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METHOD OF TEST FOR MECHANICS, OPERATION, CALIBRATION AND DIAPRAGM INSTALLATION OF THE STABILOMETER

A. SCOPE

The procedure describes the mechanics of the stabilometer, including procedures for operation, calibration, and diaphragm installation. The stabilometer is used to establish R-values for treated and untreated soils and stability values for bituminous mixtures.

B. REFERENCES

California Test 301 – Test for Determining the Resistance "R" Value of Treated and Untreated Bases, Subbases and Basement Soils by the Stabilometer
California Test 304 – Preparation of Hot Mix Asphalt for Test Specimens

C. APPARATUS AND MATERIALS

1. A stabilometer and stage base are required as shown in Figure 1.

2. A standard metal specimen with a nominal outside diameter of 4 in. and a length of 6 ½ in.

3. A pressure-checking device must consist of one of the following:

   a. An Ashton double area gage tester with a hydraulic system is acceptable.

   b. A Bourdon tube gage with a maximum capacity of 200 psi. The gage must be sensitive to 0.5 % of the total scale. It must be a hydraulic system with minimum dial face diameter of 6 in.

   c. A dead weight tester is acceptable.

4. A diaphragm installation kit must consist of the following:

   a. A diaphragm pretension and installation device is required as illustrated in Figure 2.

   b. Neoprene tubing must have an inside diameter of 4 in. and a minimum length of 7 ½ in. with Durometer of 60-65 type A (ASTM D2240).

   c. A diaphragm-cutting tool is required as illustrated in Figure 3.

   d. A small tool box must contain the following items: a screwdriver, a 12 in. crescent wrench, a set of Allen wrenches, a small center punch and a small ball peen hammer.

e. A solid rubber specimen must have a diameter of 4 in. and a height 2 ½ in. It must have an R-value of 55 ± 10.

5. A 1-L can of Shell Tellus Oil (No. 15), or equivalent, is required.

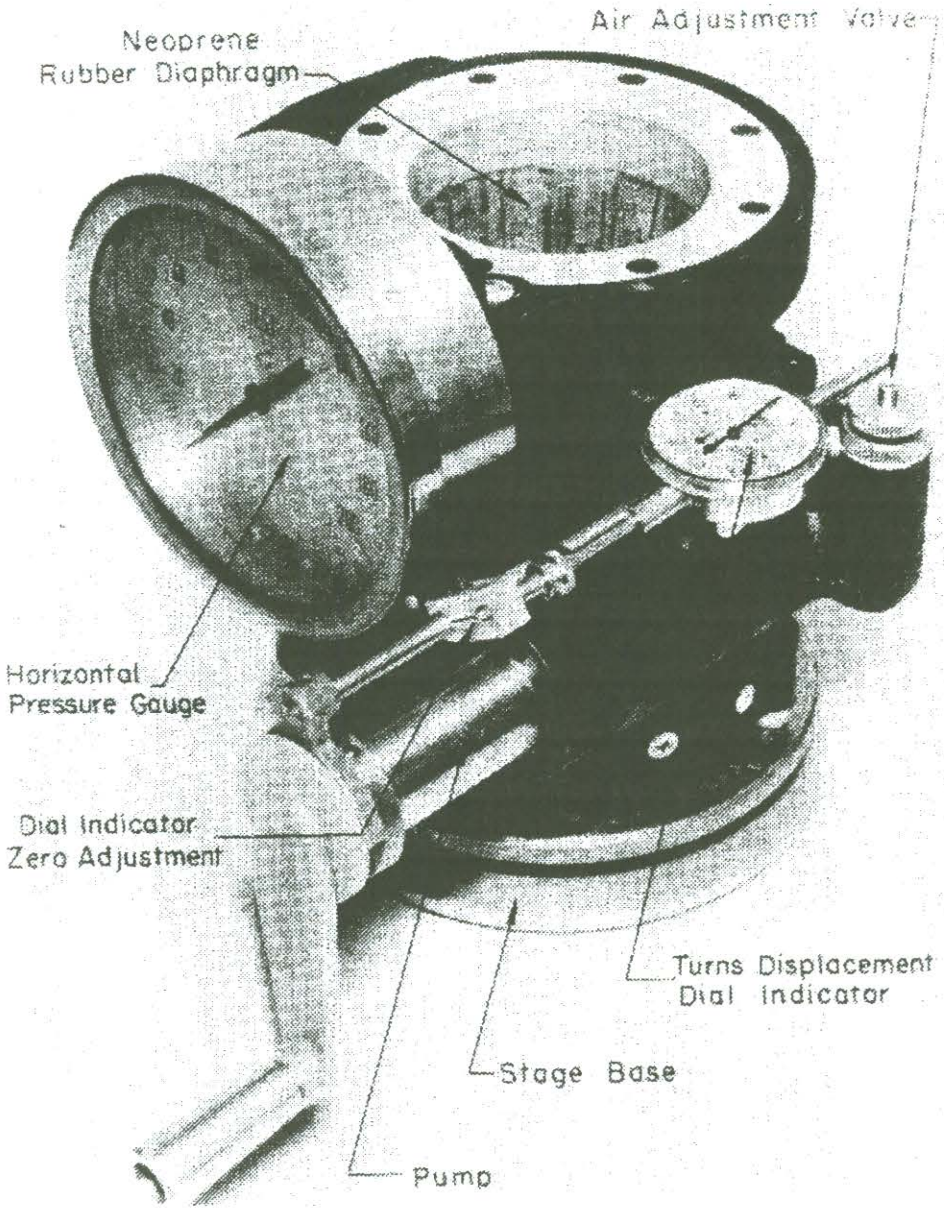


FIGURE 1 - STABILOMETER

D. STABILOMETER PARTS NOMEN-CLATURE

Refer to Figures 3 and 4 for the listing and identification of the various parts, which make up the stabilometer.

