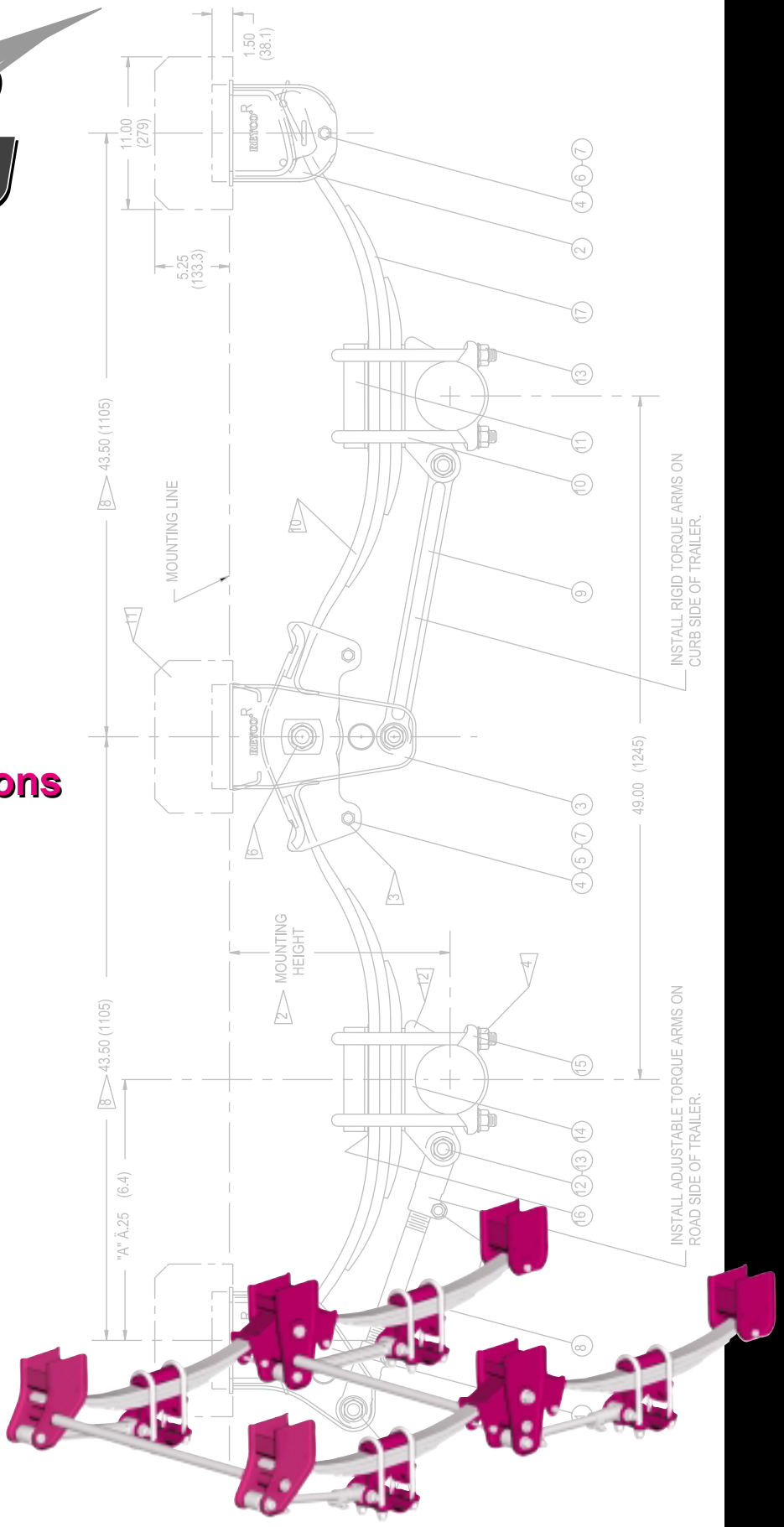
Reyco Granning
SUSPENSIONS

Model 86/88

Suspension System

Installation and

Maintenance Instructions



SAFETY FIRST

Be sure to read and follow all installation and maintenance procedures.

LIFTING

Practice safe lifting procedures. Consider size, shape and weight of assemblies. Obtain help or the assistance of a crane when lifting heavy assemblies. Make sure the path of travel is clear.

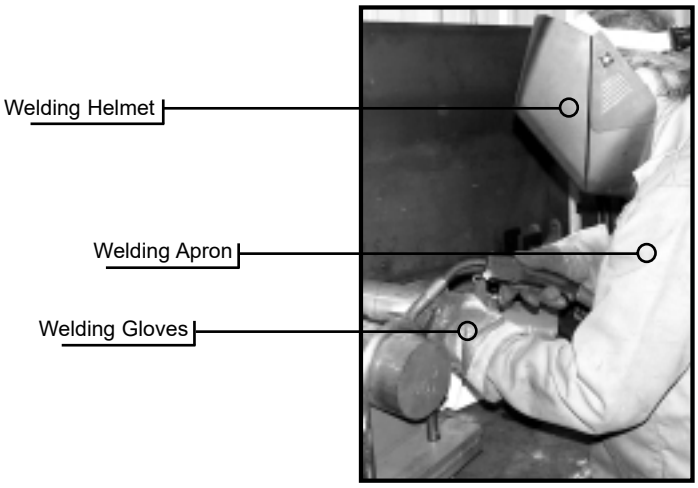
PARTS HANDLING

When handling parts, wear appropriate gloves, eyeglasses and other safety equipment to prevent serious injury.

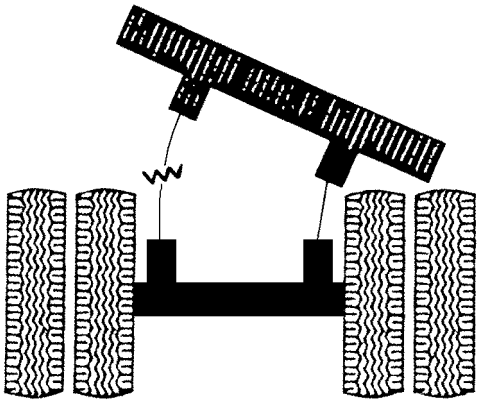
WELDING

When welding, be sure to wear all personal protective equipment for face and eyes, and have adequate ventilation. When welding, protect spring beams and air springs from weld spatter and grinder sparks. Do not attach “ground” connection to springs.

Under normal use, steel presents few health hazards. Prolonged or repeated breathing of iron oxide fumes produced during welding may cause siderosis.



WARNING

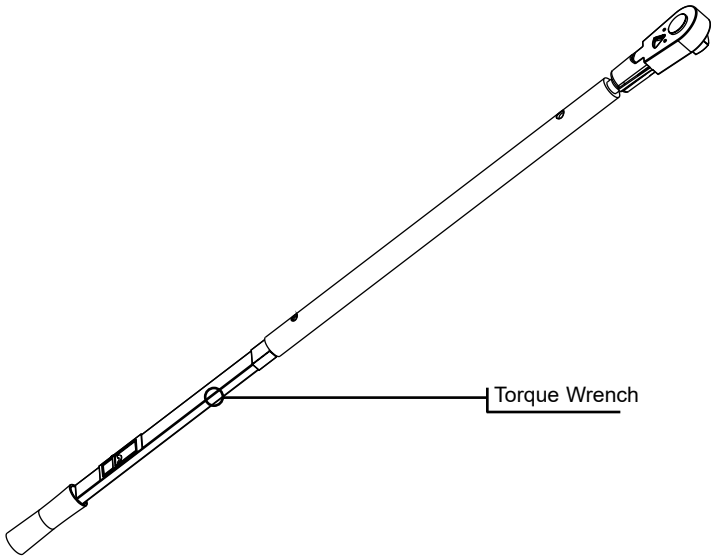


OVERLOADING

Overloading is the practice of transporting cargos that surpass the specified vehicle's ratings. Overloading can cause component failure, resulting in accidents and injuries.

This symbol indicates to the reader to use caution when seen and to follow specific requirements or warnings stated.

CAUTION: Specific torque requirements are recommended.



TORQUE

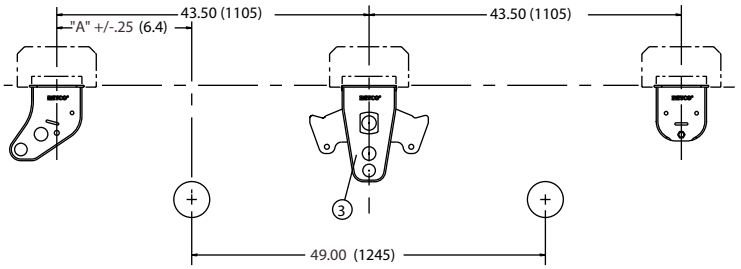
Proper tightening of the U-bolt nuts and alignment bolts are high priority items. A fastener system is considered "loose" any time the torque is found below required values. Failure to maintain the specified torque and to replace worn parts can cause component failure resulting in accident with consequent injury.

NOTE: **It is extremely important after the first 1,000 to 3,000 loaded miles (1,600 - 4,800 kms) of operation, and with each annual inspection thereafter, that all of the bolt and nut tightening recommendations be followed. Any loose fasteners must be retorqued to comply with warranty requirements and to ensure long, trouble-free performance.**

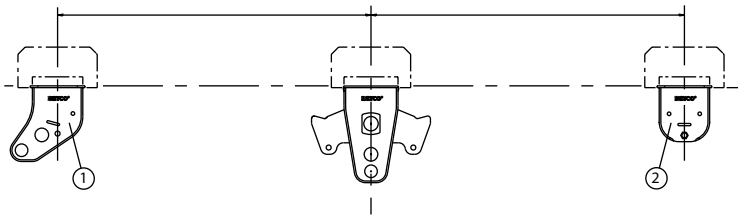
Drawings 1000-1(Front Hangers), 1000-1B (Equalizer Hangers) and 1000-3 (pages **i-5** thru **i-9**) provide detailed requirements for hanger installations. Before proceeding, please refer to these drawings for trouble-free maintenance.

HANGER INSTALLATION

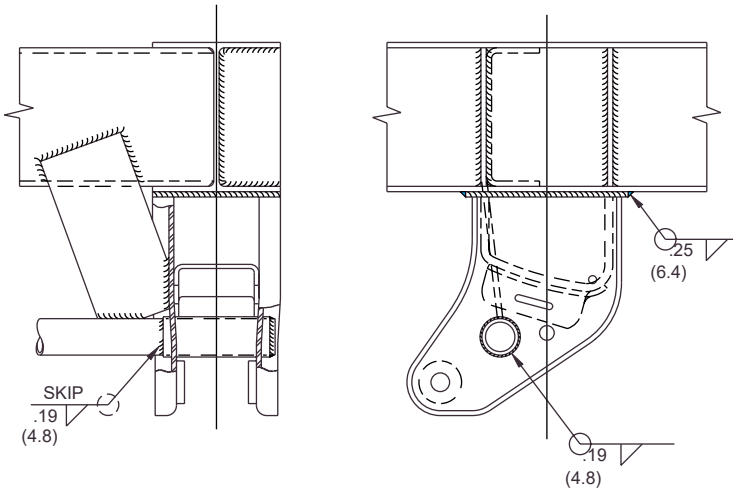
Based on your axle spread requirement, determine the hanger center to center dimension, from drawings on pages **i-10** thru **i-15**. Then, on the subframe, mark the centerline of the equalizer hanger (item 3) from the king pin. Typical 49" setup shown below:

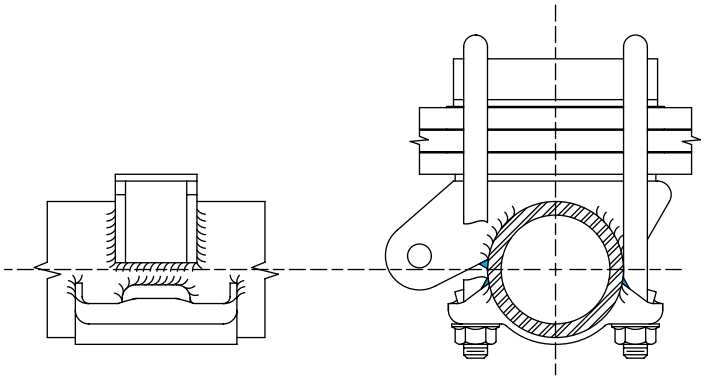


From the equalizer locate the center line of the front (item 1) and rear hangers (item 2). Clamp or tack weld the hangers in position. Be sure the brackets are secure in both the horizontal and vertical planes and that the hangers are square in the frame. Hanger centers should be in line within 1⁄16". See pages **i-10** thru **i-15** for proper spacing.



Weld hangers to frame using AWS E7018 electrode specifications or equivalent, for proper results and specific mounting requirements see page **i-5**. Add 1.25" schedule 40 pipe cross tube steel pipe braces to front and center hangers.

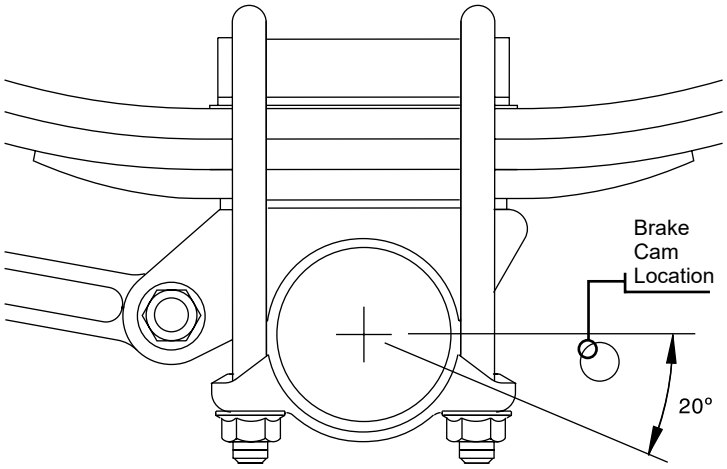




AXLE SEAT INSTALLATION

Before axle seat installation, please review and follow the recommended procedures found on pages **i-16** & **i-17**.

CAUTION: Specific welding procedures are required for installation.



BRAKE CAM LOCATION REQUIREMENTS

Brake camshafts are designed to the rear of the axle and chambers underneath the axle. If camshafts are located differently, assembler must check for adequate clearances. Be sure that the axle seats which are selected provide brake chamber and brake camshaft assembly clearances.

FRONT HANGERS

1. Locate and mark on subframe the center line of desired center hanger position from the king pin. If single axle suspension, locate front hangers as above.

2. Locate the center line of the front and rear hangers from the equalizer center line. Refer to assembly drawing for proper spacing dimensions.

3. Clamp or tack weld hangers in position. Be sure flanged brackets are secure in both horizontal and vertical planes, or if weld-on, the hangers are square with the frame. Hanger center lines should be within +/-.06" (1.6). laterally and longitudinally. Weld hangers as shown. Use A.S.T.M. & A.W.S. E7018 electrode or equivalent.

4. Flanged hangers (bolted)-drill and ream all holes in frame and hangers for bolts to have drive fit. Install and tighten all bolts.

