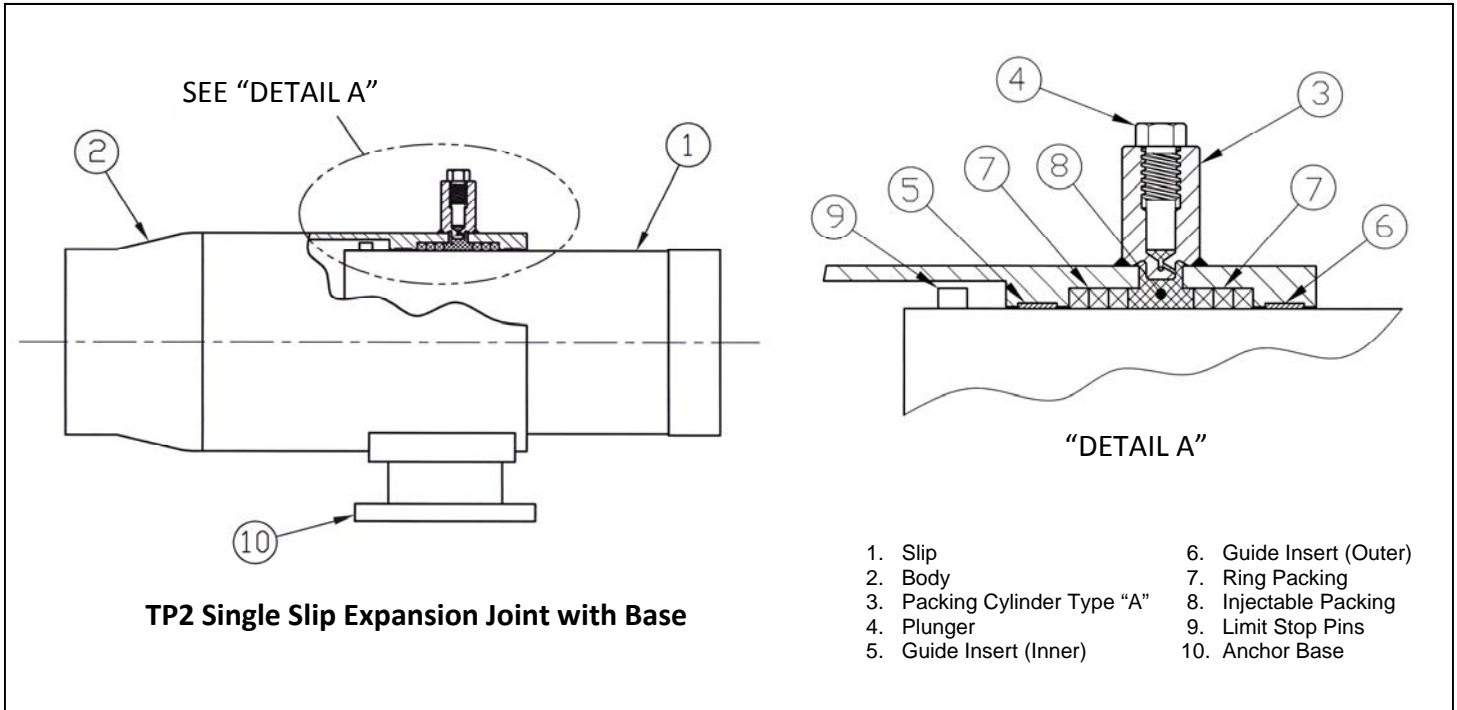




# TP2 THERMAL PAK SLIP-TYPE EXPANSION JOINTS

## INSTALLATION, OPERATING AND MAINTENANCE INSTRUCTIONS & SPARE PARTS LIST



### GENERAL

1. The sliding slip of the TP2 is factory pre-compressed 1" unless otherwise specified. In these cases, the TP2 will have a rating of the nameplate traverse in compression and 1" in extension. Chilled water applications require additional pre-compression. Unless otherwise specified, the slip will be factory pre-compressed the nameplate traverse and have a rating of 1" compression and the nameplate traverse in extension. A yellow tag attached to the TP2 Slip Joint states the amount of factory pre-compression if other than 1". Prior to installation, the responsible installing party must assure that the correct amount of slip pre-compression has been accomplished, otherwise anchor failure and subsequent damage to the slip joint anchor and/or pipeline may occur. A measurement of the slips exposed chrome will give the maximum allowable movement in compression.
2. Double ply cardboard has been wrapped around the chrome plated slip surface for protection while in transit and should remain in place until the installation has been completed. If any damage to the cardboard wrapping is noted upon delivery of the slip joint, it should be reported to the carrier by noting the delivery Bill of Lading "possible hidden damage". If damage has occurred, ATS will assist the purchaser in making a claim with the carrier if requested.
3. The inside of the pipeline should be reasonably clean of sand, dirt, gravel, scale, etc. as these foreign materials may become embedded in the packing when the system is energized and may cause damage to the slip joint or prevent a leak tight seal.



