

Shoulder-Type Cylinder Studs

Two, major, contributing causes of cylinder breakage on machines supplied with shoulder-type front cylinder studs are failure to maintain proper torque on front cap shoulder studs and improper tightening of front cap stud nuts.

Stud Torquing

The shoulder-type stud design requires that the studs be torqued carefully to specifications and that the torque loads be maintained at all times. The studs are torqued properly before each machine leaves the Factory; but, if the proper torque loads are not maintained to keep the studs in a pre-stressed condition, the inherent advantage of the shoulder is lost, and eventual stud failure is certain. In order to properly torque the shoulder-type studs, a "stud driver" tool is required. See following instructions regarding the making of a stud driver.

Stud Nut Tightening

It is absolutely necessary that the front cap stud nuts be tightened evenly with care taken to build up the proper torque load on each nut as equally as possible. If the nuts are not tightened evenly, then unusual loads will be brought to bear on each stud, and a flexing (bending) action will take place, ensuring eventual stud failure.

Torque applied to the nuts should never be greater than the recommended torque load on the studs. If this condition is allowed to occur, the stud shoulder will be pulled away from the cylinder, flexing will result and rapid stud failure will occur.

Instructions for Making a Stud Driver (See sketch on the last page.)

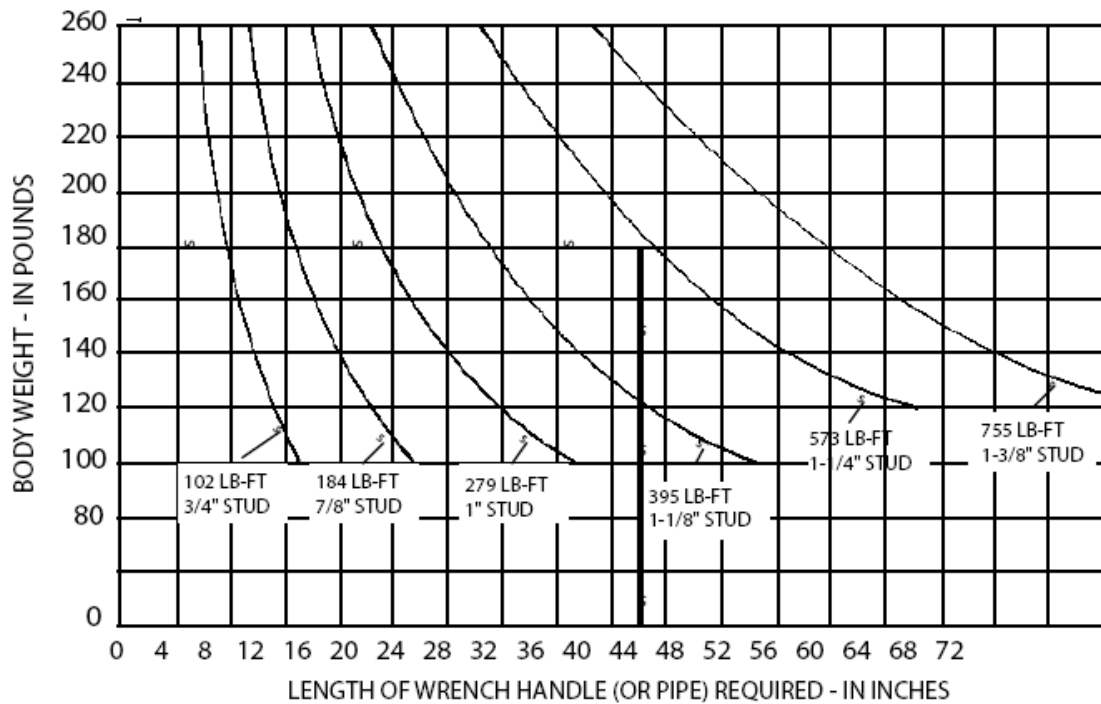
1. Use a piece of hexagon stock approximately twice the length of the thread on the stud and of a size to enable a hole to be drilled and tapped through the center of the diameter of the stud thread.
2. The hole may be drilled by hand on a lathe, a drill press or on a radial drill, depending upon the type of machinery available and the size of the hole to be drilled.
3. When the recommended size for the size to be used has been drilled through the length of the hexagon stock, the hole should be tapped from one end to the other, either by machine or by hand using a tap wrench or adjustable wrench.

