



For: S-Cam Piston Type Service and Spring Brake Chambers

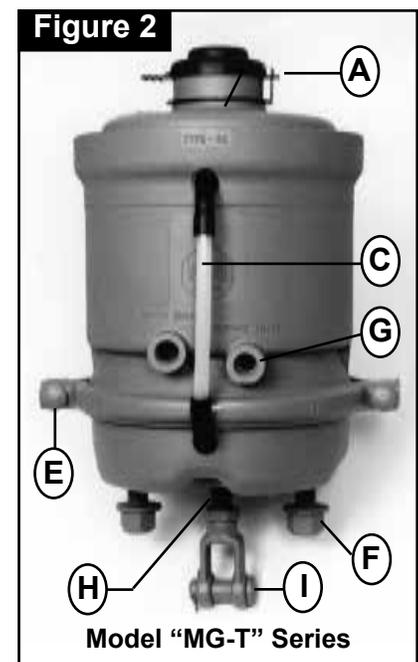
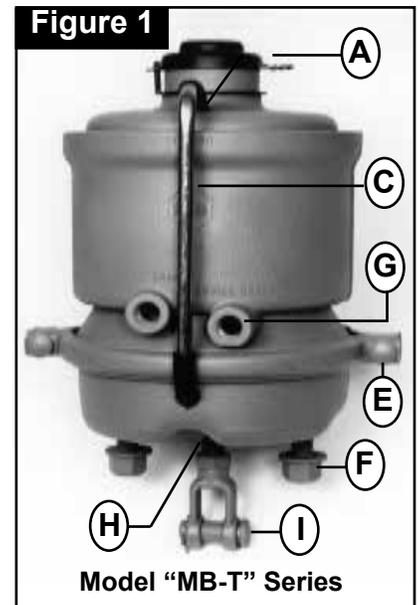
Your MGM Brakes MAGNUM spring brake chambers are an important part of your braking system. While they do not require scheduled servicing, it is good preventative maintenance to make the following routine inspections while they are in the shop for regular servicing of other components or at a minimum of every 50,000 miles.

SECTION (1): RECOMMENDED INSPECTION POINTS

- (A)** The plastic END CAP on all "MB-T" (Figure 1) and "MG-T" (Figure 2) models requires no positioning or maintenance, but must be snapped tightly into place. Inspect the cap for damage and replace as necessary. Operating these units without the END CAP securely in place will void the MGM Brakes warranty without remedy.
 - (B)** Remove the END CAP (Figure 3) and check to ensure that the RELEASE BOLT (Figure 4) is tightened to **35-45 Lbs.-Ft. of torque**. The release bolt must be properly installed for the brake to function properly. Be sure to replace the END CAP properly (Figure 17).
 - (C)** Ensure the BREATHER TUBE is securely engaged a minimum of 1/2 inch into the rubber elbows (Figure 10) and glued together with a high quality rubber cement. These units must be mounted with the BREATHER TUBE in the upper half of the non-pressure chamber facing away from the road surface (Figure 9). Failure to comply with these installation instructions will void the MGM Brakes warranty without remedy.
 - (D)** Visually inspect the exterior surfaces of the unit for signs of damage from outside sources.
 - (E)** Check to ensure the SERVICE CHAMBER CLAMPBAND is evenly seated and the clampband hex nuts are tightened to **25-30 Lbs.-Ft. of torque**.
 - (F)** Check to ensure the MOUNTING STUD NUTS are tightened to **100-115 Lbs.-Ft. of torque** (clockwise) and washers are in place between the nuts and bracket.
 - (G)** Inspect air lines, hoses and fittings attached to the chamber. Replace any damaged or leaking parts. MGM Brakes recommends the fittings be tightened to **25 Lbs.-Ft. of torque** into the chamber air-inlet ports.
 - (H)** Inspect the PUSH-ROD to be sure it is working free, not bent, not binding and is square to the chamber bottom within $\pm 3^\circ$ in any direction at any point in the stroke of the chamber. If the PUSH-ROD is not square, make corrections by repositioning the chamber on the mounting bracket and/or by shimming the slack adjuster to the right or left on the camshaft.
 - (I)** Inspect the YOKE ASSEMBLY being sure the YOKE PIN is installed and locked into place with a COTTER PIN. Replace any damaged, worn or missing parts. MGM Brakes recommends the YOKE LOCKNUT be tightened to **25-35 Lbs.-Ft. of torque**.
- On units equipped with a DUST BOOT, check the BOOT for tears and replace as necessary.

