SAE International

SURFACE VEHICLE RECOMMENDED PRACTICE

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Long-Stroke Air-Brake Actuator Marking

RATIONALE

Rationale for revision: Figure 4 is overly specific (remove Figure 4). Replace the term Readjust with Brake Adjustment Limit in Tables 1A, 1B, and 1C to update obsolete terminology associated with manual slack adjusters. Remove Type 14 from Table 1A and 1B as this size is the only hybrid size (externally the same as a type 16) on the table and not relevant for stroke ratings. Revise standard rated stroke for type 24 from 2.25" to 2.50". Reduce specifications on trapezoidal clamp tag and call for alternative marking with same information for chambers with clamps.

1. SCOPE

This SAE Recommended Practice describes a marking system to distinguish long-stroke from standard stroke for service, parking, and combination air-brake actuators, roto-chambers, and components. Said actuators are used for applying cam and disc-type foundation brakes by slack adjuster means.

1.1 Purpose

This document establishes a uniform marking system to identify long-stroke actuators and components used in air-brake systems.

2. REFERENCES

2.1 Applicable Document

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

2.1.1 SAE Publication

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

SAE J1469 Air-Brake Actuator Test Procedure, Truck, Tractor, Bus, and Trailers

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2.2 Related Publication

The following publication is provided for information purposes only and are not a required part of this SAE Technical Report.

2.2.1 SAE Publication

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

SAE J1953 Brake-Stroke Indicator Design Guideline for Cam or Disc Air-Brake Actuators

3. DEFINITIONS

3.1 RATED STROKE

The minimum design stroke of a unit as listed in Table 1.

3.2 STANDARD STROKE ACTUATORS

Brake actuators having a rated stroke as listed in Table 1A, Column 1.

3.3 LONG-STROKE ACTUATORS

a. Class I - An actuator having a stroke 6.4 to 12.4 mm (0.25 to 0.49 in) greater than standard rated stroke. Refer to Table 1B.

b. Class II - An actuator having a stroke 12.7 to 18.8 mm (0.50 to 0.74 in) greater than standard rated stroke. Refer to Table 1B.

c. Class III - an actuator having a stroke 19 mm (0.75 in) greater than standard rated stroke. Refer to Table 1B.

TABLE 1A - RECOMMENDED AIR-BRAKE ACTUATOR SERVICE STROKE - CLAMP BAND/SEALED DESIGNS - STANDARD STROKE

Type (Size)	Standard Rated Stroke mm	Standard Rated Stroke in	Brake Adjustment Limit For Standard Rated Stroke mm	Brake Adjustment Limit For Standard Rated Stroke in
9	44.5	1.75	35.1	1.38
12	44.5	1.75	35.1	1.38
16	57.2	2.25	44.5	1.75
20	57.2	2.25	44.5	1.75
24	63.5	2.50	50.8	2.00
30	63.5	2.50	50.8	2.00
36	76.2	3.00	57.2	2.25

TABLE 1B - RECOMMENDED AIR-BRAKE ACTUATOR SERVICE STROKE CLAMP BAND/SEALED DESIGNS - LONG-STROKE BRAKE ACTUATORS

Type (Size)	Class I Std. + 8.4 mm (0.25 in) Minimum Rated Stroke mm	Class I Std. + 8.4 mm (0.25 in) Minimum Rated Stroke in	Class I Std. + 8.4 mm (0.25 in) Brake Adjustment Limit mm	Class I Std. + 8.4 mm (0.25 in) Brake Adjustment Limit in	Class II Std. + 12.7 mm (0.50 in) Minimum Rated Stroke mm	Class II Std. + 12.7 mm (0.50 in) Minimum Rated Stroke in	Class II Std. + 12.7 mm (0.50 in) Brake Adjustment Limit mm	Class II Std. + 12.7 mm (0.50 in) Brake Adjustment Limit in	Class III Std. + 19.0 mm (0.75 in) Minimum Rated Stroke mm	Class III Std. + 19.0 mm (0.75 in) Minimum Rated Stroke in	Class III Std. + 19.0 mm (0.75 in) Brake Adjustment Limit mm	Class III Std. + 19.0 mm (0.75 in) Brake Adjustment Limit in
9	50.8	2.00	38.1	1.5	—	—	—	—	—	—	—	—
12	50.8	2.00	38.1	1.5	—	—	—	—	—	—	—	—
16	63.5	2.50	50.8	2.0	69.9	2.75	57.2	2.25	—	—	—	—
20	63.5	2.50	50.8	2.0	69.9	2.75	57.2	2.25	76.2	3.00	63.5	2.50
24	69.9	2.75	57.2	2.25	76.2	3.00	63.5	2.50	—	—	—	—
30	69.9	2.75	57.2	2.25	76.2	3.00	63.5	2.50	—	—	—	—
36	82.6	3.25	66.5	2.62	88.9	3.50	69.9	2.75	—	—	—	—

