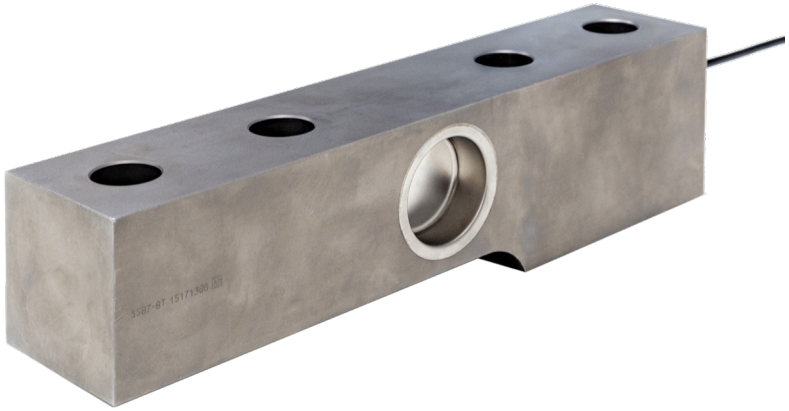
SSB7 8t & 12t Load Cell

Installation guidelines

Where Quality Meets Precision

Chassis-body mounted onboard weighing load cells

Logging Trucks, Waste Compactors, Agricultural Machines & Axle Weighbridges



SSB7 8t & 12t (17,600 lbs + 26,400 lbs)

Approved to C3 (3000 divisions) & General Purpose

These guidelines provide guidance for the safe installation and operation of Flintec load cells.
Installations should be carried out by suitable qualified engineers.
Please read this manual carefully.

CE UKCA RoHS compliant OIML NTEP IP68

V2 09 December 2025

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Introduction

Disclaimer
We reserve the right to make changes to the products contained in this manual in order to improve design, performance and reliability.

The information in this manual is believed to be accurate in all respects at the time of publication, but is subject to change without notice. Flintec or its distributors assumes no responsibility for any consequences resulting from the use of the information provided herein.

The Flintec on board mounted load cell is a highly advanced electronic measuring device. Weight is measured by load cells installed between the body and the chassis. These rugged load cells are strong enough to provide years of reliable service, yet are sensitive enough to detect a change in weight of just a few kilos. Due to differences from application to application there may be some significant assembly variations. The installation process is virtually the same whether it is being performed as a retrofit or to a new vehicle or machine. It is extremely important to follow these installation guidelines and use the specified materials to ensure that the completed assembly will maintain its high strength for maximum safety. It will also result in minimum installation costs, high accuracy and long life for your weighing system.

WARNING
Failure to follow these instructions could cause a hazardous operating condition. Upon completion of the load cell installation, you or an appropriately trained service engineer will need to install a weighing indicator and calibrate the system; Calibration is simply an electronic adjustment of the scale to compensate for minute installation variations. Complete instructions for these procedures can be found in the weighing indicator's operator’s manual.

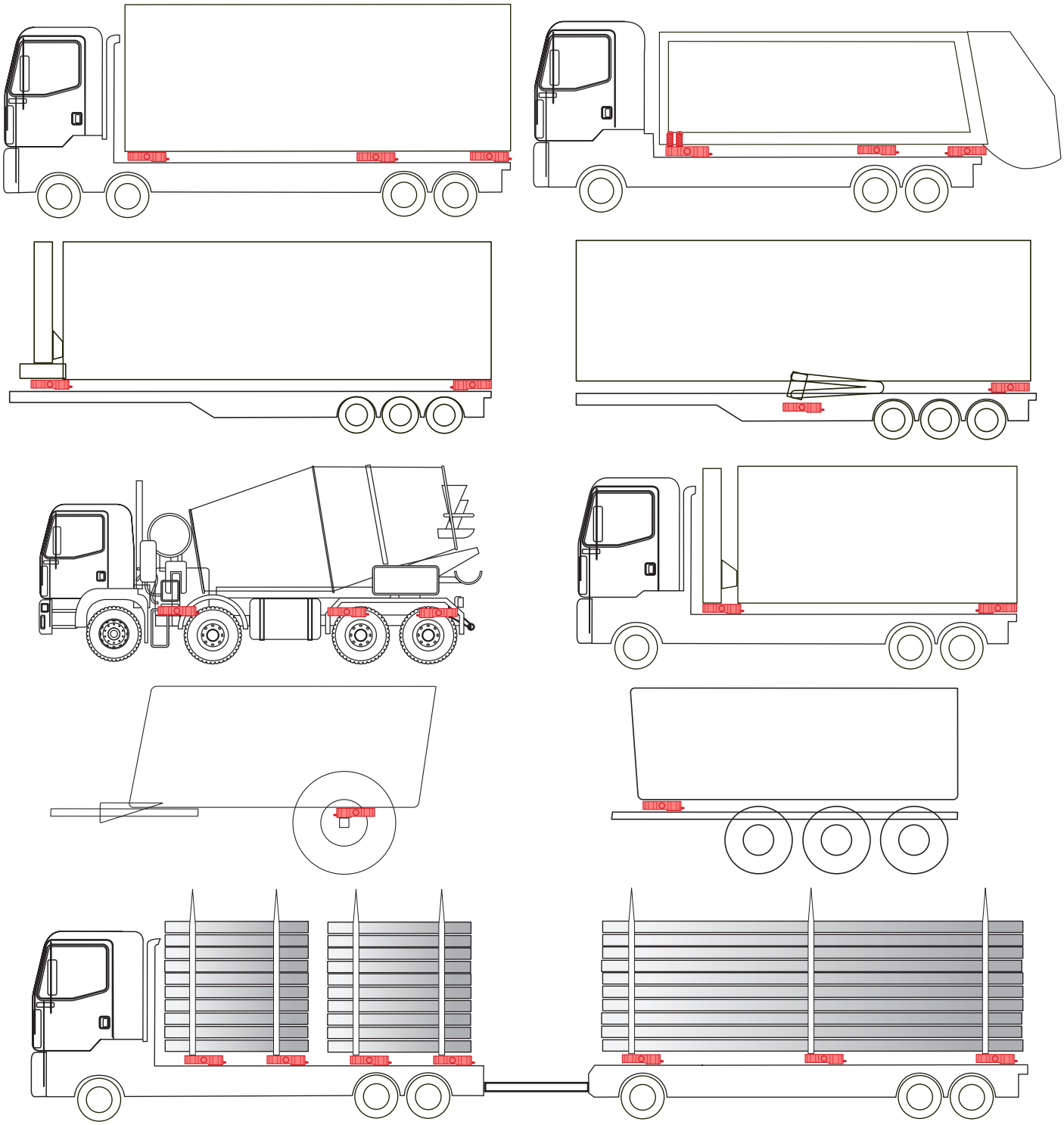
Installation must be in accordance with national laws and regulations. An installation checklist has been provided in the back of this manual. Please refer to it during installation and check-off the important steps as they are completed.

Weighing system overview
Flintec on board weighing systems are ideal for industrial weighing applications and suitable for measuring either gross vehicle weight or the net weight of cargo being loaded or delivered. The basic system consists of load-supporting transducers (load cells) and an electronic meter (weighing indicator or display) capable of being calibrated to display the weight in convenient lbs or kgs, electrical cabling connecting the load cells and indicator: see diagram below.

Accuracy and Performance

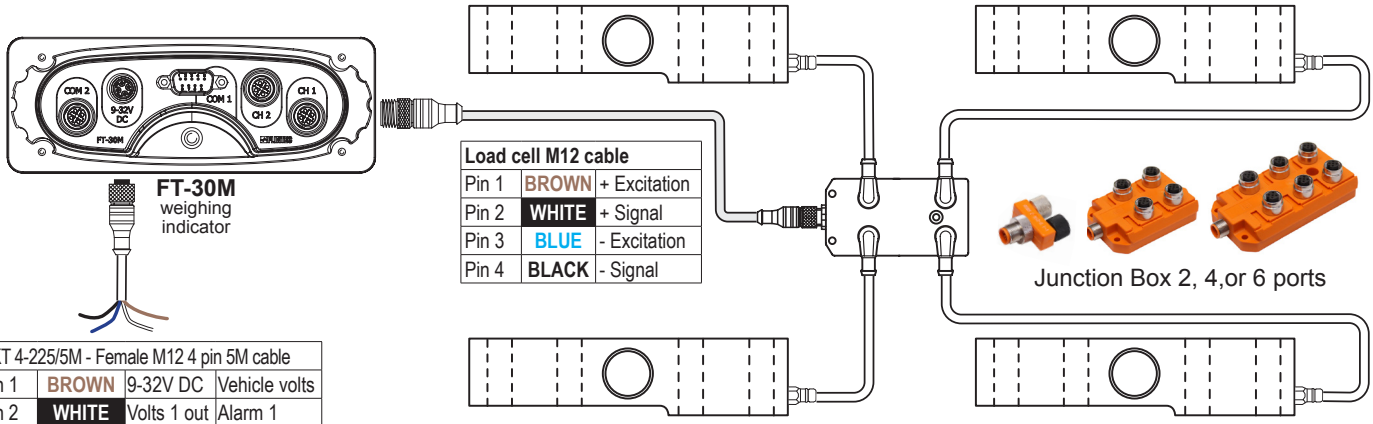
This manual is primarily concerned with the mechanical installation of the Flintec SSB7 8t + 12t capacity truck load cells and cables. Please refer to the FT-30M operator's manual for the installation and use of the indicator which is available on the Flintec web site. Optionally, install suitable electronics or a suitable indicator. Optimum onboard weighing performance is obtained when the load cells are installed between the load-carrying body-frame and the vehicle chassis and carrying the entire weight of the superstructure and payload. No weight-supporting structure other than the load cells, such as braces or gussets should attach the superstructure to the chassis; this will result in an alternate load-path that will degrade weighing system accuracy. Typical applications include: waste trucks, tippers, tankers, flat-beds and van type structures mounted on either truck chassis or trailers. Truck bodies and payloads are supported above the chassis with load cells mounted directly to the truck frame (see example illustrations below) are usually accomplished by separating the suspension subframe from the trailer frame and installing load cells between these structures. Installations are typically accomplished by separating the body frame from the chassis or trailer frame and installing load cells between these typical vehicle structures;