SECTION (2): RELEASE

- (a) Before releasing brakes, chock wheels of the vehicle to prevent a runaway.
- (b) Remove the plastic end cap from the spring chamber (Figure 3). Manually release the spring brake by turning the release bolt counter-clockwise using a 3/4-inch deep socket wrench (Figure 4) until the bolt is completely removed from the unit.



IMPORTANT - Unlike double diaphragm spring brakes, the unscrewing or removal of the release bolt does not cage the power spring, but only removes the power spring force from the slack adjuster. When an “MB” or “MB-T” model is manually released, the push-rod will extend in the “brakes applied” direction approximately 1/2-inch to 3/4-inch. The “MG-T” model will fully retract to the zero stroke position.

NOTE - For easier turning of the release bolt, apply 85-100 psi air pressure to the spring port. After removal of the release bolt, completely exhaust air from the spring chamber.

SECTION (3): REMOVAL AND INSTALLATION INSTRUCTIONS FOR “COMBINATION CHAMBERS”

NOTE - Refer to SECTION (6) before removing the air brake chamber to be replaced to ensure that the brake chamber being replaced will be properly installed with the correct push-rod length.

(a) Determine the manufacturer of the combination chamber to be removed from the vehicle and, following that manufacturer’s instructions exactly, manually release the spring brake completely. Instructions for MGM Brakes Model-Series “MB-T” and “MG-T” spring brakes having internal release bolts are given in SECTION (2) of this manual. Service Manuals for all other MGM Brakes design-series of spring brakes are also available upon request to MGM Brakes, or available online at www.mgmbrakes.com.

(b) Remove cotter pin from the yoke pin, knock out yoke pin, and remove both air lines from the assembly.

IMPORTANT - Be sure to mark air line from air-inlet port marked “SPRING BRAKE” for later re-installation reference.

(c) Using a 15/16-inch wrench, unscrew hex nuts on mounting bolts and cautiously remove the old chamber from the mounting bracket.

(d) Procedure to Cut Service Push-Rod to Proper Length

It is mandatory that the service push-rod of the new unit be cut to the proper length. Improper installation of the new unit could result in malfunctioning brakes or premature failure of the braking system. Refer to SECTION (6) for proper cam brake adjustment.

If the old brake chamber was properly installed, use the old brake measurement to determine the proper push-rod length. If the brake being removed was not properly installed or has been damaged too greatly to allow measurement, the other chamber on the same axle may be used. Otherwise, consult the vehicle manufacturer for proper push-rod length.

Replacing a Double-Diaphragm or an MG-T Model Spring Brake with an MG-T Combination Chamber

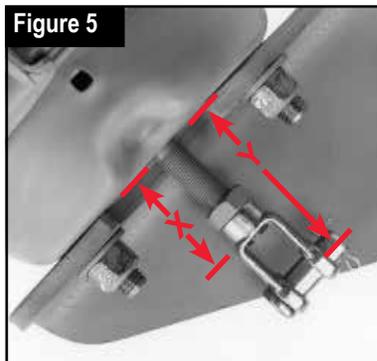
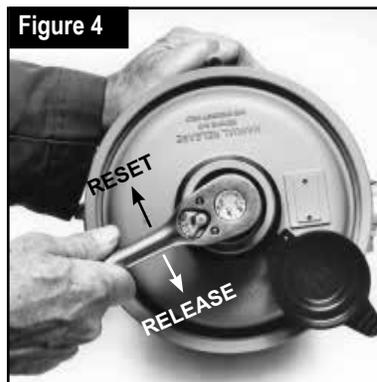
Make sure the old spring brake is manually-released fully as outlined in Step (a) above, and that the service brake push-rod is fully retracted into the brakes “OFF” position, then measure and record both of the following dimensions outward from the bottom face of the service brake chamber (Figure 5):

