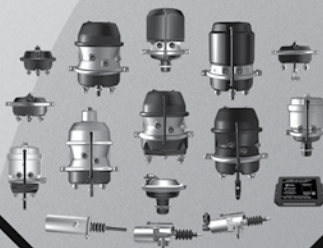




Self-Study Training Program
SPRING BRAKES / SERVICE CHAMBERS



**YOUR COMPLETE
AIR BRAKE GUIDE
FOR ALL THOSE
UNANSWERED
QUESTIONS**



**Form 5038
Revised 1/2021**

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Self-Study Training Program

Introduction

Welcome to the MGM **“BrakeTECH”** Self-Study Training Program. MGM Brakes has created this course for counter and outside sales personnel involved in providing replacement parts to the heavy-duty trucking industry. This booklet has been designed to allow you to work at your own pace, regardless of your schedule, to become better acquainted with MGM Brakes and our products. When you complete this course you should have a thorough knowledge of the spring brakes, service chambers, parts and kits that MGM Brakes offers and the segments of the heavy-duty trucking industry for which each product has been designed. Our goal is to help you become an expert on the MGM Brakes products you sell each and every day.

How To Use The Study Guide

Begin by carefully reading each chapter. Feel free to make notes, underline, or highlight if you wish. This can help you remember what you have read. Study at your own pace. There is no time limit on completing this program.

At the end of this booklet you will find a final review quiz. This quiz is an important part of self-study learning since it is intended to reinforce the material covered. The questions contained are straightforward true and false, or multiple choice. There are no “trick questions”. Be sure to answer each question to the best of your ability. If you are unsure about your answer to a particular question, review the appropriate chapter before finalizing your choice. The correct answers to all of the questions are contained within the text of this booklet.

MGM Brakes will issue a “Certificate of Completion” to each participant scoring a minimum of 85%. Information on how to obtain your Certificate is provided at the end of this booklet.

MGM Brakes: Brief Company History

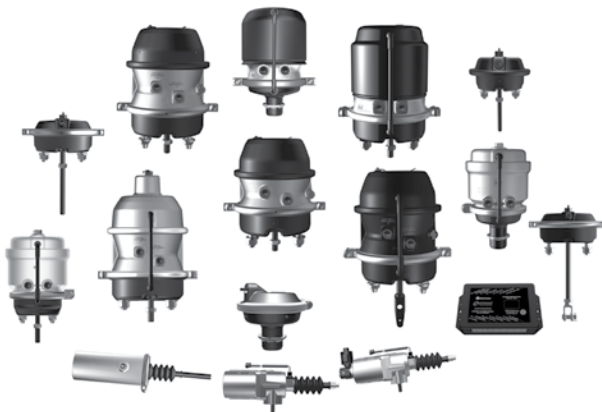
MGM Brakes was established in 1957 when John **Miller**, Swen **Gummer**, and Joseph **Meyer** developed and marketed the very first **MGM** Spring Parking Brake. Gummer, owner of a sawmill, and a logger himself, had experienced first-hand the dangers inherent in hauling heavy loads up and down steep, rugged, poorly developed forestry “roads”. This environment was a torture chamber for the braking systems commonly found on heavy trucks during that time period. Frequent brake failures resulted in costly accidents and even loss of life.

Recognizing the need for a device that would lesson the probability of such events occurring, Gummer and his two colleagues succeeded in inventing an innovative safety device which they fitted to their trucks with excellent results. This MGM Brake, a remote mount design, soon swept through the logging industry and quickly revolutionized the entire trucking industry.

Vehicles fitted with spring brakes had a real safety advantage. Sudden losses in brake system air pressure caused the spring brake to engage, giving the operator the ability to bring the vehicle to a safe, controlled stop. Manual release of the system air, utilizing a dash-mounted valve, also provided the operator with an effective parking brake.

The spring parking brake became very popular during the ensuing four decades, and MGM Brakes grew to become the premier spring brake manufacturer/supplier in the world. Today, MGM Brakes, the acknowledged leader in the development of new spring brake technology, is the only “full-line” spring brake manufacturer in the world, offering more types, more models, and more combinations of brakes, for the widest and deepest product line in the industry.

MGM Brakes offers a full line of double-diaphragm and piston-diaphragm spring brakes. Many models including the most popular Type 24 and Type 30 are available in both standard 2.5 inch stroke and 3.0 inch “Long Stroke” designs. Models with 1.75-inch and 2.25-inch strokes are available for specialty applications. Some spring brake models have an integral (built-in) release bolt, while others have a detachable release bolt. There are also “Severe Service” spring



brakes, targeted at industries with characteristically harsh environments such as mining, livestock hauling, industrial waste, redi-mix concrete and refuse hauling. MGM Brakes also manufactures Remote Mount Cylinders (typically used as tailgate actuators), as well as Wedge and Disc Brakes. Combining this robust line up with our expansive array of service chambers, it soon becomes evident just why MGM Brakes is the leader in spring brake technology, worldwide.

Spring Brake Basics

A spring brake is sometimes called an air-brake actuator. Whatever the name, it is important to know how this device functions. Spring brakes function as:

- Service Brakes
- Emergency Brakes
- Parking Brakes

The spring brake has two chambers (Fig. 1):

- The service brake chamber portion (a) performs the service brake function;
- The “parking brake” chamber portion (b) contains either a diaphragm or piston, and a powerful spring.

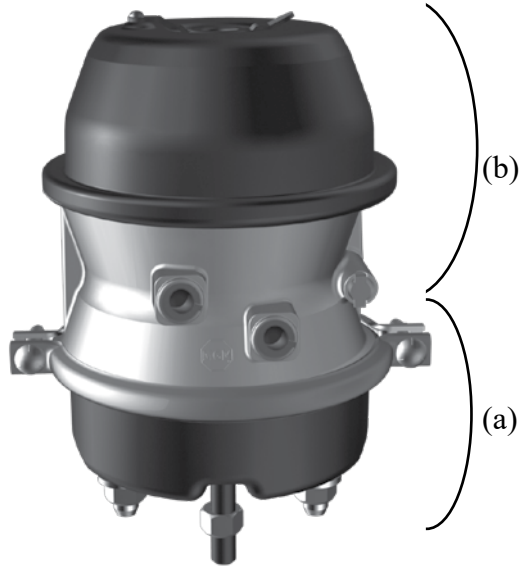


Figure 1

Note: *Never disassemble a spring brake chamber. The large spring is compressed and has a force of up to 3,000 lbs. Accidental release of this spring can cause severe injury.*

The Service Brake (a)

The service brake chamber portion operates independently of the spring brake chamber and provides stopping power for the vehicle during normal operation. When the brake pedal is depressed, compressed air fills the chamber. When this occurs, the compressed air pushes against the diaphragm, simultaneously compressing the return spring and extending the push-rod. Since the push-rod is connected via a yoke and slack adjuster to the vehicle’s foundation brake, whether drum or disc, the result is a gradual slowing of the vehicle, dependent upon the amount of air pressure applied.

The Spring Brake (Parking/Emergency Brake) (b)

An MGM Spring Brake is the simplest and most reliable parking brake ever invented for heavy-duty vehicles. It is also the most fool-proof emergency brake for air brake systems. The principle is basic: An MGM Parking Brake automatically actuates the foundation brakes when there is no air pressure.

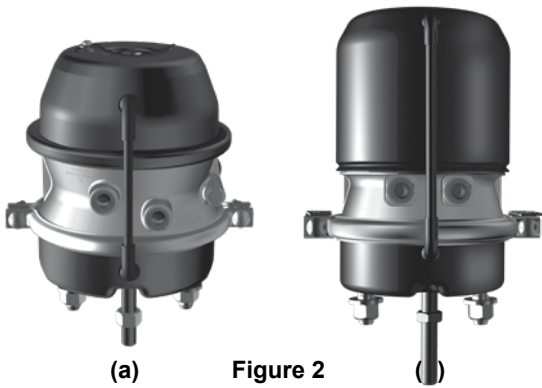


Figure 2

Currently, two main types of spring brakes are commonly used on air-braked trucks, buses, trailers and other heavy commercial vehicles worldwide: the double-diaphragm type (**Fig. 2a**) and the piston-diaphragm type (**Fig. 2b**).

The parking brake (or emergency brake) chamber can utilize either a piston or a diaphragm, and normally remains filled with compressed air

when the vehicle is in operation. This air pressure pushes upon the diaphragm or piston (depending upon the design of the actuator), compressing the power spring, thereby holding the parking brake in the disengaged position (**Fig. 3a**).

Since the service brake and parking brake chambers are isolated from each other by a seal (**Fig. 3b**), the parking brake cannot interfere with the normal operation of the service brake. The parking brake chamber serves two functions: 1.) it provides for parking the vehicle; 2.) it is part of the emergency brake system. To park the vehicle, air in this chamber is released by activating a parking brake valve generally mounted on the vehicle's dash. This releases the compressed air from the parking chamber, enabling the power spring to force the push-rod down toward the lower

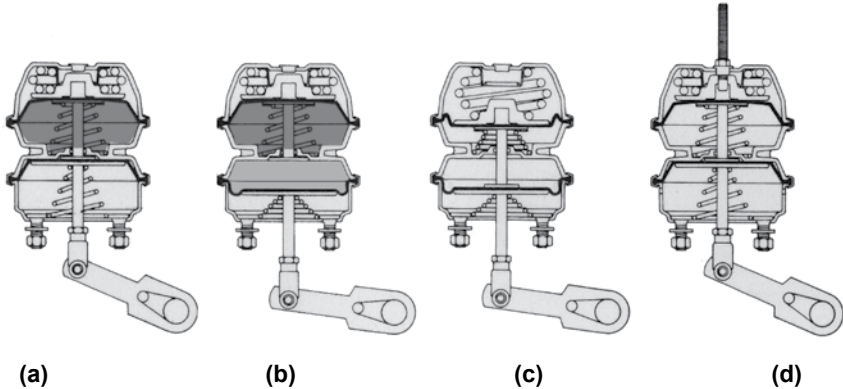


Figure 3

service chamber. This downward motion of the push-rod exerts force against the service chamber's push-rod, causing engagement of the vehicle's foundation brakes via the yoke and slack adjuster (**Fig. 3c**). The manual release bolt allows easy release of spring brakes to reline brakes or move the vehicle in the absence of air pressure (**Fig. 3d**).

Most North American heavy-duty commercial vehicles have spring brakes installed on their drive axles only, while a typical trailer will have spring brakes on all axles. Service chambers are typically used on front axles (see pg. 30).

