

Procedures for Operation of the Slip Table

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1. Terminology

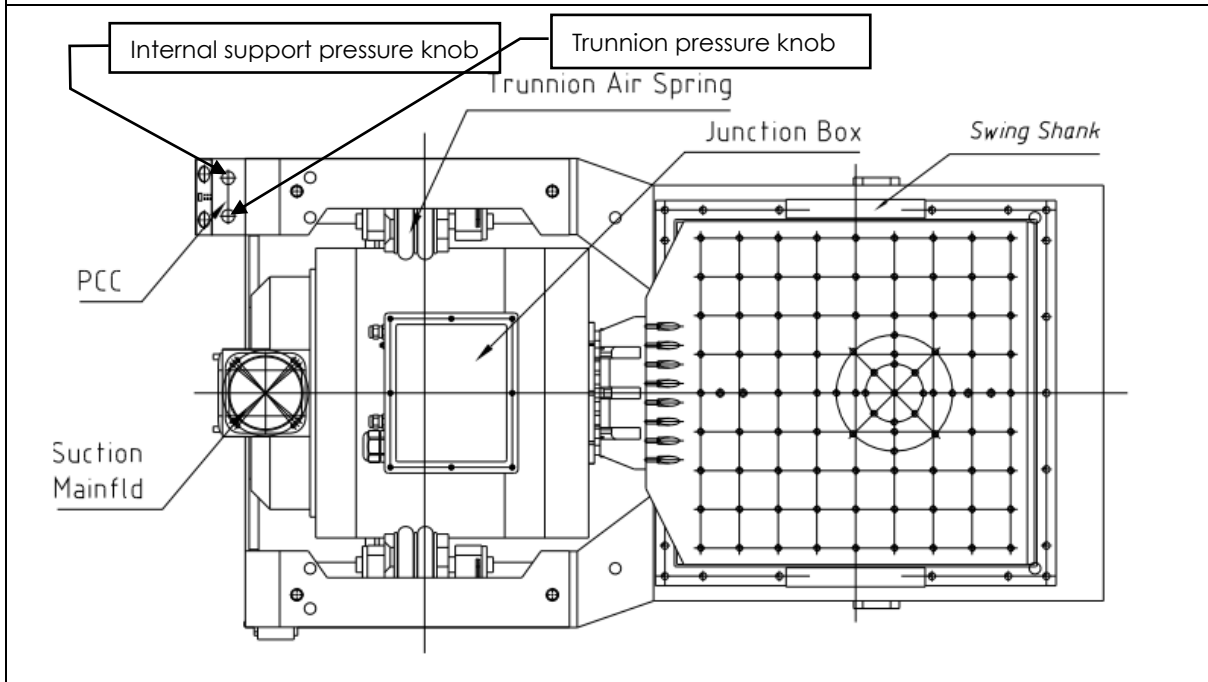
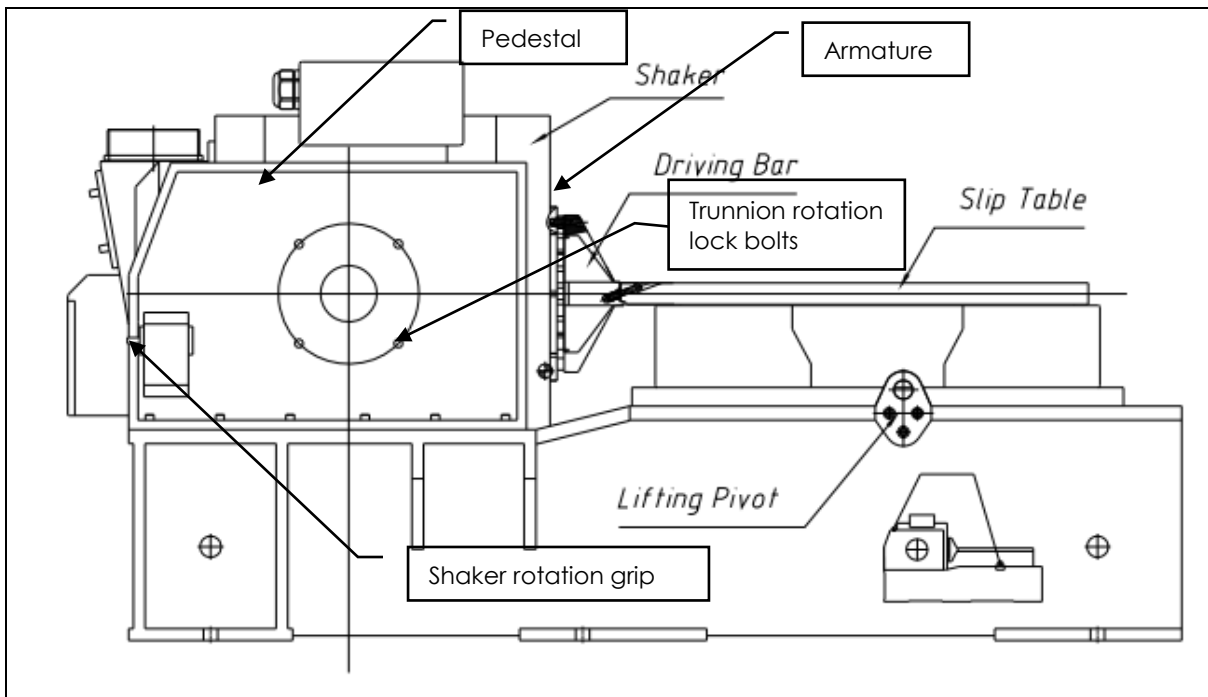
The armature is the vibrating head of the shaker.

