Soft Foot and Top Plane Flatness Checks for Proper Main Bearing Bore Alignment in Reciprocating Compressors

Main bearing bore alignment is critical to main bearing and crankshaft life. Ariel manufactures the top cover mounting surface of a compressor frame in close tolerance to a flat plane, to the main bearing bores, and to the bottom of the compressor feet. The main bearing bores align when frame feet are supported so the top cover mounting surface is flat and "in plane". Perform a soft foot check and top plane flatness measurement at these times:

- Setting of a new compressor (pre and post grouting).
- Commission of a compressor in the field.
- Reinstallation of a compressor.
- Relocation of a package.
- Discovery of loose hold down fasteners.
- Performance of recommended scheduled maintenance inspection every 6 months or 4000 hours.

With new unit installations, Ariel recommends checking and recording initial top plane flatness before shimming the guide feet and after initial rough coupling alignment. On compressors shipped disassembled, perform the initial check before guide and cylinder assembly installation. Shim or otherwise adjust the height to bring the top cover mounting surface within the specified plane tolerance. Record subsequent readings after complete guide and cylinder installation, and again after any vessel installation and shimming. Re-adjust height if guide, cylinder, and/or vessel installation results in frame top rail measurements out of Table 1 tolerances.

JGB:V:Z:U and KBB:V:Z:U 4 and 6-throw frames require **both** a top plane flatness **and** soft foot checks. For all other frames, the soft foot check is required; the top plane flatness measurement is optional, except for the JGI, which requires none.

Use the procedure below to properly install and periodically inspect compressor frames.

1. To check soft foot, properly install and torque compressor frame hold down bolting. Loosen each hold down bolt individually while checking the frame foot to skid deflection with a calibrated dial indicator. Correct any hold down position that deflects more than 0.002 inches (0.05 mm) when released. Re-torque the hold down bolt and repeat on each frame-to-skid bolt. See ER-26 for proper frame foot and crosshead guide bolt size and torques.
2. Remove or reposition the top cover(s) and gasket(s) to expose the frame top cover mounting surface. Verify it is clean.

   NOTE: For KBZ:U frames only, the frame top rail has been coated with a light coat of Cortec VPCI 369 corrosion inhibitor or equivalent to protect the aluminum to cast iron joint. If the top cover is removed, clean both the top rail and the top cover and re-coat the frame top rail with a light coat of the same compound. If VPCI 369 or equivalent is not available, use marine grade grease. Apply only a light coat of the corrosion inhibitor; do not allow excess material to flow into the frame when the top cover is installed.

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		0	010374	11-13-06	5	015718	6-17-09

3. To check top plane flatness, use measurement equipment with a published accuracy of ±0.001 inches (0.025 mm) over the distance required to measure the entire length of both frame rails. Measure the top surface of both sides of the frame rails at each anchor bolt (see Figure 1), or between each pair of anchor bolts for frames with pairs of anchor bolts (see Figure 2). Readings between any two adjacent points must be within 0.002 in. (0.05 mm). For proper alignment, total accumulated out of plane flatness must be within Table 1 tolerances.

TABLE 1 Top Plane Flatness Tolerances

Compressor Frame	Tolerance Inches (mm)
JGM:N:P:Q/1/2, JG:A/2/4, JGR:J/2	0.004 (0.10)
JGA/6, JGR/4, JGJ/4/6, JGH:E:K:T:C:D:Z:U/2/4, JGB:V/4[a], KBZ:U/2/4, KBB:V/4	0.006 (0.15)
JGE:K:T/6, JGC:D/6, JGU:Z/6, JGB:V/6, KBB:V:Z:U/6	0.008 (0.20)

a. Underlined frames require both soft foot and top plane flatness checks.

NOTE: If the unit will not be restarted immmediately, re-preserve the unit in a manner appropriate to the time duration until restart.