Double-Diaphragm vs. Piston-Type Spring Brakes

Double-diaphragm actuators, as the name implies, generate force-output by utilizing two separate diaphragms, one within the service chamber portion, the other inside the parking chamber (Fig. 4a). Piston-type models have a piston in place of a diaphragm inside the parking chamber (Fig. 4b), though the service chamber portion utilizes a diaphragm just like the double-diaphragm models. Generally speaking, the piston-type parking chamber design has much higher parking force-output than a double-diaphragm design of the same size. As a result, piston designs are more efficient, offering increased parking, holding and emergency stopping performance.

In North America, piston-type air-brake actuators are not as common as double-diaphragm brakes. U.S. Department of Transportation regulations require spring brakes on trailers to assist the brakes on tractors when parking. Therefore, tractors are typically equipped with double-diaphragm spring brakes since the higher parking force-output of piston type parking brakes is usually unnecessary. However, large buses (or transit coaches), fire trucks, emergency vehicles, mixer trucks, dump

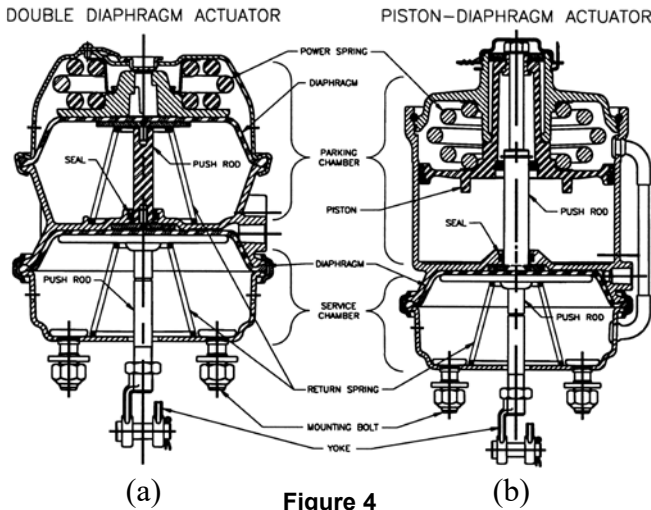


Figure 4

trucks, etc. tend to be the most common vehicles in North America fitted with piston-style spring brakes because of their added performance and safety. Piston-style spring brakes also work well with the increasingly popular disc brake systems found on more and more of today's heavy-duty vehicles.

The increased performance of piston-type actuators is very important in some markets, especially in Europe where regulations specify that when parking, a tractor-trailer combination must be held entirely by the action of the tractor's parking brakes. Therefore, usually piston-type air-brake actuators (with their superior parking force-output) are the only spring brakes capable of meeting such regulatory requirements. These models will likely remain the spring brake of choice for vehicles in Europe for

some time. This scenario underscores how governmental regulation can effectively mandate the use of specific products, in this case, piston-type actuators.

As a rule, even though a diaphragm-type parking (emergency) brake is less powerful than a piston-style model of the same size, several working together on a tractor-trailer combination easily generate more than enough park and hold capability.

Why MGM Brakes Is Your Best Choice

When You Go With MGM Brakes, You've Got More Ways To Stop

It has been said that imitation is the highest form of flattery. Outwardly, many spring brakes on the market today look alike, and it's no mistake that a lot of them look like an MGM Brake. Unfortunately for the consumer, looks, as they say, are only skin deep, and it's what's inside that makes the difference. With that in mind, think about the product you've been selling and ask yourself: *Am I providing my customer with the right spring brake for his vocation or operating environment.*

Two major mistakes can be made by your customer when choosing a spring brake:

Mistake #1: One Size Fits All

Most customers are not aware that MGM manufactures lots of different spring brakes, many specifically engineered and designed to withstand the unique demands of severe braking situations and harsh operating environments.

A truck hauling dry freight across the flatlands today can be high in the mountains tomorrow, transporting heavy loads down steep grades, under the harshest operating conditions. Therefore, the spring brake that worked well at one time may no longer be the right spring brake for that vehicle. That's why it is so important to determine how a vehicle is used before recommending a particular size or model spring brake.

Mistake #2: One Price Fits All

Because many customers are unaware of the differences between spring brake products, they don't understand why prices vary so much from manufacturer to manufacturer. That's why many customers make their buying decision on price alone. This problem is compounded by the fact that those spring brake manufacturers who emphasize price tend to offer only one model spring brake for use in all applications and environments. MGM Brakes is the only manufacturer who offers a full line of spring brakes and service chambers designed to meet the requirements of all vocations and operating environments.

These assumptions, if followed, can potentially lead to undesirable results. Recommending the correct spring brake for your customer's operating environment can prevent premature failure of the unit, saving your customer unnecessary and costly "down time". As a brake "specialist" you need to convey to your customer that selecting the right spring brake is very important. By carrying MGM Brake products, you'll be assured of being able to offer just the right spring brake for any customer's needs. In fact, the MGM name spells out why our spring brakes are your customer's best choice.

Maximum Performance

MGM manufactures spring brakes to the industry's highest standards, outperforming the competition in both quality and performance.

Greater Value

It was once said "Quality is remembered long after the price is forgotten". While the cost of MGM combination units could have a higher initial cost than competitive brands, MGM spring brakes are manufactured to higher standards and last longer, meaning significant amounts of money are saved over the long term. MGM piggyback units are within pennies of the cost of the "low priced" products, and our replacement "Piggyback Plus" Kits which include a piggyback, diaphragm and clamp band, allow the quick refurbishing of genuine MGM spring brakes at a very cost effective price.

More Coverage

MGM Brakes offers more choices for more applications and environments than any other spring brake manufacturer in the world. Our multi-million dollar Technology Center allows us to stay at the forefront of the industry, leading the way in product development and testing, giving us the technological edge (see Technology Center section, pg. 40).

The bottom line is clear: MGM Brakes invests money in designing, testing and manufacturing a vast array of spring brake and service chamber products. With manufacturing plants in Cloverdale, California and Murphy, North Carolina, customers receive only the highest quality, best performing products for their money. Choosing to go with MGM Brakes is the right choice. However, deciding upon the proper spring brake for a particular vehicle will take some considered thought.

MGM Brakes Product Features & Benefits

For over fifty years MGM Brakes has been the leader in the development of spring brakes with industry-exclusive innovations and features not found anywhere else. The following section of this booklet will fully detail spring brake models and features.

Industry Firsts

MGM Brakes was the first in the industry with the following significant design and performance improvements:

- Compact, high output, barrel-shaped power springs
- Low profile, non-pressure chambers to lower the center of gravity
- Reinforced non-pressure chambers for high stress applications
- External breather-tube design to prevent ingestion of contaminated air
- Sealed, tamper-resistant design to prevent accidental disassembly
- Center-hole diaphragm design maintains alignment of components providing longer service life
- Floating center-hole shield to prevent contaminants from entering the non-pressure housing
- Composite guide assures proper alignment of piston. Constructed from heavy-duty non-metallic composite material slowing the corrosion process and reduces corrosion related failure
- All epoxy-coated brake components for severe service applications
- Elimination of short-lived O-ring air seals
- Integral release bolt
- Welded yoke

TR/TR-T/TR-TS Models (2.5" and 3.0" Stroke) (Fig. 5)

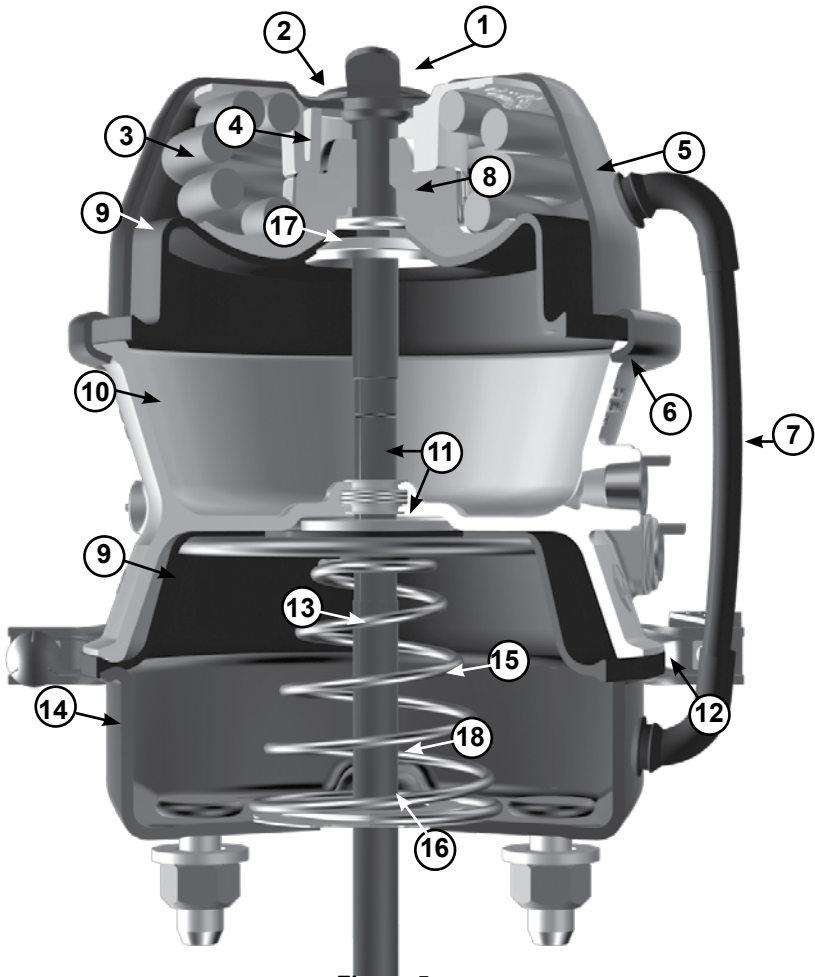


Figure 5

1. Release Bolt

- Detachable
- Standard SAE threads, not special ACME THREADS like competitors, so nut can be easily replaced if lost or damaged, and threads can be repaired

2. Weatherseal™ Plug

- Positive Snap Lock Seal Design
- Attached to head with drive screw to prevent loss
- O-ring added on TR-T and TR-TS models to form weather-resistant closure

3. Power Spring

- Each production lot is thoroughly inspected and rigorously tested to ensure quality
- Electrostatically applied, baked on *epoxy coating to resist corrosion—toughest coating available

4. Upper Non-Metallic Piston Guide (Patent Pending)

- Constructed from heavy-duty non-metallic composite material
- Prevents metal to metal contact between power spring and head
- Slows the corrosion process and reduces “corrosion” related failures

5. Steel Head

- Tapered-head design for tight space installations
- Protected by epoxy coating inside and out

6. Tamper Resistant Design

- Tamper-resistant design prevents inadvertent disassembly

7. External Breather-Tube System

- Vents air from the inside protected area of the non-pressure chamber
- Seals out liquid and solid corrosive contaminants
- Standard on TR-T and TR-TS Models only

8. Upper Piston

- Made of 360 aluminum alloy to resist corrosion
- High pressure die-cast molded to improve strength and eliminate porosity
- Fluted design precludes piston bind and consequential brake drag
- Positive stops assure proper engagement of the release bolt
- Protected by *epoxy coating in TR-TS Models only

9. Diaphragms

- Heavy-duty, nylon-reinforced for longer service life and resistance to deterioration from flexing
- Low temperature range to -40°F/-40°C
- Suitable for extreme operating conditions
- Neoprene available as an option for resistance to oil contamination experienced in high duty cycle air systems typical of some vehicles, i.e., buses, refuse vehicles, etc.

