DBI SALA®
A Capital Safety Company

USER INSTRUCTIONS 2

LAD-SAF®
Flexible Cable Ladder Safety Systems
1

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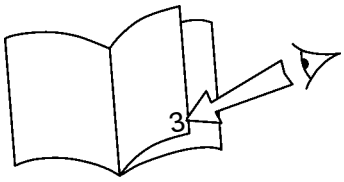
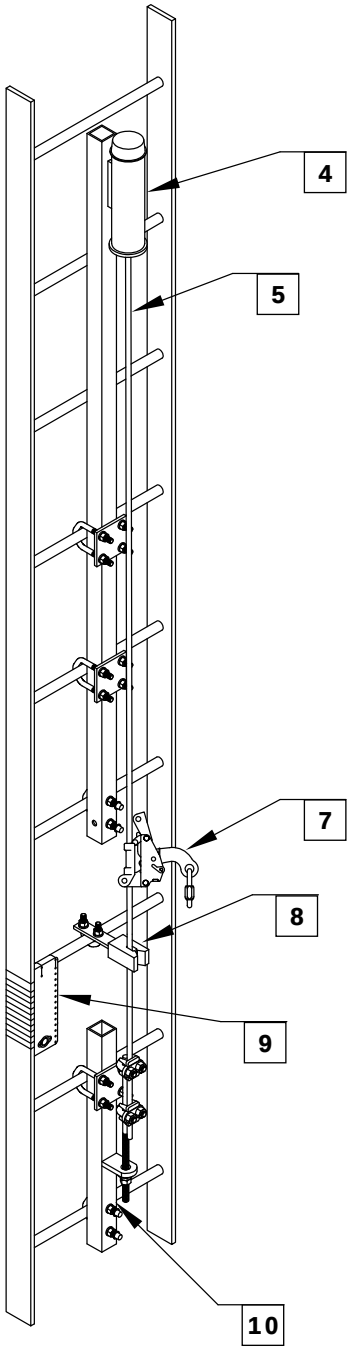
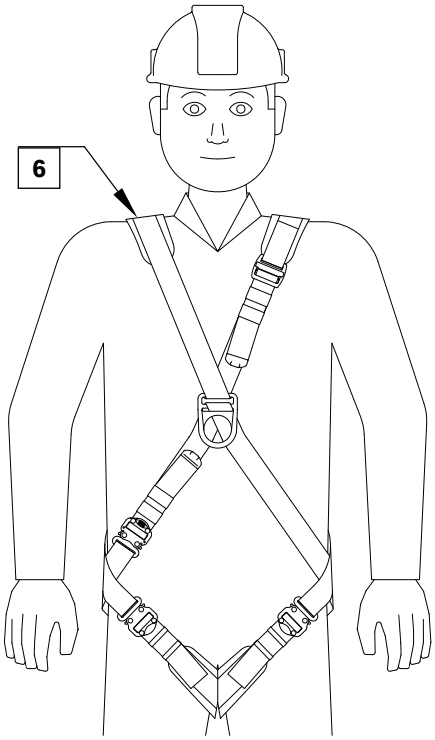


CE TYPE TEST	No. 0320 TUV NEL East Kilbride, Glasgow G75 0QU UK 11
CE PRODUCTION QUALITY CONTROL	No. 0086 BSI Product Services Kitemark House Mayland Ave. Hemel Hempstead HP2 4SQ UK 12

3	
ISO 9001 Certificate No. FM 39709	ANSI Z359 ANSI A14.3
CE	EN 353-1:2002
CSA	CSA Z259.2.1
AS/NZS	AS/NZS 1891.3:1997





FORM NO: 5902228
REV: O

FORWARD

EN

This instruction describes installation and use of Lad-Saf® Flexible Cable Ladder Safety Systems. It should be used as part of an employee training program as required by OSHA, ANSI, CSA, and CE.

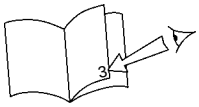
WARNING: *These instructions must be provided to the user and installer of this equipment. The user and installer of this equipment must read and understand these instructions before use or installation. Follow the manufacturer's instructions for safety equipment used with this system. Follow these instructions for proper use, inspection, and maintenance of this equipment. This equipment is intended to be used as part of a complete LAD-SAF® ladder safety system. Alterations, substitutions, or misuse of this equipment, or failure to follow instructions, may result in serious injury or death.*

IMPORTANT: *If you have questions on the installation, use, maintenance, or suitability of this equipment for your application, contact DBI-SALA.*

IMPORTANT: *Before using this equipment, record the product identification information from the installation and service label in the maintenance log in section 9.0 of this manual.*

PART LISTS AND PART REFERENCES

The Part Lists in the next section of this instruction illustrate and list the parts that can comprise a typical Lad-Saf® Ladder Safety System. Because various part types may have multiple part options and part numbers, part references in the ensuing instructions will use the Item Number defined in the left hand column of each Part List (e.g., TB-1, BB-5, etc.) where appropriate. Refer back to the Part Lists for associated part numbers.

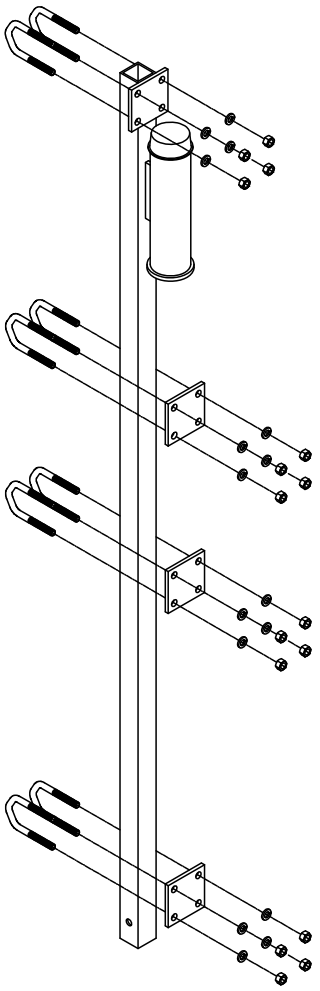


GLOSSARY REFERENCE BOXES

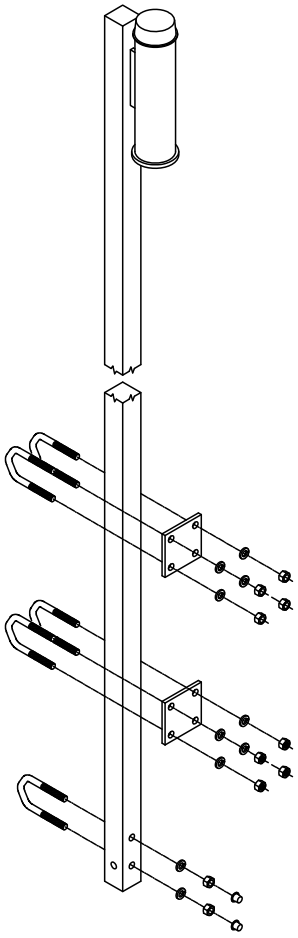
Numbered *Glossary Reference Boxes* on the front cover of this instruction reference the following items:

1: Flexible Cable Ladder Safety Systems **2**: User Instructions **3**: Standards **4**: Top Bracket **5**: Cable **6**: Full Body Harness with Front Attachment **7**: Detachable Cable Sleeve **8**: Cable Guide **9**: System Label with i-Safe™ RFID Tag **10**: Bottom Bracket **11**: EC Test Performed **12**: Number of body checking the manufacture of this PPE

Figure 1: Part List TB - Top Brackets



TB-1



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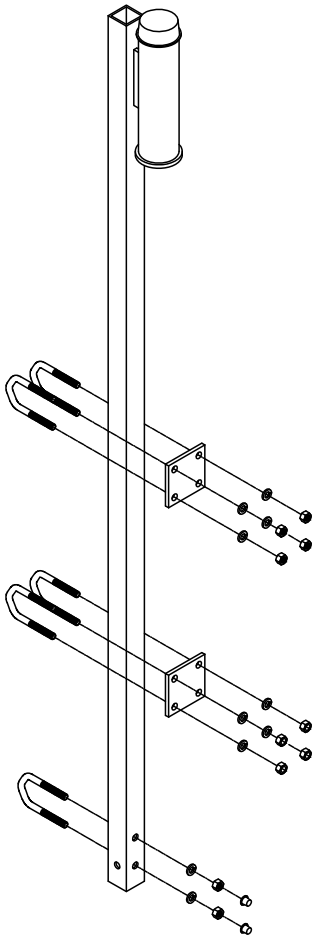

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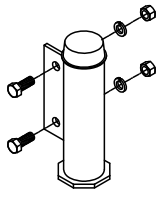
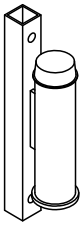


TB-4



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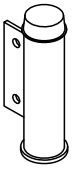

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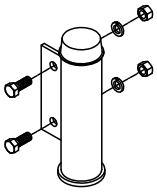
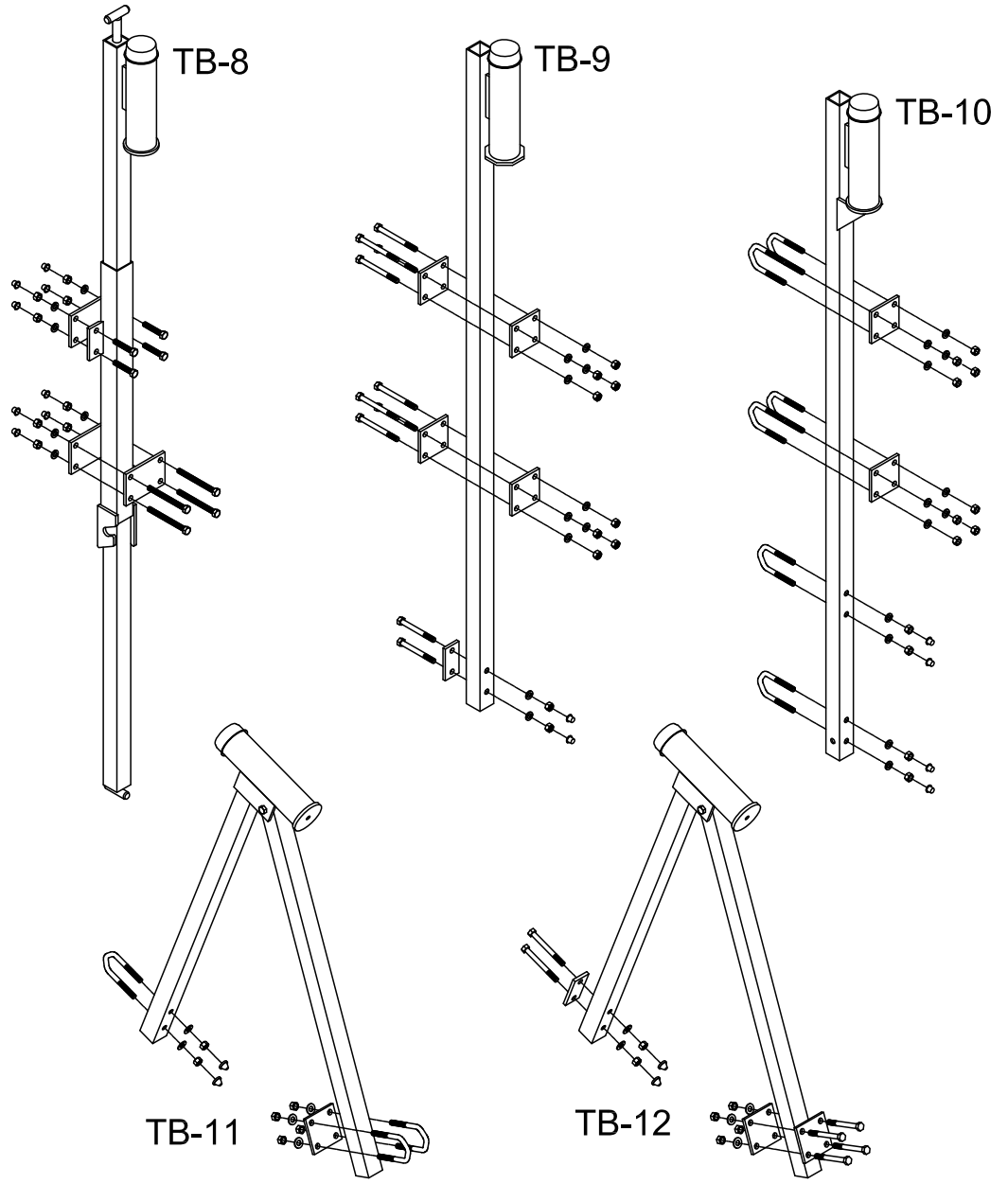


TB-7

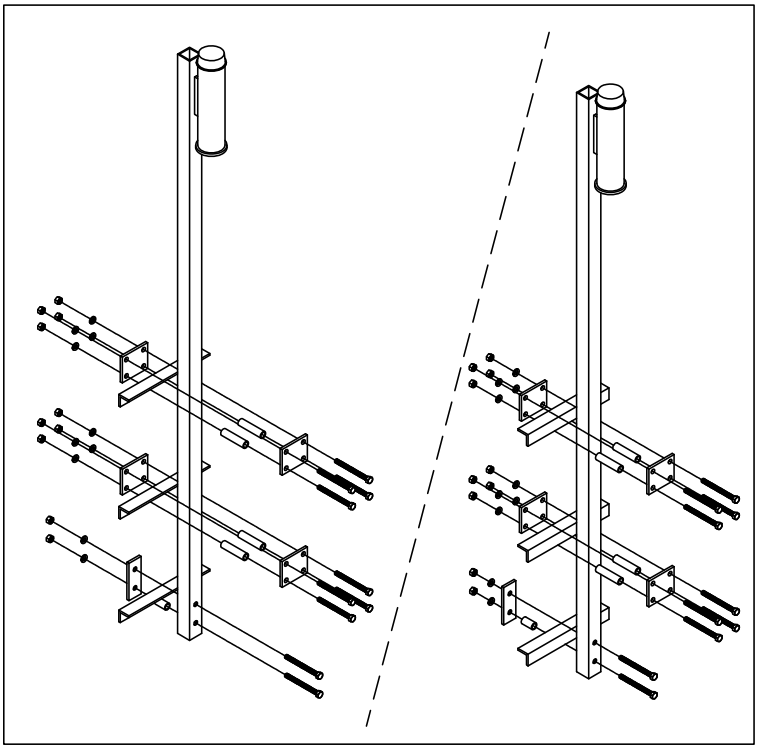
ITEM	ANSI, CSA, AS/NZS	CE	DESCRIPTION
TB-1	6116054	6116054	Top Bracket Galvanized
TB-2	6116056	KC36116056	Top Bracket Galvanized
TB-3	6116280	KC3PL280	Top Bracket Galvanized
	6116278	6116278	Top Bracket Galvanized, 8 mm
TB-4	6116210	KC3PL210	Top Bracket Stainless Steel
TB-5	6116224	6116224	Top Bracket Galvanized
TB-6	6116250	KC36116250	Top Bracket Galvanized
TB-7	6116261	KC36116261	Top Bracket Galvanized

Figure 1 *(continued)*: Part List TB - Top Brackets

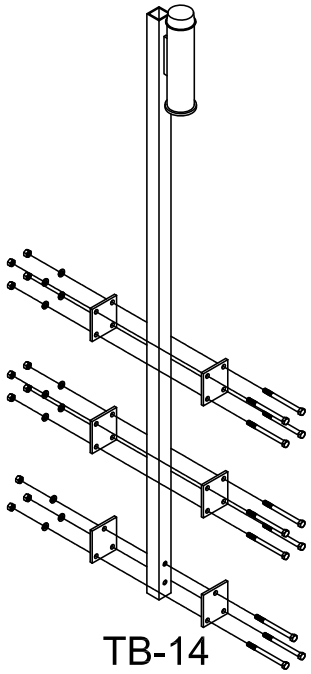


ITEM	ANSI, CSA, AS/NZS	CE	DESCRIPTION
TB-8	6116120	6116120	Top Bracket, Galvanized, Telescoping
TB-9	6116005	KC36110020	Top Bracket, Stainless Steel for 1-1/4” rung (2 clamps)
	6116050	6116050	Top Bracket, Galvanized for 2” x 1-1/2” rung
	6116052	6116052	Top Bracket, Galvanized for 1-1/2” rung
	6116325	6116325	Top Bracket, Stainless Steel for 1-1/8” rung
	6116328	6116328	Top Bracket, Galvanized for 1-1/8” x 2” rung
TB-10	6116410	6116410	Top Bracket, Galvanized
TB-11	6116010	KC3PL10	Curved Ladder Top Bracket, Galvanized
TB-12	6116016	6116016	Curved Ladder Top Bracket, Stainless Steel