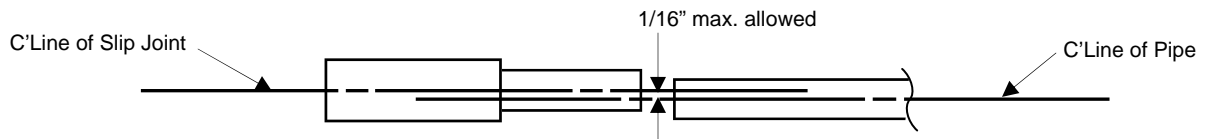
## INSTALLATION

1. The preferred method of installing any type of expansion joint is to first install the pipe run, anchors and alignment guides. Pipe anchors should not be bolted or welded in place until after the slip joints have been installed and properly aligned. Once the pipeline, anchors and guides are in place and after any required testing, i.e. hydrostatic or air test is completed, the piping should be cut out where the slip joint is to be installed. This method, when properly accomplished, will result in the best possible alignment of the slip joint with the adjacent piping. If it is not possible to run the pipe straight through before the slip joints are installed or if the slip joints are replacements in an already existing pipeline, the procedure described below is recommended. Testing the pipeline prior to installing the slip joint is the preferred method especially when the ATS TP2 slip joint is factory packed to seal a hot fluid.

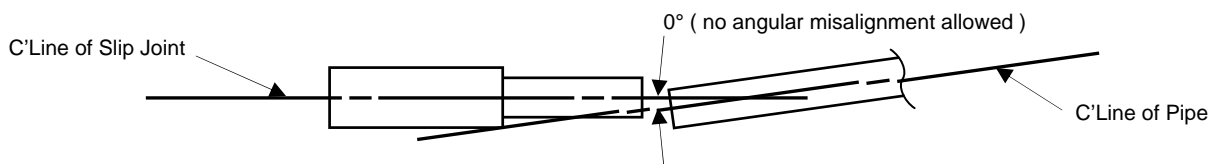
**CAUTION: It is very important to obtain correct alignment of the slip joint to the adjacent piping. Only parallel misalignment of the piping relative to the slip end of the slip joint is permitted and should not exceed 1/16". Any angular misalignment must be corrected prior to attaching the slip joint to the adjacent piping. Obtaining the correct alignment may require that the pipe alignment guides be moved and/or adjusted. Installation of the slip joint with angular misalignment may cause binding of the joint's sliding slip and/or damage to anchors and will void the Warranty and Service Guarantee.**

