SERVICE MANUAL SECTION

DOUBLE DIAPHRAGM MGM SPRING BRAKE

Vendor: MGM

Vendor Code: TR, TR-T, TR-LP3, TR-LP3–T

Truck Model: 2000

Truck Model: 3000

Truck Model: 4000

Truck Model: 5000

Truck Model: 8000

Truck Model: 9100

Truck Model: 9200

Truck Model: 9300

Truck Model: 9400

Truck Model: 9600

Truck Model: 9700

Truck Model: 9800

S04020X, Formerly CTS-5107X

09/30/1998

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1. DESCRIPTION

The double diaphragm spring brake chamber assembly (Figure 1(See Figure 1, page 1)) consists of a tandem-type cylinder assembly connected to the foundation brake group through the air brake slack adjuster.

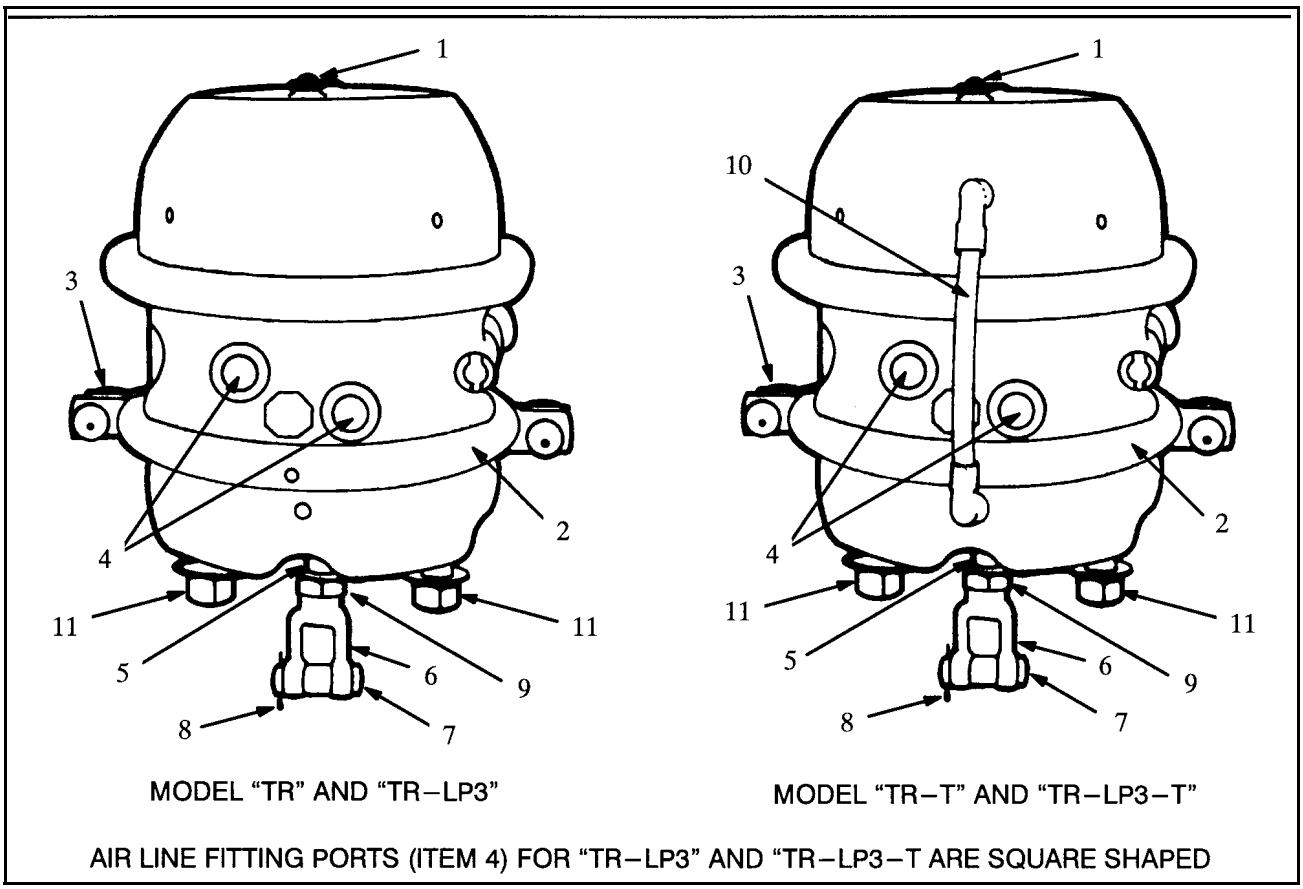

Figure 1 MGM Service and Spring Brake

1. PLASTIC END CAP
2. SERVICE BRAKE CLAMP RING
3. CLAMP RING HEX NUT
4. AIR LINE FITTINGS
5. PISTON ROD
6. YOKE
7. YOKE PIN
8. COTTER PIN
9. YOKE LOCKNUT
10. BREATHER TUBE
11. MOUNTING STUD HEX NUT

The cylinder assembly consists of two basic sections (Figure 2(See Figure 2, page 2)). One section is a conventional service brake chamber while the second section is the spring (parking) brake chamber. The spring (parking) brake contains a powerful spring which is completely compressed by air pressure in normal driving mode. The spring applies the parking brake when air is released from the spring brake chamber.

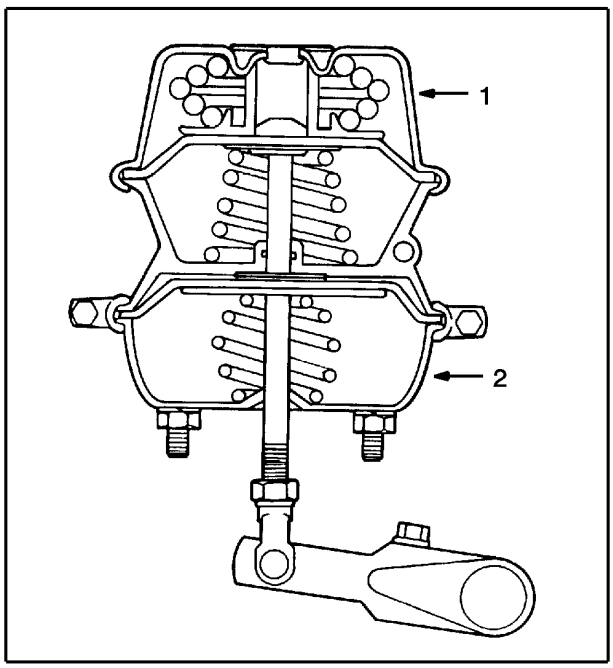

Figure 2 Normal Operation-Spring (Parking) Brake Released

1. SPRING BRAKE CHAMBER
2. SERVICE BRAKE CHAMBER

2. OPERATION

2.1. NORMAL DRIVING

In normal operation with the spring (parking) brake released (Figure 2(See Figure 2, page 2)), the parking brake control valve on the instrument panel must be in the released position. When the control valve is in the released position, air pressure is permitted to pass through the control valve and provide the spring brake chamber with air, thereby loading the spring brake chamber and compressing the spring (parking) brake spring, holding the rear wheel brakes in the released position.

2.2. SERVICE BRAKE APPLICATION

When the service brakes are applied, air is forced into the service brake chamber (Figure 3(See Figure 3, page 3)), forcing the pushrod and piston assembly outward, extending the pushrod assembly.