(*see Epoxy Coating pg. 15)

10. Flange Case

- Alloy 360 aluminum - more magnesium, less copper content for increased corrosion resistance
- Integral release bolt holder
- High pressure die-cast molded to increase strength and eliminate porosity
- Protected by *epoxy coating on TR-TS Models only

11. Flange Case Push-Rod & Seal

- Push-rod is ground, hard-coated aluminum for long center seal life
- Multi-lipped pressure activated seal—MGM exclusive; with wiping edge and lube retention grooves to ensure positive air seal at full range of stroke; will not dry out, score the push-rod, or develop leaks like O-rings used by competitors
- Push-rod seal held in position by two (2) nylon guides to prevent metal-to-metal contact and wear

12. Clamp Band

- Two-piece trivalent chromate coated with wide flanges for easy positioning
- Carriage bolts and self-locking nuts to maintain torque for proper sealing

13. Stroke Alert

- Highly visible “safety orange” paint on black epoxy-coated service push-rod
- Indicates push-rod stroke at 75-80% of recommended readjustment point

14. Non-Pressure Chamber

- Heavy 8-gauge steel housing—heaviest gauge in the industry, embossed for added strength—standard on all Type 30 aftermarket units
- Epoxy-coated to protect against rust and corrosion
- Grade 5 mounting studs—heat treated, plated, then press fit and staked into the housing - welded on HDW models
- Prevailing torque nuts with hardened flat washers
- Reverse chamber bridge designed bottom for positive axle bracket positioning

(*see Epoxy Coating pg. 15)

15. Return Spring

- Conical shape to assure full release
- *Epoxy coated for long life

16. Center Hole Shield

- Two piece design moves with service piston rod
- Protects non-pressure housing from granular contaminants
- Replaces rubber boots that can crack and/or tear and prevent view of “Stroke Alert”

17. Center-Hole Diaphragm (CHD)

(Long Stroke & HD models)

- Aligns the power spring with the diaphragm and the flange case push-rod
- Prevents spring skewing, reduces power spring stress and coil clash, and increases center seal life

18. Service Push-Rod

- Precision true-weld connection to piston plate
- Standard aftermarket units fully threaded to meet universal installation requirements
- *Epoxy-coated and marked with the MGM “Stroke Alert” (*see below)

***Epoxy Coating**

- Electrostatically applied and baked on to resist cracking and peeling
- Provides complete pin-hole free encapsulation of the part
- Applied to components including power springs, steel heads, non-pressure chambers, and service push-rods and plates
- Flange cases, upper piston and upper piston guide coated on Severe Service models only

-
1. **Release Bolt**
 - Integral design
 - Permanently installed—always available
 - Trivalent chromate coated to eliminate corrosion
 - Permits safe, easy release of the actuator for vehicle service
 2. **Aluminum Head**
 - Made of lightweight 360 alloy aluminum to resist corrosion
 - High pressure die-cast molded to improve strength and eliminate porosity
 3. **Tamper Resistant Design**
 - Tamper resistant “Continuous Clamp” design
 - Prevents inadvertent disassembly
 4. **Power Spring**
 - Powerful, reliable, non-coil clashing (3-inch “Long Stroke” model)
 - Provides 100 lbs. additional parking force @ 1.25 inches of stroke over standard Type 30 spring brakes (3-inch “Long Stroke” model)
 - Each production lot is thoroughly inspected and rigorously tested to ensure quality
 - Electrostatically applied, baked on *epoxy coating to resist corrosion—toughest coating available
 5. **Upper Piston Guide**
 - Maintains power spring alignment
 - Prevents spring skewing during application and release
 - Reduces power spring stress and coil clash
 - Increases center seal life
 6. **Upper Piston**
 - Made of 360 aluminum alloy to resist corrosion
 - High pressure die-cast molded to improve strength and eliminate porosity
 - Extended design maintains power spring alignment
 - Maintains alignment between power spring and internal push-rod
 7. **Diaphragms**
 - Heavy-duty, nylon-reinforced for longer service life and resistance to deterioration from flexing
 - Low temperature range to -40°F/-40°C
 - Suitable for extreme operating conditions
 - Neoprene available as an option for resistance to oil contamination experienced in high duty cycle air systems typical of some vehicles, i.e., buses, refuse vehicles, etc.
 8. **Flange Case**
 - Made of 360 aluminum alloy to resist corrosion
 - High pressure die-cast molded to improve strength and eliminate porosity

(*see Epoxy Coating pg. 19)

9. **Flange Case Push-Rod & Seal**

- Push-rod is ground, hard-coated aluminum with oversize push plates for long center seal life
- Multi-lipped pressure activated seal—MGM exclusive; with wiping edge and lube retention grooves to ensure positive air seal at full range of stroke; will not dry out, score the push-rod, or develop leaks like O-rings used by competitors
- Held in position by two (2) nylon guides to prevent metal-to-metal contact and wear from side loading

10. **Clamp Band**

- Two-piece trivalent chromate coated with wide flanges for easy positioning
- Carriage bolts and self-locking nuts to maintain torque for proper sealing

11. **Stroke Alert**

- Highly visible “safety orange” paint on black *epoxy coated service push-rod
- Indicates push-rod stroke at 75-80% of recommended readjustment point

12. **Non-Pressure Chamber**

- Heavy 8-gauge steel housing—heaviest gauge in the industry, embossed for added strength—standard on all Type 30 aftermarket units
- *Epoxy-coated to protect against rust and corrosion
- Grade 5 mounting studs—heat treated, plated, then press fit and staked into the housing
- Prevailing torque nuts with hardened flat washers
- Reverse chamber bridge designed bottom for positive axle bracket positioning

13. **Return Spring**

- Conical shape to assure full release
- Epoxy coated for long life*

(*see Epoxy Coating pg. 19)

14. Center Hole Shield

- Two piece design moves with service piston rod
- Protects non-pressure housing from granular contaminants
- Replaces rubber boots that can crack and/or tear and prevent view of "Stroke Alert"

15. Service Push-Rod

- Precision true-weld connection to piston plate
- Standard aftermarket units fully threaded to meet universal installation requirements
- Epoxy-coated and marked with the MGM "Stroke Alert" (*see below)

16. External Breather Tube System (LTR/LTR-L3T models)

- Vents air from the inside protected area of the non-pressure chamber
- Seals out liquid and solid corrosive contaminants

***Epoxy Coating**

- Electrostatically applied and baked on to resist cracking and peeling
- Provides complete pin-hole free encapsulation of the part
- Applied to components including power springs, non-pressure chambers, and service push-rods and plates



MGM Brakes Models - 2.50”

TR SERIES – Double-Diaphragm Models

The TR Series gives you all the advantages you need to maintain braking reliability on today’s heavy-duty vehicles. The TR (Tamper Resistant) sealed design does not permit internal servicing. The heavy-gauge steel head is permanently “locked” to the center case, preventing inadvertent disassembly of the power spring housing. This patented MGM Brakes design provides always-centered diaphragm seating and controlled squeeze for the diaphragm bead.

The TR Series features several important MGM Brakes innovations:

- Corrosion Fighter Non-Metallic Guide
- Center-Hole Diaphragm Design
- Molded Nitrile Rubber Push-Rod Air Seal (**Fig. 7a**)
- External Breather Tube on TR-T and TR-TS models
- “Stroke Alert” that quickly identifies when 75%-80% of the chamber stroke has been used
- Floating Center Hole Shield that protects the service chamber from debris entering at the push-rod hole (**Fig. 7b**)

These problem-solving features bring more reliable and longer-life braking performance to your customer’s air braked vehicles.

TR “EXCLUSIVE FEATURES” Figure 7

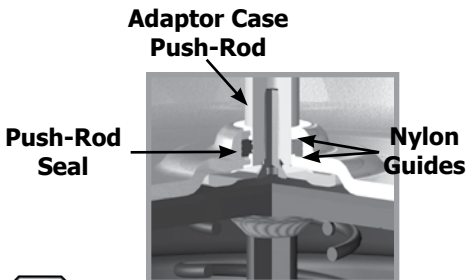
All TR models include the MGM “patented” Center-Hole Diaphragm, which maintains alignment of the power spring, diaphragm and the internal push-rod, providing the following advantages:

- Reduces power spring stress • Prevents spring skewing
- Reduces coil clash • Increases center seal life

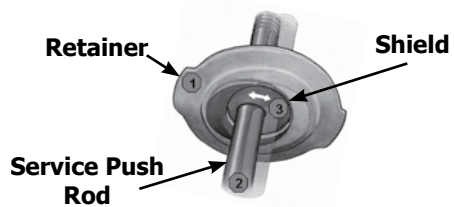
(7a) Center Case Push-Rod Air Seal

(7b) Service Push-Rod Sliding Stone Shield

(7c) Center Hole Diaphragm

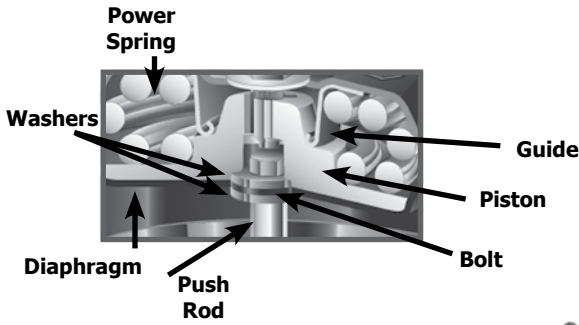


(7a)



(7b)

(7c)



Model TR (Tamper Resistant) (Fig. 8)

MGM Brakes TR Models are standard equipment on over 125 makes of heavy-duty vehicles in more than 40 countries. Available in sizes 2024, 2424L, 2430L, 3024, 3030, 3036 and 3636. Standard features include:

- Tamper Resistant Design
- Epoxy-Coated Head, Non-Pressure Chamber and Lower Piston & Rod
- 360 Aluminum Center Case
- Heavy-Duty Nylon Reinforced Diaphragms
- “Stroke Alert”
- Heavy-Duty 8-Gauge Steel Non-Pressure Chamber
- Standard on Type 3030 & 3036 Aftermarket Models
- Heavy-Duty 6-Gauge Steel Non-Pressure Chamber Standard on Type 36 Models

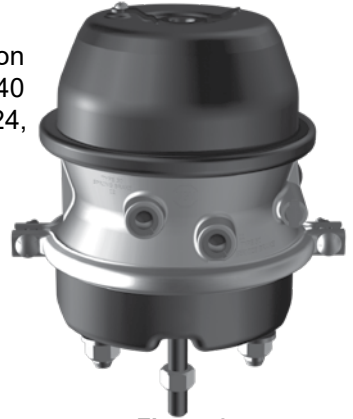


Figure 8

Model TR-T (Tamper Resistant – Breather Tube) (Fig. 9)

Same basic design features as the TR Model. However, this model includes the addition of an “External Breather Tube” which prevents contaminants from entering the spring chamber. Ideal for tough applications like dump trucks (end dumps, belly dumps), ready-mix trucks, refuse and other vocational vehicles providing longer service life in the toughest environments.