Shoulder Studs

Page 2

- When the thread has been cut and completely cleaned, it is suggested that a stud be tried from both ends to determine the fit. If a tightness is felt, the body (stock) should be retapped.
- Before the stud driver is used, the threads should be well lubricated.
- It is suggested that a piece of brass, lead or a piece of ordinary solder be inserted in the tapped hole to be located between the stud to be assembled and the compression bolt or used stud. This will enable the removal of the driver for the stud being assembled.
- Into one end of the threaded body a bolt or used stud is assembled to a depth which will only permit approximately half of the length of the threaded area on the new stud to enter the threaded body from the opposite end.
- With an open-end wrench to fit the hexagon stud driver body, tighten and torque the new stud into position.
- When the stud is assembled, hold the driver body with a wrench to prevent loosening the stud. With another wrench loosen the compression bolt or used stud and remove the driver from the stud.
- Keep threads and brass or lead piece well lubricated each time the tool is used.

Service Department

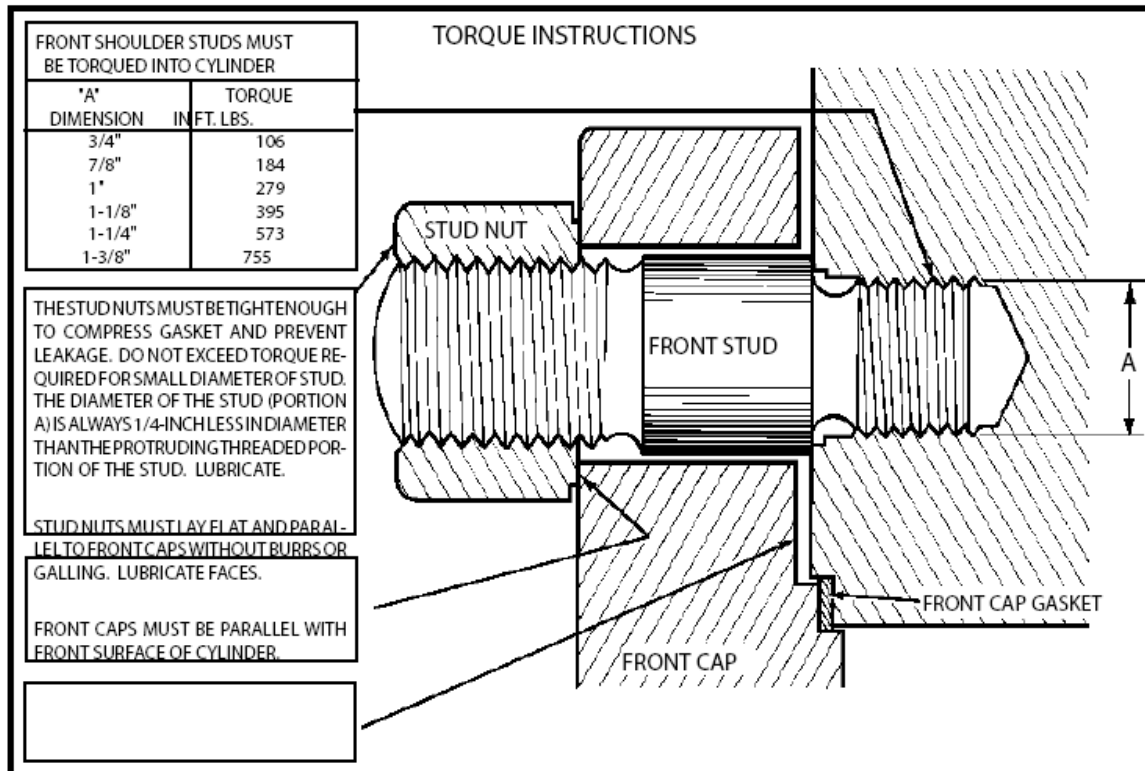


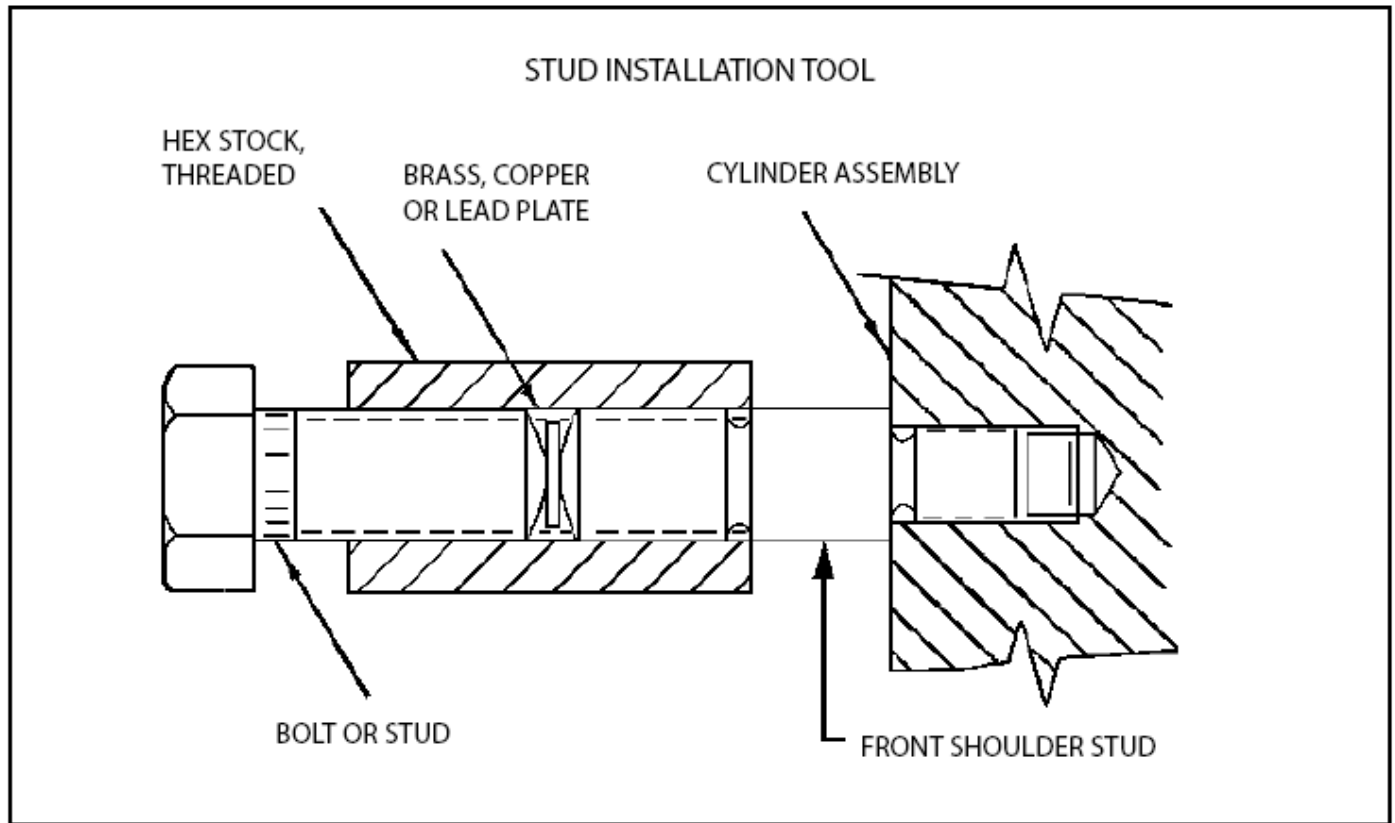
Shoulder Studs

Page 3

Example: Refer to the arrow-line shown. If a 180 lb. person wants to torque a 1-1/4" stud, they should use a 38" long wrench or pipe extension, as measured from the center of the stud.

