Compressor Model	Min. Shaft Gap (in.)
180GL - 290GL	3-3/8
400GL, 565GL	3-5/8
675GL, 800GL	4-3/8
1025GL - 1435GL	4-1/2

Table 1-6: Required Motor to Compressor Shaft Gap

D. Check motor height. If the motor is too high relative to the compressor, remove shims as required. Four alignment brackets with bolts are provided. The brackets should be welded to the motor support angle as shown in Figure 1-2. The alignment bracket will facilitate positioning of the motor for angular alignment. All motor assemblies must have permanent means of jacking the motors into position for vertical alignment.

E. Rough align for both parallel as well as angular alignment by using a dial indicator.

F. Once rough alignment is complete, weld the motor mounting blocks on the motor support angle. Weld one block at the rear, then weld the diagonally opposite block. Next weld the other rear block and then the remaining front block. Weld all four sides of the mounting block, welding approximately one inch at the corners. Weld one side at a time in the above sequence as quickly as possible. The purpose of this procedure is to prevent distortion. Allow to cool to room temperature. Dowelling of the motor is not required.

G. Remove the tie down bolts and the tube sleeve spacers or shim stock wrapping around the tie down bolts. Install the tie down bolts again. Final alignment procedure must be performed before the package is ready for operation.

Optional Shimless Motor Mounts

Shimless motor mounts are available for all GL Series compressor packages. Mounting is similar to standard motor mounts except the shimless motor mounts are bolted to the angle, not welded. Each shimless motor mount has provisions for jacking the motor horizontally and vertically.

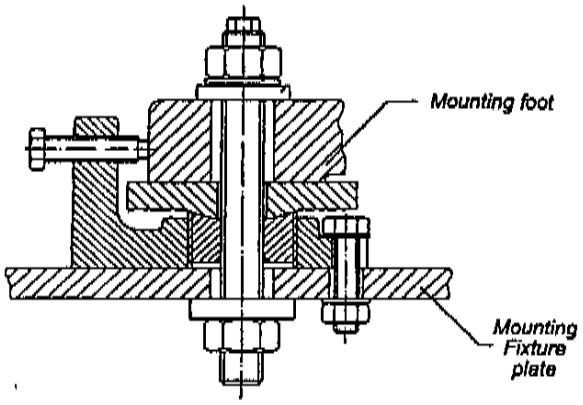

Figure 1-7: Optional Motor Mounting

Coupling Final Alignment Procedure

To ensure satisfactory performance and life from the compressor shaft seal and the motor and compressor bearings, a final alignment procedure must be performed. Whether the coupling was aligned at the factory or field installed, it must have a final alignment done after the package is installed and piped. Improper piping procedures can cause stress on the compressor casing making alignment impossible. The coupling must have a final alignment check prior to start up and again after a few hours of operation. This "HOT" check after several hours of operation is required. Another check should be made after one week of operation. The procedure used for final alignment is as follows:

A. Remove the coupling guard. Check the runout of the compressor hub. With a dial indicator base attached to the compressor, and the dial indicator reading off the hub rim, rotate the coupling assembly 180 degrees. Note the runout. Rotate the assembly another 180 degrees to the original position. Adjust the dial indicator to read the hub face. Rotate the assembly and note the runout. Repeat this procedure for the motor hub. A runout in

excess of 0.003 inches should be reported to the FES factory.

B. Check for motor soft feet. With the indicator base attached to the motor support angles, and the dial indicator reading off the top of a motor foot, loosen the tie down bolt and note the indicator reading. Any movement in excess of 0.002 inches must be corrected using shims. Repeat this procedure with the other three feet to ensure that each motor foot is in solid contact with the base.

NOTE: ***BE SURE TO MINIMIZE THE AMOUNT OF SHIMS USED. Example: If a 0.005 inch, a 0.003 inch, and a 0.002 inch were used, then replace them with one shim 0.010 inch thick.***

C. With the coupling assembled, mount the dial indicator on the compressor hub and take an indicator reading on the coupling hub as shown in Figure 1-8. Due to the span of the spacer coupling, indicator sag may be significant, and the indicator readings must be corrected to include the sag.

1. To eliminate confusion, turn the coupling in only one direction while taking readings.
2. Take five readings, 0 degrees, 90 degrees, 180 degrees, 270 degrees, and 360 degrees on both the periphery (for parallel) and face (for angular). The indicator should return to its original position after the coupling has been rotated 360 degrees.

NOTE: ***Sleeve bearing motors or any motor with measurable play must be monitored with a dial indicator to ensure that no motor shaft axial movement takes place when face readings are taken. If the motor is fitted with sleeve bearings, the motor's magnetic center must be determined from the manufacturer's recommendations or by scribing the uncoupled motor's running position at a suitable place on the shaft. The shaft must be held on its magnetic center when aligning the motor. This can be done by clamping the two hubs with a 5/8 inch diameter all thread rod and double nuts.***

