

EK 32. DÖNEL EKİPMAN MONTAJ UYGULAMA PLANI (ROTARY EQUIPMENT ERECTION METHOD STATEMENT) ÖRNEĞİ

METHOD STATEMENT for ROTARY EQUIPMENT

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1.0 PURPOSE & SCOPE

This method statement is to clarify the rotary equipment installation works and to identify the basic system and technique used for the successful completion of these works.

2.0 RESPONSIBILITIES

- 2.1 QA/QC Team shall ensure the quality and compliance during all phases of the construction.
- 2.2 HSE Team is responsible for the safety control for all construction sites and shall inform the site personnel about various kinds of safety policies, plans, etc.
- 2.3 Lifting supervisor will perform the necessary studies and calculations and will supervise the handling and lifting procedure. He will ensure that the lifting work is being carried out effectively in accordance with the established Method Statement and a specific Job Safety Analysis (JSA) is prepared.
- 2.4 Site supervisor is responsible for the execution of the work, in accordance with rules, regulations, standards, specifications and Method Statement with JSA.

3.0 WORK (APPLICATION) PROCEDURE

3.1 GENERAL CONSIDERATIONS

All materials, arriving to site for installation, will be visually checked for obvious damage before the actual lifting operation as per warehouse material handling, receipt and storage procedures.

Any damages found will be reported to the management. Whether to be returned, repaired, used or quarantined will be decided.

Equipment preservation precautions already taken by manufacturer, will not be disturbed or removed unless absolutely necessary.

The level of the surface of the foundations will be such as to allow 25 mm. of grout under the base plate.

When machinery is to be mounted directly onto the foundation, sole plate fixing will be done. Sole plates will be levelled within a tolerance of +/- 0.04 mm/m.

To minimise the placement errors, especially big size anchor bolts, preferably will be positioned with the use of templates, during the concrete works.

Grease will be applied to the anchor bolts for the length of at least 25 mm beyond the bottom of the base plate.

Foundation bolt sleeves to be filled before the grouting of the base plate, not to allow for cavities. This will be checked again after the grouting has been poured.

Preliminary alignment will be done with piping disconnected.

The final alignment tolerance will not exceed the manufacturer's recommendations.

All piping to be connected, will be checked for internal cleanliness prior to connection.

For stress free connections, all piping connections to equipment nozzles will be checked prior to bolt torqueing/tensioning.

Bolt torqueing/tensioning values will be as per manufacturer specification if available or as per technical specifications if not available.

3.2 UNPACKING & REMOVAL OF PROTECTIVE COVERS

Material preservation regulations will be observed starting from the handover to Contractor.

Unpacking of equipment will be done in the presence of Contractor, Client and Vendor or Manufacturer representative (where applicable) with photographic evidence.

Contractor & Vendor (where applicable) are required to be present to witness if equipment protective covers need be removed on site. After inspection of equipment, the protective covers and preservation will be reinstated if required.

Couplings will be inspected on arrival with respect to its bore size, any damage hit during shipping and for proper corrosion protection before being stored.

If during any of these inspections the equipment has been found to be obviously defective or damaged, a damage report will be prepared and submitted.

All spare parts and tools will be repacked, clearly marked and stored at the warehouse.

Parts that are fragile (such as level gauges, capillary tubes, small piping, small valves, etc.) or parts that need to be removed during installation will be removed after being marked and numbered. These will be properly packed, tagged and stored at the warehouse.

Unpacked equipment will not be placed directly onto the ground. These will be placed onto wooden blocks or other proper stand (concrete blocks, metal legs, etc.).

Openings of the equipment will be protected by temporary covers and will be removed only for QC inspections, cleaning, removal of preservatives (desiccants etc.) and will be closed again until such time as piping connections are made.

3.3 ERECTION of ROTARY EQUIPMENT

Care will be shown not to damage the anchor bolts or their threads.

All couplings will be installed in accordance with manufacturer's instructions.

Shims & wedges will be used while setting & levelling the equipment.