**Under no circumstance should the pipe ends be forced into alignment with the TP2 Slip-Type Expansion Joint.**

### PARALLEL MISALIGNMENT



### ANGULAR MISALIGNMENT



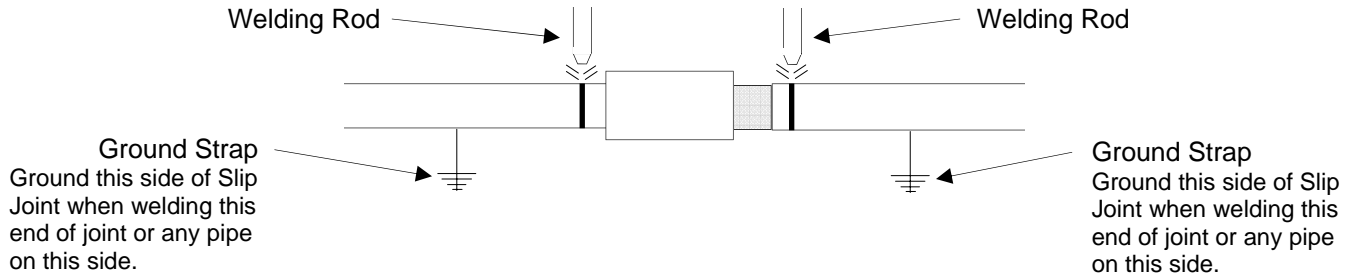
2. **Single & Double Slip Joints with Bolt Down Anchor Base:** Set the slip joint in place and install the anchor nuts, but do not tighten at this time. Align piping at both ends of the slip joint. Obtaining proper alignment may require shimming of the slip joint anchor base in combination with adjustment of the system alignment guides. Once any angular and/or parallel misalignment has been eliminated, attach the joint to the adjacent piping (tack weld or flange bolting) then tighten the anchor nuts. Recheck the alignment before final welding or tightening of bolts.
  - **Single and Double Slip Joints with Weld Down Anchor Base:** Set the slip joint on the support but do not weld it in place this time. Align piping at both ends of the slip joint. Obtaining proper alignment may require shimming of the slip joint anchor base in combination with adjustment of the system alignment guides. Once any angular and/or parallel misalignment has been eliminated, attach the joint to the adjacent piping (tack weld or flange bolting). Tack weld the anchor base to the supporting structure and recheck the alignment. Weld the base plate to the support steel per contract requirements. Fillet welds should be continuous around the perimeter of the base plate.
- Slip Joints without Anchor Base:** The body end of the slip joint should be tack welded or bolted to the adjacent pipe while being temporarily supported. Align piping at the slip end of the slip joint. Obtaining proper alignment may require adjustment of the system alignment guides. Once any angular and/or parallel misalignment has been eliminated, tack weld or bolt the slip end of the joint to the adjacent piping.



## INSTALLATION CONTINUED

- When welding or grinding on or around the slip joint, place a fire resistant blanket over the cardboard protecting the chrome plated slip. When welding the sliding slip to the adjacent piping, ground the welding equipment to the piping immediately adjacent to the slip being welded. When welding the body portion of the slip joint to the adjacent piping, ground the welding equipment to the piping adjacent to the body portion of the slip joint body.

**CAUTION: Whenever welding on or near the slip joint, the welding ground must be located on the pipe, adjacent to the weld being performed to prevent a welding arc between the slip and the stuffing box. (See below.) For the remainder of the piping installation, the slip joint cannot be in the welding ground path. Improper placement of the welding ground will result in damage to the chrome plated sliding slip surface and will void the Warranty and Service Guarantee.**



- When the pipeline cannot be tested prior to installation of the TP2 slip-type expansion joint, testing with the slip joint installed is acceptable. All guides and anchors **must** be in place before testing. Test pressure cannot exceed 1.5 times the expansion joint design pressure shown on the nameplate. To obtain a leak tight seal on slip joints packed for a hot fluid may require the injection of additional packing plugs. Avoid injecting excessive packing during testing as the resiliency of the packing as a steam seal (or other hot fluid seal) may be damaged.
- Thermal Insulation should not encapsulate the TP2's sliding slip unless it is removable (i.e. removable insulation blankets) and should not be installed until the slip joint has been in service for two (2) or three (3) weeks.
- Pipe alignment guides should be spaced in accordance with ATS recommendations.