- _____ - inches ... Y-dimension to center line of the yoke pin
- _____ - inches ... X-dimension to end of threaded push-rod

Replacing an MB or MB-T Model Spring Brake with an MG-T Combination Chamber or Replacing any Model Spring Brake with an MB-T Model Combination Chamber

Because manually releasing the spring brake portion of MB and MB-T chambers will not retract the service push-rod completely to zero stroke, the procedure for measuring the push-rod length is slightly different.

Make sure the old spring brake is manually-released fully as outlined in Step (a) above.





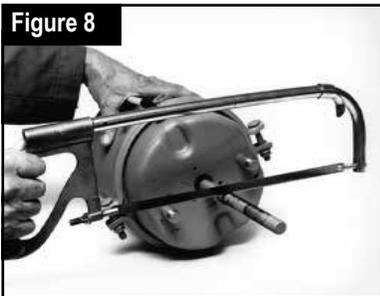
Apply air pressure to the service port of the brake until the service push-rod is fully extended and then measure and record both of the following dimensions outward from bottom face of service brake chamber (Figure 5):

- _____ - inches ... Y-dimension to center line of the yoke pin
- _____ - inches ... X-dimension to end of threaded push-rod

NOTE - If unable to apply air pressure, manually pull the push-rod out as far as it will extend and lock in place with vice-grip pliers to prevent push-rod from retracting (Figure 11).

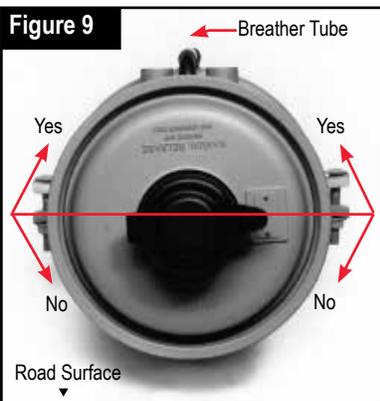
IMPORTANT - The non-pressure chamber (steel housing with mounting bolts) may be standard (Figure 6) or extra high profile (Figure 7) on some older models. While the standard height housing will normally replace the extra high profile, it is recommended that each installation be checked for sufficient clearance with chassis components.

For ALL Installations: Procedure to Cut Push-Rod on New Replacement Combination



- On chambers that are to be re-attached to standard, manual slack adjusters, the Y-dimension is the most critical measurement, and the new service push-rod must be cut (Figure 8) to exactly duplicate this “rod-plus-yoke” length after the yoke assembly is re-installed on the push-rod. Use the same procedure to measure the push-rod on the new unit as had been used on the unit being replaced.
- On chambers re-attached to automatic slack adjusters, the X-dimension is the most critical measurement, and the new service push-rod must be cut (Figure 8) to exactly duplicate this “rod only” length before the yoke assembly is re-installed on the push-rod. Use the same procedure to measure the push-rod on the new unit as had been used on the unit being replaced.

- (e) Remove hex nuts and washers on mounting bolts of new chamber, clean face of mounting bracket and install chamber on bracket with close attention given to positioning chamber air-inlet ports for correct alignment to vehicle air lines. Then install one washer and hex nut on each mounting bolt and, using a 15/16-inch hand wrench (**DO NOT USE AN IMPACT-TYPE WRENCH**), tighten nuts to MGM Brakes recommended **100-115 Lbs.-Ft. of torque**.

