# *Attaching BDI Strain Transducers to Structural Members*

There are two basic methods for attaching the strain transducers to the structural members: C-clamping or with special tabs and adhesive. For steel structures, quite often the transducers can be clamped directly to the steel flanges of rolled sections or plate girders. If the transducer is to be clamped, insure that the clamp is centered over the mounting holes. In general, the transducers can be clamped directly to painted surfaces. However, if the surface being clamped to is rough or has very thick paint, it should be cleaned first with a grinder. The alternative to clamping is the tab attachment method outlined below.

1) Place two tabs in mounting jig (if available, if not simply hold with vice grips). Place transducer over mounts and tighten the 1/4-20 nuts until tight. Be sure that the transducer calibration number is facing up. This procedure allows the tabs to mounted without putting stress on the transducer itself.

2) Mark the centerline of the transducer location on the structure. Place marks 1-1/2 inch on either side of the centerline and using a grinder, remove paint or scale from these areas. For steel structures, a power grinder is recommended for the initial cleaning. If available, use a portable grinder (a Makita Model 9500D battery-powered grinder with a 46-grit wheel works very well) to “touch up” the newly-cleaned surface. If attaching to concrete, lightly grind the surface with the portable grinder to remove any scale.

3) Using the portable grinder, very lightly grind the bottom of the transducer tabs to remove any oxidation or other contaminants. Before mounting, set the transducer in the location it is to be attached, and ensure that the tabs seat uniformly on the member and that the transducer doesn’t “rock”. This is important for a good bond.

4) Apply a thin line of adhesive to the bottom of each transducer tab (Loctite 410 Black Toughened Adhesive, Part # 41045 in 0.7oz containers) about 1/4” wide. If bonding to concrete, a little more adhesive is necessary to allow some to flow out and around the tabs. Mount the transducer in the marked location, and then pull it away. This action will apply adhesive to the structural member at the tab locations.

5) Spray each adhesive contact area on the structural member (just one “light shot”) with the adhesive accelerator (Loctite Tak Pak 7452, Part # 18637 in 0.7oz aerosol spray container).

6) Very quickly, mount transducer in its proper location and apply a light force to the top of the tabs (not the center of the transducer) for approximately 15-20 seconds.

If the above steps are followed, it should be possible to mount each transducer in approximately five minutes. When the test is complete, *carefully* loosen the 1/4-20 nuts from the tabs and remove transducer. If one is not careful, the tab will pop loose from the structure (particularly when testing concrete structures) and the transducer may be damaged. Use vice grips to remove the tabs from the structure. If the tabs remain with the transducer during removal, use vice grips to hold the bottom of the tab while loosening the nut. DO NOT try to loosen the nut without keeping the tab from twisting as the transducer can be bent! The tabs can be re-used by soaking them in acetone for a few hours to remove the hardened adhesive. Be sure to cover the container since the acetone will evaporate quickly and is very flammable! For closest Loctite Distributor call: 1 (800) 243-4874. For timber members, the transducers can be mounted with self-tapping phillips-head screws and a power screwdriver. Usually, washers are required to ensure that the head of the screw does not sink into the transducer mounting hole. The screws should be snugged up with the power driver, and then hand-tightened with a standard phillips screwdriver.

**Adjusting excessive transducer offset**: If it is determined while balancing (zeroing) the wheatstone bridge circuit in the transducers that it cannot be zeroed, it is possible it has either been damaged or just deformed slightly. The first item to determine is which direction the offset is in. If the gage is too far in compression, loosen the free end of the gage (the end opposite of where the cable exits) and pull on it gently and re-tighten the nut or C-clamp. If enough force cannot be applied with the gage attached to the structure, remove the gage and pull it from both ends. Hopefully, while watching the gage in “Monitor” mode, the gage will come closer to zero. Perform the same operation, except in the opposite direction if the gage is too far offset in tension. If this initial offset cannot be removed, please return the transducer to BDI for evaluation. **Remember!** The transducers are high-quality precision sensors and are therefore quite sensitive, so be very careful while handling them! For further installation techniques, review our “Structural Testing System Operation Manual” available from us and our website.