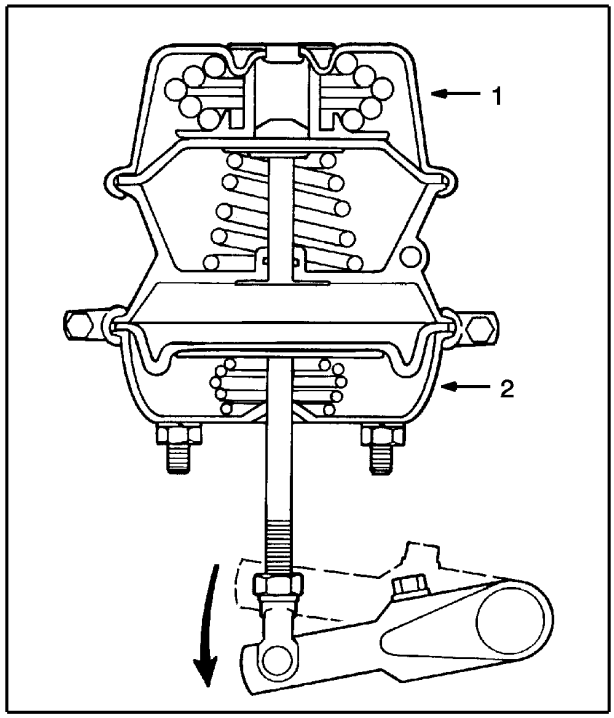

Figure 3 Service Brake Applied

1. SPRING BRAKE CHAMBER
2. SERVICE BRAKE CHAMBER

When the brake (foot) valve is released, air in the service brake system is exhausted and the service brake chamber pushrod assembly and diaphragm are permitted to return to the normal released position (Figure 2(See Figure 2, page 2)). The service brake spring assists in this function by forcing the pushrod and plate assembly into the normal released position.

2.3. SPRING (PARKING) BRAKE APPLICATION

To apply the spring (parking) brake, the operator of the vehicle positions the control valve in the parking brake applied position which exhausts air pressure from the spring brake chamber (Figure 4(See Figure 4, page 4)). Upon reduction of air pressure in the spring brake chamber, the spring brake will apply the rear brakes through the spring brake pushrod and service brake pushrod assemblies which are in turn connected to the air brake slack adjuster which is connected to the foundation brakes.

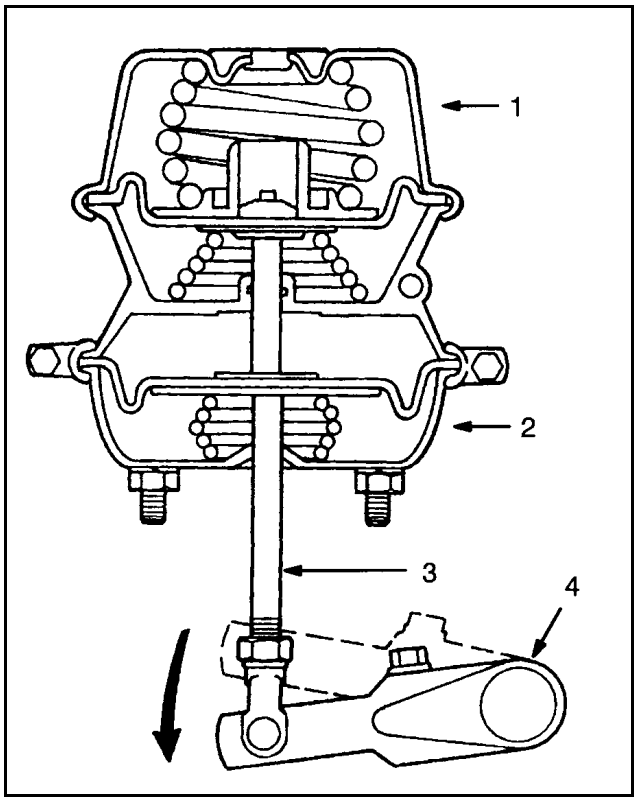

Figure 4 Spring (Parking) Brake Applied

1. SPRING BRAKE CHAMBER
2. SERVICE BRAKE CHAMBER
3. PUSHROD
4. SLACK ADJUSTER

To release the spring (parking) brake, the operator positions the control valve to the released position which applies air in the spring brake chamber, thereby loading the chamber. Air pressure overcomes the heavy springs forcing the spring brake pushrod and diaphragms to the released position or normal driving position (Figure 2(See Figure 2, page 2)).

Upon loss of air pressure or reduction of air pressure in the vehicle air system, the spring brakes will automatically apply, providing an emergency brake.

3. MAINTENANCE

The MGM Tamper Resistant spring brake chambers are an important part of your braking system. While they do not require scheduled servicing, it is good preventive 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.

WARNING – Your MGM Tamper Resistant spring brake has been factory sealed for your protection. There are no user-serviceable parts inside the spring brake chamber. If you experience any damage or failure of your spring brake chamber, replace the complete assembly. Never attempt to disassemble the spring brake chamber as serious personal injury or death could result from accidental sudden release of the high energy spring.

4. INSPECTION

4.1. RECOMMENDED INSPECTION POINTS

1. The plastic WEATHER SEAL END CAP (Figure 5(See Figure 5, page 5)) requires no positioning or maintenance, but must be snapped tightly in place. Inspect the cap for damage and replace as necessary. Units equipped with a WEATHER SEAL END CAP must be equipped with a rubber “O” ring (Figure 6(See Figure 6, page 5)) to ensure proper sealing of the spring brake chamber.

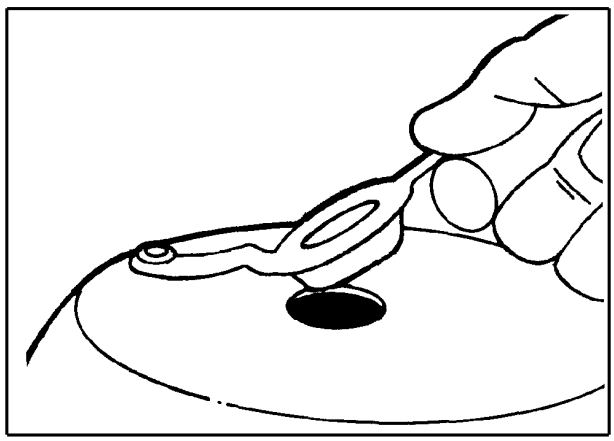

Figure 5 Plastic End Cap

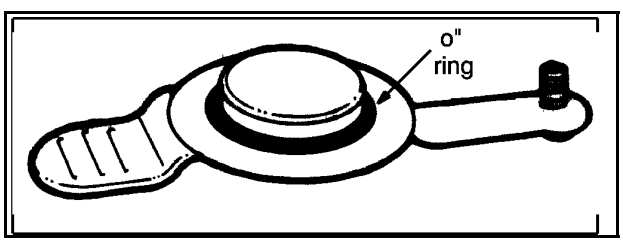

Figure 6 Plastic End Cap with “O” Ring

Visually inspect the exterior surfaces of the unit for signs of damage from outside sources, corrosion and/or rust. If any of these are seen or suspected, cautiously remove the complete combination chamber assembly after releasing (caging) the spring brake.

2. Inspect SERVICE BRAKE CLAMP RING (Item 2, Figure 1(See Figure 1, page 1)) to be sure it is securely in place and damage free. If any damage is seen or suspected, cautiously remove and replace the complete double diaphragm spring brake assembly.

3. Check to ensure the MOUNTING STUD HEX NUTS (Item 11, Figure 1(See Figure 1, page 1)) are tightened to **100 to 115 ft-lbs. (136 to 156 N•m) torque** and washers are in place between the nut and the bracket.

