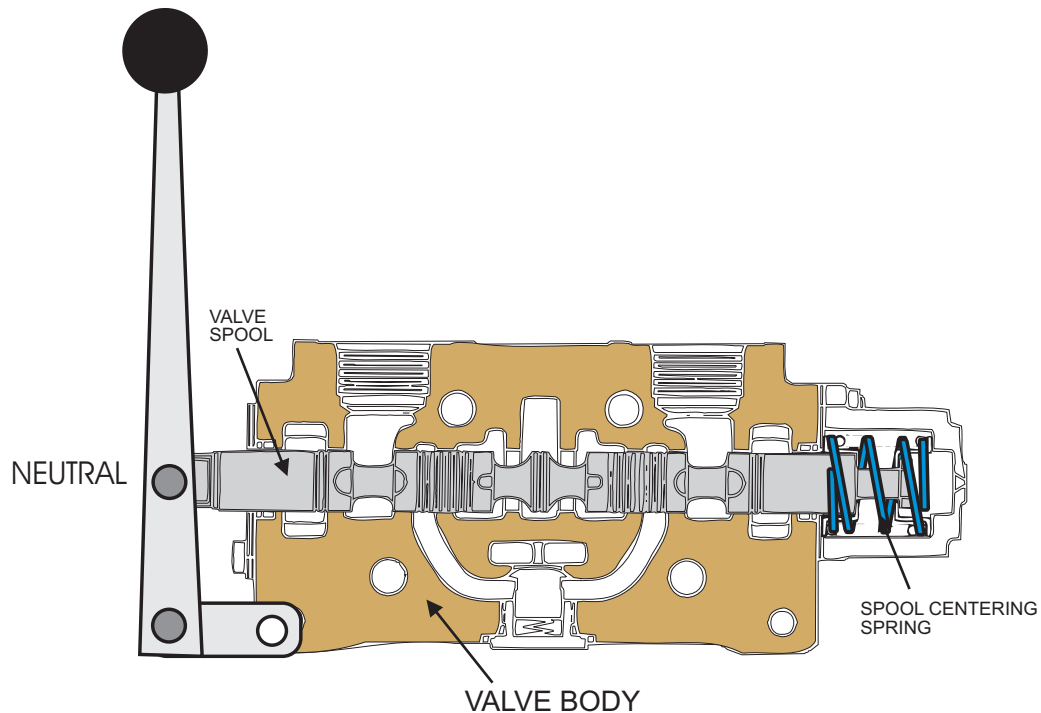


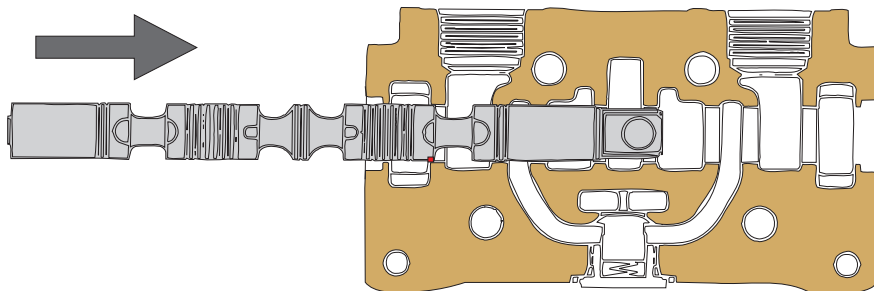
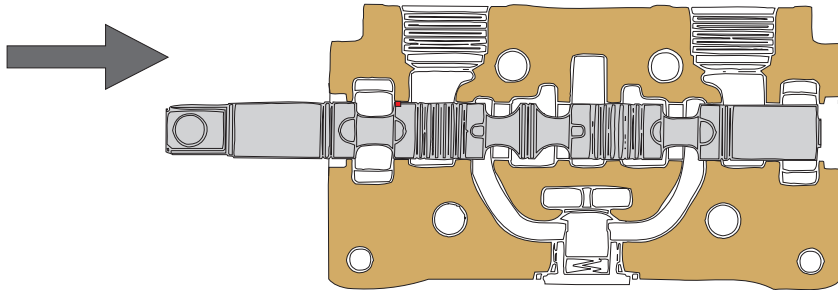
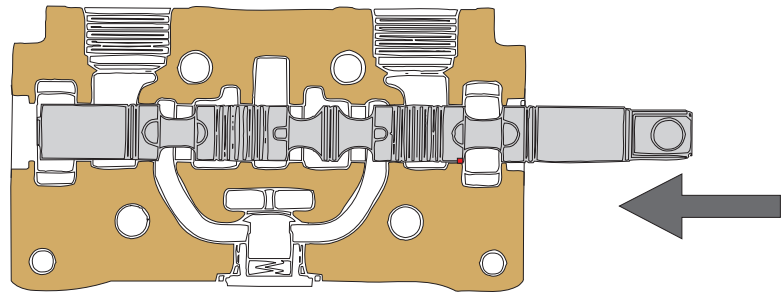
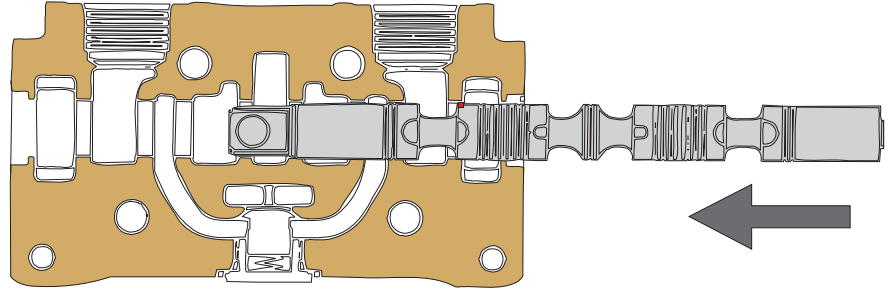
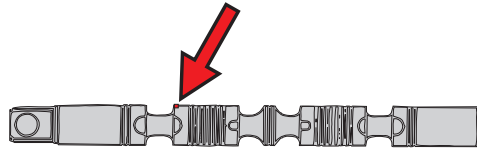
VALVE SPOOL STICKING