Typical Applications



Electrical cabling and wiring connections

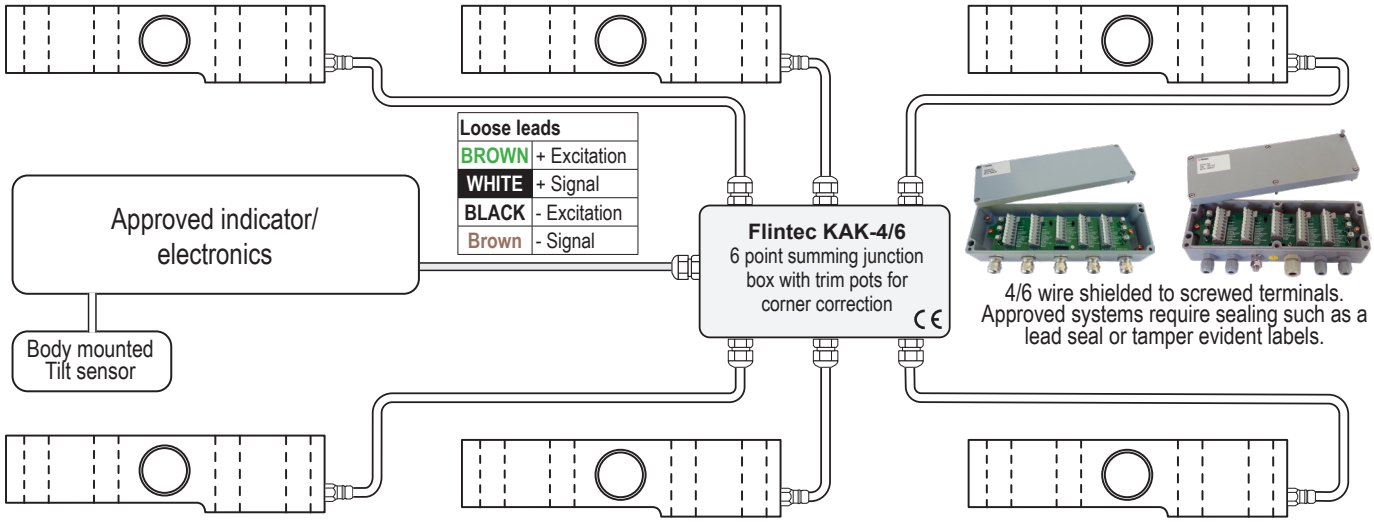
Typical four cell arrangement - non approved with optional M12 cables



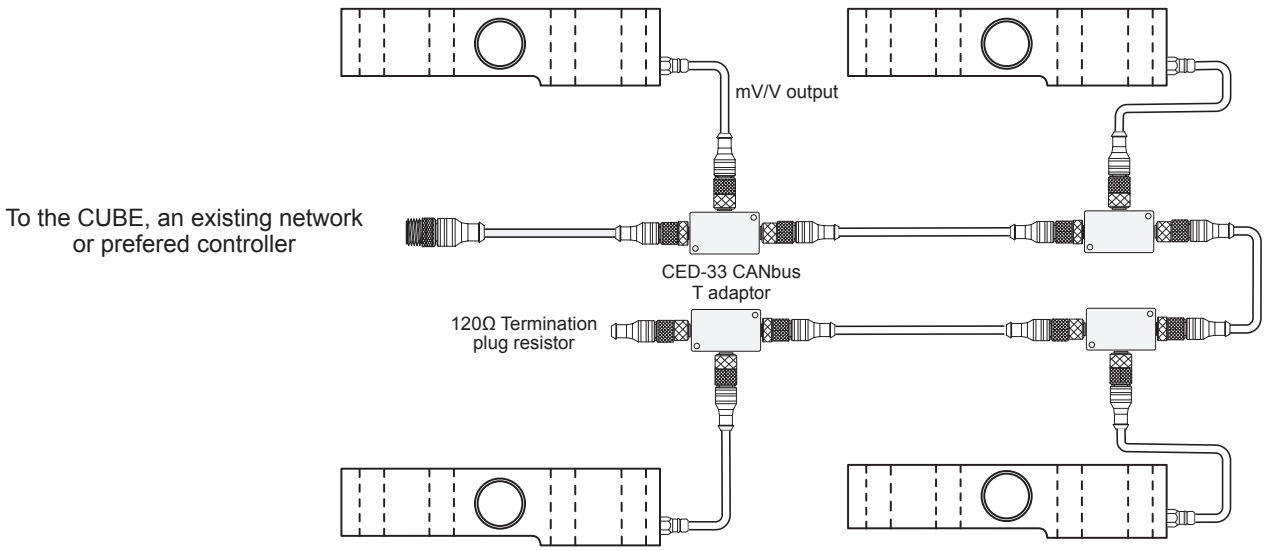
RKT 4-225/5M - Female M12 4 pin 5M cable			
Pin 1	BROWN	9-32V DC	Vehicle volts
Pin 2	WHITE	Volts 1 out	Alarm 1
Pin 3	BLUE	Ground	-Ve
Pin 4	BLACK	Volts 2 out	Alarm 2

Typical six cell arrangement - approved with standard free loose leads

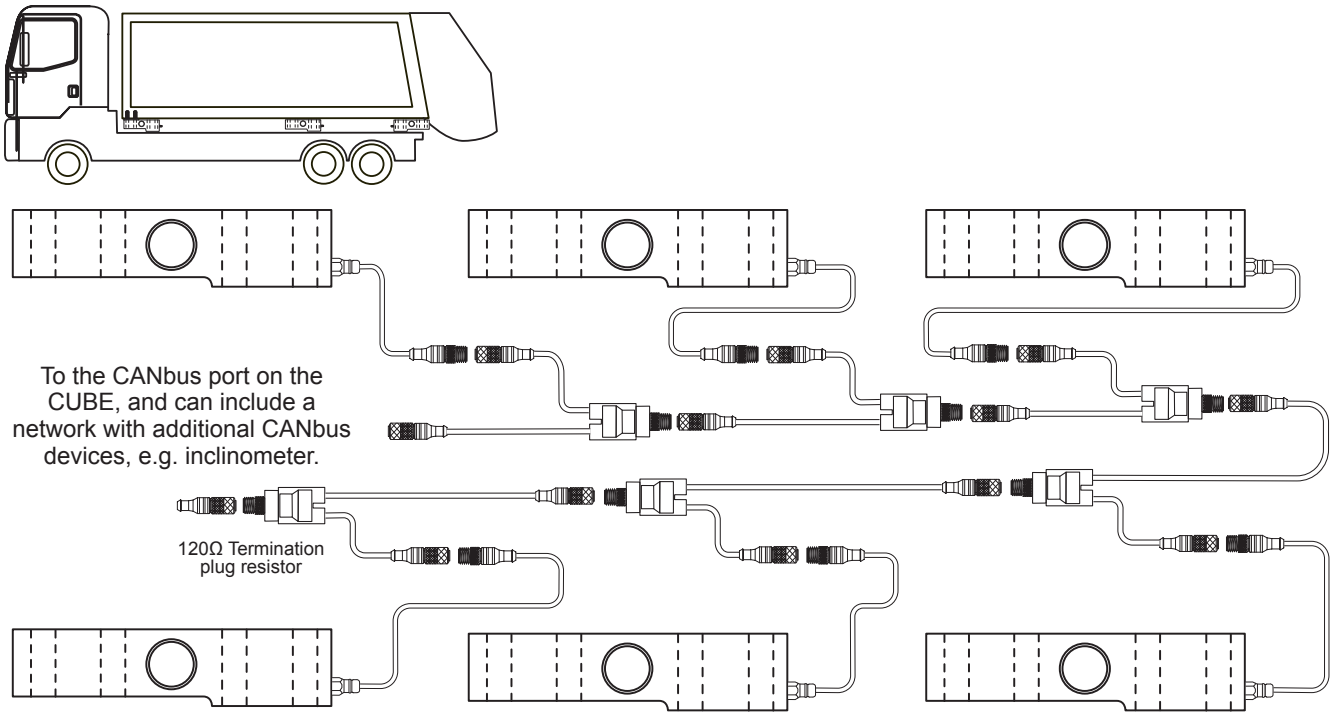
Note. SSB7-8t & 12t is available with free leads or an M12 connector - the M12 connector can be off if needed.



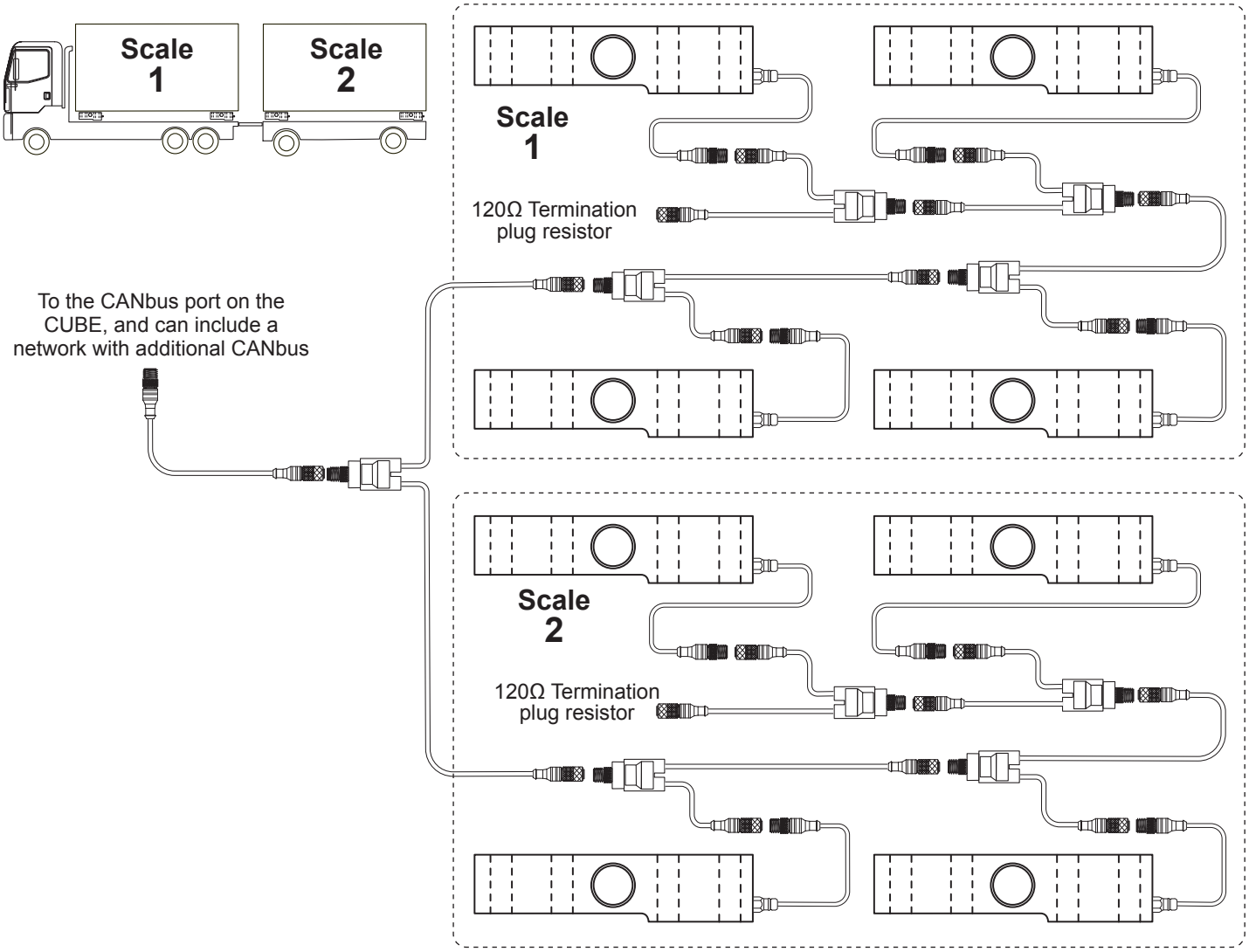
Typical for load cell arrangement using CANbus CED-33 T adapters



