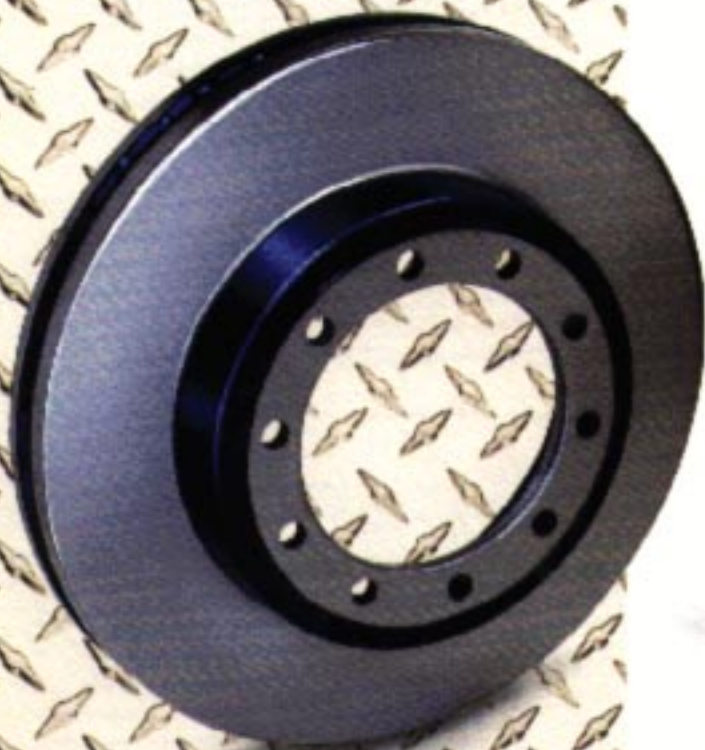


# GUNITE DISC BRAKE ROTORS



***Maintenance  
Manual***

**GUNITE<sup>®</sup>**  
CORPORATION

*Gunite is the industry leader in the development of brake system components for heavy-duty truck applications including air disc brake rotors. Gunite was the first to introduce ventilated disc brake rotors which significantly improved heat dissipation as required for applications on class 7 and 8 vehicles. Today, Gunite continues to lead the industry in the development of durable, light-weight disc brake rotor designs for current and future brake systems.*

*This manual provides you with a comprehensive program for the inspection and maintenance of disc brake rotors. By following the proper procedures, you can effectively spot problems, take preventive or corrective action, and ensure many miles of profitable, trouble-free service from your Gunite disc brake rotors.*

## When and how to inspect Disc Brake Rotors

A regular and thorough inspection is very important to the proper operation of your braking system and should be included in your regularly scheduled preventative maintenance program. By inspecting your brake components on a regular basis, you can greatly reduce your per-mile brake maintenance cost as compared to simply reacting to brake problems as they occur.

When following the inspection procedures outlined in this manual, it is not necessary to remove the rotor. The common problems shown here can easily be seen by simply removing the tire and rim and inspecting the rotor surface. The following problems are the most common problems experienced with rotors in the normal operation of the braking system. If one or more of these problems exist, the proper corrective action indicated should be taken immediately to insure safe braking on demand.

### CRACKED ROTORS

Braking surface cracks are seen as radial cracks appearing in the braking surface and rounding the edge of the rotor at the inside or outside diameter of the braking surface.

