ELECTRO-MOTIVE

M.I. 1512

MAINTENANCE INSTRUCTION

COIL, ELLIPTIC, AND RUBBER TRUCK SPRING QUALIFICATION AND REPLACEMENT

INTRODUCTION

EMD locomotive trucks utilize coil, elliptic, rubber sandwich, and rubber chevron-type springs as suspension elements. The suspension system of most EMD trucks consists of a primary, truck frame to axle journal, and a secondary, bolster to truck frame, suspension. The overall functions of the suspension system are to provide for proper tracking of the truck, efficient utilization of traction forces, and appropriate isolation of equipment and operating personnel from track induced shocks and vibrations.

Because of the critical role played by the suspension system in overall locomotive performance and safety, proper maintenance of suspension components is vital. This Maintenance Instruction contains pertinent information and procedures to be used for identifcation, inspection, qualification, and application of EMD suspension components.

COIL SPRINGS

GENERAL

Typically, locomotive truck primary or secondary suspensions, or both, are provided by combinations of steel helical coil springs. In many cases multiple coil assemblies are utilized. Coil springs generally provide large amounts of deflection which assist in wheel load equalization and improve ride quality on rough track.

EMD helical coil springs are specifically designed for various locomotive weight ranges. This provides the optimum suspension system for each range of locomotive weights.

INSPECTION

Before qualification, the coil springs should receive a thorough inspection for signs of fatigue or degradation.

First, inspect the coils for breaks or surface cracks. Magnetic particle inspection techniques may be utilized to locate and identify cracks. Springs with any indication of surface cracks should be scrapped. Check the spring visually for indications of surface nicks. Deep, sharp surface nicks can cause failure of a spring and their presence is cause for rejection.

Second, hand wash or shot blast the coil to remove surface rust. "Pickling" to clean the spring is to be avoided. If the cleaning operation removes all indications of surface rust and does not reveal corrosion pits, the spring is acceptable for qualification. If corrosion pits are visible after the cleaning operation, scrap the affected coil.

Smooth worn spots on a coil caused by rubbing do not condemn the coil; however, the coil must pass the qualification criteria.

QUALIFICATION

The spring qualification procedure consists of compressing the spring to a specified load and measuring the height of the compressed spring; therefore, the test is performable on any reliable calibration-type testing press. EMD makes available File Drawing 647 which provides detailed plans for the fabrication of a testing press.

The following procedure details use of the EMD designed testing press.

A hydraulic press above the spring applies the compressive load. A pressure gauge, adjacent to the fixture, shows the force applied to the spring. A pointer, also adjacent to the fixture, indicates the height of the spring.

Fig. 1 shows the EMD testing fixture. To protect the operator from possible spring fragments, safety wire mesh encloses the working parts of the test fixture. With the two hinged doors at the front of the test fixture open, a moveable table within the fixture can slide out. To place a spring in the testing press, slide out this table and apply the spring. Push the table and the spring into the fixture and release the eccentric rollers which support the table. To release the table rollers, place the table release handles in the "up" position. Close and lock the front access doors in place before testing.

To operate the testing press, position the directional valve to compress the spring. Next, open the pump operation valve to compress the spring. Open the pump operation valve gradually and compress the spring to solid. Release the pressure promptly after the spring reaches the solid point to avoid overloading the hydraulic system. Repeat this procedure two times for a total of three presses to the solid load.

On the fourth compression, compress the spring to the specified static load. Place the directional valve in the neutral or non-directional position. The relieving valve allows the operator to adjust the hydraulic pressure.

Measure and record the loaded height at the specified static load. Compare the recorded height to the nominal static height specified for the spring. Color code the spring in accordance with the provisions of the following section.

COLOR CODING

Color coding provides a reliable method for properly matching springs.

Table I in the Service Data pages of this instruction specifies the static height ranges for coil and elliptic springs. Each range has a specified color code, and each range represents a deviation from nominal static height. The color codes for coil springs are brown, blue, green, and white.

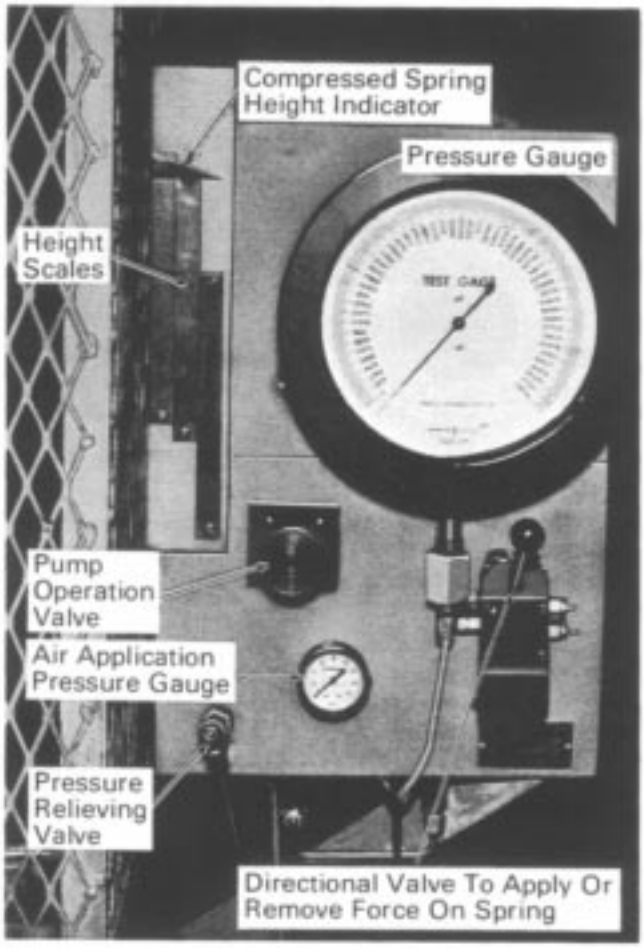
The purpose of the white range is to permit use of springs which have undergone set, but can still provide an acceptable suspension function. These springs are for service replacement only. New springs are color coded either brown, blue, or green.