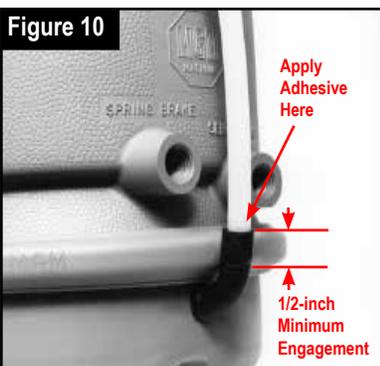


IMPORTANT - If it is required to reposition the air-inlet ports to assure proper mating and alignment with vehicle air lines, refer to SECTION (4) of this Service Manual and follow Steps (c) through (f) very carefully.

IMPORTANT - When installing any MGM Brakes Model “MB-T” or “MG-T” chamber, it is mandatory to position the non-pressure chamber end of the breather tube in the upper half of the chamber facing away from the road surface (Figure 9). Failure to comply will void the MGM Brakes Warranty without remedy on these models.

- (f) Reconnect yoke to slack adjuster, making sure the correct diameter and length of yoke pin is installed into the correct hole in the slack adjuster. Secure yoke pin with a new cotter pin.

IMPORTANT - When reconnecting to an automatic slack adjuster, follow the vehicle manufacturer’s recommendations for installation and set-up for this type of slack adjuster.



- (g) Inspect the push-rod to be sure it is working free, not bent, not binding and is square to the chamber bottom within $\pm 3^\circ$ in any direction at any point in the stroke of the chamber. If the push-rod is not square, make corrections by repositioning the chamber on the mounting bracket and/or by shimming the slack adjuster on the camshaft as required.

- (h) Apply Teflon® tape or sealing compound to hose fittings and re-install both air lines to the chamber making sure each is mated to the correct air-inlet port according to markings made earlier. MGM Brakes recommends the fittings be tightened to **25 Lbs.-Ft. of torque** into the chamber’s air-inlet ports.

- (i) Using vehicle system air, charge spring brake with full line pressure (minimum 100 psi). Using only soapy water (**NEVER ANY TYPE OF OIL!**), inspect for air leaks at air lines and fittings. If bubbles appear, tighten fittings slightly, but not over **25 Lbs.-Ft. of torque**.

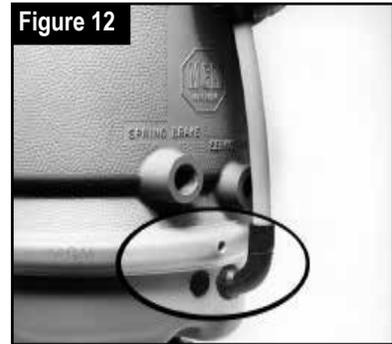
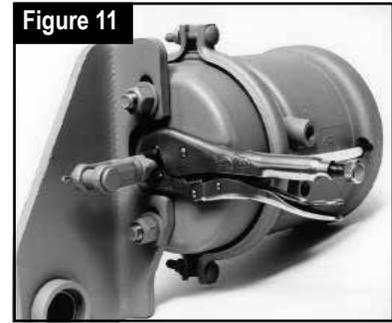
IMPORTANT - If service brake clampband was loosened to reposition air-inlet ports in Step (e) previously, apply air to spring brake and then apply and hold foot brake treadle valve down to charge service brake chamber. Test for air leaks around circumference of service clampband. If bubbles appear, firmly tap circumference of clampband with a hammer (Figure 16) and retighten clampband hex nuts until leaks cease. MGM Brakes recommends **25-30 Lbs.-Ft. of torque** on clampband hex nuts. Completely exhaust air from both chambers after testing.

- (j) With air pressure now exhausted from service brake chamber (but still applied on the spring brake), install the release bolt completely and torque to **35-45 Lbs.-Ft.** (Figure 4). If release bolt is not properly installed, the spring brake portion of the unit will not function properly.

- (k) Replace the END CAP properly (Figure 17). Operating these units without the END CAP securely in place will void the MGM Brakes warranty without remedy.