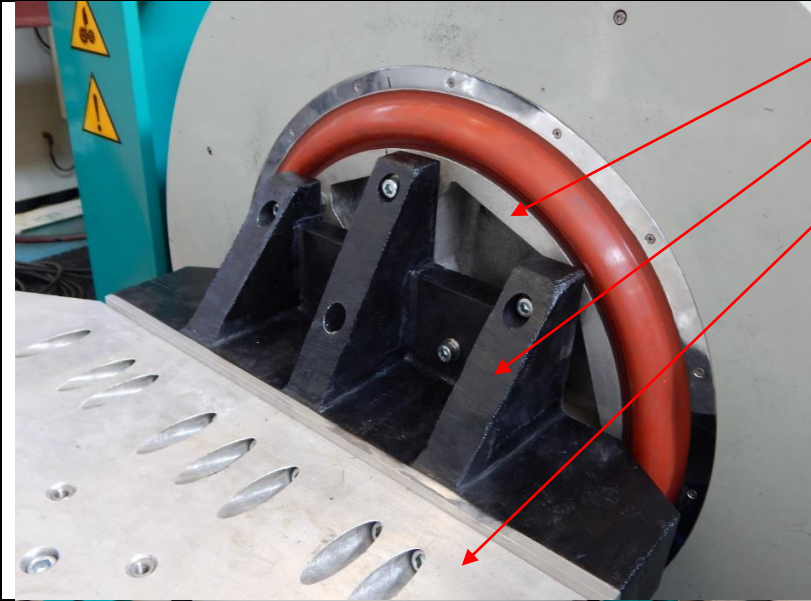
The trunnion is the rotation axis of the shaker body, and is mounted on airbags on the pedestal, which allows the trunnion height to be adjusted.

The internal support is another air bag system inside the shaker that allows the armature height in the shaker to be adjusted in response to differences of the test specimen weight.

Note position of the control point, i.e. location of the feedback accelerometer.

See the diagrams below.