In order to use Table I, find the drawing tolerance for the assembly and individual springs in the specification section. The specification section lists springs by part number after the respective truck model. The drawing tolerance will be either 0.19", 0.24", or 0.28". The ranges shown in Table I for these drawing tolerances are the ranges for color coding each spring of the assembly.

Each spring of the assembly is to be individually color coded. To color code, determine the deviation between the nominal height specified in Table I and the measured height. Compare the deviation with the specified ranges in Table I and mark the spring with a daub of the indicated color paint. Paint springs with a daub of paint on the bottom of one end only.

NOTE

If the deviation does not fit a specified range, discard the spring.



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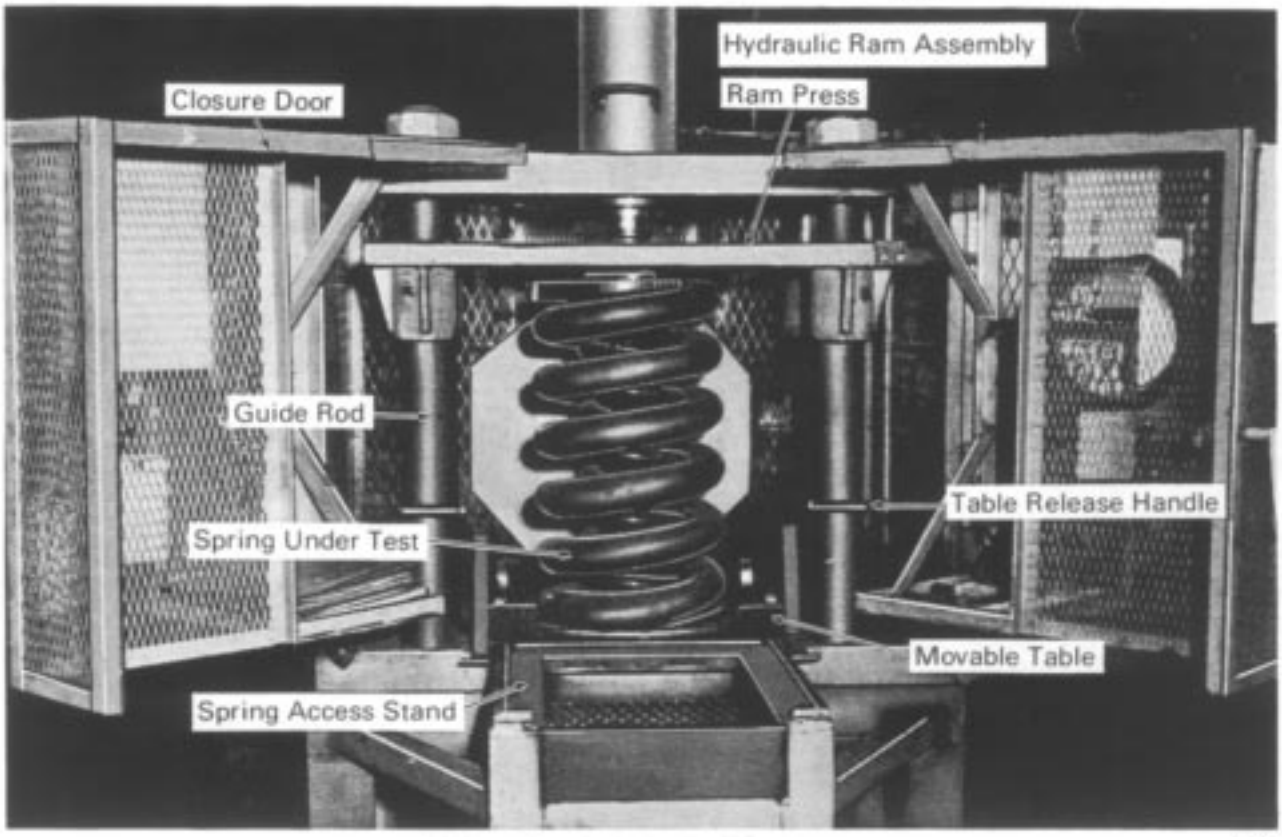

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Fig.1 – Spring Testing Machine

After color coding each spring, rebuild the assembly utilizing springs of the same color. If the assembly must be made up of differing color individual springs, the entire assembly must be re-color coded with the proper color paint completely covering any previous color markings.