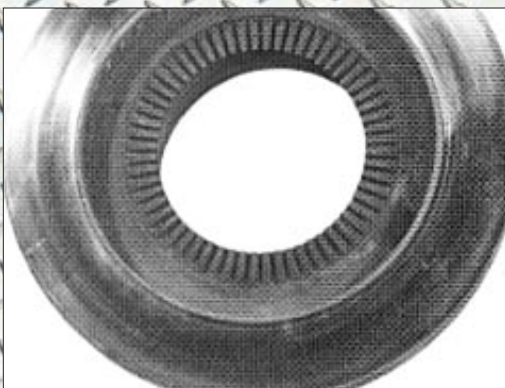
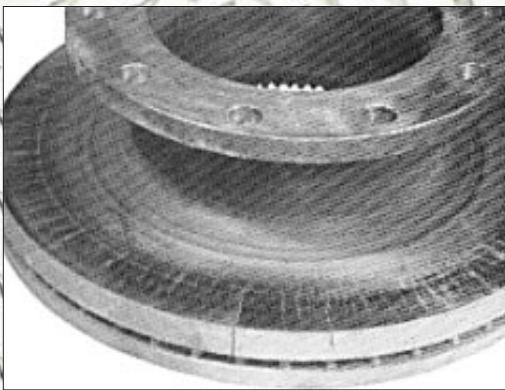
These cracks are usually caused by torque imbalance which shifts a greater share of the braking function to only a few of the vehicles brakes. The brakes, which are providing a greater share of the braking action, will always be the ones to show the greater rotor wear and will sometimes crack.

Cracked rotors observed during regular inspection must be replaced. If the rotor is not replaced, the cracks will accelerate lining wear and can eventually progress into the barrel section of the rotor and cause separation of the braking section from the mounting flange. Rotors found to have cracks while enroute should be replaced at the next available service facility. After installing a new disc brake rotor, the braking system should be checked for proper brake balance to allow for maximum brake efficiency and prevent subsequent cracking.

### HEAT-CHECKING

Heat-checking is the appearance of numerous short, thin, radial interruptions of the braking surfaces of the rotor. Heat-checking is a normal phenomena of the disc brake function just as they are on brake drums.

Heat-checking is the result of the heating and cooling of the braking surface which occurs as the brakes are applied during normal operation of the vehicle. Heat-checks are not detrimental to the function or the performance of the braking system and no corrective action is required for this condition. Heat-checks will frequently wear away and reform as a result of the normal braking process however, heat-checks can progress over time into cracks in the braking surface depending on such factors as lining/rotor wear rate, brake system balance, and how hard the brakes are used.



# Proper Selection of New Rotors

Brake performance is directly affected by compatibility of each component in the brake system. Disc brake rotors are carefully engineered to meet the specific requirements of each brake system. All replacement rotors must meet the quality and performance standards set by the brake system manufacturer. By replacing worn or damaged rotors with rotors of equal quality, each brake will perform equally to provide a balanced system and maximum braking efficiency. In addition, care must be taken to properly match the correct brake lining with the replacement rotor specifications. Proper matching of

brake components allows the braking system to operate efficiently which will result in maximum stopping performance, longer service life between relining and overall lower brake maintenance costs.

When replacing worn or damaged rotors, there is certain information which will be required to identify the correct replacement rotor. When specifying the replacement rotor you will need to know the manufacturer's part number and provide any other information appearing on the rotor.

## Sizing of Disc Brake Rotors

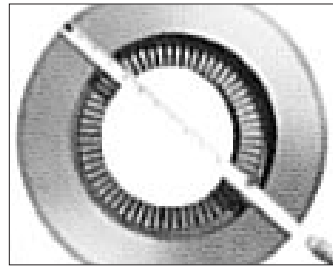
If the manufacturer's part number is not available, your parts supplier can still determine the correct rotor for your application if you provide the following information. The first step is to identify the basic rotor design. It is either "U - Section" figure A or "Hat Section" figure B. Once this is determined, follow each of the eight steps pictured below making careful note of the measurements and information.



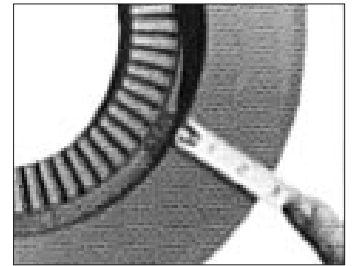
Figure A



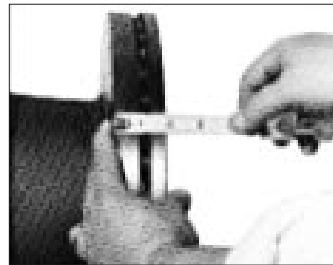
Figure B



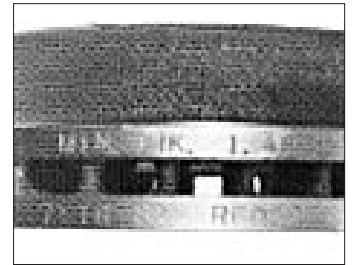
1. Outside diameter of rotor, measured across the braking surface.