Armature

Driver bar

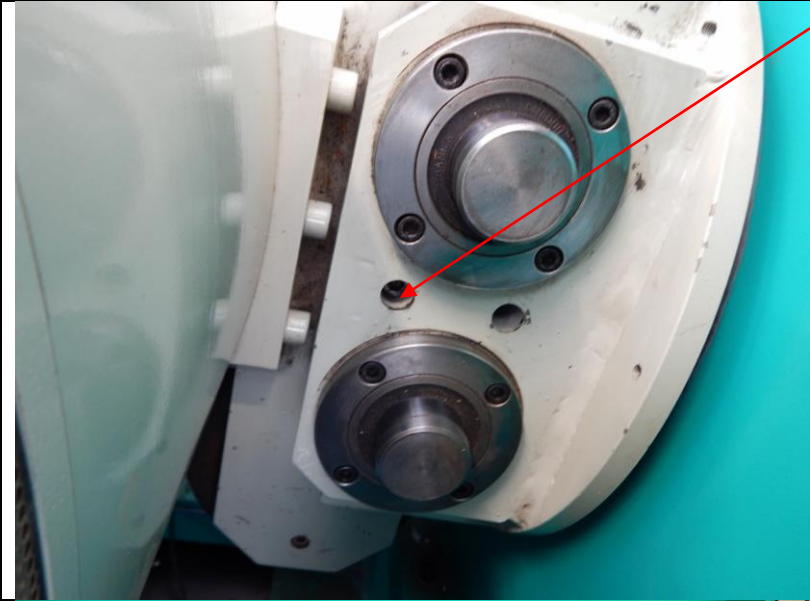
Slip plate



Main power supply switch



Oil pressure switch

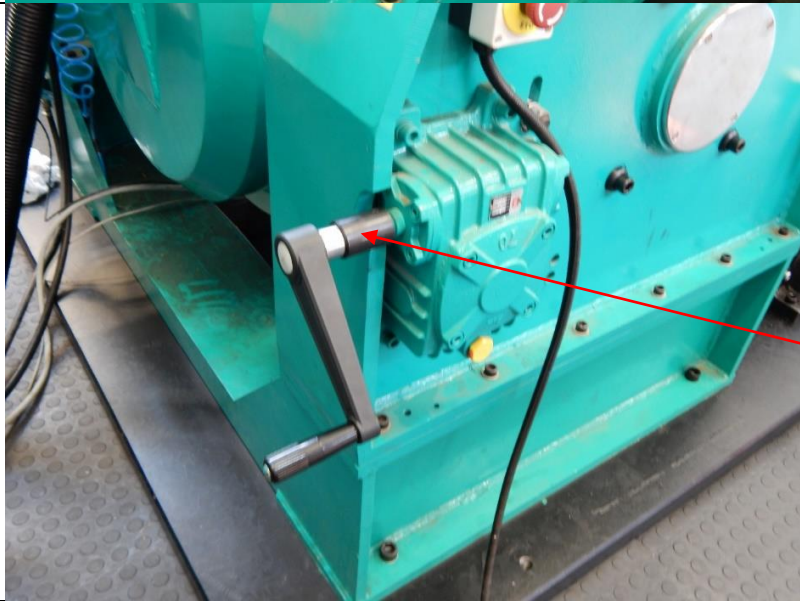


Trunnion Lock-Screws

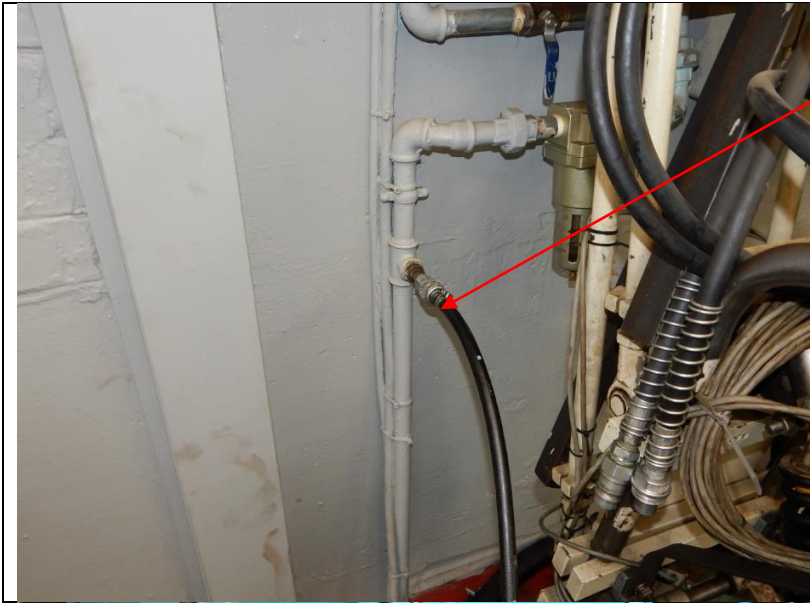


Pedestal

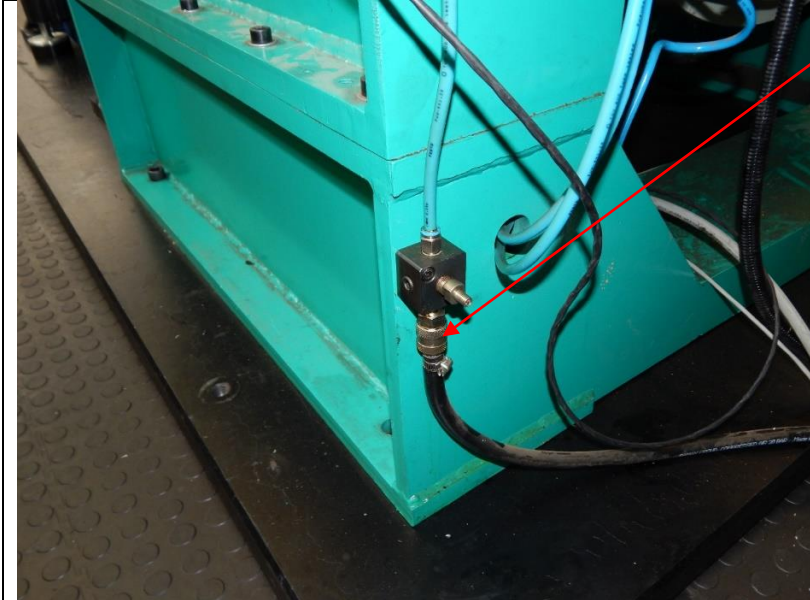
Trunnion rotation lock bolts



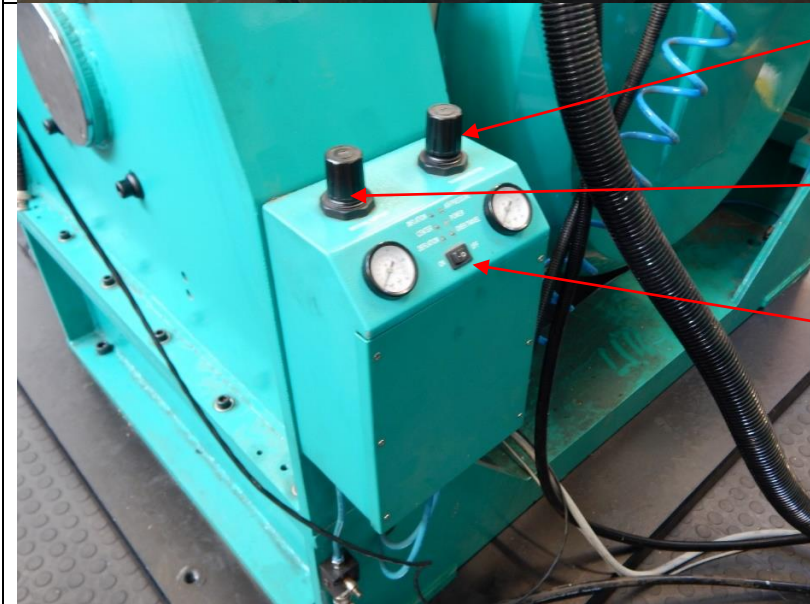
Shaker rotation grip & lever



Air pressure line: wall connection



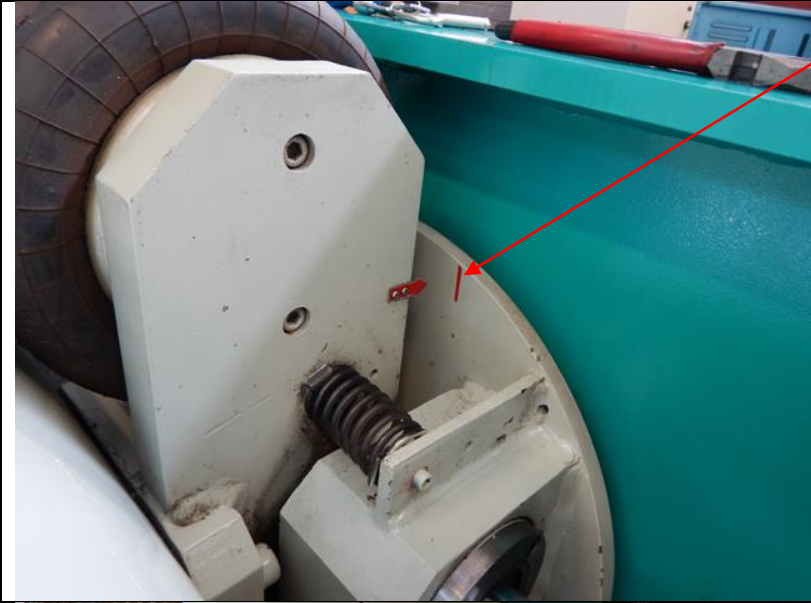