4. Inspect air lines, hoses and fittings (Item 4, Figure 1(See Figure 1, page 1)) attached to chamber. Replace any damaged or leaking parts. **Tighten fittings to 25 ft-lbs. (34 N•m) torque into the chamber air inlet ports.**

5. Inspect the PISTON ROD (Item 5, Figure 1(See Figure 1, page 1)) to be sure it is working free, not bent, not binding and is square to the chamber bottom with ± 3° in any direction at any point in the stroke of the chamber. If the PISTON 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 as required.

6. Inspect the YOKE ASSEMBLY (Item 6, Figure 1(See Figure 1, page 1)) being sure YOKE PIN (Item 7, Figure 1(See Figure 1, page 1)) is installed and locked into place with a COTTER PIN (Item 8, Figure 1(See Figure 1, page 1)). Replace any damaged, worn or missing parts. **Tighten the YOKE LOCKNUT (Item 9, Figure 1(See Figure 1, page 1)) to 25 to 35 ft-lbs. (34 to 47 N•m) torque.** On units equipped with a DUST BOOT, check the BOOT for damage and replace as necessary.

7. On units equipped with an external BREATHER TUBE (Item 10, Figure 1(See Figure 1, page 1)), be sure both ends of the connector tube are engaged a minimum of 1/2 inch into each of the flexible elbows (Figure 7(See Figure 7, page 6)). The tube must be glued to both of the elbows with a high quality rubber adhesive. 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 8(See Figure 8, page 7)).

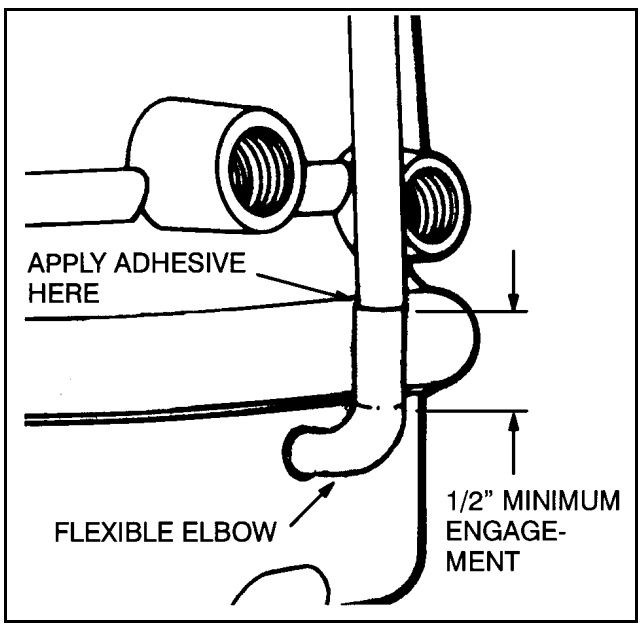

Figure 7 Install Breather Tube (If Equipped)

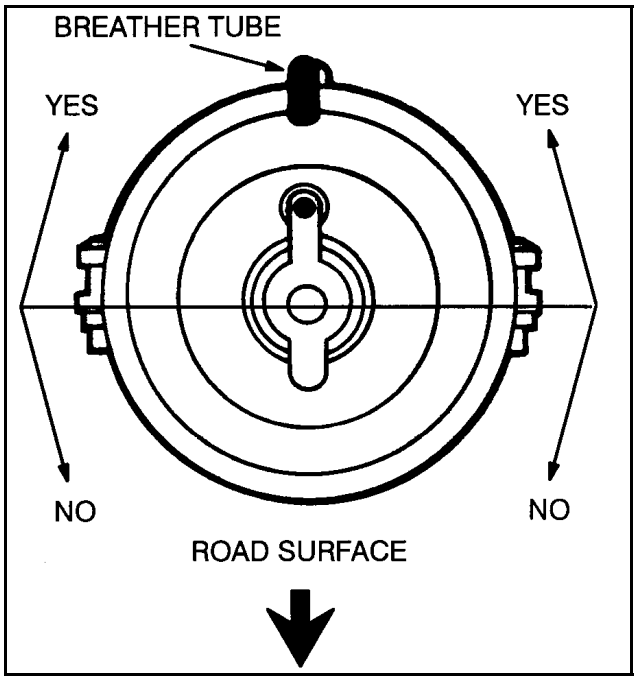

Figure 8 Position Breather Tube

CAUTION – Failure to operate any MGM Model Series “TR-T” and “TR-LP3–T” chamber without the EXTERNAL BREATHER TUBE and END COVER CAP being installed and in good condition will cause premature failure of the spring brake assembly and void any warranty.

5. REMOVE

5.1. CAGING SPRING

In the event there is loss of air and the vehicle must be towed or whenever the service and spring brake assembly is serviced or removed from the vehicle, the spring brake must be “caged.”

Mechanical Release

1. Before releasing brakes, chock wheels of the vehicle to prevent a runaway.

2. Remove the plastic end cap from the spring brake chamber (Figure 5(See Figure 5, page 5)).

3. Use a 3/4-inch wrench (15/16-inch wrench for TR3036 and TR3636 models). Loosen the release nut (Figure 9(See Figure 9, page 8)) and remove the nut, flat washer, and release bolt from their storage pocket on side of chamber (Figure 10(See Figure 10, page 8)).

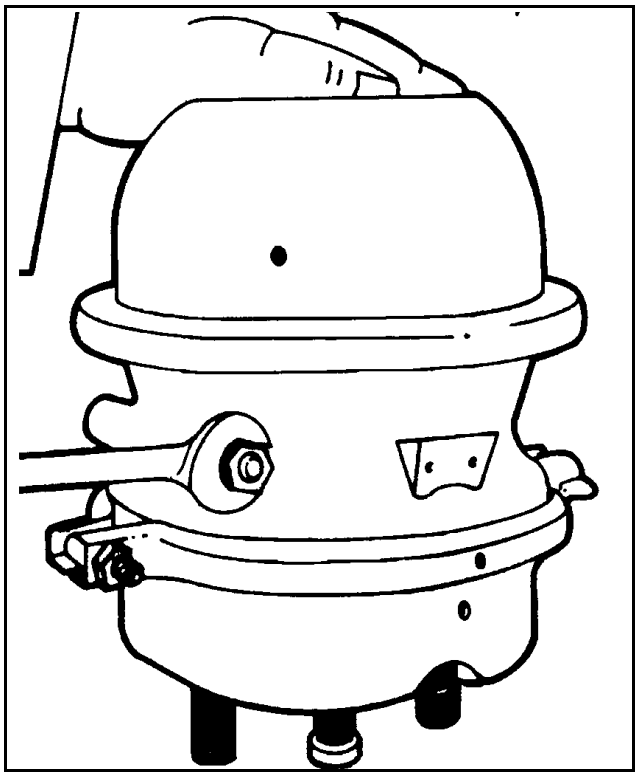

Figure 9 Release Bolt and Nut

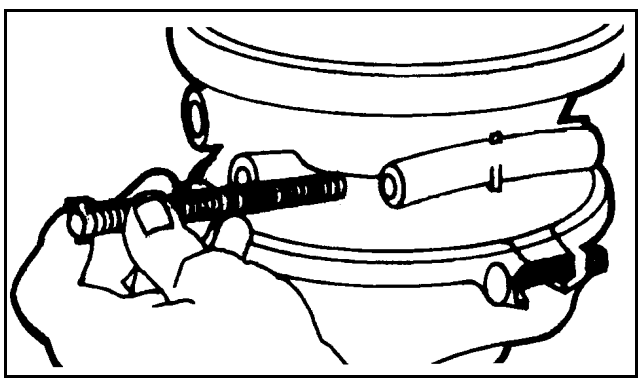

Figure 10 Release Bolt and Storage Pocket

IMPORTANT – If these parts are not stored on the chamber, they must be obtained from vehicle tool box or service department, as the spring brake cannot be CAGED without them.