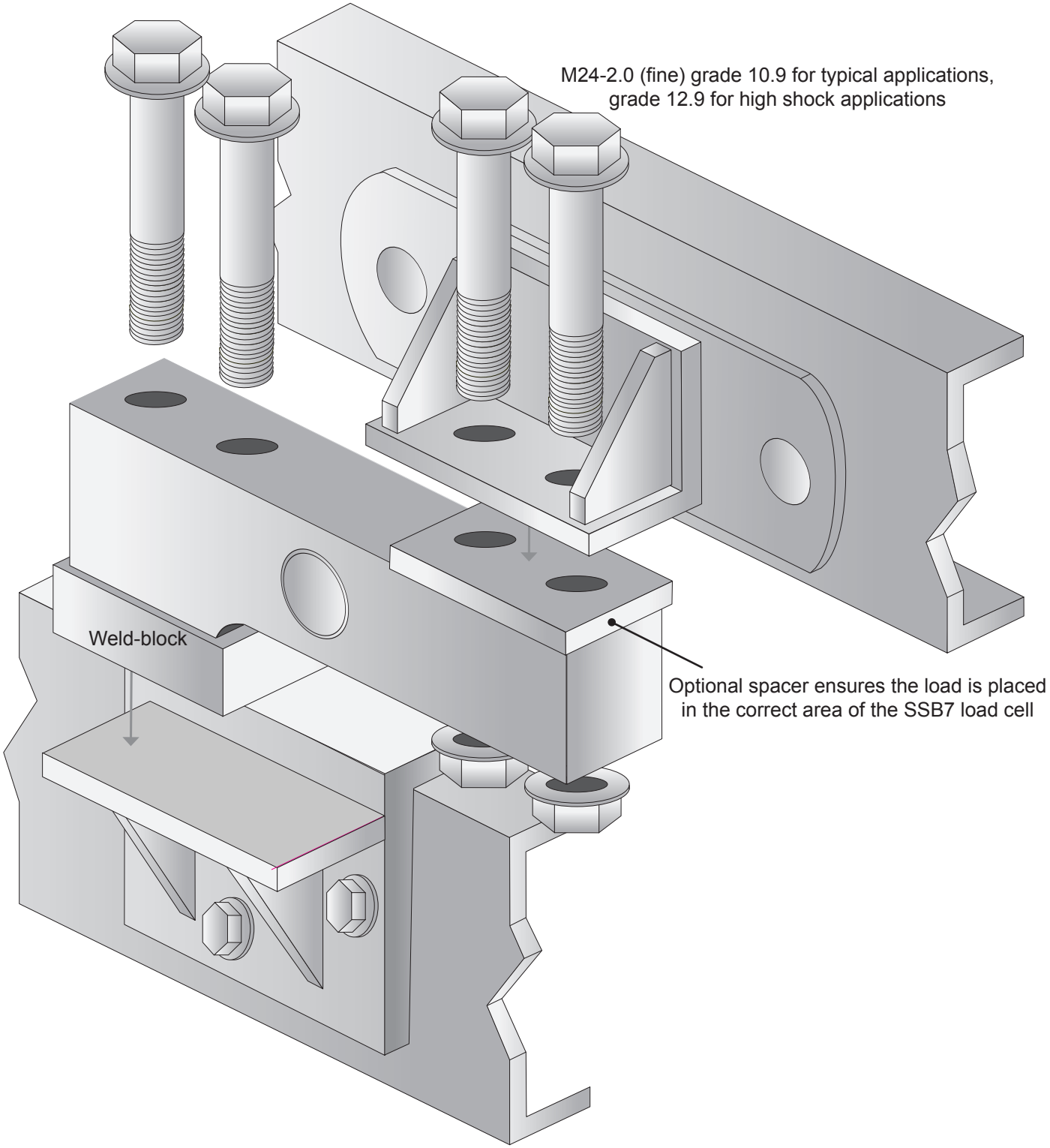
Embeded CANbus PCB non approved six cell system to a rigid waste collector.



Embeded CANbus PCB non approved two truck bodies.



Installation assembly overview



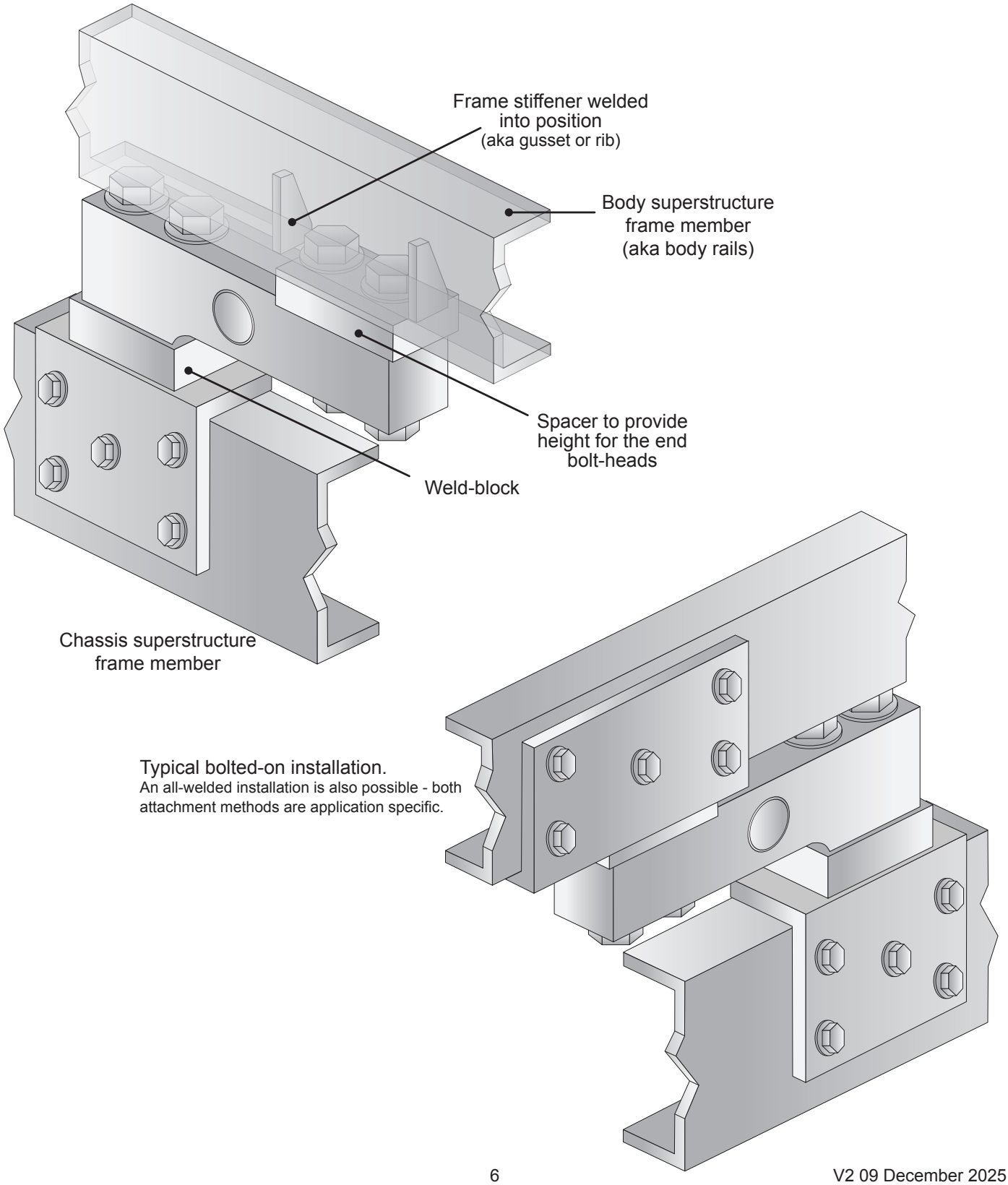
Installation styles

Mounting Styles:
Two basic mounting styles are used for installing chassis mounted onboard weighing load cells: the in-line mount and the out-board mount.

In-line mounted load cell
An in-line mounted load cell is installed between the flanges of the upper body-rail and lower chassis frame and aligned with those frame members. Load spreading plates, sometimes called cover plates, fish-plates or angle sections are frequently used to spread the load over a greater area. A chassis or body subframe may be required where the body is prone to flexing.

