

UPTHRUST HANDLING FOR ELECTRIC SUBMERSIBLE PUMPS

ABSTRACT

Systems and methods for handling upthrust for electric submersible pumps are provided. An electric submersible pump includes a plurality of centrifugal pump stages, each stage including a rotating impeller and a stationary diffuser mounted on a shaft coupled to a motor. In use, the motor rotates the shaft, which rotates the impeller within the stationary diffuser. An upthrust washer can be disposed axially between an impeller and its associated diffuser at or near a tip of the impeller, and the gap between the impeller tip and diffuser can define the end play or axial clearance for the pump. If the upthrust washer wears away, upthrust rubbing occurs at the impeller tip instead of proximate the pump shaft to advantageously help protect the shaft from damage or failure related to heat. In some ESPs, an upthrust bearing assembly can be located at the pump head.

Fig. 2