



# TIM'S TECH TIPS

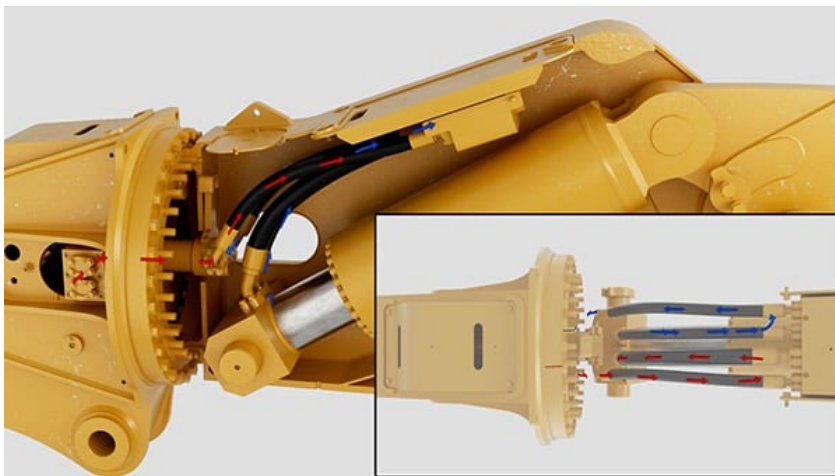


## Shear Cylinder Operation and Rotation Basics

While shear cylinder operation and rotation both operate based upon the flow of oil from the excavator to which the shear is attached, they are completely independent functions. Both functions are relatively simple but can be confusing if you are unsure of how the system works or how to troubleshoot it, so we'll explain below and have created [this video](#) to illustrate.

### Cylinder Operation

Cylinder circuit operation occurs as oil is pushed into the shear's port blocks through the excavator boom tubes and hydraulic "jump" hoses. The oil is then routed through a swivel manifold on a rotating shear, into the Regen Valve, and ultimately into the main shear cylinder, forcing it to extend or retract based upon whether the bore side or rod side of the cylinder is receiving the high-pressure oil input. When cylinder operation is reversed, oil flow direction is reversed.



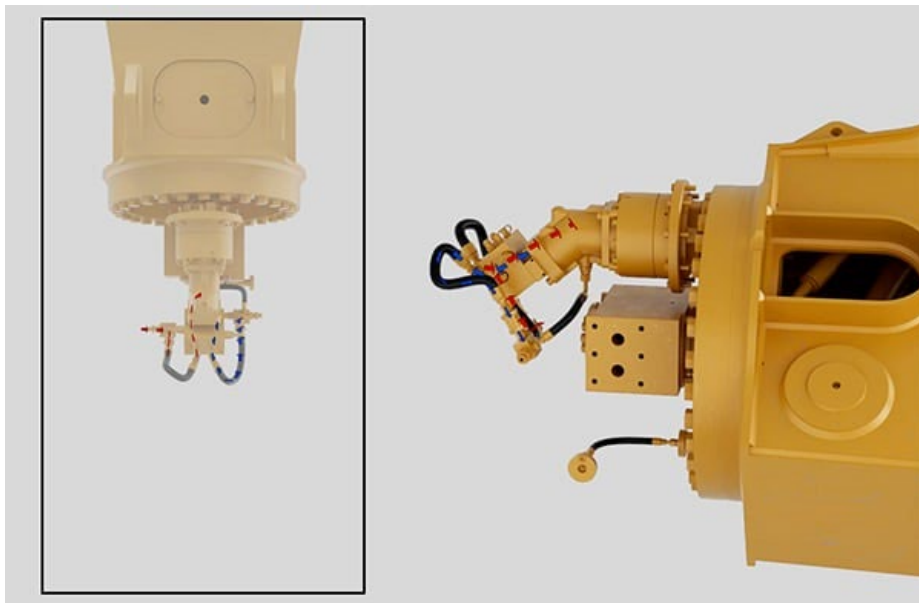
Excavator spools, which control oil flow, open and close by sliding back and forth inside the control valve spool bore. Control valve spool position is a function of the excavator, controlled by the operator, and not a function of the shear. A shear will not perform properly if this operation is compromised.

Be sure to verify the excavator's pressure and flow before contacting us for shear troubleshooting. Since a shear doesn't have a brain, it can only respond, or attempt to respond, to the input it's receiving via the hydraulic pressure and flow.

That's not to say there can't be an issue in the shear, but some symptoms that seem to indicate a shear performance problem may actually be the result of an issue farther back in the system that's preventing the shear from receiving appropriate oil input.

## Rotation

The excavator function for shear rotation is very similar to that of the shear cylinder function, only it's on a separate valve and at lower pressure and flow volume. Oil flow in one direction will result in clockwise rotation, while reversing the oil flow will result in counterclockwise rotation. There are several devices in the rotation motor circuit that regulate rotational speed and protect the motor circuit from back-driving and over-pressurization forces, but the circuit is not complex.



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Always verify carrier function of the individual circuits before assuming you are dealing with a shear issue. If the rotation circuit and main cylinder circuit malfunction at the exact same time, unless there is floating debris in the hydraulic system, the issue is almost always in the excavator.

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