Figure 1 *(continued):* Part List TB - Top Brackets



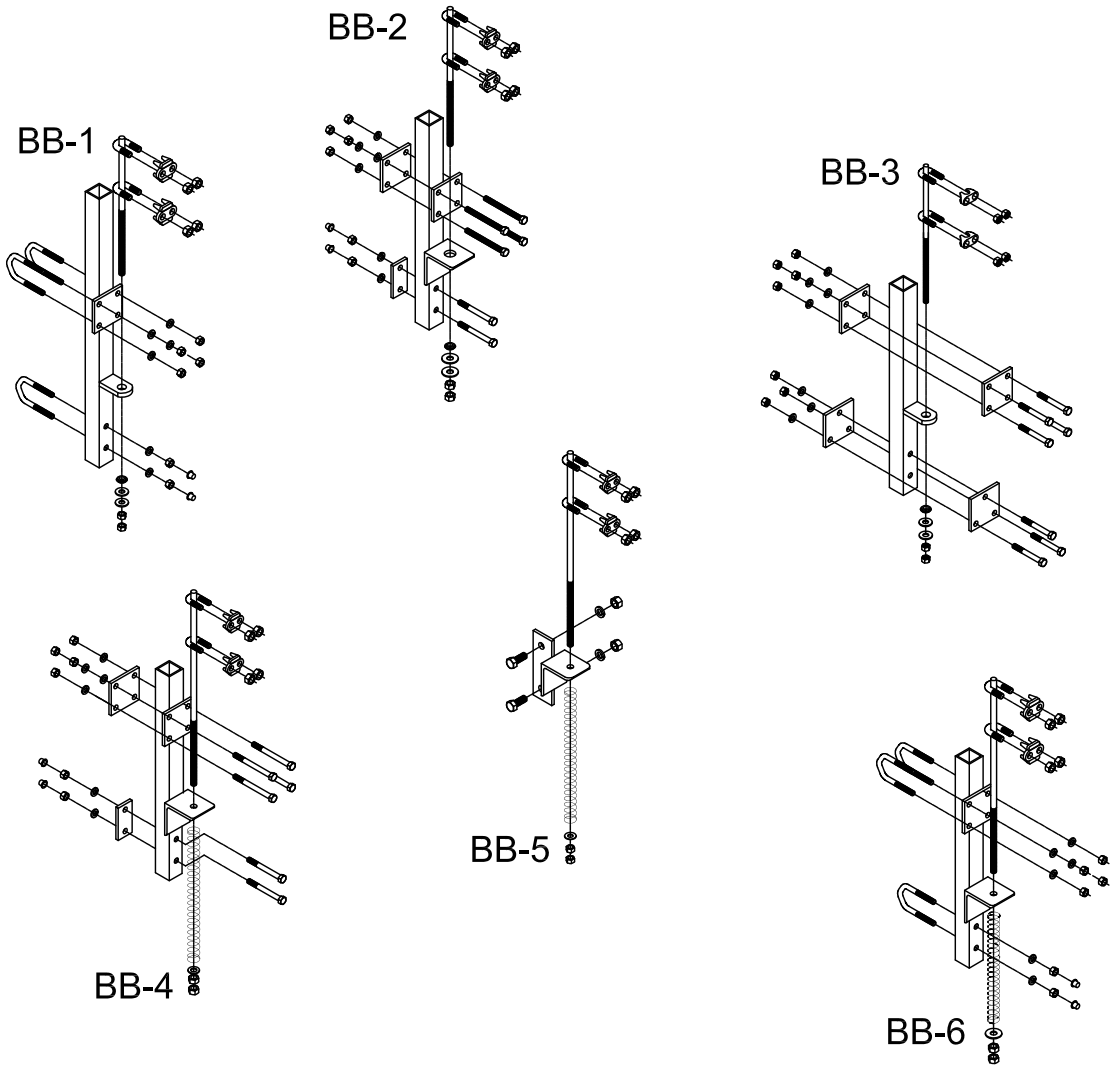
TB-13



TB-14

ITEM	ANSI, CSA, AS/NZS	CE	DESCRIPTION
TB13	6116048	6116048	Top Bracket, Galvanized for 1-1/2” x 1-1/2” angle x 30°
	6116051	6116051	Top Bracket, Galvanized for 1-1/4” angle
	6116055	6116055	Top Bracket, Galvanized for 1” x 3/4” angle
	6116057	6116057	Top Bracket, Galvanized for 1-1/2” x 1-1/2” angle
	6116059	6116059	Top Bracket, Galvanized for 1” angle
	6116282	KC36116282	Top Bracket, Galvanized for 1-1/2” x 1-1/2” angle (square spacer)
TB14	6116286	6116286	Top Bracket, Galvanized for 1-1/2” x 1-1/2” rung
	6116290	6116290	Top Bracket, Galvanized for 1-3/4” round rung
	6116291	6116291	Top Bracket, Galvanized for 1-3/4” x 2-1/4” rung
	6116292	6116292	Top Bracket, Galvanized for 2-1/2” x 3/8” rung
	6116293	6116293	Top Bracket, Galvanized for 2” x 1” rung
	6116294	6116294	Top Bracket, Galvanized for 2” x 2” rung
	6116295	6116295	Top Bracket, Galvanized for 4” x 2” rung
	6116296	6116296	Top Bracket, Galvanized for 2” x 4” rung
	6116324	6116324	Top Bracket, Stainless Steel for 2” round rung

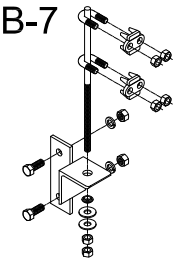
Figure 2: Part List BB - Bottom Brackets



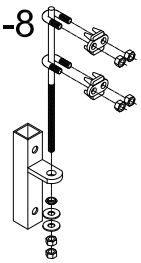
ITEM	ANSI, CSA, AS/NZS	CE	DESCRIPTION
BB-1	6100090	KC3PL90	Bottom Bracket, Galvanized
	6100091	KC36100091	Bottom Bracket, Galvanized, Extra-Long
	6100092	6100092	Bottom Bracket, Galvanized, 37"
	6100093	6100093	Bottom Bracket, Galvanized, 48"
BB-2	6100060	6100060	Bottom Bracket, Galvanized for 2" x 1-1/4" rung
	6100070	6100070	Bottom Bracket, Stainless Steel
	6100073	6100073	Bottom Bracket, Stainless Steel for 1-1/8" x 2" rung
	6100128	6100128	Bottom Bracket, Galvanized for 1-1/2" rung
BB-3	6100072	6100072	Bottom Bracket, Stainless Steel for 2" round rung
	6100100	KC361001W	Bottom Bracket, Galvanized for 1-1/2" x 1-1/2" rung
	6100110	6100110	Bottom Bracket, Galvanized for 1-1/4" x 2-1/4" rung
	6100111	6100111	Bottom Bracket, Galvanized for 4" x 2" rung
	6100112	6100112	Bottom Bracket, Galvanized for 2" x 1" rung
	6100113	6100113	Bottom Bracket, Galvanized for 1-3/4" round rung
	6100114	6100114	Bottom Bracket, Galvanized for 2-1/2" x 3/8" rung
	6100115	6100115	Bottom Bracket, Galvanized for 2" x 2" rung
	6100116	6100116	Bottom Bracket, Galvanized for 2" x 4" rung
BB-4	6100095	KC3PL95	Bottom Bracket, Stainless Steel
BB-5	6100224	6100224	Bottom Bracket, Stainless Steel
BB-6	6100015	KC3PL822	Bottom Bracket, Galvanized

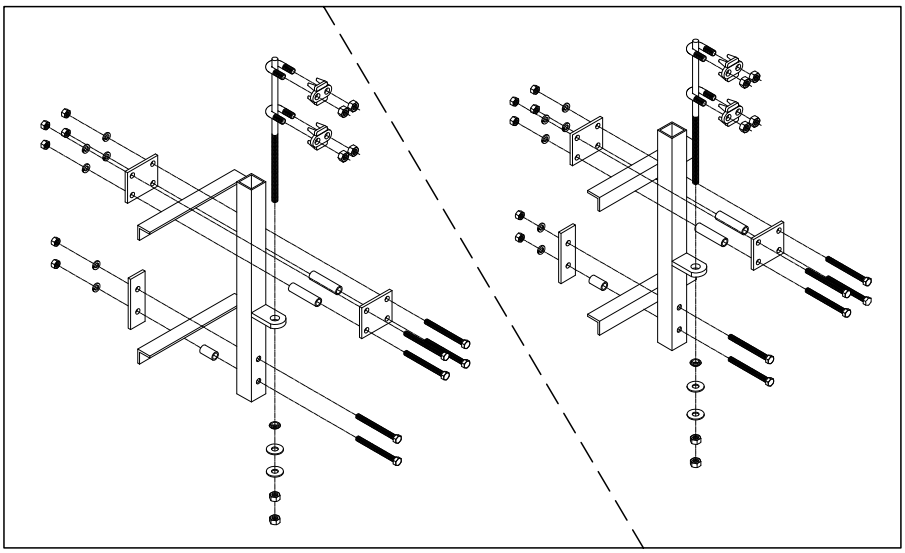
Figure 2 *(continued)*: Part List BB - Bottom Brackets

BB-7



BB-8

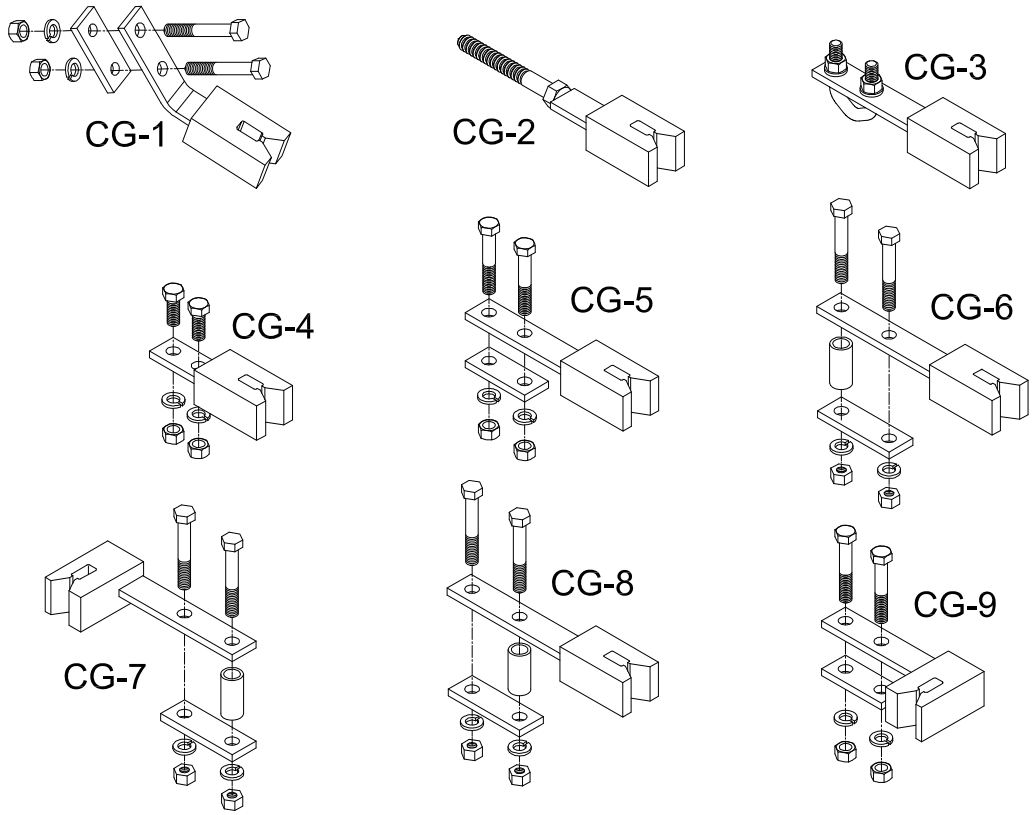




BB-9

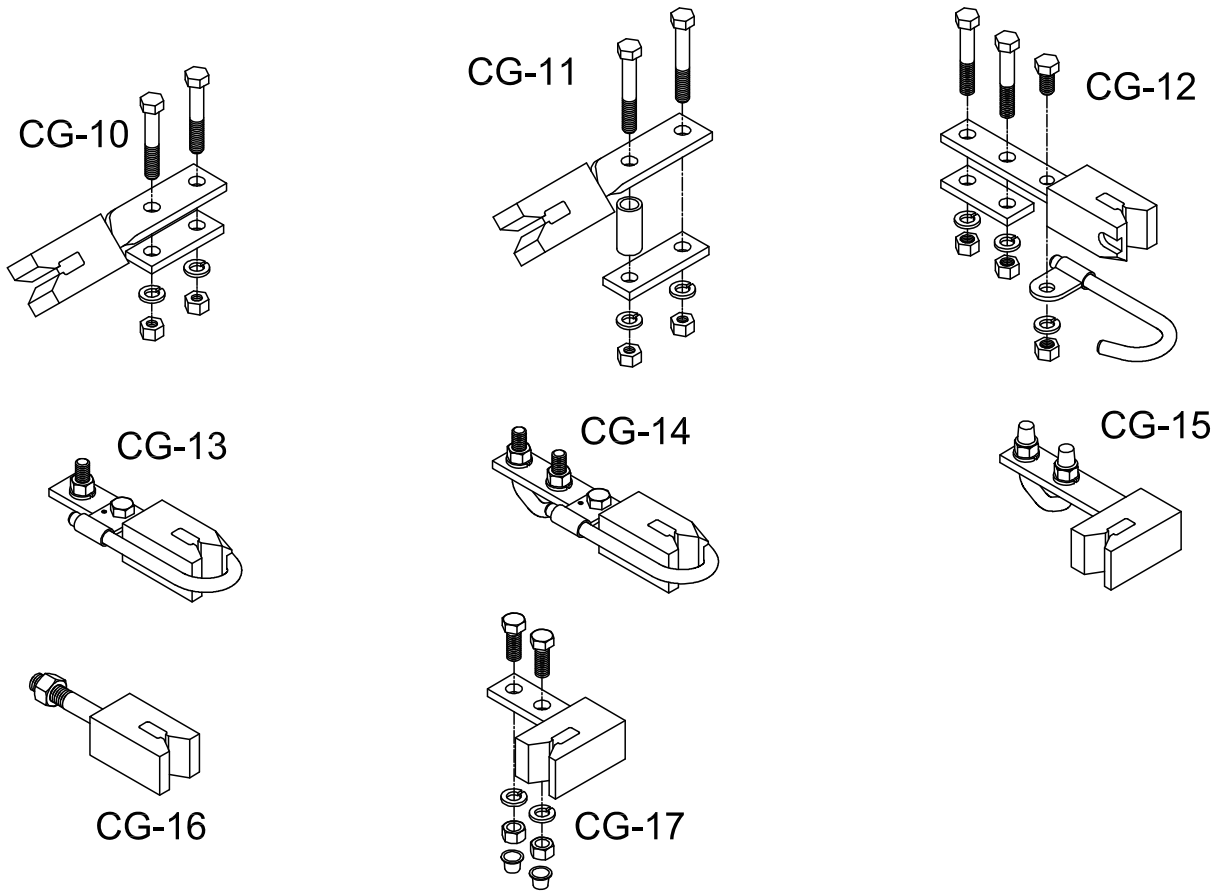
ITEM	ANSI, CSA, AS/NZS	CE	DESCRIPTION
BB-7	6100035	KC36100035	Bottom Bracket, Galvanized
	6100038	KC36100038	Bottom Bracket - Stainless Steel
BB-8	6100045	6100045	Bottom Bracket, Galvanized
BB-9	6100050	6100050	Bottom Bracket, Galvanized for 1-5/8" x 1-3/8" rung
	6100055	6100055	Bottom Bracket, Galvanized for 1-1/2" x 1-1/2" angle 30°
	6100065	KC36100065	Bottom Bracket, Galvanized for 1-1/2" x 1-1/2" x 3/16" angle (square spacer)
	6100131	6100131	Bottom Bracket, Galvanized for 1/14" angle
	6100132	6100132	Bottom Bracket, Galvanized for 1-3/4" angle
	6100133	6100133	Bottom Bracket, Galvanized for 1-1/2" x 1-1/4" rung
	6100134	6100134	Bottom Bracket, Galvanized for 1" rung