5. Bolts to be S.A.E. grade 5 minimum, with suitable locknuts and flat structural washers. On aluminum frames, steel backing plates should be used and properly treated to prevent electrolysis.

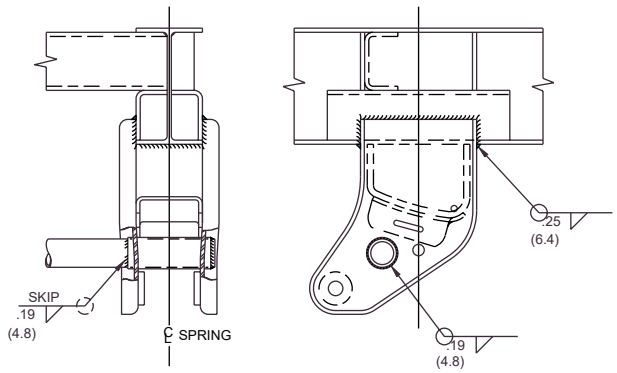
6. Hangers depicted below show minimum reinforcement. When suspension is mounted on light subframe, or subjected to rough service, hanger gusseting should be increased accordingly. Gusset material 7 gage minimum.

7. Add 1 1/4" (1.660" 42.2 mm o.d.) schedule 40 black pipe braces to front and center hangers. Pipe brace is not required between rear hangers unless subjected to abnormal abuse.

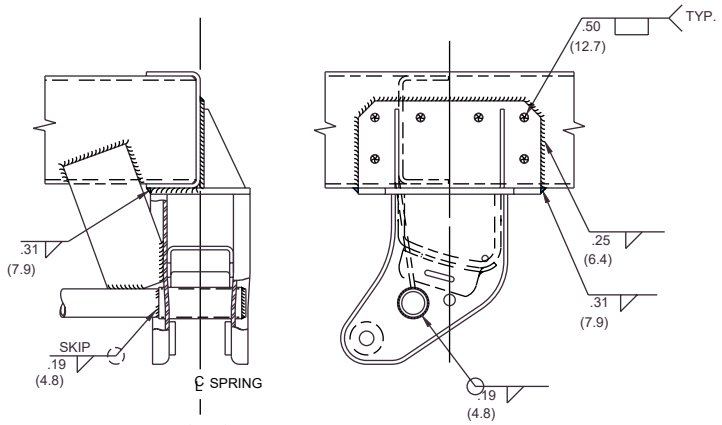
8. Torque flange mount hanger bolt nuts to 150 ft. lbs. (203.4 nm).

9. Front hanger installations shown typical for all hangers.

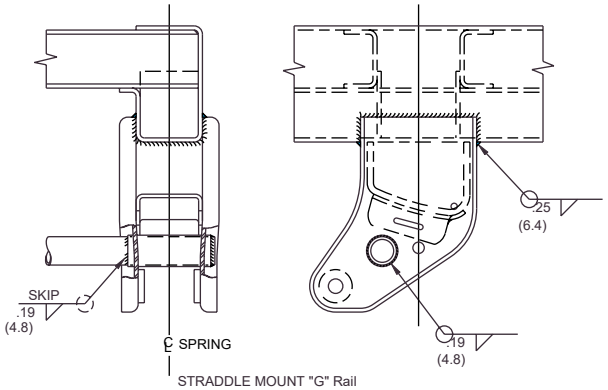
10. Dimensions shown in inches and millimeters.



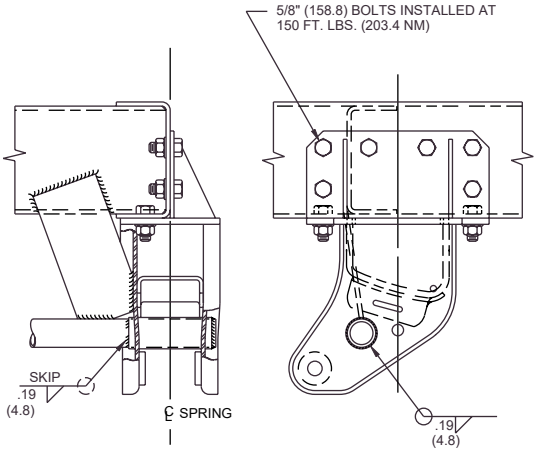
STRADDLE MOUNT, I-BEAM FRAME



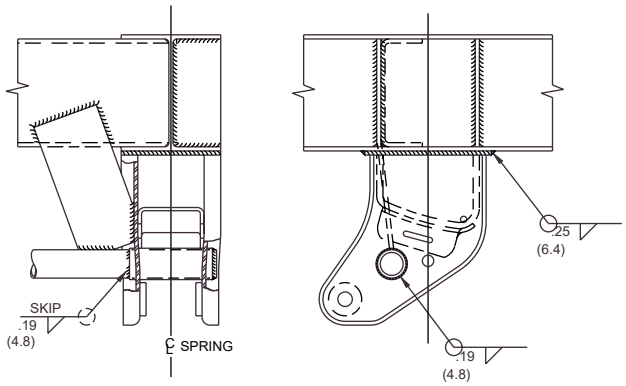
FLANGE MOUNT - WELDED



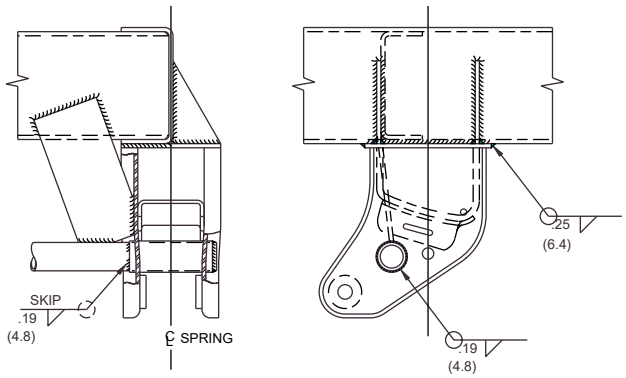
STRADDLE MOUNT "G" Rail



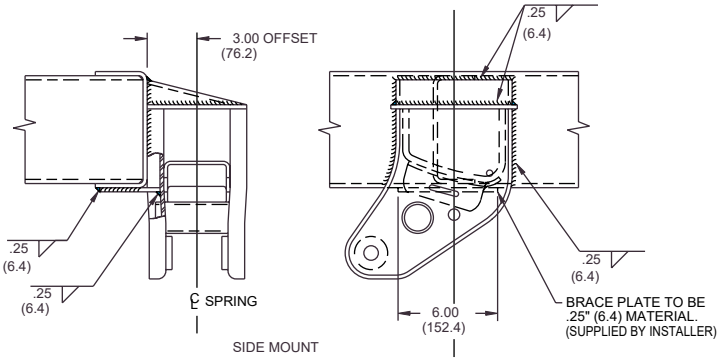
FLANGE MOUNT - BOLTED



UNDER MOUNT, I-BEAM FRAME



UNDER MOUNT



SIDE MOUNT

PIPE BRACE NOT REQUIRED ON SIDE MOUNT FRONT HANGERS. FULL PIPE BRACE REQUIRED ON CENTER HANGERS.

CENTER HANGERS

For 44", 49", 54 ½" Spreads

1. Locate and mark on subframe the center line of desired center hanger position from the king pin.

2. Locate the center line of the front and rear hangers from the equalizer center line. refer to assembly drawing for proper spacing dimensions.

3. Clamp or tack weld hangers in position. be sure flanged brackets are secure in both horizontal and vertical planes, or if weld-on, the hangers are square with the frame. hanger center lines should be within .06" (1.6) laterally and longitudinally. weld hangers as shown. use a.s.t.m. & a.w.s. e7018 electrode or equivalent.

4. Flanged hangers (bolted)-drill and ream all holes in frame and hangers for bolts to have drive fit. install and tighten all bolts.

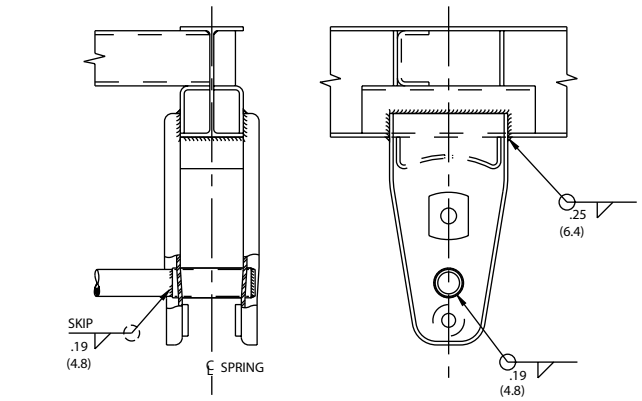
5. Bolts to be S.A.E. grade 5 minimum, with suitable locknuts and flat structural washers. on aluminum frames, steel backing plates should be used and properly treated to prevent electrolysis.

6. Hangers depicted below show minimum reinforcement. when suspension is mounted on light subframe, or subjected to rough service, hanger gusseting should be increased accordingly. gusset material 7 gage minimum.

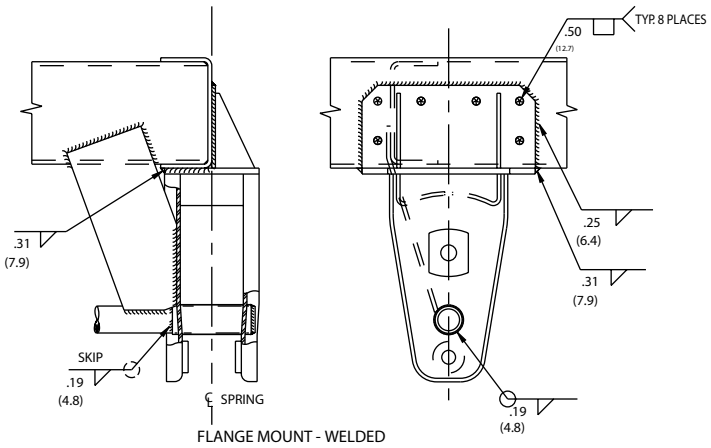
7. Add 1 1/4" (1.660" 42.2 mm o.d.) schedule 40 black pipe braces to front and center hangers. Pipe brace is not required between rear hangers unless subjected to abnormal abuse.

8. Torque flange mount hanger bolt nuts to 150 ft. lbs. (203.4 nm).

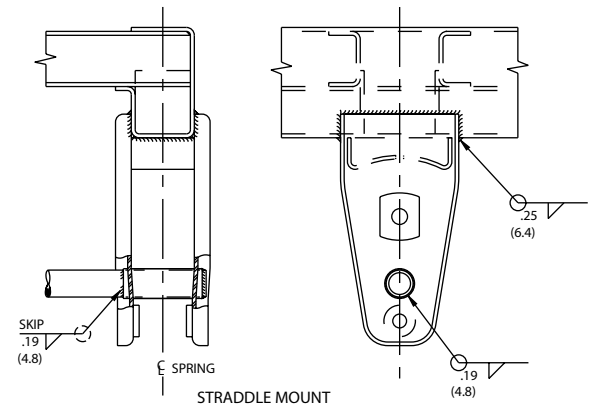
9. Dimensions shown in inches and millimeters.



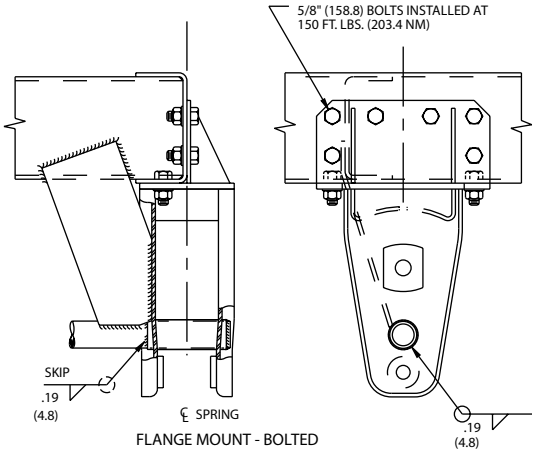
STRADDLE MOUNT, I-BEAM FRAME



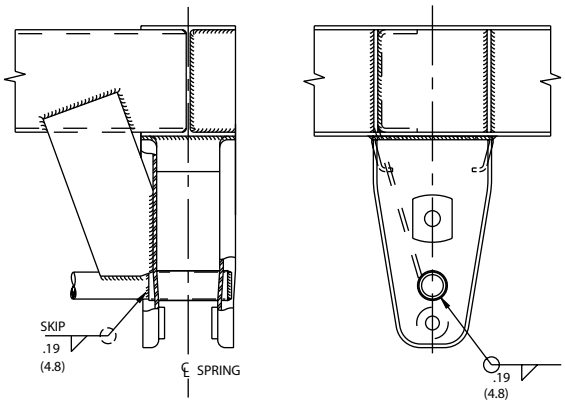
FLANGE MOUNT - WELDED



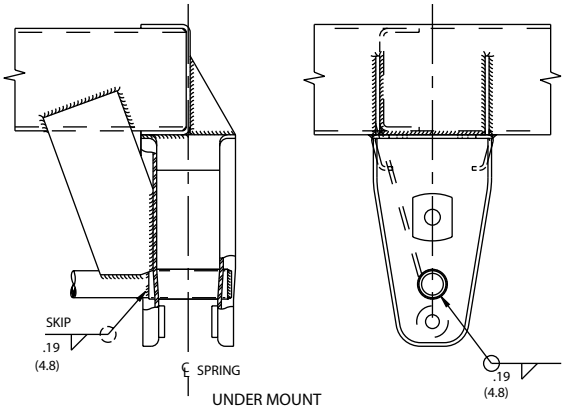
STRADDLE MOUNT



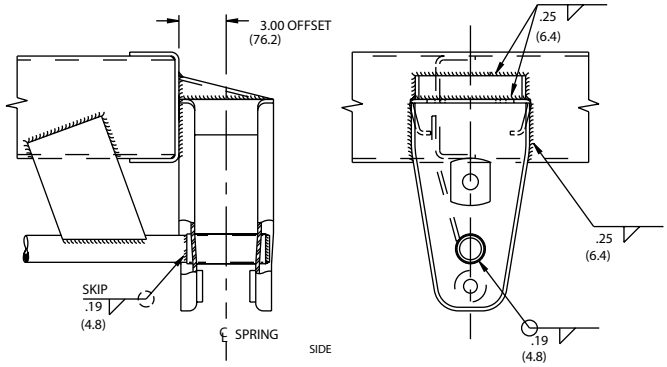
FLANGE MOUNT - BOLTED



UNDER MOUNT, I-BEAM FRAME



UNDER MOUNT



SIDE

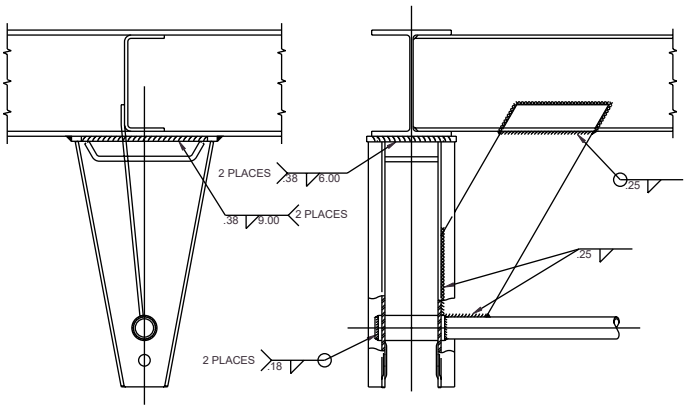
CENTER HANGERS

For 72", 109", 121" Spreads

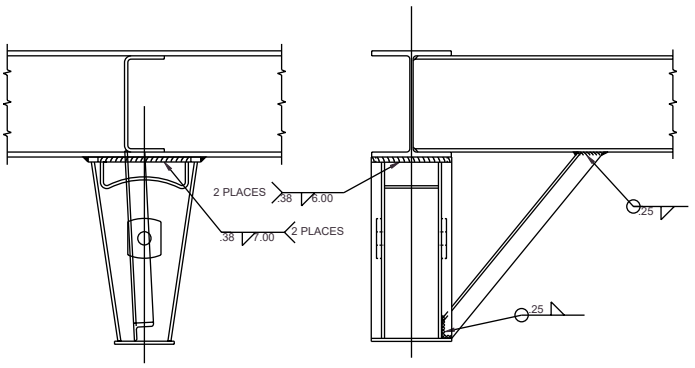
Notes:

1. See drawing 1000-1 for front and rear hanger installation instructions and welding information.

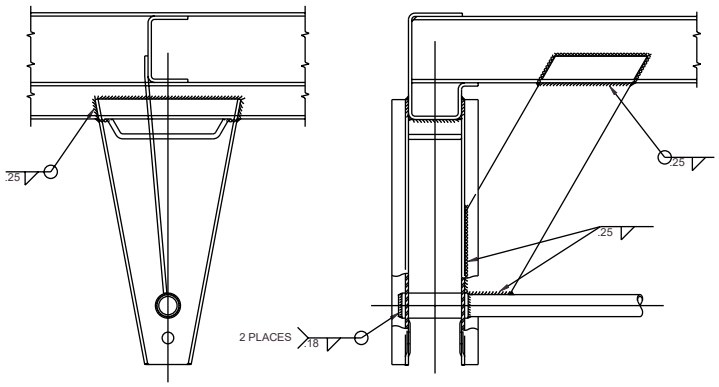
2. This drawing shows minimum installation configuration. For heavy-duty applications additional bracing must be used.



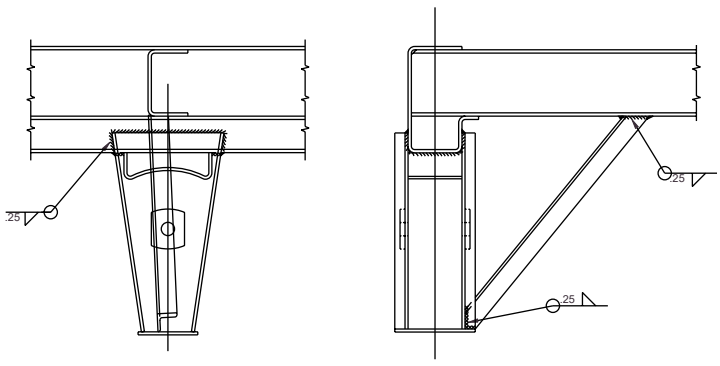
EQUALIZER GUIDE AND TORQUE ARM BRACKET
UNDERMOUNT, I-BEAM FRAME



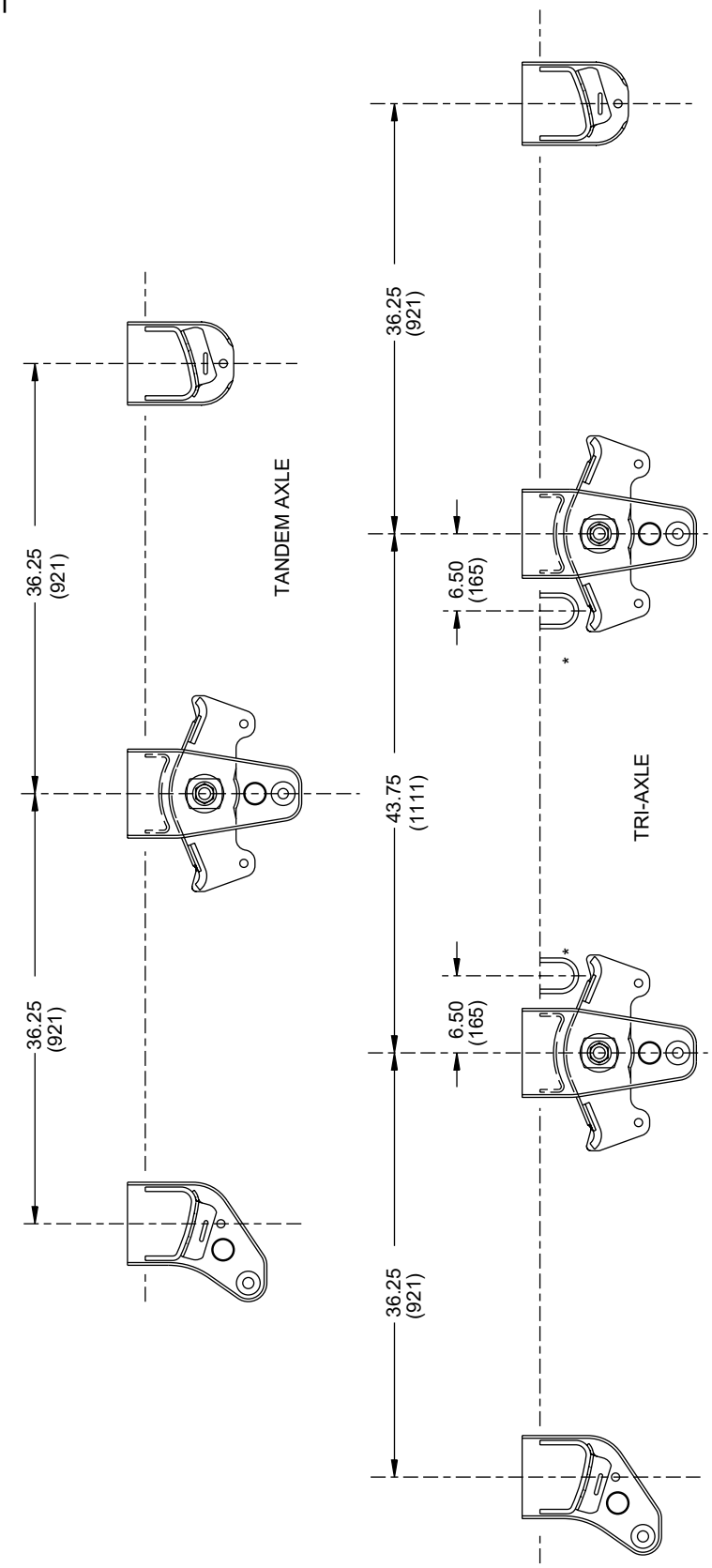
EQUALIZER HANGER
UNDERMOUNT, I-BEAM FRAME



EQUALIZER GUIDE AND TORQUE ARM BRACKET
STRADDLEMOUNT



EQUALIZER HANGER
STRADDLEMOUNT



Recommended hanger spacing for Models 86/88 tandem and tri-axle suspensions with 44" Axle Spacing.

Straddle mount hangers are shown. Dimensions are typical with all hanger types.

Dimensions shown in inches (millimeters)

*Bump blocks for multi-axle suspensions are mandatory, and are available as an option for tandem application.

Installation Instructions Models 86/88

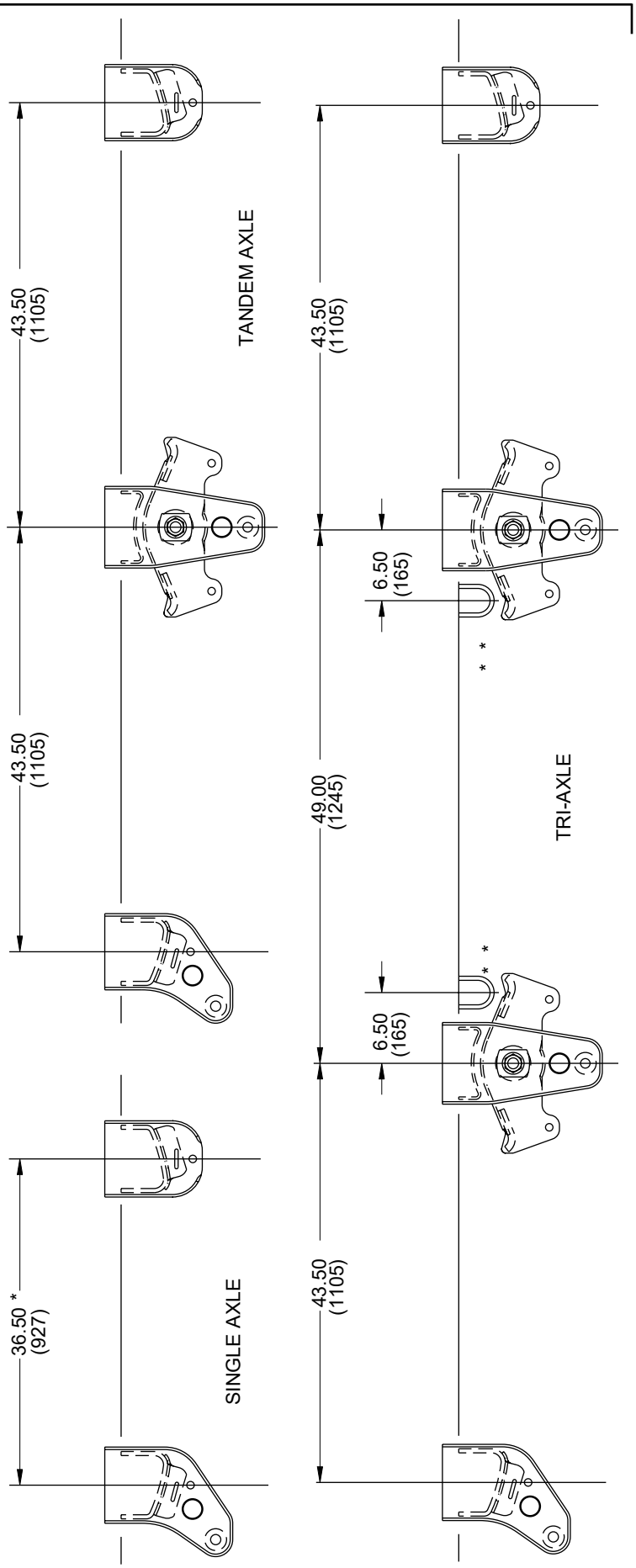
Recommended hanger spacing for Models 86/88 tandem and tri-axle suspensions with 49" Axle Spacing.

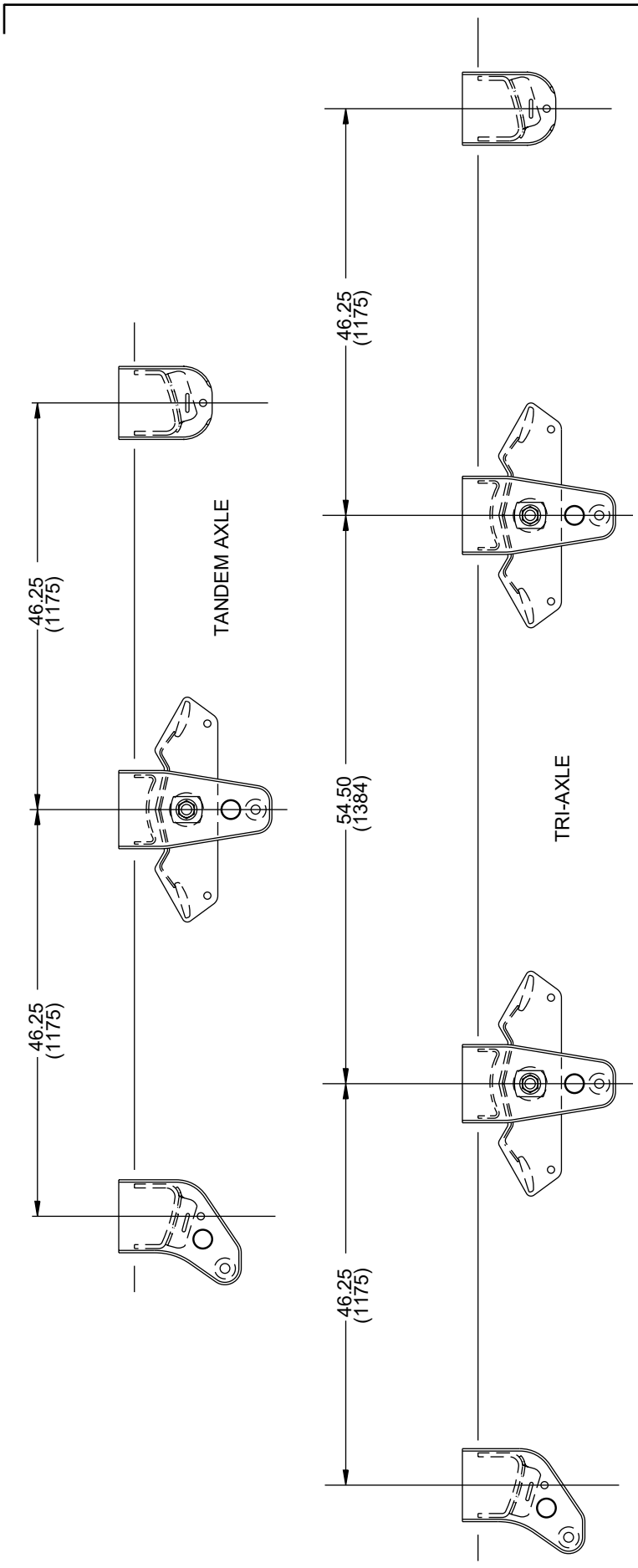
Straddle mount hangers are shown. Dimensions are typical with all hanger types.

*Hanger spacing for single axle suspensions must be 38" when using 9-leaf springs.

Dimensions shown in inches (millimeters).

**Bump blocks for multi-axle suspensions are mandatory, and are available as an option for tandem application.





Recommended hanger spacing for Models 86/88 tandem and tri-axle suspensions with 54 1⁄2" Axle Spacing.

Straddle mount hangers are shown. Dimensions are typical with all hanger types.