TABLE 1C - RECOMMENDED AIR-BRAKE ACTUATOR SERVICE STROKE ROTO-CHAMBER DESIGNS

Type (Size)	Rated Stroke mm	Rated Stroke in	Brake Adjustment Limit mm	Brake Adjustment Limit in
9	50.8	2.00	38.1	1.50
12	50.8	2.00	38.1	1.50
16	63.5	2.50	47.8	1.88
20	63.5	2.50	47.8	1.88
24	63.5	2.50	47.8	1.88
30	76.2	3.00	57.2	2.25
36	88.9	3.50	66.5	2.62
50	101.6	4.00	76.2	3.00

4. GENERAL

Long-stroke air-brake actuators have pushrod stroke capabilities in excess of standard stroke actuator designs. As some of these chambers are nearly identical in exterior appearance to the standard chambers, a unique marking system is needed for the purpose of identification by mechanics, inspectors, and others in the field. This marking will help assure both types of actuators are serviced correctly and that brakes are adjusted properly. Unique long-stroke actuator components are not interchangeable between actuator manufacturers nor standard actuator components.

5. REQUIREMENTS

5.1 Identification - Long-Stroke Actuators

There are three methods described as follows, for differentiating long-stroke from standard stroke actuators. Long-stroke actuators should incorporate at least two of the three methods and 76.2 mm (3.00 in) long-stroke actuators must use square inlet ports per 5.1.3.

5.1.1 Servicing Instructions

Service instructions embossed or stamped on spring brake center sections, service chamber pressure caps or in the case of the tie rod style chamber (see Figure 1), the markings will be located on the end cap. These instructions will instruct that long-stroke diaphragms are required for replacement. Numerical values shall be in mm and inches. (See Figures 1, 2, and 3).