Figure 3: Part List CG - Cable Guides



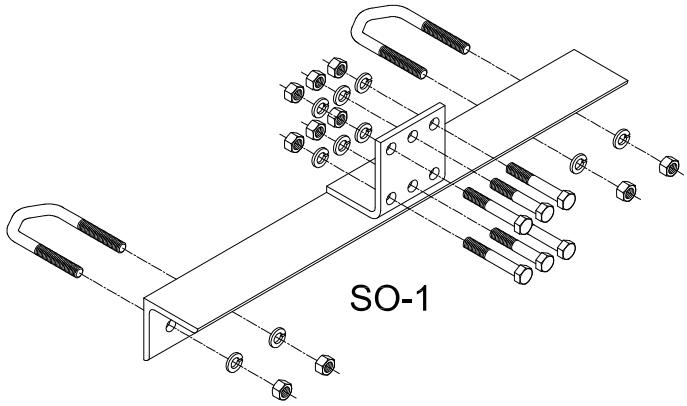
ITEM	ANSI, CSA, AS/NZS	CE	DESCRIPTION
CG-1	6100249	6100249	Cable Guide, Stainless Steel, 45° bend
CG-2	6100140	6100140	Cable Guide
CG-3	6100400	KC3PL330	Cable Guide, Galvanized
	6100401	6100401	Cable Guide, Stainless Steel
	6100402	6100402	Cable Guide, Galvanized, 1-3/4" center
CG-4	6100430	KCPL379	Cable Guide, Galvanized
	6100431	6100431	Cable Guide, Galvanized
	6100432	6100432	Cable Guide, Stainless Steel
	6100435	6100435	Cable Guide, Stainless Steel, 4" extra length
CG-5	6100420	6100420	Cable Guide, Galvanized, (Stainless Steel hardware), 1-1/4" x 2" rung
	6100421	6100421	Cable Guide, Stainless Steel, 1-1/4" x 2" rung
	6100422	6100422	Cable Guide, Stainless Steel, 1-3/4" x 1-3/4" rung
	6100423	6100423	Cable Guide, Stainless Steel, 1-3/4" x 2-1/4" rung
	6100424	6100424	Cable Guide, Stainless Steel, 1-3/8" x 1-3/4" rung
	6100425	6100425	Cable Guide, Stainless Steel, 2" x 1" rung
	6100426	6100426	Cable Guide, Stainless Steel, 2" x 2" rung
	6100427	6100427	Cable Guide, Stainless Steel, 1-5/8" x 1" rung
	6100428	KC36100428	Cable Guide, Galvanized, 1-1/2" rung
	6100429	6100429	Cable Guide, Stainless Steel, 2-1/4" x 2-1/2" rung
	6100457	KC3PL333	Cable Guide, Stainless Steel
CG-6	6100448	KC36100448	Cable Guide, Stainless Steel, 1-1/15" angle rung
	6100449	6100449	Cable Guide, Stainless Steel, 2-3/8" x 7/8" rung
	6100453	6100453	Cable Guide, Stainless Steel, 1-1/4" angle rung
	6100454	6100454	Cable Guide, Stainless Steel, 1" x 3/4" angle
CG-7	6100525	6100525	Cable Guide, Stainless Steel, 1-1/2" angle rung
CG-8	6100455	6100455	Cable Guide, Stainless Steel, 1-1/4" x 1-1/4" angle
CG-9	6100505	KC3PL190	Cable Guide, Stainless Steel
	6100506	6100506	Cable Guide, Stainless Steel, 1-1/4" x 1-1/4" x 3/16" angle

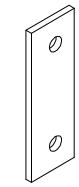
Figure 3 *(continued)*: Part List CG - Cable Guides

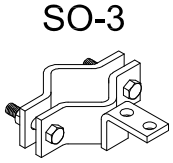


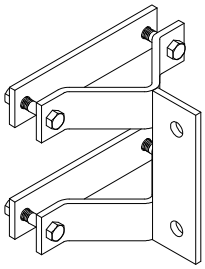
ITEM	ANSI, CSA, AS/NZS	CE	DESCRIPTION
CG-10	6100460	6100460	Cable Guide, Stainless Steel, w/Twist 39°
	6100461	6100461	Cable Guide, Stainless Steel, w/Twist 27°
	6100462	6100462	Cable Guide, Stainless Steel, w/Twist 45°
CG-11	6100475	6100475	Cable Guide, Stainless Steel, 1-1/2" x 1-1/2" angle 30°
CG-12	6100533	6100533	Cable Guide, Stainless Steel, w/Latch and Clamp Plate
CG-13	6100532	6100532	Cable Guide, Galvanized, w/Latch
CG-14	6100530	KC36100530	Cable Guide
	6100531	6100531	Cable Guide, no U-Bolt
CG-15	6100515	KC3PL105	Cable Guide, Galvanized
	6100516	KC36100516	Cable Guide, Galvanized, w/Caps
	6100517	6100517	Cable Guide, Stainless Steel
CG-16	6100470	6100470	Cable Guide
CG-17	6100520	6100520	Cable Guide, Stainless Steel, 4.313" long
	6100521	6100521	Cable Guide, Galvanized, w/Caps
	6100522	6100522	Cable Guide, Galvanized
	6100523	KC3PL310	Cable Guide, Stainless Steel, 4.125" long

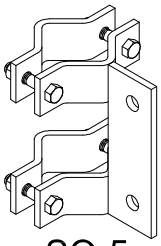
Figure 4: Part List SO - Stand-Offs

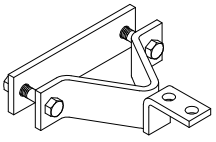


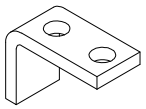






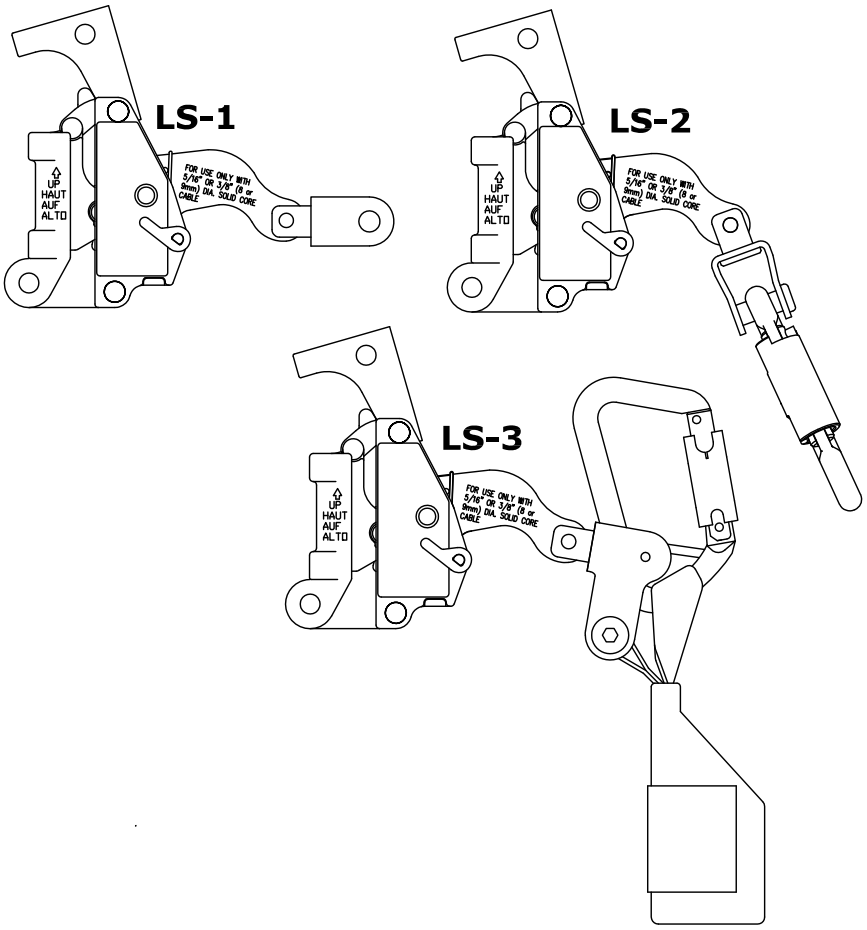






ITEM	ANSI, CSA, AS/NZS	CE	DESCRIPTION
SO-1			Top/Bottom Bracket Horizontal Stand-Off
SO-2	6100710	KC36100710	Top/Bottom Bracket Weld-On Stand-Off
SO-3			Cable Guide Round Leg Stand-Off Support
SO-4	6100600	6100600	Top/Bottom Bracket Angle Stand-Off, 60° angle, 2" - 2-1/2" angle size, Stainless Steel
	6100601	6100601	Top/Bottom Bracket Angle Stand-Off, 60° angle, 3" - 3-1/2" angle size, Galvanized
	6100602	6100602	Top/Bottom Bracket Angle Stand-Off, 60° angle, 3" - 3-1/2" angle size, Stainless Steel
	6100603	6100603	Top/Bottom Bracket Angle Stand-Off, 60° angle, 4" - 4-1/2" angle size, Galvanized
	6100604	6100604	Top/Bottom Bracket Angle Stand-Off, 60° angle, 4" - 4-1/2" angle size, Stainless Steel
	6100606	6100606	Top/Bottom Bracket Angle Stand-Off, 60° angle, 6" - 6-1/2" angle size, Stainless Steel
	6100607	6100607	Top/Bottom Bracket Angle Stand-Off, 60° angle, 5" - 5-1/2" angle size, Galvanized
	6100635	6100635	Top/Bottom Bracket Angle Stand-Off, 90° angle, 2" - 2-1/2" angle size, Stainless Steel
	6100636	6100636	Top/Bottom Bracket Angle Stand-Off, 90° angle, 3" - 3-1/2" angle size, Galvanized
	6100637	6100637	Top/Bottom Bracket Angle Stand-Off, 90° angle, 3" - 3-1/2" angle size, Stainless Steel
	6100638	6100638	Top/Bottom Bracket Angle Stand-Off, 90° angle, 4" - 4-1/2" angle size, Stainless Steel
	6100639	6100639	Top/Bottom Bracket Angle Stand-Off, 90° angle, 4" - 4-1/2" angle size, Galvanized
	6100640	6100640	Top/Bottom Bracket Angle Stand-Off, 90° angle, 5" - 5-1/2" angle size, Stainless Steel
	6100641	6100641	Top/Bottom Bracket Angle Stand-Off, 90° angle, 6" - 6-1/2" angle size, Stainless Steel
	6100642	6100642	Top/Bottom Bracket Angle Stand-Off, 90° angle, 8" - 8-1/2" angle size, Galvanized
	6100643	6100643	Top/Bottom Bracket Angle Stand-Off, 90° angle, 9" - 9-1/2" angle size, Stainless Steel
	6100644	6100644	Top/Bottom Bracket Angle Stand-Off, 90° angle, 3-1/2" - 4" angle size, Stainless Steel
SO-5			Top/Bottom Bracket Round Leg Stand-Off
SO-6	6100610	6100610	Cable Guide Angle Leg Stand-Off Support, 60° angle, 2" - 2-1/2" angle size, Galvanized
	6100611	6100611	Cable Guide Angle Leg Stand-Off Support, 60° angle, 3" - 3-1/2" angle size, Galvanized
	6100612	6100612	Cable Guide Angle Leg Stand-Off Support, 60° angle, 3" - 3-1/2" angle size, Stainless Steel
	6100613	6100613	Cable Guide Angle Leg Stand-Off Support, 60° angle, 4" - 4-1/2" angle size, Galvanized
	6100614	6100614	Cable Guide Angle Leg Stand-Off Support, 60° angle, 4" - 4-1/2" angle size, Stainless Steel
	6100620	6100620	Cable Guide Angle Leg Stand-Off Support, 90° angle, 2" - 2-1/2" angle size, Stainless Steel
	6100621	6100621	Cable Guide Angle Leg Stand-Off Support, 90° angle, 3" - 3-1/2" angle size, Galvanized
	6100622	6100622	Cable Guide Angle Leg Stand-Off Support, 90° angle, 3" - 3-1/2" angle size, Stainless Steel
	6100623	6100623	Cable Guide Angle Leg Stand-Off Support, 90° angle, 4" - 4-1/2" angle size, Galvanized
	6100624	6100624	Cable Guide Angle Leg Stand-Off Support, 90° angle, 4" - 4-1/2" angle size, Stainless Steel
	6100625	6100625	Cable Guide Angle Leg Stand-Off Support, 90° angle, 5" - 5-1/2" angle size, Stainless Steel
	6100626	6100626	Cable Guide Angle Leg Stand-Off Support, 90° angle, 5" - 5-1/2" angle size, Galvanized
	6100627	6100627	Cable Guide Angle Leg Stand-Off Support, 90° angle, 6" - 6-1/2" angle size, Galvanized
	6100628	6100628	Cable Guide Angle Leg Stand-Off Support, 90° angle, 6" - 6-1/2" angle size, Stainless Steel
	6100629	6100629	Cable Guide Angle Leg Stand-Off Support, 90° angle, 8" - 8-1/2" angle size, Galvanized
	6100630	6100630	Cable Guide Angle Leg Stand-Off Support, 90° angle, 8" - 8-1/2" angle size, Stainless Steel
	6100631	6100631	Cable Guide Angle Leg Stand-Off Support, 90° angle, 3-1/2" - 4" angle size, Stainless Steel
SO-7	6100135	6100135	Cable Guide Stand-Off Support, Galvanized
	6100136	KC36100136	Cable Guide Stand-Off Support, Stainless Steel

Figure 5: Part List LS - LAD-SAF® Detachable Sleeves



ITEM	ANSI, CSA	CE	DESCRIPTION
LS-1	6116541 (ANSI A14.3, CSA Z259.2.1)		Flex Sleeve, 8.0 mm or 9.5 mm (5/16” or 3/8”), Sleeve Only
LS-2	6116540 (ANSI A14.3, CSA Z259.2.1)		Flex Sleeve, 8.0 mm or 9.5 mm (5/16” or 3/8”), w/Carabiner
LS-3		6116507 (EN353-1:2002)	Flex Sleeve, 8.0 mm or 9.5 mm (5/16” or 3/8”), w/Shock Pack & Carabiner

1.0 APPLICATIONS

1.1 PURPOSE: LAD-SAF® flexible cable ladder safety systems are designed to provide protection against falling for persons connected to the system while climbing fixed ladders or similar climbing structures.

A. APPLICATIONS: LAD-SAF® systems include installations on fixed ladders or ladder like climbing surfaces that are part of a structure. Examples include; water tank ladders, mono poles (wood, steel, or concrete) buildings, manways, antenna structures, and towers.

1.2 LIMITATIONS: LAD-SAF® systems are not intended to be installed on portable ladders. These systems are designed for use on ladders that are generally vertical. Ladders must be at least 75 degrees from horizontal for proper system operation, except for curved top bracket installations. The following application limitations must be considered before installing or using the LAD-SAF® system.

A. LADDER STRUCTURE: The ladder structure to which the system is installed must be capable of withstanding the loads applied by the system in the event of a fall (see Section 2.3).

B. SYSTEM CAPACITY: The number of users allowed on the system at one time varies depending on the type of system and installation. Generally, system capacities range from one to four users. See sections 2.0 and 3.0 for more information on capacity limitations. System capacities are based on a maximum user's weight, including tools and clothing, of 310 lbs (140.6 kg).

