Calculate the Approximate Clamping Time of a Fixture

1. Anticipated system operating pressure = ___________________________ (psig)

2. For each non-sequenced branch of a system:
   A. Effective area per device __________ (in²) x stroke used __________ (in) = __________________________ (in³)
   B. Total number of devices = __________________________
   C. Multiply line (2-A) x (2-B) = __________________________ (in³)
   D. Repeat steps (2-A) thru (2-C) for each different device and/or stroke length: = __________________________ (in³)
   E. Total non-sequenced volume = lines (2-C) + (2-D) = __________________________ (in³)

3. First stage pump flow rate (faster - in³/min, lower pressure) from the corresponding pump specifications page or Vektek catalog = __________________________ (in³/min)

4. Approximate time to achieve low pressure function = [line (2-E) ÷ line (3)] x (60) = ___________________________ (seconds)

5. For each circuit branch with a sequence valve [if no sequence valves are used, skip to line (5-J) and enter -0-]:
   F. Effective area per device __________ (in²) x stroke used __________ (in) = __________________________ (in³)
   G. Total number of devices = __________________________
   H. Multiply line (5-F) x (5-G) = __________________________ (in³)
   I. Repeat steps (5-F) thru (5-H) for each different device and/or stroke length: = __________________________ (in³)
   J. Total sequenced volume = line (5-H) + (5-I) = __________________________ (in³)

6. Estimate the approximate accumulator volume (if no accumulator is used, enter -0-) = .0007 x system pressure _________________ (in³)
   K. 10-1016-XX ≈ .00065 x ____________ (system pres.) = __________________________ (in³)
   L. 10-1014-XX ≈ .00200 x ____________ (system pres.) = __________________________ (in³)

7. Estimate the approximate flex hose expansion volume (*below) from the Vektek or supplier catalog:
   M. Flex hose expansion volume (in³ / ft.) = __________________________ (in³)
   N. Total length of hose used (feet) = __________________________ (ft)
   O. Multiply line (7-M) x (7-N) = __________________________ (in³)
   P. Repeat steps (7-M) thru (7-N) for each different sized hose = __________________________ (in³)
   Q. Total expansion volume for flex hoses = line (7-O) + (7-P) = __________________________ (in³)

8. Low flow volume of devices in the system = line (5-J) + line (6K or 6L) + line (7-Q) = __________________________ (in³)

9. Estimate the anticipated volume of oil in the plumbing lines of the system:
   R. Steel tubing: 1/4” O.D. x .049” wall = (.218 in³ / ft) x (______ ft) = __________________________ (in³)
   S. Steel tubing: 3/8” O.D. x .065” wall = (.566 in³ / ft) x (______ ft) = __________________________ (in³)
   T. Flexible Hose: 5/64” I.D. = (.058 in³ / ft) x (______ ft) = __________________________ (in³)
   U. Flexible Hose: 3/16” I.D. = (.331 in³ / ft) x (______ ft) = __________________________ (in³)
   V. Flexible Hose: 3/8” I.D. = (1.325 in³ / ft) x (______ ft) = __________________________ (in³)
   W. Total of lines (9-R) thru (9-V) = __________________________ (in³)

10. Approximate total fluid volume = lines (2-E) + (5-J) + (6K or 6L) + (7-Q) + (9-W) = __________________________ (in³)

11. Approximate fluid compression factor = [line (10) x line (1)] ÷ 250,000] = __________________________ (in³)

12. Second stage pump flow rate (slower - in³/min, higher pressure) from the corresponding pump specifications page or Vektek catalog: = __________________________ (in³/min)

13. Approximate time to achieve high pressure function = [line (8) + line (11)] ÷ line 12 x 60 = ___________________________ (seconds)

14. Estimated position and clamp time (** below) = line (4) + line (13) + 1.25 (motor control performance factor for on demand pumps such as Vektek offers) = ___________________________ (seconds)

Notes:
* Values listed in this chart are approximate for VektorFlo® hoses. Not all manufacturers provide this information, therefore, some logical assumptions must be made to accommodate additional volume needed (you may assign 10% of the value of our Ø 3/16” hose for use of our Ø 5/64” hose).
  Consult your individual supplier if using hoses not supplied by Vektek (may be as much as 2 times the volume of Vektek hoses).
** Flow rates will be additionally influenced by the style and number of fittings, control valves, specialty valves, manifolds, hose connectors and quick connects. Final positioning and clamping time can vary slightly from the above calculated times due to actual physical plumbing installation.