

MGM Brakes

A Division of Indian Head Industries, Inc.

TECHNICAL BULLETIN

SUBJECT: J-Series Spring Brake Head Movement - In The Roll Area

The roll process for the J-series Spring Brake design displaces a circumferential strip of head material into the securing groove in the flange case by a cold forming operation. The inward radial deformation of the head material, which occurs during the roll process, imparts residual stresses into the head material comparable to similar cold forming operations. The material stresses developed in the roll deformation area, and the geometry of the joint itself, provide the strength necessary to prevent the head from separating from the case. This Tamper Resistant closure design has been qualified through extensive testing as specified in SAE Standard J1469 Section 15.

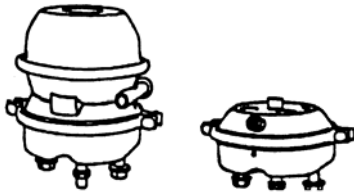
This design has proven itself to be unaffected by the pressure application of 38 bar. High pressure testing shows that the pushrod moves past the seal as the components deflect under pressure pushing the seal out and effectively becoming a pressure relief. Testing has shown this to occur at approximately 33 – 38 bar. Post test evaluation shows no change in the head to flange case joint. See photo 1, 2 and sketch 1.

The head deformation profile will vary from unit to unit. This may result in a gap between the deformed head material and the securing groove in the flange case. The magnitude and position of this gap will vary depending on the tolerances associated with the thickness of the head material, the relative positions of the parts during assembly, the spring back of the head material, and the depth of the securing groove. During manufacture, the application of air pressure to the parking brake side of the unit for leak test and manual caging of the spring brake prior to shipment will introduce internal loads to expand the unit so that the deformed profile in the head is in direct mechanical contact with the securing groove of the case as illustrated in View A.

During transit there will be no internal loads to keep the unit in the expanded position as illustrated in View A. Only the friction of the seals will be present to maintain this position. However, the external forces introduced by handling or the motion of transit may be sufficient to overcome the friction of the seals and move the head relative to the case, resulting in the repositioning of any gap that may be present in the joint. View B illustrates the possible “As Delivered” condition. Position in View B is only possible in the manually caged position with no air pressure. This is not a condition that occurs while installed on the vehicle, and therefore no movement will occur during vehicle operation. Please note that the gap could still be as illustrated in View A or somewhere between the positions in View A and View B when the unit is received.

If the gap is positioned anywhere other than as illustrated in View A, some relative movement (2.5mm Max) between the head and the flange case may be observed when air pressure is initially applied. Conditions when this relative movement may occur include the following:

- 1.) Application of Air Pressure to the parking spring side of the unit while the parking spring is maintained in the manually caged position. See View B which illustrates this possible movement and View A which illustrates the final position.
- 2.) Manually uncaging of the unit (release bolt wound-in) during which no air is applied to the parking spring side of the unit or subsequently as air pressure is applied to the parking spring side of the unit. See View B which illustrates this possible movement and Views C and D which illustrate the final positions

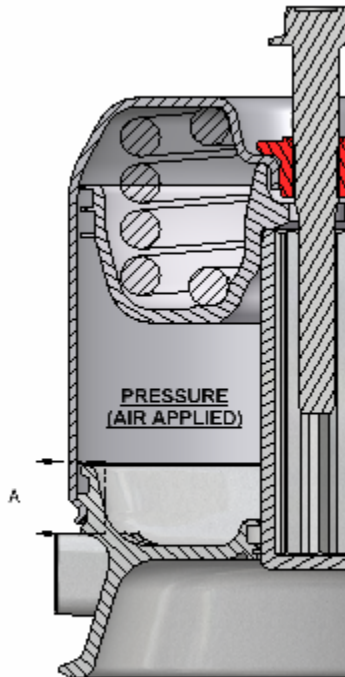


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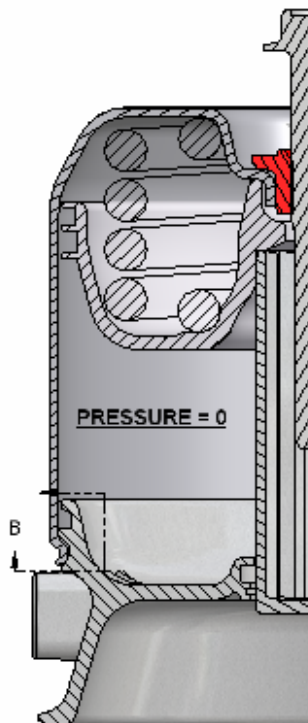
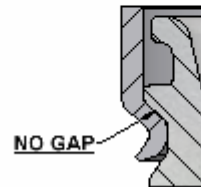
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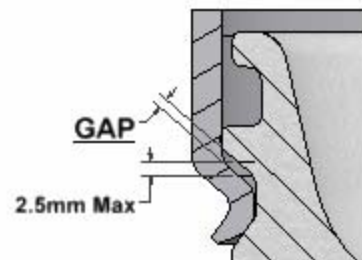
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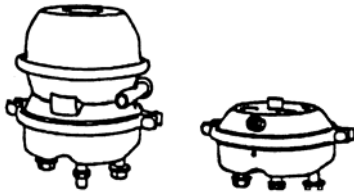