The torque value curves shown above represent calculated value based on dead body weight. The use of additional body force or push on the wrench or pipe handle end (such as jumping on the handle) will produce an over-torque on the stud.





TORQUING THE SHOULDER-TYPE STUD

A torque wrench is normally required to properly install studs. However, if none is available, it is necessary to install studs with the use of a socket wrench, adjustable wrench or open-end wrench and a piece of pipe of a length as specified in the torque curve chart. It is very important to use exactly the length of the pipe indicated. When using the specified length of pipe, slide the pipe over the wrench handle all the way up to the wrench end. Do not permit the pipe to slip off the end of the wrench. Now, using your body weight, grip the pipe at the very end, so that both your hands are next to each other. Lean on the pipe, forcing the hex stock to turn. When you cannot turn any further, this will have produced a torque equal to or greater than the maximum torque required.

APV, An SPX Brand
 Phone: 1-888-278-4321
 Email: answers.us@apv.com

For more information about our worldwide locations, approvals, certifications, and local representatives, please visit www.apv.com.

SPX reserves the right to incorporate our latest design and material changes without notice or obligation. Design features, materials of construction and dimensional data, as described in this bulletin, are provided for your information only and should not be relied upon unless confirmed in writing. Certified drawings are available upon request.

Issued: 02/2009 3140-01-08-2008-US

Copyright © 2008 SPX Corporation

SPX[®]
 WHERE IDEAS MEET INDUSTRY