Air pressure line: shaker connection



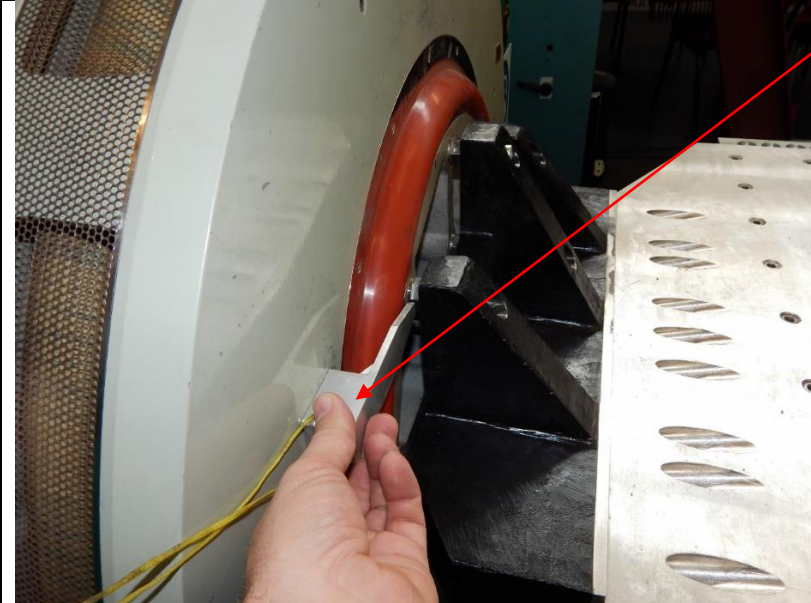
Trunnion isolator air pressure adjustment knob

Internal support air pressure adjustment knob

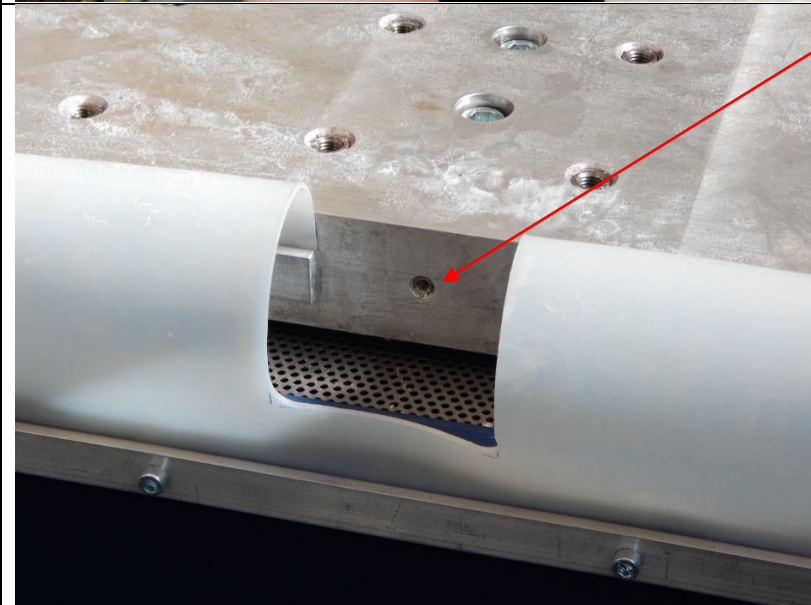
Internal support on/off switch



Trunnion height
arrow and
reference mark



Armature
height gauge



Control
accelerometer
position

2. Slip Table Specification

Slip table model	---	GT1000M
Working area	mm x mm	1000x1000
Thickness	mm	50
Usable frequency range	Hz	2000
Slip plate mass	kg	99
Bearing qty.	---	2
Mass per bearing	kg	0.58
Static max. payload	kg	1200
Overturning moment	Pitch [Nm]	20,232
	Roll [Nm]	20,232
	Yaw [Nm]	203
Armature mass	kg	50
Pressure pump type		Gear
Pressure pump operating pressure	MPa	0.1
Pressure pump delivery rate	l/min	4 (@ 0.1MPa, 50Hz)
Recommended oil type	---	Shell Tellus 32 or equivalent
Filtration, Pressure	---	10 micron

