

# **Repairing Tek-Made Circuit Board-Mounted Push-Button Switches**

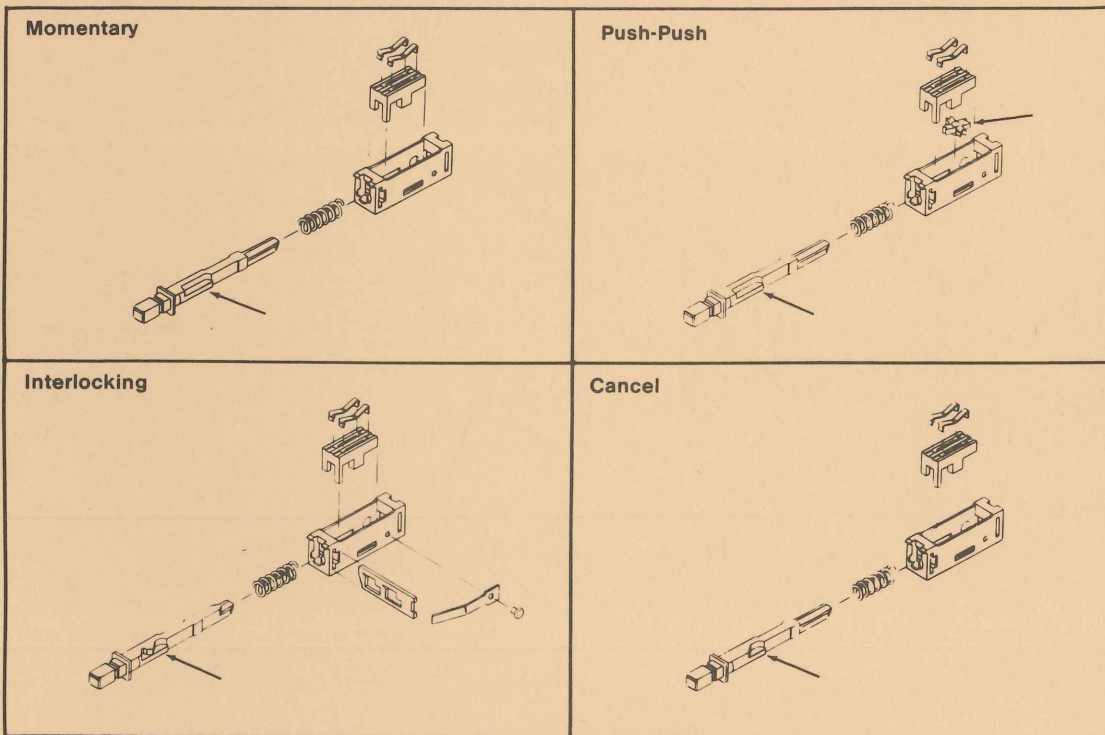
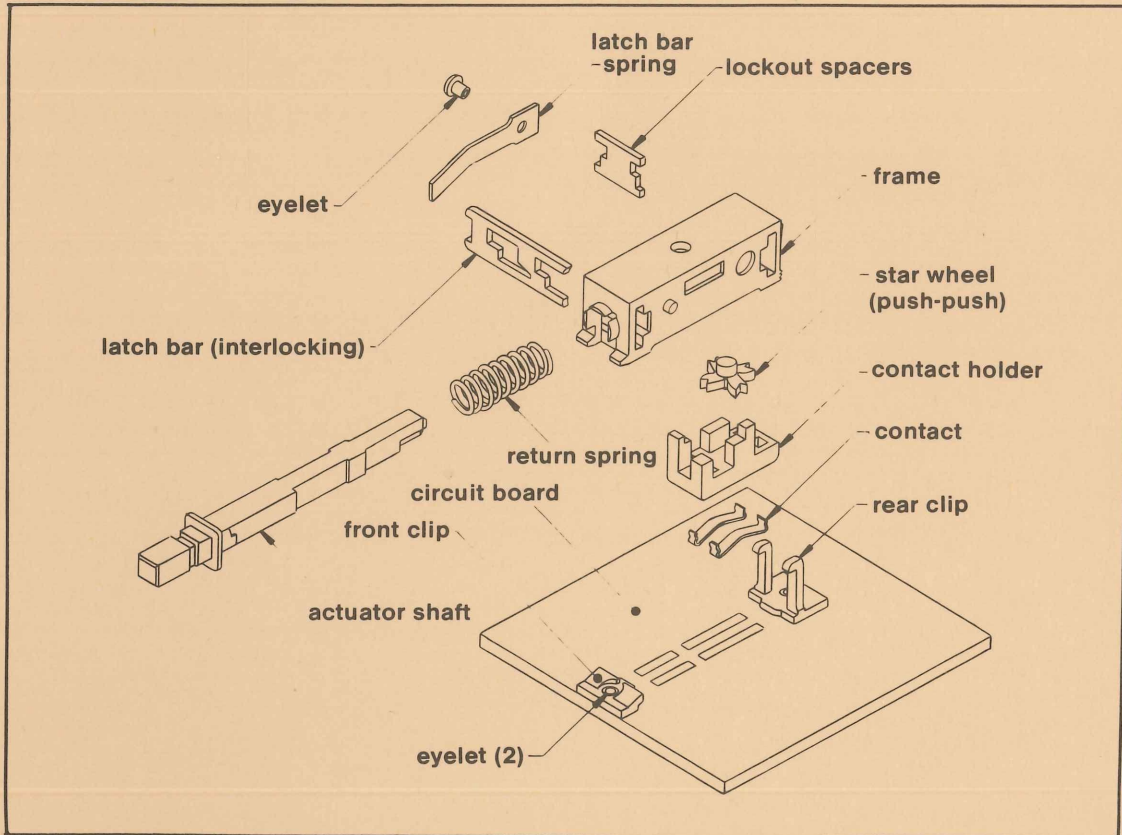
**Tektronix uses three types of push-button switches that connect with and attach to circuit boards: Modular Button switches (MBS); Series 71 switches; and Miniature Momentary (Mini-Mom) switches. When failures occur, repair or replacement procedures depend upon the type of switch. The MBS can be repaired whereas the Series 71 and Mini-Mom must be replaced.**

