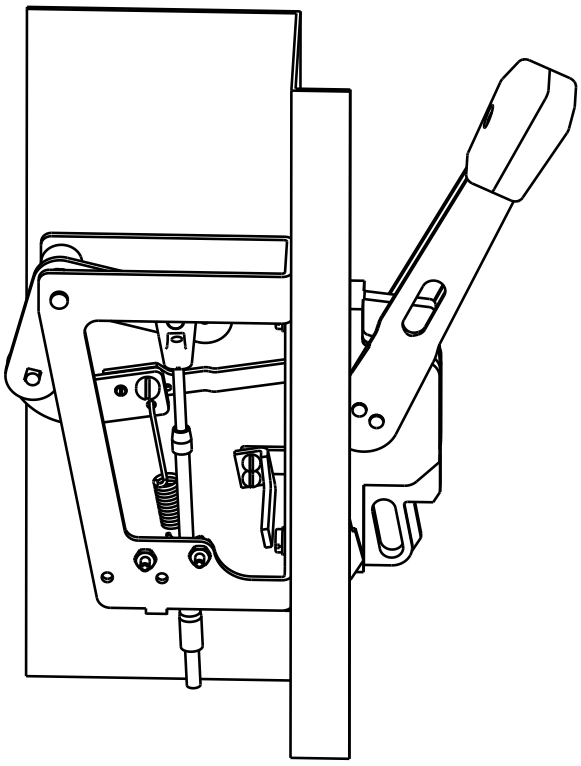
Instruction Leaflet **IL012159EN** Effective August 2018

Instructions for drilling and assembling Flex Shaft™ handle mechanism for PDG1 circuit breakers, molded case switches, and HMCPs



Contents

Powering Business Worldwide

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⚠ WARNING

DO NOT ATTEMPT TO INSTALL OR PERFORM MAINTENANCE ON EQUIPMENT WHILE IT IS ENERGIZED. DEATH, SEVERE PERSONAL INJURY,OR SUBSTANTIAL PROPERTY DAMAGE CAN RESULT FROM CONTACT WITH ENERGIZED EQUIPMENT. ALWAYS VERIFY THAT NO VOLTAGE IS PRESENT BEFORE PROCEEDING WITH THE TASK, AND ALWAYS FOLLOW GENERALLY ACCEPTED SAFETY PROCEDURES. EATON IS NOT LIABLE FOR THE MISAPPLICATION OR MISINSTALLATION OF ITS PRODUCTS.

The user is cautioned to observe all recommendations,warnings, and cautions relating to the safety of personnel and equipment as well as all general and local health and safety laws, codes, and procedures.

The recommendations and information contained herein are based on Eaton experience and judgment, but should not be considered to be all-inclusive or covering every application or circumstance which may arise. If any questions arise, contact Eaton for further information or instructions.

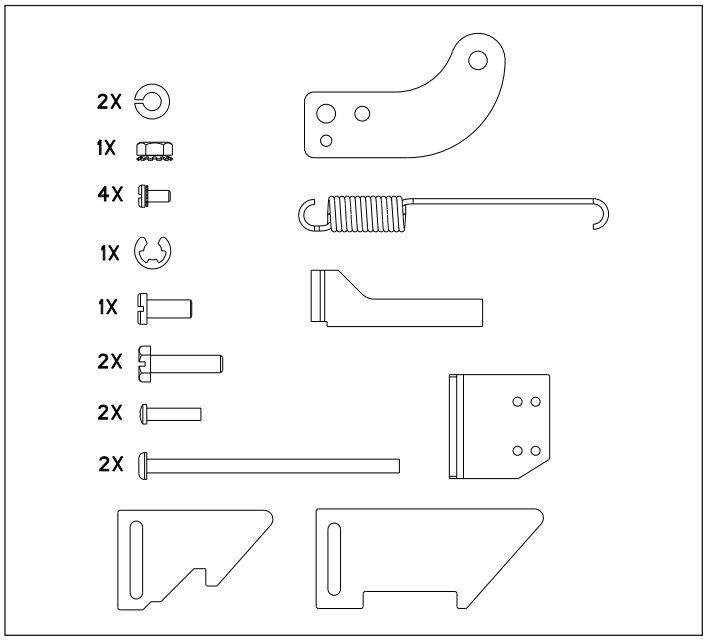

Figure 1. Hardware contents.