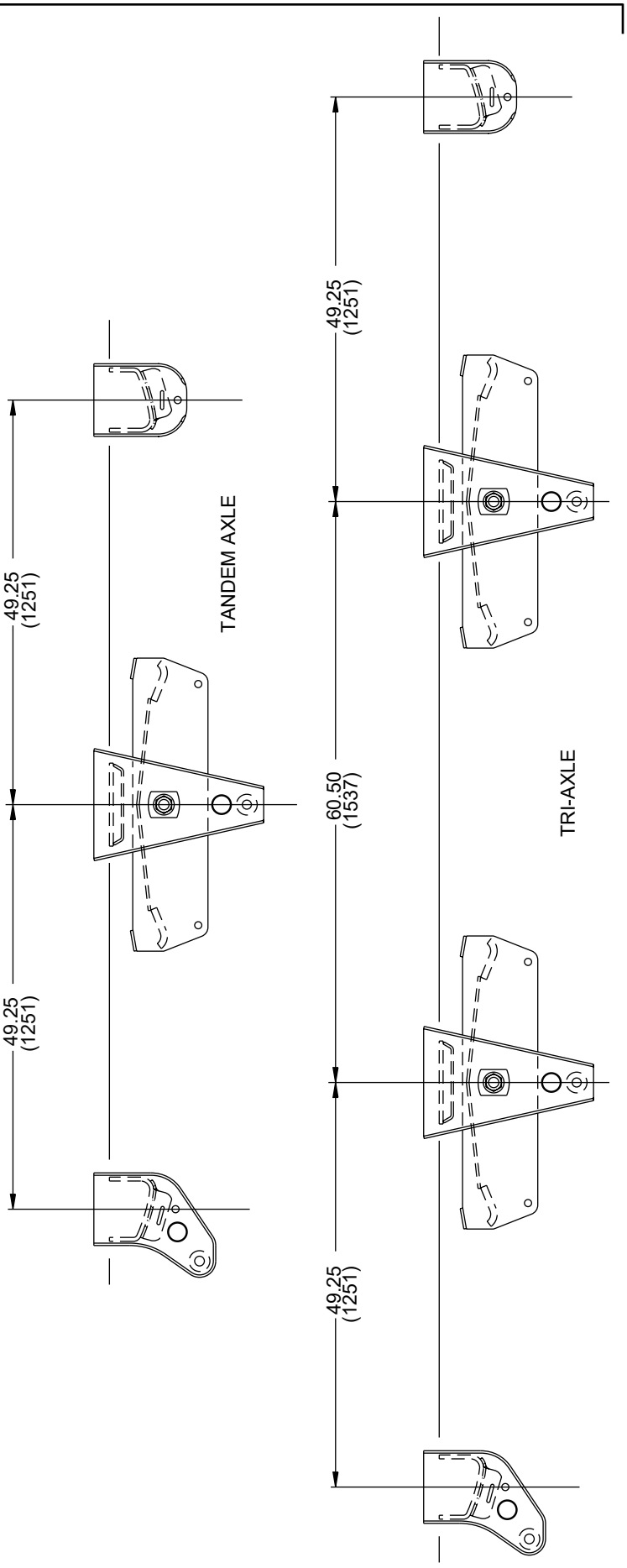
Dimensions shown in inches (millimeters)

60 1/2" Axle Spacing

Recommended hanger spacing for Model 88 tandem and tri-axle suspensions with 60 1⁄2" Axle Spacing.

Straddle mount hangers are shown. Dimensions are typical with all hanger types.

Dimensions shown in inches (millimeters)

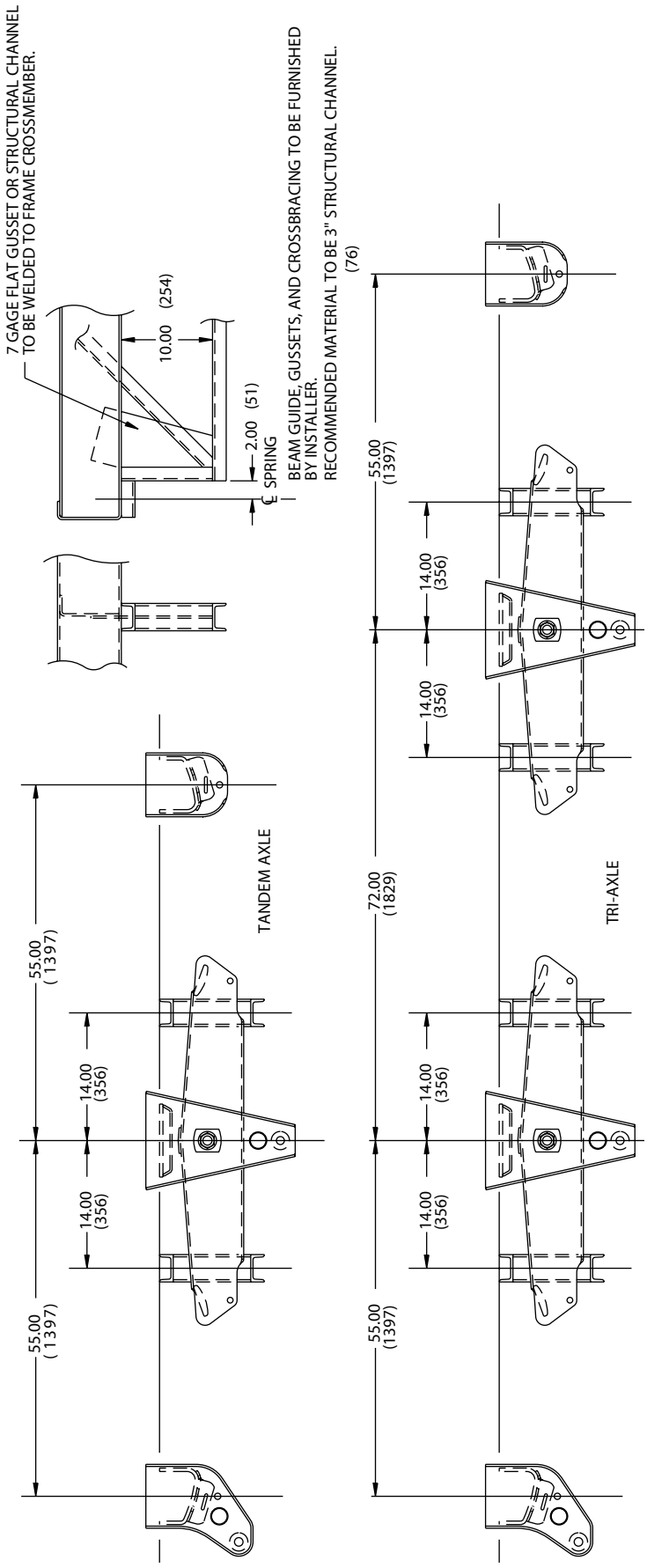


Recommended hanger spacing for Model 88 tandem and tri-axle suspensions with 72" Axle Spacing.

Straddle mount hangers are shown. Dimensions are typical with all hanger types.

Beam guide detail typical for both tandem axle and tri-axle application.

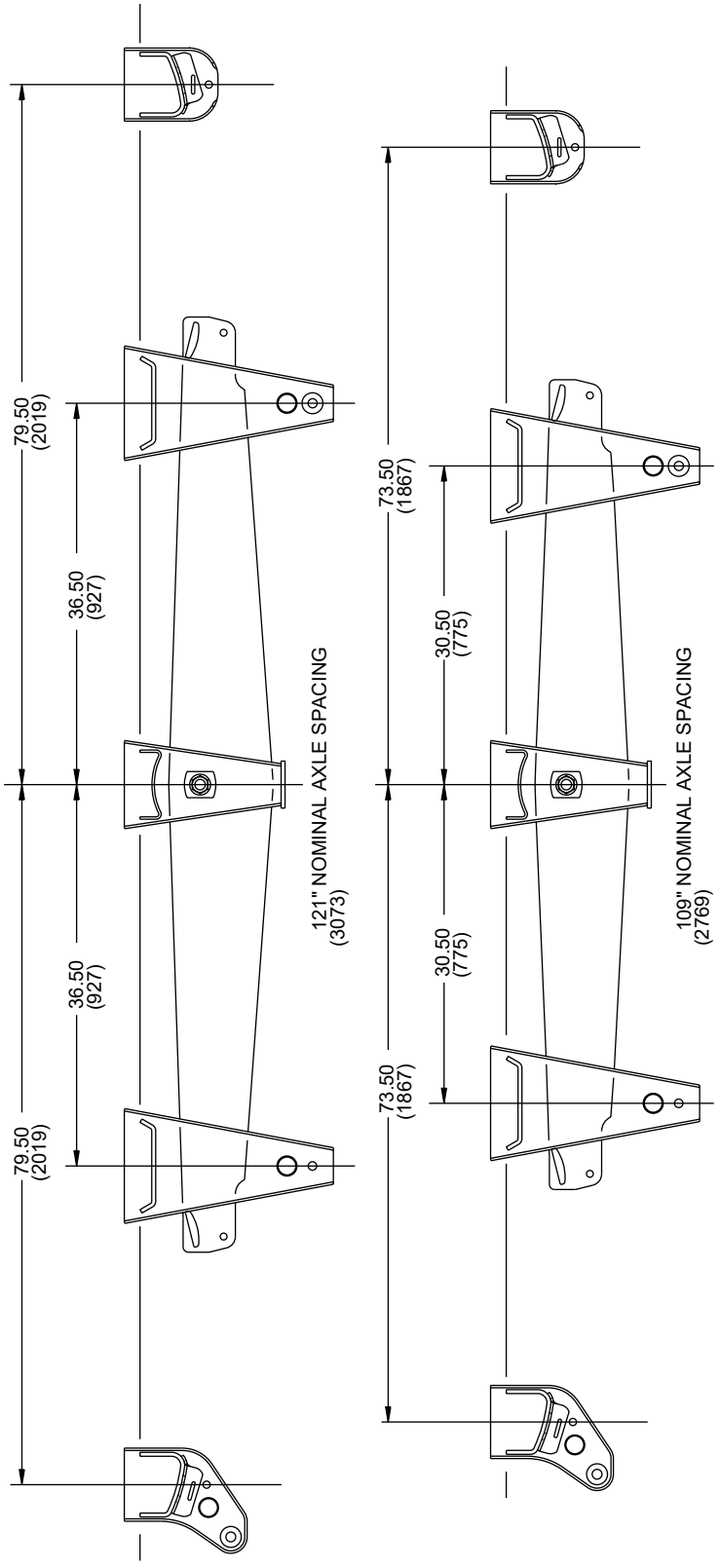
Dimensions shown in inches (millimeters)



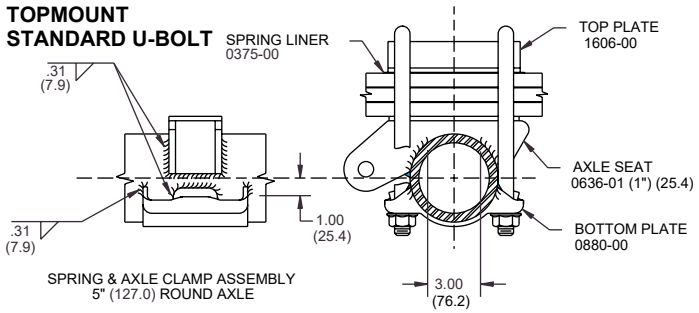
Recommended hanger spacing for Models 88 tandem suspensions with 109" and 121" Axle Spacing.

Straddle mount hangers are shown. Dimensions are typical with under mount hangers.

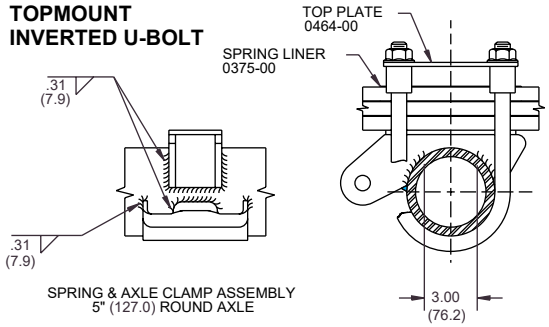
Dimensions shown in inches (millimeters)



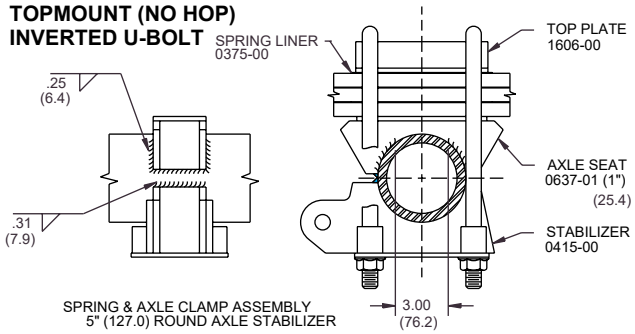
TOPMOUNT
STANDARD U-BOLT



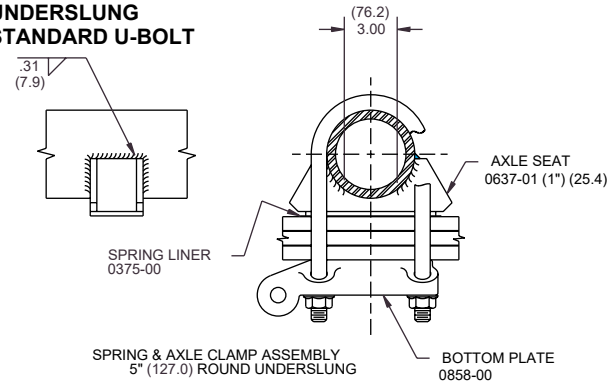
TOPMOUNT
INVERTED U-BOLT



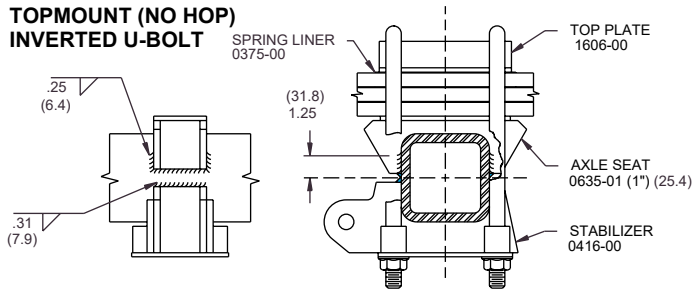
TOPMOUNT (NO HOP)
INVERTED U-BOLT



UNDERSLUNG
STANDARD U-BOLT



TOPMOUNT (NO HOP)
INVERTED U-BOLT



SPRING AND AXLE CLAMP INSTALLATION INSTRUCTIONS

Before axle seat installation, please review and follow the recommended procedures listed below.

1. Locate and mark the upper camber line on the axle.

2. Position the spring seats on the axle at the correct spring center spacing (same as transverse distance between hanger center lines). Center line of spring bolt hole must pass through the axle camber line and the upper surface of spring seats must be parallel to the ground. Clamp axle seat securely in position and tack weld to axle front and rear.
Note: Check for clearance with brake cylinder and camshaft.

3. Check fit of axle seats and bottom plates before welding.

4. Weld spring seats to axle. see below for minimum weld pattern. Contact axle manufacturer for weld requirements as to pre-heat. Electrode must meet or exceed the requirements of a.w.s. e7016.