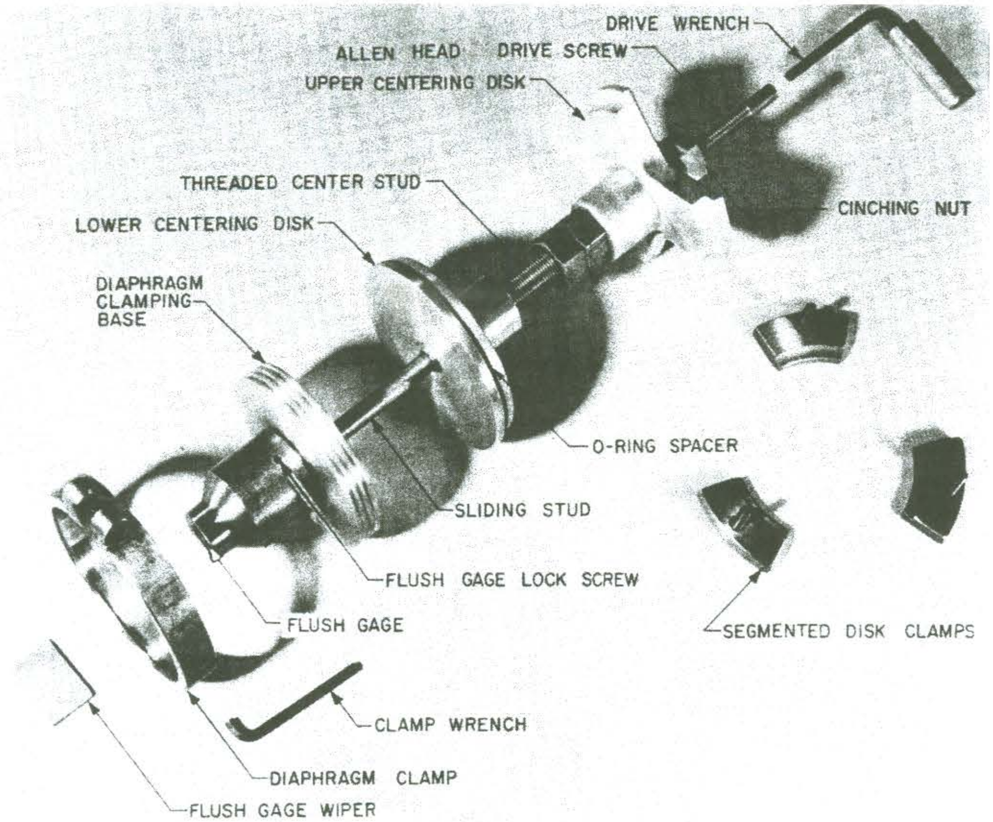


FIGURE 2 - DIAPHRAGM PRETENSIONING AND INSTALLATION DEVICE

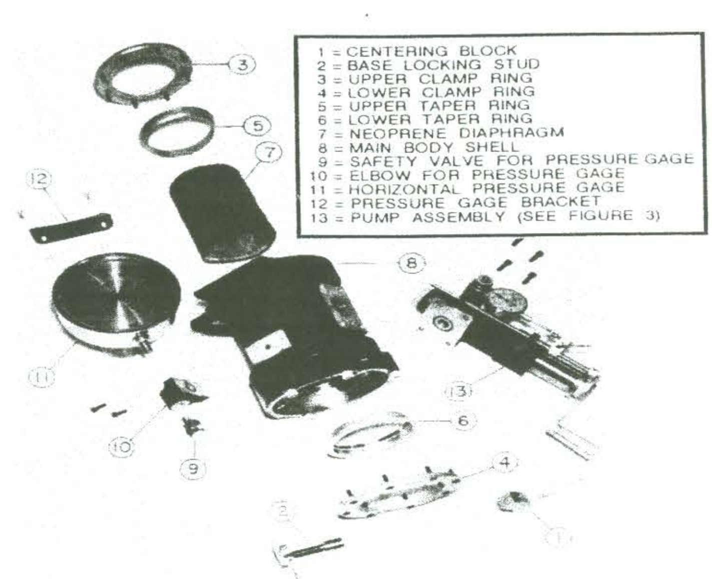


FIGURE 3 - COMPONENTS OF THE STABILOMETER

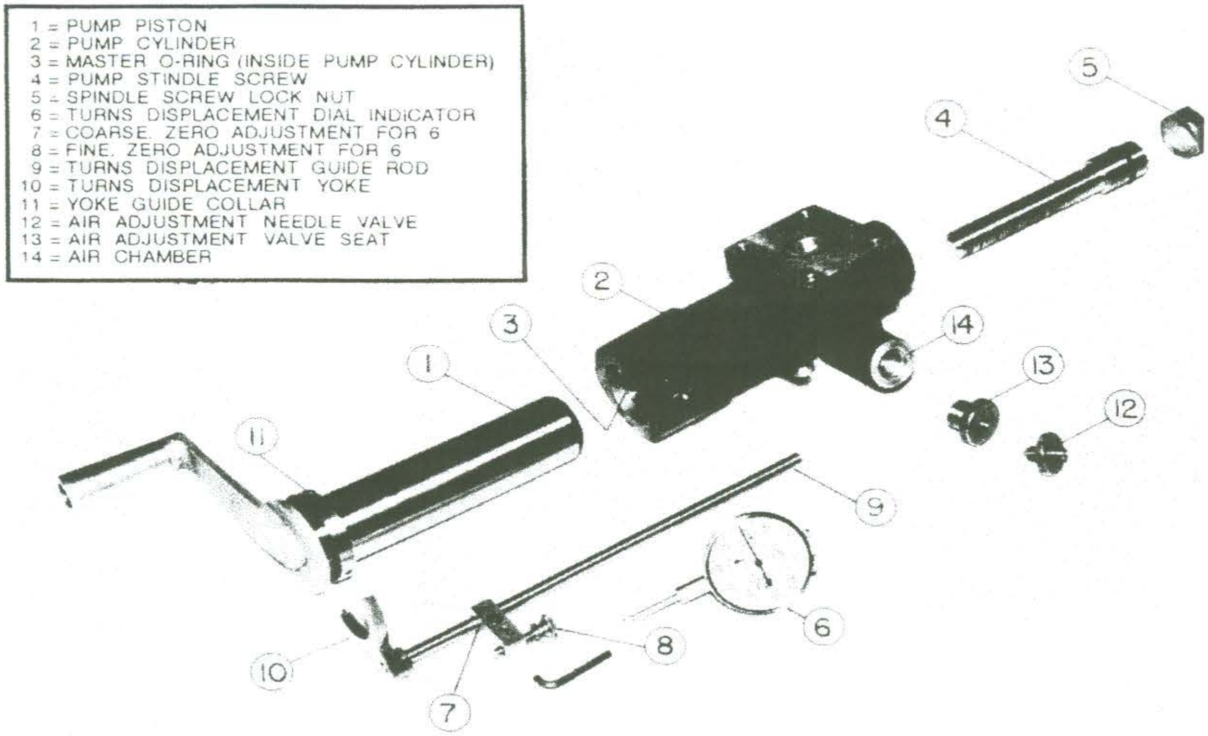


FIGURE 4 - PUMP ASSEMBLY FOR THE STABILOMETER

E. PRINCIPAL OF OPERATION

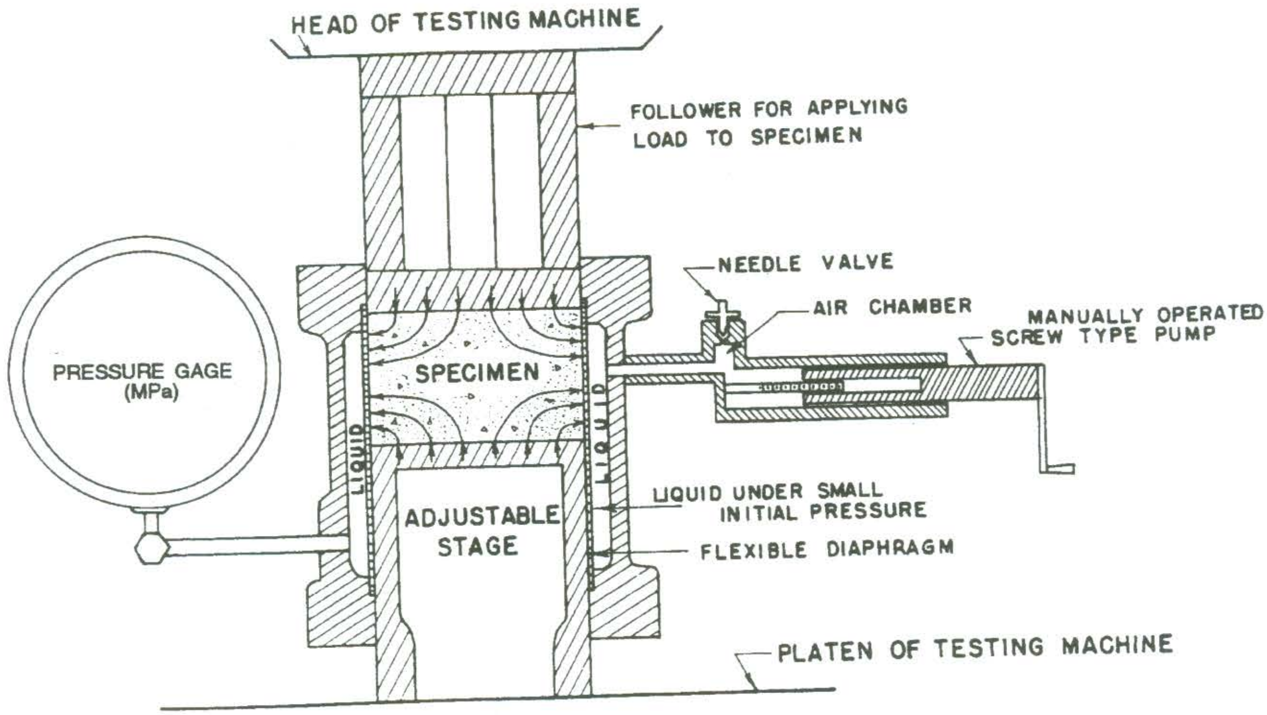
The stabilometer is an instrument designed for subjecting a 4 in. diameter test specimen (composed of either soil or bituminous mixtures) to triaxial compression. Normally, 2 ½ in. specimens are tested; however, specimens of other heights may also be tested. The instrument measures the lateral pressure transmitted through the specimen from the applied vertical load. The ratio of a given applied unit compressive stress to the transmitted lateral or horizontal pressure is used to determine an index, on a scale ranging from 0 to 100, of the ability of the material under test to resist deformation.

1. Reference is made to the diagrammatic sketch in Figure 5. The stabilometer fundamentally consists of a cylindrical metal body shell, a flexible diaphragm, a pressure gage, a screw-type hand pump assembly and an air chamber fitted with a needle valve for adjusting the quality of air in the system.

    a. The main body shell contains a recessed section around its inside circumference which, when covered with a flexible diaphragm, serves as a cell for the hydraulic fluid, Shell Tellus Oil (No. 15) or equivalent.

