



Inspection Bulletin

North American Standard Inspection Program

2014-02 – Identification of Long Stroke Brake Chambers or Brake Adjustment Limit Markings

Created: April 10, 2014

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Summary

This Inspection Bulletin provides guidance to correctly identify a long stroke brake chamber on an air-braked vehicle during inspection. This information gives clarity to some of the inquiries and issues encountered during roadside inspections. Correct identification of the brake chambers is necessary to ensure proper reference to the appropriate brake adjustment charts in the North American Standard Out-of-Service Criteria (OOSC). This Inspection Bulletin pertains only to clamp-type brake chambers on drum brake and exposed-pushrod-style disc brake systems.

An accompanying training video is available by logging into the CVSA member portal at www.cvsa.org/memberportal and selecting the “CVSA Learning” tab, and via the CVSA Out-of-Service Criteria app.

Background

Long stroke brake chambers manufactured for use in North America generally comply with a recommended practice (RP) published by the Society of Automotive Engineers (SAE J1817). SAE RP J1817 compliant long stroke brake chambers use at least two of three different identification methods. Some brake chambers are in use that do not comply with J1817 identification methods, but may have alternative markings to identify them as being a long stroke design.

Chamber Type and Size

The type of brake chamber, in terms of its **size**, for all brake chambers is determined by using a caliper or a tool (chambermate) to measure the outside diameter.

The type of brake chamber, in terms of its **stroke**, is determined by looking for visual identifiers that indicate it is a long stroke chamber. The absence of a recognizable long stroke marking requires the inspector to deem the brake chamber to be a standard type and not a long stroke type.

Stroke Markings are Rated Stroke not Adjustment Limit

All stroke markings placed on a brake chamber by the manufacturer refer to the rated stroke of the chamber. Rated stroke is a design feature and is generally one-half inch (13 mm) greater than the brake adjustment limit of a chamber. Inspectors must be careful to differentiate between these two values. Rated strokes are included in the clamp-type brake chamber data reference tables in the OOSC for type 20 and 24 long stroke chambers to help identify the brake chamber type.

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Identifying Long Stroke Brake Chambers

SAE RP J1817 includes three different methods for identifying long stroke brake chambers. These methods are:

1. Service instructions embossed or stamped onto the chamber.
2. Tags showing the rated stroke of the chamber. These tags are trapezoid-shaped (trapezoidal) with information embossed on the surface.
3. Square-shaped air ports or a square-shaped embossment around the air port.

Many chambers will use all three of these identification methods, but only two of the three are required. It is also possible that one or more of these identification methods has become obscured, and in the case of the trapezoidal tags, detached from the chamber.

Inspectors need to be prepared to locate, recognize and accept one, two or three of these identifiers. In some cases, inspectors may also need to recognize and accept an alternative identification method to those listed in SAE RP J1817, as described below.

1. Trapezoidal Stroke Tags

Many manufacturers of long stroke chambers identify them by installing a tag in the shape of a trapezoid that shows the rated stroke for the chamber. These tags can be any color and any suitable material, and are usually installed near the air fitting or a clamp bolt. Information on the tag may also be repeated on the chamber itself. The design of the tag from SAE RP J1817 is shown in figure 1, and figures 2 and 3 show examples of the tags. **One of these tags is an *acceptable identifier* of a long stroke chamber.**



Figure 1



Figure 2

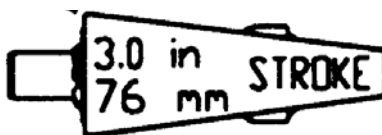


Figure 3

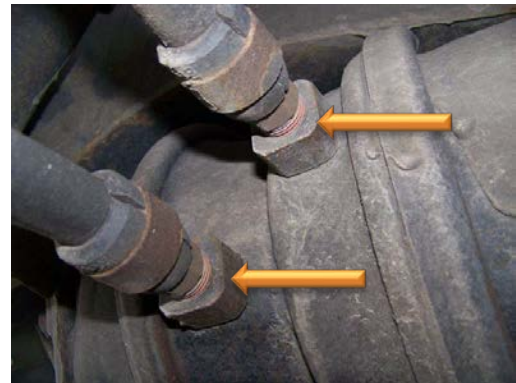
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2. Square-Shaped Ports or Embossment