CUTAWAY VIEW OF A COMMERCIAL A20 VALVE SECTION

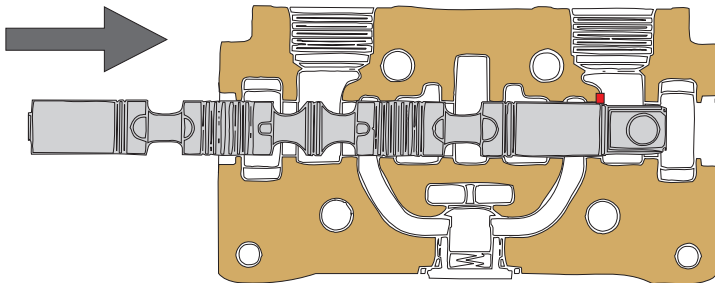
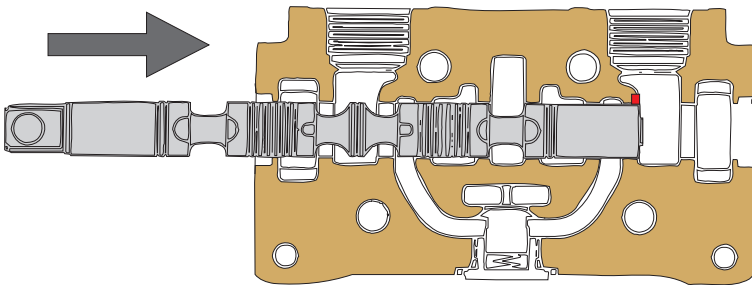
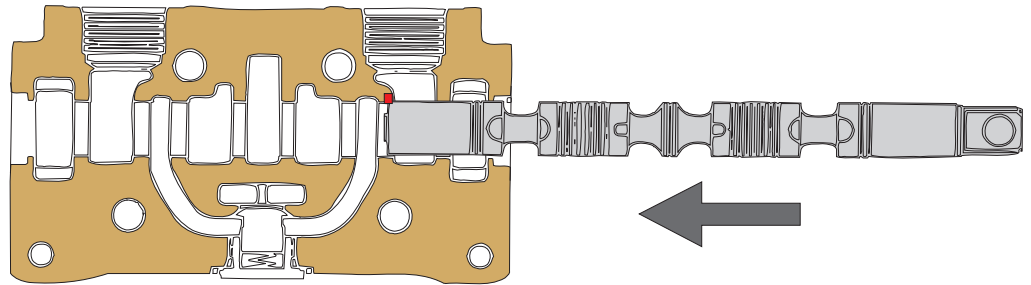
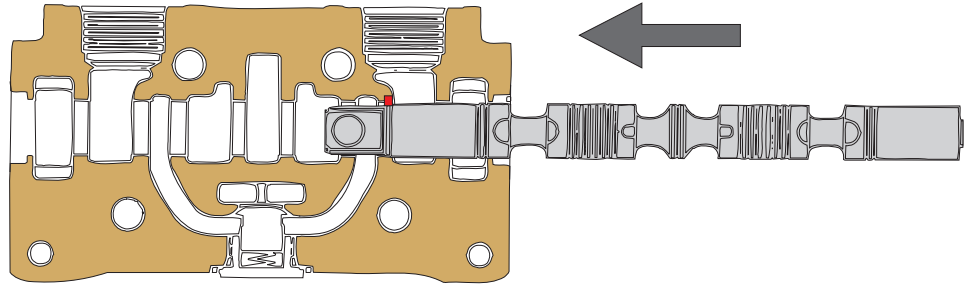
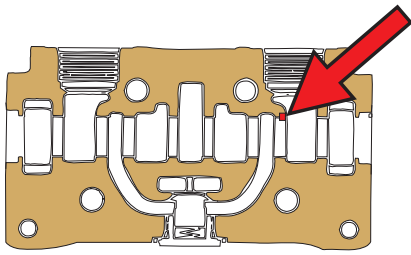