1. General information

The Flex Shaft™ handle mechanism provides a means of externally operating the circuit breaker and can be applied to enclosures of varying heights and depths. The handle can be used with NEMA 1, 3R, and 12 enclosure applications, depending on the accessory components selected. An operating handle, flexible shaft, and mechanism are required for standard application. Nine lengths of shafts are available for use with the wide range of depths of various enclosures (2 ft. through 10 ft [0.61 m through 3.05 m]). When selecting the length of the Flexible Shaft, ensure minimum bending radius of 4 in. (101.6 mm) is maintained to operate properly. The standard method of shipment includes the mechanism preset at the factory. If minor field adjustments are required, see Figure 5. For this publication, the term circuit breaker shall also include the molded case switch and motor circuit protector (HMCP).

⚠ WARNING

WHEN INSTALLING A NEW HANDLE MECHANISM, OR A NEW CIRCUIT BREAKER AND HANDLE MECHANISM IN AN EXISTING ELECTRICAL SYSTEM, MAKE SURE THERE IS NO VOLTAGE PRESENT WHERE WORK IS TO BE PERFORMED. SPECIAL ATTENTION SHOULD BE PAID TO REVERSE FEED APPLICATIONS TO ENSURE NO VOLTAGE IS PRESENT. THE VOLTAGE IN ENERGIZED, EQUIPMENT CAN CAUSE DEATH OR SEVERE PERSONAL INJURY.

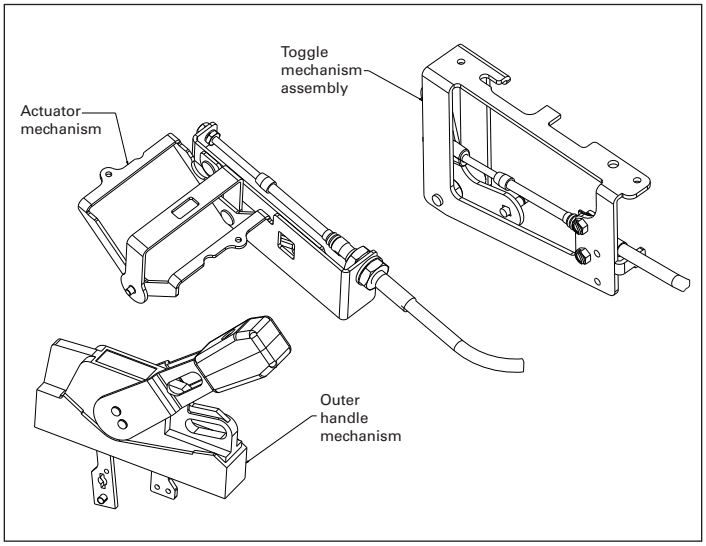

Figure 2. Assembly contents.