- External Breather Tube
- Seals Out Contamination
- Optional Heavy-Duty Nylon Reinforced Neoprene Diaphragms
- Weatherseal™ Plug
- Center Hole Shield
- Heavy-Duty 8-Gauge Steel Non-Pressure Chamber Standard on Type 3030 & 3036 Aftermarket Models
- Heavy-Duty 6-Gauge Steel Non-Pressure Chamber Standard on Type 36 Models



Figure 9

Model TR-THD (Tamper Resistant – Breather Tube, Heavy Duty) (Fig. 10)

Ideal for tough applications like dump trucks (end dumps, belly dumps), ready-mix trucks, refuse and other vehicles that operate in harsh environments. Features of the HD models include:

- Epoxy Coated Steel Head
- Corrosion Fighter Non-Metallic Upper Piston Guide
- External Breather Tube
- Center-Hole Diaphragm (CHD)
- Heavy-Duty Power Spring*
- Sliding Stone Shield
- Heavy-Duty Nylon Reinforced Diaphragms (*Neoprene Optional*)
- 8-GA. Steel Mounting Base (*Epoxy Coated*)

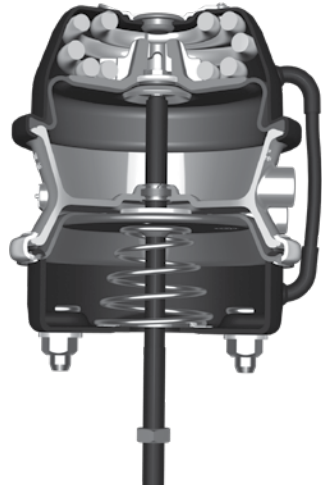


Figure 10

- * 2.50 inch stroke models - 160 lb. of additional parking force @ 1.25 inches of stroke.
- 3.00 inch stroke models - 145 lb. of additional parking force @ 1.25 inches of stroke.

Model TR-THDW (Tamper Resistant – Breather Tube, Heavy Duty, Welded Yoke) (Fig. 11)

This brake has the same qualities as the TR-THD model, except the mounting bolts are weld-reinforced into the 8 gauge pressure housing, providing the industries

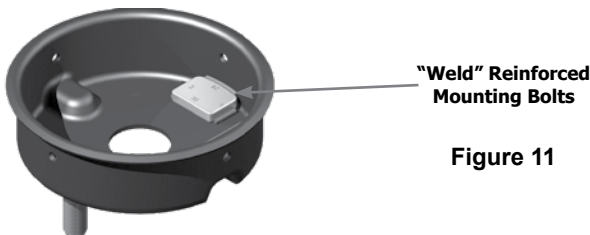


Figure 11

strongest spring brake mounting base (**Fig.11**). Designed specifically for use on equipment with reverse cam rotation, heavy spring or rubber block suspension or on vehicles utilizing flotation and/or “super single” tires or any combination of those components.

Model TR-TS (Tamper Resistant – Breather Tube – Severe Service)

(Fig. 12)

A true “Severe Service” brake, this model provides the same basic design features as both the TR and TR-T Models, but with additional epoxy-coating inside and out for extra insurance in unusually tough, corrosive operating environments. Excellent for use on vehicles hauling acids and liquid corrosives, salt and dry bulk chemicals, ready-mix concrete, livestock and poultry, petroleum products, and toxic waste.

- Epoxy-Coated Flange Case—Inside And Out
- Epoxy-Coated Upper Piston
- “Corrosion Fighter” Non-Metallic Upper Piston Guide
- Heavy-Gauge Steel Non-Pressure Chamber
- Heavy-Duty Nylon Reinforced Diaphragms
- Center Hole Shield
- Weatherseal™ Plug
- Heavy-Duty 8-Gauge Steel Non-Pressure Chamber Standard on Type 3030 & 3036 Models
- Heavy-Duty 6-Gauge Steel Non-Pressure Chamber Standard on Type 36 Models



Figure 12

*The TR-TS is also available with “weld-reinforced” mounting bolts, model TR-TSW.

Model LTR-T (Integral Release Bolt – Tamper Resistant – Breather Tube) (Fig. 13)



The LTR-T “Long Life” Brake, besides being tamper-resistant, is characterized by many distinguishing design features and is backed by one of the best warranties in the business.

The LTR-T Spring Brake: proven reliability for over 30 years and hundreds of millions of miles of on-the-road service.

- Six (6) Year Limited Warranty
- Heavy-Duty “Long Life” Power Spring
- Integral Release Bolt
- Low Friction Piston & Guide
- Heavy-Duty Nylon Reinforced Diaphragms
- External Breather Tube Design
- Heavy-Duty 8-Gauge Steel Non-Pressure Chamber (Type 3030 Models)
- Center Hole Shield
- Lightweight Aluminum Design

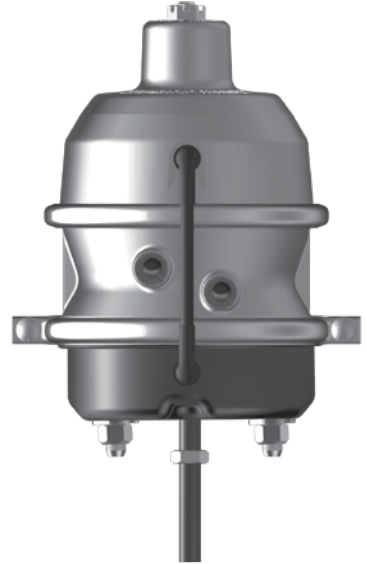


Figure 13

Note: All MGM TR and LTR Models can be purchased with the “weld” reinforced mounting base. These models are designated with “W” suffix and are for extreme service such as logging and other off highways operations.



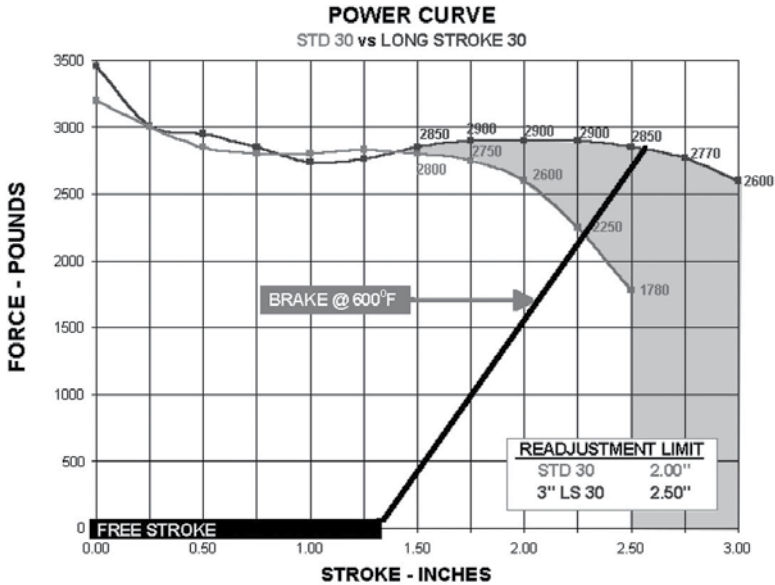
MGM Brakes Models - 3.00"

3 Inch "Long Stroke" Models

Elevated brake temperatures represent a significant factor in the loss of braking effectiveness. Tests have proven that stopping distances are greatly influenced by the increase in chamber stroke due to drum expansion resulting from the high temperatures generated by the friction of lining rubbing against the drum. As brake temperatures rise and drums expand, a longer stroke is necessary to ensure proper braking efficiency. MGM Brakes "Long Stroke" models provide just that, and markedly outperform standard stroke brakes as indicated by the Drum Temperature line in the chart below (Fig. 14).

SERVICE BRAKE PERFORMANCE CURVE COMPARISON

Standard TR3030 Spring Brake vs. Long Stroke TR3030LP³ Spring Brake
(at 100 psi Air Pressure Fig. 14)



On the chart above, note that the service brake performance curve of the MGM TR-LP³ 3-inch "Long Stroke" spring brake (red line) is flatter over the entire stroke compared to the curve of a typical Model TR 2-1/2 inch std. stroke spring brake (black line) at 100 psi air pressure.

NOTE: The gray shaded area on the chart above denotes the additional force and stroke a "Long Stroke" chamber can provide over a standard stroke chamber.

MGM has developed a full line of 3-inch “Long Stroke” spring brakes and service chambers offering an array of design features and benefits for added braking safety and reliability. The National Highway Transportation Safety Administration (NHTSA) has determined that long stroke chambers provide:

- Improved Braking Efficiency
- Improved Stopping Performance
- Increased Reserve Stroke
- Reduced Out-of-Adjustment Citations

“LONG STROKE” SPRING BRAKE IDENTIFICATION

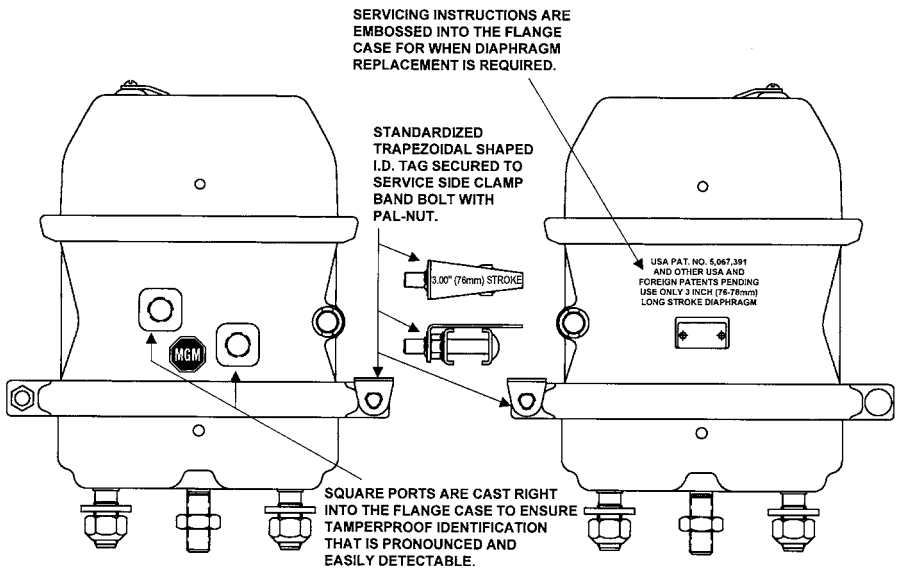


Figure 15

MGM 3-Inch “Long Stroke” brakes are uniquely identified by their square inlet ports, trapezoidal identification tags and embossed diaphragm replacement instructions (Fig. 15).

