

Permanent Steel Tension Rod Installation JHA

Worked instructional example

Work and worksite

A steel connection crew will install one specified permanent Halfen DETAN-S carbon-steel tension-rod run between accepted building-frame connection plates. The supplied identified assembly is checked and adjusted on supported ground positions, transferred under the handling plan, pinned and completed through the actual system and engineering criteria. Temporary frame stability remains independently controlled. This fictional learning example describes planned controls and records no actual inspection or work authorization.

- The US project's issued connection and stability package identifies the accepted DETAN-S run, plates, rod components, actual engagement, locking and required force/geometry verification. Manufacturer assembly instructions INST_DT03/23 support this family; foreign product approval alone does not establish project acceptance.
- The frame and connection plates are separately accepted, with retained temporary restraint, protected installer access, safe rod-transfer arrangements and clear tension/reaction paths. Any required adjustment and force-assessment method is actually supplied before work.
- Steel connecting 238120-05 is a partial connection: a permanent proprietary tension-member run only. Temporary plumbing pulls, beam initial connecting, rod cutting/thread repair, substitute couplers, plate fabrication, hydraulic pretensioning and temporary-restraint removal are excluded.

Questions before work

- Which current project and DETAN-S documents identify this permanent run and its actual completion criteria?
- How will the complete rod remain supported through adjustment, transfer and attachment at both accepted plates?
- Who verifies engagement, retention and the required force/geometry evidence while temporary frame restraint remains?

Task Hazard Control

1 Establish the permanent connection and retained stability

Hazard: A rod installed into an unaccepted plate or used as an improvised plumbing cable can introduce an unintended load path.

Control: Connection lead identifies the issued run and accepted supporting plates and obtains current system-specific installation and engineering requirements. Confirm independent temporary frame stability and name the actual connection verifier. Resolve unaccepted components or required force-assessment instructions before assembly. Keep frame alignment and temporary support changes outside this operation; a delivered tension system does not authorize its structural use.

Verification: Lead verifies current run identity, accepted interfaces and actual retained-stability evidence.

Reasoning: The permanent member needs its own defined function and ready connections before installation.

2 Check the supplied system and prepare support

Hazard: Mixed thread directions, transit damage or an unsupported long rod can cause a defective connection or strike installers.

Control: Match the supplied DETAN-S component identification and allocation to the project package and examine required surfaces, threads, forks, pins and retainers. Stage the complete assembly on stable supports near its permitted transfer route. Segregate damage and mismatched parts for disposition; do not rethread, bend or fit a generic replacement pin. Protect access and the area below any later work position.

Verification: Installer records actual component identity/condition and the supported preparation arrangement.

Reasoning: A proprietary rod system relies on the matched complete assembly, not interchangeable-looking hardware.

3 Establish the actual length and engagement condition

Hazard: Uncontrolled adjustment can leave inadequate thread engagement or place workers in a shifting rod's pinch and reaction paths.

Control: Assigned installers use the selected carbon-steel system's actual permitted adjustment method on restrained supports. Verify the required run geometry, component orientation, engagement indications and sealing/locking preparation against the applicable instructions. Keep hands clear of moving forks and tool reaction and stop for jamming or an out-of-range fit. Do not borrow stainless-family criteria or adjust until the rod merely looks long enough.

Verification: Lead verifies actual geometry and prescribed engagement evidence before transfer.

Reasoning: Length adjustment must preserve the connection conditions that allow the rod to develop its intended load.

Complete the work and hand over

4 Transfer and attach the supported rod run

Hazard: A sagging assembly, trapped fingers or forced pin can injure workers and introduce bending into a nominal tension member.

Control: Use the accepted handling plan, qualified lifting roles where needed and protected receivers to retain support while fitting the run to its accepted plates. Check prescribed fork/plate alignment and complete pin and retention through the actual method. Keep hands outside closing interfaces and hold incorrect fit; do not force a pin with impact or pull the frame into alignment using the arriving rod.