IMPORTANT - If chamber is equipped with an external breather tube, be sure the tube is securely engaged a minimum of 1/2-inch into the rubber elbow (Figure 10) and glued together with a high quality rubber cement. These units must be mounted with the breather tube in the upper half of the non-pressure chamber facing away from the road surface (Figure 9). Failure to comply with these installation instructions will void the MGM Brakes warranty without remedy.

! WARNING - After replacement of any brake chamber, the chamber push-rod stroke and actuating alignment must be checked to assure correct installation and foundation brake adjustment. It is very important to recognize that no foundation brake adjustments can be made at either the spring brake chamber or at the service brake chamber, and that all "stroke adjustments" must be made at the slack adjuster according to the specific recommendations of the foundation brake manufacturer or of the vehicle manufacturer.



SECTION (4): REMOVAL AND INSTALLATION INSTRUCTIONS FOR SINGLE / PIGGYBACK SPRING BRAKES

The removal and installation of single/piggyback spring brake chambers (without removal of the service brake chamber) can be made easier by "locking off" the service chamber push-rod. To do this, apply air to service brake by holding down driver's foot brake treadle valve and, while applied, clamp vise-grip pliers onto push-rod to prevent rod from retracting when air pressure is released (Figure 11).

- (a) Determine manufacturer of single/piggyback spring brake chamber to be removed from vehicle and, following that manufacturer's instructions exactly, manually release the spring brake completely. Instructions for MGM Brakes Model-Series "MB-T" and "MG-T" single/piggyback spring brakes having internal release bolts are given in SECTION (2) of this manual. Service Manuals for all other MGM Brakes design-series of spring brakes are also available upon request to MGM Brakes, or available online at www.mgmbrakes.com.

- (b) Remove both air lines from chamber.

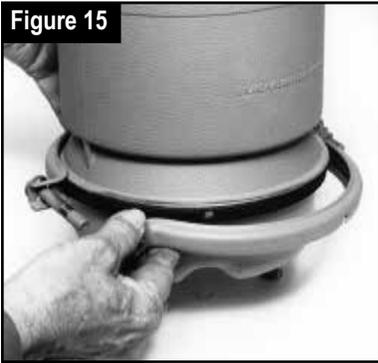
IMPORTANT - Be sure to mark air line from air-inlet port marked "SPRING BRAKE" for later re-installation reference.

- (c) On MGM Brakes Models "MB-T" and "MG-T" fitted with external breather tubes, disconnect the tube and elbow from the service chamber housing (Figure 12).
- (d) Using a 9/16-inch wrench or socket, remove hex nuts on service clampband. Then, while holding the single/piggyback spring brake securely in place, remove clampband (Figure 15), and separate piggyback from service chamber.

IMPORTANT - At this time take the opportunity to inspect all parts in service chamber (especially the diaphragm) and replace any parts which may be damaged or worn. Use only genuine MGM Brakes replacement parts.



Figure 15



(e) Make sure new single/piggyback spring brake is fully released as outlined in SECTION (2) of this manual. Position diaphragm in bottom recess of chamber (Figure 13) and, with very close attention taken to assure all mating parts are aligned straight and the air lines are positioned to mate with vehicle air supply lines (Figure 14), replace service clampband (Figure 15).

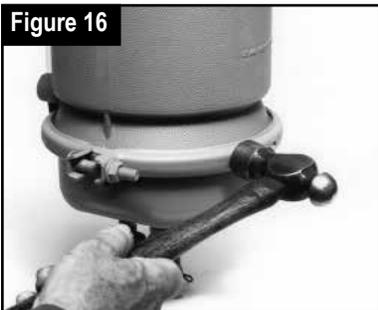
(f) Re-install clampband bolts and nuts. Alternately tighten each hex nut in **5-10 Lbs.-Ft. of torque** increments while constantly rechecking mating parts alignment. If realignment is required, loosen clampband nuts and repeat Step (e) (above). Firmly tap around the circumference of clampband with hammer (Figure 16) and tighten nuts to **25-30 Lbs.-Ft. of torque**.