4. Insert the release bolt into the centerhole of the spring brake chamber (Figure 11(See Figure 11, page 9)) and, being sure that the formed end of the bolt has entered the hole in the piston inside the chamber, continue to insert the bolt until it bottoms out.

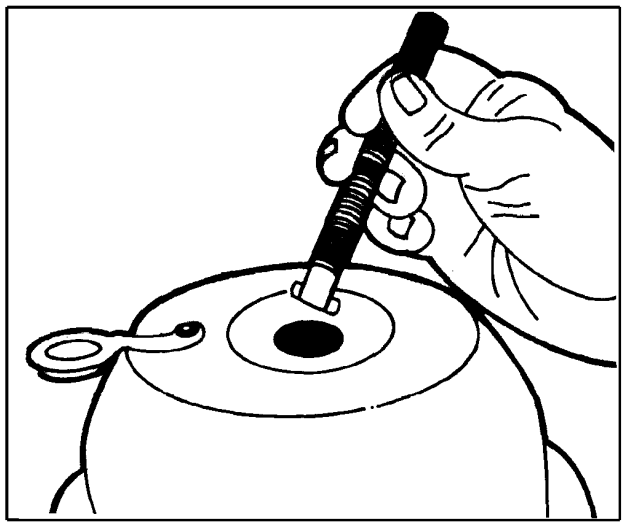

Figure 11 Insert Release Bolt

IMPORTANT – If you are not absolutely sure of correct bolt-to-piston engagement, repeat this step until you are sure.

5. Turn the release bolt 1/4 turn clockwise and pull the bolt outward to lock the formed end into the piston.

   IMPORTANT – If the bolt does not lock into the position in less than 1/2-inch outward movement, repeat steps 4 and 5 until you are sure it does lock.

6. Holding the bolt locked into the piston, install the flat washer and the release nut on the end of the release bolt, and turn the nut down against the flat washer until finger tight (Figure 12(See Figure 12, page 9)).

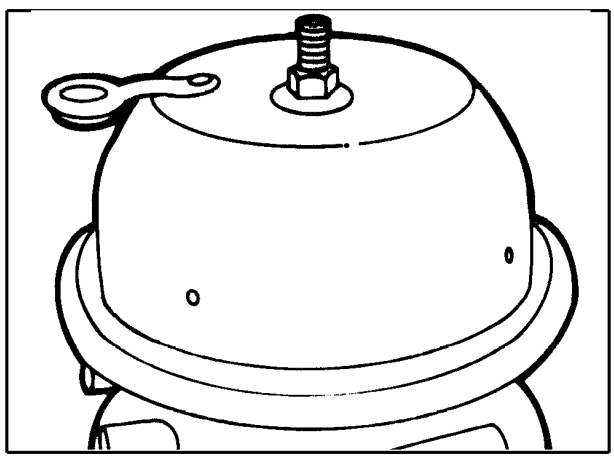

Figure 12 Install Flat Washer and Nut On Release Bolt (Finger Tight)

7. Use a 3/4-inch wrench (15/16-inch wrench for models TR3036 and TR3636) **(DO NOT USE AN IMPACT-TYPE WRENCH).** Turn the release nut clockwise until the bolt extends above the nut (Figure 13(See Figure 13, page 10)) by the amount listed in Table 1.

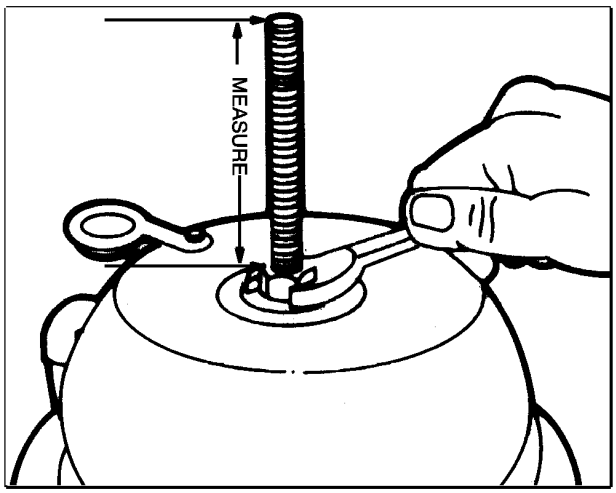

Figure 13 Turn Release Nut Clockwise Until Measurement Is Obtained

Table 1 Measurements

3.00 inch	Type 2430 Chamber
3.00 inch	Type 3030 Chamber
4.00 inch	Type 3036 Chamber
4.00 inch	Type 3636 Chamber

CAUTION – Do not exceed the lengths listed in Table 1 and do not exceed 50 ft-lbs. (68 N•m) torque on release nut at any time or damage may occur which could prevent any further correct caging of the spring brake chamber. If 50 ft-lbs. (68 N•m) torque or more is required to obtain the measurement in Table 1, replace the spring brake assembly.

NOTE – For easier manual-releasing, apply 90 to 125 psi air pressure to inlet port marked "SPRING BRAKE" before step 4 above, but be sure to exhaust all air pressure after step 7 above.

NOTE – To reactivate the piggyback/spring brake from its manually released position, reverse the order of steps 1 through 7 above.

NOTE – When re-installing the release bolt, flat washer and release nut into the storage pocket, torque the nut against the flat washer to 10 ft-lbs. (14 N•m) (Figure 9(See Figure 9, page 8)).

With Air Pressure

1. Chock wheels of the vehicle to prevent a runaway.

2. Remove the plastic end cap from the spring brake chamber (Figure 5(See Figure 5, page 5)).

3. Use a 3/4-inch wrench (15/16-inch wrench for TR3036 and TR3636 models). Loosen the release nut (Figure 9(See Figure 9, page 8)) and remove the nut, flat washer, and release bolt from their storage pocket on the side of the chamber (Figure 10(See Figure 10, page 8)).

4. Insert the release bolt into the center hole of the head (Figure 11(See Figure 11, page 9)) and, being sure that the formed end of the bolt has entered in the piston inside the chamber, continue to insert bolt until it bottoms out.

5. Turn the bolt 1/4 turn clockwise and pull the bolt outward to lock the formed end into the piston.

   IMPORTANT – If the bolt does not lock into the position in less than 1/2-inch outward movement, repeat steps 4 and 5 until you are sure it does lock.

6. Hold the bolt in the locked position and install the flat washer and release nut on the end of the release bolt. Turn the nut down against the flat washer until it is finger tight (Figure 12(See Figure 12, page 9)).

7. Apply vehicle parking brake or a minimum of 90 psi air pressure to the inlet port marked “SPRING BRAKE.”

8. Turn the nut down against the flat washer until it is **FINGER TIGHT**. The bolt should extend above the nut by the amount listed in TABLE 1.

   CAUTION – If the length of the bolt extending above the nut is less than is listed in TABLE 1, the spring brake chamber is not functioning properly and must be replaced.