Verification: Connection lead verifies required alignment, pin engagement and complete retention with support maintained.

Reasoning: The permanent connection must fit its designed interfaces without an unintended bending or alignment action.

5 Complete adjustment locking and required verification

Hazard: A visually attached run can remain incorrectly adjusted, unretained or outside its specified force condition while later crews assume permanent stability.

Control: Follow only the actual system and engineer-issued completion method, preserving independent frame restraint and clear reaction/tension zones. Complete prescribed adjustment and locking and obtain required engagement, retention, geometry and force evidence through the supplied verification procedure. Hold uncertain results for the responsible connection authority; no universal turns, torque or visible-straightness rule establishes rod force or final acceptance.

Verification: Named verifier records actual completion findings and connection disposition at the required hold point.

Reasoning: An attached pin and a taut-looking rod do not establish every permanent-system acceptance requirement.

6 Protect the completed run and transfer restrictions

Hazard: Later loosening, impact or premature removal of temporary frame restraint can invalidate the accepted installation and expose other trades.

Control: Record the actual run, components, engagement and completion findings with accepted or held dispositions. Remove handling equipment only through its released method and protect the rod and locking interfaces from interference. Brief the receiving erection lead on permanent-system status and retained temporary restraints. Any subsequent force adjustment or restraint removal needs its separate project decision; this record does not release the whole frame.

Verification: Receiving lead confirms actual connection status, protection and continuing temporary-stability ownership.

Reasoning: Completing one permanent tension run does not by itself establish the building's complete stable condition.

Pause and reassess

- The permanent run, supporting plates, actual system instructions or required engineering completion criteria are unaccepted or uncertain.
- Damage, thread engagement, alignment, pin retention, adjustment or measured response differs from the selected method.
- A crew proposes using the run to plumb the frame, modifying a component or removing independent temporary restraint without its separate release.

Improve the controls

Needs improvement: The bar is taut, so its design force is established.

More useful: Obtain the actual specified force/geometry verification with component engagement and locking evidence before permanent-system disposition.

Needs improvement: A tension rod can pull this plate into alignment.

More useful: Use separately accepted plate geometry and a supported fitting method; hold a mismatch instead of turning installation into an unplanned plumbing operation.

Decisions that change the analysis

May exposed threads be accepted because the rod reaches both plates?

Only the actual selected-system and project engagement criteria determine acceptability. Keep the run supported and held if required evidence is missing or outside limits. Obtain responsible system/design disposition instead of changing components, adding a washer or forcing fit. A completed length alone does not demonstrate the required thread engagement or force condition.

What must the connection crew record for actual use?

Record the current run and component identities, accepted plate/stability package, applicable DETAN-S instructions and supported handling method. Document actual orientation, engagement, pin/retention, adjustment, locking and required force/geometry findings, with authority dispositions and unresolved holds. Preserve temporary-restraint ownership without prefilled acceptance or a claim that the whole frame can be released.

Training needs

- Actual selected DETAN-S installation instruction on identity, thread direction/engagement, supported transfer, pin retention and locking verification.
- Instruction on permanent-system engineering hold points, tension/reaction exposures, protected access and keeping temporary frame stability separate from rod completion.

Confirm applicable qualifications and actual training evidence for the people assigned. Related toolbox talks support discussion; they do not establish competence.

References and adaptation

Halfen DETAN-S and DETAN-D assembly instructions INST_DT03/23: use the selected family
https://www.ancon.co.uk/downloads/7366/Halfen-Detan%20Installation%20Instructions_EN.pdf

Leviat/Ancon current installation-guide catalog: Halfen Detan systems
<https://www.ancon.co.uk/resources/installation-guides>

OSHA 1926.754 Structural steel assembly and continuing stability
<https://www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.754>

References reviewed October 13, 2026. Use actual equipment and product instructions, project design and site requirements. This original draft supplies no fabricated inspection, signature or approval.