

## Tuff Breed® Well Service Packing Trouble Shooting

Problem	Potential Causes	Possible Solutions
Leakage at start-up	Packing installed backwards	Remove and reinstall packing. The rubber header ring should be on the high-pressure end of the assembly, nearest the suction and discharge valves.
	Worn stuffing box	Replace stuffing boxes that are excessively worn, damaged, or show signs of "wash boarding."
	Packing too loose	Review installation and tightening procedure. Packing should be squeezed (axially compressed) 0.025" to 0.040" after the plunger is installed.
Wiper or secondary seal failure	Damaged during installation	Lubricate packing and plunger before installing plunger. Make sure plunger shoulder is radiused or chamfered. Use bevel lipped wiper seals only.
	Incorrect wiper size	The wiper ring or secondary seal should not be loose in the groove - radially or axially. Contact CDI for assistance.
	Lubrication pressure too high	CDI secondary seals should be run with a low pressure air-over-oil type lubrication system. If other lube systems are used, provisions must be made to avoid pressure trapping between the packing set and the secondary lubrication seal. Contact CDI for assistance.
Short packing life, catastrophic failure or sever damage to packing	Can be caused by extreme problems listed above.	See 'Short packing life-no apparent damage to packing other than header ring' solutions.
	Extrusion or fatigue of female adapter and/or pressure ring.	Worn adapters may allow the pressure ring to extrude at high pressure. Ensure that the bronze spacer ring used to back up the female adapter is in good condition and not more than 0.060" over the plunger size. Use PEEK adapter from CDI with each packing set.
	Grooving, gouging, and extreme wear to all packing rings.	Hardened abrasive materials will cause severe damage to packing components. Ensure pumps are thoroughly cleaned or flushed after each job.

Problem	Potential Causes	Possible Solutions
Packing running hot or showing damage on only one cylinder	Over-tightened gland nut	Review installation instructions. Packing should be compressed about 0.040" or 1/4-turn of a typical gland nut. If the packing is too tight, it will run hot. On equipment with adjustable stuffing boxes, simply back off the gland nut slightly. If the stuffing box is non-adjustable, the metal trim should be modified to reduce the compression of the packing. Contact CDI for assistance.
	Fluid cylinder not filled or pumps not properly primed	Remove and replace packing. Check all valves to ensure they are operating properly. Remove old packing and reinstall new packing. Run pump slowly until it is fully primed.
	Insufficient lubrication	Check lubrication levels and ensure each plunger is receiving adequate lubrication. Increase lubrication rate until packing is running without excessive heat.
Short packing life-no apparent damage to packing other than header ring	Stuck or damaged discharge valve	Increase charge-pump pressure or reduce pump speed.
	Over tightening, rough plunger finish or inadequate lubrication	Maximum packing life is achieved when the packing is compressed approximately 0.040" during installation and is run on smooth plungers with adequate lubrication. A normal failure will show wear and some damage to the rubber header ring and pressure ring(s).
	Low suction pressure or inadequate volume	Avoid running packing dry.
Loose gland nut	Loose gland nut	If the packing is not slightly compressed, the packing can move excessively in the stuffing box. Excess movement can cause leakage or, in severe cases, catastrophic packing failure. Ensure gland nut is compressing packing approximately 0.040". Mark the gland nut and fluid end so operators can visually check to ensure the gland nut has not backed off.

## Tuff Breed® Well Service Packing (WSP) Installation Instructions

1. Make sure pump stuffing box corners in the fluid end are clean and free of any grease, frac solids, or solid cement. Thread surfaces must be clean and free of damage.
2. Check plungers to make sure there is no excessive wear, nicks or grooves. Check all metal trim over the plungers to ensure proper fit.
3. Lubricate all parts and threads with light oil and install packing set one ring at a time. NOTE – If using a step-type junk ring, be sure the large diameter of the ring is against the header ring of the packing set.
4. Tighten gland nut with a spanner wrench or bar to seat packing.
5. Back off gland nut.
6. Re-tighten gland nut to make contact with the packing. Tighten 1/4 turn or 0.040". Mark both gland nut and stuffing box to indicate alignment.
7. Back off gland nut 3/4-turn in order to install plunger through header ring.
8. Oil plunger and install into the packing.
9. Tighten gland nut with a standard spanner wrench or bar to align the marks on the gland nut and stuffing box. **DO NOT** use a hammer and drift to tighten packing. This will knock plunger out of alignment.

No additional adjustment is needed on High-Pressure WSP1 (single PTFE Pressure Ring & PEEK). See Figure 1.

Prior to starting the pump, all fabric packing should be checked and, if loose, tightened. See Figure 2. Check packing lubricating system for satisfactory operation before each job.

### Operational Notes:

Gland nut should be checked prior to starting the pump to ensure packing remains tight.

Fill and start lubrication system before running pump.

### DO NOT ATTEMPT PACKING ADJUSTMENT WITH PUMP RUNNING!

