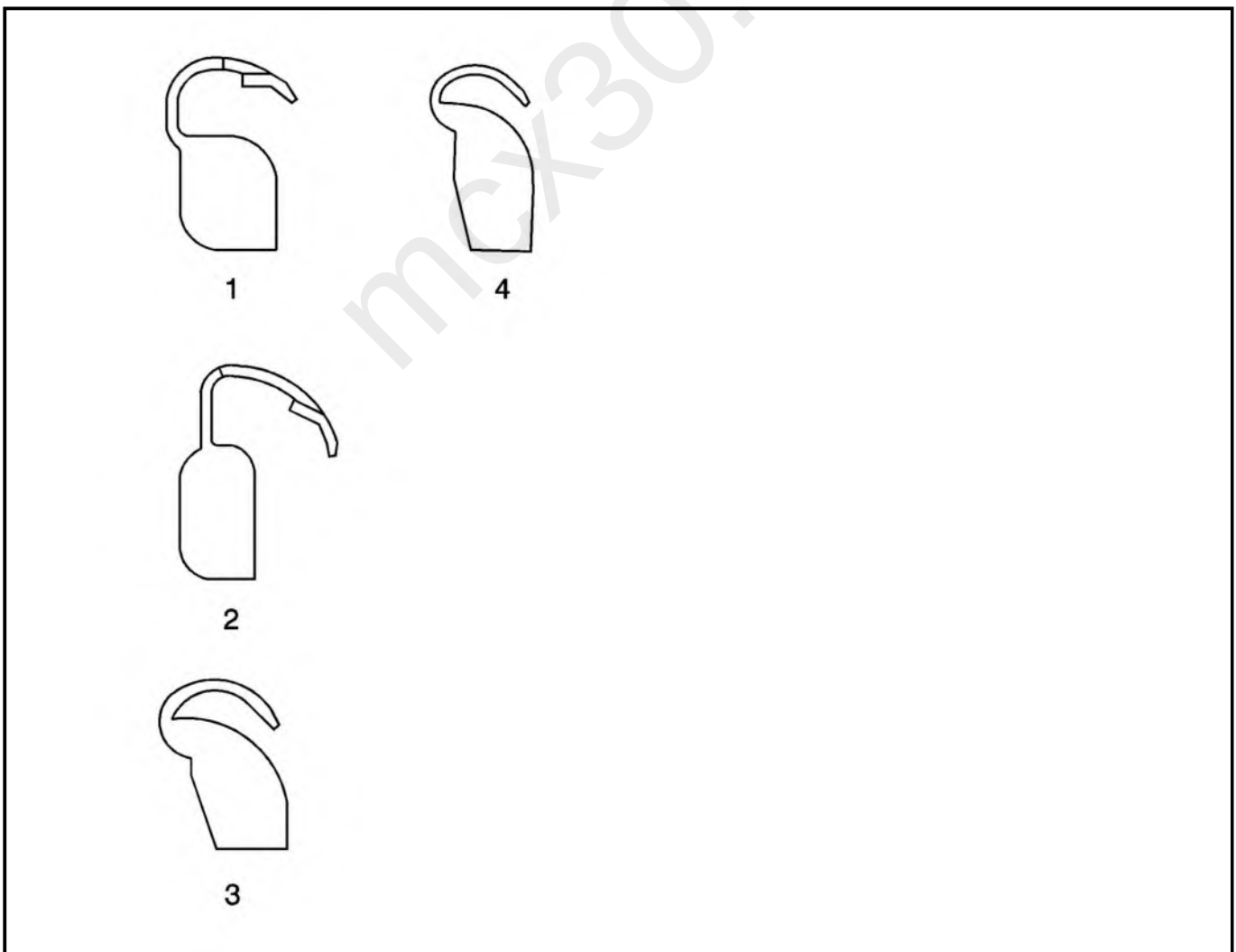
1. Raise and support the vehicle. [Lifting and Jacking the Vehicle](#)
2. Mark the location of the wheels to the wheel studs and mark the specific vehicle position on each tire and wheel - LF, LR, RF, RR.
3. Remove the tire and wheel assemblies one at a time and mount on a spin-type wheel balancer. [Tire and Wheel Removal and Installation](#)
4. Carefully follow the wheel balancer manufacturer's instructions for proper mounting techniques to be used on different types of wheels.

Regard aftermarket wheels, especially those incorporating universal lug patterns, as potential sources of runout and mounting concerns.