Model TR-LP3 (Fig. 16)
(Tamper Resistant – Low Profile – 3 Inch Stroke)

MGM “Long Stroke” Spring Brakes are available in a variety of models designed to meet the performance and operational needs of every customer. From over-the-road hauling to the severe operating environment of refuse collection, MGM has the right model for the toughest jobs.



Figure 16

- Tamper Resistant Design
- “Long Life” Power Spring—Reduced Coil Clash
- Center Hole Diaphragm (CHD fig. 17) Prevents Power Spring Skewing
- Epoxy-Coated Head, Non-Pressure Chamber and Lower Piston & Rod
- Heavy-Duty 8-Gauge Steel Non-Pressure Chamber (Type 3030 Models)
- Heavy-Duty Nylon Reinforced Diaphragms
- “Stroke Alert”

Center-Hole Diaphragm (Fig.17)

MGM “patented” Center-Hole Diaphragm (CHD), which maintains alignment of the power spring, diaphragm and the internal push-rod, providing the following advantages:

- Reduces power spring stress
- Prevents spring skewing
- Reduces coil clash
- Increases center seal life

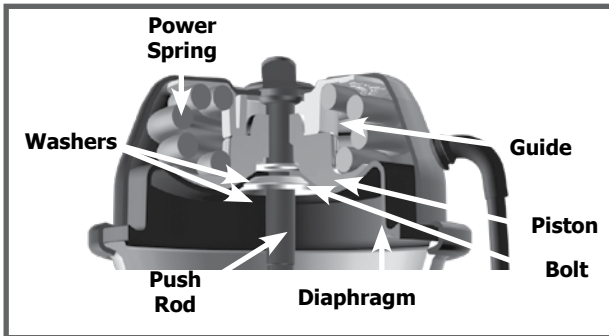


Figure 17



Figure 18

Model TR-LP3T (Tamper Resistant – Low Profile – 3 Inch Stroke – Breather Tube) (Fig. 18)

Same basic design features as the tamper-resistant Model TR, however, this model includes the addition of an “External Breather Tube” which prevents contaminants from entering the spring chamber. Ideal for tough applications like dump trucks (end dumps, belly dumps), ready-mix trucks, refuse and other vehicles that operate in harsh environments.

- External Breather Tube—Seals Out Contamination
- Optional Heavy-Duty Nylon Reinforced Neoprene Diaphragms
- Center Hole Shield
- Weatherseal™ End Cap

Model TR-LP3THD (Heavy Duty Power Spring)

“Heavy Duty” Brakes have all the same design features as all the other TR Models, except they replace the standard power spring with a heavy-duty model (approximately 158 lbs. more powerful @ 1.25 inches of stroke). HD’s are available in “Severe Service” and “Long Stroke” versions and are a great choice for applications needing extra parking capability such as school buses, transit buses, dump trucks, concrete and refuse haulers.

NOTE: Some TR-THD models are available with a “weld-reinforced” mounting base. These models are designated TR-THDW and are for extreme severe service such as logging and other off-highway operations.

Model LTR-L3T (Integral Release Bolt – Tamper Resistant – 3 Inch Stroke - Breather Tube) (Fig. 19)

The LTR-L3 “Long Life” 3 inch “Long Stroke” brake has many unique design features and is backed by one of the best warranties in the industry. The LTR-L3 Spring Brake: proven “L” Model technology for dependability, performance and reliability.



- Six (6) Year Limited Warranty
- Heavy-Duty “Long Life” Power Spring
- Built-In Manual Release Bolt
- External Breather Tube - Seals out Contamination
- Lightweight 360 Aluminum Alloy Design
- New “Weatherseal” Diaphragm Design
- Heavy-Duty 8-Gauge Steel Non-Pressure Chamber (Type 3030 Models)
- Center Hole Shield

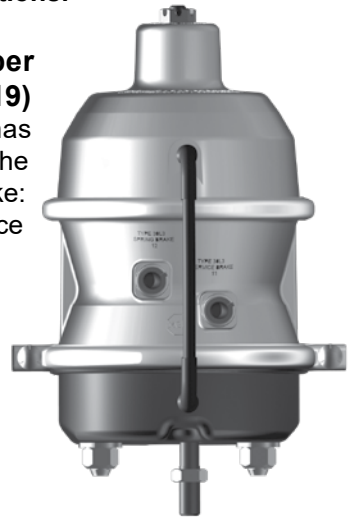


Figure 19

Model MJ-ET Magnum Plus (Piston Type – Steel Head – 3 Inch Stroke – Breather Tube) (Fig. 20)

This line of piston-type spring brakes is the next generation of our Magnum models. The Magnum Plus models include many unique features that offer real solutions when difficult space, weight, performance and life expectancy issues are a concern. Compatible with S-Cam, Air Disc, and Wedge Brakes, making them ideally suited for highway, refuse, transit, military, and emergency vehicles such as fire equipment.



Figure 20

- Tamper-Resistant Design
- Lighter Weight
- 3-Inch Stroke - Square Ports signify Long Stroke design
- Compact Size (Shorter Height–Smaller Diameter)
- “New” Patented Integral Release Bolt Mechanism- Minimal Bolt Protrusion (Approximately 1.25-inch protrusion on “Long Stroke” models when manually released)
- Lower Hold-Off Pressure (Less Air Consumption)
- Non-Coil Clash Power Spring (Higher Performance, Longer Life)
- Increased Corrosion Resistance - Steel Head Double-Coated with Black Zinc Iron Chromate and Epoxy
- Available with 1,550-2,600 lbs. of Push-Rod Braking Force @ 1.25-inch Stroke / Service Brake Sizes 16-36

Special Features of the Magnum “J” Series (Fig. 21)

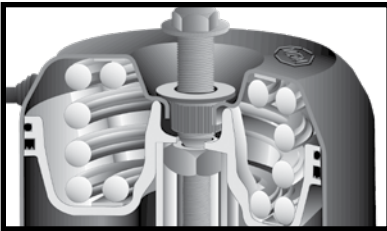


Figure 21

- Patented “Dual Thread” manual release bolt, which allows for installation in tight areas.
- Provides minimal bolt protrusion
1.07 inches - 2.50 inch stroke
1.27 inches - 3.00 inch stroke

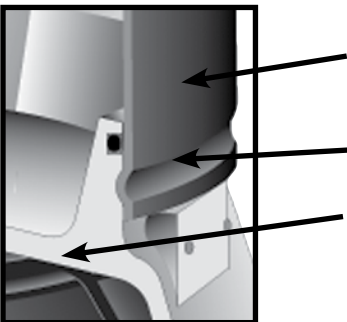


Figure 22

(Fig. 22)

- Impact resistant heavy-gauge steelhead, double coated for maximum corrosion protection
- MGM patented “roll-in” tamper resistant design
- 360 alloy aluminum center case

SERVICE CHAMBERS

Model C, CS & CL

“Long Stroke” Service Chambers (Fig. 23)

With heavy-gauge steel construction, MGM “Steelhead” Service Chambers are the strongest service chambers you can buy. Built tough with heavy-duty components and corrosion protection throughout to take on hard work, the ravages of time, and the elements. Available in 1.75, 2.25, 2.50 and 3.00 inch “Long Stroke” designs (Fig. 23). MGM Brakes service chambers are manufactured to the strictest quality standards, making them a good choice for all different types of applications.

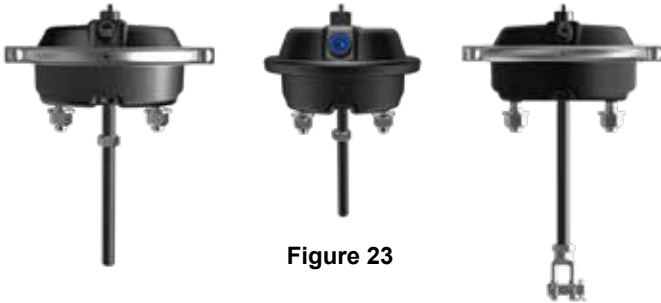


Figure 23

- Low Profile Design
- Formed Steel Pressure Cap—Epoxy-Coated (CS20 Models Have Zinc Iron Chromate Coating)
- Formed Steel Non-Pressure Chamber—Epoxy-Coated
- Heavy-Duty Nylon Reinforced Diaphragms
- Top and Side Air Ports—3/8 In. NPTF
- Center Hole Shield

LONG STROKE” SERVICE CHAMBER IDENTIFICATION (Fig. 25)

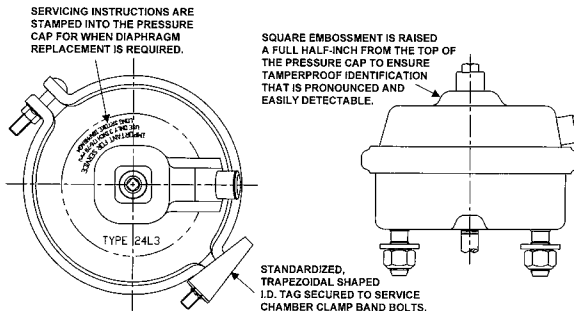


Figure 25

WELDED YOKES

The MGM “Welded Yoke” is permanently attached to the push-rod, making re-use of the yoke virtually impossible. Therefore, if the yoke, piston rod or mounting base are damaged, replace the complete unit with an MGM combination brake with a welded yoke: part number ending in ‘951. **(Fig. 24)**

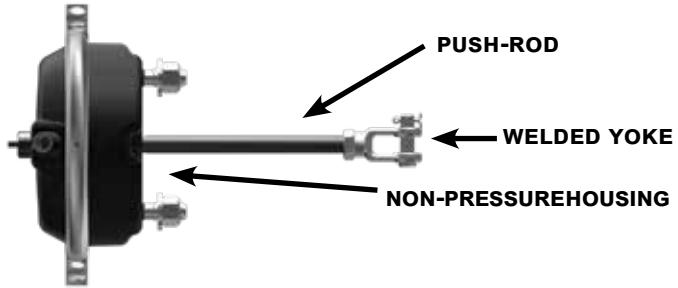


Figure 24

Replacing with the single/piggyback unit preserves the geometric set-up of the brake, assuring that the relationship between the push-rod and the slack adjuster remains at the angle established at the time the unit was originally installed. Also, because the unit can only be purchased as a “kit”, the possibility that the wrong diaphragm will be used is eliminated.