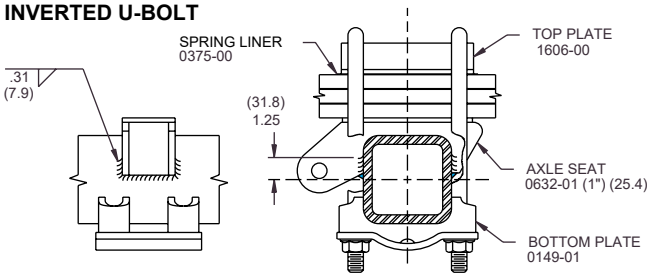
Installation Instructions Models 86/88

Position spring on spring seat. See assembly drawings for proper orientation of spring hooks. Secure the spring in place with the top and/or bottom plate, u-bolts and nuts provided. Recheck springs for proper spring spacing and alignment. For steel spring installation, tighten 7/8" (22.2) u-bolt nuts to 300-325 ft. lbs. (410-440 nm). For Delco composite spring installation, tighten 7/8" (22.2) u-bolt nuts to 250 ft. lbs. (339 nm).
Note: When spring liners are furnished, they are to be placed on top side of spring between spring and top u-bolt plate.

Tighten torque arm bolt nuts to 325-350 ft. lbs. (440-475 nm.)
Tighten 3/4-10 torque arm clamp bolt nuts (old style) to 175-200 ft. lbs. (240-275 nm)
Tighten 5/8-11 torque arm clamp bolt nuts (new style) to 125-150 ft. lbs. (175-205 nm).

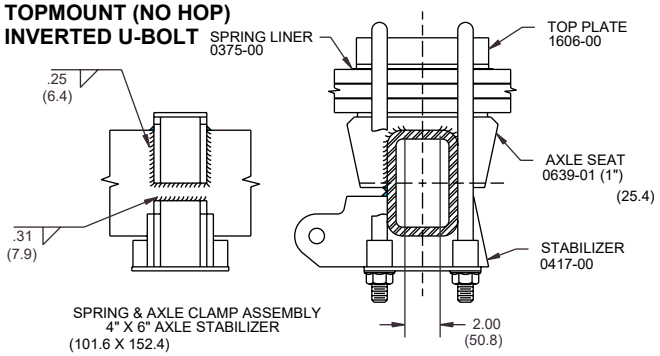
Dimensions shown in both inches and millimeters.

TOPMOUNT
INVERTED U-BOLT



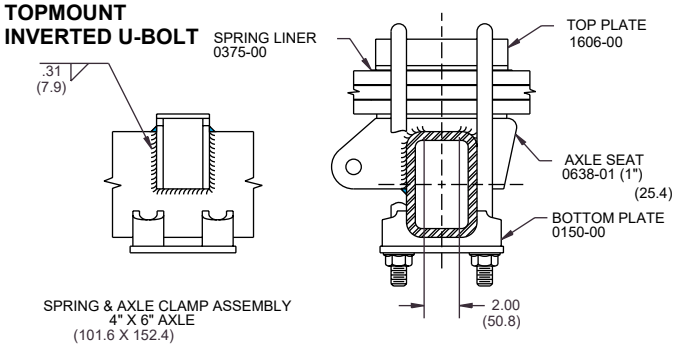
SPRING & AXLE CLAMP ASSEMBLY
5" (127.0) SQUARE AXLE

TOPMOUNT (NO HOP)
INVERTED U-BOLT

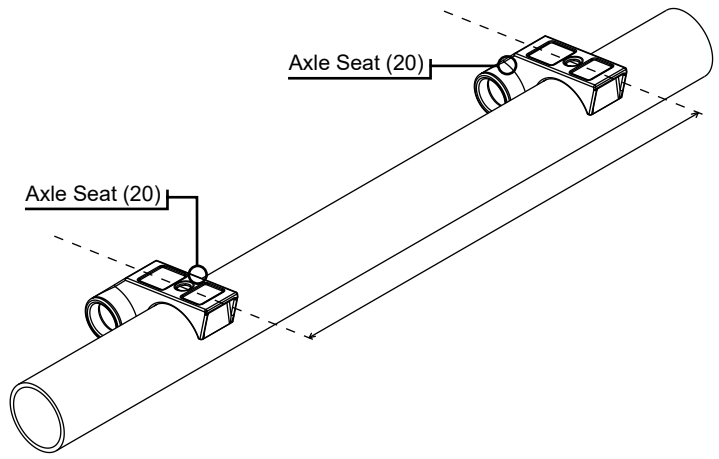


SPRING & AXLE CLAMP ASSEMBLY
4" X 6" AXLE STABILIZER
(101.6 X 152.4)

TOPMOUNT
INVERTED U-BOLT

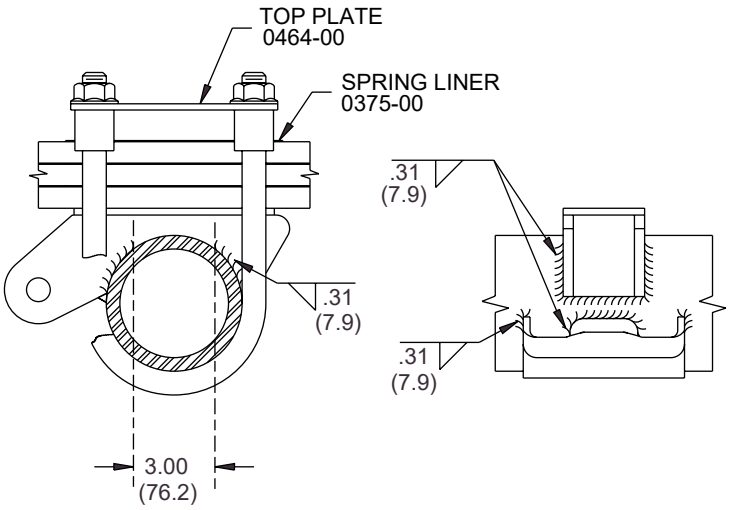


SPRING & AXLE CLAMP ASSEMBLY
4" X 6" AXLE
(101.6 X 152.4)



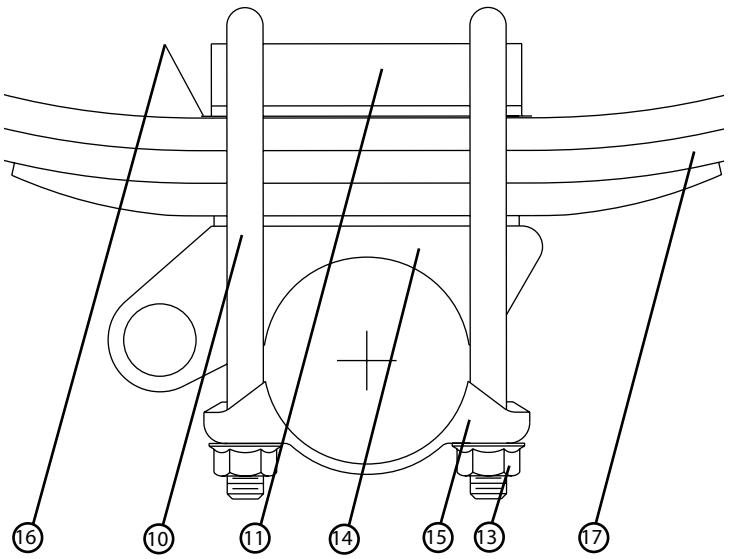
AXLE ASSEMBLY INSTALLATION

Position the spring seats (item 14) on the axle at the correct spring center spacing (same as the transverse distance between hanger centerlines as mounted to the sub-frame). The centerline of the spring bolt hole must pass through the axle camber line and the spring surface of the seats must be parallel to the ground. Clamp the seats in position securely and tack weld front and rear (not on the axle camber line).



Weld the spring seats to the axle. Electrode must meet or exceed the requirements of AWS E7018. Do not weld 1½" each side of the axle center line. At this point, the spring beams and u-bolts should not be attached to the seat.

NOTE:Refer to drawing #1000-2 (pg. 14) for welding detail

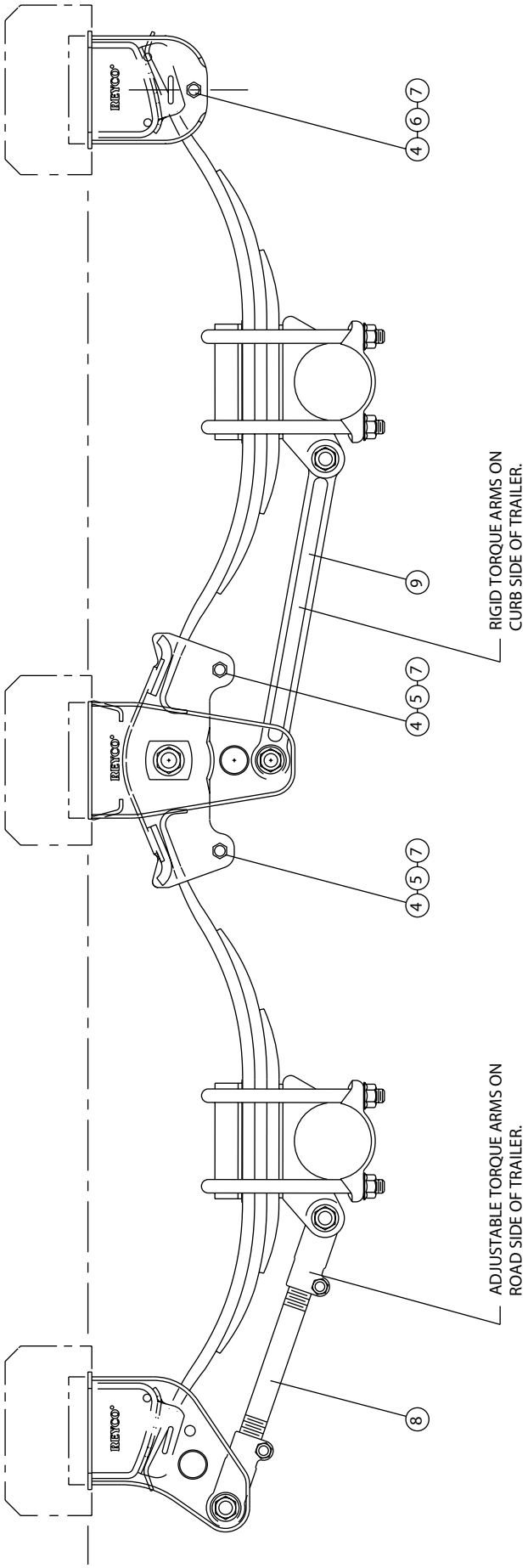


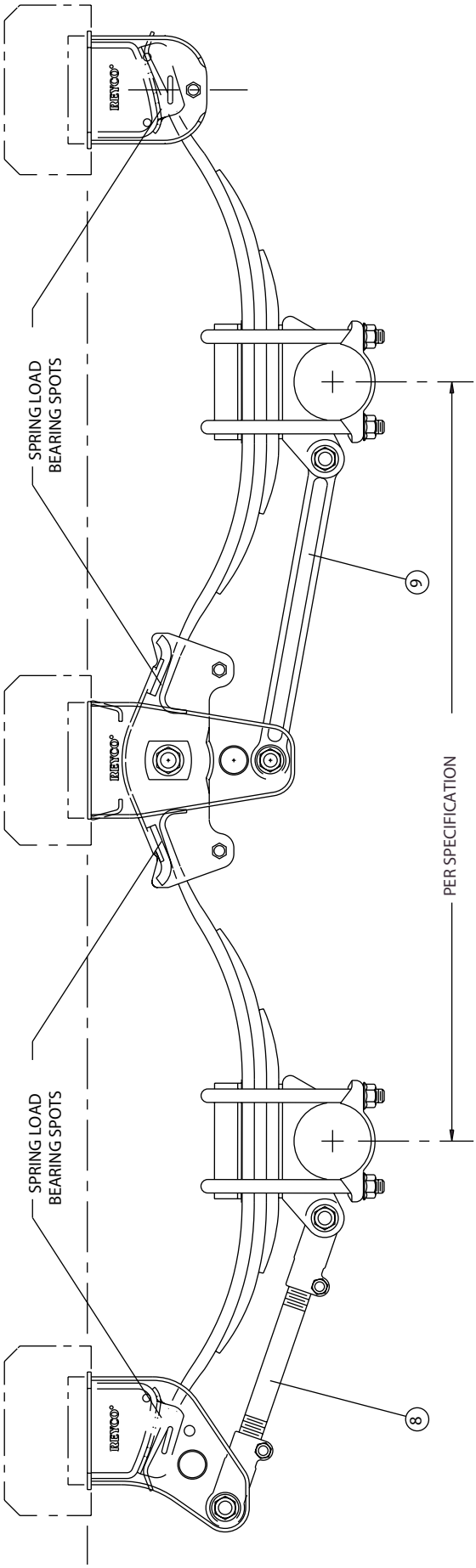
Position spring (item 17) on spring seat. See installation drawing (#2I3N pg. 21) for proper location of spring hook ends. Secure the spring in place with the top plate, u-bolts and nuts (items 11, 10 & 13) provided. Recheck springs for proper spring spacing and alignment. Tighten 3/4" or 7/8" u-bolts to 300-325 FP torque.

NOTE: Spring liners (item 16) needed on the top side only on all 1-, 2- & 3-leaf springs. If axle seat spacers are used they must be welded to axle seat, front and rear.

AXLE TO HANGER ASSEMBLY INSTALLATION AND PRELIMINARY ALIGNMENT

Position the axle and spring assembly between the hangers. Secure the torque arms (adjustable on road, left side, item 8) & (rigid on curb, right side, item 9) to the front and center hangers. Install the spring rollers (item 4) and 5⁄8" bolts in the equalizer and where required in the rear hanger.





Check to see that springs are seated, interference-free, on all bearing surfaces. Install bolts to hold torque arms. DO NOT TORQUE at this time.

Position the frame at the desired mounting height and perform preliminary rough alignment by centering axle laterally, and aligning axles squarely with respect to frame to within 1/4" (right and left compared). Torque arm attaching 7/8" bolts and nuts (supplied with the torque arms item 8 & 9) can now be torqued to 325-350 ft. lbs. (440-475 NM). Do not tighten the adjustable eye end clamp bolts at this time. See next page.

FINAL AND IN SERVICE SUSPENSION ALIGNMENT INSTRUCTIONS

The following steps are recommended and necessary for proper suspension alignment.

Release the brake system and pull the trailer forward while keeping to a straight line to free the suspension from binding. The ground must be level and smooth.

For best results the use of axle extensions and a “BAZOOKA” type king pin post, or a suitable optical alignment device are recommended. Align the front axle by lengthening or shortening adjustable torque arm (located on left side of trailer) with the king pin as shown in the sketch.

When the axles are aligned to +/- 1/8" tighten the 5⁄8" torque arm clamp nuts on the front axle to 125-150 FP (170-205 NM).

Tighten the older 3⁄4" torque arm clamp nuts to 175-200 FP (240-275 NM), if so equipped.