       The test specimen is normally placed inside the upper half of the diaphragm where, during loading, it may act upon and be resisted by the hydraulic cell through the diaphragm wall.

    b. Any positive pressure developed in the system, resulting from either the lateral distortion of the test specimen during loading or the manual operation of the pump, is registered on a pressure gage connected directly to the hydraulic cell.



NOTE: SPECIMEN GIVEN LATERAL SUPPORT BY FLEXIBLE SIDE WALL WHICH TRANSMITS HORIZONTAL PRESSURE TO LIQUID MAGNITUDE OF PRESSURE MAY BE READ ON GAUGE

FIGURE 5 - STABILOMETER DIAGRAM

c. The pump performs three functions:

(1) It applies a small initial lateral pressure to the specimen before loading commences. This assures that the diaphragm is snugly fitted around the specimen and that any "slack" existing in the system is eliminated. It also provides a positive initial starting point, which is maintained as a standard for all specimens.

(2) It provides a means of obtaining a standard quantity of air in the liquid system of the stabilometer, when used in conjunction with a standard metal specimen.

(3) It provides a means of applying a correction for the surface roughness and/or specimen displacement of the test specimen.

d. The air chamber and needle valve are provided to facilitate the regulation of the amount of air within the stabilometer system.

2. The test specimen is arranged within the stabilometer on a stage base in such a manner that the hydraulic cell covers only a measured portion along the length of the specimen. See Figures 5 and 6. This specimen length which acts against the liquid phase of the stabilometer is termed "effective height."

F. CALIBRATION OF THE HORIZONTAL PRESSURE GAGE ON THE STABILOMETER

1. For this purpose, some accurate loading indicating device must be connected to either the hydraulic system of the stabilometer or directly to the horizontal pressure gage. Any one of the devices listed under apparatus is acceptable.

2. The following calibration procedure is used for checking the horizontal pressure gages installed on stabilometers and involves the use of a standard Bourdon tube test gage as described above.

    a. With the stabilometer mounted on the stage base, insert the standard metal specimen and turn the pump handle until 2 or 3 psi pressure is registered on the horizontal pressure gage.

    b. On some models of the stabilometer, where the air chamber is an integral part of pump assembly, carefully remove the air adjustment valve seat. See Figure 4, Item 13. This may cause a little oil spillage due to the pressure in the system, but will prevent the inclusion of unwanted air in the main shell.

    c. For other types of the stabilometers, repeat the above procedure, except lay the stabilometer horizontally on its dial face and remove the plug at the point where the pump line connects with the main body shell.

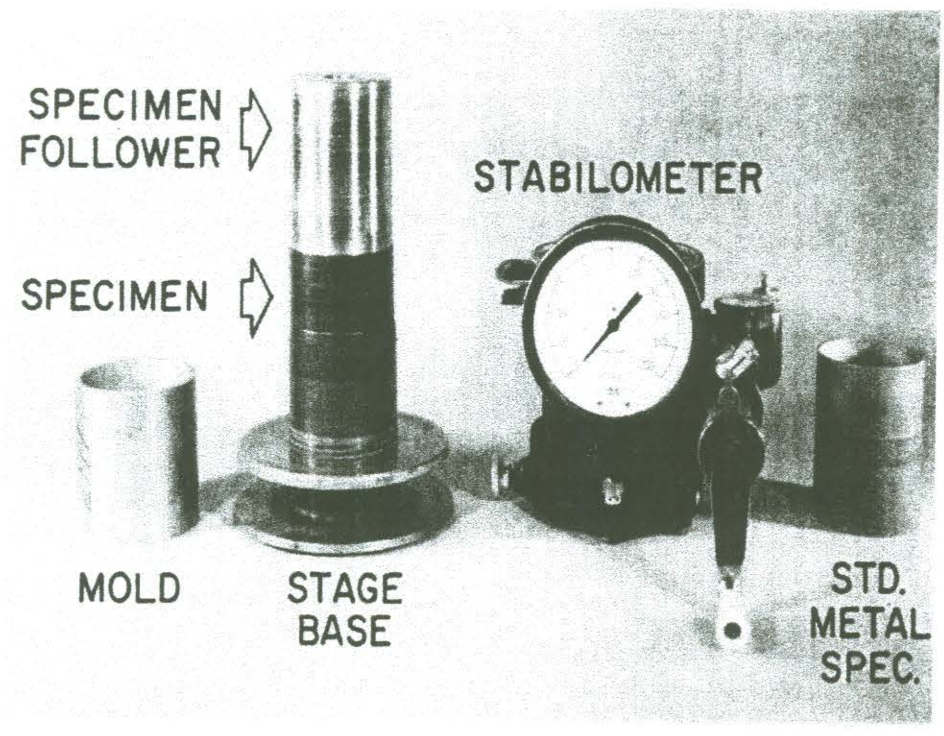


FIGURE 6 - STABILOMETER WITH MAIN ACCESSORIES

Install the correct pipefitting (i.e., nipples, elbow and collar) and fill them with hydraulic fluid by means of the pump while at the same time bringing the stabilometer to an upright position. Finish filling the vertical fitting and attach the standard test gage. See Figure 7 a, 7 b and 7c.

d. With the standard metal specimen in place, apply pressure to the gages with the stabilometer pump. Starting at 10 psi on the gage, raise the pressure in 10 psi increments up to and including 100 psi. The reading on the horizontal pressure gage at each increment should correspond to ± 1 psi with that on the test gage.

e. If the horizontal pressure gage does not indicate correctly within the ± 1 psi limit, then it is necessary to observe the manner in which the error occurs before proper remedial measures can be taken. For example, it may be noted that at each increment the horizontal pressure gage differs from the test gage by a constant amount (i.e., suppose a horizontal pressure gage reads 7, 17, 27, 37 psi, etc, at each increment). In this case, the gage measurements are linear and merely require resetting of the pointer to correct the error within the dial range. Some gages have micrometer pointers that can be adjusted directly while others, such as the Helicoid gage, are equipped with an adjustment screw in the rear of the case which is easily operated with an offset screw driver. On other makes of gages, it is necessary to pull the pointer and reset it on the staff to correct the error. When the amount of error changes from one increment to another, then the gage is said to be "out of linearity". For example, suppose a horizontal pressure gage gave readings of 7, 19 30, 42. 53 psi at each increment. Correction of this type of error requires shop repair. Therefore, the gage should be removed and replaced with a spare that is functioning correctly as verified by calibration.

f. After the horizontal pressure gage has been calibrated and adjusted, it is necessary to accurately establish the location of the 5 psi initial starting point on the dial scales. This is accomplished by setting the standard test gage (either the 200 psi capacity gage or the 15 ± 5 psi capacity gage described in Footnote 1 on Page 6) at 5 psi with the stabilometer pump and marking the point on the horizontal pressure scale of the stabilometer gage. The 5 psi mark may also be set with the dead weight tester. For emphasis, this mark is usually made in the form of a line slightly longer than the scale divisions with high visible ink.

3. It is desirable to run spot checks on the function of the stabilometer at frequent intervals and two respectively simple methods have been devised for this operation.

a. The testing of a solid rubber specimen 4 in. in diameter and 2 ½ in. high will indicate discrepancies from any one of a number of sources. The equipment is operated as prescribed for a normal R-value specimen with readings on the horizontal pressure gage and turns displacement recorded. An R-value is then calculated for the rubber specimen and compared with a standardized R-value. These comparative readings will indicate whether or not the equipment is functioning properly. Since the check with the rubber specimen can be made easily its application is warranted at frequently intervals. Daily checks are recommended with additional spot checks at the discretion of the operator.

b. Occasionally there is reason to suspect the accuracy of a stabilometer horizontal pressure gage at a time when a calibration gage is not readily available. A quick check may be provided by the use of a rubber balloon (or equivalent) which has been filled with enough water to make a ball about 4 in. in diameter. The balloon is placed in the stabilometer in the same manner as a soil or bituminous test specimen and loaded with the testing machine. Since there is a direct pressure transmittal through the confined water specimen, the horizontal pressure gage reading should correspond to the load in psi indicated by the testing machine dial if both are in good calibration. It should be noted; however, that this method is satisfactory only when there is reasonable confidence in the accuracy of the testing machine gage.