REPLACEMENT

All journal springs installed in a locomotive truck should have the same color code. Likewise, all bolster springs installed in a locomotive truck should have the same color code. It is generally desireable to have the color of the coil springs match the color of the bolster coil springs. This is done to maintain the nominal coupler height. Proper coupler height can also be maintained by utilizing brown and green spring combinations as indicated in the table that follows.

Color Of Journal Springs Or Switcher Coil Springs		Color Of Bolster Springs Or Switcher Semi-Elliptic Springs
Blue	with	Blue
Brown	with	Green
Green	with	Brown

These color combinations do not apply to rubber spring applications. There are no restrictions on the matching of colors between coil and rubber springs.

If a single spring fails by breaking, replace all springs from that spring pocket with similarly colored springs.

ELLIPTIC SPRINGS

GENERAL

Elliptic springs provide secondary suspension on swinghanger trucks. The elliptic springs act between the bolster and the spring plank and absorb shock due to vertical carbody and truck motion. In addition, the springs provide vertical suspension damping.

INSPECTION

Before testing, the elliptic springs should receive a thorough inspection for fatigue, degradation, and mismatching.

1. Check that the half elliptic spring sections are of the same leaf style and thickness. Replace any mismatched half elliptic spring section with a matching section. All leaf styles are acceptable for reuse provided the spring meets the static load test and other requirements. Do not intermix leaf styles in the same spring assembly.

2. Check for broken or cracked leaves and bands. If any leaf has evidence of breaks or cracks, replace only the distressed half elliptic section. If the assembly is a semi-elliptic spring for a 4-wheel rigid switcher truck, signs of cracking condemn the entire spring assembly.

3. Check for leaf springing. If any leaves are sprung by more than 1/16", measured 1/4" from the end of the leaf, Fig. 2,replace that half elliptic spring section.

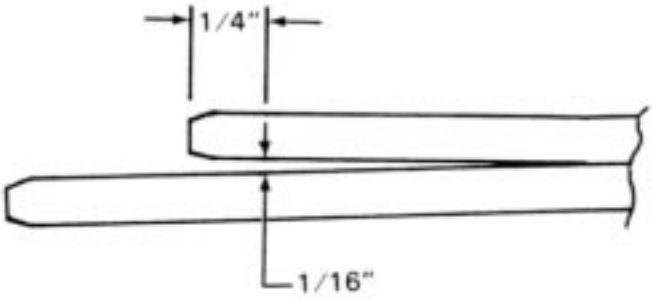

Fig.2 - Measurement Location And Tolerance For Sprung Leaves

4. Hand wash or shot blast the elliptic spring to remove surface rust. Do not "pickle" the spring. If the cleaning operation removes all indication of rust and does not reveal indication of corrosion pits, the spring is acceptable. If corrosion pits are visible after the cleaning operation, scrap the affected half elliptic section.

5. Check the end blocks for excessive wear. If the nib recess is worn by more than 1/8" in any direction, replace the end block and test the spring assembly.

6. Check the spring band for wear. The spring band thickness should be 3/8 ± 1/16". If the band is less than 5/16" thick, the band may be rebuilt by adding an 11 gauge plate; however, the welder must use caution during welding and grinding to avoid damaging the spring leaves. During welding, the welder should use a shield to prevent striking an arc on the spring leaves. The shield should expose only the upper portion of the spring band. During grinding, shield the upper spring leaf to avoid accidental notching of the spring.

QUALIFICATION

The procedure for load testing the elliptic springs is the same as the procedure for testing coil springs with the following exceptions:

1. Preflex the elliptic spring three times to 1.5 times the specified static load.

2. On the fourth compression, load to the specified static load and record the height of the spring.

COLOR CODING

Color code elliptic springs using the same procedure used for color coding coil springs, with one exception. The drawing tolerance for elliptic springs is 0.19". The range for any single color code is 0.12". Paint elliptic springs with a daub of paint applied to the spring band.

The white range is for service use only of both coil and elliptic springs, and both types of springs are subject to the restrictions given in the coil spring discussion.

REPLACEMENT

The free heights of the half elliptic spring sections within a full elliptic spring assembly should be within 3/8". Take particular care to ensure that any replacement section matches the other sections in the assembly. Test and color code spring assemblies containing replacement sections to determine the static height of the regrouped spring.

All elliptic springs applied to a single truck should have the same color code.

RUBBER SPRINGS

GENERAL

Rubber springs are used on many EMD locomotive trucks. Rubber springs are used as secondary suspension elements (between bolster & truck frame) for HT-C, GH-C, GL-C, HT-B, and GP-SS trucks. The AEM-7 truck utilizes rubber chevron-type springs in the primary suspension (between truck frame & axle journal box).

INSPECTION

Before testing, the rubber springs should receive a thorough inspection for signs of degradation.

Grease and dirt accumulations on the rubber spring, resulting from normal service, will not cause deterioration of the elastomeric material; however, continuous exposure to lubrication and fuel oils has a detrimental effect on the life of the rubber spring. Take care to keep such oil deposits off the rubber springs. In addition, cleaning the rubber spring will facilitate visual inspection.

To clean the rubber spring , wipe excess grease, oil, and dirt from the spring with a clean cloth soaked in a mild alkali solution. Do not wash the spring in paraffin degreasing agents (such as trichloroethylene), caustic soda, or diesel fuel oil.