**Before working on any switch, identify it first. This will prevent much lost time and problems later on. This manual describes repair and replacement procedures for all three kinds of switches.**



# Modular Button Switch (MBS)

The MBS is used in both single and ganged assemblies and may have any of four types of actuation: momentary, push-push, interlocking and cancel.





# MBS Maintenance Procedure

## Switch Installation/Removal

During installation or removal, the actuator shaft must be in the relaxed (out) position.

**To remove:** Insert tip of a small screwdriver between rear of frame and rear clip. At the same time, lightly press down on front of actuator shaft. This will pivot the switch up off the circuit board. For ganged switches, repeat above procedure until all switches are free.

**To install:** Insert tips on frame under lip of front clip. Press down on rear of frame until the protrusions on back of frame snap into rear clip.

## Board Cleaning/Lubrication

With switch removed, clean pads on circuit board with isopropanol (isopropyl alcohol) or fotocol (ethyl alcohol) and allow to air dry. Avoid touching contact surfaces with fingers and do not use abrasive cleaners such as typewriter erasers.

After cleaning, lubricate pads with a thin film of No Noise (P/N 006-0442-00).

**Warning:** Use of any other cleaning solvent may render switch inoperable.

## Switch Replacement

If switch cannot be repaired and must be replaced, order a new switch using the part number from the instrument manual.

## Switch Repair

The MBS is repairable by part replacement. Replacement parts are available from stock or salvageable from other MBS switches. Note that MBS switches come in two size spacings (7.5 mm and 10 mm), and that not all contact holders contain the same number of contacts or locations. This is a function of the switch's application and must be verified with the circuit board configuration. Also note the different actuator shaft designs and do not mix them.

Follow the correct board cleaning procedure during any switch repair.



### **Contact Replacement**

Damaged contacts may be removed and replaced with a pair of tweezers. There is no need to disassemble the switch beyond removing it from the circuit board. Note: Do not attempt to reshape contacts and do not touch contacts with your fingers.

### **Contact Holder Replacement**

**To remove** contact holder from switch, lay switch on bench with the contacts facing upward. With left thumb on rear frame and finger on actuator shaft to prevent it from flying out (do not depress shaft), insert probe beneath rear of holder and pry up.

**To install** contact holder, hold it as before but with actuator shaft fully depressed. Tip rear of holder up and clip front legs over actuator shaft. Use probe to press down on rear of holder. When in place, press down lightly on holder to make sure it is fully seated on actuator shaft.

### **Actuator Shaft Replacement**

Note the three different actuator shaft configurations (momentary and push-push are the same). The actuator installed must be the same configuration as the one removed.

**To remove** actuator shaft, first remove the contact holder per previous instructions. On switches that do not have a latching bar, the shaft will slide out. On switches that have a latching bar, lift the latch bar spring and rotate it upward. This allows free movement of the latch bar and the actuator shaft will slide out.

**To replace** actuator shaft, reverse this process.

### **Star Wheel Removal**

The star wheel is located under the actuator shaft on push-push switches. Remove contact holder and actuator shaft per previous instructions and lift out star wheel with tweezers.