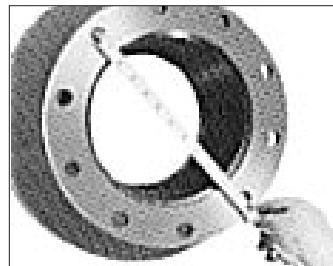
2. Width of braking surface.



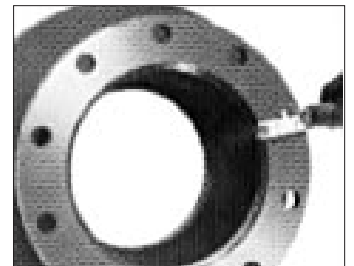
3. Rotor width, braking surface to braking surface.



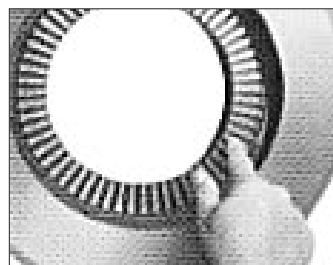
4. Identification stamped on outer diameter.



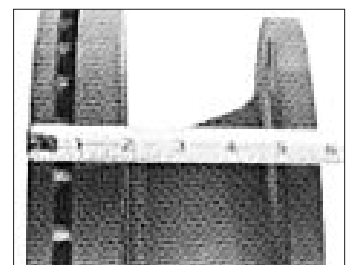
5. Bolt circle diameter.



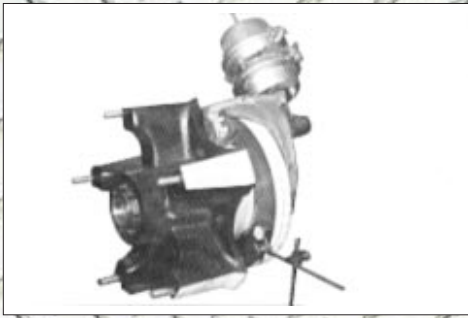
6. Size and number of bolts.



7. Are there any exciter teeth cast into the rotor?



8. Overall depth of the "U - Section" or "Hat Section" of the rotor.



### LATERAL RUN-OUT (WOBBLE)

Using a dial indicator, as shown in the photo, measure the lateral runout or wobble of the rotor. The lateral run-out should not exceed a total indicator reading of .020" during one full revolution on properly adjusted wheel bearings. If the lateral run-out exceeds .020" total indicator reading, check the mounting surfaces between the rotor and the wheel or hub, fastener torques, as well as the condition of and adjustment of the wheel bearing.

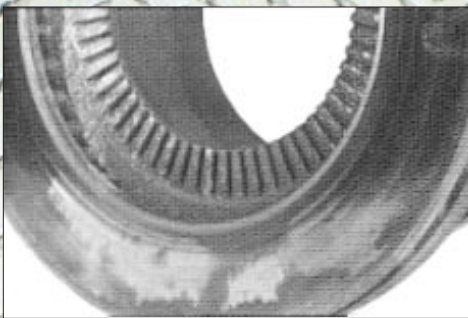
### RADIAL RUN-OUT

Using a dial indicator, check the radial run-out as measured at the outside diameter of the braking surface. The radial run-out should not exceed .035" total indicator reading. If the radial run-out of the rotor exceeds .035", replace the rotor.



