

Safety Alert OF THE MONTH

PLEASE PASS THIS ON TO PEOPLE AND ORGANIZATIONS IN BC'S FOREST INDUSTRY

August 2018

Maintenance of Bolster and Scale Pad Bolts

This alert contains up to date information for recommended inspection and maintenance practices for bolster and scale pad bolts on log trucks. Similar information was published in 2013, however, it did not contain the recommended torque values for both S.I. and Vulcan on-board scales. This alert provides values for both systems.

If not maintained or torqued properly, bolts can be damaged which can contribute to spilled loads (see below for an incident description).

Driver's Daily Inspection

1. Brush off any buildup of mud, ice or other debris that may obstruct the load cell's deflection under load, and will impair your ability to see and feel your rigging. It's best to do scale pad checks in daylight during your **circle check**.
2. Visually check load cells, mounting brackets, and fasteners for cracks, or other external damage. Check mounting bolts to confirm they are tight.

The easiest way to check that bolts are secure is by using **torque striping** (see below).

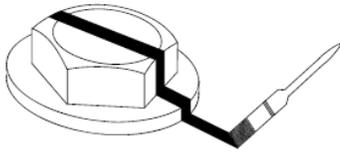


Figure 5-A: Painting a Torque Stripe

If torque stripes have been applied, confirm they are properly aligned. To apply a torque stripe: Use a durable, brightly colored paint. Paint a stripe crossing the head of the fastener, continuing down the fastened structure, as shown.

3. Another method to check bolts is the *hands-on method*. Confirm the head of the mounting bolt is there. Grab hold of the head of each mounting bolt; twist it left and right. Give it a wiggle. If it has recently snapped or is coming loose, you should be able to feel a little play. If you do, get your mechanic to check / fix things before you leave the shop.
4. Watch your rigging during loading and unloading.
 - If the loader operator is rocking the unit, you might see extra play at the bolster or trunion (depending on your system) if you have broken or loose mounting bolts.
 - When the log stacker is lifting the load off the unit, look for slop or play at the bolster or trunion. If you see daylight under the scale pads, or your trailer frame looks to be lifting away from the suspension / axle assembly – you've got big problems to fix.

Torque Tip – Scale pad bolts are more likely to fail as a result of a severe torque or twist (rather than an accumulation of the day to day ordinary stresses). If the D8 has towed you through a mudhole with a nasty lean; the loader operator gives your rig a severe push; or, if you have hit the weeds, double-check your rigging and your scale pad bolts.



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Monthly Inspection – Mechanic

Check the torque on load cell cap screws monthly. For new installations, check them at least weekly for the first two weeks.

S.I. On-Board Scales Recommended Torque Values:

Bolt Diameter	5/8"	3/4"	7/8"	1"	1-1/8"	1-1/4"
Lb-ft	225-250	380-420	500-550	650-700	900-950	1000-1100

Vulcan On-Board Scales Recommended Torque Values:

Bolt Diameter	3/4"	7/8"	1"	1-1/8"	1-1/4"
Lb-ft	400-500	400-590	650-890	1000-1400	1450-1780

Torque Tip – A lot of shops won't have a torque wrench that goes up to 1400 lb-ft. Using a 1" impact gun won't necessarily give you the torque you need – some 1" guns are rated up to 3200 lb-ft and others top out at 1300 lb-ft. The condition of the tool and the shop air system has a big influence on torque output. You really can't use an impact driver to estimate torque.

A cost-effective solution you can use to reliably apply the correct torque is a **torque multiplier**.

Check welds on load cell brackets. **IMPORTANT: If a weld repair is required, remove the load cell. CAUTION! Do not exceed 140 degrees Fahrenheit (60 C) on the load cell. Arcing on the body of the load cell voids the manufacturer's warranty and may seriously damage the load cell's structural integrity. The load cell must NOT be installed if this occurs.**

Check load cell connectors; make sure they are finger-tight plus an additional 1/8 of a turn with channel lock pliers (helps avoid scale errors due to moisture entering connector).

Do not grease or lubricate inside the load cell connector or VSL Vulcoder connector. They are highly sensitive to foreign substances and inaccurate readings will occur if components are contaminated.

If a connector is opened, clean the load cell connector and cable connector with cotton swabs and isopropyl alcohol, dry with a hair dryer (**DO NOT OVERHEAT**), and replace the O-ring before reconnecting.

In areas where salt is used on the roads, wrap the threads of the load cell connector with plumber tape (Teflon tape). This will prevent salt from penetrating the threaded connection.

Vulcan load cells are plated for increased rust protection, but maintenance is necessary to claim warranty of load cells. Annually, apply high quality paint to the load cells, bearing pads, and mounting brackets.

For environments where high concentrations of salts are used on road surfaces, undercoating is recommended (3M, Universal Rubberized Undercoating, 3M P/N: 8883). Spray undercoating when load cells are connected to electronics and fully assembled with bearing pads and brackets.

Fill unused holes in load cells with grease to protect against rust.