### **Latch Bar Replacement**

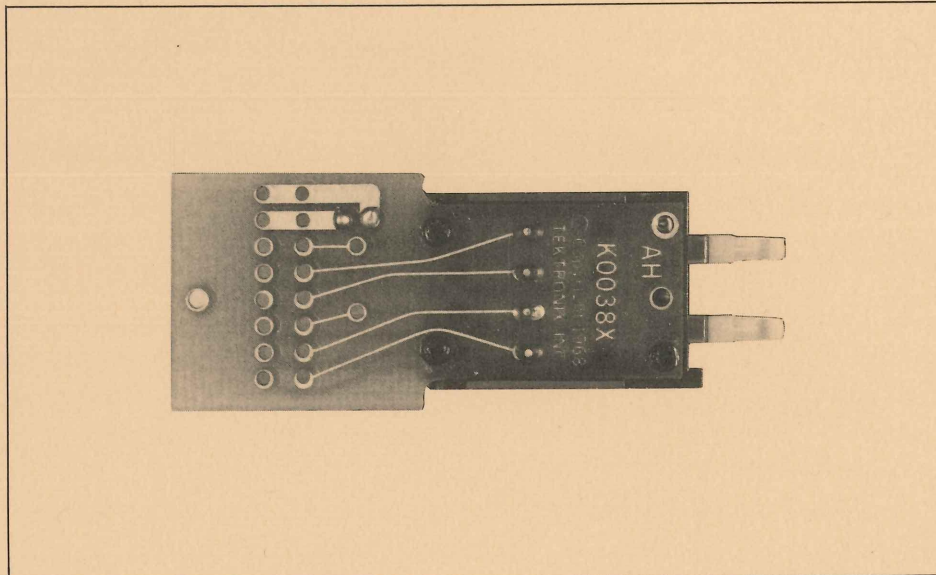
To remove latch bar on interlocking switches, first remove contact holder and actuator shaft per previous instructions, then slide the bar out. Replace the latch bar with one having the same length and spacing (7.5 mm or 10 mm).

### **Mounting Clips**

The front and rear clips are secured to the circuit board by eyelets and are not considered field replaceable. Damaged clips require replacement of the entire circuit board assembly.



## Series 71 Switch



View from stake head side of switch

The Series 71 is the predecessor to the MBS and is still widely used. Like the MBS, it is circuit board-mounted and electrically connects to pads on the board. Unlike the MBS, Series 71 switch housings are destroyed during removal, and therefore the entire switch assembly must be replaced.

Because these switches are non-repairable, instrument manuals normally combine the circuit board and switch under a single part number. To get the part number of the switch alone, contact Tektronix Service Support. When you order a replacement Series 71 be sure and order a spare housing because housings are easily ruined if a mistake is made during heatstaking.

### Removal/Replacement

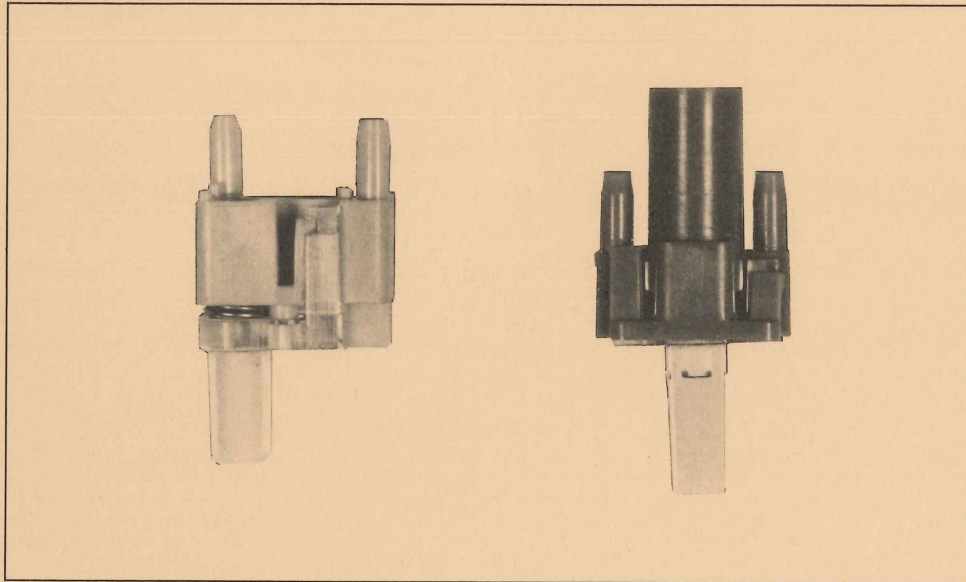
Removal is done with a pair of small "dyke" clippers or an x-acto knife. Carefully cut the stake heads off on the backside of the circuit board being extremely careful not to cut into the board itself.

After the switch is removed, clean the circuit board pad area with either fotocol or isopropanol alcohol and allow to air dry before proceeding.

Install the new switch on the circuit board but do not secure it. First make sure the body of the switch housing is firmly seated against the board. Then functionally test it to assure proper operation.

After test, secure the switch by heatstaking. Many technicians making field repairs do not have access to heatstake tools. The Tektronix Component Design unit has fabricated a heatstaking tip that is used with a controlled temperature soldering iron. When using this tip, be cautious to avoid melting the plastic stake heads below the level of the circuit board. Heatstaking requires some practice to get the correct iron setting and tip pressure, hence the need to have a spare housing on hand.

## Miniature Momentary (Mini-Mom) Switch



The Mini-Mom is the simplest of Tek-made push-button switches. It is press-fit into the circuit board and must be replaced if defective. Simply snap the old switch out and snap a new one in. Be sure and clean the board pad area with alcohol before replacing switch.

For information contact Virgil Hanes, Switch Design, ext. 1626(BDR)



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