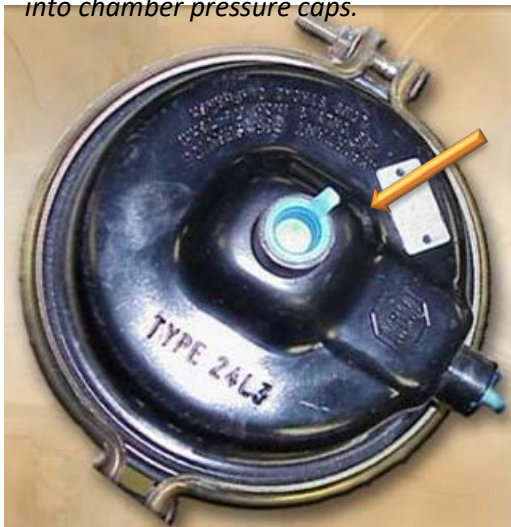
Most long stroke brake chamber manufacturers identify the chamber by using square-shaped ports where the air fittings connect or emboss the pressure cap section of the chamber housing with a square shape. In many cases, the square shape has rounded corners. **Any indication of the square shape is an acceptable identifier of a long stroke chamber.**



Square-shaped air fitting ports



Examples of square shapes embossed into chamber pressure caps.



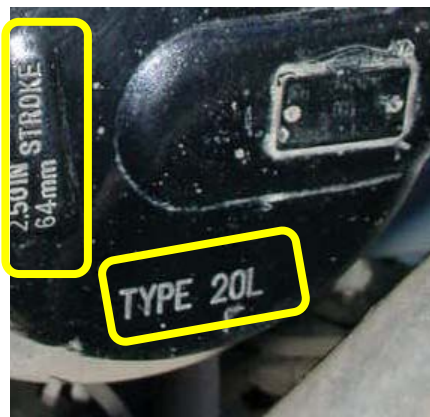
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3. Identification and Service Data

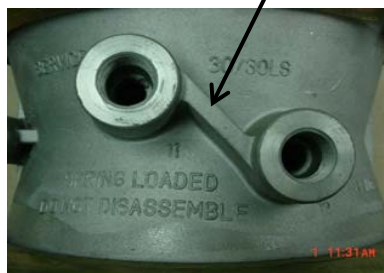
Many long stroke brake chambers have identification and service data stamped, cast or embossed onto the metal parts of a brake chamber. Others are provided with an adhesive data label. The data provided often identifies the type of brake chamber and may also include the rated stroke. For example, the letter “L” and “LS” following the size (12 through 30) are often (but not always) used to identify long stroke chambers. Other alpha-numeric codes are also used to identify chamber type.

Special note for type 20 and 24 long stroke chambers: There are two sizes of these two long stroke chambers. As shown in the long stroke clamp-type brake chamber data reference in the OOSC, the rated stroke of these chambers could be 2.5 inches or 3 inches. Confirm the chamber is correctly identified. Whenever the square embossment is 0.5 inch high, it indicates a long stroke chamber with a rated stroke of 3 inches, having a brake adjustment limit of 2.5 inches.

Identification and service data provided by the chamber manufacturer that shows a rated stroke consistent with the long stroke data reference table in the OOSC is an acceptable identifier of a long stroke chamber.



Examples of identification data and marking.