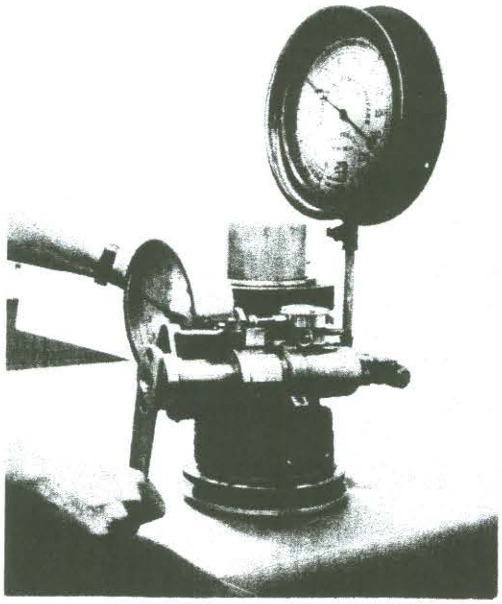


FIGURE 7a - STABILOMETER WITH BOURDON TUBE PRESSURE GAGE[1]

FIGURE 7b - STABILOMETER WITH DEAD WEIGHT TESTER

[1] It is desirable to have a 0.10 ± 0.035 MPa capacity, Bourdon tube type, test gage (equipped with a safety valve) for accurately setting the 0.035 MPa mark on the stabilometer dial. However, the large gage may also be used for this purpose.

Figure 7c- Dead Weight Load Tester

G. PROCEDURE FOR INSTALLING THE NEOPRENE DIAPHRAGM

1. Since the inception of the first hydraulic model of the stabilometer in 1932, a few modifications have been made in certain mechanical details of this instrument. However, since these changes have not appreciably affected the arrangement of the neoprene diaphragm, the installation technique outlined below will apply to all stabilometers. With the exception of the device shown in Figure 7a, the figures concerning nomenclature and diaphragm installation are illustrations of the stabilometer shown in Figure 7b.

2. To prepare that stabilometer for the replacement of the diaphragm, it is first necessary to release the hydraulic fluid and remove the old diaphragm. Draining the fluid is accomplished by removing either the safety valve, Item 9 in Figure 3, or the air adjustment valve seat, Item 13 in Figure 4, and turning the stabilometer in various positions until all flow of the liquid ceases. Then with the stabilometer in an inverted position remove the tapered pin from the locking stud, Item 2 in Figure 3, by means of the small punch and unscrew the stud toward the center of the stabilometer. Also remove the centering block, Item 1 in Figure 3. Release the eight Allen screws which hold the lower clamp ring, Item 4 in Figure 3, taking note of the positioning of the reference marks and remove both the clamp ring and lower tapered ring, Item 6 in Figure 3.

   NOTE: When removing both the lower and upper clamp rings, the arrangement of any reference marks used for matching screw holes with their threaded counterpart in the main body shell and the other set adjacent to it on the clamp ring. They may be in the form of zeros or punch dots. If none are in evidence, reference marks should be provided by means of a punch before removing the clamp rings.

   Place the stabilometer in an upright position and release the Allen screws on the upper clamp ring, Item 3 in Figure 3, and remove the clamp ring, upper tapered ring and old diaphragm. Clean any sludge ore residue from the hydraulic chamber of the main body shell.

   CAUTION:

   Exercise extreme care when performing this task. The walls of the hydraulic cell are coated with a special lacquer to prevent the passage of air or liquid through the pores of the main body shell. Excessive abrasion or scoring with tools will damage this lacquer coating and necessitate major repairs.

3. Installation of a new neoprene diaphragm in the stabilometer may now be undertaken. This task is accomplished by means of a specially designed tool, which is called a "Diaphragm Installation and Pretensioning Device." The device not only facilitates the proper placement of the diaphragm in the stabilometer body, but also provides assurance that the neoprene material is uniformly stretched to a predetermined tensile stress when the diaphragm is locked in place within the stabilometer. The tensioning measurement is performed with a "flush gage" device, which is attached to one end of the tool. See Figure 8. Calibration of the flush gage is described in Section H of this method.

4. The nomenclature of the parts for the Diaphragm Installation and Pretensioning Device is given in Figure 2. With the stabilometer ready to reassemble as shown in

Figure 9, proceed according to the following steps and accompanying photographs to install the neoprene diaphragm.

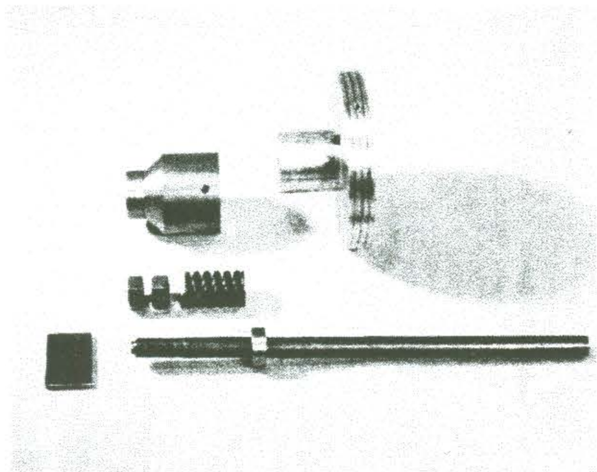


FIGURE 8 - FLUSH GAGE ASSEMBLY

a. For Step 1, refer to Figure 10. The diaphragm material is normally furnished in 14 in. lengths, which provides sufficient material for the installation of two diaphragms. The 14 in. length is not cut into two 7 in. pieces; rather, the entire length is used in the first installation and then cut after the final tensioning operation. This method results in a remnant between 7 ½ to 8 in. in length. Insert the upper tapered ring into one end of the diaphragm (the untrimmed end if a remnant is being installed); so that the top of the ring is flush with the end of the diaphragm. Place the stabilometer in an upright position on the opened installation device storage box (after first removing device and allied parts), and insert the diaphragm containing the tapered ring into the main body shell as shown in Figure 10a. Using the open box as a stand allows space for the excess diaphragm material (where the 14 in. length is being used) to extend below the stabilometer. Set the upper clamp ring in position (Figure 10b) and orient its reference mark with that on the main body shell (Figure 10c). Now take the installation device, remove (and set aside) the diaphragm clamping base by simply withdrawing the sliding stud from the threaded center stud, and unscrew the lower centering disk (also setting aside) from the threaded center stud. Place the upper centering disk in position on the upper stabilometer clamp ring with the threaded center stud extending down into the stabilometer. Set the three-segmented disk clamps over the respective legs of the upper centering disk and insert the three Allen screws provided, through the segments into the nearest screw holes in the upper stabilometer clamp ring.

NOTE: The fact that the segments do not exactly line up with the legs of the centering disk, may be ignored as long as the segments overlap at least one half of each leg.

Fill the balance of the screw holes in the upper stabilometer clamp ring with the screws provided with the stabilometer and tightens all sight screws uniformly (including those securing the segments) in a "criss-cross" pattern. See Figure 10.

NOTE: "Criss-cross" pattern refers to the method of tightening screws in pairs at opposite ends of a diameter where the screws are arranged in a circle.

In tightening the screws, care must be exercised to assure that the upper clamp ring is being depressed uniformly around its perimeter, so that the axis of the tapered ring coincides with the axis of the stabilometer.

b. For Step 2, refer to Figure 11. Invert the stabilometer on the bench (box not needed now) and apply talc powder to both the inside and outside of diaphragm in the location where the lower tapered ring will be positioned. See Figure 11a. Insert the lower tapered ring into the diaphragm and position the ring as close to the main body shell as possible. See Figure 11b.

Insert the lower centering disk into the diaphragm and screw it onto the threaded center stud. See Figure 11c.

NOTE: The lower centering disk is provided with an O ring spacer, in a groove around the perimeter of the disk shoulder, in order to ensure centering in tapered rings which are "step-bored." See Figure 12a. These step-bored rings are normally found in the older model stabilometers. In the case of some model stabilometers, which generally have smooth bored lower tapered rings, the O ring space must be removed from the lower centering disk, before setting the disk in place, in order to ensure proper seating. See Figure 12b.

