Top operated bottom outlet valves are a style of valve that is mounted internally in the bottom of the tank car tank using manufacturer specific designed outlet saddles, and linked to a “T” handle (also called a “stuffing box” cover) with a socket to engage the operating rod on top of the tank car. There are several manufacturers of top operated bottom outlet valves which are similar in form and function though each manufacturer uses their own unique terminology to describe the different valve parts.

Common Problems:
- Damage to the packing gland nut by the use of a pipe wrench.
- Damage to the operating rod by using a pipe wrench to turn it.
- Damage from wear or corrosion of the packing (stuffing) box and or packing gland nut.
- Loose, damaged or insufficient packing in the packing box.
- Excessive wear on operating rod sealing surface.
- Damage to the valve seal.
- Damage to the valve seal seating surface.
- Damage to operating rod from “rounding” of the “T” handle.
- Operating rod frozen due to corrosion, makes it appear valve is closed since operating rod will not turn.
- Operating rod disengagement due to;
  - These conditions render the valve inoperable.
  - Broken connecting pins (bolts).
  - Bent operating rod.
  - Corrosion damage to operating rod.
  - Unauthorized modifications to operating rod.
- Gallling of threaded operating rod components.
- Commodity buildup that prevents proper operation.
- A viscous or thick commodity could cause the valve to stick and not operate properly. May have to apply heat to thin the commodity.

Use - Preloading Inspection:
1. Remove the “T” handle.
2. Invert the “T” handle so that the socket engages the valve operating rod.
3. Loosen the packing gland nut by turning the nut counter-clockwise.
4. Ensure that the operating rod operates freely by turning the “T” handle/operating rod counter-clockwise to the fully open position.
5. Inspect the operating rod for corrosion or damage to the packing gland area of the rod.
6. Turn the “T” handle/operating rod clockwise the necessary number of turns to ensure the rod operates freely and the valve closes tightly.
7. Tighten the packing gland nut by turning the nut clockwise.
8. If possible, shine a flash light through the manway to inspect the operating rod for straightness and confirm the valve is closed.
9. Remove the plug from the bottom outlet cap, or remove the plug from the auxiliary bottom outlet valve, open the auxiliary bottom outlet valve, if so equipped, and leave open during loading.
10. Any release of commodity during loading requires corrective action.

Use – Unloading Inspection:
11. Remove the “T” handle.
12. Invert the “T” handle so that the socket engages the valve operating rod.
13. Loosen the packing gland nut by turning the nut counter-clockwise.
14. Ensure that the valve is closed by turning the “T” handle/operating rod clockwise.
15. Carefully loosen the plug from the bottom outlet cap, or loosen the plug from the auxiliary bottom outlet valve, open the auxiliary bottom outlet valve, if so equipped, and check for product leakage.
16. If no leakage occurs, then tighten the plugs and close the auxiliary bottom outlet valve, if so equipped.
17. Remove the bottom outlet cap and attach hose/fittings.
18. Open the valve by turning “T” handle/valve rod counter-clockwise.
19. Inspect the operating rod for corrosion or damage to the packing gland area of the rod.
20. When the car is unloaded, close the valve by turning “T” handle/operating rod clockwise.
21. Tighten the packing gland nut. For best results, tighten the packing gland nut loosen it and tighten it again.

Basic Inspection:
- Do NOT use pipe wrenches or adjustable wrenches with “teeth” to operate the rod or to adjust the packing gland nut.
- Do use open end wrenches or adjustable wrenches without “teeth”.
- Examine the “T” handle socket for wear (rounding) or abuse.
- Examine the operating rod for rounding or tool mark damage from pipe wrenches.
- Examine the top of the operating rod for wear, corrosion or signs of abuse.
- Assure that the operating rod surface that contacts the packing is smooth, clean, and free of corrosion, tool marks or gouges.
- Inspect the operating rod for straightness. For empty tank cars only, if possible, shine a flash light through the manway to inspect the operating rod for straightness and determine that the valve operates properly and the valve is closed.
- Inspect the packing gland and packing box for wear, corrosion, nicks, or burrs.
• Inspect the packing material for wear and assure that there is sufficient packing to create a seal on the operating rod. If rod can move (up and down) with the packing gland nut tight or if vapor is seen bubbling around the packing, the packing needs to be replaced.

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