## INITIAL START UP

- During the initial energizing of the pipeline, inspect each slip joint to ensure the sliding slips are operating properly and no leakage is apparent.
- A lubricant has been added to the injectable packing at the factory to facilitate hydraulic injection of the packing. This lubricant may run out during the first few weeks of operation and **should not be considered a leak of the flowing media**. To compensate for the slight loss of packing density due to the loss of lubricant, and redistribution of the injectable packing in the stuffing box when exposed to heat, a slight leak may develop requiring packing plugs to be injected. Tubes of spare packing plugs (six plugs/tube) are furnished with each slip joint at the time of shipment.
- Packing plugs are NOT a lubricant. Inject packing plugs to the slip joint **ONLY** if a leak is apparent. Once the leak has stopped, it may be desirable to add a few additional packing plugs to ensure the leak does not start again when the packing is re-distributed due to exposure to heat; however, **DO NOT** inject more than one (1) or two (2) additional packing plugs per packing cylinder after the leak has been completely contained. Instructions for packing injection are packaged with the tubes of spare packing plugs furnished with each order.
- The slip joint should be inspected several times during the first two (2) months of continuous operation to ensure no leaks have developed.
- For detailed instructions on injecting packing refer to ATS publication **ATS-Packing-IOM-2009**.



## ROUTINE MAINTENANCE

**SAFETY PRECAUTION:** The injection of packing into a fully pressurized slip joint is a safe operation when it is accomplished using the procedures and instructions furnished with the slip joint. Personnel doing the packing injection should read and understand the instructions before starting packing injection. ATS offers factory training seminars for maintenance personnel on request. Phone ATS at 1-800-443-9194 for any questions concerning packing injection or maintenance.

1. When the pipeline is properly aligned and anchored at installation, routine maintenance of the TP2 Slip-type Expansion Joint is **minimal**. Each slip joint should be inspected for leakage on a regular basis determined by previous performance. A record of each inspection should be maintained noting the slip joint S/N or location, date and leaks noted and the severity of the leak and the number of packing plugs, if any, injected to contain leakage. Any slip joint requiring packing to contain leakage should be re-inspected the following day to verify the leak has stopped.
2. Twice yearly the packing plungers should be removed from the packing cylinder and lubricated with an anti-seize compound or equivalent high temperature lubricant.
3. During any system shutdown, the chrome plated sliding slip surface should be inspected and cleaned of any buildup of packing material, debris, or water treatment compound. A clean slip will assure a more leak-free operation of the expansion joint with less requirements for packing injection.

**CAUTION:** Packing plugs should only be injected to stop a leak. Any leakage must be stopped as soon as possible by injecting packing plugs. If leaks are allowed to continue the sliding slips and/or guide surfaces may wire draw making it difficult and costly to contain leakage (if at all). Severe wire draw may necessitate slip joint replacement. Leaks that continue to re-occur soon after being contained can often be attributed to misalignment of the pipeline. Do not add excessive packing plugs to obtain immediate sealing. Allow two or three hours for packing to adjust.

## RECOMMENDED SPARE PARTS & ACCESSORIES

TUBES OF 6 PACKING PLUGS

**PLUNGERS:** CARBON STEEL OR ALUMINUM BRONZE

**SAF-T-PACKERS:** TYPE GA, GB OR GC - All slip type joints are shipped with a minimum of two (2) spare packing plugs per cylinder. The plugs are shipped inside the joint and **must** be removed prior to installation. To reduce the packing injection torque ATS can furnish a type GA, GB or GC **SAF-T-PACKER** to safely loosen or remove the impacted packing at the bottom of the packing cylinder.

**INSULATION BLANKETS:**

**LT 450 SS** - 450°F Max, indoor/outdoor non-corrosive environments.

**MT 550 NN** - 550°F Max, wet environments, salt water exposure, **best for man hole usage.**

**MT 800 SGM** - 800°F Max, indoor/outdoor non-corrosive environments

## OTHER ATS PUBLICATIONS

ATS publications are now available in PDF format by request.

<b>P2 / S2 Thermal Pak Ball Joints</b>	ATS-P2/S2-IOM-2010
<b>“S” Series Ball Joints</b>	ATS-S-Series-IOM-2010
<b>Solar “S2” Ball Joints</b>	ATS-Solar-IOM-2010
<b>Anchors, Guides &amp; Supports</b>	ATS-G/A/S-IOM-2009
<b>Injection Packing Instructions</b>	ATS-Packing-IOM-2009
<b>SAF-T-PACKER Instructions</b>	ATS-SAF-IOM-2009