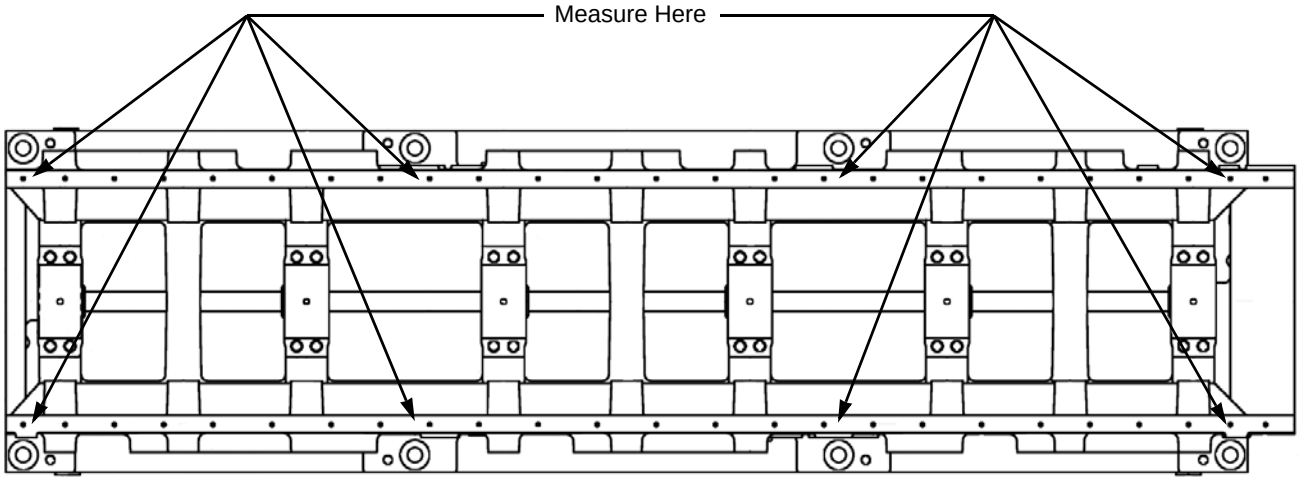

FIGURE 1 Flatness Check Locations for Frames with Single Anchor Bolts

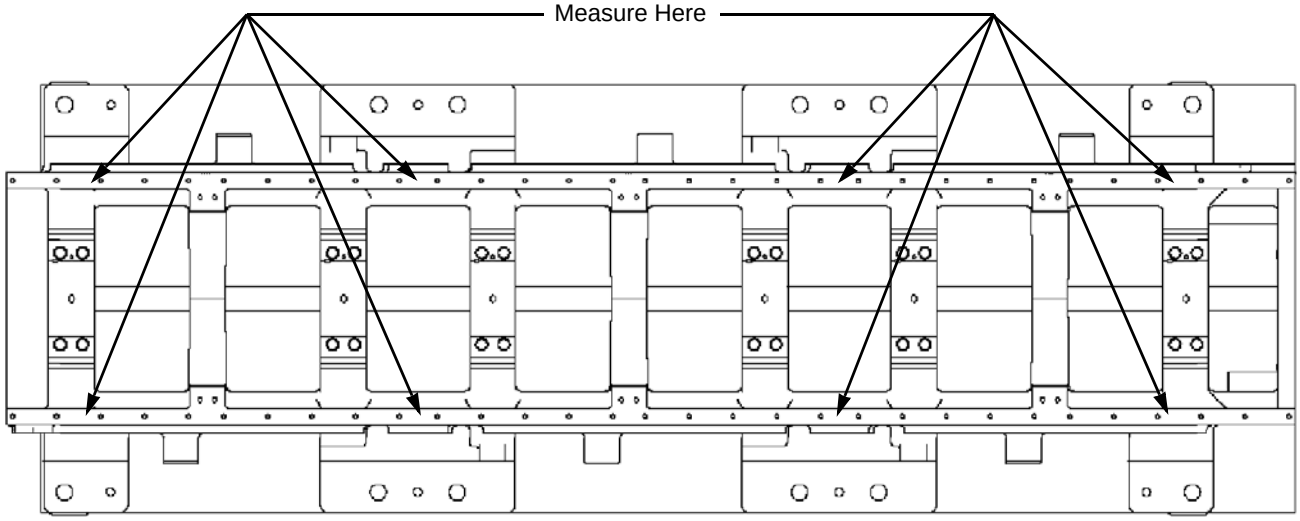

FIGURE 2 Flatness Check Locations for Frames with Pairs of Anchor Bolts