For more information on welded yokes, see MGM Brakes Bulletin 03-003 available on-line at www.mgmbrakes.com.

MGM Replacement Units = Exact Fit

REMOTE MOUNT CYLINDERS

MODELS R4 & R5

(Fig. 26)

With a design dating back to the original MGM Brake, these cylinders are typically used today to remotely activate tailgate locks on dump trucks and dump trailers, or any other application that requires a lightweight, easy to mount “cylinder” that is dependable and rugged.

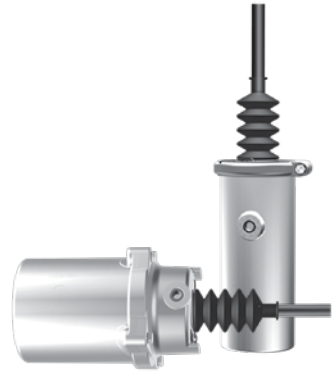


Figure 26

DRIVE-LINE BRAKES

MODELS R7 & R8

(Fig. 27)

SAAR and SAHR drive-line brakes were developed as replacements for manually operated lever applied “drive-line” brakes on class 6 and 7 vehicles. Mounted to the frame rail, the actuator utilizes a cable to apply parking force to a drum mounted on the drive-line. An optional electronic “travel” sensor provides the operator with information pertaining to the position of the push rod - “applied” or “released”.



R7 - SAAR

R8 - SAHR

Figure 27

SAHR mounted on a frame (Fig. 28)

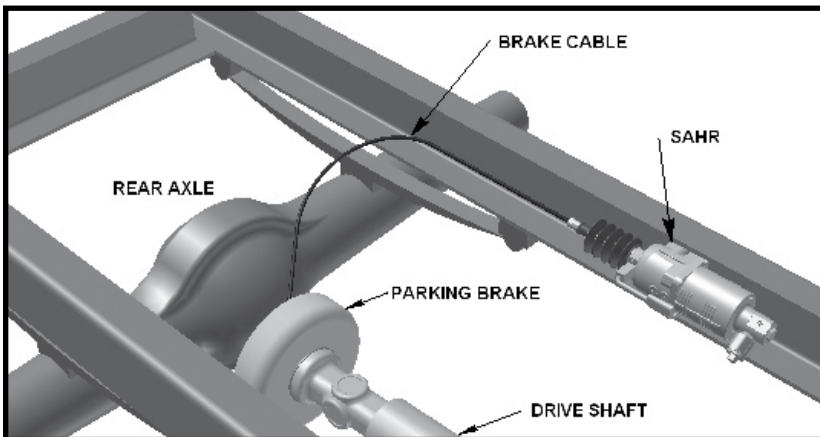


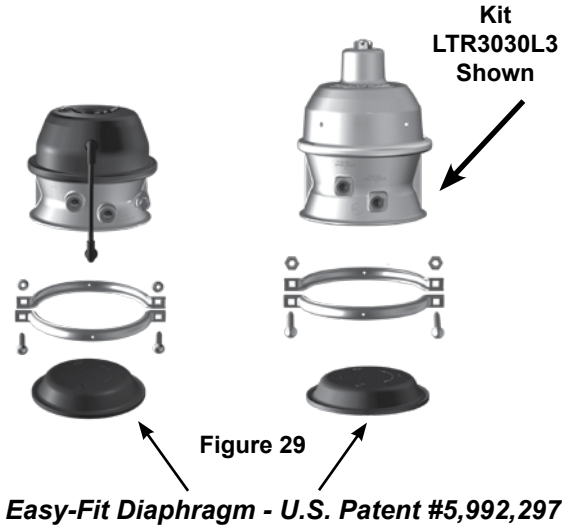
Figure 28

“PIGGYBACK PLUS” KITS

(Fig.29)

“Piggyback” is just another industry term for the parking or emergency chamber found atop the service brake chamber of a typical spring brake combination. Now, MGM piggyback chambers are available in “kits” which provide a low-cost way of replacing the parking (emergency) side of a double-diaphragm spring brake. And, because your customer is replacing just the piggyback, the operation can be done without having to remove the entire brake assembly and cut a new push-rod, thereby leaving the “geometric” set-up of the brake untouched. For a very economical price, each kit comes complete with OEM Approved parts:

- MGM Piggyback Chamber
- Heavy-Duty Nylon Reinforced Diaphragm
- Two-Piece Clamp Band
- Three (3) Year Warranty



When You Choose MGM BRAKES, You Have More Choices

There are 14 performance-engineered double-diaphragm MGM Spring Brakes to choose from, plus several models of special piston-diaphragm types. Always select the model that best suits each customer’s needs for S-Cam or air disc foundation brakes.

With an MGM Spring Brake for every need, take a look at our selection, then suggest a choice for your customer(s). Quite simply, you can’t go wrong when choosing from the strongest, most reliable problem-solver in the industry.

NOTE: Type 36 Non-Pressure Housings are made of extra heavy-duty 6-gauge material

Product Identification

All MGM brake actuators manufactured after October, 1987, have an aluminum identification plate attached to the actuator which contains the MGM part number, date of manufacture and often, a customer part number.

TR, TR-T and TR-TS model sizes have the I.D. plate attached to the aluminum center casting, while on all MB-T, MG-T, WL and WM model sizes the I.D. plate is attached to the aluminum head casting. All C, CL and CW model sizes have the plate attached to the pressure cap or to the clamp ring (**Fig. 30**).

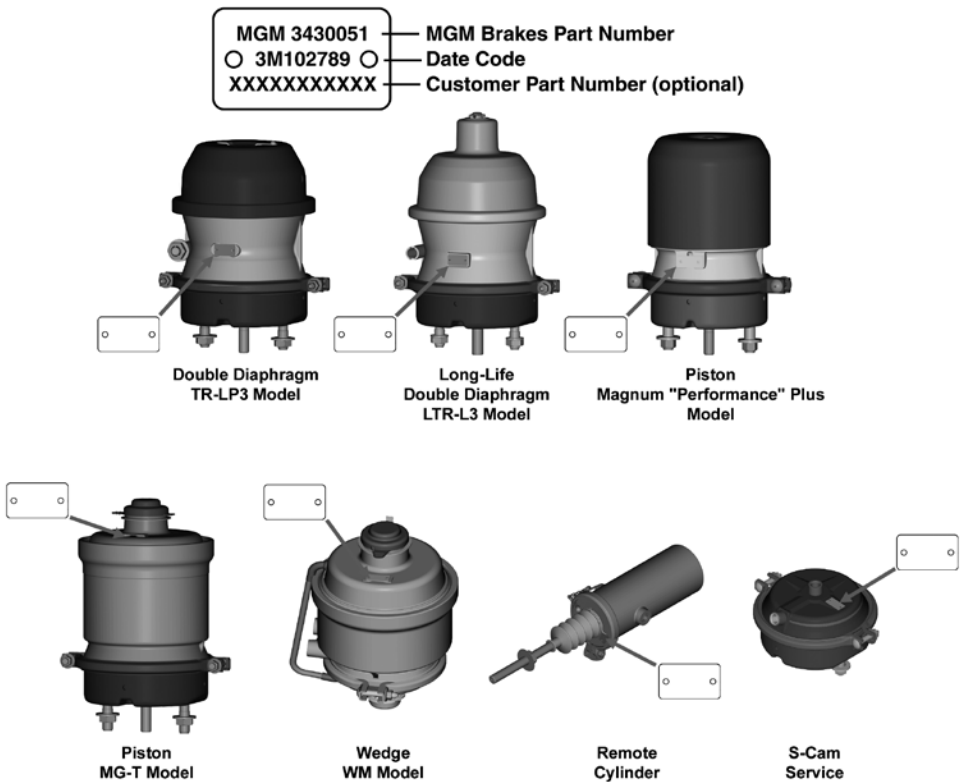


Figure 30

FEATURES	TR	TR-HD	TR-T	TR-THD	TR-THDW	TR-TS	TR-TSHD	TR-TSHDW	TR-LP3	TR-LP3HD	TR-LP3T	TR-LP3THD	TR-LP3THDW	TR-LP3TS	TR-LP3TSHD	TR-LP3TSHDW	MJS-ET	
Epoxy-Coated Piston & Guide, Return Spring, Center Case - Inside & Out																		
Center Hole Diaphragm																		
Tamper-Resistant Mechanically Locked Spring Housing																		
Molded Nitrile Rubber Push-Rod Air Seal																		
Center Hole Shield																		
Steel Head/Epoxy Coated																		
External Breather Tube																		
Externally Stored Release Bolt																		
Stroke Alert																		
"Long Life" Power Spring																		
Heavy-Duty "Long Life" Power Spring																		
Polymer Push-Rod Guides																		
Heavy-Duty 8 Gauge Steel Non-Pressure Chamber																		
3 Inch Long Stroke																		
Weatherseal™ Plug																		
360 Aluminum Center Case																		
Heavy-Duty Nylon Reinforced Diaphragms																		
Weld Reinforced NPC																		

 **Indicates Feature**

With an MGM Spring Brake for every need, take a look at our selection, then suggest a choice for your customer(s). Quite simply, you can't go wrong when choosing from the strongest, most reliable problem-solver in the industry.

NOTE: Type 36 non-pressure housings are made of extra heavy duty 6 gauge material.

MGM Brakes manufactures a wide variety of spring brakes, many designed specifically for niche applications. While all MGM models are engineered for the longest life and most reliable service, choosing the right spring brake for a particular application is crucial to ensuring maximum value.

APPLICATION	MJS-ET	LTR-L3	LTR-T	TR-LP3TSHDW	TR-LP3TSHD	TR-LP3TS	TR-LP3THDW	TR-LP3THD	TR-LP3T	TR-LP3HD	TR-LP3	TR-TSHDW	TR-TSHD	TR-TS	TR-THDW	TR-THD	TR-T	TR-HD	TR
MGM Brakes Spring Brake Application Matrix: This matrix is intended for use as a general information guide only. If you have any questions concerning the application of any particular MGM Brakes model, contact your local MGM Brakes representative for assistance.																			
ACIDS / LIQUID CORROSIVES		X																	
DRY BULK CHEMICALS																			
DUMP TRUCK																			
FERTILIZER																			
FIRE & EMERGENCY																			
LINE HAUL																			X
LIVESTOCK / POULTRY																			
LOGGING																			
PETROLEUM PRODUCTS																			
READY-MIX CONCRETE																			
REFUSE																			
SALT TRUCK																			
SCHOOL BUS																		X	
TOXIC WASTE																			
TRANSIT																			

MGM Brakes Spring Brake Application Matrix: This matrix is intended for use as a general information guide only. If you have any questions concerning the application of any particular MGM Brakes model, contact your local MGM Brakes representative for assistance.