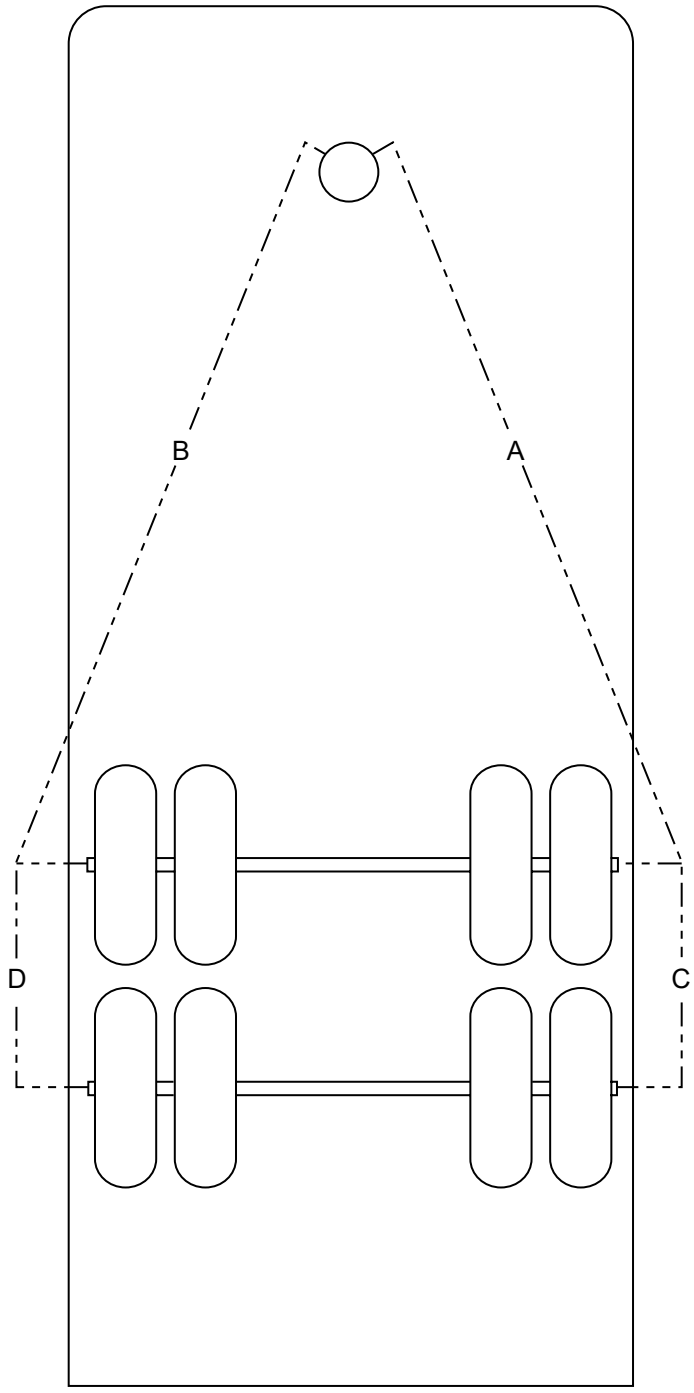
CAUTION: Specific torque requirements are recommended.

Align the rear axle with the front axle to +/- 1/16".

NOTE: Left side and right side axle measurements should be equal to within +/- 1⁄16". When the axles are aligned, tighten the adjustable torque arm clamp nuts on the rear axle to 125-150 FP (170-205 NM).

CAUTION: Specific torque requirements are recommended.

After an initial loaded run-in period of approximately 1,000 miles, (1600 km) the alignment should be rechecked and corrected if necessary.



A = B +/- 1/8
C = D +/- 1/16

Installation Instructions Models 86/88

Suspension System

Suspension System

Installation Instructions Models 86/88

The ReycoGranning Models 86 & 88 Leaf Spring Suspensions, by design requires minimum maintenance. Suspensions require periodi checks to assure continued trouble-free performance.			
RECOMMENDED MAINTENANCE SCHEDULE			
1. Pre-service inspection			
2. First service inspection, after 1,000-3,000 miles, (1600-4800 KM).			
3. "C" Inspections-Annually.			
4. During replacement of any service parts.			
5. Upon discovery of any loose components.			
TORQUE REQUIREMENTS (Verify with each inspection.)			
1. Tighten 7/8" U-bolt nut	300-325 FP	410-440 NM	
2. Tighten 1"-14 equalizer thru bolt	500-525 FP	680-715 NM	
3. Tighten 7/8" torque arm bolt nuts	400-425 FP	545-580 NM	
4. Tighten 5/8" torque arm clamp nuts	125-150 FP	170-205 NM	
5. Tighten 5/8"-18 spring retainer nuts (Spring Retainers should freely roll in hangers and equalizers.)		25-30 FP	35-41 NM
VISUAL INSPECTION			
1. Loose or missing fasteners.			
2. Cracks in hangers or axle connection brackets.			
3. Springs, not centered in hangers and equalizers.			
If any of the above defects are noted, have vehicle checked by a qualified mechanic. Torque values are specified with clean, li fasteners, and should only be verified with a quality calibrated torque wrench. Failure to follow these instructions may lead to could result in subsequent injury.			

ft lb = Foot - Pounds; Nm = Newton - Meters

MAINTENANCE KIT

The following item numbers will help when maintaining parts for the model 86/88 suspension.

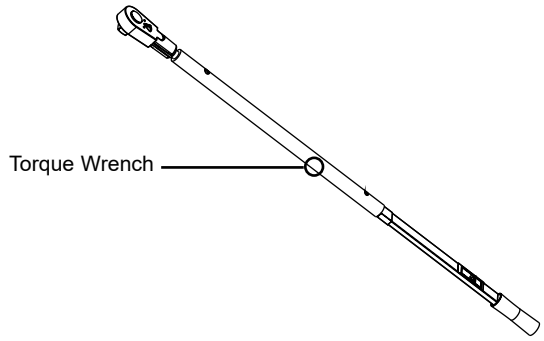
K0022-01 - Torque Arm Rebush Kit - (One End)

K0045-00 - Hanger Replacement Wear Pads - (Front & Rear)

K0649-04 - Equalizer Bushing Kit - (One Equalizer)

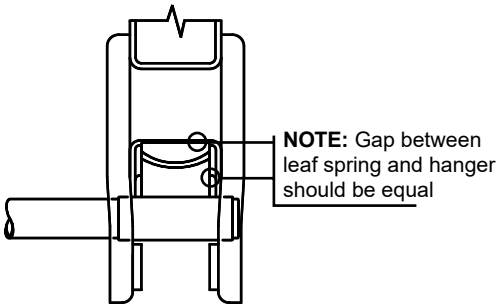
K0741-00 - Equalizer Spring Roller Assembly - (One Assembly)

K0741-05 - Hanger Spring Roller Assembly - (One Hanger)



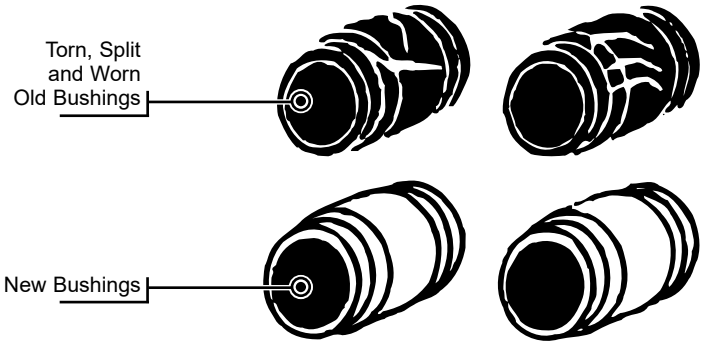
FASTENERS

Loose fasteners need immediate attention. Check components for wear and be sure holes are not worn or egg shaped. When replacing, be sure threads are clean, lightly oiled and not deformed. Consult the maintenance section for the correct torque specification. To insure an accurate torque reading, the torque tool used for checking torque, must provide a correct measurement.



ALIGNMENT

The alignment procedure is found on page 17 of the installation instructions. Check the alignment after the first 1,000 - 3,000 loaded-miles, (1,600-4,800 KMS) of operation and at twelve (12) month intervals thereafter.



BUSHINGS

Inspect rubber bushings for large splits, tears and major wear. Rubber is attacked by sun, oils and greases. Replace any bushings which have noted damage.

WEAR PAD REPLACEMENT PROCEDURE

Front Hanger-

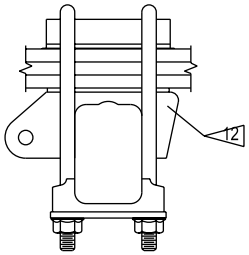
1. Remove 7⁄8" front hanger torque arm bolts and move axle rearward so that spring end is clear of the wear pad area. (If 5⁄8" spring retainer bolts are installed, these must be removed also).
2. Torch cut 2" slots on each side of hanger and plug welds on centerline of wear pad. With hammer & chisel remove remaining portion of wear pad. Use small die grinder to smooth areas where slot and plug welds were removed.
3. Position new wear pad and weld in place. Use jack to move spring & axle forward into hanger. Move axle forward and reinstall torque arm bolts and spring retainer bolts.

Rear Hanger-

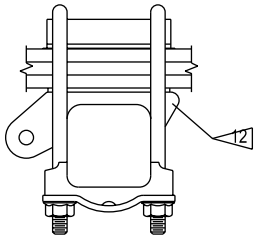
1. Remove the spring retainer bolts, and move spring and axle forward.
2. Follow as above from step 2 on.

Warning: In all cases, protect springs from weld spatter and nicks.

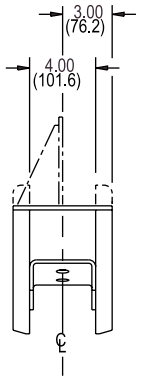
Drawing - 213N



AXLE CLAMP GROUP
4" X 6" AXLE
(101.6 X 152.4)



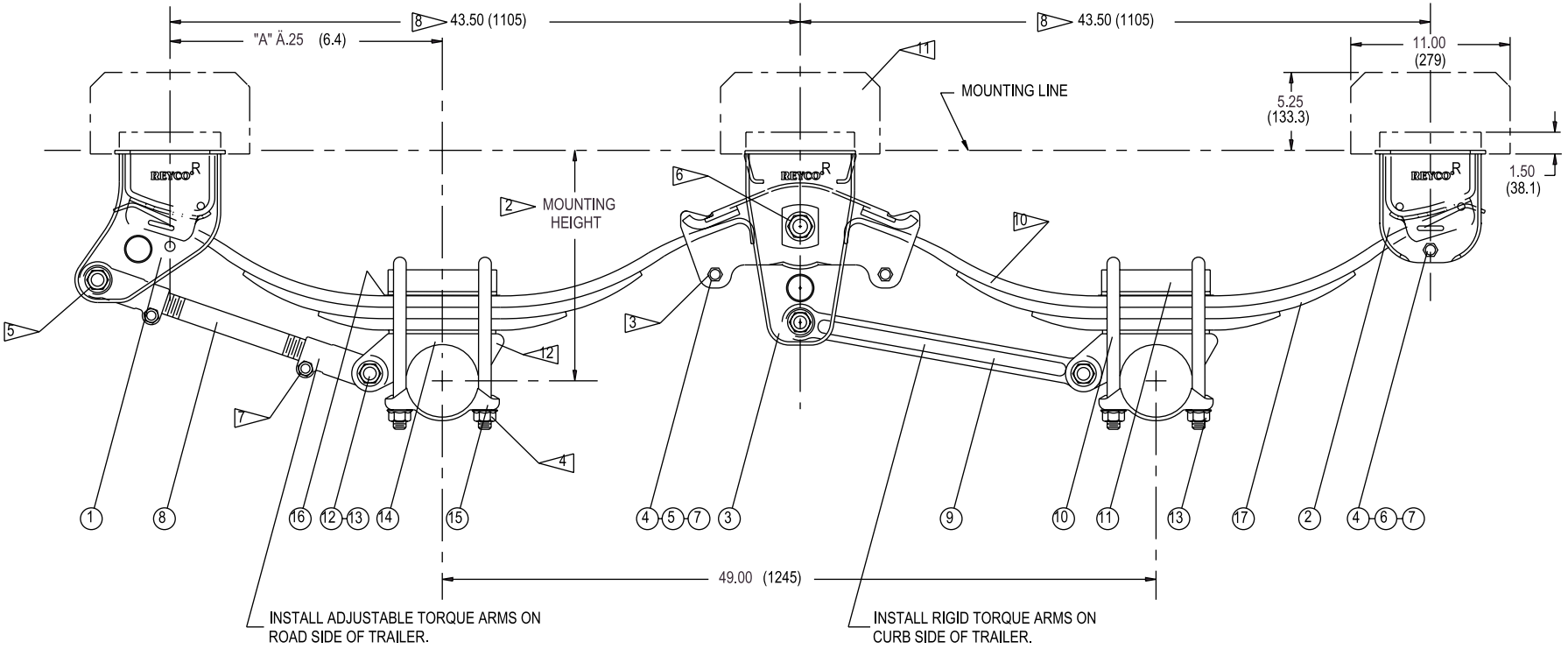
AXLE CLAMP GROUP
5" X 5" AXLE
(127.0 X 127.0)



REAR VIEW OF HANGER.
SPRING AND CLAMP COMPONENTS
NOT SHOWN.

NOTES:

1. DIMENSIONS ARE SHOWN IN INCHES AND MILLIMETERS.
2. MOUNTING HEIGHT SHOWN NOMINAL AND UNLOADED, TOLERANCE Ä.25" (6.4).
3. TIGHTEN 5/8" (15.9) SPRING RETAINER NUTS TO 25-30 FT. LBS. (35-41 NM). SPRING RETAINER ROLLERS SHOULD ROLL FREELY ON RETAINER BOLT.
4. TIGHTEN 7/8" (22.2) U-BOLT NUTS TO 300-325 FT. LBS. (410-440 NM). CHECK PERIODICALLY.
5. TIGHTEN 7/8" (22.2) TORQUE ARM BOLT NUTS TO 325-350 FT. LBS. (440-475 NM). CHECK PERIODICALLY.
6. 1" (25.4) EQUALIZER BOLT NUTS ARE PRE-ASSEMBLED AND TORQUED TO 480-500 FT. LBS. (650-680 NM). CHECK PERIODICALLY.
7. TIGHTEN 3/4" (19.1) TORQUE ARM CLAMP BOLT NUTS TO 175-200 FT. LBS. (240-275 NM). TIGHTEN 5/8" (15.9) TORQUE ARM CLAMP BOLT NUTS TO 125-150 FT. LBS. (170-205 NM). CHECK PERIODICALLY.
8. HANGER SPACING TOLERANCE TO BE HELD TO Ä.06" (1.6).
9. REFER TO 1000 SERIES INSTALLATION INSTRUCTIONS FOR RECOMMENDED WELDING AND INSTALLATION PRACTICES.
10. INSTALL THREE LEAF SPRINGS WITH FULL HOOK END IN EQUALIZER BEAM.
11. UNDERMOUNT/SIDEMOUNT HANGERS SHOWN. STRADDLEMOUNT AND FLANGEMOUNT HANGERS DRAWN IN PHANTOM.
12. STANDARD 1" (25.4) HIGH AXLE SEATS ARE SHOWN. AXLE SEAT HEIGHTS TO 4" (101.6) IN .50" (12.7) INCREMENTS ARE AVAILABLE.