9. Completely exhaust air from the spring brake.

5.2. REMOVE SPRING BRAKE ASSEMBLY

1. Cage the spring brake completely. Refer to CAGING SPRING.

2. Remove the cotter pin from the yoke pin, knock out the yoke pin, and remove both air lines from the assembly (Figure 14(See Figure 14, page 12)).

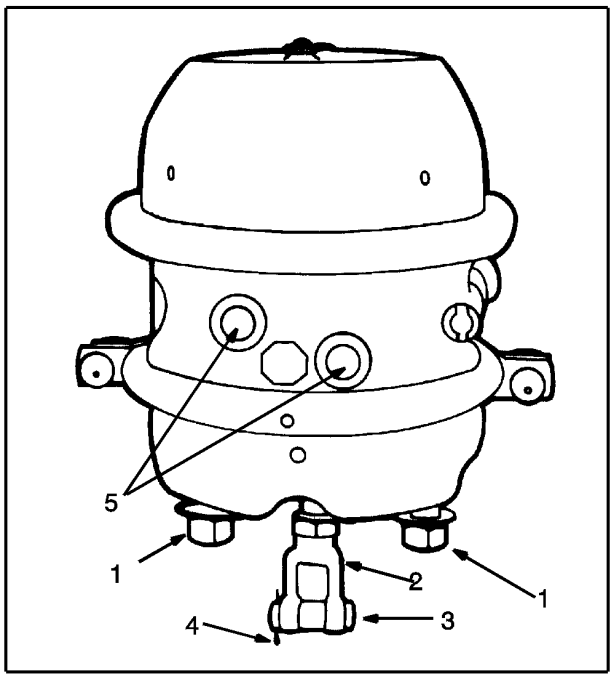

Figure 14 Remove Spring Brake Assembly

1. MOUNTING STUD NUT
2. YOKE
3. YOKE PIN
4. COTTER PIN
5. AIR LINE FITTINGS

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

3. Using a 15/16-inch wrench, loosen hex nuts (Item 1, Figure 14(See Figure 14, page 12)) on mounting studs and cautiously remove the chamber from the mounting bracket.

6. REPLACE SPRING BRAKE ASSEMBLY

It is mandatory that the service pushrod 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.

If the old double diaphragm spring brake assembly was properly installed, use the old assembly measurement to determine proper rod length. If the brake being removed was not properly installed or has been damaged too greatly to allow measurement, the following procedure must be followed to determine the proper rod length.

1. Make sure that the old spring brake is fully caged. Refer to CAGING SPRING. Be sure the service brake piston is fully retracted into brakes “OFF” position. Then measure outward from the bottom face of the service brake chamber and record both the X and Y dimensions (Figure 15(See Figure 15, page 13)).

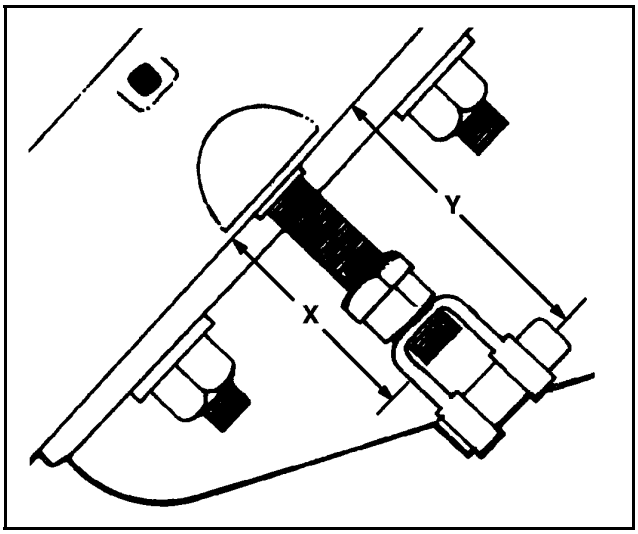

Figure 15 Piston Rod Measurement

INCHES — X DIMENSION TO END OF THREADED PISTON ROD
INCHES — Y DIMENSION TO CENTER LINE OF THE YOKE PIN

a. On double diaphragm spring brake assemblies that are to be re-attached to standard, manual slack adjusters, the Y dimension (Figure 15(See Figure 15, page 13)) is the most critical measurement, and a new service piston rod must be cut (Figure 16(See Figure 16, page 13)) to exactly duplicate this “rod-plus- yoke” length after the yoke assembly is re-installed on the piston rod.

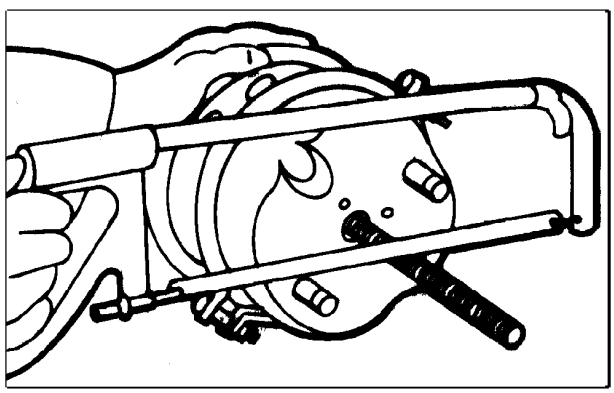

Figure 16 Cut Service Piston Rod

b. On double diaphragm spring brake assemblies that are to be re-attached to automatic slack adjusters, the X dimension (Figure 15(See Figure 15, page 13)) is the most critical measurement, and a new service piston rod must be cut (Figure 16(See Figure 16, page 13)) to exactly duplicate this “rod only” length before the yoke assembly is re-installed on the piston rod.

2. Remove the hex nuts (Item 1, Figure 14(See Figure 14, page 12)) and the flat washers on the mounting studs of the new chamber, clean the face of the mounting bracket and install the chamber on the bracket with close attention given to positioning the chamber air inlet ports for correct alignment to the vehicle air lines. Then install one flat washer and hex nut (Item 1, Figure 14(See Figure 14, page 12)) on each mounting stud and using a 15/16-inch wrench **(DO NOT USE AN IMPACT-TYPE WRENCH)**, tighten nuts to **100 to 115 ft-lbs. (136 to 156 N•m) torque.**

CAUTION – When installing any MGM MODEL "TR-T" and "TR-LP3–T"chamber, it is mandatory to position the non-pressure chamber end of the breather tube in upper half of chamber facing away from the road surface (Figure 8(See Figure 8, page 7)). Failure to comply will void the warranty on these models.

3. Reconnect yoke to the slack adjuster, being sure that the correct diameter and length of yoke pin is installed into the correct hole in the slack adjuster. Secure the yoke pin with a new cotter pin.

4. Inspect the piston rod to be sure that it is working free, not binding and is square to the service brake chamber bottom within ± 3° in any direction at any point in the stroke of the chamber. If the piston rod is not square, make corrections by repositioning the assembly on the mounting bracket and/or by shimming the slack adjuster to the right or left on the camshaft as required.

5. Apply Teflon tape or sealing compound to the hose fittings (Item 5, Figure 14(See Figure 14, page 12)) and re-install both of the air lines to the chamber being sure each is mated to the correct air inlet port according to markings made earlier. **Tighten fittings to 25 ft-lbs. (34 N•m) torque into the chamber air inlet ports.**

6. Using vehicle system air, charge the spring brake with full line pressure (minimum 100 psi). Using only soapy water (NEVER ANY TYPE OF OIL!), inspect for air leaks at the air lines and fittings. If bubbles appear, **tighten fittings (Item 5, Figure 14(See Figure 14, page 12)) slightly, but not over 30 ft-lbs. (41 N•m) torque.**

   IMPORTANT – If the service brake clamp ring was loosened to reposition air inlet ports, apply air to the spring brake and then apply and hold foot brake treadle valve down to charge the service brake chamber. Test for air leaks around the circumference of the service clamp ring. If bubbles appear, firmly tap the circumference of the clamp ring with a hammer (Figure 17(See Figure 17, page 14)) and retighten the clamp nuts until leaks cease. Tighten the clamp nuts to 25 to 30 ft-lbs. (34 to 41 N•m) torque. Completely exhaust air from service brake chamber when complete.