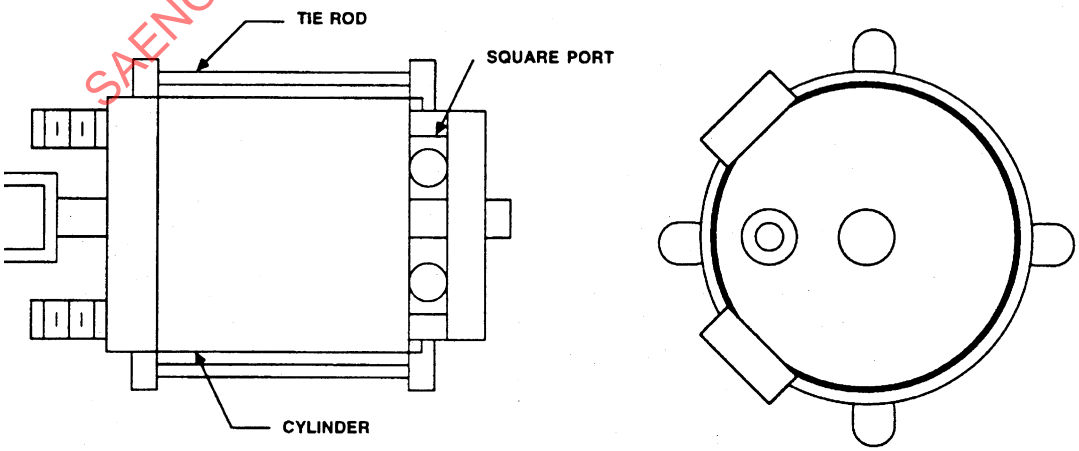

FIGURE 1 - TIE ROD STYLE PISTON BRAKE CHAMBER

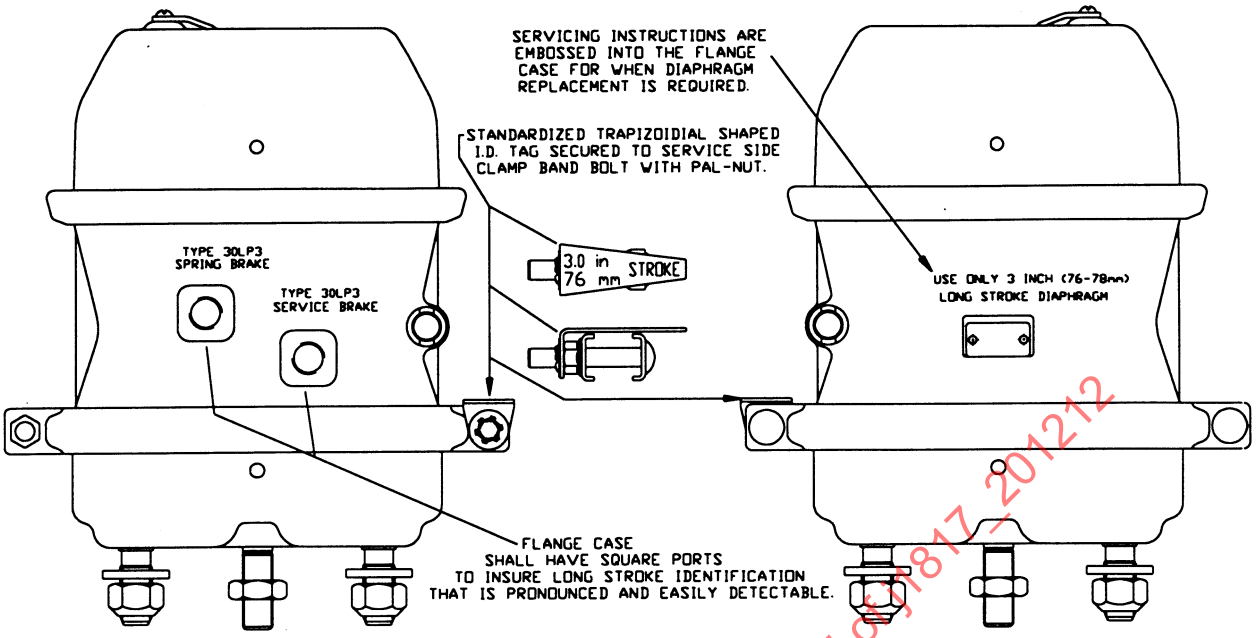

FIGURE 2 - 76.2 mm (3.00 in) LONG-STROKE SPRING BRAKE CHAMBER IDENTIFICATION

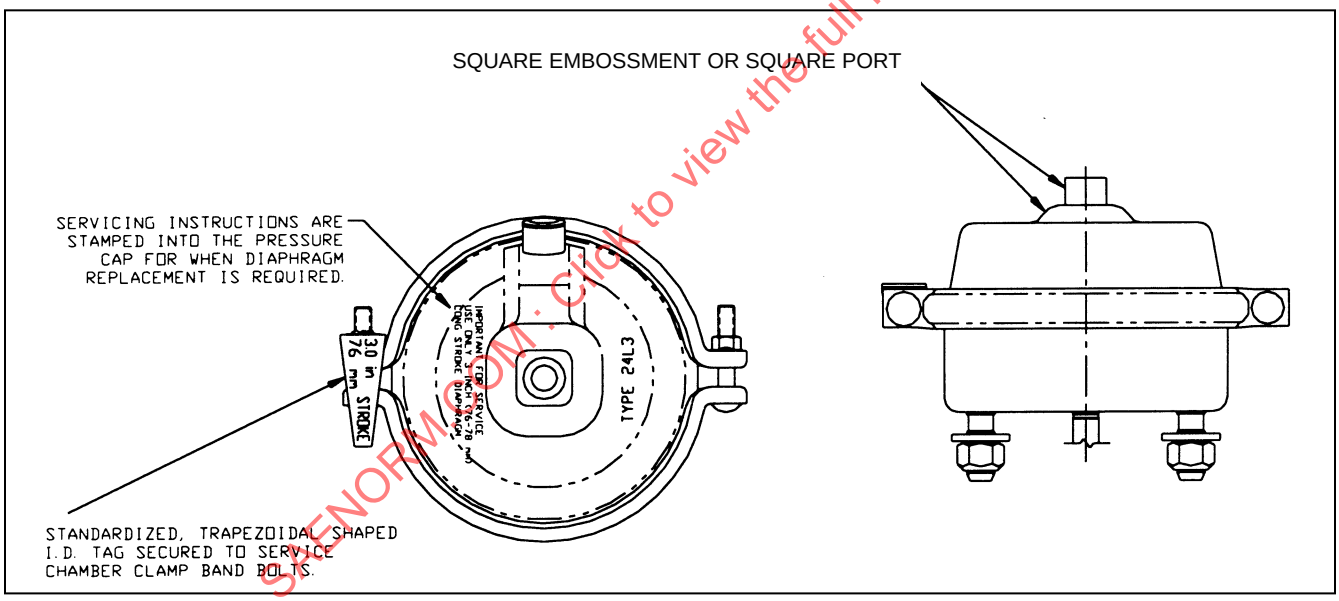

FIGURE 3 - 76.2 mm (3.00 in) LONG-STROKE SERVICE CHAMBER IDENTIFICATION

5.1.2 Tags

A tag (typically trapezoidal) shall be secured to the service chamber clamp band bolts or attached/affixed to the service chamber by a suitable means. The actuators rated stroke shall be embossed or otherwise readable within the trapezoidal area with numerical values in millimeters and inches. For actuators without clamp bands, the same information is to be provided in a highly visible alternative directly on the actuator.

5.1.3 Square Air Port and/or Pressure Cap Embossment

All 76.2 mm (3.00 in) long-stroke actuators shall have square inlet ports. The top port of the service chambers shall have a square embossment that is clearly visible and cannot be obscured by paint or square port can be used. (See Figures 1, 2, and 3).

5.2 Components unique to the long-stroke actuator shall have suitable text permanently marked on the components in order to identify them as long-stroke. Typical components might include (refer to Figure 4):

a. Diaphragm

b. Center section

c. Pressure cap service chamber

d. End cap combination

e. Non-pressure housing

f. Service pushrod