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Diagrams for Vulcan On-Board Scales

Typical Western Logger Mounting

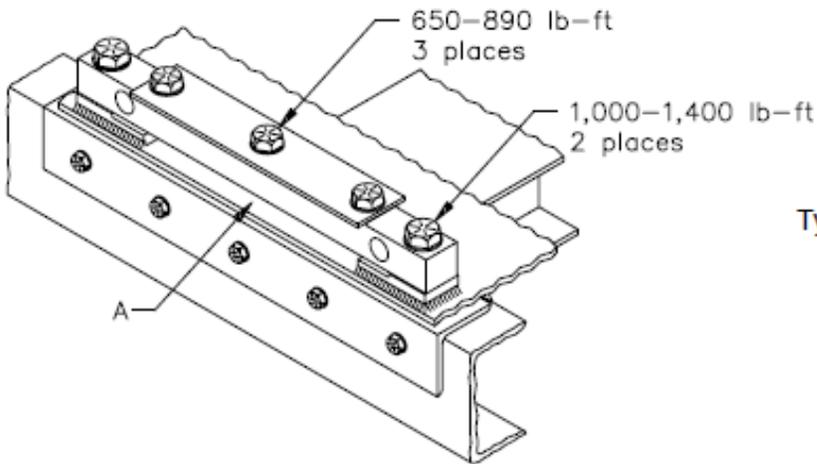


Figure 5-C

Typical Holland 5th Wheel Mounting

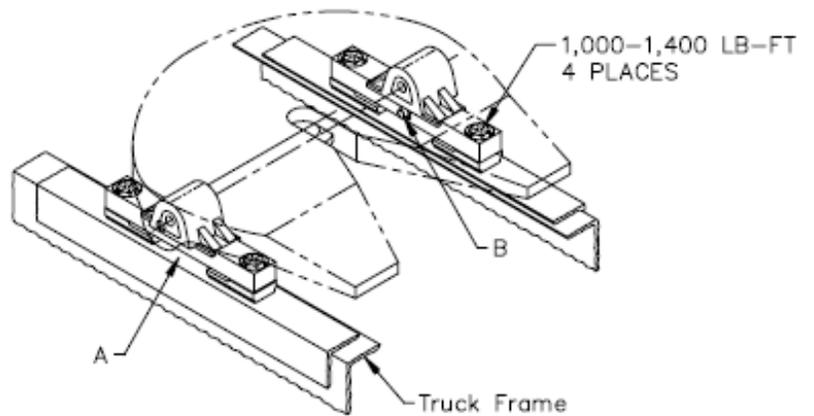
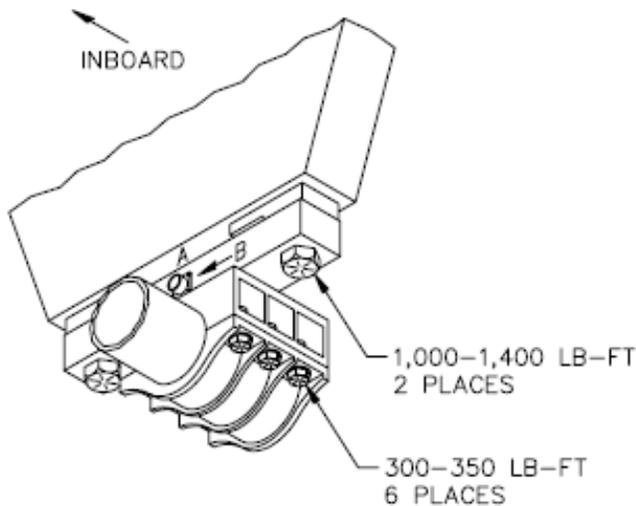


Figure 5-G

Typical Single Point Mounting



Link to Vulcan On-Board Scales Manuals: <https://vulcanscales.com/index.php/about-us/library/manuals/>



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Incident Description: Broken Bolts Cause Load To Shift

While negotiating a turn a loaded logging truck rolled onto its passenger side. Once the scale pad bolts pulled loose, and the load spilled, the tractor up-righted itself and the vehicle came to a stop. As the truck up-righted the driver was thrown against the driver's door injuring his upper body and head.

Initial on-site investigation identified broken bolster bolts on the road approximately 200 meters behind the incident scene. The shearing off of the bolts in combination with the force and direction of travel may have caused the truck's load to shift forcing the logging truck to roll onto its side.

Upon investigation of the bolts, it was identified that the threads on the upper portion of the bolt hole were completely worn off. The right side scale pad bolts were cracked 70% through.

The previous driver had experienced problems with the bolster and scale pad bolts loosening; the issue was dealt with by having a local maintenance shop tighten the bolts.

Learnings & Suggestions:

- Daily pre-trips to include checking recognized weak points
- Change scale pad and bolster bolts annually
- Replace bolster and scale pad bolts with new ones when scale pad/bolster maintenance takes place
- When scale pad/bolster bolts are tightened it is recommended that the bolt itself be checked for overall condition (integrity/durability), a locking device is in place, they are torqued to the correct torque, and they are then backed all the way out again to check for thread integrity
- A wash station be made available to allow drivers to visually inspect truck & trailer easily and accurately
- Review maximum load sizes to ensure compliance with the manufacturer's maximum load ratings for truck and trailers.

