BRAKE ADJUSTMENT GUIDE

Chamber Specifications & Adjustment Limits | FMCSA §393.47

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STANDARD BRAKE CHAMBERS — PUSHROD STROKE LIMITS

Chamber Type	Effective Area (sq in)	Outside Diameter	Max Pushrod Stroke (Manual)	Max Pushrod Stroke (Auto)	OOS Limit (Applied)
Type 6	6	4-1/2"	1-1/4"	—	**1-3/8"**
Type 9	9	5-1/4"	1-3/8"	1-3/4"	**1-3/4"**
Type 12	12	5-11/16"	1-3/8"	1-3/4"	**1-3/4"**
Type 16	16	6-3/8"	1-3/4"	2"	**2"**
Type 20	20	6-25/32"	1-3/4"	2"	**2"**
Type 24	24	7-7/32"	1-3/4"	2"	**2"**
Type 30	30	8-3/32"	2"	2-1/2"	**2-1/2"**
Type 36	36	9"	2-1/4"	2-3/4"	**2-3/4"**

LONG-STROKE BRAKE CHAMBERS — PUSHROD STROKE LIMITS

Chamber Type	Effective Area (sq in)	Outside Diameter	Max Pushrod Stroke (Manual)	Max Pushrod Stroke (Auto)	OOS Limit (Applied)
Type 16L	16	6-3/8"	2"	2-1/4"	**2-1/4"**
Type 20L	20	6-25/32"	2"	2-1/4"	**2-1/4"**
Type 24L	24	7-7/32"	2"	2-1/2"	**2-1/2"**
Type 30L	30	8-3/32"	2-1/4"	2-3/4"	**2-3/4"**

HOW TO MEASURE PUSHROD STROKE (Applied Method)

1. With brakes released, mark the pushrod at the brake chamber or use a measuring tool at the pushrod clevis.
2. Have someone make a full brake application (90+ psi) — or chock wheels and release parking brake, then apply service brake.
3. Measure how far the pushrod has moved from the released to the applied position.
4. Compare measurement to the adjustment limit for the chamber type (see tables above).
5. If stroke exceeds the limit, the brake is out of adjustment and must be corrected BEFORE the vehicle is operated.

OUT-OF-SERVICE CRITERIA

A CMV will be placed Out of Service if 20% or more of its service brakes are defective (e.g., 1 of 4 axles on a tractor, or any brake exceeding the pushrod stroke limit above). Violations carry fines, CSA points, and potential shutdown.

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SPRING BRAKE (PIGGYBACK) CHAMBERS

Type	Service Area	Spring Area	OOS Limit
3030	30 sq in	30 sq in	**2-1/2"**
3024	30 sq in	24 sq in	**2-1/2"**
2424	24 sq in	24 sq in	**2"**
3036	30 sq in	36 sq in	**2-1/2"**
3030L	30 sq in	30 sq in	**2-3/4"**
2424L	24 sq in	24 sq in	**2-1/2"**
3624	36 sq in	24 sq in	**2-3/4"**

SLACK ADJUSTER TYPES

Manual Slack Adjusters

- Require periodic manual adjustment
- Identified by external adjusting bolt/nut
- Must check stroke at every pre-trip
- Adjustment: Turn adjusting bolt to shorten
- pushrod stroke to 1/2" to 3/4" free stroke

Automatic Slack Adjusters (ASA)

- Self-adjusting during normal operation
- Required on all CMVs since 1994
- Do NOT manually back off an ASA
- If out of adjustment — replace, do not adjust
- Check for wear, damage, and proper mounting

NOTES / MEASUREMENTS

BRAKE COMPONENT INSPECTION

Brake Drums / Rotors

- No cracks longer than 1/2 of drum width
- No external cracks on rotors
- No heat-checking or scoring beyond limits

Brake Linings / Pads

- Lining thickness: min 1/4" (clamp) or 1/16" above rivet
- No cracks, contamination, or missing sections
- Even wear across surface

Brake Hoses & Tubing

- No bulges, leaks, or chafing
- Connections tight, no air leaks
- No kinks restricting air flow

Air Chamber & Mounting

- Chamber securely mounted — no cracks
- Pushrod moves freely, no binding
- Clamp band tight (diaphragm type)
- No rust-through on chamber body

QUICK REFERENCE

Most common tractor chamber:
Type 3030 (30/30)
Most common trailer chamber:
Type 3030 or 2424
OOS = 20% of brakes defective:
1 of 4 axles = violation
Automatic adj. out of spec:
Replace — do not adjust
Brake pressure for testing:
90 psi minimum applied
Free stroke target (manual):
1/2" to 3/4"
Parking brake spring force:
~2,400 lbs (Type 30)

REGULATORY REFERENCES

49 CFR §393.47 — Brake adjustment requirements
49 CFR §393.53 — Automatic brake adjusters
49 CFR §396.3 — Inspection, repair, and maintenance
CVSA OOS Criteria — Appendix A, Brake Adjustment

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