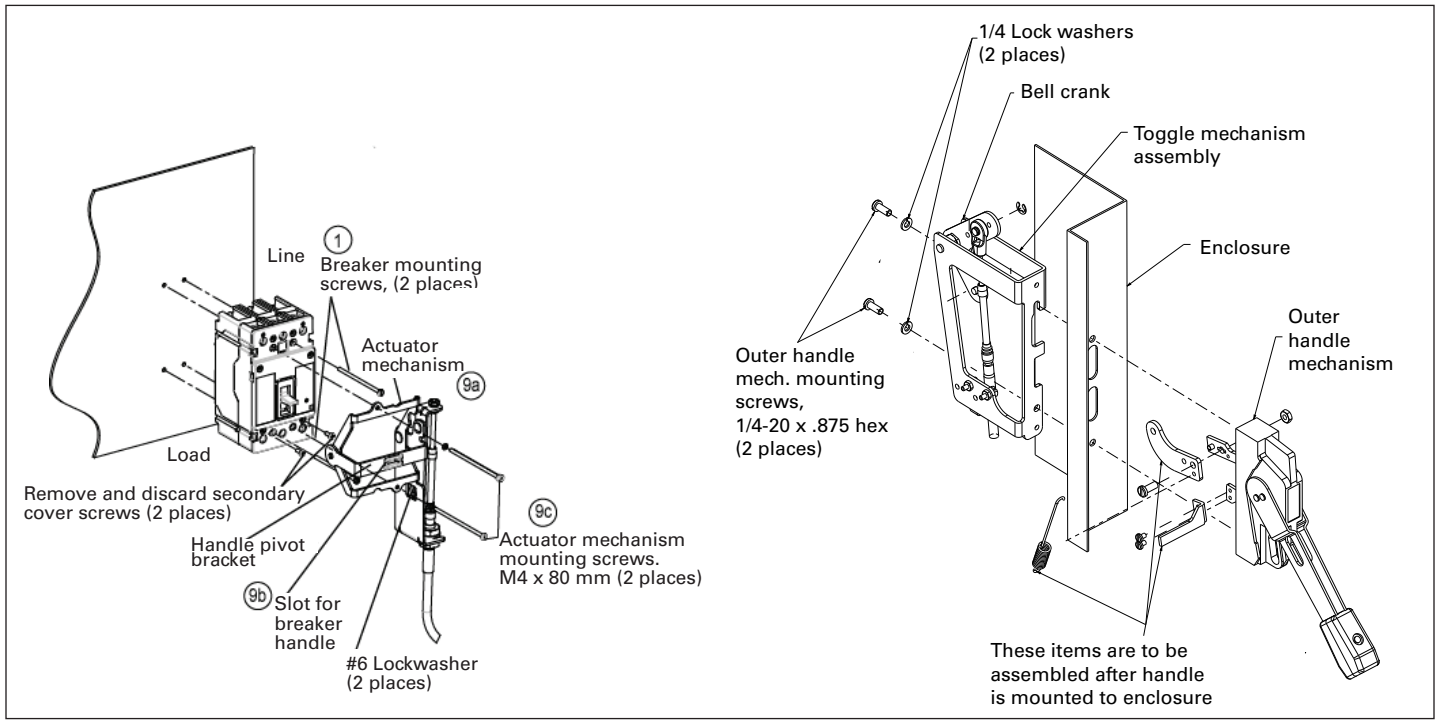

Figure 3. Securing the actuator mechanism to the breaker, toggle mechanism, and handle to enclosure.

2. Installation

For assembly steps, refer to Figure 3, unless otherwise noted.

1. Mount the breaker with two of the breaker mounting screws. Install the screws in the diagonal fashion as shown, opposite of the actuator mechanism.
2. Place the outer handle mechanism with attached gasket over the enclosure cutout. (For cut-out dimensions, refer to Figure 9). Insert the top 1/4-20 outer handle mechanism mounting screw and lock washer through the enclosure and thread into the outer handle mechanism for a few turns, but not all the way.
3. Slide the toggle mechanism assembly over the top of the handle mounting screw. Insert the bottom outer handle mechanism mounting screw and lock washer through the toggle mechanism bracket, through the enclosure, into the handle. Fully tighten both mounting screws.
4. Insert the adapter link into the pin of the bell crank via the largest hole on the link (see Figure 6). Secure the adapter link by inserting the E-ring into the slot on the bell crank pin.
5. Rotate the bell crank towards the handle and rotate the handle to the "On" position. Align the adapter link and attach it to the actuator link using the 1/4-20 pan head screw and nut (see Figure 7).
6. Connect the long end of the spring through hole in the adapter link. Hook the shorter end of the spring into the tab on the lower portion of the toggle mechanism (see Figure 8).
7. Mount door interlock hasp to handle using two #8-32 SEMS screws (see Figure 4). Hasp orientation may be modified per customer requirements and enclosures.
8. Remove and discard the two secondary cover screws shown in Figure 3. Verify that the breaker is in the "Trip" position. Put outer handle mechanism in the trip position for ease of mounting the actuator mechanism.
9. Place actuator mechanism around the front of the breaker (see Figure 3). Orient handle pivot bracket so that the slot captures the breaker handle. Fasten securely with the two M4 x 80 mm actuator mechanism/breaker mounting screws and lock washers, as shown.
10. Operate handle mechanism to ensure functionality. To operate, either close door or defeat door interlock lever.
11. If minor adjustments are necessary, refer to adjustment checklist on page 5.
12. Install appropriate door hardware (supplied) (see Figure 9).