VIEW A
UNIT WITH PARKING SPRING MANUALLY
CAGED AND AIR APPLIED TO SPRING
SIDE OF UNIT
(AS MANUFACTURED UNIT
DURING LEAK TESTING)



VIEW B
POSSIBLE "AS DELIVERED"
ILLUSTRATES MAXIMUM GAP



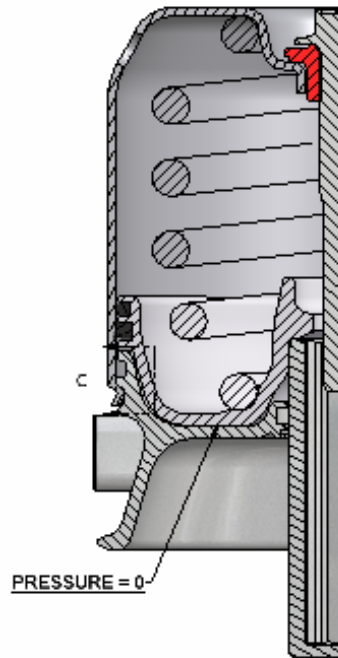


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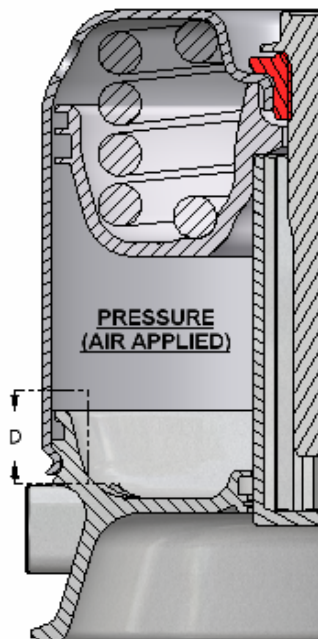
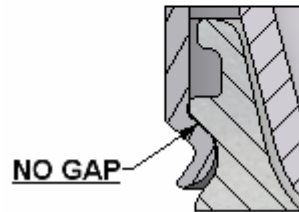
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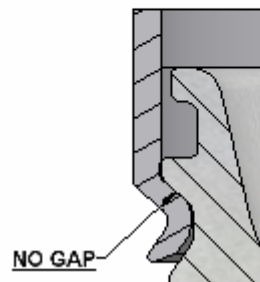
VIEW C

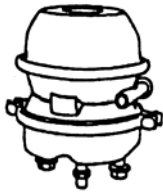
UNIT NOT CAGED
NO AIR APPLIED TO
PARKING SPRING SIDE



VIEW D

UNIT NOT CAGED
AIR APPLIED TO
PARKING SPRING
SIDE OF UNIT





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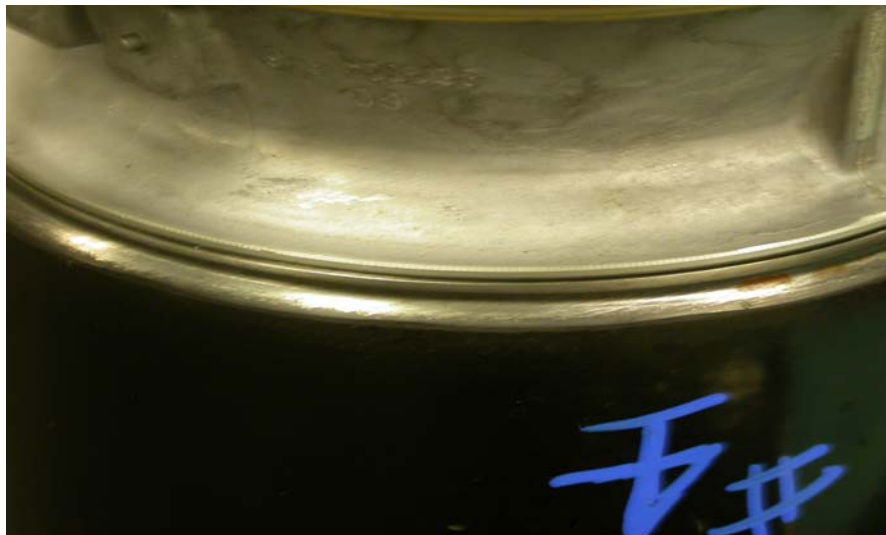
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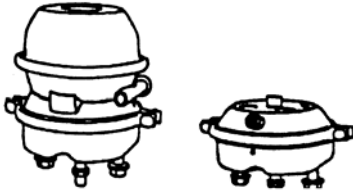
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Leak @ Pushrod Seal (Photo 1)