C. FALL CLEARANCE: Fall clearance below the feet of the user and the ground or other surfaces must not be less than 7 ft. (2 m).

D. ENVIRONMENTAL HAZARDS: Use of this equipment in areas with environmental hazards may require that additional precautions be taken to reduce the possibility of injury to the user or damage to the equipment. Hazards may include, but are not limited to: high heat caused by welding or metal cutting; caustic chemicals; seawater; high voltage power lines; explosive or toxic gases; moving machinery; sharp edges.

E. COMPONENT COMPATIBILITY: LAD-SAF® systems must be installed and used as a complete system. Only DBI-SALA's detachable cable sleeve (see Figure 5) may be used with this system. DBI-SALA recommends using a full body harness with a front attachment for ladder climbing. A body belt is not recommended for use with the LAD-SAF® system. If a fall occurs when using a body belt it may cause unintentional release and possible suffocation because of improper body support. Substitutions of equipment or system components must not be made without the written consent of DBI-SALA.

> ***WARNING:*** *Before using a LAD-SAF® Ladder System in combination with a climb assist system, consult the climb assist system manufacturer's instructions for any restrictions or limitations concerning simultaneous use of these systems. Capital Safety has found that some connection combinations may interfere with proper operation of the LAD-SAF® Detachable Sleeve and may result in failure to arrest a fall. Avoid connecting the sleeve used on the LAD-SAF® Ladder System into the same harness connection D-ring as is occupied by the climb assist system. Ensure that movement of the arm of the LAD-SAF® sleeve is not restricted or interfered with by the climb assist system or its connectors. Failure to heed this warning may result in serious injury or death.*

F. TRAINING: This equipment is intended to be installed and used by persons who have been trained in its correct application and use.

1.3 Refer to applicable local, and national requirements governing this equipment for more information on ladder safety systems and associated components, including OSHA 1910.27.

2.0 SYSTEM REQUIREMENTS

2.1 COMPATIBILITY OF COMPONENTS AND SUBSYSTEMS: This equipment is designed for use with DBI-SALA approved components and subsystems. The use of non-approved components and subsystems may jeopardize compatibility of equipment, and could affect the safety and reliability of the complete system.

2.2 COMPATIBILITY OF CONNECTORS: Connectors used with this system (hooks, carabiners, D-rings) must be capable of supporting a minimum of 5,000 lbs (22.2 kN). Use caution to assure compatibility of hooks and the connection point. See section 4.4 on making connections. Non-compatible connectors may unintentionally disengage (roll-out). Connectors must be compatible in size, shape, and strength. Self closing/self locking connectors are highly recommended by DBI-SALA.

2.3 LOAD REQUIREMENTS FOR STRUCTURE AND BRACKET CONNECTIONS: The climbing structure to which the LAD-SAF® system is installed must be capable of supporting the loads imposed by the system. For calculation purposes the required bracket load may be assumed to be distributed evenly between the number of rung attachments. For example; the TB-3 top bracket is supplied with three rung connections. The load required for each rung for a single user system is 1,125 lbs (5.0 kN) per rung (3,375 lbs [15.0 kN]/3).

A. TOP BRACKET: The top bracket connection loads include system pretension and forces associated with arresting a fall. Load requirements for the top bracket vary depending on the number of users allowed on the system at one time, top bracket model, and type of connection to the structure.

1. The following top brackets allow up to four users on the system at one time:
Item Numbers; TB-2, TB-3, TB-4, TB-6, TB-7, TB-10 and *Part Numbers;* 6116048, 6116050, 6116051, 6116052, TB-1, 6116055, 6116057, 6116059, TB-5, 6116282, 6116286, 6116290, 6116291, 6116292, 6116293, 6116294, 6116295, 6116296, 6116328.

Note: Other installation requirements may limit the number of users allowed on a system. See section 3.0.

Top Bracket Connection Loads:
One user on the system: 3,375 lbs (15.0 kN)
Two users on the system: 4,350 lbs (19.3 kN)
Three users on the system: 5,325 lbs (23.7 kN)
Four users on the system: 6,300 lbs (28.0 kN)

Exception: TB-1 top bracket is designed for use with 6116336 or 6116337 grab bar extension. When the grab bar is used as a connection for a personal fall arrest system the bracket connection must support a minimum of 5,000 lbs (22.2 kN)., or 3,600 lbs (16.0 kN) for a certified anchorage. See ANSI Z359.1 and OSHA regulations.

2. These top brackets allow one user only:
Item Numbers; TB-8, TB-11 and *Part Numbers;* TB-9 (KC36110020), 6116325, and 6116324

Top Bracket Connection Loads: One user on the system: 3,375 lbs (15.0 kN)

B. BOTTOM BRACKET: The bottom bracket connection must be capable of supporting a system pretension load of 750 lbs (3.3 kN) in the direction of loading.

3.0 SYSTEM INSTALLATION

3.1 LAD-SAF® systems are designed for easy installation onto a variety of ladder structures. To begin the installation you need to know the model numbers of the top and bottom brackets, cable guides, and type of cable (galvanized or stainless steel). Figures 1, 2, and 3 identify most models. Some brackets are designed to be installed using stand-off supports which go between the bracket and structure. You need to know model numbers of stand-off supports if included with your system. See Figure 4 for model numbers of most stand-off supports. Follow the instructions for the models included in your system.

Generally, the LAD-SAF® system is installed from the top of the ladder down. The basic procedure is:

Step 1. Install the top bracket
Step 2. Connect the cable to the top bracket
Step 3. Install the cable guides
Step 4. Install the bottom bracket
Step 5. Tension the cable
Step 6. Inspect the installation

Planning the installation can minimize the amount of time on the ladder and improve safety.

WARNING: *Use caution when installing LAD-SAF® systems. Wear personal protective equipment, including safety glasses and steel-toed shoes. Use personal fall arrest or restraint systems when exposed to a fall hazard. Use caution when installing LAD-SAF® systems near electrical power lines. LAD-SAF® cables are conductive. Do not connect to a partially installed LAD-SAF® system.*

3.2 WELDING RECOMMENDATIONS: Some installations require welding brackets to the structure. DBI-SALA recommends that welding be completed by a certified professional welder in accordance with applicable national welding codes or standards. Base and filler materials must be compatible with galvanized or stainless steel, depending on the materials of your system. Protect finished welds from corrosion with coating or paint.

3.3 TOP BRACKET INSTALLATION: Before installing the top bracket it is recommended that the ladder or climbing structure be evaluated by a qualified engineer to determine if the load requirements for the system are satisfied.

A. INSTALLATION OF TB-2, TB-3, TB-10 TOP BRACKETS:

Direct Connection to Ladder:
See Figure 6 for typical installations of the TB-3, TB-10, and TB-2 top brackets onto a round rung ladder. The top bracket should be positioned to allow users safe access when connecting or disconnecting from the system. The top bracket is typically mounted in the center of the climbing surface for ease of climbing, but may be located towards the side of the ladder if required.

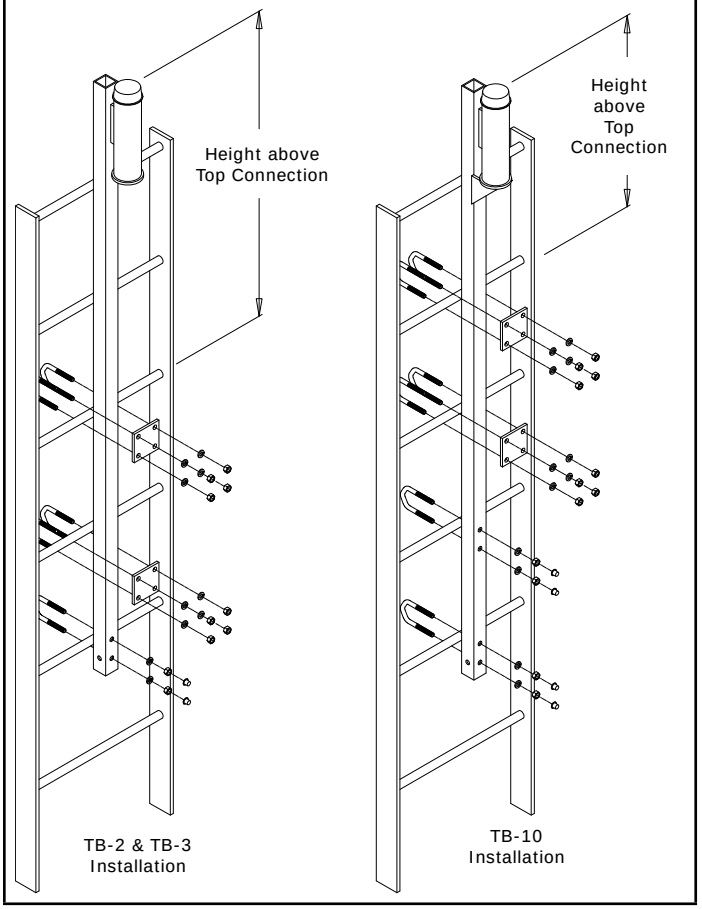
TB-3, TB-10:

- The top bracket may be installed with up to four feet extending above the top rung connection for systems limited to one user. This will allow the use of only two ladder rung clamps. Ensure the ladder will withstand the required loads between the two rungs.
- The top bracket may be installed with up to three feet extending above the top rung connection for systems allowing up to two users simultaneously.
- The top bracket may be installed with up to two feet extending above the top rung connection for systems allowing up to four users simultaneously.

TB-2:

- The top bracket may be installed with up to five feet extending above the top bracket connection for systems allowing up to four users simultaneously.

Figure 6 - Installing Top Brakcets



WARNING: *One rung clamp (two for the TB-10 bracket) is designed to bolt through the bracket and onto the rung. This clamp must not be omitted, or the bracket may slip under load.*

Install rung clamps using the hardware provided. Do not substitute other fasteners. Torque fasteners to 20-25 ft-lbs (27.1-33.9 N-m).

Stand-off Support Connection:
Figure 6 shows the installation of the TB-3 top bracket using a horizontal stand-off bracket. These installations are limited to one user on the system at a time. Use hex bolts in place of U-bolts to attach the TB-3 top bracket to the horizontal stand-off. Torque fasteners to 20-25 ft-lbs (27.1-33.9 N-m).

Ladder Rung Support:
Figure 8 shows the installation of the 6100151 ladder rung support piece. The rung support is used to support hollow rungs with a minimum inside diameter between 1 in. (2.54 cm) and 1-1/8 in. (2.86 cm). In some applications the ladder rungs

Figure 7 - Stand-off Support Connection

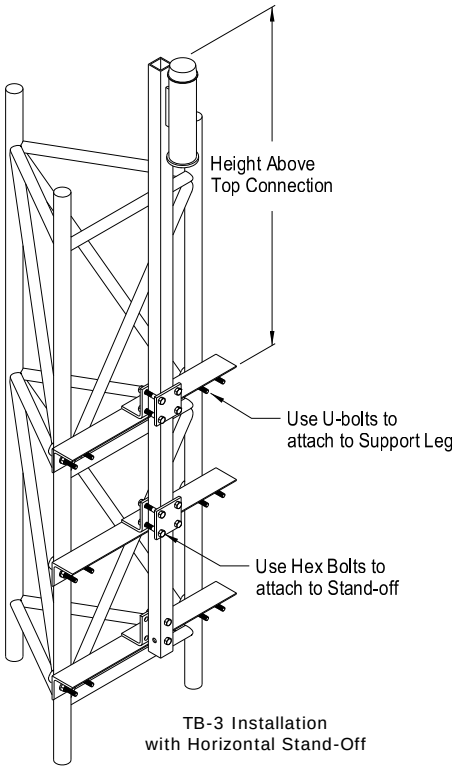
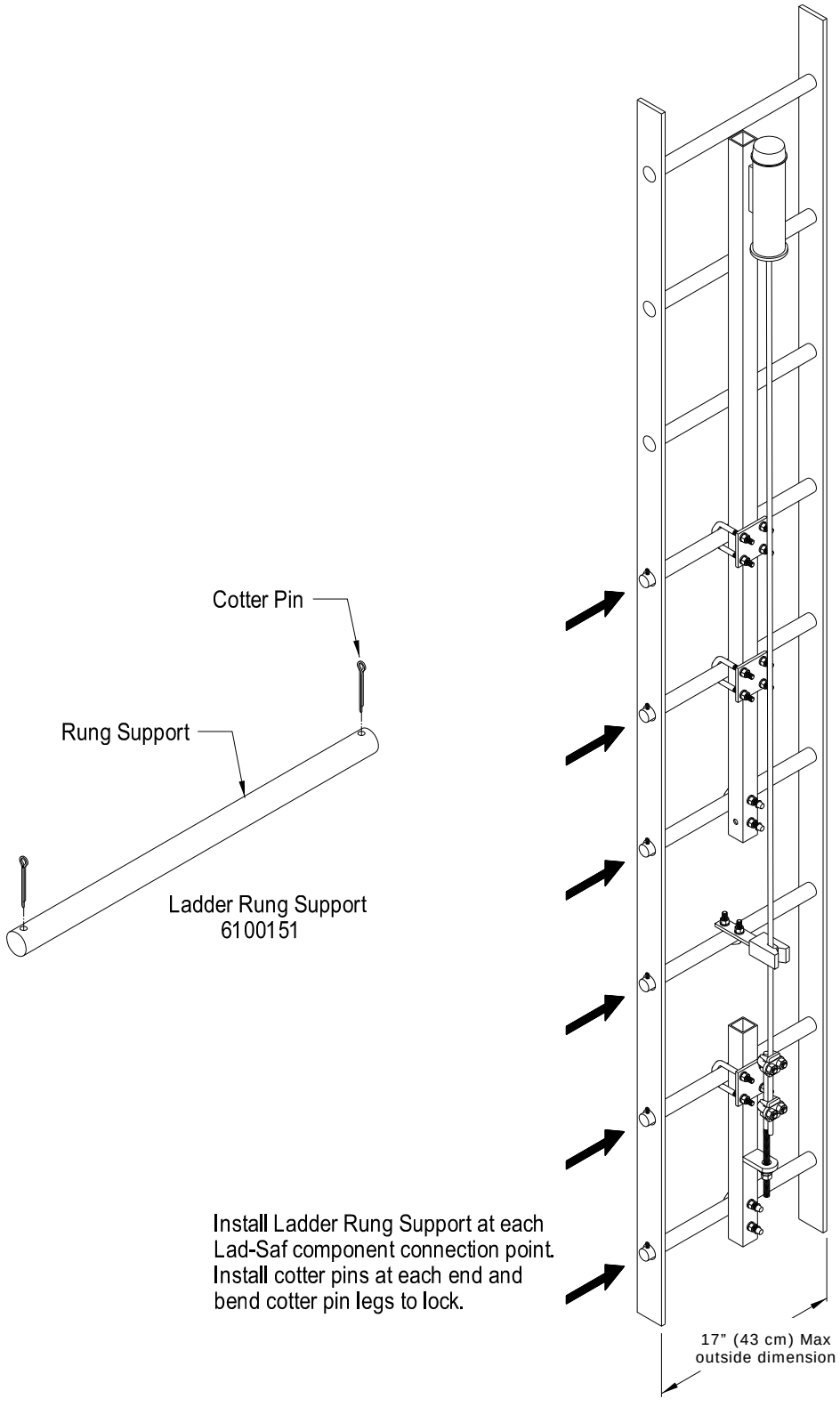


Figure 8 - Ladder Rung Support Piece

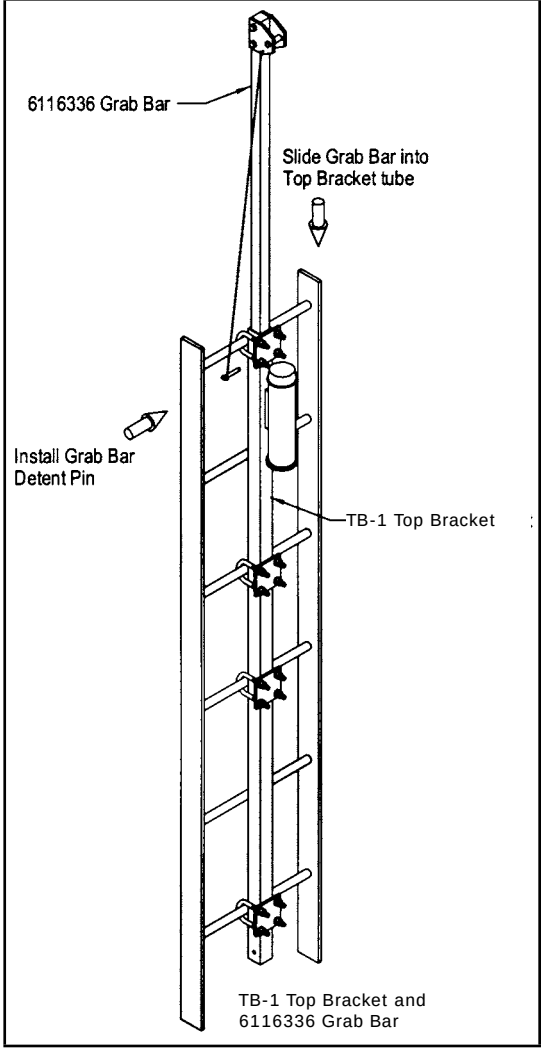


must be supported in order to meet required strengths and to prevent rung collapse. The rung support piece can be used on those rungs supporting top brackets, cable guide and bottom brackets.

