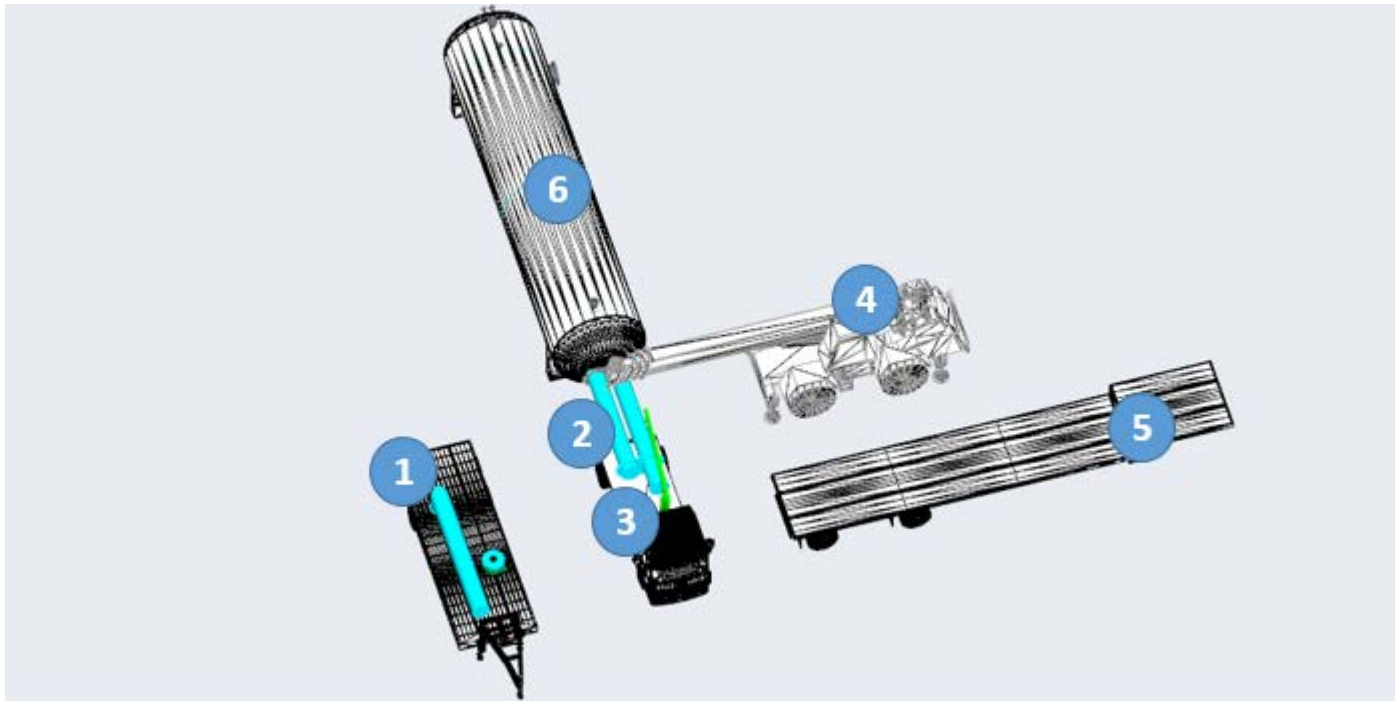




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## FIRETUBE REMOVAL AND INSTALLATION PROCESS



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It is very important to remove and install treater firetubes appropriately to eliminate the possibility of damage to the vessel or the firetube. We have created a step by step process to perform a firetube removal and installation to help us prevent the possibility of damage. Large cranes have a lot of power and can bend a firetube if used to both lift and side in at the same time. We have not included any points for safety as this is usually set out by the company through their safety program. We have merely laid out the action and the field set up of the equipment for a safe and efficient process.



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- Step 1.** The small truck mounted crane/service truck decks off their trailer to the left of the treater so that the stack and flame arrestor can be placed on it (1). The crew then backs the truck up to the treater (6) and removes the flame arrestor and stack and place them on the trailer.
- Step 2.** Crane/Service Truck then backs up to the firetube (2) and uses the deck of the truck (3) as a platform to remove the firetube bolts. Bolts are placed in a pail so they can be cleaned and lubricated in preparation for reinstallation.
- Step 3.** Crane/Service Truck (3) relocates and then pulls the firetube out about half way.
- Step 4.** Large crane (4) arrives and decks off trailer (5) to its left to be ready for the firetube. Then backs in at 90 degrees to the treater centered on the firetube flange. The large crane then straps to the center of gravity point of the firetube.
- Step 5.** Both cranes work together to remove the firetube from the treater. Once the firetube is out the small crane can disconnect and the large crane then sets the firetube on the large trailer. The firetube can then be hauled to the wash area or tub.
- Step 6.** Re installation. The crew may want to attach the gasket to back of the firetube flange. The two cranes then work together much the same way as the firetube was removed by following the steps in reverse order.
- Step 7.** Prior to bolt up it is important to ensure that the two flanges are perfectly aligned and there are no pinch points on the gasket. Improper alignment can cause the gasket to squeeze out and fail prematurely. In order to be sure that the flanges are aligned a Vernier caliper should be used to measure the match up. It may be necessary to jack up the back end of the firetube for a perfect fit.
- Step 8.** The appropriate torquing and tightening sequence should be used for installation (See NRG Treater manual). The tightening/torquing should be done in at least three stages with a star pattern around the oval firetube flange.