(g) Apply Teflon® tape or sealing compound to hose fittings and re-install both air lines to chamber, making sure each is mated to the correct air-inlet port according to markings made earlier. MGM Brakes recommends the fittings be tightened to **25 Lbs.-Ft. of torque** into the chamber's air-inlet ports.

(h) Using vehicle system air, charge parking brake with full line pressure (minimum 100 psi). Using only soapy water (**NEVER ANY TYPE OF OIL!**), inspect for air leaks at air lines and fittings. If bubbles appear, tighten fittings slightly, but not over **25 Lbs.-Ft. of torque**.

(i) With spring brake still fully charged with full line pressure, apply and hold foot brake treadle valve down to charge service brake chamber.

Figure 16



IMPORTANT - At this time, remove vise-grip pliers (Figure 11) from the service push-rod so it returns to a normal position inside chamber. Now test for air leaks around circumference of service clampband. If bubbles appear, firmly tap circumference of clampband with a hammer (Figure 16) and retighten clamp nuts until leaks cease. MGM Brakes recommends **25-30 Lbs.-Ft. of torque** on the clampband hex nuts.

(j) On MGM Brakes Models "MB-T" and "MG-T" fitted with external breather tubes, wipe open end of connector tube clean to be sure no oil is present, apply a good quality rubber cement to the tube and re-insert tube into flexible elbow with a minimum 1/2-inch engagement into elbow (Figure 10).

If old single unit was not fitted with an external breather tube, drill a 1/2-inch diameter hole 1-inch from the top of the non-pressure chamber (Figure 18), at a point closest to the centerline between the air ports, but in the upper half of the chamber facing away from the road surface (Figure 9). Remove burrs around the hole, install new rubber elbow in non-pressure chamber, wipe open end of connector tube clean to be sure no oil is present. Apply a good quality rubber cement to the tube and insert the tube into flexible elbow with a minimum 1/2-inch engagement into elbow (Figure 10).

Figure 17



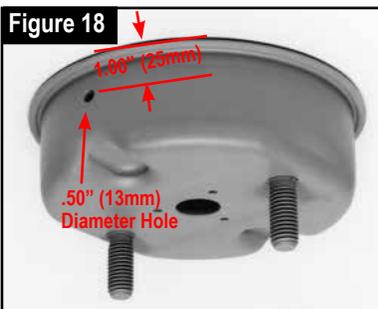
IMPORTANT - These units must be operated with the breather tube in the upper half of the non-pressure chamber facing away from the road surface (Figure 9), and the tube must be securely glued into the rubber elbows. Failure to comply with these installation instructions will void the MGM Brakes warranty without remedy.

(k) With air pressure exhausted from service chamber, but with line pressure still on the spring brake, install the release bolt completely into chamber and tighten to **35-45 Lbs.-Ft. of torque** (Figure 4).

(l) Replace the end cap properly (Figure 17). Operating these units without the END CAP securely in place will void the MGM Brakes warranty without remedy.

IMPORTANT - Release bolt must be properly installed for the correct function of the spring brake.

Figure 18



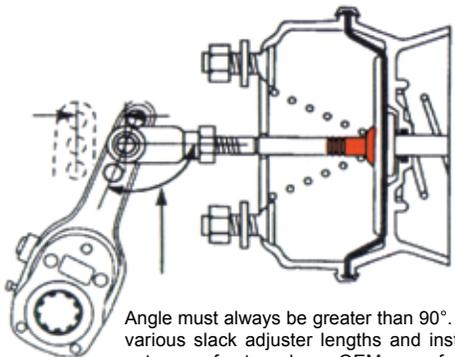
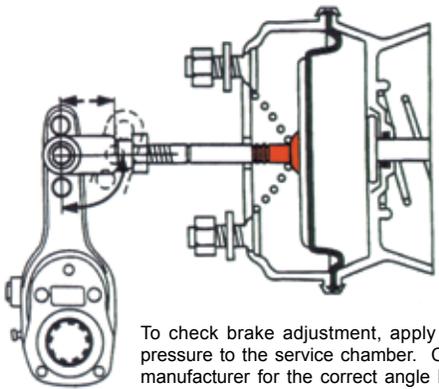
SECTION (5): REMOVAL AND INSTALLATION INSTRUCTIONS FOR "SERVICE BRAKE DIAPHRAGM"