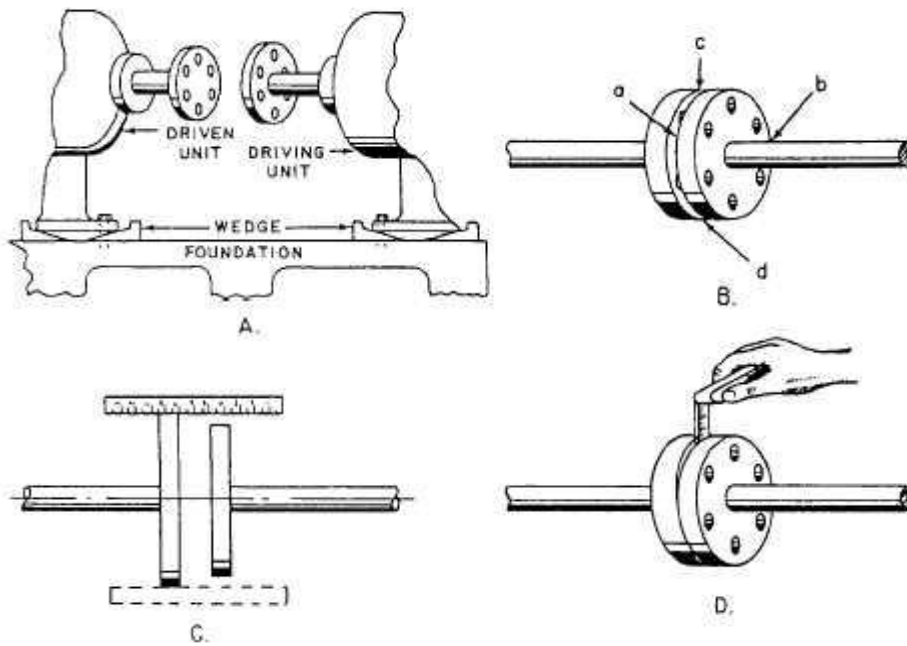
All equipment will be installed in concordance with the latest available drawings/project specification/manufacturer requirements.

3.4 SOFT FOOT

All rotary equipment will be tested for "soft foot". A "soft foot" is a support which does not have solid, flat contact with its mating support pad when machine is sitting in place. The following procedure is used to determine and measure soft foot in accordance.

- Bolt all machine feet solidly on the pads to specified torque.
- Mount a dial indicator on the pad or adjacent base structure with a magnetic holder.
- Adjust the dial indicator to read vertically on one machine foot
- Carefully loosen the hold down bolt at that foot and record the amount that the foot rises when the bolt is loosened.
- Repeat the above procedure for each foot or hold down bolt.

3.5 COUPLING ALIGNMENT



The common alignment methods are **Laser** method, **Reverse Dial Indicator** method (which is more common) and **Rim and Face Dial Indicator** method. Follow alignment equipment manufacturers' procedures when using reverse dial indicator or laser methods.

There are several steps to be taken for a successful dial indicator alignment.

1. Visually check coupling, pipe hangers, base bolts, coupling spacing etc. and check for coupling and shaft run out.
2. Perform a Sag Check to determine the amount, an indicator bracket will sag at a given distance.
3. Clean mounting surface, file off nicks and burrs. Check indicators for sticking and loose needle. Aim indicator stem directly toward center line of shaft.
4. Measure the distance between two indicators, distance between indicator and front feet, distance between front and back feet.
Preliminary horizontal move: The horizontal move is the part of the alignment process that aligns the shaft's centerlines from side to side. View the machine from the pump end, zero the indicators on the left, and then rotate and read on the right. Make sure that you always view the pump from the same direction in order for you to keep the left and right directions correct. There is no sag compensation on the horizontal move.
5. You can avoid the horizontal move by zeroing the indicators on the left and rotate them to right. Now turn the indicator needles half way to zero and begin to walk the motor into place by moving the farthest foot toward zero and then the nearest foot. Slowly walk the motor into place by alternating the moves until you obtain two zero indicator readings. Now begin the procedure for the vertical move. Be sure to check your equipment for sag and soft foot.
6. Check for soft foot: Soft foot is a condition in which one of the feet does not sit flat on the base. The foot or the base may have been warped. When you tighten the bolt on the foot, the machinery will distort.
7. Perform vertical move: The vertical move is the part of the alignment process that aligns the two shaft's centerlines into their proper up and down position. Usually you will have to add or remove shims in this step. The indicators are zeroed on the top and read at the bottom. (start with a plus + reading if you need to compensate for sag)
8. With the shims in place, tighten all bolts and take and check your readings. If the readings are within tolerance than your equipment is aligned.
9. Tighten all bolts and recheck indicator readings.
10. Remove alignment brackets