By means of the cinching nut, advance the lower centering disk until it comes in contact with the lower tapered ring, but do not pull the tapered ring tightly into the tapered seat in the stabilometer body. See Figure 11d. It is important to leave sufficient clearance between the ring and seat in order that the diaphragm can slide easily between these two elements during the subsequent tensioning operation.

c. For Step 3, refer to Figure 13. Place the diaphragm-clamping base inside the diaphragm with the sliding stud inserted into the threaded center stud. See Figure 13a. Slide the clamping base into the diaphragm until the base rests against the centering disk. Attach the diaphragm to the clamping base using the diaphragm clamp, oriented with the inside shoulder away from the stabilometer, and tighten the Allen screw. See Figure 13b.

d. For Step 4, refer to Figure 14. Lay the stabilometer on its back and screw the Allen head drive screw into the hole in the cinching but. See Figure 14a. After the drive screw engages the sliding stud, further advance will pull the diaphragm taut. The proper amount of tension in the diaphragm is determined by means of the flush gage. Continue to advance the drive screw until the center study of the flush gage comes in line with the machined face of the flush gage shell. This condition is detected when the straight edge of the wiper, moving across the shell face, just touches but is not impeded by the center stud. See Figure 14b.

When this is attained, permit the diaphragm to remain in this stretch condition for a minimum period of 1 hour before proceeding to the next step. This allows for the initial relaxation of the rubber diaphragm material.

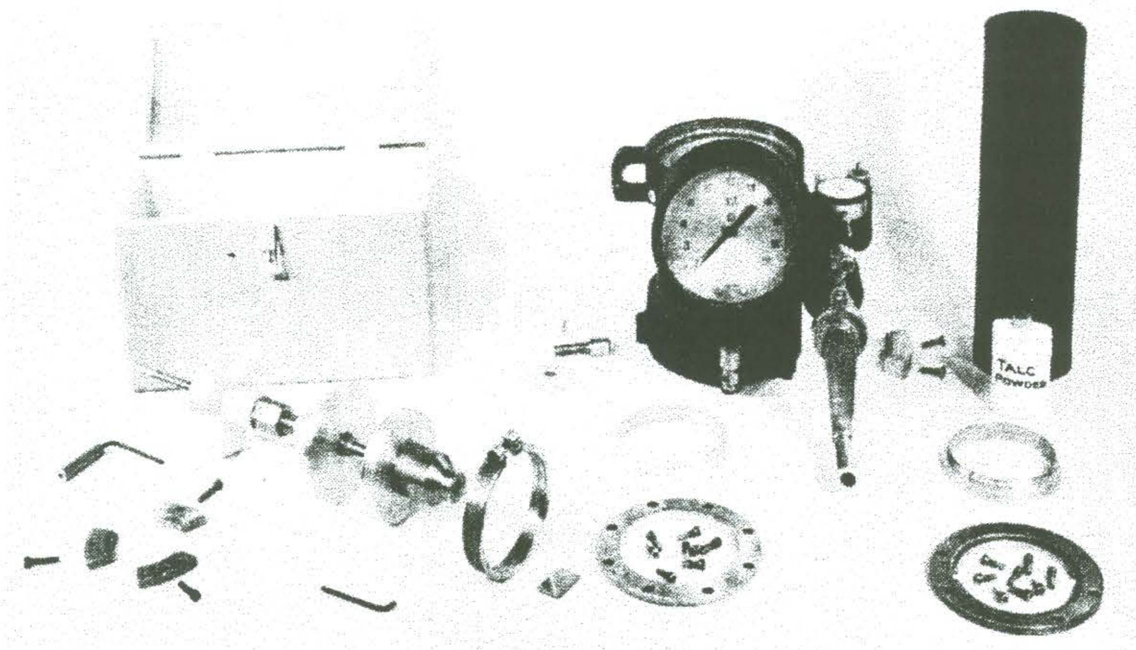
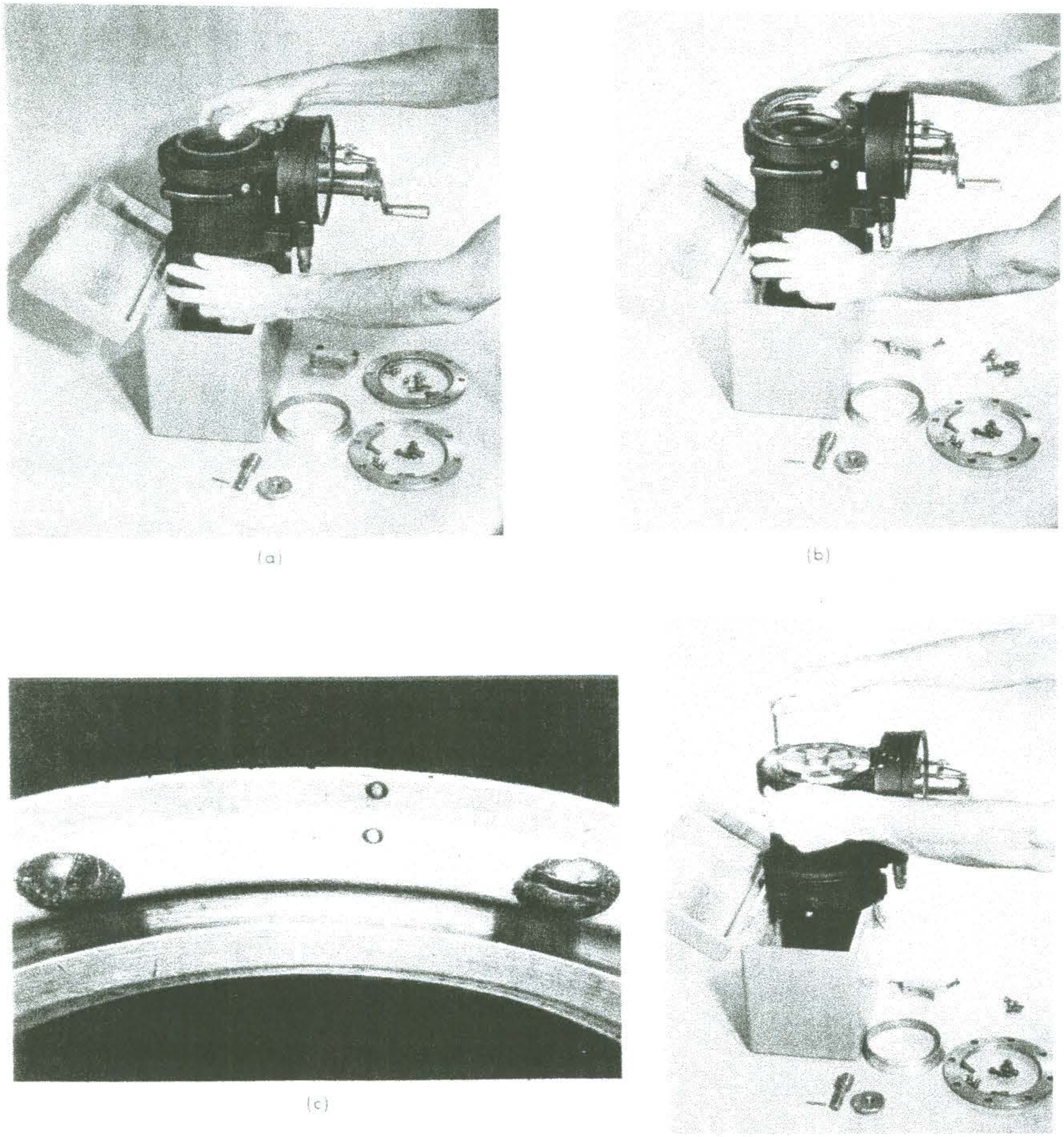
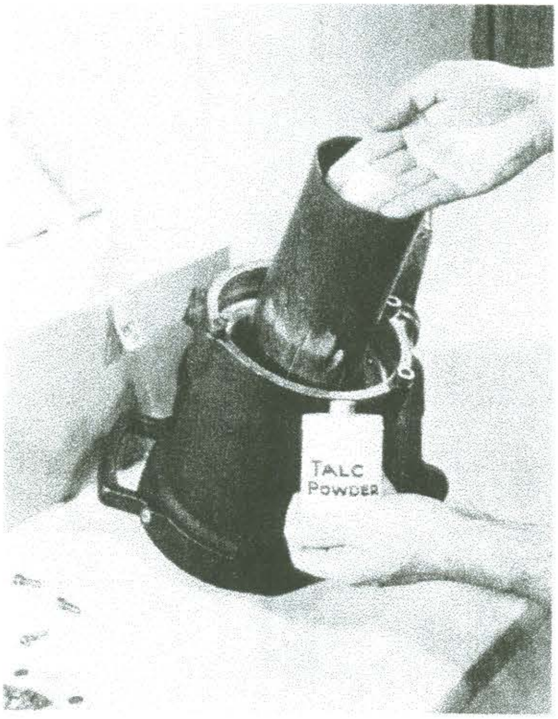