ReycoGranning Models 86 & 88			
Parts List Drawing No. 2I3N			
ITEM	PART	NUMBER #	DESCRIPTION
1	Variable	2	Front Hanger, see below
2	Variable	2	Rear Hanger, see below
3	Variable	2	Equalizer Hanger & Beam Assembly, see below
4	0741-01	6	Spring Roller 4" O.D. Tube
5	0001-04	4	Bolt 5/8"-18 x 4 1/2", Equalizer Beam
6	0001-02	2	Bolt 5/8"-18 x 5 1/2", Hanger
7	0002-07	6	Locknut 5/8-18
8	1035-20	2	Adjustable Torque Arm 8" 7
9	0075-20	2	Rigid Torque Arm, 8" 7
10	Variable	8	U-bolt 7/8-14, 3" dia. bend-lengths variable, see page 29 & 30
11	23334-01	4	Top Plate
12	0001-08	8	Bolt 7/8"-14 x 5 1/4" Long
13	0002-12	24	Flange Locknut 7/8"-14
14	Variable	4	Axle Seat, see page 25
15	Variable	4	Bottom Plate, see page 25
16	16810-02	4	Spring Liner, Only on 1 & 3 Leaf Springs
17	Variable	4	Spring, see page 25, 26, 27 or 28

* NOTE: Variables are listed on tables-on page 23 & 24.

HANGER SELECTION TABLE					
Position	Model	Left/Right Side	Front	Rear	Equalizer/Beam Ass
Straddle Mount	86	n/a	0046-00	0051-00	0658-00
	88	n/a	0046-20	0051-20	0653-00
Under Mount	86	n/a	0049-00	0053-00	0659-00
	88	n/a	0084-00	0086-00	0651-00
Flange Mount	86	left	0311-01	0313-01	0657-00
		right	0311-02	0313-02	
	88	left	0400-01	0402-01	0652-00
		right	0400-02	0402-02	
Side Mount	88	left	0894-01	0952-01	0896-00
		right	0894-02	0952-02	

AXLE SEAT SELECTION TABLE			
Part No.	Height	Axle Style	Bottom Plate
0636-01	1"	5" Round	0880-00
0636-015	1 1/2"		
0636-02	2"		
0636-025	2 1/2"		
0636-03	3"		
0636-035	3 1/2"		
0636-04	4"		
0632-01	1"	5" Square	0149-00
0632-015	1 1/2"		
0632-02	2"		
0632-025	2 1/2"		
0632-03	3"		
0632-035	3 1/2"		
0632-04	4"		
0638-01	1"	4" x 6" Square	0150-00
0638-015	1 1/2"		
0638-02	2"		
0638-025	2 1/2"		
0638-03	3"		
0638-035	3 1/2"		
0638-04	4"		

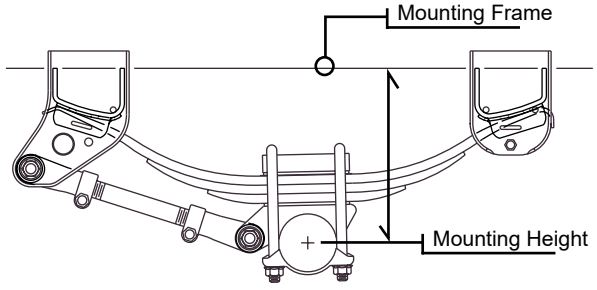
U-BOLT SELECTION TABLE	
Length	Part No.
11"	08492-01
12"	08494-01
13"	08495-01
13 1/2"	09009-01
14"	08496-01
14 1/2"	08497-01
15"	08498-01
16"	08500-01
17"	08502-01
All u-bolts on this table are 7/8"-14 x Length, with a 3" dia. bend.	

SPRING SELECTION TABLE		
Part No.	Arch	Capacity
0079-01	High	11,000#
0079-02	Low	
0693-00	Medium	
0724-00	High	12,500#
0954-00	Low	
All listed springs are 3-leaf, see pages 24, 25, & 26 for other options contact ReycoGranning Customer Service.		

SINGLE AXLE SUSPENSIONS MOUNTING HEIGHT CHART

TYPE SPRING	AXLE SEAT HEIGHT	5" DIAMETER & 5"x 5" SQUARE							
		1" US	1"	1.5"	2"	2.5"	3"	3.5"	4"
Single Leaf, Low Arch Spring No. 0179-02 11,000 Lbs. Capacity	Spring Weight 37 Lbs.	4.00"	12.50"	13.00"	13.50"	14.00"	14.50"	15.00"	15.50"
Single Leaf, High Arch Spring No. 0179-01 11,000 Lbs. Capacity	38 Lbs.	7.00"	15.25"	15.75"	16.25"	16.75"	17.25"	17.75"	18.25"
Single Leaf, High Arch Spring No. 0714-00 12,500 Lbs. Capacity	45 Lbs.	6.75"	15.25"	15.75"	16.25"	16.75"	17.25"	17.75"	18.25"
Three Leaf, Low Arch Spring No. 0079-02 11,000 Lbs. Capacity	53 Lbs.	2.75"	12.25"	12.75"	13.25"	13.75"	14.25"	14.75"	15.25"
Three Leaf, Low Arch Spring No. 0954-00 12,500 Lbs. Capacity	64 Lbs.	2.25"	12.25"	12.75"	13.25"	13.75"	14.25"	14.75"	15.25"
Three Leaf, Medium Arch Spring No. 0693-00 11,000 Lbs. Capacity	55 Lbs.	4.25"	13.75"	14.25"	14.75"	15.25"	15.75"	16.25"	16.75"
Three Leaf, High Arch Spring No. 0079-01 11,000 Lbs. Capacity	55 Lbs.	5.50"	15.00"	15.50"	16.00"	16.50"	17.00"	17.50"	18.00"
Three Leaf, High Arch Spring No. 0724-00 12,500 Lbs. Capacity	66 Lbs.	5.25"	15.25"	15.75"	16.25"	16.75"	17.25"	17.75"	18.25"
Eight Leaf, Medium Arch Spring No. 0178-03 11,000 Lbs. Capacity	95 Lbs.	3.00"	14.00"	14.50"	15.00"	15.50"	16.00"	16.50"	17.00"
Eight Leaf, High Arch Spring No. 0178-01 11,000 Lbs. Capacity	95 Lbs.	4.25"	15.25"	15.75"	16.25"	16.75"	17.25"	17.75"	18.25"
Nine Leaf, Medium Arch Spring No. 0723-00 12,500 Lbs. Capacity	108 Lbs.	2.75"	14.00"	14.50"	15.00"	15.50"	16.00"	16.50"	17.00"

1. Mounting heights shown are nominal, free and not loaded, variations of –0.25" can be expected.
2. Mounting heights shown are with straddle mount hangers. For undermount or flangemount hangers, add 0.25" to above figures.
3. 4x6 Axles: Underslung - Not available
   Overslung - Add 0.50" to above.
4. Hanger spacing must be 38.00" when using 9-leaf spring.



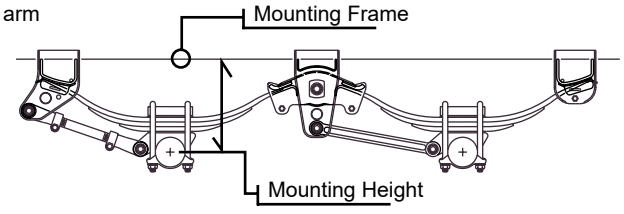
TANDEM AXLE SUSPENSIONS MOUNTING HEIGHT CHART

TYPE SPRING	AXLE SEAT HEIGHT	5" DIAMETER & 5"x 5"							
		1" US	1"	1.5"	2"	2.5"	3"	3.5"	4"
Single Leaf, Low Arch Spring No. 0179-02 11,000 Lbs. Capacity	Spring Weight 37 Lbs.	4.50"	13.00"	13.50"	14.00"	14.50"	15.00"	15.50"	16.00"
Single Leaf, High Arch Spring No. 0179-01 11,000 Lbs. Capacity	38 Lbs.	7.25"	15.75"	16.25"	16.75"	17.25"	17.75"	18.25"	18.75"
Single Leaf, High Arch Spring No. 0714-00 12,500 Lbs. Capacity	45 Lbs.	7.25"	15.75"	16.25"	16.75"	17.25"	17.75"	18.25"	18.75"
Three Leaf, Low Arch Spring No. 0079-02 11,000 Lbs. Capacity	53 Lbs.	3.25"	12.75"	13.25"	13.75"	14.25"	14.75"	15.25"	15.75"
Three Leaf, Low Arch Spring No. 0954-00 12,500 Lbs. Capacity	64 Lbs.	2.75"	12.75"	13.25"	13.75"	14.25"	14.75"	15.25"	15.75"
Three Leaf, Medium Arch Spring No. 0693-00 11,000 Lbs. Capacity	55 Lbs.	4.75"	14.25"	14.75"	15.25"	15.75"	16.25"	16.75"	17.25"
Three Leaf, High Arch Spring No. 0079-01 11,000 Lbs. Capacity	55 Lbs.	6.00"	15.75"	16.25"	16.75"	17.25"	17.75"	18.25"	18.75"
Three Leaf, High Arch Spring No. 0724-00 12,500 Lbs. Capacity	66 Lbs.	5.75"	15.75"	16.25"	16.75"	17.25"	17.75"	18.25"	18.75"
Six Leaf, High Arch Spring No. 1033-01** 10,000 Lbs. Capacity	64 Lbs.	5.25"	15.25"	15.75"	16.25"	16.75"	17.25"	17.75"	18.25"
Eight Leaf, Medium Arch Spring No. 0178-03 11,000 Lbs. Capacity	95 Lbs.	3.75"	14.75"	15.25"	15.75"	16.25"	16.75"	17.25"	17.75"
Eight Leaf, High Arch Spring No. 0178-01 11,000 Lbs. Capacity	95 Lbs.	4.75"	15.75"	16.25"	16.75"	17.25"	17.75"	18.25"	18.75"
Nine Leaf, Medium Arch Spring No. 0723-00 12,500 Lbs. Capacity	108 Lbs.	3.00"	14.50"	15.00"	15.50"	16.00"	16.50"	17.00"	17.50"

1. Mounting heights shown are nominal, free and not loaded, variations of – 0.25" can be expected.
2. Mounting heights shown are with straddle mount hangers. For undermount or flangemount hangers, add 0.25" to above figures.
3. 4x6 Axles: Underslung - Not available
   Overslung - Add 0.50" to above.
4. Mounting heights on No-Hop units not recommended over 16.00".

** Spring for 44" axle spacing.

*** Standard applications only. "No Hop" applications require torque arm and rear hanger modifications. Contact Reyco Engineering.

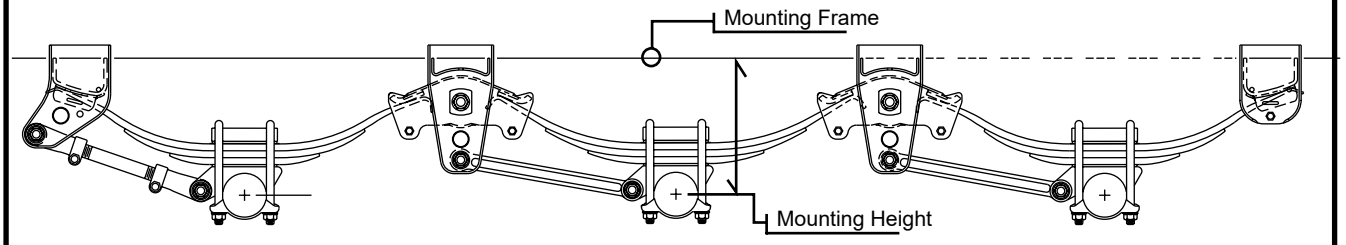


TRI-AXLE SUSPENSIONS MOUNTING HEIGHT CHART

TYPE SPRING	AXLE SEAT HEIGHT	5" DIAMETER & 5"x 5" 1" US	1"	1.5"	2"	2.5"	3"	3.5"	4"
Single Leaf, Low Arch, Part No. 0179-02, 5555-00 (Center Axle) 11,000 Lbs. Capacity Each	Spring Weight 37 Lbs.	4.50"	13.00"	13.50"	14.00"	14.50"	15.00"	15.50"	16.00"
Single Leaf, High Arch, Part No. 0179-01, 0331-00 (Center Axle) 11,000 Lbs. Capacity Each	38 Lbs.	7.25"	15.75"	16.25"	16.75"	17.25"	17.75"	18.25"	18.75"
Three Leaf, Low Arch, Part No. 0079-02, 0335-00 (Center Axle) 11,000 Lbs. Capacity Each	53 Lbs.	3.25"	12.75"	13.25"	13.75"	14.25"	14.75"	15.25"	15.75"
Three Leaf, Medium Arch, Part No. 0693-00, 0694-00 (Center Axle) 11,000 Lbs. Capacity Each	55 Lbs.	4.75"	14.25"	14.75"	15.25"	15.75"	16.25"	16.75"	17.25"
Three Leaf, High Arch, Part No. 0079-01, 0329-00 (Center Axle) 11,000 Lbs. Capacity Each	55 Lbs.	6.00"	15.75"	16.25"	16.75"	17.25"	17.75"	18.25"	18.75"
Six Leaf, High Arch, Part No. 1033-01, (Front, Center, and Rear) 10,000 Lbs. Capacity Each	64 Lbs.	5.25"	15.25"	15.75"	16.25"	16.75"	17.25"	17.75"	18.25"
Eight Leaf, Medium Arch, Part No. 0178-03, 1562-00 (Center Axle) 11,000 Lbs. Capacity Each	95 Lbs.	3.75"	14.75"	15.25"	15.75"	16.25"	16.75"	17.25"	17.75"
Eight Leaf, High Arch, Part No. 0178-01, 0330-00 (Center Axle) 11,000 Lbs. Capacity	95 Lbs.	4.75"	15.75"	16.25"	16.75"	17.25"	17.75"	18.25"	18.75"
Nine Leaf, Medium Arch, Part No. 0723-00 (Front, Center, and Rear) 12,500 Lbs. Capacity Each	108 Lbs.	3.00"	14.50"	15.00"	15.50"	16.00"	16.50"	17.00"	17.50"

1. Mounting heights shown are nominal, free and not loaded, variations of – 0.25" can be expected.
2. Mounting heights shown are with straddle mount hangers. For undermount or flangemount hangers, add 0.25" to above figures.
3. 4x6 Axles: Underslung - Not available
   Overslung - Add 0.50" to above.
4. Mounting heights on No-Hop units not recommended above 16.00".
5. The 1033-01 Six leaf spring is used on units with 44" axle spacing. Mounting heights for the 1033-01 spring reflect seat heights on the center axle. Front and rear axles must use 0.50" higher seats (overslung) and 0.50" lower seats (underslung) to maintain a consistant mounting height throughout the suspension.

*** Standard applications only "No Hop" Applications require torque arm and rear hanger modifications. Contact Reyco Engineering.