Check the unloaded spring for degradation. A certain amount of superficial cracking (crazing) of the rubber surface is not unusual or detrimental to performance. Replace any spring if any layer has a tear or cut which exceeds 1" in length and 1/4" in depth. Replace any spring if the accumulated length of tears in any layer exceeds 4".

BOND SEPARATION

Lifting of rubber from bonded metal surface is limited to a depth of 1/2", and a total length of 4" on any layer of rubber. If separation exceeds either of these specifications the rubber spring should be replaced.

Metal plates separating the rubber layers are covered with a thin layer of rubber on the exposed edges. This is to protect the metal from corrosion. Due to physical contact with foreign objects, in time, it is expected that some of the protective rubber covering at the edges and corners of the metal plates will become split and torn and ripped away. This is not bond separation. This condition will not affect the performance of the part and is not cause for replacement.

BENT OR DAMAGED METAL PARTS

Overhanging edges of metal parts are occasionally bent or burred through mishandling or excessive service conditions. This is of no consequence as long as the rubber is not trapped and there is no sharp metal edge to come into contact with the free rubber surface. Any excessive burrs should be filed off without touching the rubber.

QUALIFICATION

The following rubber bolster springs must qualify through a static load test similar to the load test used for coil and elliptic springs.

TRUCK MODEL	PART NUMBER
HT-C	8433137
HT-C	9318427
HT-C	9535253
GH-C	8455141
GH-C	8455142
GH-C	8455143
GL-C	8336775
GL-C	8365891
GL-C	8365892
GP Single Shoe	8442142

Chevron-type and inclined rubber springs require a special testing fixture to qualify the springs for shear loading. The following test procedure does not apply to those springs.

The procedure for load testing the rubber springs is the same as the procedure for testing coil springs with the following exceptions:

1. Preflex the rubber spring three times to 1.5 times the specified static load.
2. Load the spring at the rate of 0.5" per minute.
3. On the fourth compression, load to the specified static load and hold this load for one minute.
4. Record the static height of the spring.

COLOR CODING

Springs that have been in service for a period of time will have experienced set and drift. Set and drift are physical characteristics of rubber. Set is not recoverable. Drift is fully recoverable if the spring has been unloaded for a sufficient length of time. It is therefore, advisable to make all rubber spring height evaluations after the spring has been unloaded for a period of 30 days.

As a result of set and drift, the loaded height of a used spring is somewhat less than when it was new. The specification section lists the lowest tolerance which is acceptable for a particular rubber spring.

To determine whether a spring is acceptable, compare the measured static height with the specified lowest acceptable static height. As long as the spring static height remains greater than this height, and the spring passes the inspection, the spring is acceptable for reuse. A spring which is below the lowest acceptable static height is not reusable.

The rubber springs should be color coded according to the measured static height as shown in Table I. Apply a daub of paint on the steel mounting plate adjacent to the bolt holes. Completely cover the existing color code if it is still visible.

REPLACEMENT

AEM-7

Due to the high stiffness of the chevron-type springs and the arrangement of two springs per journal box, the following precautions are necessary during installation of the springs.

All chevron-type springs on a single axle must have the same color code.

Do not use new chevron-type springs in combination with used chevron-type springs.

Replace a defective chevron-type spring with one having the same color code and age. If a suitable replacement is not possible, replace all four chevron-type springs on a single axle with either new or used chevron-type springs of the same color code.

All rubber springs in a single truck should have a single color code; however, adjacent color codes are suitable for use on separate axles of the same truck.

All locomotive chevron-type springs should have the same or an adjacent color code.

Shimming may be necessary to compensate for set and drift in the rubber. Details of the shimming procedure are contained in the AEM-7 Maintenance Instruction M.I. 1510

GP Single Shoe Brake With Inclined Rubber Suspension

Due to the high stiffness of the rubber pads and due to the pairing of springs to form the suspension, the following precautions are necessary during installation of the springs.

All four springs on the same spring plank must have the same color code.

Do not use new rubber springs in combination with used rubber springs on the same truck.

Replace a defective spring with one having the same color code and age. If a suitable replacement is not possible, replace all four springs per truck with either new or used springs of the same color code.

Shimming may be necessary to compensate for set and drift in the rubber. Details of the shimming specifications are contained in EMD Maintenance Instruction M.I. 1511.

GP Single Shoe Brake With Rubber Bolster Spring

When replacing the rubber springs, the free height should not vary more than 3/16" between the two pads per truck.

HT-B

When removing rubber springs from the HT-B truck, keep the springs in pairs based upon side by side location at particular ends of the bolster. Pairing the springs upon removal will avoid confusion and facilitate reinstallation of the springs.

Because permanent set is a characteristic of rubber associated with load and time in service, the rubber springs must be matched by age when they are installed on the same bolster end. Do not pair a new replacement spring with an old spring; for there is always some permanent set in the old spring; and the new spring would carry more than its normal load. Always install new replacement springs in pairs opposite each other on the same bolster end.

HT-C, GH-C, GL-C

Replace these rubber bolster springs in sets of four according to their free height. The free height of the springs must be within 1/16" for those springs which are on the same side of the truck. The four springs must be within 1/8" in free height. In addition, the four springs must have the same color code.