FIGURE 9 - STABILOMETER READY FOR ASSEMBLY



(a) (b) (c) (d)

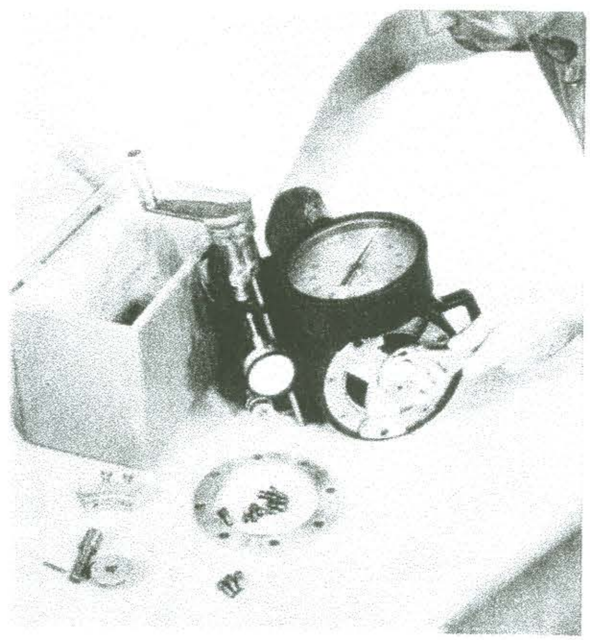
FIGURE 10 - INSTALLATION OF THE NEOPRENE DIAPHRAGM (STEP 1)



(a)

(b)

(c)



(d)

FIGURE 11 - INSTALLATION OF THE NEOPRENE DIAPHRAGM (STEP 2)

STEP BORED LOWER TAPERED RING
(a)

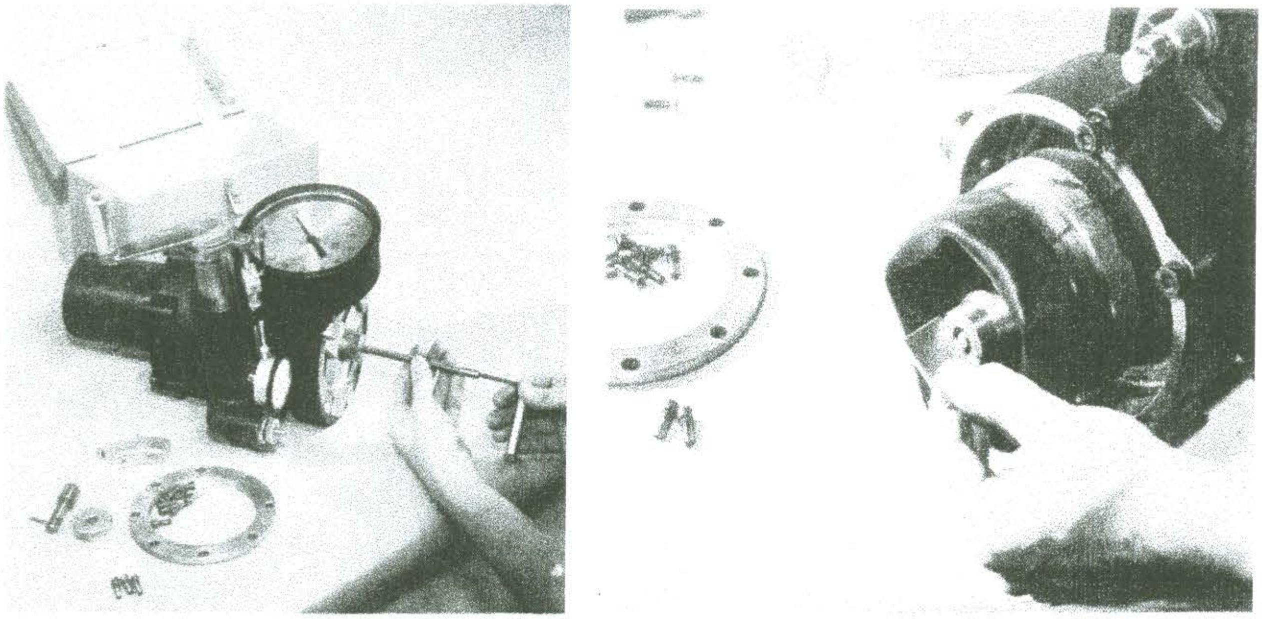
SMOOTH BORED LOWER TAPERED RING
(b)

FIGURE 12 - TAPERED RINGS (STEP AND SMOOTH)

(a)

(b)

FIGURE 13 - INSTALLATION OF THE NEOPRENE DIAPHRAGM (STEP 3)



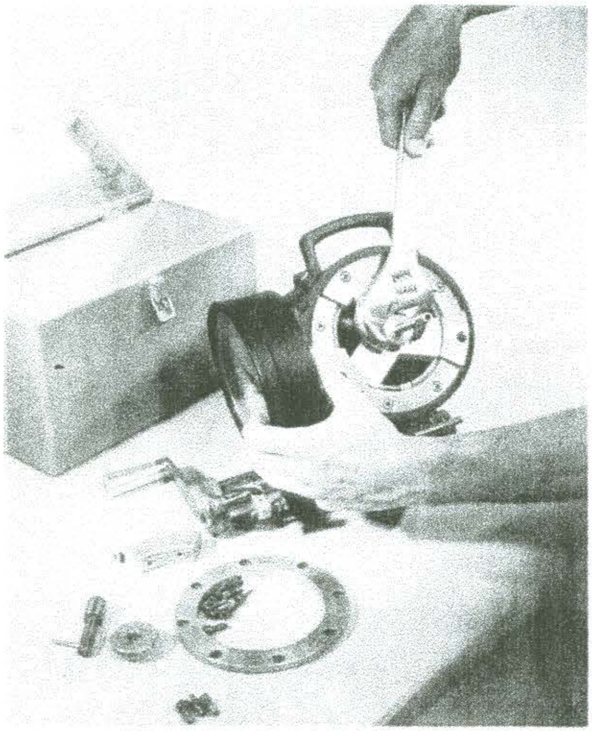
(a) (b)

FIGURE 14 - INSTALLATION OF THE NEOPRENE DIAPHRAGM (STEP 4)

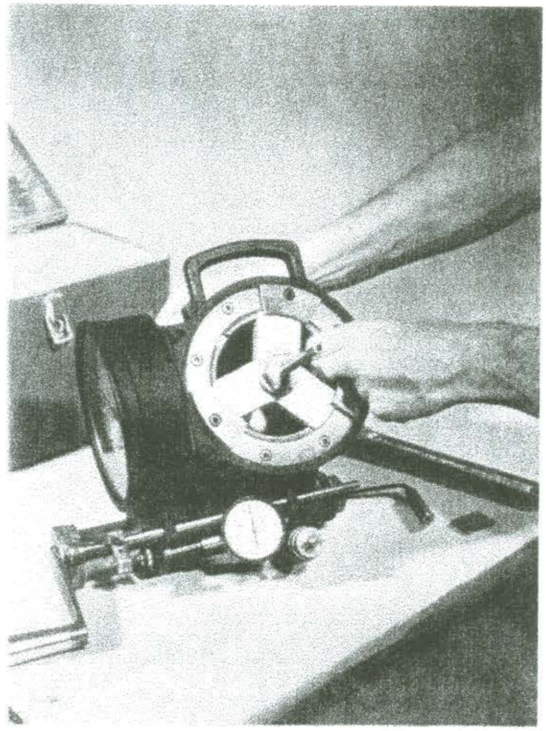
e. For Step 5, refer to Figure 15. After the waiting period, check the status of the flush gage with the wiper and if the center stud has receded below the machined face, again advance the drive screw until contact between the wiper and center stud is made as described above in Step 4. Upon completion of the check, turn the cinching nut, in a clockwise direction, to move the lower tapered ring into its proper position in the main body shell. See Figure 15a. In this "cinching" operation, the drive screw is permitted to turn with the cinching nut. However, after each revolution of the cinching nut, the status of the flush gage must be checked. If the center stud has receded below the machined face, then advance the drive screw until the proper alignment of the flush gage is attained. Continue turning the cinching nut (checking the flush gage at each revolution) until the nut can no longer be turned. At this point, the diaphragm is secured in the body shell at both top and bottom. The cut-out portion of the upper centering disk permits a manual check (with the fingers) of the tautness of the diaphragm. See Figure 15b.

f. For Step 6, refer to Figure 17. If the manual check reveals that the diaphragm is loose or slack, remove the installation device and diaphragm for the stabilometer and start over again from Step 1. If the manual check indicates that the diaphragm is taut, back the drive screw out of the cinching nut, and invert the stabilometer, then remove the diaphragm clamp and diaphragm clamping base. Using the cutting tool, (see Figure 16), cut the diaphragm off flush with the tapered ring. See Figure 17a. Secure the lower stabilometer clamp ring, in the same manner as the upper clamp ring, with the eight Allen screws. See Figure 17b.