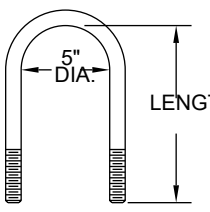


U-BOLT LENGTH CHART - HEAVY DUTY CLAMP GROUPS (BD PREFIX)

SPRING PART NUMBER	TYPE	1" SEAT	1 1/2" SEAT	2" SEAT	2 1/2" SEAT	3" SEAT	3 1/2" SEAT	4" SEAT
		5" ROUND AXLE WITH INVERTED U-BOLTS, 3" DIA. BEND						
0179-01/02, 0714-00	1 LEAF	10"	11"	11"	12"	12"	13"	13"
1600-02	2 LEAF	11"	12"	12"	13"	13"	13 1/2"	14"
0079-01/02, 0693-00	3 LEAF	11"	12"	12"	13"	13"	13 1/2"	14"
0724-00, 0954-00	3 LEAF	12"	12"	13"	13"	13 1/2"	14"	14 1/2"
1033-01 *	6 LEAF	12"	12"	13"	13"	13 1/2"	14"	14 1/2"
0178-01/03	8 LEAF	13"	13"	13 1/2"	14"	14 1/2"	15"	16"
0723-00	9 LEAF	13"	13 1/2"	14"	14 1/2"	15"	16"	16"
		5" ROUND AXLE WITH NO-HOP FEATURE (REAR AXLE ONLY), 3" DIA. BEND 5" SQUARE AXLE SAME AS 5" ROUND - ADDITIONAL 1" STACK HEIGHT FOR 4"X 6" AXLE						
0179-01/02, 0714-00	1 LEAF	13"	13"	13 1/2"	14"	14 1/2"	15"	16"
1600-02	2 LEAF	13 1/2"	14"	14 1/2"	15"	16"	16"	17"
0079-01/02, 0693-00	3 LEAF	13 1/2"	14"	14 1/2"	15"	16"	16"	17"
0724-00, 0954-00	3 LEAF	14"	14 1/2"	15"	16"	16"	17"	17"
1033-01 *	6 LEAF	14"	14 1/2"	15"	16"	16"	17"	17"
0178-01/03	8 LEAF	15"	16"	16"	17"	17"	18"	18"
0723-00	9 LEAF	16"	16"	17"	17"	18"	18"	N/A
		5" ROUND AXLE WITH CONVENTIONAL U-BOLT CONFIGURATION, 5" DIA. BEND						
0179-01/02, 0714-00	1 LEAF	10"	11"	11"	12"	12"	13"	13"
1600-02	2 LEAF	11"	12"	12"	13"	13"	13 1/2"	14"
0079-01/02, 0693-00	3 LEAF	11"	12"	12"	13"	13"	13 1/2"	14"
0724-00, 0954-00	3 LEAF	12"	12"	13"	13"	13 1/2"	14"	15"
1033-01 *	6 LEAF	12"	12"	13"	13"	13 1/2"	14"	15"
0178-01/03	8 LEAF	13"	13"	13 1/2"	14"	15"	15"	16"
0723-00	9 LEAF	13"	13 1/2"	14"	15"	15"	16"	16"
		5" ROUND AXLE - UNDERSLUNG CONFIGURATION, 5" DIA. BEND						
0179-01/02, 0714-00	1 LEAF	13"	13"	13 1/2"	N/A	N/A	N/A	N/A
1600-02	2 LEAF	12"	12"	13"	N/A	N/A	N/A	N/A
0079-01/02, 0693-00	3 LEAF	12"	12"	13"	N/A	N/A	N/A	N/A
0724-00, 0954-00	3 LEAF	12"	13"	13"	N/A	N/A	N/A	N/A
1033-01 *	6 LEAF	12"	13"	13"	N/A	N/A	N/A	N/A
0178-01/03	8 LEAF	13"	13 1/2"	14"	N/A	N/A	N/A	N/A
0723-00	9 LEAF	13 1/2"	14"	15"	N/A	N/A	N/A	N/A
		5" SQUARE AXLE WITH INVERTED U-BOLT CONFIGURATION, 3" DIA. BEND ADDITIONAL 1" STACK HEIGHT FOR 4"X 6" AXLE						
0179-01/02, 0714-00	1 LEAF	12"	12"	13"	13"	13 1/2"	14"	14 1/2"
1600-02	2 LEAF	12"	13"	13"	13 1/2"	14"	14 1/2"	15"
0079-01/02, 0693-00	3 LEAF	13"	13"	13 1/2"	14"	14 1/2"	15"	16"
0724-00, 0954-00	3 LEAF	13"	13 1/2"	14"	14 1/2"	15"	16"	16"
1033-01 *	6 LEAF	13"	13 1/2"	14"	14 1/2"	15"	16"	16"
0178-01/03	8 LEAF	14"	14 1/2"	15"	16"	16"	17"	17"
0723-00	9 LEAF	14 1/2"	15"	16"	16"	17"	17"	18"

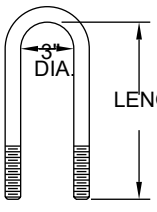
*6 LEAF 10,000# CAPACITY SPRING FOR 44" AXLE SPACING

5" DIA. BEND U-BOLT PART NUMBERS



PART NO.	LENGTH
08507-01	10"
08509-01	11"
08511-01	12"
08513-01	13"
08514-01	13 1/2"
08515-01	14"
08517-01	15"
08520-01	16"
08523-01	17"

3" DIA. BEND U-BOLT PART NUMBERS



PART NO.	LENGTH
08491-01	10"
08492-01	11"
08494-01	12"
08495-01	13"
09009-01	13 1/2"
08496-01	14"
08497-01	14 1/2"
08498-01	15"
08500-01	16"
08502-01	17"
08504-01	18"

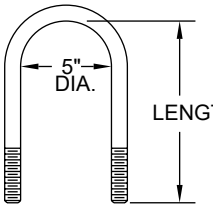
U-BOLT LENGTH CHART - HEAVY DUTY CLAMP GROUPS (BD PREFIX)

SPRING PART NUMBER	TYPE	* 1" SEAT	* 1 1/2" SEAT	* 2" SEAT	* 2 1/2" SEAT	* 3" SEAT	* 3 1/2" SEAT	* 4" SEAT
5" ROUND AXLE WITH INVERTED U-BOLTS, 3" DIA. BEND								
0179-01/02	1 LEAF	10"	11"	11"	12"	12"	13"	13"
0714-00	1 LEAF	11"	11"	12"	12"	13"	13"	13 1/2"
1600-02	2 LEAF	11"	12"	12"	13"	13"	13 1/2"	14"
0079-01/02, 0693-00	3 LEAF	11"	12"	12"	13"	13"	13 1/2"	14"
0724-00, 0954-00	3 LEAF	12"	12"	13"	13"	13 1/2"	14"	14 1/2"
1033-01 **	6 LEAF	12"	12"	13"	13"	13 1/2"	14"	14 1/2"
0178-01/03	8 LEAF	13"	13"	13 1/2"	14"	14 1/2"	15"	16"
0723-00	9 LEAF	13"	13 1/2"	14"	14 1/2"	15"	16"	16"
5" ROUND AXLE WITH NO-HOP FEATURE (REAR AXLE ONLY), 3" DIA. BEND 5" SQUARE AXLE SAME AS 5" ROUND - ADDITIONAL 1" STACK HEIGHT FOR 4"X 6" AXLE								
0179-01/02, 0714-00	1 LEAF	13"	13"	13 1/2"	14"	14 1/2"	15"	16"
1600-02	2 LEAF	13"	13 1/2"	14"	14 1/2"	15"	16"	16"
0079-01/02, 0693-00	3 LEAF	13 1/2"	14"	14 1/2"	15"	16"	16"	17"
0724-00, 0954-00	3 LEAF	14"	14 1/2"	15"	16"	16"	17"	17"
1033-01 **	6 LEAF	14"	14 1/2"	15"	16"	16"	17"	17"
0178-01/03	8 LEAF	15"	16"	16"	17"	17"	18"	18"
0723-00	9 LEAF	16"	16"	17"	17"	18"	18"	N/A
5" ROUND AXLE WITH CONVENTIONAL U-BOLT CONFIGURATION, 5" DIA. BEND								
0179-01/02, 0714-00	1 LEAF	10"	11"	11"	12"	12"	13"	13"
1600-02	2 LEAF	11"	12"	12"	13"	13"	13 1/2"	14"
0079-01/02, 0693-00	3 LEAF	11"	12"	12"	13"	13"	13 1/2"	14"
0724-00, 0954-00	3 LEAF	12"	12"	13"	13"	13 1/2"	14"	15"
1033-01 **	6 LEAF	12"	12"	13"	13"	13 1/2"	14"	15"
0178-01/03	8 LEAF	13"	13"	13 1/2"	14"	15"	15"	16"
0723-00	9 LEAF	13"	13 1/2"	14"	15"	15"	16"	16"
5" ROUND AXLE - UNDERSLUNG CONFIGURATION, 5" DIA. BEND								
1600-02	2 LEAF	12"	12"	13"	N/A	N/A	N/A	N/A
0079-01/02, 0693-00	3 LEAF	12"	13"	13"	N/A	N/A	N/A	N/A
0724-00, 0954-00	3 LEAF	13"	13"	13 1/2"	N/A	N/A	N/A	N/A
1033-01 **	6 LEAF	13"	13"	13 1/2"	N/A	N/A	N/A	N/A
0178-01/03	8 LEAF	13 1/2"	14"	15"	N/A	N/A	N/A	N/A
0723-00	9 LEAF	14"	15"	15"	N/A	N/A	N/A	N/A
5" SQUARE AXLE WITH INVERTED U-BOLT CONFIGURATION, 3" DIA. BEND ADDITIONAL 1" STACK HEIGHT FOR 4"X 6" AXLE								
0179-01/02	1 LEAF	11"	12"	12"	13"	13"	13 1/2"	14"
0714-00	1 LEAF	12"	12"	13"	13"	13 1/2"	14"	14 1/2"
1600-02	2 LEAF	12"	13"	13"	13 1/2"	14"	14 1/2"	15"
0079-01/02, 0693-00	3 LEAF	13"	13"	13 1/2"	14"	14 1/2"	15"	16"
0724-00, 0954-00	3 LEAF	13"	13"	13 1/2"	14"	14 1/2"	15"	16"
1033-01 **	6 LEAF	13"	13 1/2"	14"	14 1/2"	15"	16"	16"
0178-01/03	8 LEAF	14"	14 1/2"	15"	16"	16"	17"	17"
0723-00	9 LEAF	14 1/2"	15"	16"	16"	17"	17"	18"

* NOMINAL SEAT HEIGHT - ACTUAL DIMENSION IS 1/8" HIGHER

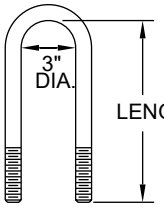
* *6 LEAF 10,000# CAPACITY SPRING FOR 44" AXLE SPACING

5" DIA. BEND U-BOLT PART NUMBERS



PART NO.	LENGTH
08507-01	10"
08509-01	11"
08511-01	12"
08513-01	13"
08514-01	13 1/2"
08515-01	14"
08517-01	15"
08520-01	16"
08523-01	17"

3" DIA. BEND U-BOLT PART NUMBERS



PART NO.	LENGTH
08491-01	10"
08492-01	11"
08494-01	12"
08495-01	13"
09009-01	13 1/2"
08496-01	14"
08497-01	14 1/2"
08498-01	15"
08500-01	16"
08502-01	17"
08504-01	18"

Tuthill Transport Technologies (TTT) (The Company) warrants ReycoGranning suspension products manufactured by it to be free from defect in material and workmanship which occur under normal use and service subject to the following conditions and limitations.

Trailer suspension models: 21B Cast, 21B Fab, 44AR, 44AR/RS1020, 74B, 86AR, 86AR/RS1015, 86AR/RS1035, 86/88, and 91. (See ReycoGranning InnovAir Warranty for models with axles.)
Powered Vehicle suspension models: 79KB, 102 series, 102AR, 240AR, 510AR, 510P, 610AR, 900 and 1200.

1. Coverage is per below in months or in miles depending upon which occurs first. *

Months	Mileage	Coverage Provided
0-12	0-100,000	Cost of Parts and Labor Allowance
13-60	100,001-500,000	100% Cost of Parts Only

*Products designed and used for off-road have six months or 50,000-mile coverage only.

2. This warranty shall not apply and no warranty of any kind shall exist as to any product which has been subject to abuse, misuse, neglect, misapplication or accident of any type or cause or which has been repaired, replaced, substituted or used with parts other than genuine parts of The Company or has been altered by anyone.

3. The Company shall not be liable for the loss of use of any product, loss of time, inconvenience, commercial loss or any other indirect consequential, special or incidental damages due to breach of the above warranty of any other failure to comply with the terms of the contract between The Company and The Buyer, The Company makes no warranties of any kind, express or implied, other than as herein expressly provided, and specifically disclaims the implied warranties of merchantability and fitness for a particular purpose.

4. With respect to parts manufactured by others, The Company shall have no duty except to assign to the buyer any claim which The Company may have against the manufacturer thereof. (TTT warrants purchased components to the same extent as the Warranty extended by the original manufacturer to TTT). This warranty does not apply to the normal "wearing out" of rubber bushings, shock absorbers, etc., or sacrificial wear areas such as springs to hangers.

5. The determination of the reasonable cost of labor as required in paragraph one (1), shall be made in accordance with the TTT shop standard times. Maximum hourly allotment for labor cost is determined by TTT annually. Shop standard times and the maximum hourly allotment for labor cost may be revised periodically at the sole discretion of The Company.

6. The Company is not responsible for damages from improper installation or operations beyond design capability. The Company in its sole discretion shall determine whether or not any product is defective or otherwise covered by this warranty. No action for breach of this warranty may be commenced more than one year after the occurrence of alleged breach. This warranty is not transferable.

7. Retention of possession or use of the product for the warranty period shall constitute an unconditional acceptance thereof and fulfillment of all warranties and obligations of TTT and no assistance rendered by The Company in operating the product or remedying any defect either before or after that time shall operate to extend the warranty period.

PRODUCT INSTALLER RESPONSIBILITIES

8. Installer is responsible for installing the product in accordance with The Company specifications and installation instructions.

Installer is responsible for providing proper vehicle components and attachments as well as required or necessary clearance for suspension components, axles, wheels, tires, and other vehicle components to ensure a safe and sound installation and operation.

Installer is responsible for advising the owner of proper use, service and maintenance required by the product and for supplying maintenance and other instruction as readily available from The Company.

PRODUCT OWNER RESPONSIBILITIES

9. Owner is solely responsible for pre-operation inspection, periodic inspections, maintenance, and use of the product as specified in the particular TTT instructions available by product model, except as provided in this warranty, and for maintenance of other vehicle components. Of particular importance is the re-torque of fasteners including axle u-bolts, torque rod bolts and track rod bolts. This re-torque must be performed within 90 days of the suspension being put in service. Owner is responsible for "down time" expenses, cargo damage, and all business costs and losses resulting from a warrantable failure.

WARRANTY CLAIM PROCEDURES

10. For a claim to be considered it must contain adequate documentation which states vehicle mileage, starting date, product model, where and how used, and a TTT Return Material Authorization Number. This claim must be made within six months of failure of the component. Such part or parts must be returned to TTT, transportation charges paid. TTT reserves the right to inspect any returned components to determine cause of defects.