SERVICE DATA

UNLESS OTHERWISE NOTED

ALL DRAWING TOLERANCES IN INCHES

ALL STATIC HEIGHTS IN INCHES

ALL STATIC LOADS IN POUNDS

Letters adjacent to spring Part Number indicate the following —

A = Assembly
O = Outer Coil
M = Middle Coil
I = Inner Coil

NOTE

An individual spring or a spring assembly is often used on more than one EMD truck model. Although most springs listed in the following Service Data are listed under the widest range of applications, not all springs are listed for all applications. A spring that is not found under a particular truck model can be tested using the data corresponding to that spring part number as listed under another truck model.

TABLE I

COLOR CODES FOR COIL AND ELLIPTIC SPRINGS

Drawing Tolerances (Inches)	$\pm.19$	$\pm.24$	$\pm.28$
Brown	+.19 +.06	+.24 +.08	+.28 +.10
Blue	+.06 -.06	+.08 -.08	+.10 -.10
Green	-.06 -.19	-.08 -.24	-.10 -.28
White	-.19 -.31	-.24 -.39	-.28 -.47

COLOR CODES FOR RUBBER SPRINGS

Truck Model	Part Number	Static Height	Color Code
HT-C	8433137	3.13 3.06 2.99 2.93 2.86 2.79	Green Yellow Red Brown White
HT-C	9318427* 9535253**	3.00 2.90 2.80 2.70 2.63	White Blue Red Brown
GH-C	8455141 8455142 8455143	4.96 4.90 4.83 4.74	Green Yellow Red
AEM-7	9511351	Stiffness 15,070 lbs/in. 14,390 lbs/in. 13,700 lbs/in. 13,020 lbs/in. 12,330 lbs/in.	Orange Yellow White Blue

*Identified by one extra hole between bolt holes.
**Identified by two extra holes between bolt holes.

SPECIFICATIONS

JOURNAL SPRINGS

HT-C TRUCK

Locomotive Weight	Part Number	Static Load	Static Height	Drawing Tolerance
Light 300-330,000 Lbs.	9533935 (A)	11360	14.00	±.28
	8484130 (O)	7910	14.00	±.28
	8433004 (I)	3450	14.00	±.28
Light 330-360,000 Lbs.	8484131 (A)	12630	14.00	±.28
	8484130 (O)	7910	14.00	±.28
	8433005 (I)	4720	14.00	±.24
Basic 360-390,000 Lbs.	8433006 (A)	13770	14.19	±.24
	8433003 (O)	10470	14.19	±.24
	8433004 (I)	3300	14.19	±.28
Basic 360-390,000 Lbs. Tapered Cartridge Journal Bearing	9549172 (A)	15750	14.19	±.24
	9539366 (O)	11070	14.19	±.24
	9549171 (I)	4680	14.19	±.28
Heavy 390-420,000 Lbs.	8433007 (A)	14780	14.25	±.24
	8433003 (O)	10330	14.25	±.24
	8433005 (I)	4450	14.25	±.24
Heavy 390-420,000 Lbs. Tapered Cartridge Journal Bearing	9539365 (A)	16630	14.25	±.24
	9539366 (O)	10940	14.25	±.24
	9539367 (I)	5690	14.25	±.24
Basic 360-390,000 Lbs. Special Bar Size	9081229 (A)	13810	14.19	±.24
	9081228 (O)	10510	14.19	±.24
	8433004 (I)	3300	14.19	±.28
Heavy 390-420,000 Lbs. Special Bar Size	9081734 (A)	14780	14.25	±.24
	8433003 (O)	10330	14.25	±.24
	9081733 (I)	4450	14.25	±.24
Heavy 390-420,000 Lbs. Special Bar Size	9082029 (A)	14800	14.25	±.24
	9081228 (O)	14800	14.25	±.24
	9081733 (I)	4450	14.25	±.24
330-360,000 Lbs. Alloy 8484131	9317680 (A)	12630	14.00	±.28
	9317679 (O)	7910	14.00	±.28
	9317673 (I)	4720	14.00	±.28
360-390,000 Lbs. Alloy 8433006	9317677 (A)	14370	14.00	±.24
	8433003 (O)	10920	14.00	±.24
	9317678 (I)	3450	14.00	±.24
390-420,000 Lbs. Alloy 8433007	9317681 (A)	15640	14.00	±.24
	8433003 (O)	10920	14.00	±.24
	9317673 (I)	4720	14.00	±.24

JOURNAL SPRINGS (Cont'd.)

GP TRUCKS (FOUR-WHEEL SWINGHANGER)