Remove the lower centering disk and install the centering block and base-locking nut. See Figure 17c. Place the stabilometer in an upright position, remove the segmented disk clamps and upper centering disk assembly, and insert the remaining three Allen screws in the upper clamp ring. See Figure 17d.

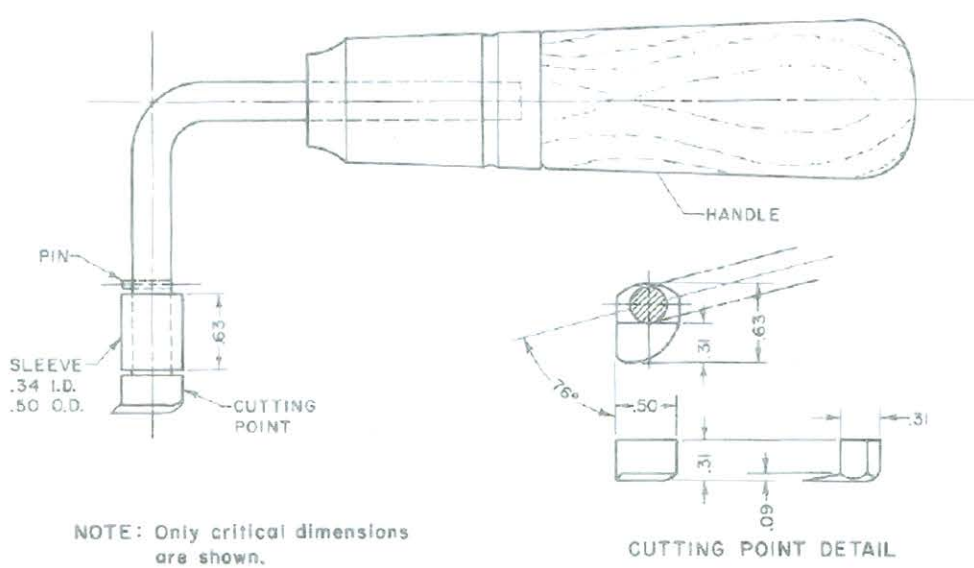


(a)



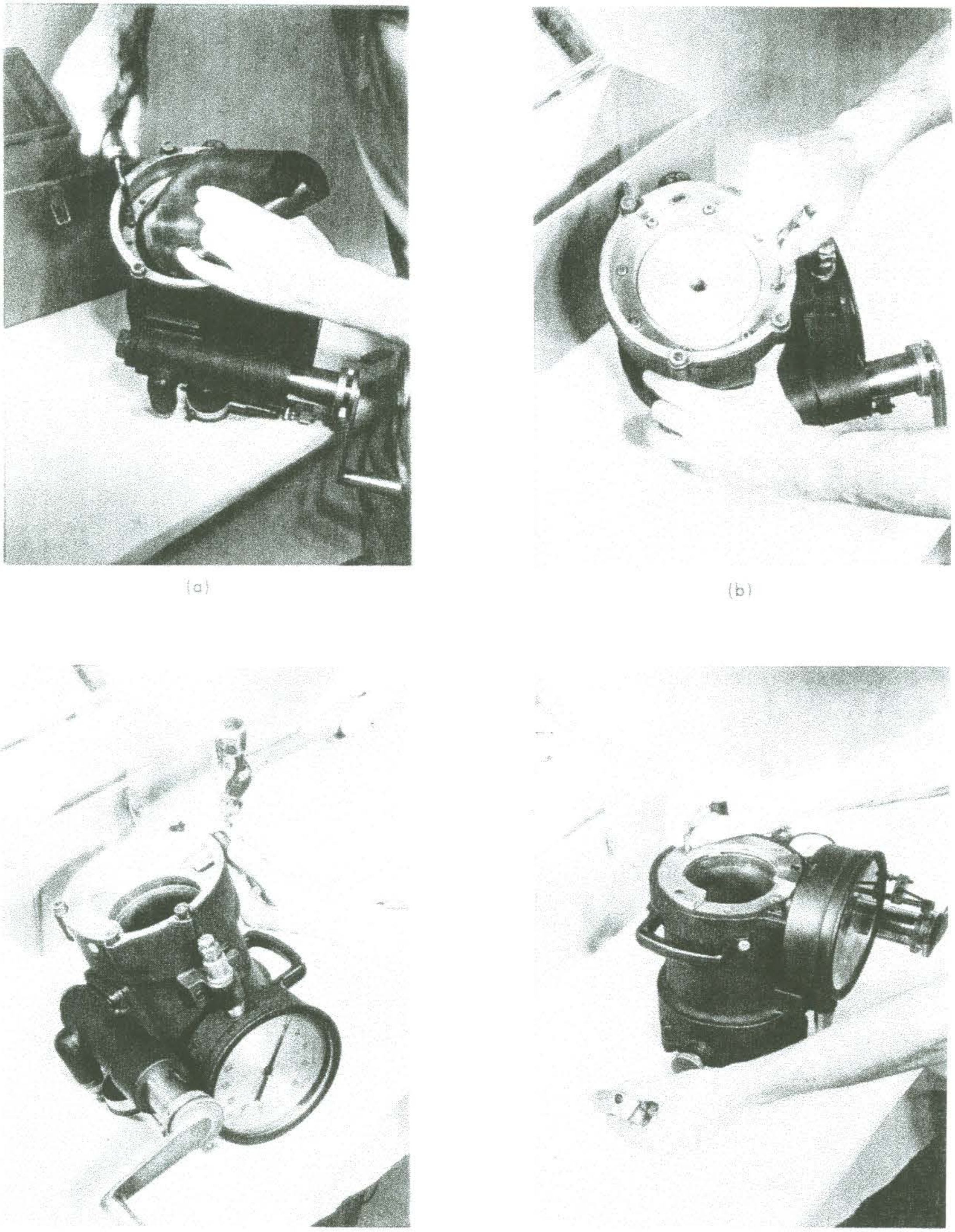
(b)

FIGURE 15 - INSTALLATION OF THE NEOPRENE DIAPHRAGM (STEP 5)



DIAPHRAGM CUTTING TOOL

FIGURE 16



(a) (b) (c) (d)

FIGURE 17 - INSTALLATION OF THE NEOPRENE DIAPHRAGM (STEP 6)

g. Step 7 consists of filling the stabilometer with hydraulic fluid. This is normally done through the threaded hole at the top of the air chamber, Item 14 of Figure 4, where the air adjustment valve seat, Item 13 of Figure 4, is secured.

NOTE: On some models of the stabilometer it is best to fill through the plug openings at either the rear of the pump assembly or the point where the pump line connects with the main body shell.

Before the filling operations commence, secure the safety valve, Item 9 of Figure 3 (which was previously opened to remove the fluid) and turn the pump piston so that the pump handle is about 3 in. from the front edge of the pump cylinder. During the filling operation, the stabilometer should be gently tapped or moved to assist in the release of air pockets. It is important that the major portion of the air be removed from the main body and pressure gage. After this is accomplished effectively the air necessary for the correct adjustment of the stabilometer may be added and controlled easily at the air adjustment of the stabilometer may be added and controlled easily at the air adjustment needle valve. See Item 12 of Figure 4. When the stabilometer apparently becomes filled with fluid, replace and tighten (by hand only) the valve seat and needle valve. Pick the stabilometer up and turn it back and forth to work out any entrapped air through the air chamber. Insert the standard metal specimen into the stabilometer for the full length of the diaphragm and turn the pump handle until 3 or 4 psi is registered on the horizontal pressure gage. Then open the air adjustment needle valve and release the accumulated air. Repeat the rolling and release the procedure until no further air escapes. As a final operation to remove the air from the Bourdon tube in the pressure gage, invert the stabilometer with thestandard metal specimen in place as before. Using the pump, vary the horizontal pressure from about 5 psi to 150 psi and back again about a dozen times. This agitates and raises any remaining air bubbles from the gage into the elbow. See Item 10 of Figure 3. To release this air, set the stabilometer pressure with the pump at 1 or 2 psi and slowly open the safety valve. See Item 9 of Figure 3. Some fluid spillage will result from the small amount of pressure in the system; however, this assures that additional unwanted air will not be pulled in the stabilometer.

h. Step 8 is described below.