Installation styles

In-line mounting	Outboard mounting
Used when outboard clearances or suspension systems means space is limited	Requires space for load cell installation outboard of chassis
Requires only one mounting bracket per load cell	Requires an upper and lower mounting bracket per load cell
Will raise the overall vehicle height by approx. 50 mm (2.0") unless frame is recessed	Will raise the overall vehicle height by approx. 15-20 mm (5/8"-3/4")
Mounting holes for the load cell must be added to the body frame structure	Load cell mounting holes are located in the mounting brackets



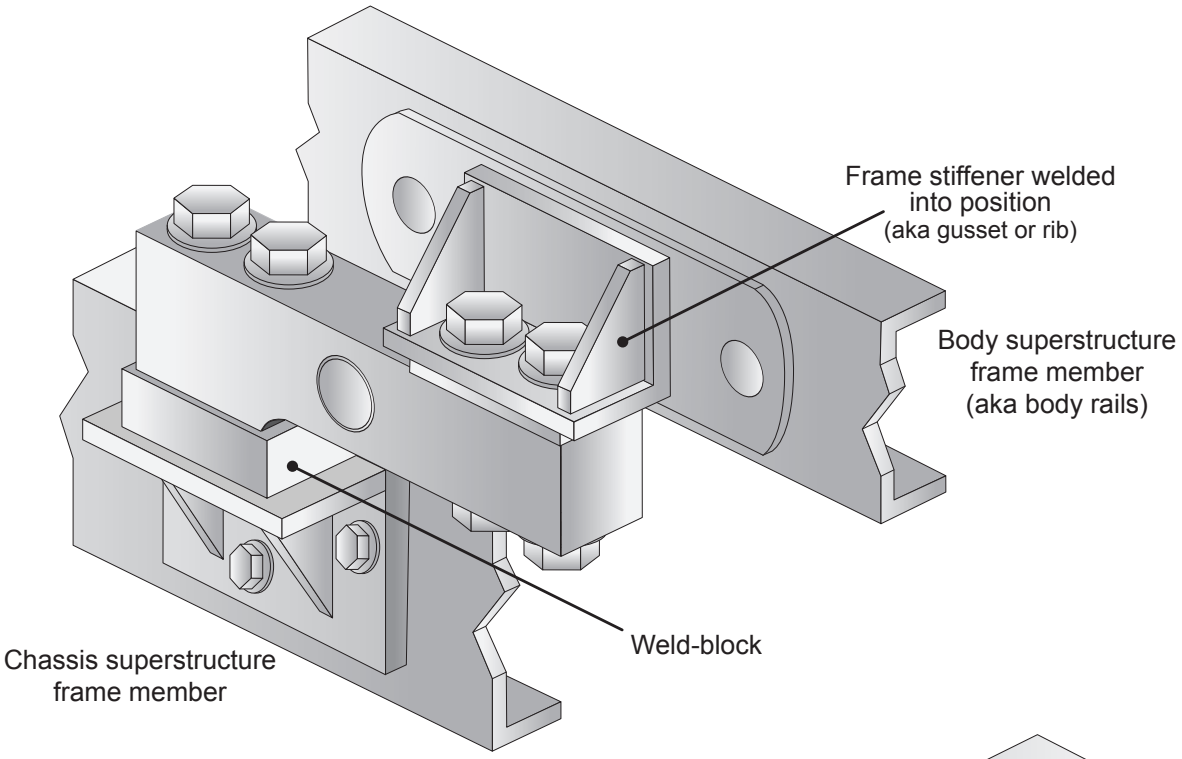
Typical bolted-on installation.
An all-welded installation is also possible - both attachment methods are application specific.

Installation styles

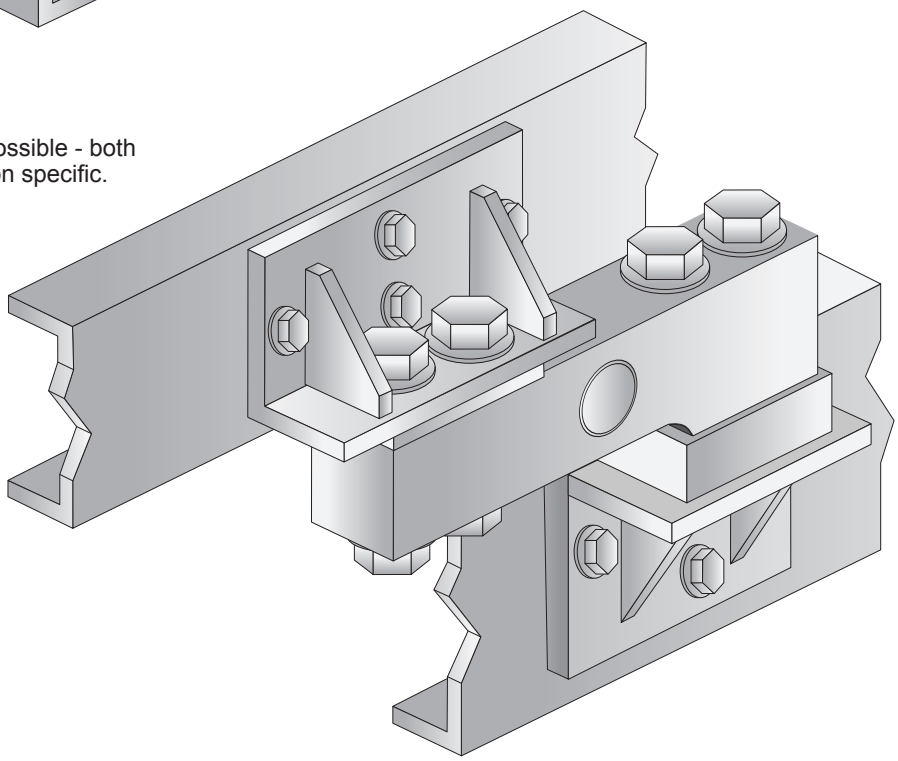
Out-board mounted load cell
An out-board mounted load cell is installed alongside the frame members using brackets located out-board of the chassis and body frame rails. Shown here are both bolted and welded methods of attachment to the top & bottom load cell brackets.

Load cell mounting brackets are attached to the superstructure by means of welding or bolting. In order to provide for the mounting of load cells and mounting brackets (illustrated in later sections), some modification to the superstructure may be required. The modifications may be as simple as providing a flat surface for bracket welding or may be as extensive as providing a recess in the under frame for the mounting of the load cells.

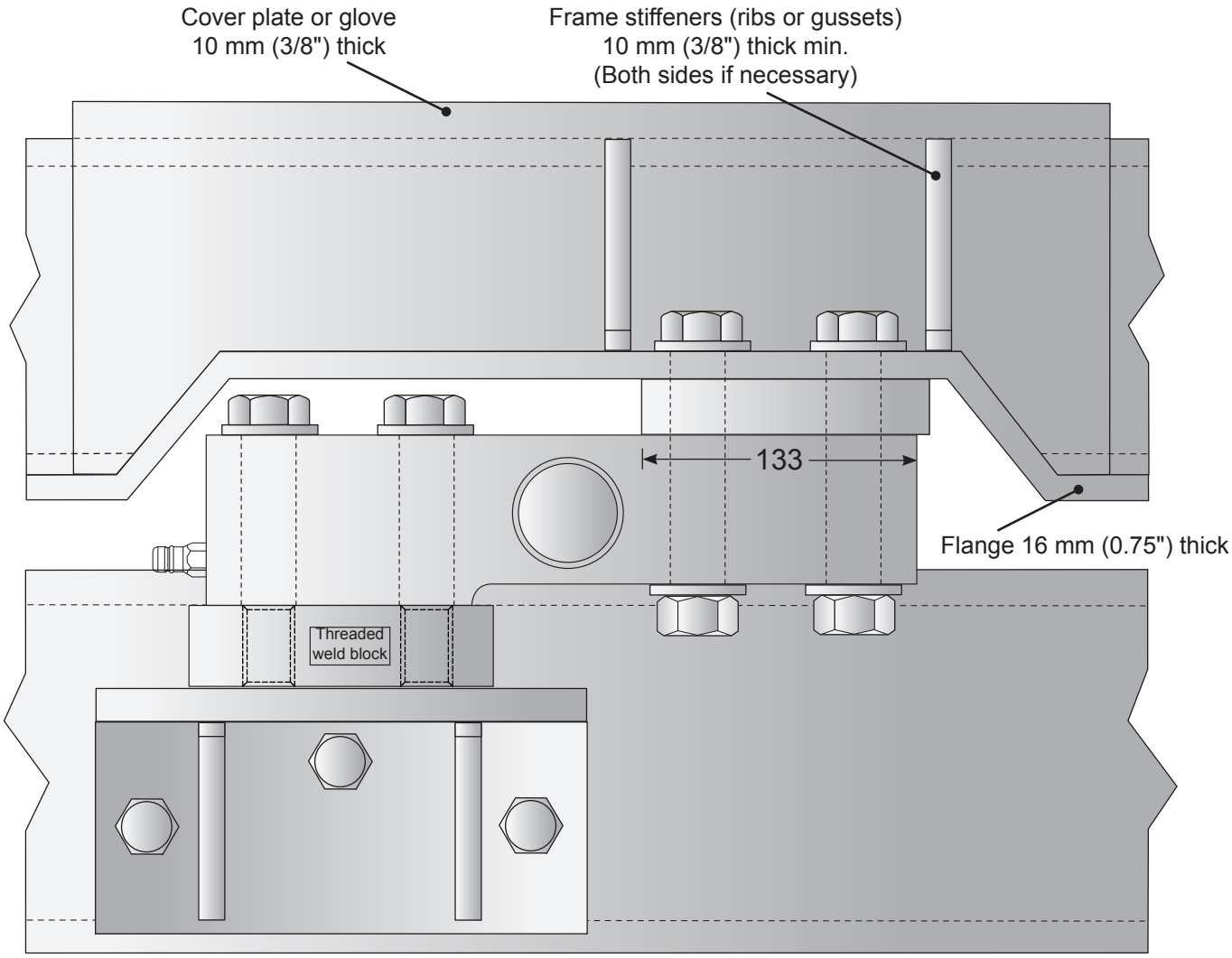
Modification to the superstructure will vary according to the specific type of installation to be performed; whether it is for a trailer suspension subframe assembly or for truck frame mounted systems supporting entire payload carrying superstructures. Outboard mounted load cells may only need space to weld or bolt load cell mounting brackets, while an in-line mounted load cell system will need holes drilled in the under frame of the superstructure for the load cell mounting bolts.



Typical bolted-on installation.
An all-welded installation is also possible - both attachment methods are application specific.