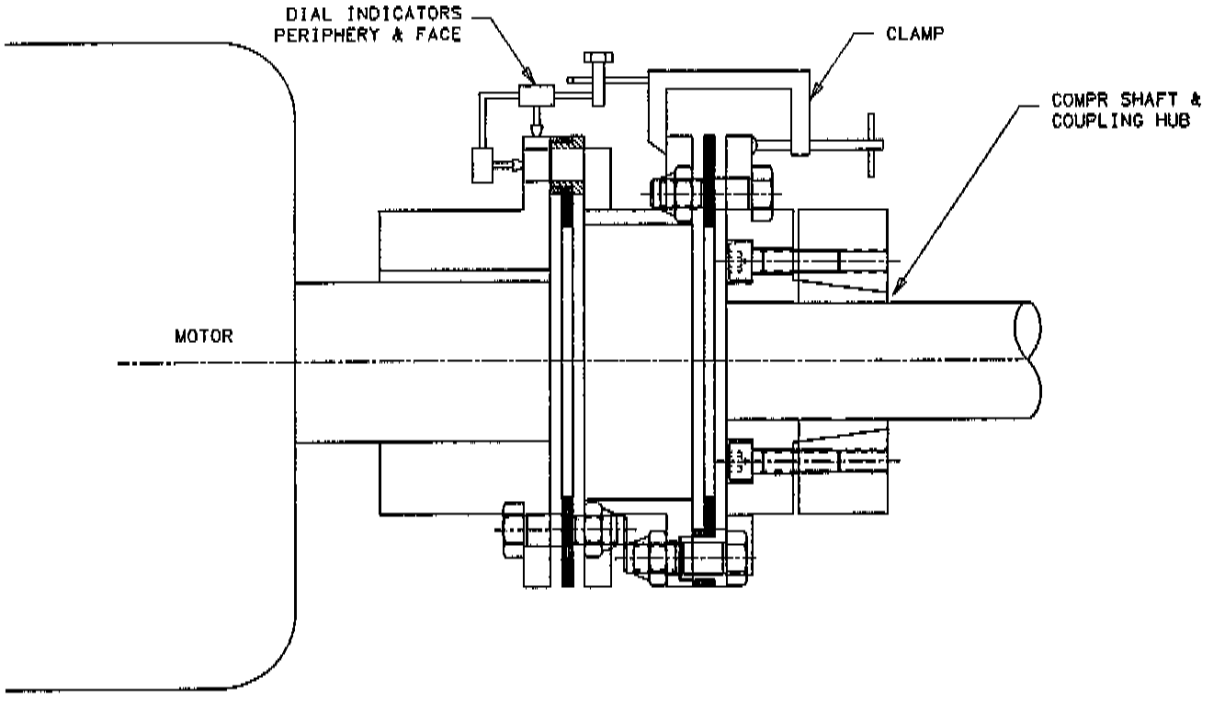

Figure 1-8: Typical Dial Indicator Mounting

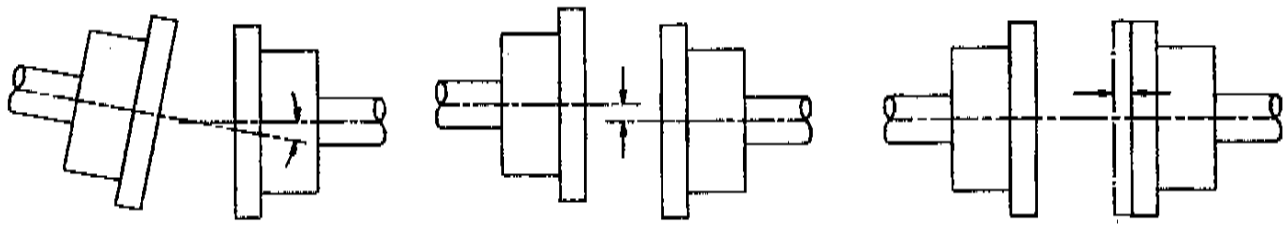

Figure 1-9: Types of Coupling Misalignment

D. Align the motor so that the total indicator reading (TIR) on the periphery and the face does not exceed 0.005 inches misalignment. With reference to Figure 1-9, the following applies to all screw compressor applications.
   1. Align the motor first for angular in elevation. This alignment is adjusted with shims to provide a maximum 0.005 inch TIR at the top.
   2. Align the motor next for parallel in elevation. This alignment is also adjusted with shims and should be a maximum 0.005 inch higher than the compressor.
   3. Align the motor angular in plan next.
   4. Finally, align the motor parallel in plan.

E. Record the alignment readings.

F. Verify that the distance between the coupling hub faces ("C" from Figure/Table 1-2) is correct. Also the shaft gap should be checked to be in accordance with Table 1-6.

NOTE: ***When the motor is field mounted the customer is responsible for aligning the motor as prescribed on pages 2 through 7. The FES representative will check the final alignment before starting the compressor package to ensure the motor was aligned properly.***

G. Run the compressor at least two hours to allow the package to reach its normal operating temperature. Stop the compressor and immediately check the alignment (keep the coupling installed). The motor must be aligned so that the TIR on the periphery and face does not exceed 0.005 inch with the package at its normal operating temperature. This check will be done by an authorized FES Service Representative at start up.

H. Install the coupling guard.

Storage and Holding Charge

GL Series compressor packages are shipped with a holding charge of dry nitrogen to prevent contaminants from entering the package following the factory pressure test and evacuation. Since the package is sealed, it is suitable for short-term storage before installation. Caution should be exercised when opening the package to safely release the nitrogen charge.

When packages are stored, they are to be kept in a clean dry location. If packages are to be stored for prolonged periods of time the package should be checked to be sure a positive nitrogen pressure is maintained. The factory should be consulted for specific recommendations when extended storage (greater than two months) is expected.

Care should also be used to protect the microprocessor and sensors from damage during storage.

Compressor Oil

The oil charge shipped with the compressor package was selected to meet the application requirements as supplied at the time of order. Questions concerning suitability can be answered by referring to FES Document ENG-5 "FES Refrigeration Oils-Properties and Applications" and Document ENG-6 "FES Recommended Oil Specifications."