The ladder or climbing structure must be evaluated by a qualified engineer to determine if the load requirements for the system with rung supports are satisfied.

Install ladder rung support at each LAD-SAF® component connection point.

Figure 9 - Installing Top Bracket and Grab Bar



B. INSTALLATION OF TB-1 TOP BRACKET AND 6116336 GRAB BAR:

See Figure 9 for a typical installation of the TB-1 top bracket onto a round rung ladder. The top bracket should be positioned to allow users safe access when connecting or disconnecting from the system. The top bracket is typically mounted in the center of the climbing surface for ease of climbing, but may be located towards the side of the ladder if required.

WARNING: *The top rung clamp bolts through a plate that is welded onto the bracket. This rung clamp must not be omitted, or the bracket may slip under load.*

Install rung clamps using the hardware provided. Do not substitute other fasteners. Torque fasteners to 20-25 ft.-lbs (27.1-33.9 N-m).

The 6116336 grab bar is installed by sliding the grab bar into the square tube of the bracket and installing the detent pin into the grab bar.

C. INSTALLATION OF TB-11 AND TB-12 CURVED LADDER TOP BRACKETS:

See Figure 10 for a typical installation of the TB-11 and TB-12 top brackets onto a curved round rung ladder. The top bracket should be positioned to allow users safe access when connecting or disconnecting from the system. Adjust the top bracket position so that the carrier cable conforms to the curvature of the ladder. Cable guides must be positioned along the ladder curve to prevent the cable from contacting the ladder. See section 3.4 for information on cable guides. The top bracket is typically mounted in the center of the climbing surface for ease of climbing, but may be located towards the side of the ladder if required. Install rung clamps using the hardware provided. Do not substitute other fasteners. Torque fasteners to 20-25 ft-lbs (27.1-33.9 N-m).

D. INSTALLATION OF TB-4, TB-6, AND TB-7 BOLT-ON TOP BRACKETS:

See Figure 11 for a typical installation of the TB-4, TB-6, and TB-7 top brackets. The top bracket should be positioned to allow users safe access when connecting or disconnecting from the system. The top bracket is typically mounted in the center of the climbing surface, directly above the ladder, for ease of climbing, but may be located towards the side of the ladder, 12 inches (30.5 cm) maximum from center, if required. The top brackets are to be connected to the structure with a DBI-SALA or customer supplied stand-off support. Stand-off supports must support the loads specified in section 2.3, and must be compatible with the LAD-SAF® system.

Figure 10 - Installing Curved Ladder Top Brackets

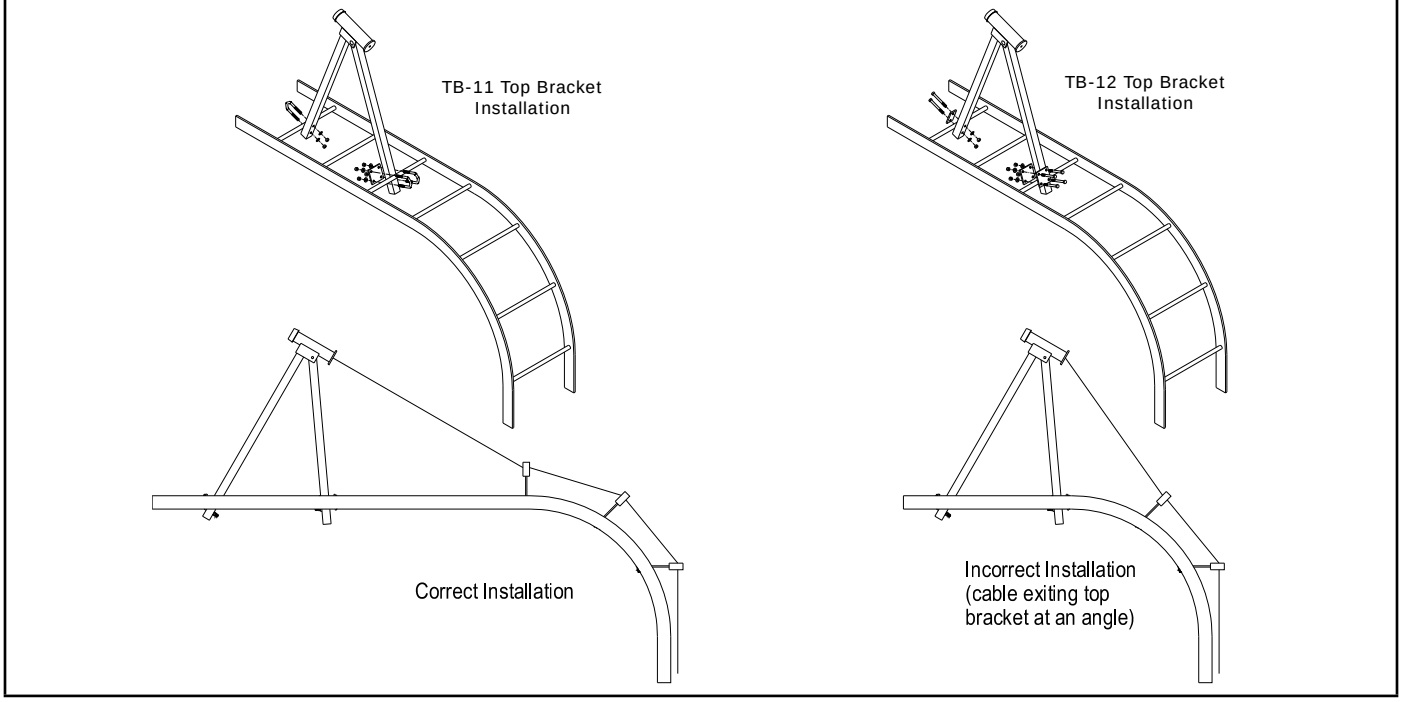
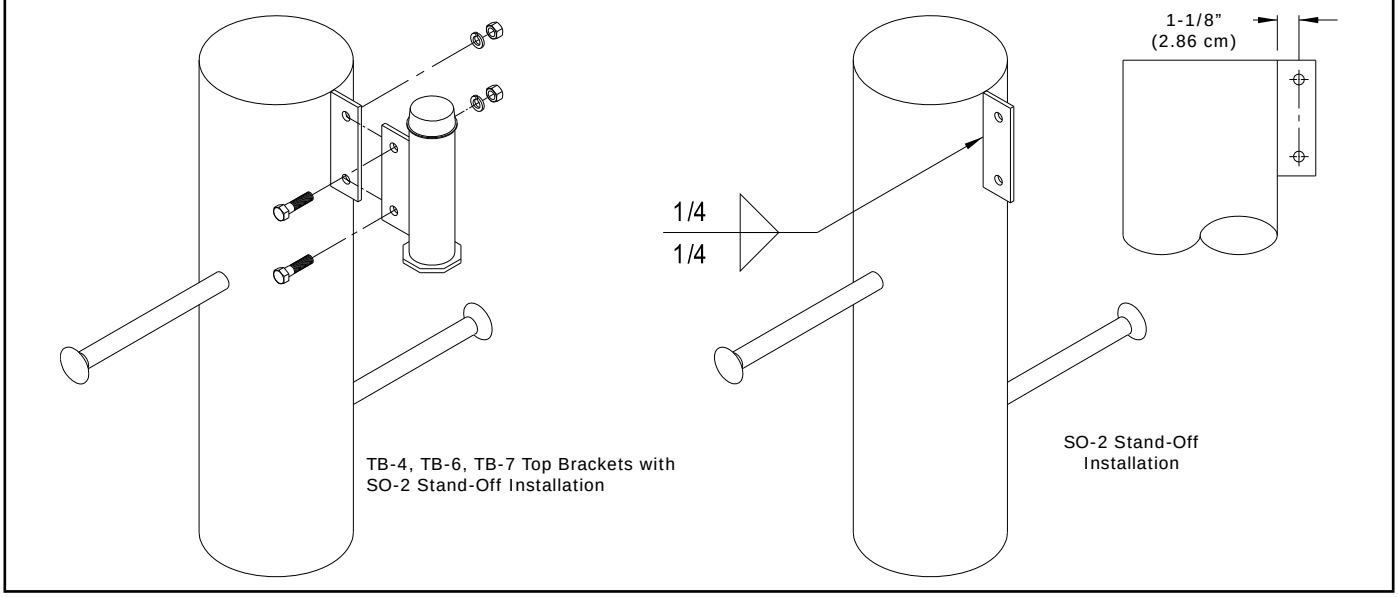


Figure 11 - Installing Bolt-on Top Bracket & Weld-on Stand-off



Angle Leg and Round Leg Stand-off Installation:

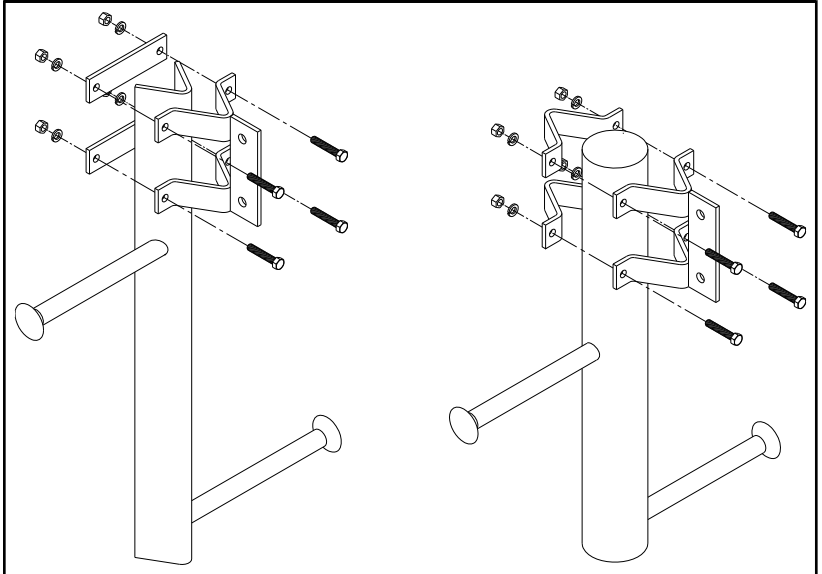
See Figure 12 for the installation of the angle and round leg stand-off supports. Install stand-off supports using the hardware provided. Do not substitute other fasteners. Torque 3/8-inch fasteners to 20-25 ft-lbs (27.1-33.9 N-m). Install the top bracket to the stand-off support using the 1/2-inch fasteners provided. Torque 1/2-inch fasteners to 40-45 ft-lbs (54-61 N-m). Note: For the TB-6 stand-off, fasteners are not supplied. DBI-SALA recommends using lock washers, double nuts, or other methods to ensure fasteners will not loosen.

SO-2 Weld-on Stand-off Installation:

Install the SO-2 stand-off support as shown in Figure 11. See section 3.2 for welding recommendations. The stand-off must be perpendicular to the pole surface and in-line with the carrier cable.

WARNING: *Installations that use the angle leg or round leg stand-off support brackets are limited to one user on the system at a time.*

Figure 12 - Installing Angle Leg & Round Leg Stand-offs



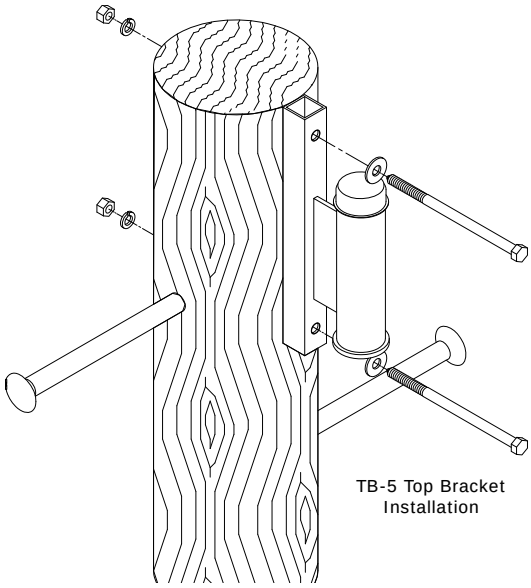
Angle Leg Stand-off Installation

Round Leg Stand-off Installation

E. INSTALLATION OF TB-5 WOOD POLE TOP BRACKET:

See Figure 13 for a typical installation of the TB-5 top bracket onto a wooden pole. The top bracket should be positioned to allow users safe access when connecting or disconnecting from the system. The top bracket is typically mounted in the center of the climbing surface for ease of climbing, but may be located towards the side of the ladder if required. Use 1/2-inch fasteners (not provided) to attach the top bracket to the pole. Fasteners should extend through the pole when possible. DBI-SALA recommends using lock washers, double nuts, or other methods to ensure fasteners will not loosen.

Figure 13 - Installing TB-5 Top Bracket

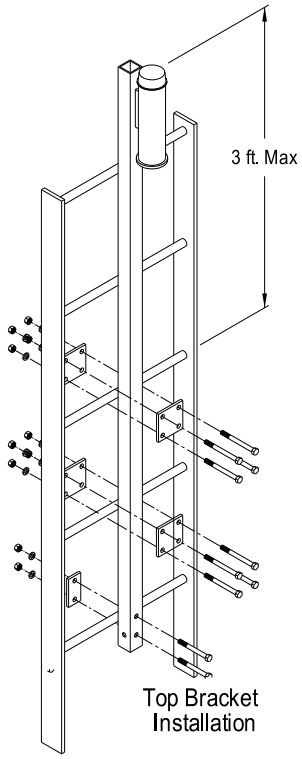


TB-5 Top Bracket Installation

F. INSTALLATION OF TB-9, TB-13, AND TB-14 TOP BRACKETS:

See Figure 14 for a typical installation of the top bracket onto a ladder. Some brackets utilize rung spacers while others do not (see Figure 1). The top bracket should be positioned to allow users safe access when connecting or disconnecting from the system. The top bracket is typically mounted in the center of the climbing surface for ease of climbing, but may be located towards the side of the ladder if required.

Figure 14 - Typical Installation of Top Bracket



Top Bracket Installation

- The top bracket may be installed with up to 4 ft. (1.2 m) extending above the top rung connection for systems limited to one user. This will allow the use of only two ladder rung clamps. Ensure the ladder will withstand the required loads between the two rungs.
- The top bracket may be installed with up to 3 ft. (0.9 m) extending above the top rung connection for systems allowing up to two users simultaneously.
- The top bracket may be installed with up to 2 ft. (0.6 m) extending above the top rung connection for systems allowing up to four users simultaneously.

WARNING: *One rung clamp (lower connection) is designed to bolt through the bracket and onto the rung. This clamp must not be omitted, or the bracket may slip under load.*

Install rung clamps using the hardware provided. Do not substitute other fasteners. Torque fasteners to 20-25 ft-lbs (27.1-33.9 N-m).