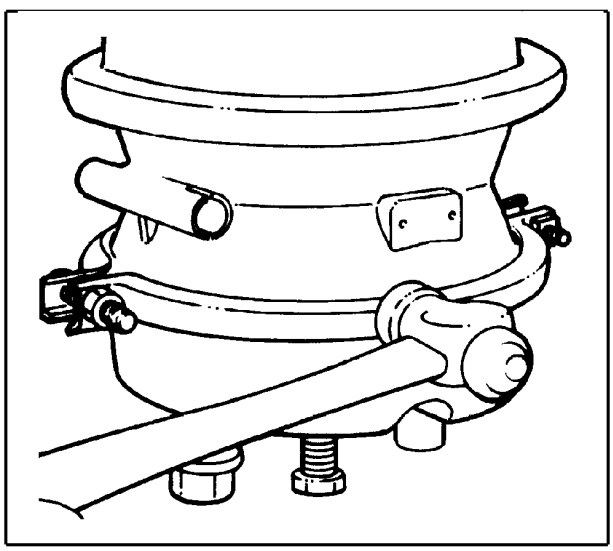

Figure 17 Tap Clamp Ring

7. With air pressure now exhausted from the service brake chamber, but still applied on the spring brake, remove release nut, flat washer and release bolt. Replace these parts in their storage pocket (Figure

10(See Figure 10, page 8)) on chamber (or in vehicle tool box if storage pocket is not present on chamber) and tighten nut (Figure 9(See Figure 9, page 8)) against flat washer to 10 ft-lbs. (14 N•m) torque.

8. Replace the END CAP properly (Figure 5(See Figure 5, page 5)). Be sure the “O” ring is installed in the plastic end cap (Figure 6(See Figure 6, page 5)).

CAUTION – Operating units without the END CAP securely in place will cause premature failure of the spring brake assembly and will void any warranty.

IMPORTANT – If chamber is fitted with an external breather tube, be sure both ends of the connector tube are engaged a minimum of 1/2 inch into each of the flexible elbows (Figure 7(See Figure 7, page 6)). The tube must be glued to both of the elbows with a high quality rubber adhesive. 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 8(See Figure 8, page 7)). Failure to comply with these installation instructions will void any warranty.

IMPORTANT – After replacement of the service brake diaphragm or the spring brake chamber, the service piston 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.

7. REPLACE SERVICE BRAKE DIAPHRAGM

The removal and installation of the service brake diaphragm can be made easier by “locking off” the service chamber piston. To do this apply the service brake by applying the driver’s foot brake treadle valve and, while applied, clamp vise grip pliers on piston rod to prevent rod from retracting when air pressure is released (Figure 18(See Figure 18, page 15)).

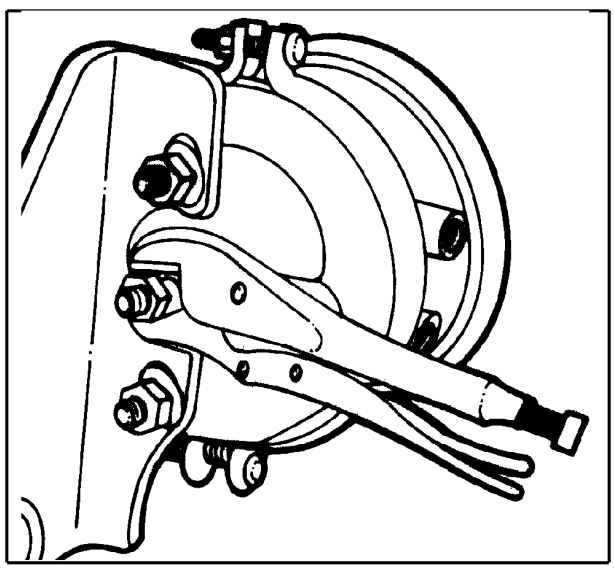

Figure 18 Vise Grip Pliers Applied To Piston Rod

1. Release (cage) the spring brake completely. Refer to CAGING SPRING.

2. Remove both air lines from the chamber.

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

3. On Models “TR-T” and “TR-LP3–T” fitted with external breather tubes (Item 10, Figure 1(See Figure 1, page 1)), disconnect the tube and elbow from the service brake chamber housing.

4. Use a 9/16-inch wrench or socket to remove the clamp ring nuts on the service brake clamp ring. Then, while holding the spring brake chamber securely in place, remove the clamp ring to allow removal of the spring brake chamber from the assembly (Figure 19(See Figure 19, page 16)).

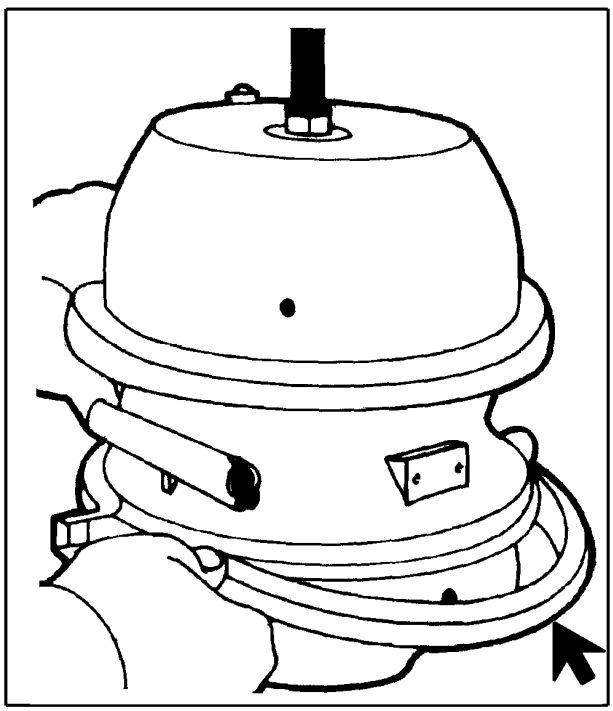

Figure 19 Remove Service Brake Clamp Ring

WARNING – Your MGM Tamper Resistant spring brake has been factory sealed for your protection. There are no user-serviceable parts inside the spring brake chamber. If you experience any damage or failure of your spring brake chamber, replace the complete assembly. Never attempt to disassemble the spring brake chamber as serious personal injury or death could result from accidental sudden release of the high energy spring.

IMPORTANT – At this time, take the opportunity to inspect all parts in the service brake chamber and replace any parts which may be damaged or worn.

5. Position the diaphragm in the bottom recess of the chamber (Figure 20(See Figure 20, page 17)) and, with very close attention taken to assure all mating parts are aligned straight and the air inlet ports are positioned to mate with the vehicle air supply lines, replace the service brake clamp ring (Figure 19(See Figure 19, page 16)).