Understanding MGM Brakes Part Numbers

MGM Brakes assigns a 7-digit part number to every assembly and part we manufacture. This number code reveals a lot of information about the part.

EXPLANATION OF 7-DIGIT PART NUMBER

- 1st Two Digits - Major models, groups, detail parts, kits, etc.
- 2nd Two Digits – (a) Model size on major groups
(b) Detail parts identification all others
- 3rd Three Digits – Numerical sequence 001-999 (a) Spring brake singles – 001 through 050
Spring brake tandems – 051 through 999
(b) All others 001 through 999

EXAMPLE OF SYSTEM

10000000 – 19999999	Service Chamber
20000000 – 29999999	Wedge Spring Brake
30000000 – 39999999	Double Diaphragm Brake
40000000 – 49999999	Piston Type Brake
50000000 – 59999999	Remote Mount Cylinder
80000000 – 89999999	Parts/Assemblies/Valves
89999999 – 99999999	Kits

The Magnum “Performance” Plus numbering system (see example below) is uniquely different from how MGM Brakes identified products in the past. The Magnum Plus part number contains all the information pertaining to the brake, allowing anyone to identify not only the model, but application, stroke, features and serial number as well.

Example: MJS3030ET051

Model Series	Style	Service Side	Spring Side	Max. Stroke	Feature	Serial Number
MJ	S	30	30	E	T	051
Magnum J-Series	S-Cam	Type 30	Type 30	3.00	Breather Tube	Aftermarket Complete Assembly

INDUSTRY SAFETY REMINDER:

DANGER OF DOUBLE CLAMP BANDED SPRING BRAKES

Before 1989 double diaphragm spring brake actuators were manufactured using two clamp bands; one to seal the service side and one to seal the spring parking side. At one time both sides of these units were considered "serviceable", meaning that if either side failed the clamp band could be removed, the diaphragm or other components could be replaced, and the unit continued in service as repaired.

While removing the clamp band on the service side of a double diaphragm spring brake actuator carries little or no risk, experience showed that all too often technicians did not follow the required safety procedures when removing the clamp band on the spring parking side, resulting in a potential for severe personal injury. If the powerful spring in the spring parking side is not properly "caged" before the clamp band is removed the spring can propel components of the assembly with great force, potentially causing severe personal injury.

In response to this safety problem MGM Brakes pioneered the development in 1987 of the "Tamper Resistant" double diaphragm spring brake actuator with the first "non-serviceable" spring parking side. By the early 1990's the entire domestic industry recognized the enhancement to safety offered by the "Tamper Resistant" design. Today every responsible spring brake manufacturer based in the United States offers only spring brakes utilizing a "Tamper Resistant" technology. As a result of the universal adoption of a "Tamper Resistant" design for the spring parking side of double diaphragm spring brake actuators, instances of injury to workers from improper repair procedures or accidents have steadily declined until today they are virtually nonexistent.

Unfortunately, a disturbing trend is emerging within the aftermarket portion of the heavy duty truck industry - the use of double clamp banded spring brake actuators as replacements for damaged or failed "Tamper Resistant" units. This "reintroduction" of double clamp banded spring brakes into the North American market seriously threatens worker safety in the heavy duty truck industry. Especially at risk are those workers least experienced in the industry. Well over a decade has passed since MGM Brakes' introduction of "Tamper Resistant" spring parking brakes and many in the service and maintenance end of the industry have not seen, let alone serviced, a double clamp banded spring brake. Younger workers are not likely to have been trained in the special safety procedures required to cage the spring before servicing the spring parking side of double clamp banded units.

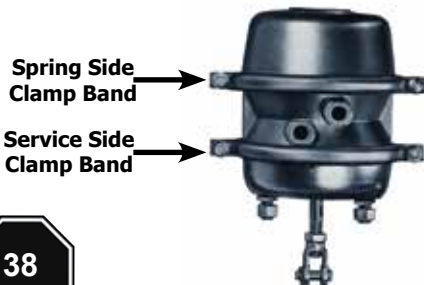
Therefore, MGM Brakes believes the industry needs to be reminded of the dangers associated with servicing double clamp banded spring brakes.

BE SURE TO PROPERLY "CAGE" THE SPRING IN THE SPRING PARKING SIDE ON ALL DOUBLE DIAPHRAGM SPRING BRAKE ACTUATORS - EVEN "TAMPER RESISTANT" MODELS - BEFORE ATTEMPTING ANY SERVICE ON THEM.

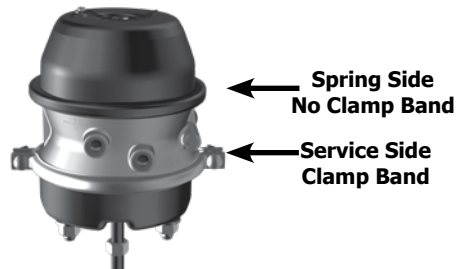
DO NOT ATTEMPT TO REMOVE OR LOOSEN THE SPRING PARKING SIDE CLAMP BAND ON A DOUBLE CLAMP BANDED SPRING BRAKE ACTUATOR UNDER ANY CIRCUMSTANCE.

IMPROPER SERVICING OF A DOUBLE CLAMP BANDED SPRING BRAKE ACTUATOR MAY RESULT IN SEVERE PERSONAL INJURY DUE TO AN UNINTENTIONAL SEPARATION OF THE HEAD FROM THE BASE OF THE UNIT.

**Double Clamp Band
Spring Brake**



**MGM "TR"
Spring Brake**



MGM Brakes— Your Full Line Spring Brake Manufacturer

MGM Brakes offers more *types* . . .

9	12	16	16L	20
20L	20L3	24L	24L3	30
30L	36			

more *models* . . .

C	CL	CS
CW	TR	TR-T
TR-TS	TR-HD	TR-THD
TR-TSHD	TR-HDW	TR-THDW
TR-TSHDW	LTR-T	LTR-L3
LTR-L3T	MJW-AT	MJS-ET
MJB-ET	R4	R5
R7	R8	

and more *combinations* . . .

1216	2020	2420	3024	3036
1620	2024	2424	3027	3636
1624	2030	2430	3030	

. . . than any other Spring Brake manufacturer in the world!

MGM Brakes Technology Center

MGM Brakes Technology Center, located at our headquarters in Charlotte, North Carolina, is a state-of-the-art facility staffed by experienced personnel including test engineers, design engineers, CAD designers and test technicians. At their disposal is a vast array of test and research equipment including



CAD work stations, metal fatigue testing stands, a corrosion chamber, an environmental chamber (-90°F to +350°F / -68°C to +177°C), presses, microscopes, and a sophisticated Data Acquisition System which can electronically collect data on components undergoing testing. Data can then be stored for future reference or manipulated and processed for development into statistical information, design standards and performance levels.

Individual test and quality-control labs are also located at MGM Brakes manufacturing plants in Cloverdale, California, and Murphy, North Carolina, ensuring that components already in production always meet the highest quality and performance standards.

The extensive testing conducted on MGM Brakes products and those of competitors includes the following tests:

- Rapid Cycle
- Air Seal Pressure Check
- Vibration
- Impact Resistance
- Environmental Corrosion
- High & Low Temperature Extremes
- Force Output Measurement
- Release & Apply Speed
- Air Displacement & Recovery



The combination of on-site manufacturing test labs and a state-of-the-art Technology Center enables MGM Brakes to be the industry's technology leader, year in and year out. The willingness of MGM Brakes to invest capital into new product development underscores our commitment to providing the trucking industry with only the best products.

Final Review

Congratulations—you have completed the MGM Brakes **BrakeTECH** Self-Study Training Program! Now you are ready to test your knowledge about MGM Brakes spring brakes, service chambers, parts and kits, including how each of these products has been specifically designed to help you capture business within certain market segments.

First, go to: <https://mgmbrakes.com/service-support/brake-tech-quiz/>. Make sure you answer each and every question. **Unanswered questions will be graded as incorrect.**

Participants scoring 85% or better will have successfully completed the **BrakeTECH** Training Program and will receive an email with a pdf of your Certificate of Completion from MGM Brakes, along with a **BrakeTECH** pin and hat (these will be mailed). These tokens of our appreciation for a job well done will go one step further toward singling you out in the eyes of your colleagues and customers as a true expert on MGM Brakes products.

Participants failing to score the required 85% will be able able to retest until a passing score is obtained. MGM Brakes will allow such a participant to succeed with the ***BrakeTECH Training Program.***

Quiz Review

True or False (1-40)

1. MGM Brakes is the oldest and largest spring brake manufacturer in the world.
2. MGM Brakes first introduced the spring brake in 1959.
3. MGM Brakes are standard equipment on more makes of heavy-duty vehicles in more countries than any other spring brake manufacturer.
4. MGM Brakes manufactures only a limited line of products.
5. The first spring brake introduced by MGM Brakes was a “remote mount”.
6. Spring brakes function as service brakes, emergency brakes and parking brakes.
7. The spring brake has two chambers: service brake chamber and parking brake chamber.
8. The service brake chamber operates independently of the spring brake chamber.
9. The service brake chamber engages when parking the vehicle or during a sudden loss of system air.
10. Double-diaphragm actuators, as the name implies, generate force-output by utilizing two separate diaphragms, one within the service chamber, the other inside the parking chamber.
11. Piston-type spring brakes have a piston instead of a diaphragm inside the parking chamber, though the service chamber utilizes a diaphragm just like the double-diaphragm models.
12. Piston brake designs are more efficient, offering increased parking, holding and emergency stopping performance.

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13. When choosing a spring brake the customer can make two major mistakes.
 14. MGM means—Maximum Performance, Greater Value, More Coverage.
 15. MGM Brakes was the first in the industry with external breather tube design; sealed, tamper-resistant design; all epoxy-coated components.
 16. The MGM Brakes removable release tool has special ACME threads.
 17. The MGM Brakes Weather Seal™ Plug attaches to the head of the Magnum Series with a drive screw to prevent loss.
 18. The MGM Brakes TR-T and TR-TS Model Weather Seal™ Plugs have an o-ring.
 19. MGM Brakes power springs are 100% magna-fluxed inspected.
 20. All MGM Brakes components have an electrostatically applied, baked on epoxy coating.
 21. MGM Brakes TR Series spring brakes have a taper-head design for tight space installations.
 22. The MGM Brakes TR Series head is made of 10-gauge steel.
 23. MGM Brakes designed and patented the “Tamper Resistant” spring brake.
 24. The MGM Brakes “Heavy Duty” Models offer a more powerful power spring than the standard models.
 25. The External Breather-Tube System seals the head against liquid and solid corrosive contaminants.
 26. The upper piston in the MGM Brakes TR Series is made of 380 Aluminum Alloy to resist corrosion.
 27. The MGM Brakes TR Series upper piston has a spiral design that precludes piston bind and consequential brake drag.