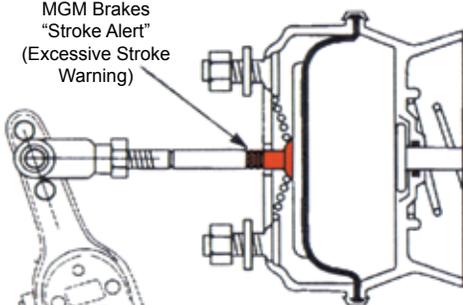
(a) Follow all instructions given in SECTION (4) of this manual and install the new diaphragm at Step (4-e). Use only genuine MGM Brakes replacement diaphragms.

IMPORTANT - It may not be necessary to disconnect air lines from spring brake during this procedure as long as correct parts are used and alignment can be obtained during re-assembly operation.

SECTION (6): CAM BRAKE ADJUSTMENT - ALL MODELS SPRING BRAKE AND SERVICE BRAKE ACTUATORS.

NOTE -An air chamber's last half of stroke is less efficient than the first half. Therefore, the following adjustments are recommended for maximum efficiency when using manually adjusted slack adjusters.

<p style="text-align: center;">BRAKES "OFF" – NOT APPLIED</p>  <p>Angle must always be greater than 90°. Due to various slack adjuster lengths and installation setups, refer to axle or OEM manufacturer's manual for recommended angle.</p> <p>Maximum stroke should be as short as possible with no lining to drum contact (dragging brakes).</p>	<p style="text-align: center;">PROPERLY ADJUSTED BRAKES "ON" – APPLIED</p>  <p>To check brake adjustment, apply 90 to 100 psi air pressure to the service chamber. Consult the vehicle manufacturer for the correct angle between the slack adjuster arm and push-rod and/or the push-rod length. This is necessary since different dimensions are required for automatic or manual slacks, various slack lengths and different slack adjuster manufacturers.</p>
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<p style="text-align: center;">IMPROPERLY ADJUSTED BRAKES "ON" – APPLIED (Maximum recommended readjustment stroke has been exceeded)</p>  <p>MGM Brakes "Stroke Alert" (Excessive Stroke Warning)</p> <p style="text-align: right;">See chart on right for recommended readjustment stroke.</p>	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Type</th> <th rowspan="2">Effective Area (Sq. In.)</th> <th colspan="2">Approx. Diaphragm O.D.</th> <th colspan="2">Rated Stroke of Chamber</th> <th rowspan="2">Max. Stroke with Brakes Adjusted</th> <th colspan="2">"B" MV/MA Rec. Readjustment Stroke</th> </tr> <tr> <th>Inches</th> <th>mm</th> <th>Inches</th> <th>mm</th> <th>Inches</th> <th>mm</th> </tr> </thead> <tbody> <tr> <td>9</td> <td>9</td> <td>5.00</td> <td>125</td> <td>1.75</td> <td>45</td> <td rowspan="14" style="text-align: left; vertical-align: middle;">SHOULD BE AS SHORT AS POSSIBLE WITHOUT BRAKES DRAGGING</td> <td>1.35</td> <td>35</td> </tr> <tr> <td>12</td> <td>12</td> <td>5.50</td> <td>140</td> <td>1.75</td> <td>45</td> <td>1.35</td> <td>35</td> </tr> <tr> <td>16</td> <td>16</td> <td>6.00</td> <td>150</td> <td>2.25</td> <td>57</td> <td>1.75</td> <td>45</td> </tr> <tr> <td>16L</td> <td>16</td> <td>6.00</td> <td>150</td> <td>2.50</td> <td>64</td> <td>2.00</td> <td>51</td> </tr> <tr> <td>20</td> <td>20</td> <td>6.50</td> <td>165</td> <td>2.25</td> <td>57</td> <td>1.75</td> <td>45</td> </tr> <tr> <td>20L</td> <td>20</td> <td>6.50</td> <td>165</td> <td>2.50</td> <td>64</td> <td>2.00</td> <td>51</td> </tr> <tr> <td>24</td> <td>24</td> <td>7.00</td> <td>175</td> <td>2.25</td> <td>57</td> <td>1.75</td> <td>45</td> </tr> <tr> <td>24L</td> <td>24</td> <td>7.00</td> <td>175</td> <td>2.50</td> <td>64</td> <td>2.00</td> <td>51</td> </tr> <tr> <td>24LP3</td> <td>24</td> <td>7.00</td> <td>175</td> <td>3.00</td> <td>76</td> <td>2.50</td> <td>64</td> </tr> <tr> <td>30</td> <td>30</td> <td>8.00</td> <td>200</td> <td>2.50</td> <td>64</td> <td>2.00</td> <td>51</td> </tr> <tr> <td>30LP3</td> <td>30</td> <td>8.00</td> <td>200</td> <td>3.00</td> <td>76</td> <td>2.50</td> <td>64</td> </tr> <tr> <td>36</td> <td>36</td> <td>9.00</td> <td>230</td> <td>3.00</td> <td>76</td> <td>2.25</td> <td>57</td> </tr> </tbody> </table> <p>SOURCE: MVMA (Motor Vehicle Manufacturers Association)</p> <p>Note: The push-rod must remain perpendicular to the bottom surface of the non-pressure chamber (NPC) within ±3° from zero to full stroke.</p>	Type	Effective Area (Sq. In.)	Approx. Diaphragm O.D.		Rated Stroke of Chamber		Max. Stroke with Brakes Adjusted	"B" MV/MA Rec. Readjustment Stroke		Inches	mm	Inches	mm	Inches	mm	9	9	5.00	125	1.75	45	SHOULD BE AS SHORT AS POSSIBLE WITHOUT BRAKES DRAGGING	1.35	35	12	12	5.50	140	1.75	45	1.35	35	16	16	6.00	150	2.25	57	1.75	45	16L	16	6.00	150	2.50	64	2.00	51	20	20	6.50	165	2.25	57	1.75	45	20L	20	6.50	165	2.50	64	2.00	51	24	24	7.00	175	2.25	57	1.75	45	24L	24	7.00	175	2.50	64	2.00	51	24LP3	24	7.00	175	3.00	76	2.50	64	30	30	8.00	200	2.50	64	2.00	51	30LP3	30	8.00	200	3.00	76	2.50	64	36	36	9.00	230	3.00	76	2.25	57
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36	36	9.00	230	3.00	76		2.25	57																																																																																																									

SECTION (7): RECOMMENDED SPRING BRAKE ACTUATOR DISARMING PROCEDURE

All retired spring brake actuators must be safely disarmed before they are disposed of to prevent serious personal injury from accidental sudden release of the high energy spring (as much as 2,700 lbs. of force) in the parking chamber. To disarm the unit, remove it from the vehicle following the instructions in SECTION (3) for combination chambers, or SECTION (4) for single/piggyback chambers. Be sure to release the brake per SECTION (2) of this manual. Never attempt to remove the head which contains the power spring. Observe all safety precautions. Place the unit in a steel container* and use an acetylene torch to cut a hole through the head housing the power spring. Cut completely through at least two spring coils. The steel container must have openings to expose the head where it is to be cut with the acetylene torch and it must be strong enough to prevent parts from hurtling out should the unit suddenly separate before it is safely disarmed. It is the user's responsibility to ensure the steel container is safe.

*Information concerning a suitable container is available through your MGM Brakes Representative, or online at www.mgmbrakes.com