

Load Locking Solutions for Pneumatic Manta Ray Installations

For Manta Ray installers who use pneumatic powered installation equipment there has always been a problem tensioning the anchors to the desired load. This is because the product is traditionally installed with hydraulic breakers and the hydraulic power unit provides the pressurized hydraulic fluid to the “Load Locker” cylinder. The only options available to pneumatic users was to “lock” the anchors by other mechanical means or buy a hydraulic power unit just to power the Load Locker. A solution has been found by using air driven hydraulic pumps. This allows installers to run a hydraulic Load Locker off the same air used to drive their pneumatic installation tools.

Foresight Products tested two air powered hydraulic pumps from Enerpac for use in this application. The larger, the ZA-4, provides similar performance compared to locking an anchor with a gas powered hydraulic power unit. This unit uses up to 100 CFM of 90 PSI [620 Kpa] air which is similar to a 90lb class pneumatic breaker. Being a two stage pump it turns the anchor to the locked position and a capacity of 10,000 lb [44 KN] in a comparable time compared to a gas powered unit. From 10,000 lb [44 KN] to the maximum load for a LL-1 Load Locker, 20,000 lb [89 KN], it is slightly slower but still managed to achieve full capacity in less than a minute with an MR-1 anchor in normal soil. With an approximate weight of 70 lb depending on configuration and a footprint of only 16.38 in [416 mm]x 17.55 in [446 mm] it is easily transported when compared to a gas power unit

For the ZA-4, the addition of a relief valve is necessary due to the pumps capacity to produce 10,000 PSI. This far exceeds the rating of the hoses and Load Locker cylinder. Have this relief valve installed and set by your Enerpac dealer or qualified hydraulic shop to a maximum pressure of 2000 PSI [13.8 MPa]. An air filter/dryer and a hydraulic pressure gauge are also highly recommended but not required for operation.



Enerpac ZA-4 Air Drive Hydraulic Pump

The smaller pump tested was an Enerpac XA-12. This pump is much smaller, easier to transport, and requires far less air (30 CFM, 90 psi). It is intended for applications that require maximum portability or for jobs having a small number of anchors to install. It only costs a third of the price of the larger ZA-4, yet still has enough power to lock an anchor to 20,000 lb [89 KN].

The adjustable relief valve on the XA-12 is built-in eliminating the cost of an additional relief valve. **The internal relief valve should be set by trained personnel to a maximum setting of 2,000PSI [20.7 MPa].** A check valve should also be installed on the pressure line to prevent accidentally applying pressure to the return side of the Load Locker valve. This smaller pump takes twice as long as the ZA-4 to lock the anchor to the full capacity of 20,000 lb [89 KN], although, it may still be a good choice for applications requiring up to 10,000 lb [44 KN]. It will achieve 20,000 lb but it could take some time to get there.



Enerpac XA-12 Air Drive Hydraulic Pump

Depending on your application, it is a tradeoff between cost, air requirements, portability, and speed. Either pump will satisfactorily power a LL-1 and lock an anchor to the desired load. For more information and pricing on air drive hydraulic pumps contact your local Enerpac distributor.