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28. MGM Brakes heavy-duty diaphragms are reinforced with cotton fibers for longer service life.
 29. Flange case push-rods are made from hardened stainless steel.
 30. A flange case push-rod is held in position by two nylon guides to prevent metal-to-metal contact and wear.
 31. The MGM Brakes multi-lipped pressure activated seal has a wiping edge and lube retention grooves.
 32. The MGM Brakes “Stroke Alert” indicates when push-rod stroke is at 65-70% of the recommended readjustment point.
 33. The MGM Brakes Type 30 non-pressure chamber housing is made from heavy 8-gauge steel and is embossed for added strength.
 34. The MGM Brakes Center Hole Diaphragm (CHD) aligns the power spring with the diaphragm and the internal push-rod.
 35. The “CHD” prevents spring skewing, reduces power spring stress and coil clash, and increases center seal life.
 36. The service push-rod is fully threaded to meet universal installation requirements.
 37. An integral release bolt is not a feature of the MGM Brakes TR Model.
 38. The MGM Brakes Model TR-T has the same basic design features as the Model TR, plus it has an External Breather Tube.
 39. The MGM Brakes Model TR-TS is ideal for use in severe service applications.
 40. Every MGM Brakes “Piggyback Plus” Kit contains OEM Approved parts.

(multiple choice questions begin on next page)

MULTIPLE CHOICE (41-79)

(circle your answer here as a guide for filling in the Mail-In Quiz Form)

41. MGM BRAKES was established in _____.
- A. 1955
 - B. 1956
 - C. 1957
 - D. 1958
42. The letters "MGM" are derived from the founders of MGM BRAKES, _____, _____ and _____.
- A. Milton, Gummer and Meyer
 - B. Miller, Gomer and Meyer
 - C. Miller, Gummer and Meyer
 - D. none of the above
43. The first MGM Brake was a _____ design.
- A. Wedge Brake
 - B. Severe Service
 - C. Remote Mount
 - D. Disc Brake
44. MGM BRAKES is the only full line Spring Brake manufacturer in _____.
- A. the United States
 - B. North America
 - C. the World
 - D. South America
45. MGM BRAKES offers a full line of Double-Diaphragm and _____ -Diaphragm Spring Brakes.
- A. Hydro
 - B. Neoprene
 - C. Piston
 - D. none of the above
46. Spring Brakes are sometimes called Air Brake _____.
- A. Actuators
 - B. Reservoirs
 - C. Containers
 - D. Valves
47. Spring Brakes function as _____.
- A. Service Brakes
 - B. Parking Brakes
 - C. Emergency Brakes
 - D. all of the above

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48. The Service Brake Chamber operates _____ the Spring Brake.
- A. in conjunction with
 - B. independently of
 - C. simultaneously with
 - D. none of the above
49. The Parking/Emergency Brake engages when parking the vehicle or when _____.
- A. the brake has over stroked
 - B. there is a loss of system air
 - C. the brake pedal is depressed
 - D. A & B
50. Typical North American heavy-duty trucks have Spring Brakes installed on _____.
- A. all axles
 - B. only front axles
 - C. drive axles only
 - D. none of the above
51. Generally speaking, _____ Spring Brakes have a higher force-output than a Double-Diaphragm design.
- A. Wedge Type
 - B. Piston Type
 - C. Remote Type
 - D. all of the above
52. In North America, _____ are the most common vehicles equipped with Piston-Type Actuators.
- A. Large Buses
 - B. Concrete Mixers
 - C. Dump Trucks
 - D. all of the above
53. "Quality is remembered long after the _____."
- A. day has ended
 - B. price is forgotten
 - C. deal is done
 - D. fat lady sings
54. MGM BRAKES manufacturing plants are located in _____.
- A. Charlotte, NC and Reno, NV
 - B. Murphy, NC and Compton, CA
 - C. Cloverdale, CA and Murphy, NC
 - D. Greensboro, NC and Fresno, CA

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55. MGM BRAKES was the first in the industry to offer _____.
- A. External Breather Tube
 - B. Tamper Resistant Design
 - C. Integral Release Bolt
 - D. all of the above
56. The threads on the MGM BRAKES Detachable Release Tool are _____.
- A. special ACME threads
 - B. standard SAE threads
 - C. special European threads
 - D. none of the above
57. The _____ is not epoxy-coated in the MGM Brakes TR Model Spring Brake.
- A. Power Spring
 - B. Steel Head
 - C. Upper Piston Guide
 - D. Non-Pressure Chamber Housing
58. The Breather Tube System on the MGM Brakes TR-T and TR-TS Models is _____.
- A. for the equalization of air pressure
 - B. to expel excess moisture from the Spring Brake
 - C. to prevent contaminants from entering the Spring Brake Chamber
 - D. to relieve excess pressure in the system
59. The Flange Case on the MGM Brakes TR, TR-T and TR-TS Models is made from _____ for increased corrosion resistance.
- A. Alloy 350 Aluminum
 - B. Alloy 360 Aluminum
 - C. Alloy 370 Aluminum
 - D. Alloy 380 Aluminum
60. The MGM Brakes Type 30 Non-Pressure Housing is manufactured from _____, and is embossed for added strength.
- A. hardened 380 aluminum
 - B. 11-gauge steel (.120" thick)
 - C. stainless steel, zinc dichromate coated
 - D. 8-gauge steel (.164" thick)
61. The Epoxy Coating on all MGM Brakes brake parts is _____ to resist cracking and peeling.
- A. hydrostatically applied, then freeze dried
 - B. applied by air brush, then heat dried
 - C. electrostatically applied, then baked on
 - D. applied by dipping the parts in an epoxy resin, then baked at 400°F

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62. The MGM Brakes patented Center Hole Diaphragm (CHD) _____.
- A. aligns the Power Spring, Diaphragm and Flange Case Push-Rod
 - B. prevents skewing
 - C. reduces Power Spring stress
 - D. all of the above
63. The _____ is not a standard feature on the MGM Brakes TR Model.
- A. Integral Release Bolt
 - B. Floating Center Hole Shield
 - C. Multi-Lipped, Pressure Activated Push-Rod Seal
 - D. 8-gauge steel Non-Pressure Chamber
64. The Upper Piston on the MGM Brakes TR Model, made from 360 Alloy Aluminum, is fluted to prevent _____.
- A. incorrect installation
 - B. counter rotation of the piston
 - C. binding and consequential brake drag
 - D. proper alignment of the release tool
65. The MGM Brakes Model TR-T features _____ which prevents contaminants from entering the spring chamber.
- A. a Self-Cleaning Filter
 - B. a One-Way Check Valve
 - C. an External Breather Tube
 - D. a Rolling Diaphragm
66. MGM Brakes heavy-duty Power Springs are _____.
- A. inspected and rigorously tested by production lot
 - B. 100% statically inspected in processing to the coiler
 - C. spring steel, cold-rolled for greater strength
 - D. 100% magnaflux inspected in processing to the coiler
67. Flange Case Push-Rods are constructed of _____.
- A. stainless steel, flash coated for protection against wear
 - B. hard coated aluminum, Teflon® coated for lubrication
 - C. hardened brass, finished slightly porous to retain lubricants
 - D. ground, hard-coated aluminum for long center seal life
68. The MGM Brakes Flange Case Push-Rod Seal is multi-lipped with wiping edges and lube retention grooves and is held in position by _____.
- A. the Center Case Push-Rod
 - B. a Retaining Ring
 - C. two Nylon Guides
 - D. two Brass Rings

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69. MGM Brakes uses _____ mounting studs and nuts for maximum load support.
- A. special grade 8, heat-treated and plated
 - B. 3/4" US high tensil steel and zinc plated
 - C. grade 5, heat-treated and plated
 - D. 3/4" SAE, case hardened and pre-stressed
70. The mounting studs in MGM Brakes Non-Pressure Housings are _____.
- A. press fit and spot welded to the housing
 - B. press fit and staked into the housing
 - C. press fit and secured with Loctite® adhesive
 - D. machine fitted to the housing and spin welded
71. The MGM Brakes Model TR-TS "Severe Service" Brake is totally epoxy-coated inside and out and ideal for use on vehicles hauling _____.
- A. acids and liquid corrosives
 - B. salt and dry bulk chemicals
 - C. livestock and poultry
 - D. all of the above
72. MGM Brakes "Heavy Duty" Spring Brakes feature a Power Spring with _____ more force output at 1.25 inches of stroke.
- A. 200 ft.-lbs.
 - B. 155 ft.-lbs.
 - C. 185 ft.-lbs.
 - D. 158 ft.-lbs.
73. MGM Brakes Model LTR-T "Long Life" Spring Brakes feature _____.
- A. Six (6) Year Limited Warranty
 - B. Integral Release Bolt
 - C. External Breather Tube
 - D. all of the above
74. According to the National Highway Transportation Safety Administration (NHTSA), 3 Inch "Long Stroke" chambers provide _____.
- A. improved parking efficiency
 - B. improved starting performance
 - C. increased reserve stroke
 - D. reduced slack adjuster life
75. MGM Brakes Model TR-LP3 3-Inch "Long Stroke" Brakes feature the patented _____.
- A. Integral Release Bolt design
 - B. internal Piston Rod Boot
 - C. Positive Alignment System (PAS)
 - D. epoxy-coated Clamp Band

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76. The MGM Brakes Magnum “Performance” Plus Spring Brake is _____
Spring Brake.
- A. an air over hydraulic
 - B. a piston-type
 - C. a double-diaphragm
 - D. a remote mount
77. All MGM Brakes “Steelhead” Service Chambers feature _____.
- A. formed steel Pressure Caps
 - B. Center Hole Shields
 - C. formed steel, epoxy-coated Non-Pressure Chamber housings
 - D. all of the above
78. MGM Brakes “Piggyback Plus” Kits include the Piggyback, _____.
- A. Clamp Band and hardware
 - B. Diaphragm and installation instructions
 - C. Diaphragm and Clamp Band
 - D. Release Bolt, Washer and Nut
79. 3 Inch “Long Stroke” Spring Brakes are identified by _____.
- A. Square Inlet Ports
 - B. Trapezoidal Tags
 - C. Embossed Instructions
 - D. all of the above



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