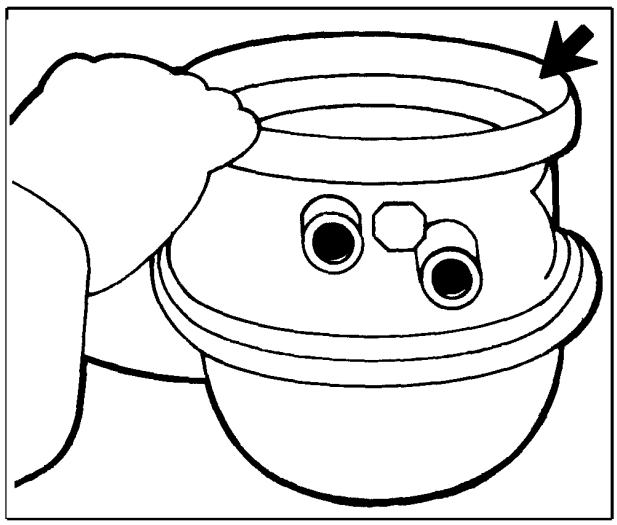

Figure 20 Install New Diaphragm

6. Re-install the clamp ring bolts and nuts. **Alternately tighten each nut in 5 to 10 ft-lbs. (7 to 14 N•m) torque increments** while constantly rechecking mating parts alignment. (If re-alignment is required, loosen clamp ring nuts and repeat step 5 above.) Firmly tap around circumference of the clamp ring with a hammer to assure the full seating of the clamp ring (Figure 17(See Figure 17, page 14)) and **tighten the nuts to 25 to 30 ft-lbs. (34 to 41 N•m) torque.**

7. Apply Teflon tape or sealing compound to the hose fittings (Item 5, Figure 14(See Figure 14, page 12)) and re-install both of the air lines to the chamber, being sure each is mated to the correct air inlet port according to markings made earlier. **Tighten the fittings to 25 ft-lbs. (34 N•m) torque into the chamber air inlet ports.**

8. Use vehicle system air to charge the spring brake chamber with full line air pressure (minimum 100 psi). Use only soapy water (NEVER ANY TYPE OF OIL!) to inspect for air leaks at the air lines and fittings. **If bubbles appear, tighten fittings slightly, but not over 30 ft-lbs. (41 N•m) torque.**

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

   IMPORTANT – At this time, remove the vise grip pliers (Figure 18(See Figure 18, page 15)) from the service piston rod so that the piston can return to a normal position in the chamber. Now test for air leaks around the circumference of the service brake clamp ring. If bubbles appear, firmly tap the circumference of the clamp ring with a hammer and retighten the clamp ring nuts until leaks cease (Figure 17(See Figure 17, page 14)). Tighten the clamp nuts to 25 to 30 ft-lbs. (34 to 41 N•m) torque.

10. On “TR-T” and “TR-LP3–T” models fitted with an EXTERNAL BREATHER TUBE, wipe the ends of the connector tube clean to be sure that no oil is present. Apply a high quality rubber cement to the tube and re-insert tube into flexible elbows with minimum 1/2-inch engagement into both elbows (Figure 7(See Figure 7, page 6)).

    IMPORTANT – 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 8(See Figure 8, page 7)) and the tube glued securely into the rubber elbows (Figure 7(See Figure 7, page 6)). Failure to comply with these instructions will void any warranty.

11. With air pressure exhausted from the service chamber, but with line pressure still on the spring brake, remove the release nut, flat washer and release bolt. Replace these parts in their storage pocket (Figure 9(See Figure 9, page 8)) on the chamber (or in the vehicle tool box if a storage pocket is not present on the chamber) and **tighten the nut against the flat washer to 10 ft-lbs. (14 N•m) torque**.

12. Replace the end cap properly (Figure 5(See Figure 5, page 5)). Operating these units without the END CAP securely in place will void any warranty.

CAUTION – Operating units without the END CAP securely in place will cause premature failure of the spring brake assembly and will void any warranty.

8. CAM BRAKE ADJUSTMENT

NOTE – The last half of an air chamber stroke is less efficient than the first half. Therefore, the following adjustments are recommended for maximum efficiency.

8.1. BRAKES OFF - NOT APPLIED (FIGURE 21(SEE FIGURE 21, PAGE 18))

Angle must always be greater than 90° due to various slack adjuster lengths and installation setups. Refer to GROUP 04 - AIR BRAKES in the CTS-5000 Master Service Manual for recommended angle.

Maximum stroke should be as short as possible without brakes dragging.

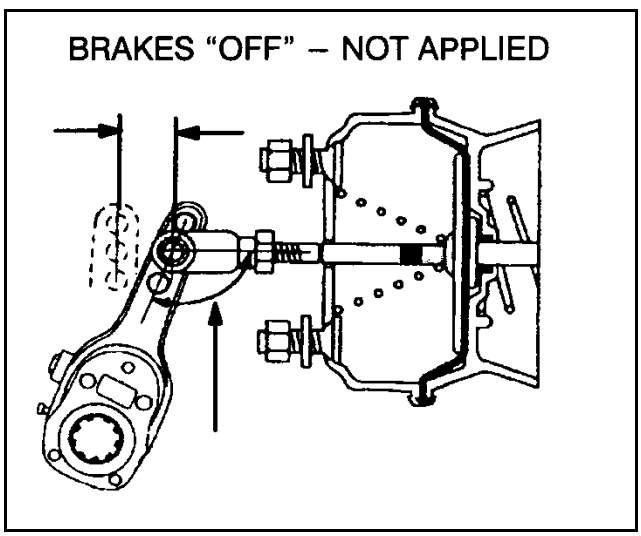

Figure 21 Brakes Off - Not Applied

8.2. PROPERLY ADJUSTED BRAKES - BRAKES APPLIED (FIGURE 22(SEE FIGURE 22, PAGE 19))

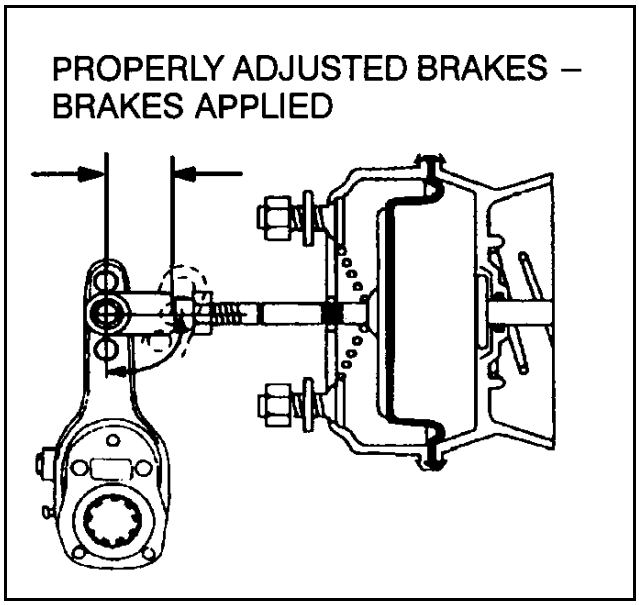

Figure 22 Properly Adjusted Brakes - Brakes Applied

To adjust the brakes, apply 80 to 90 psi air pressure to the service chamber. Refer to GROUP 04 - AIR BRAKES in the CTS-5000 Master Service Manual for the correct angle between the slack adjuster arm and the pushrod and/or the pushrod length. This is necessary since different dimensions are required for automatic or manual slacks, various slack lengths and different slack adjuster manufacturers.