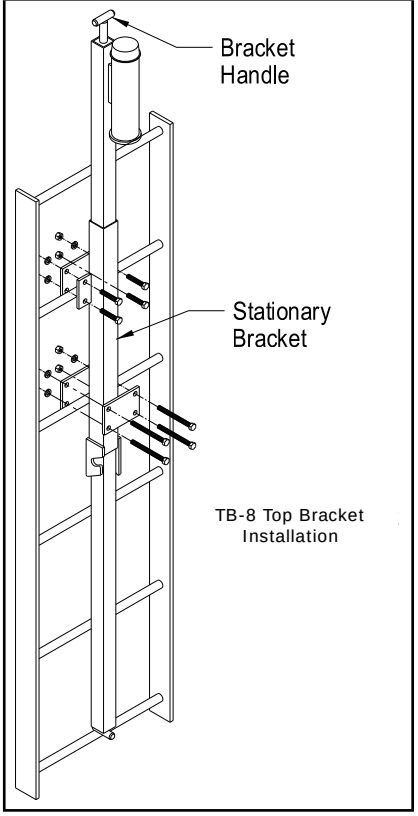
G. INSTALLATION OF TB-8 TELESCOPING TOP BRACKET: See Figure 15 for a typical installation of the TB-8 top bracket onto a round rung ladder. The top bracket should be positioned to allow users safe access when connecting or disconnecting from the system. The top bracket is typically mounted in the center of the climbing surface for ease of climbing, but may be located towards the side of the ladder if required. The TB-8 top bracket is designed to mount at or near the top of the ladder and telescope up when in use. Typical installations include access ladders into manholes and under trap doors.

Installations that use the TB-8 top bracket are limited to one user on the system at a time.

Install rung clamps using the hardware provided. Do not substitute other fasteners. Torque fasteners to 20-25 ft-lbs (27.1-33.9 N-m).

TO OPERATE: Pull up on the bracket handle and rotate it clockwise to lock it in place. Secure the front attachment point on a full body harness to the carrier cable with a Lad-Saf® detachable cable sleeve and climb up and down the ladder. (See the Lad-Saf® Detachable Cable Sleeve User Instruction Manual for details). When you are done rotate the bracket handle counterclockwise and allow the bracket to slide back down into the stationary bracket.

Figure 15 - Installing TB-8 Top Bracket



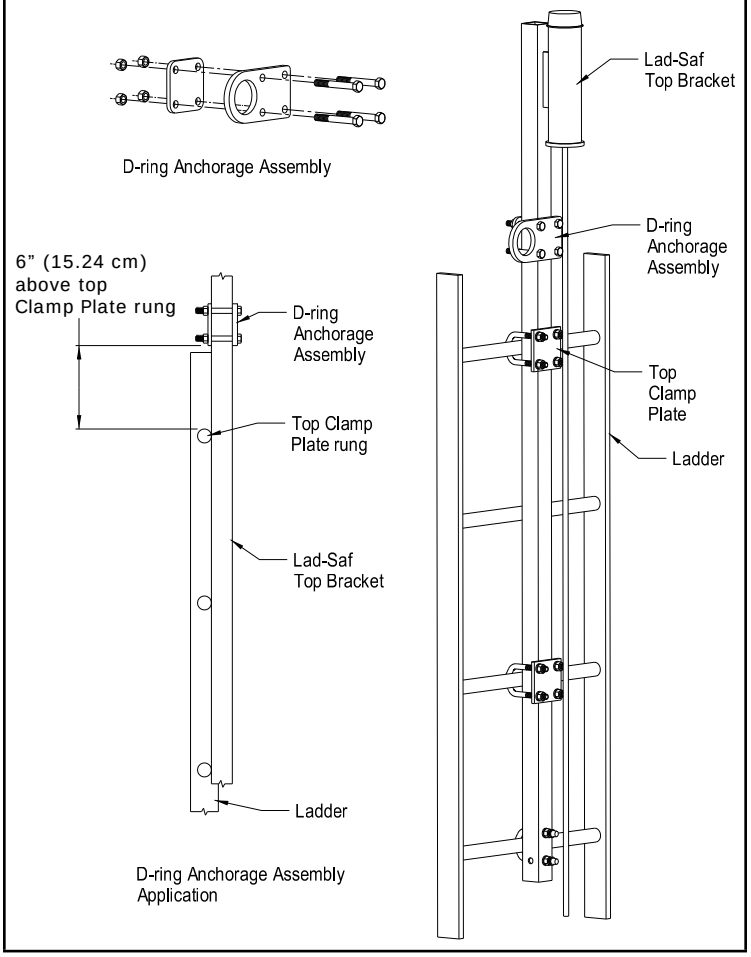
H. INSTALLATION OF D-RING ANCHORAGE: The D-ring Anchorage is designed for used with the DBI-SALA Force2™ energy absorbing lanyard and full body harness. The D-ring Anchorage must be attached to a Lad-Saf® top bracket that is attached to a structure that meets the top bracket load requirements. See Figure 16.

APPLICATION: The D-ring anchorage must be used in accordance with local requirements for fall arrest or rescue systems.

INSTALLATION: See Figure 16. Install the D-ring anchorage assembly no more than 6 in. (15.2 cm) above the ladder rung where the top clamp plate of the Lad-Saf® top bracket is attached. The D-ring must be on the climbing (cable) side of the top bracket. Clamp the D-ring anchorage assembly to the top bracket with the fasteners provided with the assembly. Torque fasteners to 20-25 ft.-lbs (27.1-33.9 N-m).

USE: Connect the lanyard end of the energy absorbing lanyard to the D-ring anchorage. Connect the energy absorber end to the back D-ring on your full body harness. Do not disconnect from the Lad-Saf system before connecting to the D-ring anchorage.

Figure 16 - Installing D-ring Anchorage



4. SWING FALLS: Swing falls occur when the anchorage point is not directly above the point where a fall occurs. The force of striking an object in a swing fall may cause serious injury. See the instructions provided with the energy absorbing lanyard for more information.

3.4 INSTALLATION OF CARRIER CABLE TO TOP BRACKET:

WARNING: *Keep the carrier cable and carrier clamp clean during installation. Contamination of the carrier clamp or cable could cause the clamp to malfunction.*

A. INSTALLATION OF GALVANIZED CARRIER CABLE:

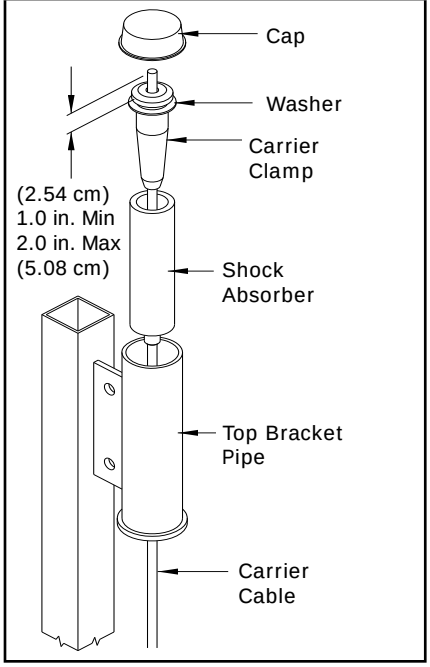
1. Lay the carrier cable out on the ground in a clean area by rolling the coil. Do not pull cable from center of coil. For some installations it may be easier to lower the carrier cable from the top connection level down to the bottom bracket. If so, carefully lower the cable by unspooling without twisting the cable at the top connection. Do not drop the cable to the lower level.

WARNING: *Carrier cable is very stiff and may spring out of coil unexpectedly. Use caution when unrolling cable. Use appropriate safety gear, including gloves and safety glasses, when unrolling cable.*

Inspect the cable for shipping damage before proceeding. Do not install damaged cable.

2. See Figure 17 for installation of the galvanized carrier cable into the top bracket. Ensure the end of cable is free of kinks and unraveled strands. Pass the cable up through the top bracket pipe and the urethane shock absorber. Install the washer and carrier clamp onto cable with the cone of carrier clamp pointing down. At least 1.0 in. (2.5 cm), but no more than 2 in. (5.1 cm). of cable must protrude through the carrier clamp.

Figure 17 - Installing Galvanized Carrier Cable



WARNING: *Excess cable protruding through the carrier clamp may prevent installation of the cap. If this occurs, cut off extra cable. Do not remove carrier clamp from cable to avoid damage to the carrier clamp.*

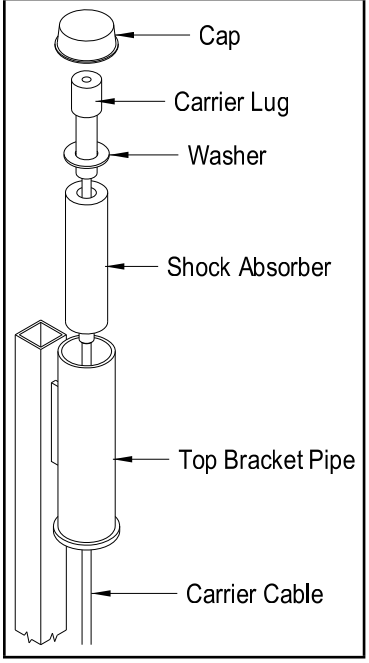
Seat the carrier clamp into shock absorber by pulling firmly on carrier clamp below the top bracket pipe. Install cap by seating it firmly onto the pipe.

B. INSTALLATION OF STAINLESS STEEL CARRIER CABLE:

1. Lay the carrier cable out on the ground in a clean area by rolling the coil. Do not pull the cable from the center of the coil.

WARNING: *Carrier cable is very stiff, and may spring out of the coil unexpectedly. Use caution when unrolling cable. Use appropriate safety gear, including gloves and safety glasses, when unrolling cable.*

Figure 18 - Installing Stainless Steel Carrier Cable



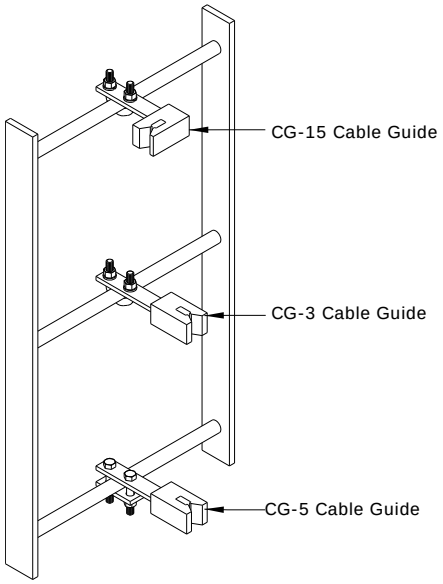
Inspect the cable for shipping damage before proceeding. Do not install damaged cable.

3. See Figure 18 for installation of a stainless steel carrier cable into the top bracket. Most stainless steel carrier cables are supplied with a swagged end fitting for connection to the top bracket. To install the carrier cable, feed the free end of the cable down through the top bracket pipe and the urethane shock absorber until the swage fitting is firmly seated into the shock absorber. Install the cap by seating it firmly onto the pipe.

3.5 INSTALLATION OF CABLE GUIDES, ALL MODELS:

Cable guides protect the carrier cable from chafing against the ladder or structure and to prevent the climber from excessively deflecting the cable from side to side. Cable guides should be positioned at approximately 25 ft (7.62 m) intervals along the carrier cable between the top and bottom brackets, and at any point along the system where the cable may abrade against the structure. Cable guides should be staggered along the system to reduce harmonic effects of the wind, such as at 23 (7.01), 25 (7.61), and 27 (8.23) feet (m) intervals. For high wind areas "L" shaped cable guides may be used. The "L" shaped cable guides should be alternated with opening on the left, then right, etc. up the ladder. Latching cable guides are also available.

Figure 19 - Installing Cable Guides



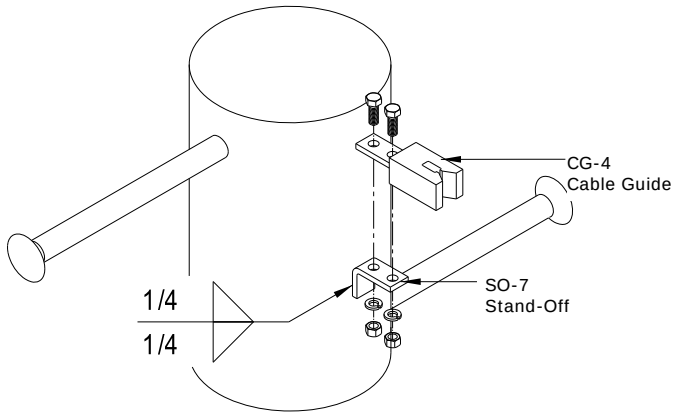
Direct Connection to Ladder:

See Figure 19 for a typical installations of cable guides onto a ladder. Some cable guides utilize rung spacers and clamp plates while others do not (see Figure 3). Install the cable guide using the hardware provided. Do not substitute other fasteners. Torque fasteners to 20-25 ft-lbs (27.1-33.9 N-m).

SO-7 Weld-on Stand-off Support Installation:

Install the SO-7 stand-off as shown in Figure 20. See section 3.2 for welding recommendations. The stand-off must be perpendicular to the pole surface and in-line with the carrier cable.

Figure 20 - Installing Weld-on Cable Guides

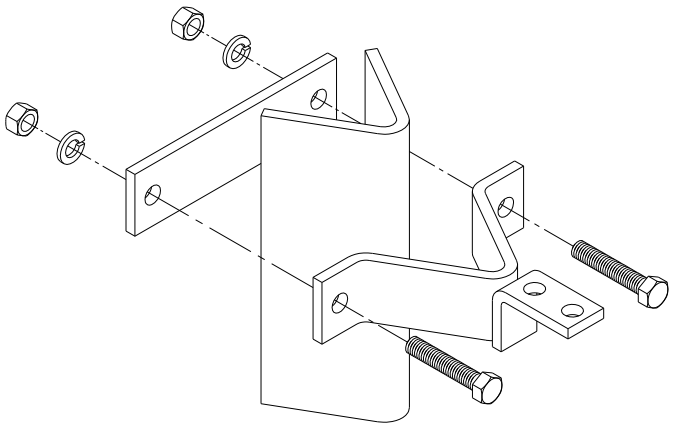


Angle Leg and Round Leg Stand-off Support Installation:

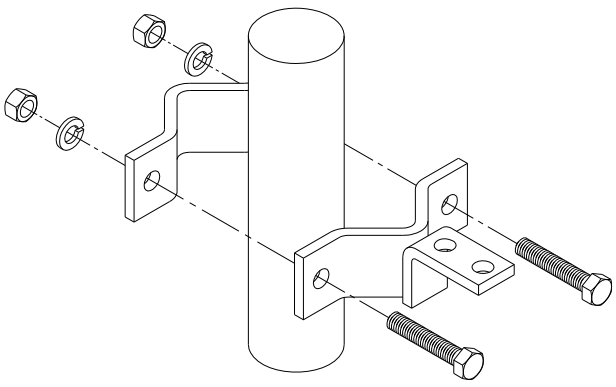
See Figure 21 for typical installations of angle leg and round leg stand-off supports. Install the stand-off support using the hardware provided. Do not substitute other fasteners. Torque fasteners to 20-25 ft-lbs (27.1-33.9 N-m).

Install the cable guide to the stand-off support using the hardware provided. Do not substitute other fasteners. Torque fasteners to 20-25 ft-lbs (27.1-33.9 N-m).

Figure 21 - Installing Angle Leg & Round Leg Stand-off Supports



Angle Leg Stand-off Support Installation



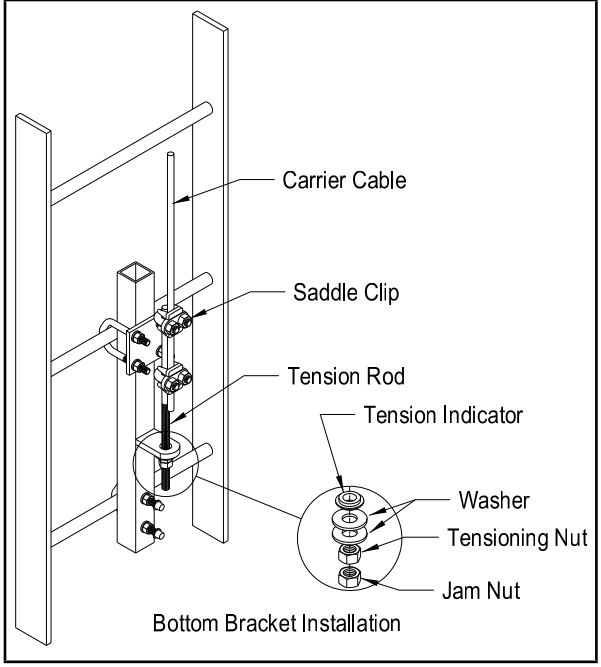
Round Leg Stand-off Support Installation

3.6 INSTALLATION OF BOTTOM BRACKET AND CARRIER CABLE TENSION ADJUSTMENT:

Before installing the bottom bracket it is recommended that the ladder and/or climbing structure be evaluated by a qualified engineer to determine if the load requirements for the system specified in section 2.3 are met.

