Abstract: This update describes methods to assist in identifying the component that is causing blood pump (BP) noise on the Phoenix and recommend some preventative measures to help reduce future occurrences.

Note that the BP will always have a slight thumping noise that will vary in volume depending on BP speed and blood pressure in the cartridge. When the noise is perceived to be “too loud”, there are components that can be inspected for the cause.

Items needed to test the BP:
2. Container filled with warm water

When a BP becomes excessively noisy, there are some distinct noises that can help identify the cause. A thumping noise is heard when the screws that hold the BP mounting plate become loose, or the BP rotor becomes sticky. A squeaking noise typically is the hinge of the BP cover or may also be caused by the BP rotor. A grinding noise indicates a failure of the BP bearings. It’s also important to make sure that the lubricating spacer between the rotor and front panel (#6969687) is present and in good condition when replacing the rotor or entire BP.

To aid in troubleshooting the BP system, the BP Accessory Test can be utilized. This test can be accessed by following the menu path: MACHINE / CALIB / Enter Password / OPERATIONS / ACC. TESTING / BL. PUMP TEST.

To test for noise, run the BP with the BP Rotor Occlusion Test Tool installed and with the venous and arterial lines in a container of warm water. Prime the test tool tubing by pressing the BL. PUMP TEST key to turn on the BP (key turns yellow). Once the set is primed, use a syringe to raise the water level to the indicated marks on the cartridge. To stop the BP, press the BL. PUMP TEST key again (key turns gray).

It has been found that the screws that hold the BP motor to the mounting plate can work loose (see figure 1). When this occurs, the BP motor rocks as the rotor rotates around the tubing set. This causes the BP motor to “bang” into the plate resulting in a thumping noise. The volume of noise is dependent on how loose the mounting screws have become. Gambro has addressed this problem by applying liquid thread locker (see part number below) to the mounting plate screws starting with serial number PH23976. BPs that has had thread locker application can be identified by a yellow sticker located on the lower right corner of the mounting plate when looking at the back of the BP.
Older BPs in current use can be updated with the new spare part BLOOD PUMP MOUNTING BRACKET (#6989479). The spare includes the mounting plate, screws, washers, and sticker (see figure 2). Also needed, but not included with the above bracket and hardware is the liquid THREADLOCKER (#6991053).

If the screws have been loose for an extended period of time, the stress on the shaft from rocking can prematurely wear out the bearings and cause a grinding noise. Once the bearings are worn and the grinding noise occurs, the only solution is to replace the BP. With the machine turned off, remove the BP rotor and manually turn the shaft by hand. You should normally feel a smooth turning of the motor. If there is any hesitation or play in the shaft (in-and-out or side-to-side), the bearings are worn.

When the motor and mounting screws have been eliminated as possible sources of noise, run a test of removing the BP rotor and initiating the BL. PUMP TEST. If the noise is reduced or eliminated, then the likely cause is either the BP rotor or the BP door. When there is a thumping noise that wasn’t present when the BP rotor was removed but present when installed, the likely cause is the rotor. Be aware that when the BP rotor is installed there is normally some radial rotor play when it is rocked back and forth by hand. You will also normally see that when the rotor is turning on a tubing segment, the center of the rotor will appear to wobble slightly as it turns in relation to the hole located in the BP door.

When a squeaking noise is heard, it usually indicates a fault with the BP rotor or BP cover. When the BP rotor flexes on and off of the tubing set, it sometimes will squeak. If the squeak stops when you put pressure on the top right corner of the BP cover just above the hinge, the BP cover is the cause. The squeak is caused by the BP cover rubbing up and down on the hinge as the rotor turns.

**NOTE:** Any attempt to replace worn bearings in the BP reducer or secure the BP rotor differently from the manufacturers intended design is considered to be adulterating the equipment and is not authorized by the manufacturer.