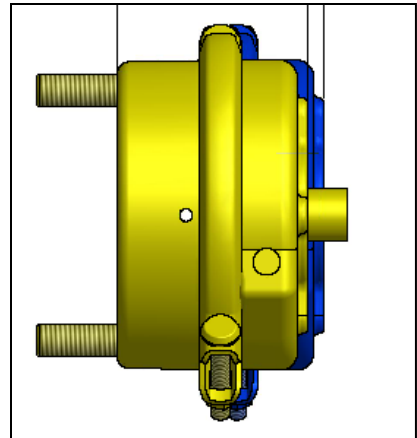


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4. Unacceptable Means of Identifying Long Stroke Chambers

To avoid confusion, inspectors must also be aware of other means that may be claimed as being suitable for identifying long stroke chambers. **These methods are not accepted as identifiers of long stroke brake chambers for inspector's purposes.**

- The measurement of the thickness of the chamber cannot be used to identify a long stroke chamber. The interior design of the chamber differs among manufacturers. Exterior brake chamber dimensions do not reliably identify the rated stroke. Rated strokes can even differ among chambers with similar exterior dimensions from the same manufacturer.



- A square hole where the pushrod enters the brake chamber is not an indicator of a long stroke brake chamber. The hole is sometimes square in order to allow the pushrod yoke to pass through the housing.



- The color of the trapezoidal tag does not indicate a particular rated stroke.



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Brake Adjustment Limit for Air Brake Chambers – *New Option*

In December 2013, SAE J2899 was developed and a new recommended practice was approved to provide an alternative way of determining the size and allowable stroke of a brake chamber. By putting a standardized rated stroke marking on the air brake chamber in a known location, the only conversion required is between the rated stroke marking to the brake adjustment limit. This method would reduce the likelihood of an inspector passing a vehicle that should be out of service or putting a vehicle out of service that is within acceptable operating conditions.

Rated stroke markings are to be located on the spring brake housing base for spring brakes or on the pressure housing base for service chamber brakes as shown in Figure 1 and marked per column “Rated Stroke Marking” as shown in Figure 2.

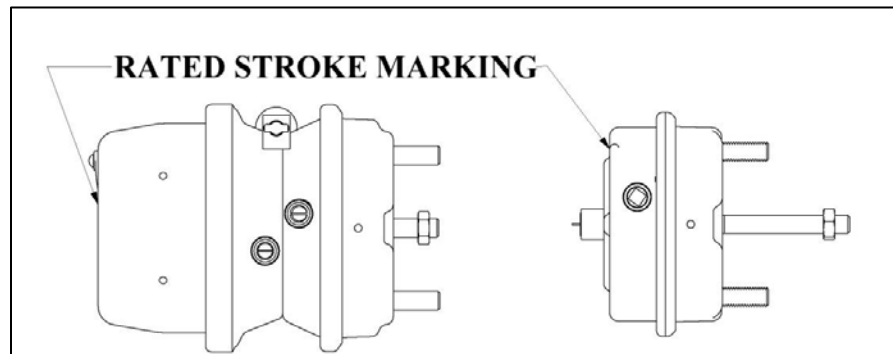


Figure 1

Rated Stroke Marking	Rated Stroke on Brake Chamber			Brake Adjustment Limit		
A	1.50"	1 1/2"	38 mm	1.25"	1 1/4"	32 mm
B	1.75"	1 3/4"	44 mm	1.38"	1 3/8"	35 mm
C	2.00"	2"	51 mm	1.50"	1 1/2"	38 mm
D	2.25"	2 1/4"	57 mm	1.75"	1 3/4"	44 mm
E	2.50"	2 1/2"	64 mm	2.00"	2"	51 mm
F	3.00"	3"	76 mm	2.50"	2 1/2"	64 mm
G	3.25"	3 1/4"	83 mm	2.62"	2 5/8"	67 mm
H	3.50"	3 1/2"	89 mm	2.75"	2 3/4"	70 mm
X.XX	Other					

Figure 2

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Rated Stroke

The rated stroke marking (A,B,C,D, etc.) is to be permanently stamped or embossed on the housing or on a corrosion-resistant tag permanently affixed or bonded to the housing. The font height of the stroke marking is to be at least 3/8 inches (10 mm) tall and at least 3 times the size of any other characters located on the same tag or within a 1/2 inch (12 mm) from the stroke marking if located directly on the housing.

Reminder: This is a recommended practice only and not a regulatory requirement to have brake chambers marked as per SAE Standards.