Locomotive Weight	Part Number	Static Load	Static Height	Drawing Tolerance
Light	8484503 (A)	11840	11.25	±.24
200-230,000 Lbs.	8484505 (O)	8660	11.25	±.24
	8484504 (I)	3180	11.25	±.24
Basic	8272084 (A)	14080	11.38	±.24
230-266,000 Lbs.	8272255 (O)	9260	11.38	±.24
	8272256 (I)	4820	11.38	±.24
Heavy	8354464 (A)	15690	11.75	±.24
266-280,000 Lbs.	8354466 (O)	5340	11.75	±.24
	8354465 (I)	10350	11.75	±.19
Extra-Heavy	8413508 (A)	16430	11.75	±.24
280-300,000 Lbs.	8354466 (O)	5340	11.75	±.24
	8354465 (M)	10350	11.75	±.19
	8413507 (I)	740	11.75	±.19
Light 200-230,000 Lbs.	9317675 (A)	11840	11.25	±.24
Alloy Spring	9317676 (O)	8660	11.25	±.24
	9317674 (I)	3180	11.25	±.24
Basic 230-266,000 Lbs.	9085317 (A)	12590	11.75	±.24
Alloy Spring	9085319 (O)	8310	11.75	±.24
	9085318 (I)	4280	11.75	±.24
Basic 240-260,000 Lbs.	9097970 (A)	14040	13.00	±.24
F40PH	9097969 (O)	9280	13.00	±.24
	9097968 (I)	4760	13.00	±.24
Heavy 266-280,000 Lbs.	9094221 (A)	15690	11.75	±.24
Alloy Spring	8354466 (O)	10350	11.75	±.24
	9094220 (I)	5340	11.75	±.19
Extra-Heavy	9317671 (A)	16430	11.75	±.24
280-300,000 Lbs.	8354466 (O)	10350	11.75	±.24
Alloy Spring	9094220 (M)	5340	11.75	±.19
	9317672 (I)	740	11.75	±.19

HT-B TRUCK

Locomotive Weight	Part Number	Static Load	Static Height	Drawing Tolerance
Basic	9322481 (A)	15930	14.17	±.24
260-290,000 Lbs.	9322479 (O)	10230	14.17	±.24
	9322480 (I)	5700	14.17	±.24

SIX-WHEEL SWINGHANGER TRUCKS

Part Number	Static Load	Static Height	Drawing Tolerance
8100801 (A)	15350	11.00	±.19
8041426 (O)	9720	11.00	±.19
8041427 (M)	4040	11.00	±.19
8041428 (I)	1590	11.00	±.19

JOURNAL SPRINGS (Cont'd)

RIGID SWITCHER TRUCKS

Locomotive Weight	Part Number	Static Load	Static Height	Drawing Tolerance
Light	8100101 (A)	15860	13.50	±.19
Below 200,000 Lbs.	8097296 (O)	10850	13.50	±.19
	8097295 (I)	5010	13.50	±.19
Basic	8309863 (A)	19570	13.56	±.19
200-220,000 Lbs.	8057051 (O)	13720	13.56	±.19
	8057052 (I)	5850	13.56	±.19
Heavy	8100585 (A)	21270	13.56	±.19
220-300,000 Lbs.	8057051 (O)	13720	13.56	±.19
	8057052 (M)	5850	13.56	±.19
	8057053 (I)	1700	13.56	±.19

GH-C TRUCKS

Locomotive Weight	Part Number	Static Load	Static Height	Drawing Tolerance
Extra Light				
192-210,000 Lbs.	8468317	6780	13.50	±.24
Light	8468319 (A)	7940	13.50	±.24
210-240,000 Lbs.	8452792 (O)	5300	13.50	±.24
	8468318 (I)	2640	13.50	±.28
Basic	8452790 (A)	8640	13.50	±.24
240-270,000 Lbs.	8452792 (O)	5300	13.50	±.24
	8452791 (I)	3340	13.50	±.24
Heavy	9531212 (A)	10120	13.50	±.24
270-300,000 Lbs.	8468317 (O)	6780	13.50	±.24
	8452791 (I)	3340	13.50	±.24
Extra Heavy	9536004 (A)	10860	13.50	±.24
300-330,000 Lbs.	9536005 (O)	7520	13.50	±.24
	8452791 (I)	3340	13.50	±.24

JOURNAL SPRINGS (Cont'd)

GL-C TRUCK

Locomotive Weight	Part Number	Static Load	Static Height	Drawing Tolerance
Basic 156-174,000 Lbs.	9334120 (A)	11600	12.50	±.24
	8381080 (O)	8610	12.50	±.24
	9334119 (I)	2990	12.50	±.24
Heavy 174-192,000 Lbs.	8381082 (A)	13430	12.50	±.24
	8381080 (O)	8610	12.50	±.24
	8381081 (I)	4820	12.50	±.24
Extra Heavy 192-210,000 Lbs.	9082550 (A)	14660	12.50	±.24
	9082549 (O)	9840	12.50	±.24
	8381081 (I)	4820	12.50	±.24
GT18 MC - Metric	8494728 (A)	53 690 N	320 mm	±5 mm
	8494730 (O)	35 430 N	320 mm	±5 mm
	8494729 (I)	18 260 N	320 mm	±5 mm
GT18MC - English	8494731 (A)	12440	12.50	±.24
	8494733 (O)	8220	12.50	±.24
	8494732 (I)	4220	12.50	±.24

SD TRUCKS

Locomotive Weight	Part Number	Static Load	Static Height	Drawing Tolerance
Basic Below 360,000 Lbs. Clasp Brake	8179174 (A)	12550	8.82	±.19
	8218531 (O)	6930	8.82	±.19
	8218530 (M)	4140	8.82	±.19
	8218529 (I)	1480	8.82	±.19
Heavy 360-390,000 Lbs. Clasp Brake	8228051 (A)	12710	10.00	±.19
	8268328 (O)	7430	10.00	±.19
	8268329 (M)	3860	10.00	±.19
	8268330 (I)	1420	10.00	±.19
Basic 300-345,000 Lbs. Single Shoe	8484503 (A)	11840	11.25	±.24
	8484505 (O)	8660	11.25	±.24
	8484504 (I)	3180	11.25	±.24
Heavy 345-399,000 Lbs. Single Shoe	8272084 (A)	14100	11.38	±.24
	8272255 (O)	9270	11.38	±.24
	8272256 (I)	4830	11.38	±.24
Extra Heavy 399-432,000 Lbs. Single Shoe	8354464 (A)	15690	11.75	±.24
	8354466 (O)	10350	11.75	±.24
	8354465 (I)	5340	11.75	±.19