Recessed mount



Frame Preparation

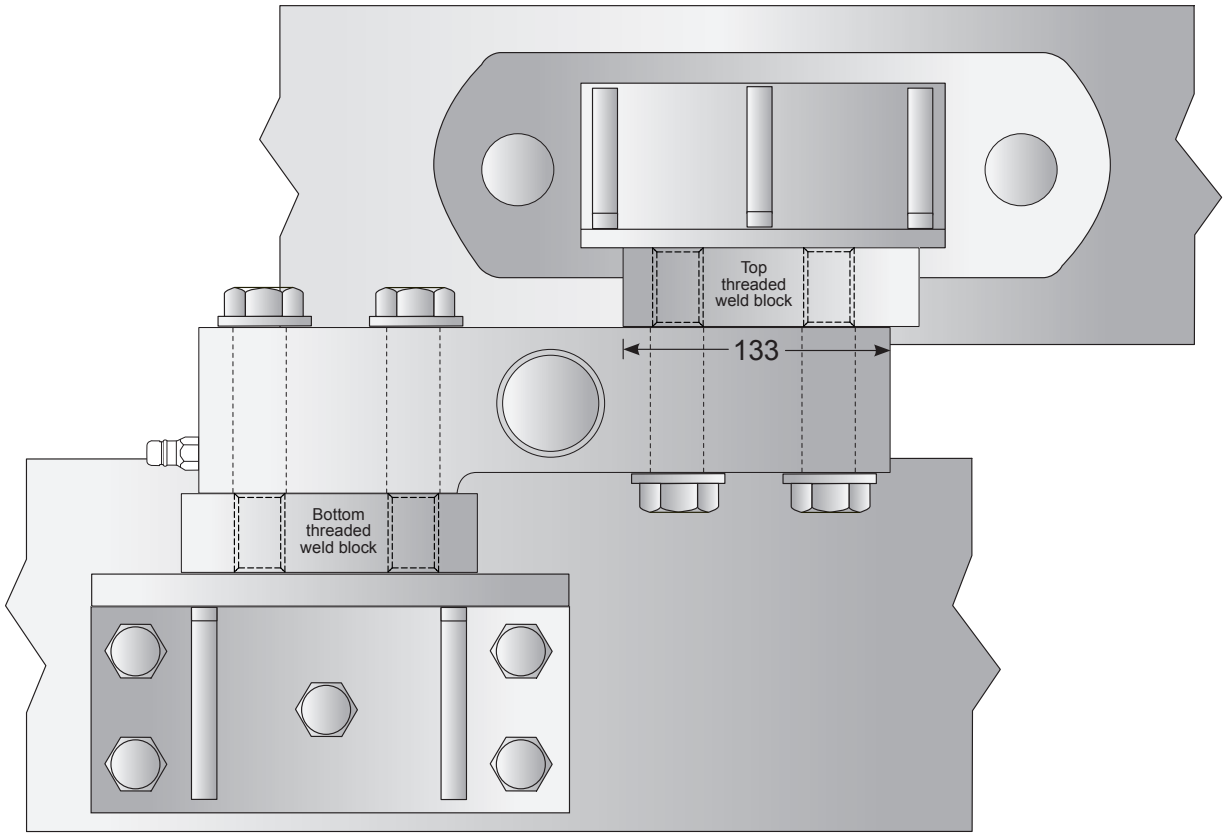
Recess Mounting:
Often the most practical method for installing on-board frame mounted scales (particularly with an in-line mounted system) without an undesirable height increase of the trailer or body, is to provide a recess in the superstructure under frame. A general recommendation for this approach is shown in the following illustration. The installer should assure that any modified structure will retain the strength and stiffness properties of the original structure.

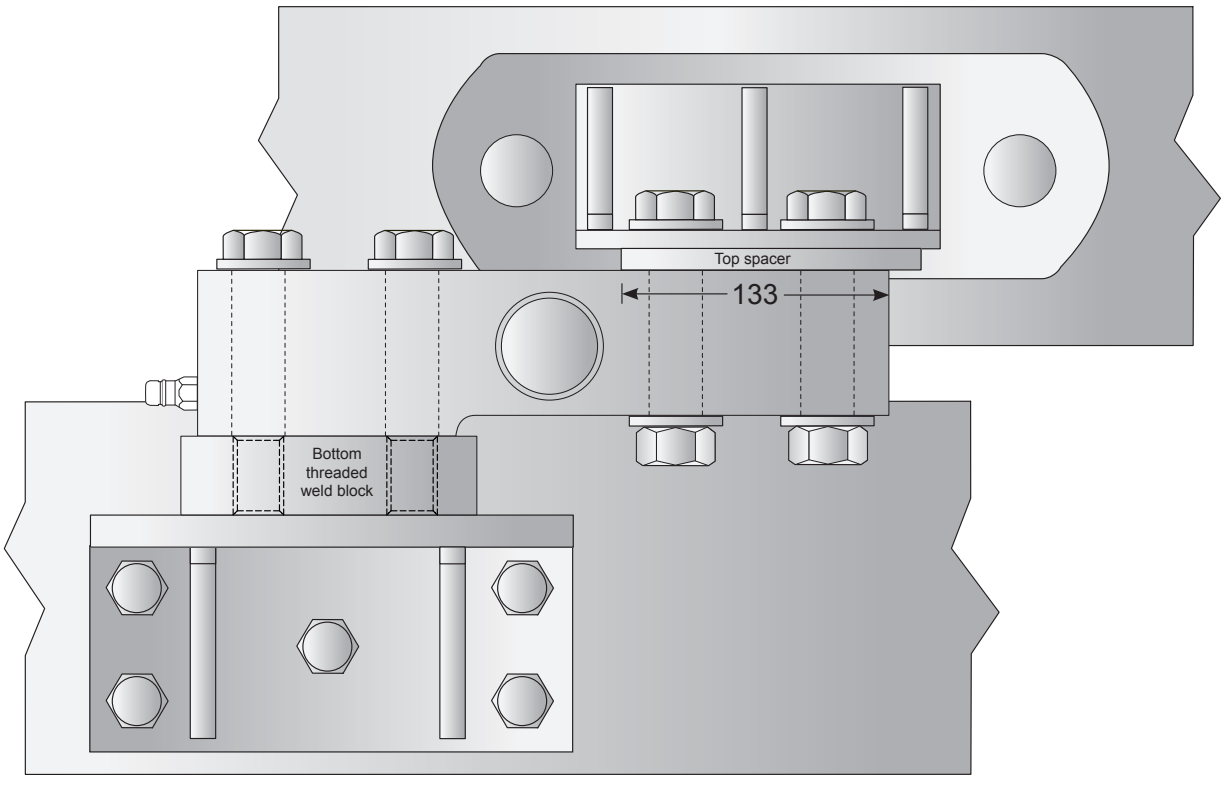
Whenever making modifications to a structure, care must be taken to provide for bolt strength and rigidity (stiffness) for the finished installation. Every structure will deform (bend, twist or sag) to a certain degree when carrying a load. The installer must ensure that the modified structure is strong enough to prevent not only permanent (elastic) bending so that upper structural elements will not contact lower elements and create an alternative load path around the load cells. Excessive frame bending can be prevented by either adding a ‘glove’ (a structural supporting sleeve) to the frame, or by adding additional load cells in that area for more support.

Frame Stiffeners:
If the frame section above the load cell is an open section, such as a channel or ‘I’ beam, web stiffeners are required to avoid frame twist (see illustration below). The stiffeners are located near the ends of each bearing plate for inverted load cell mounting, or between the mounting holes for load cells installed with the bearing plates beneath the load cells.

Installation position

There is a mark on the top of the SSB7 cell to show where the load should be placed - 133mm from the end of the cell. Considerations such as available space, tyre clearance and restrictions for overall vehicle height will generally determine which mounting style will be used. The following illustrates the features of each mounting style:





Body-chassis alignment

Flintec load cells are designed to be installed between the body and chassis of industrial trucks. It is imperative the load cells are installed in-line with the chassis and body rails with no misalignment or twisting forces projected on to the bolts or fixings.

Alignment:

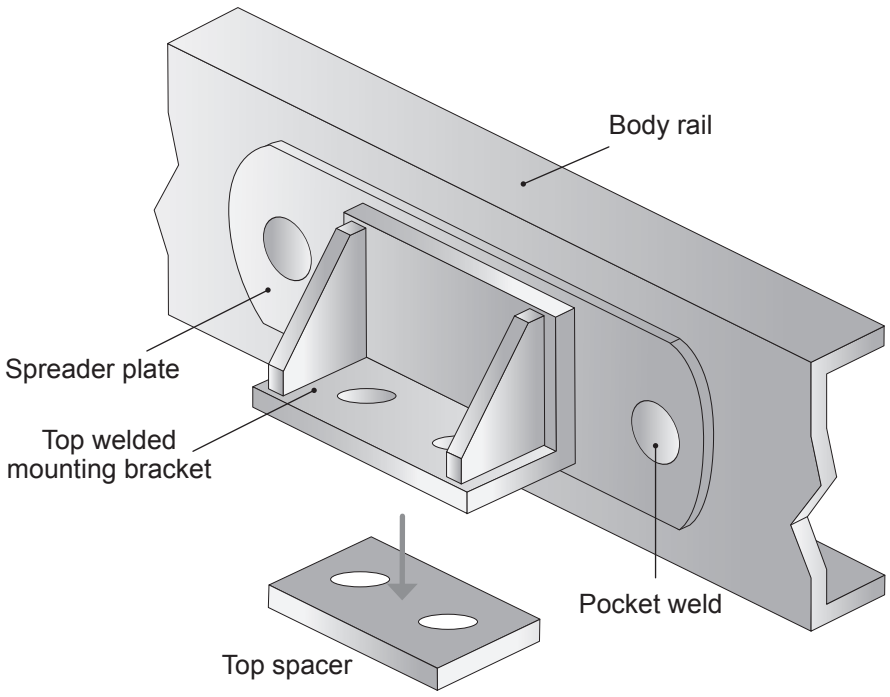
Because the installation of load cells involves the separation of the body superstructure from the supporting chassis frame, care must be taken to ensure the separated elements are installed and in alignment; new build or retrofits. The body must sit flat and load cell mounting bolt-holes align without the use of additional tools. e.g. jemmy bars or jacks. Bolts should be inserted by hand and screwed by hand prior to final tightening with a torque wrench.

Marking the relative positions on the frame elements before assembly is an effective means of assuring proper alignment. Also ensure the straightness of frame elements when cutting or welding to prevent undesirable bending or warping during assembly. The use of a simple frame stiffener (rib, gusset or stiff-back), welded into place prior to modification, is effective for this purpose.

Mounting Structure:

Optimum performance of SSB7 is dependent upon a solid mounting base for the load cells. Steel brackets of heavy construction are required. Since this is a thicker section than usually found on trucks, a cover plate may be necessary to evenly distribute forces to avoid stress concentrations and possible cracking in the thinner sections of the superstructure. Locating load cells in the immediate vicinity of cross members or other frame strengthening/stiffening elements to provide maximum support is also important for providing a structurally sound installation, as well as a reliable on-board weighing system. When separating and/or aligning the body to the supporting chassis frame, be careful when re-routing hoses, airlines, fuel lines etc. Some of these items may need to be replaced by longer ones to prevent secondary load paths which cause poor weighing performance.