NOTE: *Depending on the length of the system, and the environment in which the system is installed, it may be necessary to periodically re-tension the system. Extreme temperature ranges and very long systems will likely require periodic re-tensioning. The tension indicator can be purchased separately. Contact DBI-SALA for details.*

Figure 22 - Installing Bottom Brackets



Bottom Bracket Installation

A. INSTALLATION OF BB-1, BB-2, BB-3, AND BB-9 BOTTOM BRACKETS:

Direct Connection to Ladder:

See Figure 22 for a typical installation of the bottom bracket onto a ladder. Some brackets utilize "U"-bolts while others utilize bolts and clamp plates to attach to the ladder (see Figure 2). The bottom bracket should be positioned to allow users safe access when connecting or disconnecting from the system. The bottom bracket must be mounted in-line (vertically) with the top bracket.

WARNING: *One rung clamp is designed to bolt through the bracket and onto the rung. This clamp must not be omitted, or the bracket may slip under load.*

Install the rung clamps using hardware provided. Do not substitute other fasteners. Torque fasteners to 20-25 ft-lbs (27.1-33.9 N-m).

Stand-off Support Connection:

Figure 23 shows the installation of the above bottom brackets using a horizontal stand-off bracket. Use hex bolts provided in place of U-bolts to attach the bottom bracket to the horizontal stand-off. Torque fasteners to 20-25 ft-lbs (27.1-33.9 N-m).

Carrier Cable Tension Adjustment:

Figure 22 shows the assembly of the tension rod to the bottom bracket and carrier cable. Loosely clamp the saddle clips around the carrier cable. Slide the tension rod down the carrier cable and through the hole in the bracket until sufficient threads are exposed to allow the installation of the tension indicator, washers, and nuts. Remove the slack in the carrier cable by the pulling cable though the saddle clips. Tighten saddle clips to 35 ft.-lbs (47.5 N-m). Tighten the tensioning nut until the ring on the tension indicator is sheared off. A small amount of grease on the tension rod threads will reduce the effort required to tension the carrier cable. If there are insufficient threads exposed to fully tension the carrier cable, pull more carrier cable through the saddle clips on the tension rod and repeat the procedure. When correct carrier cable tension is reached tighten the jam nut against the tensioning nut. Cut off excess cable just below the lower saddle clip.

Figure 23 - Installing Bottom Brackets to Horizontal Standoff

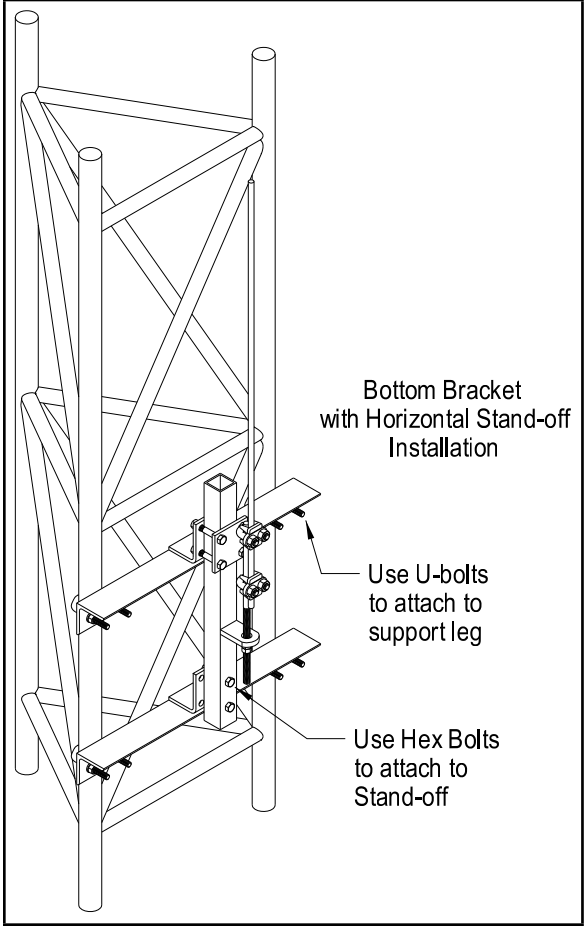
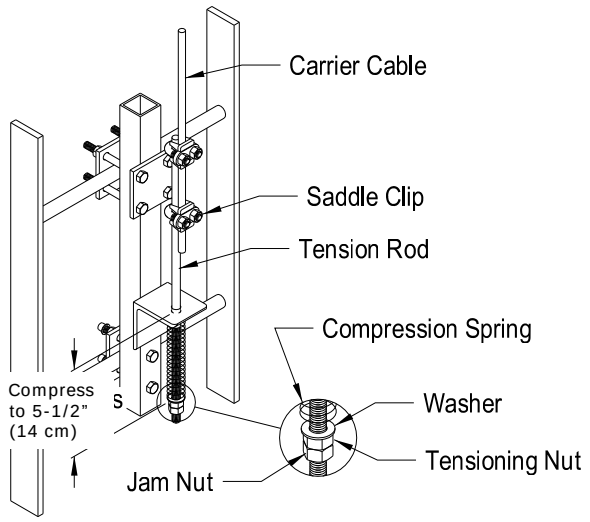
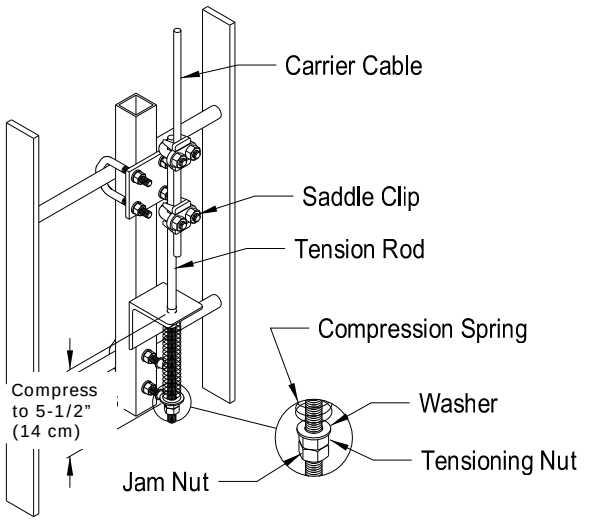


Figure 24 - Installing Bottom Brackets



BB-4 Bottom Bracket Installation



BB-6 Bottom Bracket Installation

B. INSTALLATION OF BB-4, BB-5, AND BB-6 BOTTOM BRACKETS:

Bottom Bracket Installation:

See Figure 24 for a typical installations of the BB-4 and BB-6 bottom brackets onto a round rung ladder. See Figure 25 for a typical installation of the BB-5 bottom bracket with a weld-on stand-off support. The bottom bracket should be positioned to allow users safe access when connecting or disconnecting from the system. The bottom bracket must be mounted in-line (vertically) with the top bracket.

> ***WARNING:*** *One rung clamp is designed to bolt through the bracket and onto the rung. This clamp must not be omitted, or the bracket may slip under load.*

Install the rung clamps using the hardware provided. Do not substitute other fasteners. Torque fasteners to 20-25 ft.-lbs (27.1-33.9 N-m).

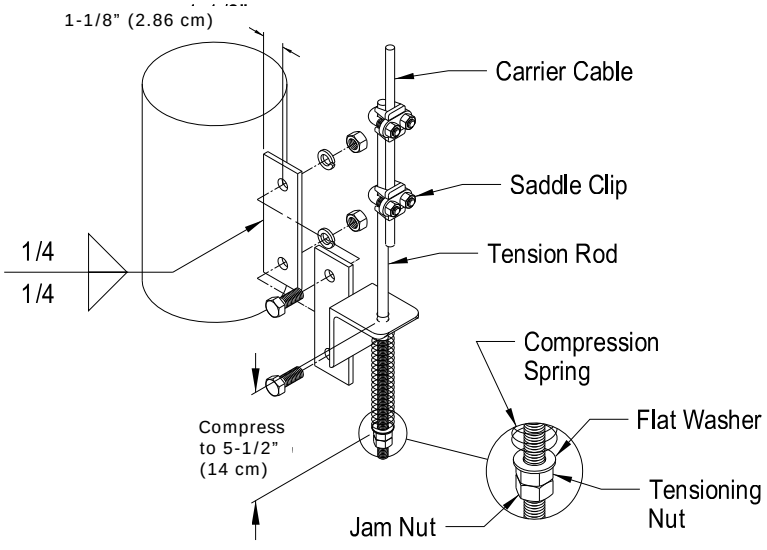
Weld-on Stand-off Installation:

Install the SO-2 stand-off support as shown in Figure 25. See section 3.2 for welding recommendations. The stand-off must be perpendicular to the pole surface and in-line with the carrier cable.

Carrier Cable Tension Adjustment:

Figures 24 and 25 show the assembly of the tension rod to the bottom bracket and carrier cable. Loosely clamp the saddle clips around the carrier cable. Slide the tension rod down the carrier cable and through the hole in the bracket until sufficient threads are exposed to allow the installation of the washers and nuts. Remove slack in the carrier cable by pulling the cable through the saddle clips. Tighten the saddle clips to 35 ft.-lbs (47.5 N-m). Tighten the tensioning nut until the carrier cable is taut. A small amount of grease on the tension rod threads will reduce the effort required to tension the carrier cable. Compress the spring to approximately 5-1/2 in. (14 cm). Do

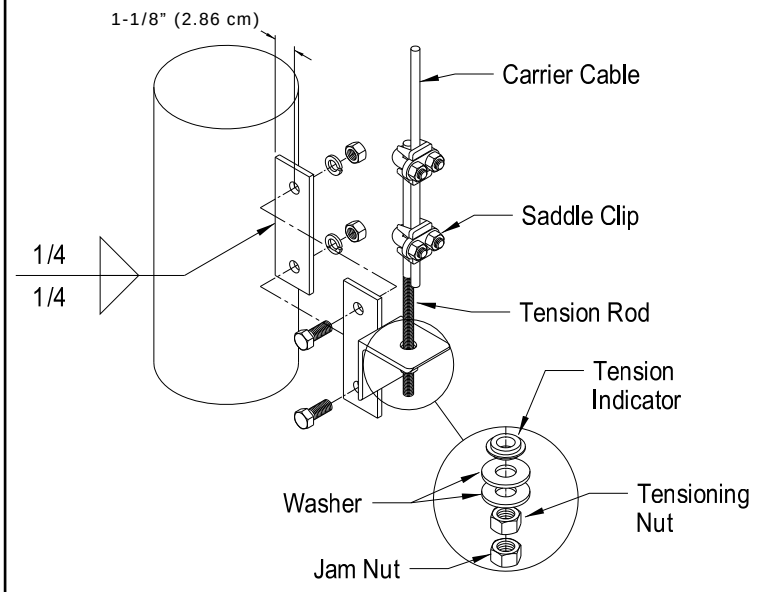
Figure 25 - Installing Bolt-on Bottom Bracket & Weld-on Stand-off



BB-5 Bottom Bracket and SO-2 Stand-Off Installation

not completely compress the spring. If there are insufficient threads exposed to fully tension the carrier cable, pull more carrier cable through the saddle clips on the tension rod and repeat the procedure. When the correct carrier cable tension is reached, tighten the jam nut against the tensioning nut. Cut off excess cable just below the lower saddle clip.

Figure 26 - Installing Bottom Brackets and Weld-on Stand-off



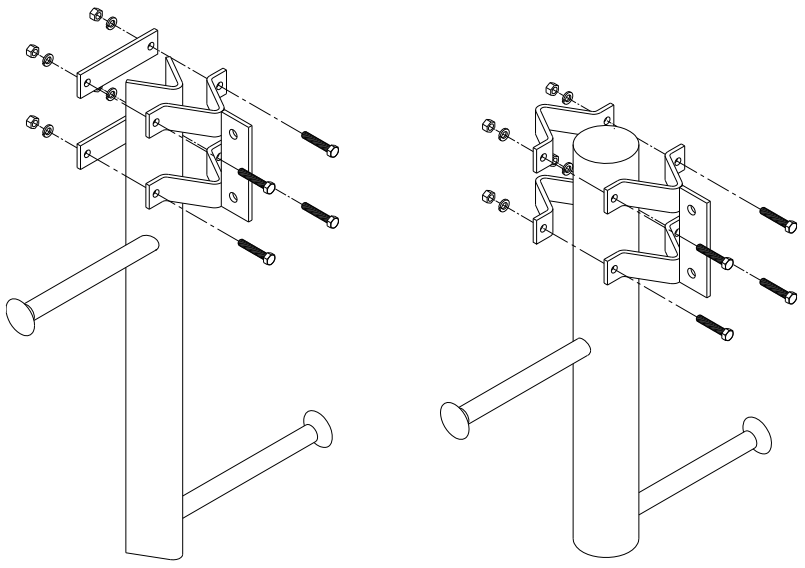
BB-7 Bottom Brackets and SO-2 Stand-Off Installation

C. INSTALLATION OF BB-7 BOLT-ON BOTTOM BRACKETS:

Bottom Bracket Installation:
See Figure 26 for a typical installation of the BB-7 bottom brackets. The bottom bracket should be positioned to allow users safe access when connecting or disconnecting from the system. The bottom bracket must be mounted in-line (vertically) with the top bracket. The 6100035 and 6100040 bottom brackets are designed to be connected to the structure using a DBI-SALA or customer supplied stand-off support. Customer supplied stand-off supports must be capable of withstanding the loads specified in section 2.3 and must be compatible with the LAD-SAF® system.

Weld-on Stand-off Installation:
Install the SO-2 stand-off support as shown in Figure 26. See section 3.2 for welding recommendations. The stand-off must be perpendicular to the pole surface and in-line with the carrier cable.

Figure 27 - Installing Angle Leg & Round Leg Stand-offs



Angle Leg Stand-off Installation

Round Leg Stand-off Installation

Angle Leg and Round Leg Stand-off Installation:
See Figure 27 for the installation of round and angle leg stand-off supports. Install stand-off supports using the hardware provided. Do not substitute other fasteners. Torque 3/8 inch fasteners to 20-25 ft.-lbs (27.1-33.9 N-m). Install bottom bracket to stand-off support using 1/2-inch fasteners provided. Torque 1/2-inch fasteners to 40-45 ft.-lbs (54-61 N-m).

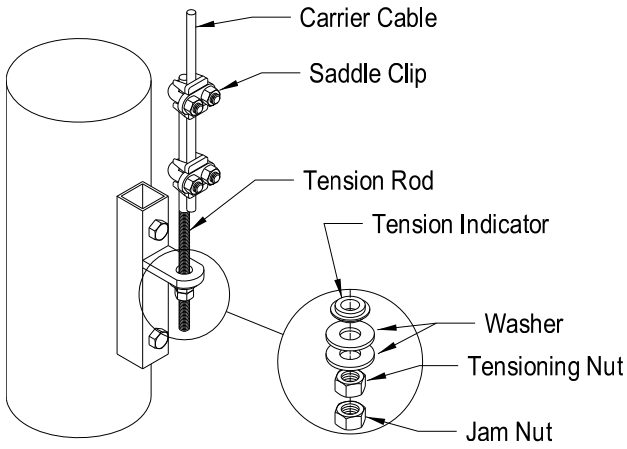
Carrier Cable Tension Adjustment:
Figure 26 shows the assembly of the tension rod to the bottom bracket and carrier cable. Loosely clamp the saddle clips around the carrier cable. Slide the tension rod down the carrier cable and through the hole in the bracket until sufficient threads are exposed to allow the installation of the tension indicator, washers, and nuts. Remove slack in the carrier cable by pulling the cable though the saddle clips. Tighten saddle clips to 35 ft.-lbs (47.5 N-m). Tighten the tensioning nut until the ring on the tension indicator is sheared off. A small amount of grease on the tension rod threads will reduce the effort required to tension the carrier cable. If there are insufficient threads exposed to fully tension the carrier cable, pull more carrier cable through the saddle clips on the tension rod and repeat the procedure. When the correct carrier cable tension is reached, tighten the jam nut against the tensioning nut. Cut off excess cable just below the lower saddle clip.