A-1-A TRUCKS

Locomotive Weight	Part Number	Static Load	Static Height	Drawing Tolerance
Idler Axle Load 26650-31650 Lbs.	8236348 (A)	5720	13.12	±.19
	8236350 (O)	4460	13.12	±.19
	8236349 (I)	1260	13.12	±.19
Driver Axle Load 35500-45500 Lbs.	8241800 (A)	8720	11.25	±.19
	8232617 (O)	6200	11.25	±.19
	8232621 (I)	2520	11.25	±.19

JOURNAL SPRINGS (Cont'd)

FLEXICOIL GC & GB TRUCKS
ELECTRIC DRIVE

Part Number	Static Load	Static Height	Drawing Tolerance
8390890 (A)	10040	11.88	±.19
8390889 (I)	3100	11.88	±.19
8390888 (O)	6940	11.88	±.19
8241800 (A)	8720	11.25	±.19
8232621 (I)	2520	11.25	±.19
8232617 (O)	6200	11.25	±.19
8223561 (A)	6800	9.50	±.24
8223559 (I)	2240	9.50	±.24
8223560 (O)	4560	9.50	±.24
8296131 (A)	7620	11.50	±.19
8296130 (I)	2550	11.50	±.19
8293170 (O)	5070	11.50	±.19
8356313 (A)	8410	12.00	±.19
8356312 (I)	2490	12.00	±.19
8285950 (O)	5920	12.00	±.19
8236348 (A)	5720	13.13	±.19
8236349 (I)	1260	13.13	±.19
8236350 (O)	4460	13.13	±.19
8268062 (A)	6960	10.00	±.19
8268061 (I)	2450	10.00	±.19
8268058 (O)	4510	10.00	±.19
8308783 (A)	7370	11.25	±.19
8250524 (I)	1170	11.25	±.19
8232617 (O)	6200	11.25	±.19
8252513 (A)	12730	11.56	±.19
8252512 (I)	1290	11.56	±.19
8252511 (M)	3290	11.56	±.19
8252510 (O)	8150	11.56	±.19
8232625 (A)	9950	11.25	±.19
8232622 (I)	1230	11.25	±.19
8232621 (M)	2520	11.25	±.19
8232617 (O)	6200	11.25	±.19

JOURNAL SPRINGS (Cont'd)

FLEXICOIL GA8 & GA12 TRUCKS
MECHANICAL DRIVE

Part Number	Static Load	Static Height	Drawing Tolerance
8250524	1170	11.25	±.19
8250525	1220	11.25	±.19
8250526	1420	11.75	±.24
8241880 (A)	8720	11.25	±.19
8232621 (I)	2520	11.25	±.19
8232617 (O)	6200	11.25	±.19
8242299	3030	12.75	±.24
8222477	5240	12.75	±.19
8252513 (A)	12730	11.56	±.19
8252512 (I)	1290	11.56	±.19
8252511 (M)	3290	11.56	±.19
8252510 (O)	8150	11.56	±.19
8232625 (A)	9950	11.25	±.19
8232622 (I)	1230	11.25	±.19
8232621 (M)	2520	11.25	±.19
8232617 (O)	6200	11.25	±.19
8223561 (A)	6800	9.50	±.24
8223559 (I)	2240	9.50	±.24
8223560 (O)	4560	9.50	±.24
8223562	4560	12.50	±.24
6915450	5520	9.75	±.19
8236348 (A)	5720	13.13	±.19
8236349 (I)	1260	13.13	±.19
8236350 (O)	4460	13.13	±.19
8268062 (A)	6960	10.00	±.19
8268061 (I)	2450	10.00	±.19
8268058 (O)	4510	10.00	±.19

TRIPLE COIL SPRINGS

AEM-7 TRUCK

Part Number	Static Load	Static Height	Drawing Tolerance
9516951 (A)	9370	17.75	±.28
9516948 (O)	5540	17.75	±.28
9516949 (M)	2660	17.75	±.28
9516950 (I)	1170	17.75	±.28

BOLSTER SPRINGS

SD FLEXICOIL TRUCKS

Locomotive Weight	Part Number	Static Load	Static Height	Drawing Tolerance
Light Below 300,000 Lbs.	8218527	24410	18.50	±.28
Basic 300-355,000 Lbs. Single Shoe	8179179 (A)	32680	18.50	±.28
	8218527 (O)	24410	18.50	±.28
	8218528 (I)	8270	18.50	±.28
Basic 300-360,000 Lbs. Clasp Brake	8179179 (A)	32680	18.50	±.28
	8218527 (O)	24410	18.50	±.28
	8218528 (I)	8270	18.50	±.28
Heavy 355-396,000 Lbs. Single Shoe	8228050 (A)	32120	19.00	±.28
	8218527 (O)	21360	19.00	±.28
	8268331 (I)	10760	19.00	±.24
Heavy 360-396,000 Lbs.	8228050 (A)	32120	19.00	±.28
	8218527 (O)	21360	19.00	±.28
	8268331 (I)	10760	19.00	±.24
Extra Heavy 396-420,000 Lbs. Single Shoe	8376484 (A)	39640	18.75	±.24
	8376485 (O)	27260	18.75	±.24
	8376486 (I)	12380	18.75	±.24