These items are also susceptible to damage if they are not of sufficient length to allow for frame separation or are not properly protected at installation. Upon completion of the installation, look closely at all the elements of the mechanical installation to avoid problems with pinched wires, ruptured hoses, etc., especially during the first operation of any moving structure such as a dump body.



Bracket welded to chassis example

Load cell mounting bracket installation methods differ depending upon whether the supporting structure is a truck chassis or a trailer suspension subframe. Truck chassis frames are manufactured from heat treated high strength steel, requiring load cell mounting angles or fully welded brackets to be bolted to these frames. Trailer subframes however, are not heat treated and mounting brackets can be welded to these frames.

CAUTION: Review truck or trailer body or chassis manufacturer's recommendations before welding to frame.

Fastener requirements:
The structural requirements for the load cell mounting brackets are affected by the actual weight being supported by the load cells and by dynamic service factors caused by road conditions. Bolted load-carrying brackets are susceptible to slippage if the proper number of bolts are not used or if the bolts are not tightened to the recommended torque. Use the following chart to determine the proper number of bolts for bolted installations. Refer to the chart on page 15 for the recommended torque values when tightening.

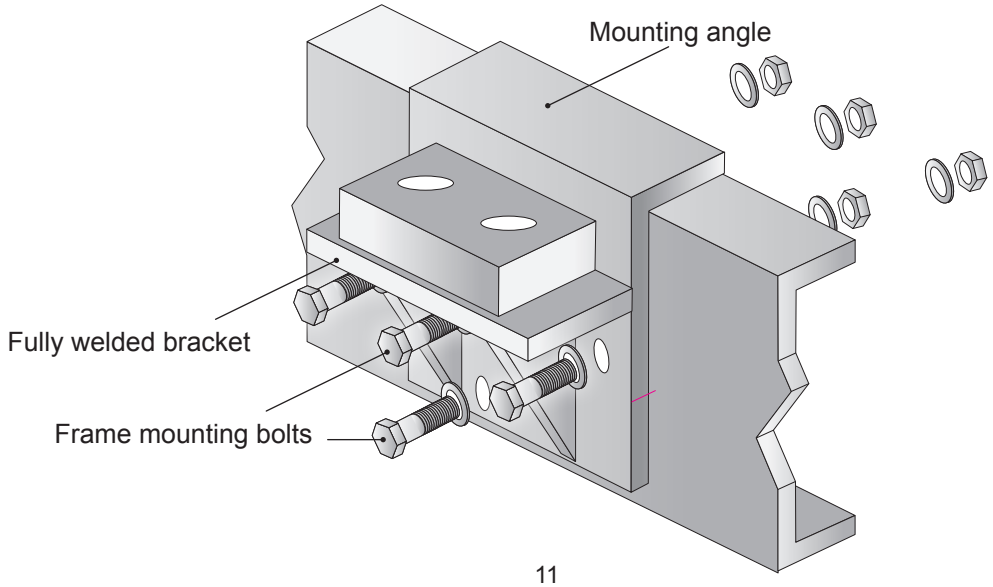
Number of bolts used - Top and Bottom brackets	Maximum rated load on load cells - normal highway use			
	SSB7 8t (17,600 Lbs) M12-1.75	SSB7 8t (17,600) 1/2" (0.5")	SSB7 12t (26,400) M16-2	SSB7 12t (26,400) 3/4" (0.75")
3	5,000 kg	11,000 Lbs	5,000 kg	11,000 Lbs
4	8,000 kg	17,600 Lbs	12,000 kg	26,400 Lbs
5	8,000 kg	17,600 Lbs	12,000 kg	26,400 Lbs
6	N/A	N/A	12,000 kg	26,400 Lbs

For in-line installations, use the bolting recommendations for highway use regardless of road condition.

Frame Rail Inspection: Inspect the frame rails to ensure they are clean, straight and free of cracks, corrosion, pitting, burrs or any other imperfections that may affect the installation and fit of the mounting angles/brackets, or the strength of the frame.

Mounting Bracket/Angle Installation: Set the mounting angles (for in-line installations) or mounting brackets (for outboard installations) in place on the frame rails. Determine if and where they must be cut or contoured to allow clearance for existing bolts, rivets, spring hangers, etc., on the frame. Mark these locations on the mounting angles/brackets, allowing for a minimum 25 mm (1") radius -no sharp corners. Remove angles/brackets, trim as required, and grind edges smooth.

NOTE: It is not necessary to cut out load cell mounting angles and brackets for easily removed items such as fuel tanks, battery boxes, etc. These items are simply repositioned or spaced out to conform to the added thickness of the load cell mounting angles/brackets.

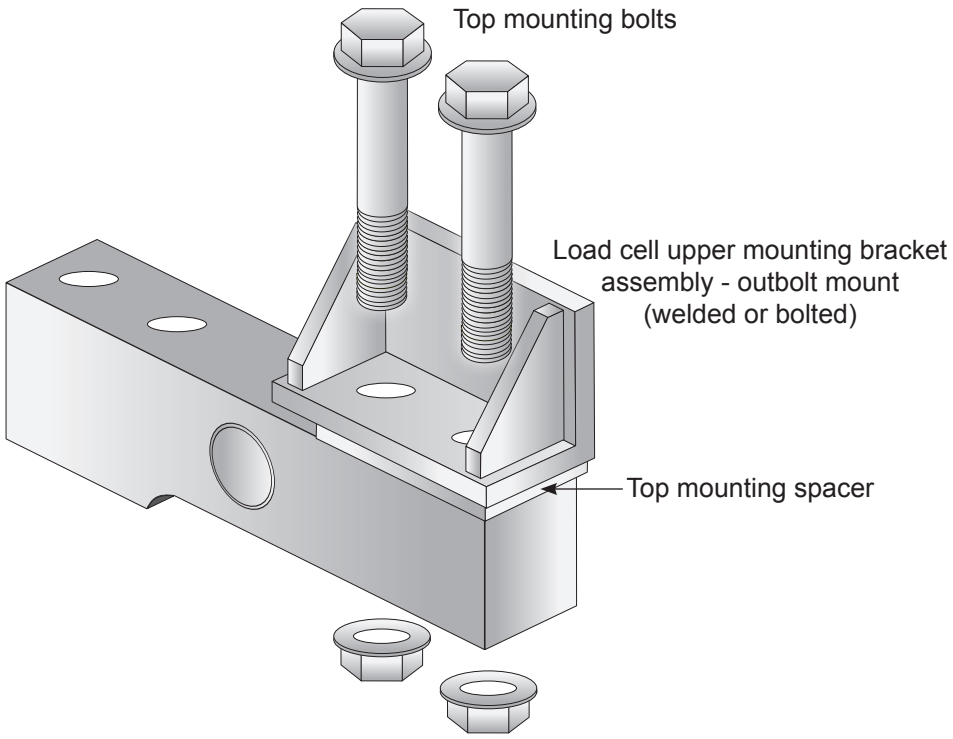


Clamp the mounting angles/brackets tightly to the frame. Be sure that the clearances and cut-outs are correct. Locate and drill holes per the recommendations in the chart on the previous page and bracket drawings in the fixing section on page 12 of this manual.

NOTE:
Bolt holes in mounting structures must be drilled, not burned. Holes should not be oversized more than 1 mm to ensure a snug fit for bolts. Use a minimum of bolts according to the guide on previous page per mounting angle or bracket. Also locate bolts within 25 mm to 38 mm of each end of the mounting angle/bracket. Do the same for the edge of each cut out deeper than 25 mm.

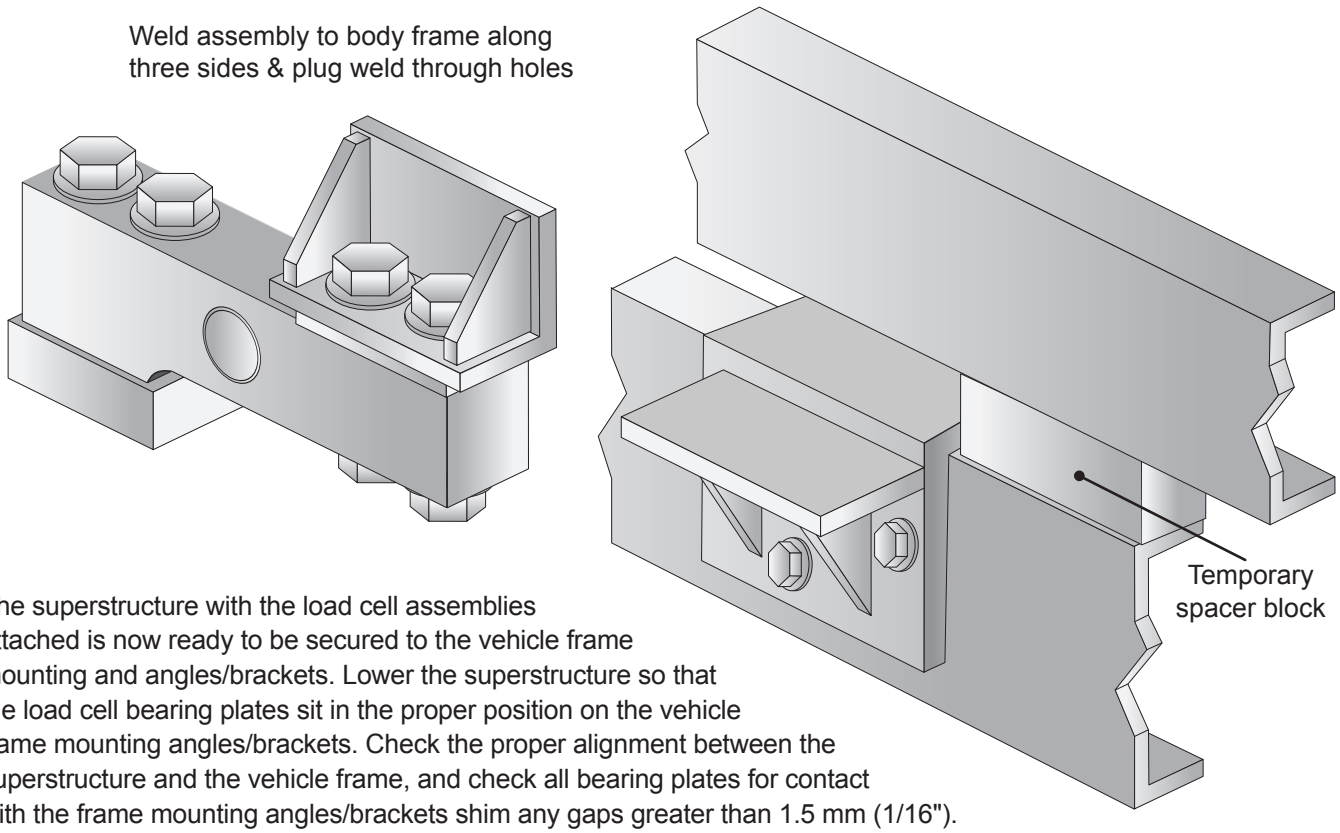
Attach the mounting angle/bracket using BS/ ISO/DIN Grade 10.9 (SAE Grade 8) quality bolts (see table on page 15), Grade C lock nuts and a hardened washer under each lock nut. The bolts must have a diameter of M16 (5/8”) minimum for 15t cells and M12 (3/8") for 7.5t cells and sufficient length to provide a minimum of 3 threads past the end of the lock nut. Tighten all bolts to the proper torque value listed in the table on page 12. When welding brackets to non-heat treated frames, use a low hydrogen process and AWS E7018 rod or equivalent. Check the lengths of all connections for items that have been moved during the installation of the mounting angles/brackets. These connections may include battery cables, fuel lines, air lines, and electrical cables.