5. Be sure to use the correct type of wheel balance weights for the type of wheel rim being balanced. Be sure to use the correct type of coated wheel balance weights on aluminum wheels. Refer to Wheel Weight Usage section below.
6. Balance all four tire and wheel assemblies as close to zero as possible.
7. Using the matchmarks made prior to removal, install the tire and wheel assemblies to the vehicle. [Tire and Wheel Removal and Installation](#)
8. Lower the vehicle.

Wheel Weight Usage

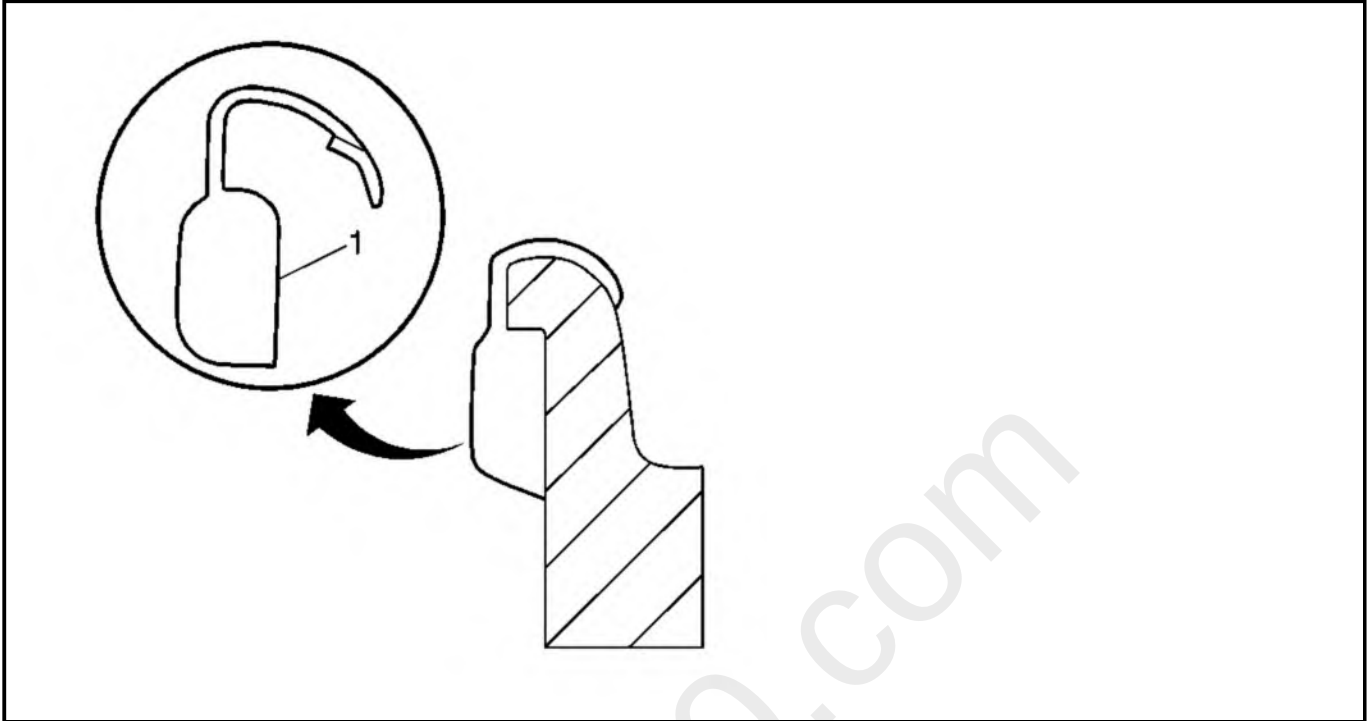
Tire and wheel assemblies can be balanced using either the static or dynamic method.

Clip-on Weights

NOTE:

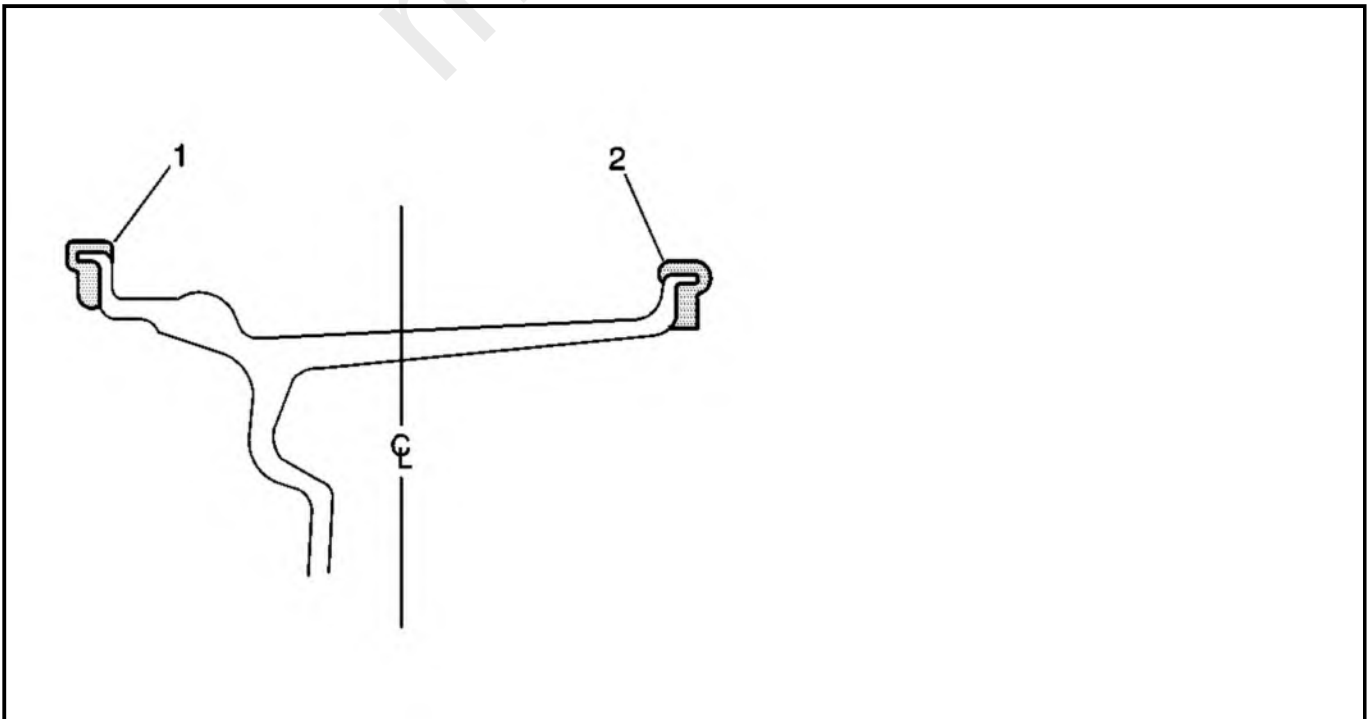
When balancing factory aluminum wheels with clip-on wheel balance weights, be sure to use special polyester-coated weights. These coated weights reduce the potential for corrosion and damage to aluminum wheels.

- MC (1) and AW (2) series weights are approved for use on aluminum wheels.
- P (3) series weights are approved for use on steel wheels only.
- T (4) series coated weights are approved for use on both steel and aluminum wheels.

**NOTE:**

Use a nylon or plastic-tipped hammer when installing coated clip-on wheel balance weights to minimize the possibility of damage to the polyester coating.

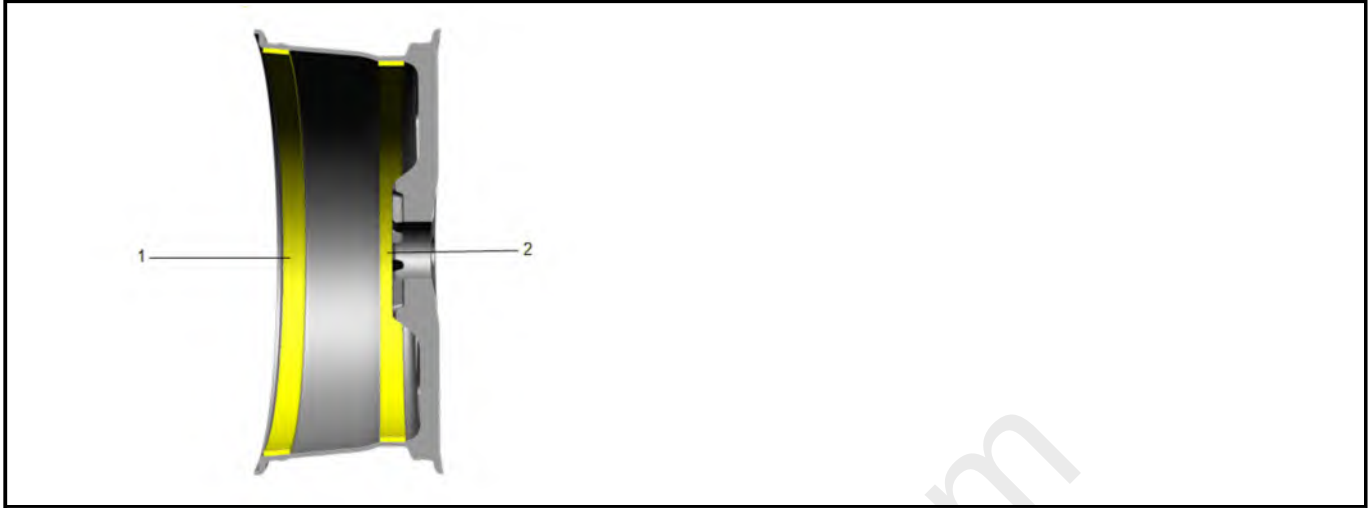
The contour and style of the wheel rim flange will determine which type of clip-on wheel weight (1) should be used. The weight should follow the contour of the rim flange. The weight clip should firmly grip the rim flange.