3. Connecting the Slip Table to the Shaker

1. Check the oil level on the slip table. It should be at least half.
2. Turn on the main power supply on the amplifier (the large red knob that is accessible when opening the front door of the amplifier). Close the front door again.
3. Turn on the slip table oil pump.
4. Allow the slip table pump to run for 10 – 15 minutes.
5. Turn the "internal support" pressure down to zero.
6. Switch **off** the power switch on the "internal support" control panel.
7. If a release valve is fitted on the internal support air line, open the valve. After all air has been released close the valve again.
8. Connect the driver bar loosely to the armature with the lip towards what will be the bottom, using the provided M10 bolts. The bolts should be inserted to within about a ¼ turn of locking the driver bar to the armature, i.e. the armature must be loose with all bolts fitted.
9. Turn the "trunnion isolator" knob down to zero pressure.
10. If a release valve is fitted on the internal support air line, open the valve. After all air has been released close the valve again.
11. Insert the two isolation trunnion system Lock-Screws of M16 (with 8mm key) through the trunnion; tighten the screws. There is one in each side.
12. Fit the shaker rotation lever.
13. Loosen and remove the trunnion rotation lock bolts on the sides of the shaker.
14. Rotate the shaker through 90° until the lip clears the bottom edge of the table with a few millimetres.
15. Insert one or two trunnion rotation lock bolts on each side of the shaker and screw them in until they are almost tight, but leave enough clearance so that the shaker can still be rotated.
16. Remove the two isolation trunnion system Lock-Screws.
17. Turn up the trunnion support pressure knob slowly until just before contact of the driver bar with the table.
18. Rotate the shaker up until contact of the driver bar lip with the slip table.
19. Tighten the already fitted trunnion rotation lock bolts on each side of the shaker.
20. Turn up the trunnion support pressure knob **slowly** until contact of the driver bar with the table.
21. Confirm that the slip table bolts clear the sides when inserted into the driver bar and screws in easily. Hand tighten two or three of the bolts.
22. Now tighten a few of the accessible bolts on the driver bar (into the armature).
23. Confirm again that the slip table bolts clear the sides when inserted into the driver bar and they screw in easily.
24. Turn down the trunnion support pressure knob to zero to release all air pressure.
25. If a release valve is fitted on the trunnion support air line, open the valve. After all air has been released close the valve again.
26. Loosen and remove the trunnion rotation lock bolts on the sides of the shaker.
27. Rotate the shaker up until all bolts on the driver bar are accessible.
28. Tighten all the bolts on the driver bar to the prescribed torque.
29. Rotate the shaker down again until the lip clears the bottom edge of the table with a few millimetres.
30. Insert all trunnion rotation lock bolts on each side of the shaker and screw them in until they are almost tight, but leave enough clearance so that the shaker can still be rotated.

31. Turn up the trunnion support pressure knob slowly until just before contact of the driver bar with the table.
32. Rotate the shaker up until contact of the driver bar lip with the slip table.
33. Remove the shaker rotation lever from the gearbox.
34. Tighten all the trunnion rotation lock bolts on each side of the shaker. Torque the bolts gradually in diagonal sequence and alternating between the two sides of the shaker.
35. Turn up the trunnion support pressure knob **slowly** until contact of the driver bar with the table.
36. Confirm that the slip table bolts clear the sides when inserted into the driver bar and screws in easily.
37. Tighten all the slip table to driver bar bolts to the specified torque.
38. Check the armature height (extension) with the supplied height gauge. If the trunnion is extended too far, the slip table will have pushed the armature to a lower than normal height. In this case turn down the trunnion support pressure knob slowly until the red arrow on the trunnion aligns with the red marker line on the pedestal. This should result in the correct armature height.
39. The slip table is now ready for testing.
40. In case of extended duration of testing, routinely check and ensure that the red arrow aligns with the red marker line.