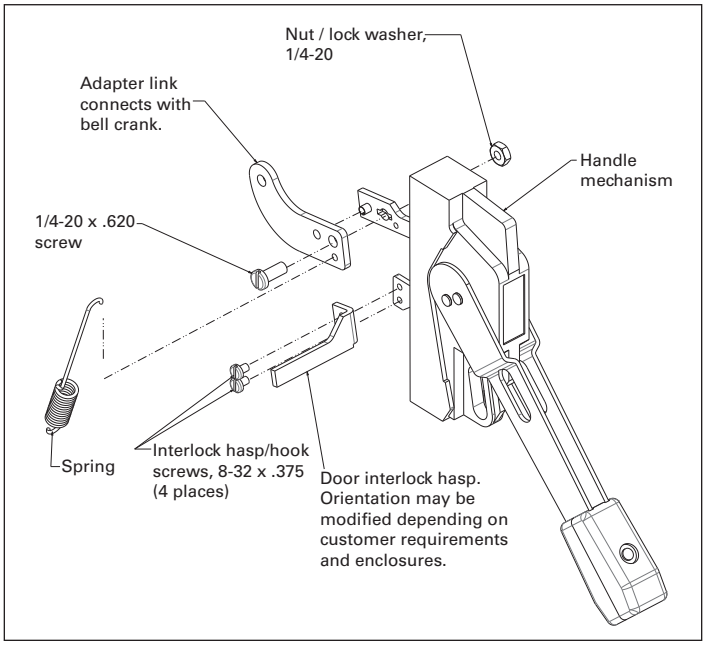

Figure 4. Outer handle mechanism assembly.

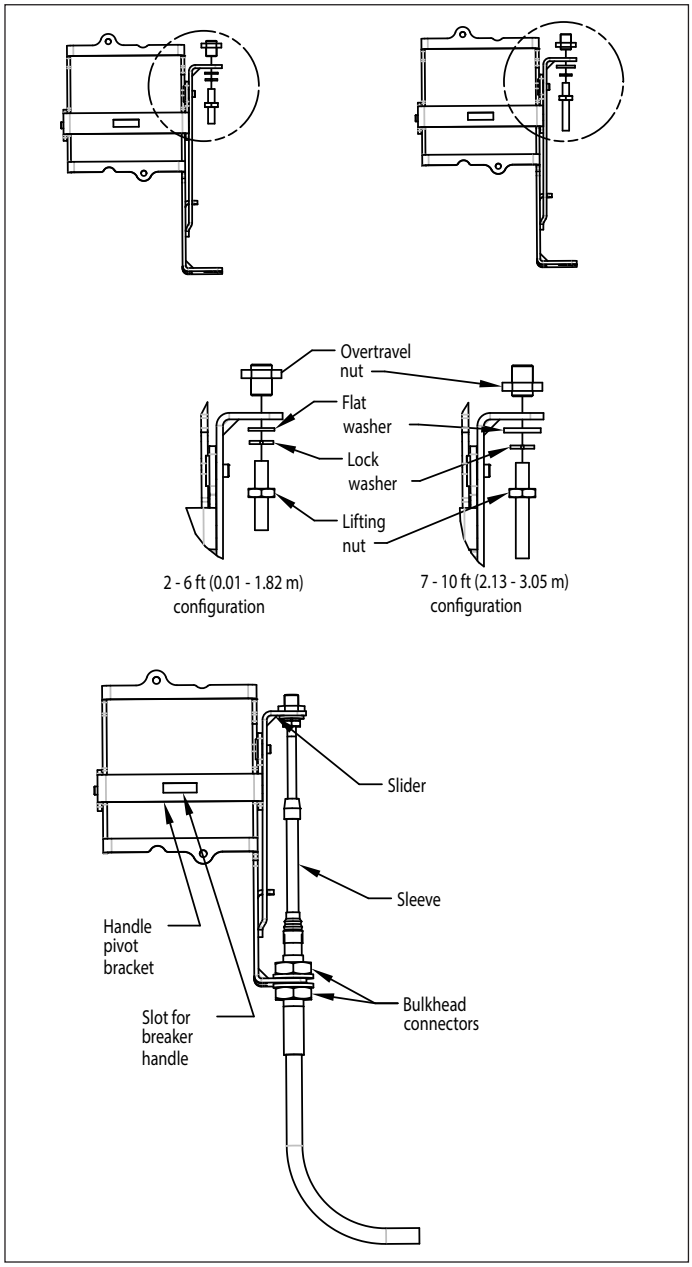

Figure 5. PDG1 actuator mechanism.