Wheel Weight Placement - Clip-on Weights

When static balancing, locate the wheel balance weights on the inboard flange (2) if only 28 g (1 oz) or less is called for. If more than 28 g (1 oz) is called for, split the weights as equally as possible between the inboard (2) and outboard (1) flanges.

When dynamic balancing, locate the wheel balance weights on the inboard (2) and outboard (1) rim flanges at the positions specified by the wheel balancer.

Adhesive Weights



NOTE: When installing adhesive balance weights on flangeless wheels, do NOT install the weight on the outward surface of the rim.

Adhesive wheel balance weights may be used on factory aluminum wheels. Perform the following procedure to install adhesive wheel balance weights.

1. Determine the correct areas for placement of the wheel weights on the wheel.
 - Wheels are designed with features such as recesses or flat surfaces to house the adhesive wheel weights typically at the most inboard (1) and outboard (2) surfaces.
 - These position features limit any interference installed adhesive weights could have with adjacent components during normal vehicle operation.
2. Ensure that there is sufficient clearance between the wheel weights and brake system components.

NOTE: Do not use abrasives to clean any surface of the wheel.

3. Using a clean cloth or paper towel with a general purpose cleaner, thoroughly clean the designated balance weight attachment areas of any corrosion, overspray, dirt or any other foreign material.
4. To ensure there is no remaining residue, wipe the balance weight attachment areas again, using a clean cloth or paper towel with a mixture of half isopropyl alcohol and half water.
5. Dry the attachment areas with hot air until the wheel surface is warm to the touch.
6. Warm the adhesive backing on the wheel balance weights to room temperature.
7. Remove the protective covering from the adhesive backing on the back of the balance weights. DO NOT touch the adhesive surface.
8. Apply the wheel balance weights to the wheel, press into place with hand pressure.
9. Secure the wheel balance weights to the wheel with a 90 N (21 lb) force applied with a roller.

DESCRIPTION AND OPERATION

GENERAL DESCRIPTION

The factory installed tires are designed to operate satisfactorily with loads up to and including the full rated load capacity when these tires are inflated to the recommended pressures.

The following factors have an important influence on tire life:

- Correct tire pressures
- Correct wheel alignment
- Proper driving techniques
- Tire rotation

The following factors increase tire wear:

- Heavy cornering
- Excessively rapid acceleration
- Heavy braking

SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

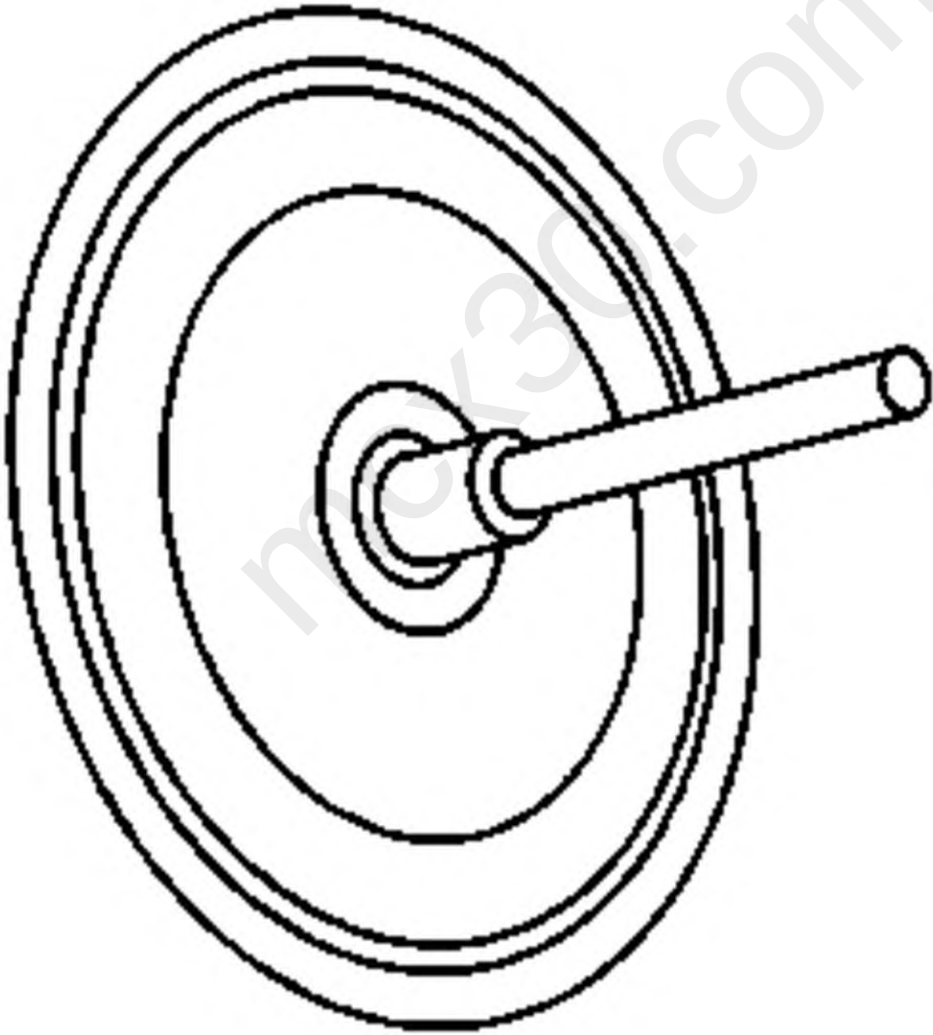
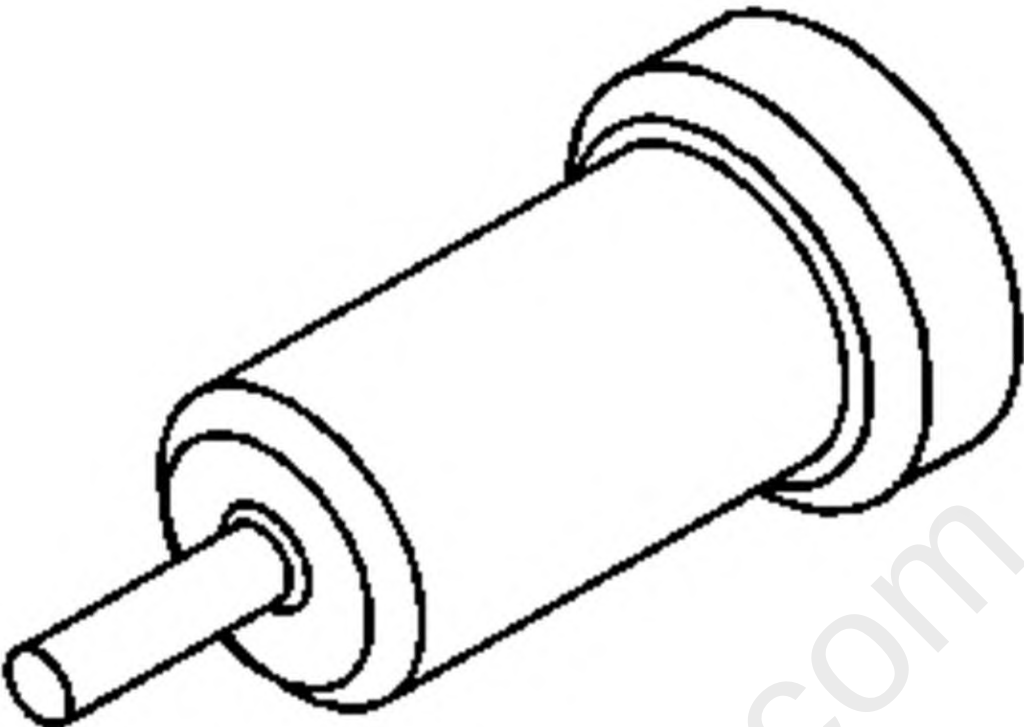
Illustration	Tool Number/Description
	CH-41013 J-41013 Rotor Resurfacing Kit

Illustration	Tool Number/Description
	CH-42450-A J-42450-A Wheel Hub Resurfacing Kit