### ROTOR THICKNESS

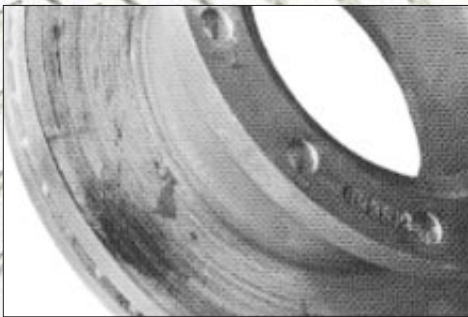
Rotor thickness should be checked to make sure that the rotor thickness meets the dimensional tolerance stamped into the rotor casting. When measuring the thickness of the rotor, the thickness should not vary more than .005" when measured at several points around the rotor. If the measurement exceeds .005" and the rotor is within allowable tolerances to be resurfaced, the rotor should be resurfaced. If the rotor is not within the allowable tolerance for resurfacing, it should be replaced.



### GREASE-STAINED ROTORS

If this condition exists, the brake rotors will show discolored spots on the braking surface, with oil and/or grease splattered on the brake assembly. This condition is most likely caused by a faulty lubrication system or improper greasing of the brake mechanism.

To correct the problem, the source of the grease and/or oil must be located and necessary repairs made to eliminate the leak. Remove the entire brake assembly and clean each component thoroughly. If the linings are soaked with oil or grease, they must be replaced.

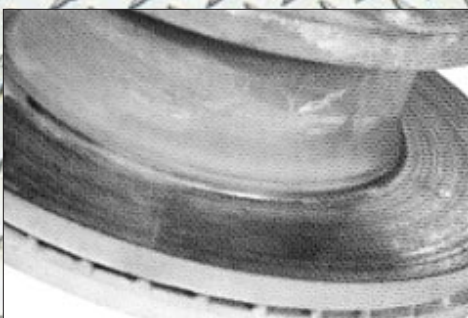


### MARTENSITE SPOTTED ROTORS

This condition indicates that the rotor has been subjected to extremely high temperatures caused by an improperly balanced braking system, a dragging brake or continued severe brake applications. These extremely high temperatures have caused structural changes to occur in the rotor material which makes the rotor more susceptible to cracking.

To correct this problem, the rotor should be resurfaced to restore concentricity by removing the hard raised areas. If resurfacing will not remove the heat spots, or if the resurfacing reduces the rotor thickness below the minimum recommended thickness, stamped on the outside diameter of the rotor, the rotor must be replaced. Brake linings should be checked for uneven wear and be replaced if necessary.

After reinstalling or replacing the rotor, the braking system should be checked for proper balance to restore maximum braking efficiency.

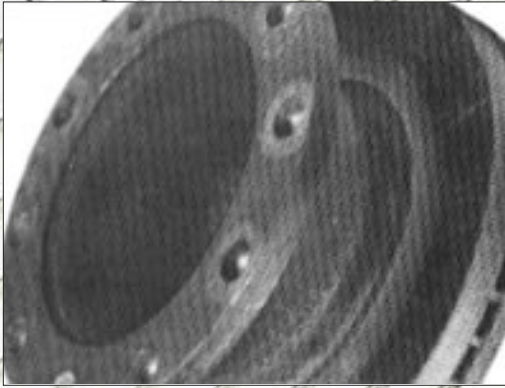


### SCORED ROTORS

A scored rotor is indicated by a defined grooved appearance on the braking surface.

If the depth of the scoring exceeds .015" and the thickness of the braking surface can be resurfaced and still remain within allowable tolerances, then the rotor should be resurfaced to restore a smooth braking surface. The linings should also be replaced to provide maximum braking efficiency.

*NOTE: WHEN RESURFACING THE ROTOR, THE FINISH OF THE BRAKING SURFACE MUST BE HELD TO A 5 MICROMETER (200 MICRO-INCH) MAXIMUM.*

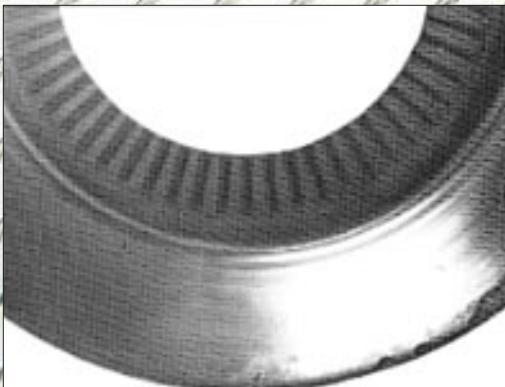


### BLUING ROTORS

A rotor which shows the signs of bluing has been subjected to extremely high temperatures. This condition may be caused by continued hard stops or by brake system imbalance. It is not necessary to resurface or replace the rotor as long as the rotor remains within the allowable tolerance for operation.