Assemble upper mounting brackets to the load cells using the fixing kits where provided, (for in-line mounted systems where the load cells bolt directly to the upper frame structure, simply mount the load cell assemblies to the upper frame). Make sure the fixings are the proper length and do not bottom out in the tapped holes. If the mounting bolts are too long, damage to the load cells is possible. A dangerous operating condition could exist if the bolts are not secure.

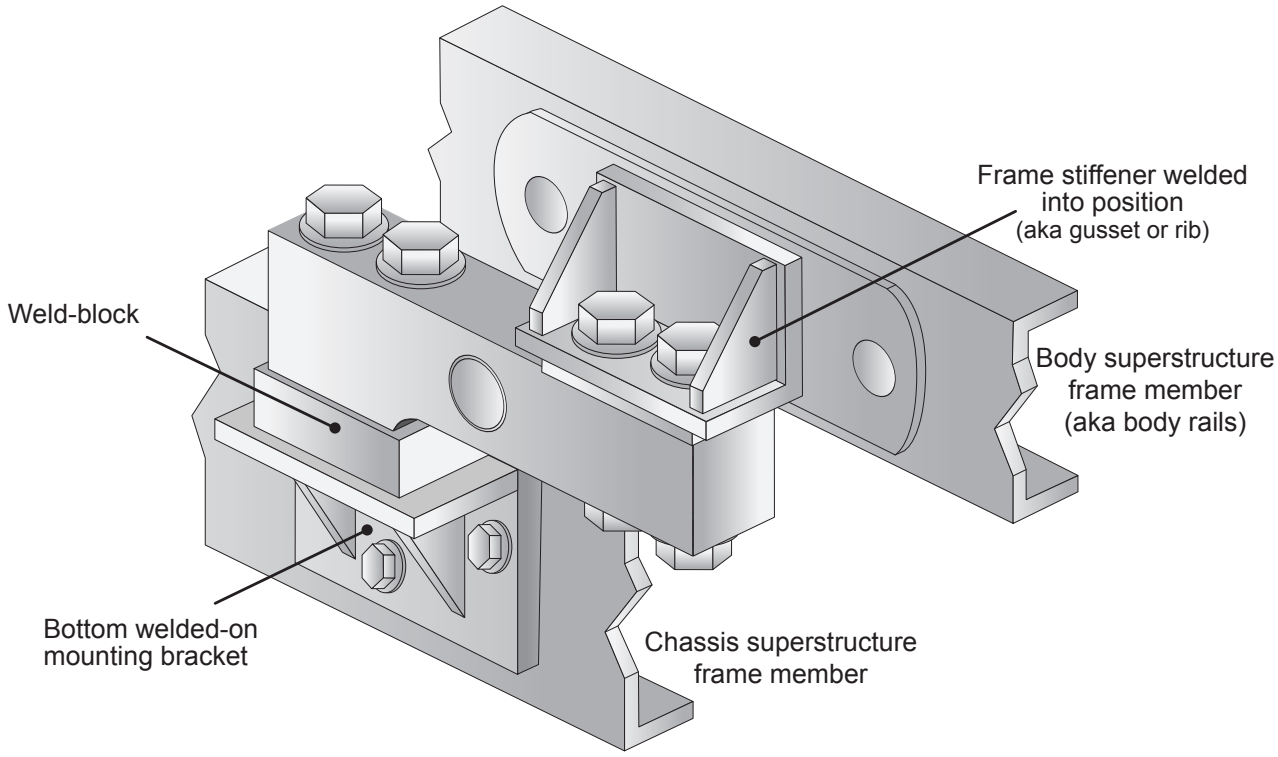


The load cell/upper mounting bracket assemblies are now ready to be installed on the superstructure. To do this, place temporary spacers usually 20 mm to 25 mm (3/4" - 1") on the vehicle frame to provide the proper spacing between the superstructure and the vehicle frame. Lower the superstructure onto these spacers. Be sure to check the superstructure for proper alignment with the vehicle frame.

Place the load cell assemblies on the vehicle frame mounting brackets which were installed in ‘Frame Preparation’ (page 8). Adjust the load cell assemblies into their final position, verifying fit and clearances with the superstructure. Bolt or weld upper mounting bracket securely to the superstructure using a low hydrogen process and AWS E7018 rod or equivalent (DO NOT WELD BEARING PLATES YET). See ‘CAUTION’ on page 13 before proceeding with welding. Lift the superstructure and remove the temporary spacers.



The superstructure with the load cell assemblies attached is now ready to be secured to the vehicle frame mounting and angles/brackets. Lower the superstructure so that the load cell bearing plates sit in the proper position on the vehicle frame mounting angles/brackets. Check the proper alignment between the superstructure and the vehicle frame, and check all bearing plates for contact with the frame mounting angles/brackets shim any gaps greater than 1.5 mm (1/16"). Weld load cell brackets in place (see caution below, and welding procedure on page 15 before proceeding with welding)



Bracket welded to chassis example

Caution:

Bearing Plate Welding: Please read the welding procedures on the following two pages completely before proceeding. The welding of the bearing plates is the most crucial step in the installation process.

Take precautions to ensure that the vehicle electrical system is not damaged by the welding. To prevent electrical current flow through the load cell, attach ground strap directly to the structure on the same side of the load cell on which welding is being done.

Complete the attachment of the superstructure/load cell assembly in the following order (in accordance with the welding procedures).

1. Tack weld the bearing plates to the mounting angles or brackets.

2. Remove the slag from tacks and 'feather' end of tack with a grinder to provide a smooth transition for the root to pass as it passes through the tack. Welding can be completed without disassembly of load cells from bearing plates. Direct electrode away from unprotected underside of load cell.

3. Alternate welds from side-to-side and end-to-end to avoid weld distortion.

Welding proceedure

The following procedure guides the welder through the recommended procedure for welding brackets and bearing plates to frame members.

WARNING: All welding, metal working, and assembly must be performed by a qualified person using proper tools and safe work habits. When welding, use a procedure that assures a sound, good quality weld. Over welding may cause distortion and damage; under welding may not develop sufficient strength.

CAUTION: Take precautions to ensure that the vehicle electrical system is not damaged by the welding. Attach ground strap directly to vehicle frame member (not load cell body) to which the bearing plates are being welded to prevent electrical flow through load cell.

Welding Process: Use a low hydrogen process and AWS E7018 rod or equivalent. The bearing plate may be welded using SMAW stick, GMAW spray transfer, or FCAW. The user should not use GMAW short circuit transfer.

Weld Configuration: The bracket plates shall be attached using a single or multi pass fillet weld sequence
Deposited Weld Metal Fillet Sizes: The finish multi-pass fillet assembly shall be a minimum of 8 mm (1/3").

Preheat: The bearing plate and the base metal mounting surface shall be warmed in preparation for welding to reduce shrinkage stress. Any suitable torch arrangement is satisfactory. Spot heating shall be avoided. The preheat temperature shall be a MINIMUM of 20°C (68°F) and a MAXIMUM of 65° C (150°F).

Cleaning Before Welding:
Bracket components and bearing plates shall be visually inspected to verify that there is no oil, grease, dirt, paint or other foreign substance that will reduce the weld quality. Where brackets are welded to the body and/or chassis, mounting surfaces should be prepared using and angle grinder or power wire brush to remove all paint, primer, or other surface coating. An area the size of the bearing plate plus 25 mm (1") should be cleaned and ground to bare base metal.

In process Cleaning:
Each fillet shall be visually inspected with all slag cover removed, before proceeding with the next bead. A stiff wire brush or needle scaler may be used for slag removal.

Final Inspection:a
Long service life depends on quality application of the fillet welds and THE FINAL SIZE OF THE FILLET. There shall be no undercut on either the upper leg (on the bearing plate) or the lower leg (frame base metal). Any undercut shall be repaired with an additional fillet or contoured by grinding to remove the mechanical notch. Visually inspect all weld stops and starts. Weld craters should be filled. All weld stops shall be staggered. A light coat of primer and paint may be applied after final inspection. Periodic Inspection: These primary load carrying fillet welds should be inspected during routine maintenance.

