

**Warning:** Undefined array key 0 in `/var/www/vhosts/amatrol.com/httpdocs/wp-content/themes/kallyas-child/dkpdf/dkpdf-index.php` on line 164

**Warning:** Trying to access array offset on value of type null in `/var/www/vhosts/amatrol.com/httpdocs/wp-content/themes/kallyas-child/dkpdf/dkpdf-index.php` on line 164

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Skill 1: Install a centrifugal pump with a close-coupled mount.

Objective 4: Describe how to start up and operate a series pump system

Skill 2: Start up and operate a series pump system.

Segment 2: SERIES PUMP CHARACTERISTICS

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Objective 8: Describe the

**OBJECTIVE 3 DESCRIBE HOW TO INSTALL A CENTRIFUGAL PUMP WITH A CLOSE-COUPLED MOUNT**

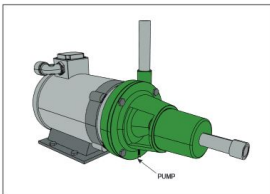
 A close-coupled pump is a centrifugal pump designed so that the pump shaft is an extension of the motor shaft. The motor shaft extends into the pump and the pump impeller is mounted directly onto the motor shaft. This pump design eliminates any alignment problems between the pump and motor.

Figure 5. Close-Coupled Pump Design

The following steps describe how to install a close-coupled pump:

**Step 1: Mount the pump to the motor**

The close-coupled pump casing is made of two casings bolted together. To mount the pump to the motor, remove the casing bolts and the front portion of the casing to gain access to the suction side of the impeller. Fit the back portion of the pump over the motor shaft so that the motor shaft extends through the impeller. Typically, a bolt and washer is then fastened to the motor shaft to secure the impeller in place. Insert the retaining bolts, hold the pump and motor together, and tighten in a cross pattern to ensure a good fit. Bolt the front half of the pump casing back onto the pump and tighten once again using a cross pattern. Check manufacturer's instructions for specific requirements.

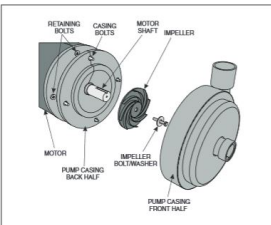
 The diagram shows the assembly of a close-coupled pump. Labels include: RETAINING BOLTS, CASING BOLTS, MOTOR SHAFT, IMPELLER, MOTOR, PUMP CASING BACK HALF, IMPELLER BOLT/WASHER, and PUMP CASING FRONT HALF.

Figure 6. Mounting to Pump to Motor

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Amatrol's Multiple Pump Systems eBook course allows learners to study the functions and real world applications of series and parallel pumps. This course presents practical skills such as installing and operating series and parallel pumps with theoretical knowledge like measuring and graphing flow/pressure characteristics and calculating pump efficiency.

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## **Multiple Pumps eBook**

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### **What Does a Series Pump System Do?**

Series pump systems feed the output of one pump directly into the input of the next pump. This effectively raises the pressure or head of the pumped fluid. This type of system is used when one pump alone cannot create enough head to meet the requirements of the application. One application of a series pump system is to raise water in a high-rise building. The system's multiple pumps produce the head necessary to lift the water from underground to the top floor.

### **Title Element**

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