To correct this problem the brake system should be checked for proper balance. The rotor should be checked to make sure that the rotor thickness is correct and the brake caliper should be checked for proper adjustment and clearance.

If this condition is left unresolved, it can result in the development of a martensite condition or cause the rotor to crack.

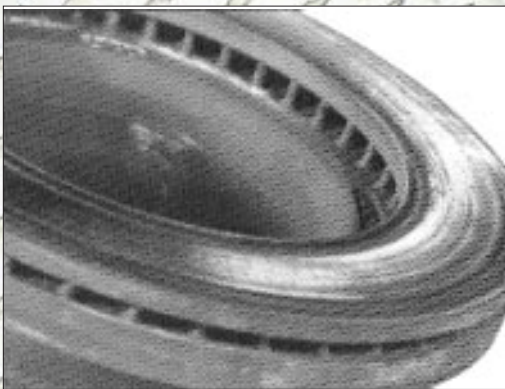


### POLISHED ROTORS

A polished rotor can be identified by the mirror-like finish on the braking surface. This problem can easily be solved by sanding the braking surface with 80 grit emery cloth. It is also necessary to remove the glaze from the linings at the same time, using the 80 grit emery cloth.

If the problem recurs, the linings should be checked to make sure that they have the correct friction rating.

*NOTE: IT IS A RECOMMENDED PROCEDURE TO SAND THE BRAKING SURFACE OF THE ROTOR AT THE TIME OF RELINING.*

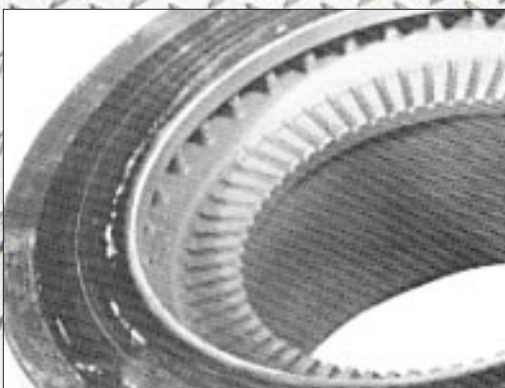


### WORN ROTORS

The minimum worn rotor thickness is shown on the outside diameter of the rotor braking section or cast into the body of the rotor. The minimum dimension applies to the cross-sectional measurement between the two braking surfaces of the rotor. This measurement should be made at several points around the entire circumference of the rotor. If the thickness of the rotor is below the minimum dimension\* shown on the rotor, the rotor must be replaced. If there is sufficient thickness remaining on the rotor, it may be resurfaced as long as the resulting thickness does not fall below the minimum thickness required.

The rotor should also be checked to make sure that the wear is approximately equal on both braking surfaces. If one surface is worn more than the other, the brake system is not functioning properly and should be inspected and repaired.

\* See chart for minimum dimensions located on the back page.



### LINING TRANSFER

Lining transfer is indicated by a thin layer of lining material which has become welded to the rotor braking surface. Initially the lining deposits will be spotty; however, as the problem progresses the lining deposits will be covering more of the braking surface. Lining transfer will accelerate lining wear.

This problem is the result of extremely high operating temperatures which are usually caused by dragging brakes, continued hard stops, brake system imbalance or brake system malfunction. The rotor can be resurfaced to remove the lining deposits and restore a proper braking surface. The rotor thickness, after resurfacing, must not be below the minimum thickness stamped on the rotor.

### CLOGGED OR RESTRICTED VENT HOLES

Vehicles operating in severe-duty environments may experience clogged or restricted vent holes due to the accumulation of mud, gravel or other debris. Such restrictions must be removed in order to provide even cooling of the rotor during normal operation.