WARNING:

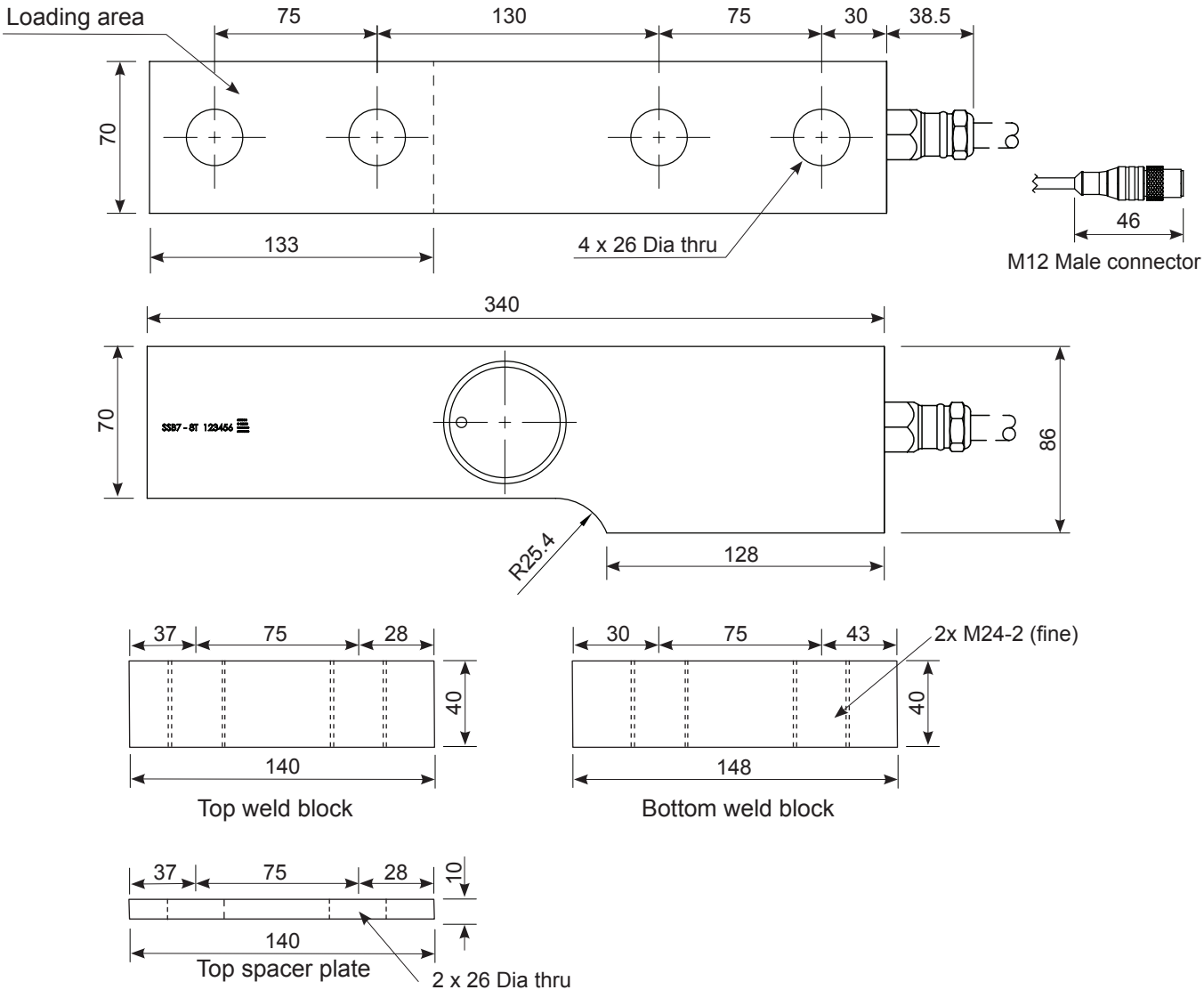
HEAT FROM WELDING MAY LOOSEN BOLTS. THEREFORE,
ALL TORQUE VALUES SHOULD BE RECHECKED AFTER
INSTALLATION WHEN ALL WELDS HAVE COOLED.

Torque values and fastener selection

Torque values can vary significantly depending upon the lubrication of threads. The following values are based on new, clean threads in 'as received condition' without additional lubrication. Flintec recommends the use of a thread lubricant, such as Locktite 767 or equivalent to prevent the seizing of threads over a long period of time. These torque values can be used for bolts with this lubricant without over-stressing bolts. All frame bolts are to be ISO/DIN 961 grade 10.9 (or SAE Grade 8), all lock nuts Grade C. Use new fasteners at all times. For load cell top and end bolts where loads are likely to reach 100% of its rated capacity and in high dynamic applications such as agricultural axles use grade 12.9, (SAE grade 9) use grade 10.9 (SAE grade 8) for all other applications. A minimum of 14 turns or 28 mm (1-1/8") thread engagement is recommended.

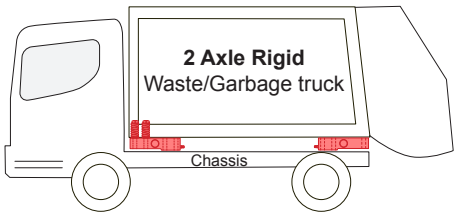
Application	Fastener size	Grade	Tightening torque
Frame mount brackets 8t (16500 Lbs)	3/8" 16 TPI UNF	SAE 8	37-44 Ft Lbs
	M12-1.75 (standard)	8.8	90-110
	M12-1.75 (standard)	10.9	100-120 (Recommended)
Frame mount brackets 12t (33000 Lbs)	5/8" 11 TPI UNF	SAE 8	180-212 Ft Lbs
	M16-2 (standard)	8.8	200-215 Nm
	M16-2 (standard)	10.9	285-305 Nm (Recommended)
SSB7 8t + 12t (33000 Lbs) Top and end bolts	M24-2 (fine)	10.9	1000-1100 Nm (Recommended)
	M24-2 (fine)	12.9	1200-1300 Nm (High & dynamic loads)

Fasteners (bolts and screws); There are many applications for the SSB7 on a wide variety of trucks and machines. Mounting styles, bracket design and choice of fasteners, such as hexagon head, socket had cap screws, etc., are too numerous to cover every possibility in this document.

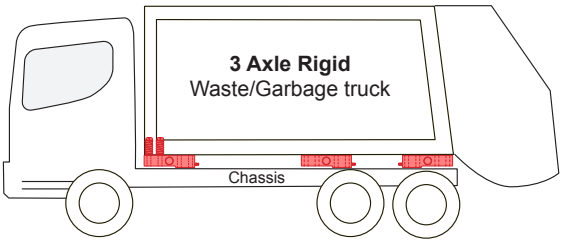


Flexible mount guidelines

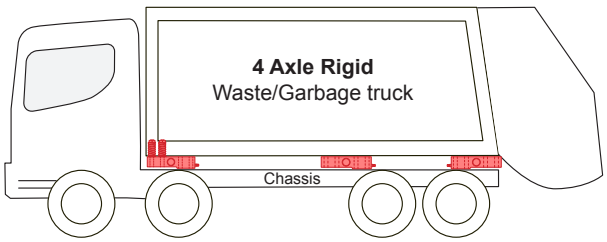
Waste collection trucks often have flexible mounts to ease in-motion dynamic loads on the chassis and where over-hanging equipment is fitted at the rear of the truck. These guidelines are drawn from typical chassis-body installations. It is the responsibilty of the installer to fit load cell brackets which are appropriate for the body and truck chassis.

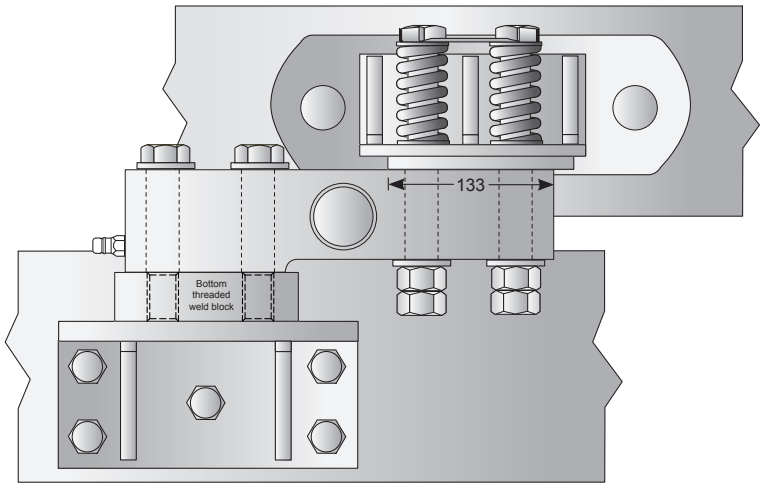


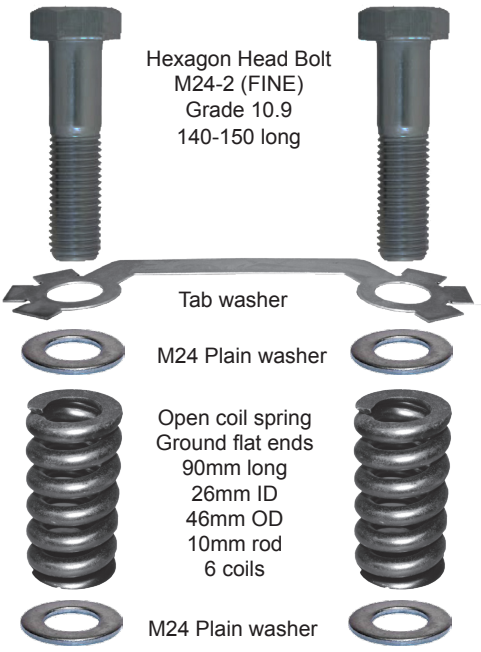
Flexible spring mounts are typically installed to the front two mounts. Some installers will also fit spring mounts or solid urethane block to the middle mounts on the largest trucks. Rear load cells are always rigidly mounted.

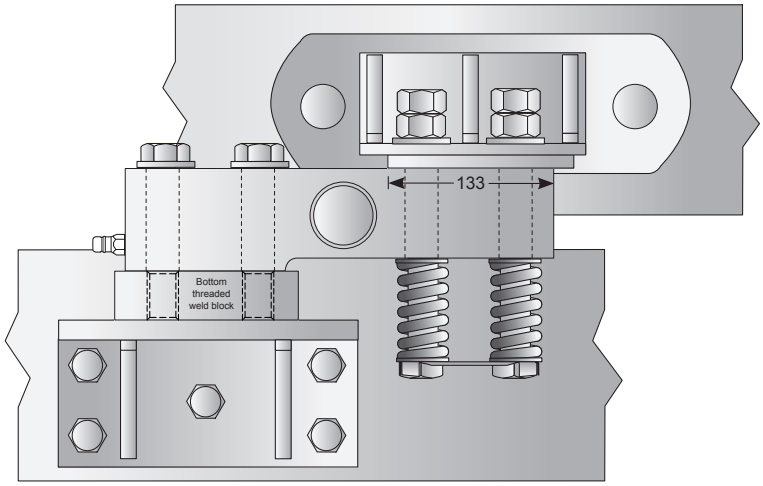


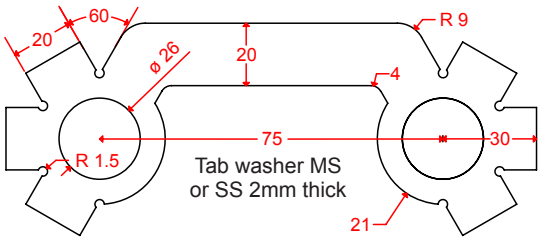
Assemble the bolts, springs, washers and tab washer as shown. Tighten the bolts so the spring reduces in height by 5mm - e.g. to 85mm. Make sure the tabs of the tab waster line up with the flats of the hexagon bolt and fold upwards to prevent rotation.











Notes