Head Roll Area After Burst Test (Photo 2)
No Leak

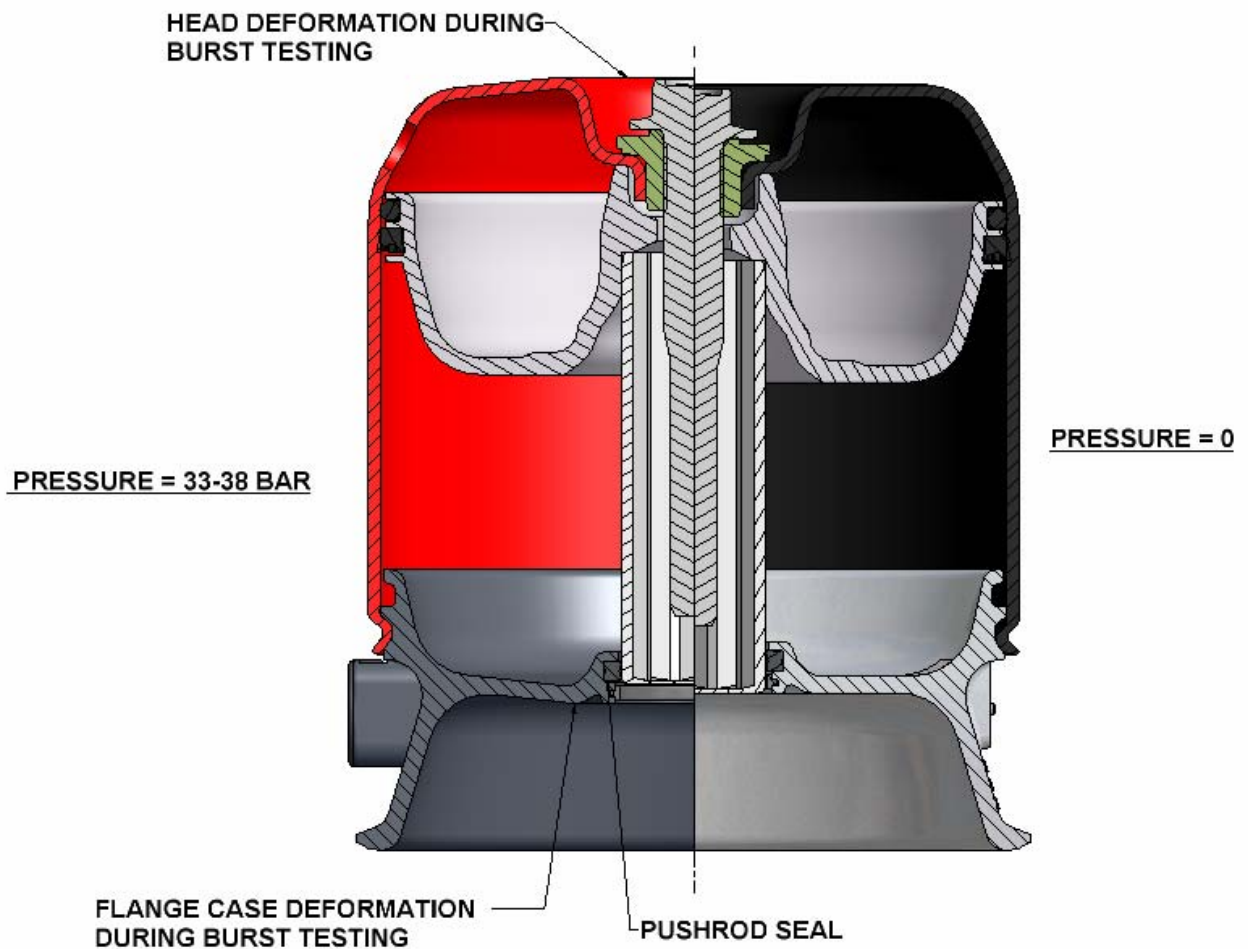


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SKETCH 1