

## **PROCEDURE FOR ALIGNMENT**

Customer Prepare: HEAT GROWTH, ALIGNMENT CONFIGURATION and Precut shim from OEM.

1. Follow pre-alignment inspection check list (in Attachment A)
2. Measure all dimensions which related to alignment calculation.
3. Install alignment tools such as: dial gauge or laser alignment tools.
4. Make sure that installation area represent the whole shaft not only coupling  
(Be careful about flexible and looseness of coupling)
5. Laser Alignment tools:
  - a. Coupling preset
  - b. Compensate heat growth
  - c. Press start button
  - d. Turn both shafts at the same time to prevent coupling mechanical run out
  - e. Follow instruction from Laser software
  - f. Press stop and result
  - g. Shim correction as result from item f. above
6. Dial gauge:
  - a. Find bar sag
  - b. Compensate for bar sag
  - c. Set zero to dial gauge
  - d. Turn both shafts at the same time to prevent coupling mechanical run out
  - e. Read 4 point for dial gauge
  - f. Re-read the dial gauge to avoid missing reading range
  - g. Calculate from reading and dimension
  - h. Shim correction as result from item g. above
7. Torque all hole down bolts as per specification.
8. Turn both shafts to recheck the reading and record to file.
9. Rework from step # 5 or #6 again if not within spec.
10. Remove all tools.
11. Release all jack bolts.
12. Assemble all accessories.
13. Return the unit to serviceable.
14. Vibration base line record and analysis.

## Attachment A

### PRE-ALIGNMENT CHECKLIST

Before shutting down the machine, take thermal growth temperature readings in the planes of target and sight Machine's feet. Look in service history for any information that may be useful.

- ☐ Tag/lock out machine to be worked on. Ensure safety of all individuals. On pumps, close suction/discharge valve to protect against pump backspin.
- ☐ Check coupling for:
  - ☐ Looseness                      ☐ Fit                      ☐ Eccentricity                      ☐ Worn grid / teeth members
  - ☐ Correct lubricant (types and amounts)                      ☐ Set screws tight
  - ☐ Proper key length                      ☐ Match marks in correct place
  - ☐ Proper bolts and washers (pay attention to length, machining and weight of each)
- ☐ Check target and sight machines shaft for:
  - ☐ Concentricity
  - ☐ Movement (more than prescribed manufacturers allowable limits) in the axial, horizontal and vertical direction
  - ☐ Cracks -visual only
  - ☐ Rotate shaft slowly (ensure no rubbing/roughness exists)
  - ☐ Predetermine **bearing** condition
- ☐ Ensure that both vertical and horizontal jack bolts are **loosened** off.
- ☐ **Remove** dowel pins from both machines.
- ☐ Inspect machine base for **cracked and warped**.
- ☐ Clean base (near feet area) of rust, foreign matter.
- ☐ If carbon steel shims are used: remove, measure and replace with **pre-cut stainless steel** shims.
- ☐ Ensure that shim **stacking** from previous alignments did not occur. (Recommend no more than 3 to 4 shims total under each foot.)
- ☐ Remove and replace any other shims that may be creased bent and folded, rusted, hand cut, brass or otherwise defective.
- ☐ Ensure all bolts on both machines are **torque**, pay attention to bolt lubrication, remove any **"Bell-shape/Cup-shape"** washers.
- ☐ Find and mark **magnetic center** on motors that have axial end float.
- ☐ Ensure that machine to machine **axial** position is corrected and that coupling will allow both machines to run in their respective axial position. (Normally using "GO-No-Go Gauge")
- ☐ Check for **soft foot** and correct.
- ☐ Check for pipe/electrical connection strains if possible.
- ☐ Ensure fixture parts are in good, operable condition.
- ☐ Proceed to machine dimensions and fixture setup.
- ☐ Jack bolt correction, to make **pivot point** at bolt end tip.
- ☐ Record shims inventory for future plan.