D. INSTALLATION OF BB-8 WOOD POLE BOTTOM BRACKET:

Bottom Bracket Installation:

See Figure 28 for a typical installation of the BB-8 bottom bracket. The bottom bracket should be positioned to allow users safe access when connecting or disconnecting from the system. The bottom bracket must be mounted in-line (vertically) with the top bracket. Use 1/2-inch fasteners (not provided) to attach the bottom bracket to the pole. DBI-SALA recommends using lock washers, double nuts, or other methods to ensure fasteners will not loosen.

Figure 28 - Installing Wood Pole Bottom Bracket



BB-8 Wood Pole Bottom Bracket Installation

Carrier Cable Tension Adjustment:

Figure 28 shows the assembly of the tension rod to the bottom bracket and carrier cable. Loosely clamp the saddle clips around the carrier cable. Slide the tension rod down the carrier cable and through the hole in the bracket until sufficient threads are exposed to allow the installation of the tension indicator, washers, and nuts. Remove slack in the carrier cable by pulling the cable though the saddle clips. Tighten saddle clips to 35 ft.-lbs (47.5 N-m). Tighten the tensioning nut until the ring on the tension indicator is sheared off. A small amount of grease on the tension rod threads will reduce the effort required to tension the carrier cable. If there are insufficient threads exposed to fully tension the carrier cable, pull more carrier cable through the saddle clips on the tension rod and repeat the procedure. When the correct carrier cable tension is reached, tighten the jam nut against the tensioning nut. Cut off excess cable just below the lower saddle clip.

E. 5900172 COUNTERWEIGHT:

To install the 5900172 counterweight onto the carrier cable, loosen the saddle clips and pass the carrier cable through the counterweight. Position the counterweight to allow users safe access when connecting or disconnecting from the system. Tighten the saddle clips against the carrier cable.

3.7 FINAL INSPECTION AFTER INITIAL INSTALLATION AND SYSTEM IDENTIFICATION:

A. Install the installation and service label onto the ladder or structure in a prominent location. Use the steel wire provided with the label to attach it to the ladder or structure. Before installing the label, mark the installation date and number of users allowed in the appropriate locations on the label. Use a metal letter stamp to mark the label. Record the system identification information in the *Installation Check Lists* at the end of this manual.

B. After installation conduct a final inspection of the system as follows:

- Ensure all fasteners are in place and properly tightened.
- Ensure the carrier cable is properly tensioned. Do not use the Lad-Saf® system if the bottom of the cable is not secured/tensioned with the bottom bracket assembly.
- For cables terminated with a carrier clamp, the cable should extend above the carrier clamp 1.0 in. - 2.0 in. (2.5 cm - 5.0 cm).
- Ensure the carrier cable does not abrade against the structure at any point.
- Ensure the system information is recorded on the label and inspection log.

4.0 LAD-SAF® SYSTEM USE

4.1 BEFORE EACH USE inspect the system according to section 5.0. Do not climb a structure that is not in good condition. Verify from the label markings that the system has been formally inspected within the last year. Do not use a defective or improperly maintained LAD-SAF® system. Inspect the detachable cable sleeve according to manufacturer's instructions. Inspect the full body harness according to manufacturer's instructions.

4.2 PLAN your use of the LAD-SAF® system before starting work. Consider all factors that will affect your safety before starting your work. The following list gives some important points to consider when planning your work:

- Ensure the system is rated for the number of users required on the system before use.
- Consider hazards associated with connecting and disconnecting from the system. Ensure adequate anchor points, landing platforms, or other means are available at connection and disconnection points to allow safe transitions to and from the system.
- Be aware of hazards in the work area that could cause injury to the user or damage to the system, such as; high heat, electrical hazards, chemical hazards, or moving machinery.
- A minimum fall clearance of 7 ft. (2 m) is required between the user's feet and surface below. The user may not be protected against hitting the ground or landing during the first 7 ft. (2 m) of ascent or last 7 ft. (2 m) of descent. Extra care should be taken when ascending or descending the portion of the ladder below the bottom bracket of the Lad-Saf™ system.
- Use caution when climbing. Avoid carrying tools or equipment that do not allow your hands to be free for climbing. Ensure items carried are secure to avoid dropping them on climbers below. Climb within your ability. Long climbs may require several rest stops during ascent or descent to avoid exhaustion. Avoid climbing in high winds or severe weather whenever possible.
- If a fall occurs the user (employer) must have a rescue plan and the ability to implement it.

4.3 TRAINING: It is the responsibility of the user and purchaser of this equipment to assure they are familiar with the instructions, operating characteristics, application limits, and the consequences of improper use of this equipment. Users and purchasers of this equipment must be trained in the correct care and use of this equipment. Contact DBI/SALA for additional training guidelines.

5.0 INSPECTION

5.1 FREQUENCY:

- **Before Each Use:** Visually inspect the full body harness, ladder safety sleeve, Lad-Saf® system installation, and ladder structure. Use the guidelines provided in section 5.2 to check the system to the extent possible for attaching. Check the system label (section 8) to verify that annual inspection is current. If the condition of the system is in doubt, do not use.
- **Formal Inspection:** A formal inspection of the ladder safety sleeve, the LAD-SAF® installation, and the ladder structure must be performed at least annually by a competent person other than the user. See Sections 5.2 and 5.3 for inspection specifics.
- **After a Fall:** If a fall occurs with the ladder safety sleeve or on the LAD-SAF® system a formal inspection of the entire system must be performed by a competent person other than the user. A separate fall protection system (not the Lad-Saf® system) should be used while inspecting the system. See sections 5.2, 5.3 and 5.4. Record the inspection results in the *Inspection and Maintenance Logs* at the end of this manual.

5.2 INSPECTION GUIDELINES - LAD-SAF™ LADDER SAFETY SYSTEM:

☑ **Top Brackets:** Reference Figure 16 & Figure 17.

- Inspect for proper installation (see Sections 3.3 & 3.4).
- Check for visible damage or corrosion. Look for cracks, bends or wear that could affect the strength and operation of the system. Inspect welds. Look for cracked or broken welds that could affect strength of bracket. Replace parts if defects are found.
- Check for loose or missing fasteners that secure top bracket to structure (bolts, clamp plates, U bolts). If fasteners are loose, re-tighten to the torque levels listed. Torque on 3/8 inch fasteners should be 20-25 ft-lbs (27-34 N-m). Torque on ½ inch fasteners should be 40-45 ft –lbs (54-61 N-m). Retighten as necessary.

- Inspect carrier clamps (some models will contain a swaged on carrier lug in place of the carrier clamp- see Figure 17). Cable should extend above carrier clamp 1.0 inch (2.5 cm) to 2.0 inch (5.0 cm). Adjust cable if amount of cable extension is outside of described range. Steel washer should be present between carrier clamp and shock absorber.
- Look down the inside of the pipe and inspect the shock absorber for damage such as cracks or splits. The bottom of the shock absorber should project out the bottom hole in the top bracket pipe. Replace the shock absorber if defects are found.
- Inspect the cap that fits on the top of the pipe. Check for cracks or damage to the cap. The cap should fit securely onto the pipe. Replace if defects are found.

☑ **Bottom Bracket:** Reference Figure 21.

- Check for proper installation (see Section 3.6).
- Check for damage or corrosion. Look for cracks, bends or wear that could affect the strength and operation of the system. Replace parts if defects are found.
- Check for loose or missing fasteners that secure bottom bracket to the structure. If fasteners are loose, re-tighten to listed torque levels. Torque on 3/8 inch fasteners should be 20-25 ft-lbs. (27-34 N-m). Torque on ½ inch fasteners should be 40 -45 ft. –lbs. (54-61 N-m). Retighten as necessary.
- Inspect the tension rod assembly. Make certain saddle clips securely retain the cable. Check torque on saddle clamps – 35 ft. lbs. (47 N-m). Replace or retighten if defects are found.

☑ **Cable Guides:** Reference Figure 18.

- Check cable guides for damage. Look for wear or damage to black urethane. Cable guides should restrain the cable and prevent cable contact with the ladder/structure. Cable guides should be placed approximately every 25 ft (8 m) or closer if required. Replace parts if defects are found.
- Check cable guide fasteners. The fasteners should the secure cable guide in position. Tighten as necessary.

☑ **Cable and Cable Tension:** Reference Figure 21 and Figure 23.

- Inspect the cable for corrosion, kinks, or damage that will affect strength and impede the cable sleeve from traveling on the cable. Look for worn or broken strands of wire. Inspect for signs of abrasion against the ladder or structure. Replace the cable if defects are found.
- Inspect the cable tension. For systems that utilize a compression spring (Figure 23), the spring in the bottom bracket should be compressed to 5-1/2 inch (13.8 cm) length. For systems that utilize a tension rod and tension indicator washer (Figure 21), the washer should be indicated (center ridge sheared off) and the washer imbedded fully into hole of bottom bracket. You should not be able to pull tension rod down by hand. Cable should be tight enough to prevent contact with the ladder/structure. Re-tension the cable if necessary. For bottom brackets that contain an indicating washer, a new washer (part no. 9504239) should be installed if the cable is re-tensioned. Tighten the system until indicating washer ring is sheared off. Do not over-tension the system.

☑ **Installation and Service Label:** Reference Section 8.

- Inspect the installation and service label. The label should be securely attached and fully legible. The installation date and number of users allowed on the system should be clearly marked on the label. Record the inspection date on the label after inspection is completed.

☑ **Ladder/Climbing Structure:**

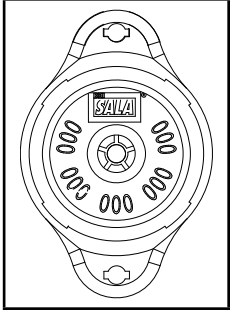
- Inspect the ladder/climbing structure to which the Lad-Saf® system is attached. Make sure the structure is in good condition, secure, and safe to climb. If the condition of the structure is questionable, consult instructions and/or personnel familiar with the structure prior to use.

5.3 INSPECTION GUIDELINES - LAD SAF® DETACHABLE CABLE SLEEVE:

Inspect the LAD-SAF® detachable sleeve per the inspection steps defined in the associated User Instructions. See Figure 5 for a listing of LAD-SAF® sleeve models and their respective User Instructions.

5.4 If inspection reveals an unsafe or defective condition remove the ladder safety system or the safety sleeve from service and destroy it or contact an authorized service center for repair.

Figure 29 - i-Safe™ RFID Tag



5.5 I-SAFE™ RFID TAG:

The Lad-Saf® system includes an i-Safe™ Radio Frequency Identification (RFID) tag (Figure 28). The RFID tag can be used in conjunction with the i-Safe handheld reading device and web based portal to simplify inspection and inventory control and provide records for your fall protection equipment. If you are a first-time user, contact a Capital Safety Customer Service representative (see back cover); or if you have already registered, go to www.capitalsafety.com/isafe.html. Follow the instructions provided with your i-Safe handheld reader or on the web portal to transfer your data to your web log.

6.0 MAINTENANCE, SERVICING, STORAGE

6.1 The LAD-SAF® installation requires no scheduled maintenance. See section 5.0 for inspection related maintenance issues. If the carrier cable becomes heavily soiled with oil, grease, paint, or other substances, clean it with appropriate cleaning solutions. Do not use acid or caustic chemicals that could damage the cable.

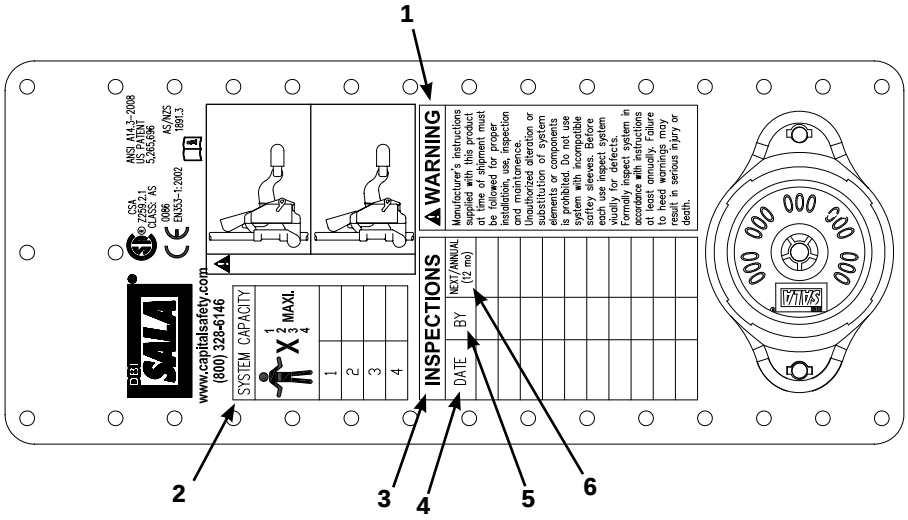
6.2 The LAD-SAF® sleeve may be cleaned using commercial parts-cleaning solvents and rinsed with warm, soapy water. Light machine oil may be applied to the moving parts if required. Do not use excessive oil, or allow oil to contact the cable clamping surfaces. Store the detachable cable sleeve in a cool, dry, clean environment, out of direct sunlight. Avoid areas where chemical vapors exits. Thoroughly inspect the sleeve after extended storage.

7.0 SPECIFICATIONS

7.1 All top and bottom brackets, cable guides, carrier cable, and fasteners are made of galvanized or stainless steel. Contact DBI-SALA for material specification details if required. The LAD-SAF® system, when installed according to the user instructions, meets OSHA, ANSI (ANSI A14.3), CSA (Z259.2.1), CE (EN 353-1:2002), and AS/NZS (AS/NZS 1891.3:1997) requirements.

8.0 LABELING

8.1 These following label must be securely attached and fully legible:



1. WARNING: Manufacturer's instructions supplied with this product at time of shipment must be followed for proper installation, use, inspection and maintenance. Unauthorized alteration or substitution of system elements or components is prohibited. Do not use system with incompatible safety sleeves. Before each use inspect system visually for defects. Formally inspect system in accordance with instructions at least annually. Failure to heed warnings may result in serious injury or death.
2. System Capacity
3. Inspections
4. Date of Inspection
5. Inspected By
6. Date of Next/Annual Inspection

INSTALLATION CHECKLIST

Serial Number(s):	
Model Number(s):	
Date Purchased:	**Date of First Use:**

Install Date: **Approved By:** **Corrective Action / Maintenance:**	☐ **Ensure all fasteners are in place and properly tightened.** ☐ **Ensure the Carrier Cable is properly tensioned.** ☐ **Ensure the Carrier Cable does not abrade against the structure at any point.** ☐ **Ensure system information is recorded on the system label and Inspection and Maintenance Log:** Components of the LAD-SAF system include an i-Safe™ Radio Frequency (RFID) tag. The RFID tag can be used in conjunction with the i-Safe handheld reading device and web based portal (www.capitalsafety/isafe).to simplify inspection and inventory control and maintain electronic records for your fall protection equipment.
Install Date: **Approved By:** **Corrective Action / Maintenance:**	☐ **Ensure all fasteners are in place and properly tightened.** ☐ **Ensure the Carrier Cable is properly tensioned.** ☐ **Ensure the Carrier Cable does not abrade against the structure at any point.** ☐ **Ensure system information is recorded on the system label and Inspection and Maintenance Log:** Components of the LAD-SAF system include an i-Safe™ Radio Frequency (RFID) tag. The RFID tag can be used in conjunction with the i-Safe handheld reading device and web based portal (www.capitalsafety/isafe).to simplify inspection and inventory control and maintain electronic records for your fall protection equipment.
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INSPECTION AND MAINTENANCE LOG

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