4. Normal Start-up Procedure

1. Check the oil level on the slip table. It should be at least half.
2. Turn on the main power supply on the amplifier (the large red knob that is accessible when opening the front door of the amplifier). Close the front door again.
3. Turn on the slip table oil pump.
4. Allow the slip table pump to run for 10 – 15 minutes.
5. Turn the "internal support" pressure down to zero.
6. Switch **off** the power switch on the "internal support" control panel.
7. If a release valve is fitted on the internal support air line, open the valve. After all air has been released close the valve again.
8. Turn the "trunnion isolator" knob down to zero pressure.
9. If a release valve is fitted on the internal support air line, open the valve. After all air has been released close the valve again.
10. Now connect the airline if it is currently disconnected.
11. Now turn up the trunnion support pressure knob until the red arrow on the trunnion aligns with the red marker line on the pedestal. This should result in the correct armature height.
12. Check & confirm that the armature height is correct.
13. Check & confirm that the slip table is in the centre position.
14. The system is now ready for testing.

5. Shut Down Procedure

1. Turn down the gain switch on the amplifier front door.
2. Turn the shaker power off on the amplifier front door.
3. Turn off the oil pressure switch on the slip table.
4. Open the amplifier front door, and turn off the main power switch. Close the front door again.

6. Disconnection of the Slip Table

1. Perform the steps under the Normal Start-up Procedure (Section 0).
2. Loosen and remove the slip table to driver bar bolts.
3. Turn the "trunnion isolator" knob down to zero pressure.
4. If a release valve is fitted on the internal support air line, open the valve. After all air has been released close the valve again.
5. Wait until the driver bar clears the slip table with approximately 10 mm.
6. Now connect the airline if it is currently disconnected.
7. Fit the shaker rotation lever.
8. Insert the two isolation trunnion system Lock-Screws of M16 (with 8mm key) through the trunnion; tighten the screws. There is one in each side.
9. Loosen and remove the trunnion rotation lock bolts on the sides of the shaker.
10. Rotate the shaker to the vertical position while taking care that
 - a. No cable at the back of the shaker are stretched or pinched
 - b. The driver bar clears the slip table
11. Insert and tighten all the trunnion rotation lock bolts on each side of the shaker. Torque the bolts gradually in diagonal sequence and alternating between the two sides of the shaker.
12. Remove the two isolation trunnion system Lock-Screws.
13. Remove the shaker rotation lever from the gearbox.
14. Disconnect and remove the driver bar from the armature.
15. Switch the oil pump off.
16. Turn up the trunnion support pressure knob until the red arrow on the trunnion aligns with the red marker line on the pedestal. This should result in the correct armature height.
17. Turn on the internal support and adjust if necessary to lift the armature to the correct height.
18. Check the armature height.

7. Slip Table Routine Inspection

1. Inspect stabilizers' rubber connections.
2. Examine/test the oil condition; replace oil if necessary.
3. Check oil level.
4. Replenish oil to half or just above half with Shell Tellus 32 (pour oil onto upper grill just below slip plate).
5. Replace filter only very occasionally.

8. Slip Table Maintenance

1. Perform maintenance roughly once a year (depending on usage level of slip table)
2. Mark the stabilizers' top sides and positions.
3. Loosen stabilizers top connections to the slip table to loosen the table.
4. Remove the stabilizers completely if necessary.
5. Fit three eye bolts on the slip table (**using washers**) to serve as lifting points.
6. Remove the splash guard lower rail.
7. Remove the earth cables.
8. Remove the bearing bolts.
9. Tighten suspension cables to the eye bolts without actually lifting the table.
10. Slide the slip plate back over the edge by roughly 75%.
11. Now lift the slip plate clear of the base.
12. Clean oil of the slip plate underside and the granite surface with a scraper.
13. Dry both surfaces properly.
14. Check both surfaces for scratches, damage, excessive wear.
15. Inspect the bearing.
16. Lower the slip plate to within 50 mm of the granite surface.
17. Insert the bearing bolts and screw them into the bearings.
18. Drop the table onto the granite surface.
19. Tighten the bearing bolts.
20. Refit the earth cables.
21. Refit the splash guard lower rail.
22. Refit the stabilizers to the slip table.

9. Shaker Maintenance

1. To be performed by qualified agents
2. Inspect and service (if necessary) armature top suspension.
3. Inspect and service (if necessary) linear bearing and shaft.
4. Inspect and service (if necessary) internal support diaphragm.