EXPORT FLEXICOIL GC & GB TRUCKS
ELECTRIC DRIVE

Part Number	Static Load	Static Height	Drawing Tolerance
8293586	7140	15.00	±.24
8374373	12310	15.25	±.24
8285949	10510	17.25	±.28
8261330 (A)	13880	17.88	±.28
8261329 (I)	2110	17.88	±.28
8236351 (O)	11770	17.88	±.28
8232623 (A)	27500	18.50	±.28
8232618 (I)	8930	18.50	±.28
8232620 (O)	18570	18.50	±.28
8293588 (A)	9180	15.00	±.24
8293587 (I)	2040	15.00	±.24
8293586 (O)	7140	15.00	±.24
8252392 (A)	41940	19.00	±.24
8252391 (I)	3320	19.00	±.24
8252390 (M)	11770	19.00	±.24
8252389 (O)	26850	19.00	±.24
8232624 (A)	31440	18.50	±.28
8232619 (I)	3940	18.50	±.28
8232618 (M)	8930	18.50	±.28
8232620 (O)	18570	18.50	±.28

BOLSTER SPRINGS (Cont'd)

A-1-A TRUCKS

Part Number	Static Load	Static Height	Drawing Tolerance
8261330 (A)	13880	17.88	±.28
8261329 (I)	2110	17.88	±.28
8236351 (O)	11770	17.88	±.28

FLEXICOIL GA8 & GA12 TRUCKS
MECHANICAL DRIVE

Part Number	Static Load	Static Height	Drawing Tolerance
8261330 (A)	13880	17.88	±.28
8261329 (I)	2110	17.88	±.28
8236351 (O)	11770	17.88	±.28
8252392 (A)	41940	19.00	±.24
8252391 (I)	3320	19.00	±.24
8252390 (M)	11770	19.00	±.24
8252389 (O)	26850	19.00	±.24
8232623 (A)	27500	18.50	±.28
8232618 (I)	8930	18.50	±.28
8232620 (O)	18570	18.50	±.28
8232624	31440	18.50	±.28
8232619	3940	18.50	±.28
8232618	8930	18.50	±.28
8232620	18570	18.50	±.28
8253041	9850	15.50	±.24
8264214	1000	7.00	±.24
8264215	2330	7.00	±.19
8227587	13090	18.06	±.19
8252022	2190	7.06	±.19
8232136	2320	4.50	±.19
8307497	1700	6.75	±.19

BOLSTER SPRINGS (Cont'd)

ELLIPTIC SPRINGS

FOUR WHEEL SWINGHANGER TRUCKS

Locomotive Weight	Part Number	Color Code	Static Load	Static Height	Drawing Tolorence
Basic	8106539	-	42500	9.75	±.19
Less Than	8460517	Brown	42500	9.88	±.06
266,000 Lbs.	8460518	Blue	42500	9.75	±.06
	8460519	Green	42500	9.63	±.06
Heavy Duty	8354463	-	51275	9.88	±.19
Spring	8460520	Brown	51275	10.00	±.06
266-280,000 Lbs.	8460521	Blue	51275	9.88	±.06
	8460522	Green	51275	9.75	±.06
Extra	8413510	-	56275	9.88	±.19
Heavy Duty	8460524	Brown	56275	10.00	±.06
Spring	8460525	Blue	56275	9.88	±.06
288-300,000 Lbs.	8460526	Green	56275	9.75	±.06
	8322928	-	42500	10.25	±.19

HALF ELLIPTIC SPRINGS

FOUR WHEEL SWINGHANGER TRUCKS

Locomotive Weight	Part Number	Color Code	Static Load	Static Height	Drawing Tolerance
Basic Less Than 266,000 Lbs.	8229325	-	42500	9.75	±.19
Heavy Duty 266-280,000 Lbs.	8354462	-	51275	9.88	±.19
Extra Heavy Duty 288-300,000 Lbs.	8413509	-	56275	9.88	±.19

SIX WHEEL SWING HANGER TRUCKS

Part Number	Color Code	Static Load	Static Height	Drawing Tolerance
8210943	-	33600	10.88	±.19

SWITCHER TRUCKS

Part Number	Color Code	Static Load	Static Height	Drawing Tolerance
8100102	-	11510	7.94	±.19
8100587	-	15120	7.94	±.19

BOLSTER SPRINGS (Cont'd)

RUBBER SPRINGS

Truck Model	Part Number	Static Load	Lowest Acceptable Static Height
HT-C	8433137	43000	2.79
	9318427	43000	2.63
	9535253	30000	2.63
GP-SS	8442142	51000	4.78
GH-C	8455141	17750	4.74
	8455142	22500	4.74
	8455143	26000	4.74
GL-C	8336775	13400	3.63
	8365891	12100	3.63
	8365892	16100	3.63