OCCASIONALLY A VALVE SPOOL WILL DEVELOP A STICKING PROBLEM THAT IS NOTICEABLE IN ONE SMALL AREA OF THE SPOOL BORE. THIS IS EVIDENT BY REMOVING THE SPOOL AND SLIDING IN FROM BOTH DIRECTIONS AND WITH BOTH ENDS AS ILLUSTRATED ON THE FOLLOWING PAGES. THE SPOOL STICKING IS CAUSED BY A VERY SMALL BURR EITHER IN THE HOUSING BORE OR ON THE EDGE OF A SPOOL LAND. THE BURR IS USUALLY SO TINY IT CANNOT BE SEEN. CAREFUL LOGICAL THINKING OF INSERTING THE SPOOL INTO THE BORE CAN DETERMINE IF THE BURR IS IN THE BORE OR ON THE LAND. WHEN THE BURR IS FOUND, IT CAN BE REMOVED WITH A STONE OR MICRO FILE.

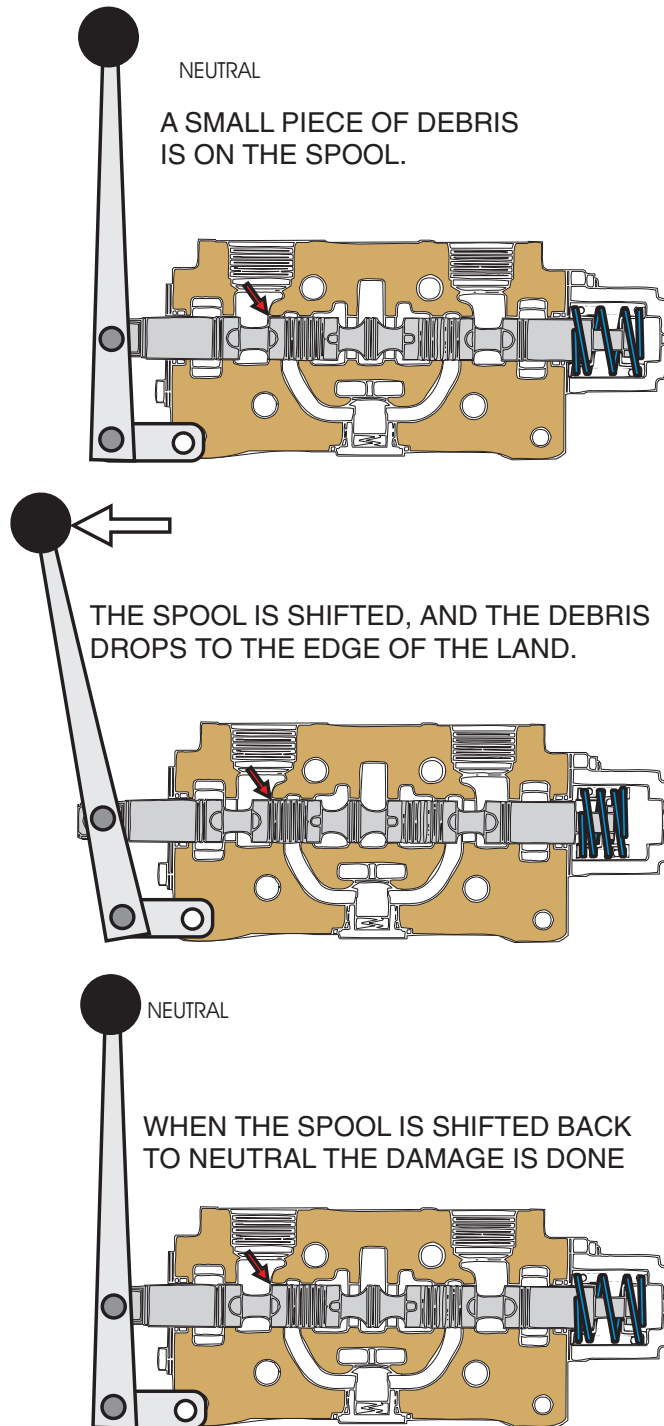
IF A BURR IS ON THE SPOOL HERE, YOU WILL BE ABLE TO INSERT SPOOL AS SHOWN BELOW



IF A BURR IS IN THE BORE HERE, YOU WILL BE ABLE TO INSERT SPOOL AS SHOWN BELOW



WHAT CAUSES THE BURR?



THE DAMAGE CAN ALSO BE DONE WHEN OIL IS FLOWING. AFTER THE SPOOL IS SHIFTED AND IS RETURNING TO NEUTRAL, THE OIL IS SQUEEZED IN A SMALLER AREA BY THE METERING GROOVES. IF THERE IS A PIECE OF DEBRIS IN THE FLOW WHEN IT IS SQUEEZED THROUGH THE SMALLEST OF METERING ACTION JUST BEFORE SHUTOFF, DAMAGE CAN BE DONE TO THE BORE OR SPOOL BY THE DEBRIS.