# Recommended Refinishing Dimensions

Applications	Outside Diameter	Width (New)	Minimum Dimension After Refinishing	Discard Dimension
Kelsey-Hayes Air Disc Brake—Model I	15.38	1.535	1.455	1.415
Kelsey-Hayes Air Disc Brake—Model II & IIF	15.38	1.750	1.670	1.630
	17.18	1.750	1.670	1.630
Rockwell Air Disc Brake—Solid Rotor	14.92	.905	.825	.785
Rockwell Air Disc Brake—Ventilated Rotor	15.25	1.750	1.670	1.630
	18.00	1.750	1.670	1.630
Kelsey-Hayes TH 24—Air Over Hydraulic Brakes	15.62	1.750	1.670	1.630
Bendix Hydraulic Brakes	15.00	1.435	1.355	1.315
	15.39	1.535	1.455	1.415
Dayton Hydraulic Brakes	14.76	1.345	1.265	1.225
	15.38	1.535	1.455	1.415
	15.39	1.535	1.455	1.415

# Trouble-Shooting Common Driver Complaints

In some cases, drivers may complain of braking irregularities between routine brake inspections. It is always recommended that the brake system and all components be inspected at the earliest possible time when complaints are received.

The following list contains some of the more common driver complaints, their causes and solutions. *Note: These conditions could result from a number of brake component malfunctions. This checklist can be used to isolate any specific problem with the rotor section of the brake assembly.*

## Driver Complaint

*Driver complains that the system squeals when the brakes are applied.*

### Common Causes:

Squealing brakes may be the result of one or more of the following problems; rotor distortion, polished rotors or improper lining friction ratings. However, other causes include vibration in the suspension or other brake components.

### Solution:

Check the rotor for distortion (lateral run-out or wobble) using a dial indicator as shown on page 3. If the rotor shows excessive lateral run-out, the rotor must be replaced. If the rotor thickness allows, the problem may be eliminated by resurfacing the rotor.

Check the braking surfaces for “polishing” as described on page 4. If the condition exists, remove the gloss on the braking surface using 80 grit emery cloth.

Check the linings for glazing. If they are glazed, remove the glaze using 80 grit emery cloth. Check the friction rating of the linings to make sure that they meet the specifications of the braking system and rotor manufacturer.

Check to make sure that the linings are properly installed and adjusted to meet brake system specifications.

## Driver Complaint

*Driver complains of roughness or chatter during brake application.*

### Common Causes:

Roughness or chatter during braking applications may be caused by excessive variation in the rotor thickness, excessive lateral run-out (wobble) or a cracked rotor.

### Solution:

Check the rotor for uneven surface areas. The thickness or width of the rotor should be checked for uniformity in several areas around the circumference of the rotor. If the thickness varies but the condition is not too serious, resurfacing the rotor commonly solves the problem. If the surface variance is excessive or if the problem persists, replace the rotor.

Check the rotor for distortion (lateral run-out or wobble) using a dial indicator as shown on page 3. If the rotor shows excessive lateral run-out, the rotor must be replaced. If the rotor thickness allows, the problem may be eliminated by resurfacing the rotor.

Check the rotor for cracks as described on page 2. If any cracks are found replace the rotor immediately.

### WARRANTY

*Gunite Corporation warrants to the original purchaser that its spoke wheels, hubs, brake drums and brake rotors are free from defects in material and workmanship. Gunite Corporation agrees to repair or replace, without charge, any and all of its products which fail in normal use and service because of defects in material and/or workmanship.*

*Gunite Corporation shall not be liable for any incidental or consequential damages for any breach of warranty, its liability and the purchaser's exclusive remedy being expressly limited to repair or replacement of the product as herein provided. There are no other warranties, expressed or implied except such as is set forth herein.*

*This manual was developed to guide you in the inspection and maintenance of disc brake rotors. In addition, the instructions and procedures have been reviewed and approved by Eaton Axle-Brake Division, Rockwell International Brake Division and Bendix. If you have problems not covered in this publication, we suggest you contact the vehicle manufacturer for additional maintenance information.*



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