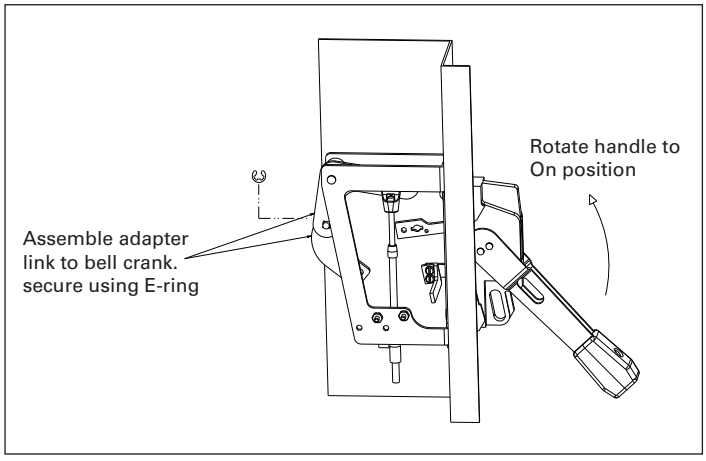

Figure 6. Assembly of the adapter link to the bell crank..

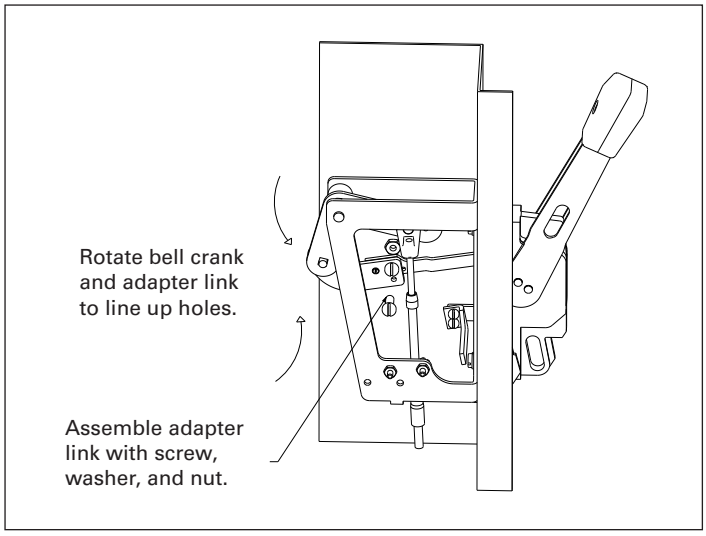

Figure 7. Assembly of the adapter link to the actuator link.

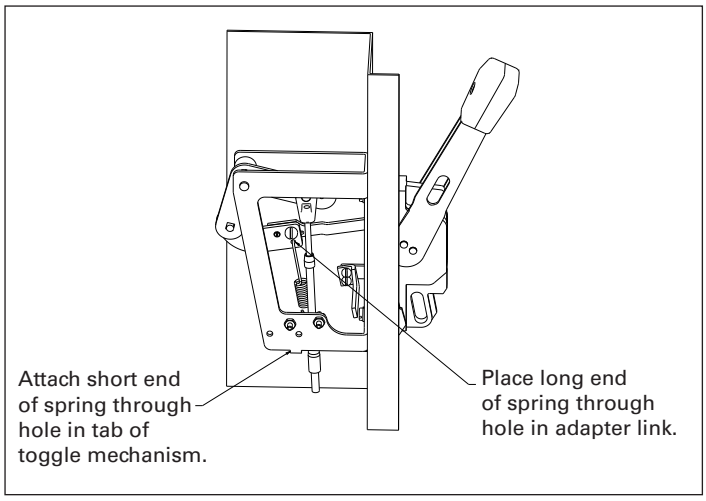

Figure 8. Assembly of the spring to the toggle mechanism.

⚠ WARNING

BEFORE ANY INSTALLATION OR MAINTENANCE IS PERFORMED, MAKE SURE THAT THE BREAKER IS NOT ENERGIZED.