8.3. IMPROPERLY ADJUSTED BRAKES - BRAKES APPLIED (FIGURE 23(SEE FIGURE 23, PAGE 20))

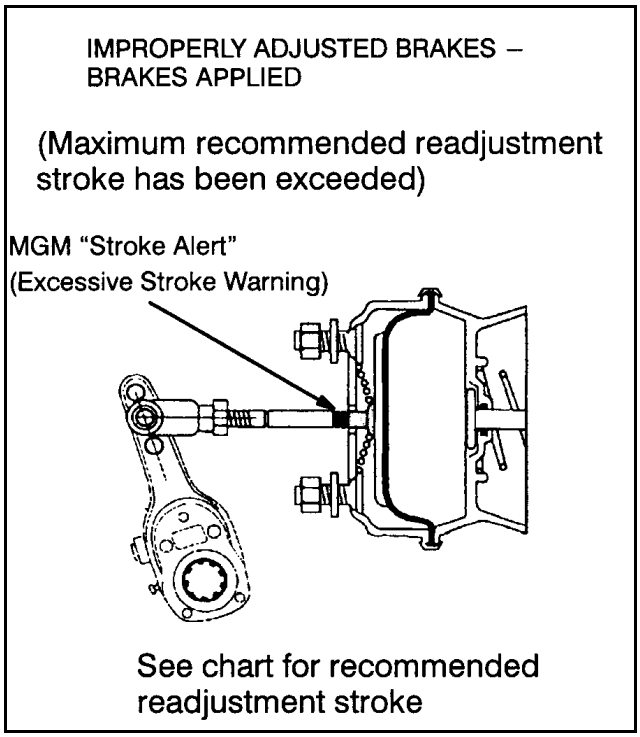

Figure 23 Improperly Adjusted Brakes - Brakes Applied

8.4. RECOMMENDED RE-ADJUSTMENT STROKE

Table 2 Recommended Re-adjustment Stroke

Chamber Type	Approximate Diaphragm O. D.	Rated Stroke of Chamber	MVMA Recommended Readjustment Stroke
	In. mm	In. mm	In. mm
20	6.50 165	2.25 57	1.75 45
24L	7.00 175	2.50 64	2.00 51
30	8.00 200	2.50 64	2.00 51
36	9.00 230	3.00 76	2.25 57
2430LP3	8.00 200	3.00 76	2.50 64
2430LP3-T	8.00 200	3.00 76	2.50 64
3030LP3	8.00 200	3.00 76	2.50 64
3030LP3-T	8.00 200	3.00 76	2.50 64
Maximum stroke with brakes adjusted should be as short as possible without brakes dragging. SOURCE: MVMA (Motor Vehicle Manufacturers Association)			

9. RECOMMENDED SPRING BRAKE DISARMING PROCEDURE

WARNING – MGM Double Diaphragm Spring Brake Assemblies must be disarmed before disposal, or forceful release of the spring brake chamber may occur in the future without warning which can cause personal injury or death.

Once an MGM double diaphragm spring brake assembly has been removed from the vehicle, uncage the spring brake chamber spring when applicable.

1. Place the Double Diaphragm Spring Brake assembly inside a safety chamber (Figure 24(See Figure 24, page 21)) for disarming. Close the lid on the safety chamber and lock closed. (The service pushrod may need to be cut off for the assembly to fit in the safety chamber.)

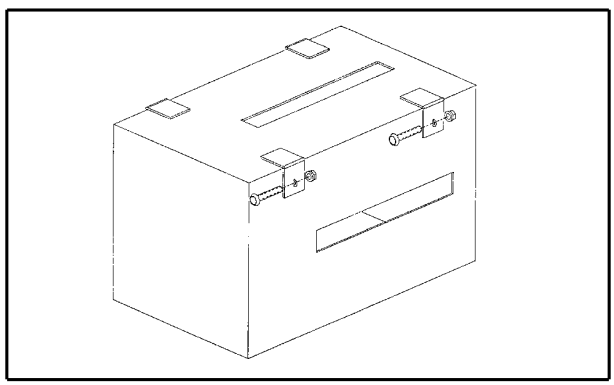

Figure 24 Safety Chamber

2. While wearing safety glasses, use an acetylene cutting torch and cut a 1/2 inch by 1-1/2-inch segment out of the spring brake chamber wall through one of the openings in the safety chamber.

3. Once the spring brake chamber spring is exposed, use the acetylene cutting torch to cut the exposed spring in one or more places until the spring brake chamber spring can be moved around inside the safety chamber with a long screwdriver or similar tool.

To purchase a safety chamber, refer to GROUP 04 - PARKING BRAKES in the CTS-5000 Master Service Manual.

A Safety Chamber can be constructed (Figure 25(See Figure 25, page 22)).

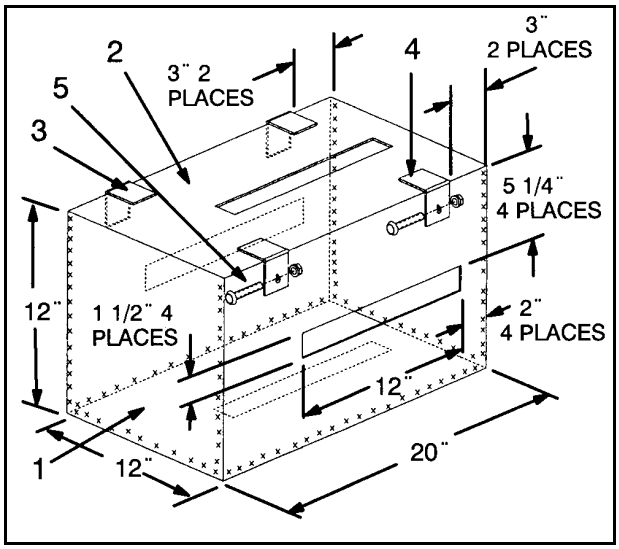

Figure 25 Safety Chamber Construction

1. BODY
2. LID
3. 6-INCH HEAVY WROUGHT STEEL HINGE
4. 1-3/4 INCH WIDE HEAVY DUTY WROUGHT STEEL HINGED HASP
5. 3/8-INCH CARRIAGE BOLT AND NUT

NOTES:

A. DRILL HOLES AND USE MANUFACTURER'S SUGGESTED FASTENERS TO MOUNT HINGES AND HASPS OR WELD IN PLACE
B. WELD WHERE INDICATED BY XXXXXXX
C. DO NOT WELD LID TO BODY
D. PAINT TO SUIT
E. MATERIAL: 2 PCS 12" X 12" X 1/4" THICK AND 4 PCS 12" X 20" X 1/8" THICK HR OR CF STEEL
F. CUT 12" X 1-1/2" SLOTS IN MATERIAL AS SHOWN, 4 PLACES

TORQUE

Table 3 Torque Chart

Item No. *	Location (Figure No.)	In/Ft-Lbs.	N•m
4	Air Line Fittings (Figure 1)	25 Ft-lbs.	34
9	Yoke Locknut (Figure 1)	25 to 35 Ft-lbs.	34 to 47
11	Mounting Stud Hex Nut (Figure 1)	100 to 115 Ft-lbs.	136 to 156
None	Release Nut (Figure 13)	50 Ft-lbs.	68
None	Storing Release Nut (Figure 9)	10 Ft-lbs.	14
1	Mounting Stud Hex Nut (Figure 14)	100 to 115 Ft-lbs.	136 to 156
5	Air Line Fittings (Figure 14)	25 Ft-lbs.	34
None	Clamp Ring Nuts (Figure 17)	25 to 30 Ft-lbs.	34 to 41

* Refer to figures specified in the location column.