3. Alternate installation

In the event a customer must disassemble the preassembled Flex Shaft handle mechanism, the procedure listed below must be followed before continuing with the "Installation" instructions (see Figure 5).

1. Remove the flat washer, lock washer, and nut assembly.
2. Loosen the bulkhead connectors and remove Flex Shaft from the actuator mechanism. The shaft may not be routed as required.
3. Place circuit breaker in the "On" position.
4. Place the operating handle in the full "On" position.
5. Replace the Flex Shaft through the actuator mechanism. Center the bulkhead connectors on the threaded portion and tighten to approximately 70 in-lb (7.91 N·m).
6. Place slot in the handle pivot bracket over the breaker handle while still in the "On" position. Turn the lifting washer/nut until flush against the slider plate.
7. Replace the flat washer, lock washer, and nut assembly for the Flexible Shaft assembly. Tighten both nuts to approximately 45 in-lb (5.08 N·m).
8. Check operation of the mechanism for "On", "Off", and "Reset". Check the reset position of the actuator mechanism, that the lifting nut and sleeve of shaft do not come in contact with each other (see Figure 5). If they do, move bulkhead connectors accordingly. If the mechanism functions incorrectly, repeat the procedure or go to Adjustment checklist.

Adjustment checklist

Situation:

Breaker turns "On" and "Off", but will not "Reset" when tripped.

Adjustment:

Loosen the lifting washer/nut while tightening the washer/lock washer/nut. Two or three turns should be sufficient (see Figure 5).

Note: Check the reset position of the actuator mechanism, that the lifting nut and sleeve of shaft do not come into contact with each other (see Figure 5). If they do, move the bulkhead connectors accordingly.

Situation:

The breaker resets after tripping, but does not turn "On".

Adjustment:

Loosen the washer/lock washer/nut on the end of the shaft while tightening the lifting washer/nut until breaker turns on with positive action. Tighten both nuts and recheck for "On", "Off", and "Reset" positions (see Figure 5).

Note: Be certain after adjustment to have a minimum of one thread past the washer/lock washer/nut assembly (see Figure 5).

If any other adjustment problems should arise, contact your local Eaton representative.

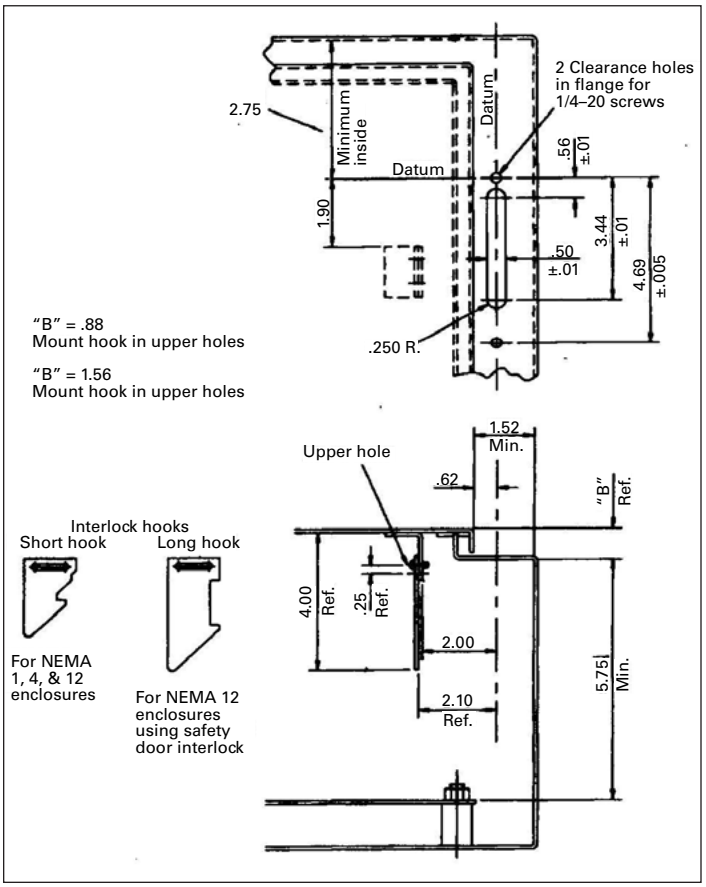

Figure 9. Flange drilling plan for handle and interlock blade mounting dimensions.

Notes:

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