The diaphragm installation is now complete as shown in Figure 18 and all that remains before use in test operations is the adjustment of the amount of air in the air cell. To do this, follow the instructions in Part 5 of California Test 301 or Part 3 of California Test 304. The instrument will then be ready for use.

H. PROCEDURE FOR CALIBRATION OF FLUSH GAGE

1. For this operation, the following apparatus is required.

   a. A scale must have a minimum capacity 100 lb and be accurate to within one oz. It must be attached with Items b and c (below) as shown in Figure 19.

NOTE: Any counter scale meeting the accuracy requirements may be used for this calibration. The scale shown in Figures 19 through 23 is typically used for the calibration of expansion pressure devices. See California Test 103.

b. A screw-type-loading frame is required.

c. A centering disc is required.

d. A loading cage is required.

2. Prior to calibration, loosen the lock screw on the side of the flush gage shell and the side of the diaphragm-clamping base and unscrew the Allen head screw on the bottom of the diaphragm-clamping base. Refer to Figure 7 for the nomenclature of the diaphragm clamping base assembly. This will allow the flush gage shell to move freely on the diaphragm-clamping base.

3. Attach the screw-type-loading frame to the counter scale. See Figure 19.

4. Place the centering disc, diaphragm clamping base assembly, and loading cage on the scale platform. See Figure 19. Balance the beam by adding weights to the pan and moving the counterpoise to the appropriate position.

5. Position the centering disc diaphragm clamping base assembly, and loading cage as shown in Figure 20.

6. Add a 100 lb. weight to the weight pan and advance the load frame screw until the scale beam is balanced. See Figure 20.

7. Adjust the position of the flush gage shell so that the center stud of the flush gage comes in line with the machined face of the flush gage shell. This condition is detected when the straight edge of the wiper, moving across the shell, just touches, but is not impeded by the center stud. See Figure 21. Hold the flush gage shell in this position and tighten the flush gage lock screw. See Figure 22.

8. Advance the Allen head screw on the bottom of the diaphragm-clamping base until it comes in contact with the bottom of the flush gage shell. See Figure 23. Securely tighten the set screw on the side of the diaphragm-clamping base. See Figure 24. The Allen head screw on the bottom of the diaphragm-clamping base is a means of detecting a change in position of the flush gage shell relative to the center stud. If at some future date, the Allen head screw and flush gage shells are not in contact, re-calibration will be indicated.

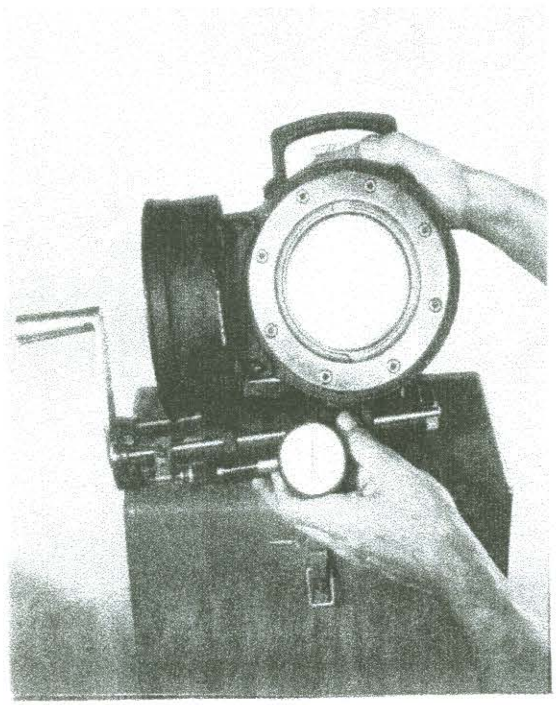


FIGURE 18 - COMPLETED DIAPHRAGM INSTALLATION

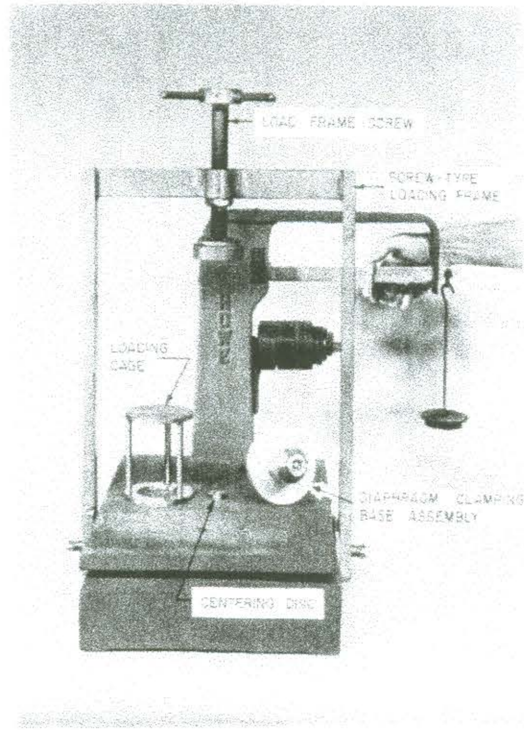


FIGURE 19 - ATTACHING THE LOADING FRAME TO THE COUNTER SCALE

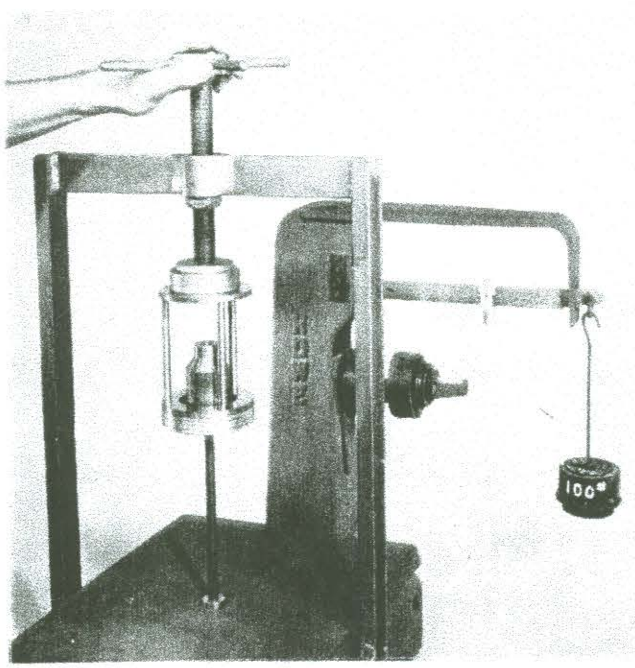


FIGURE 20 - BALANCING THE SCALE BEAM

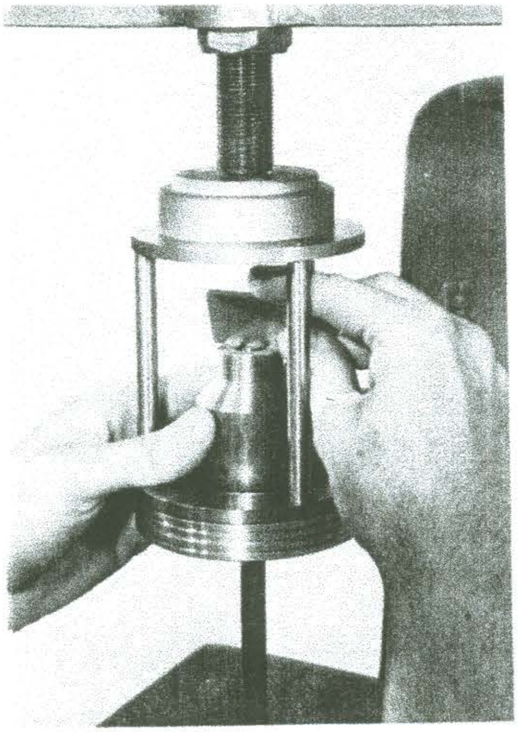


FIGURE 21 - STRAIGHT-EDGE TEST

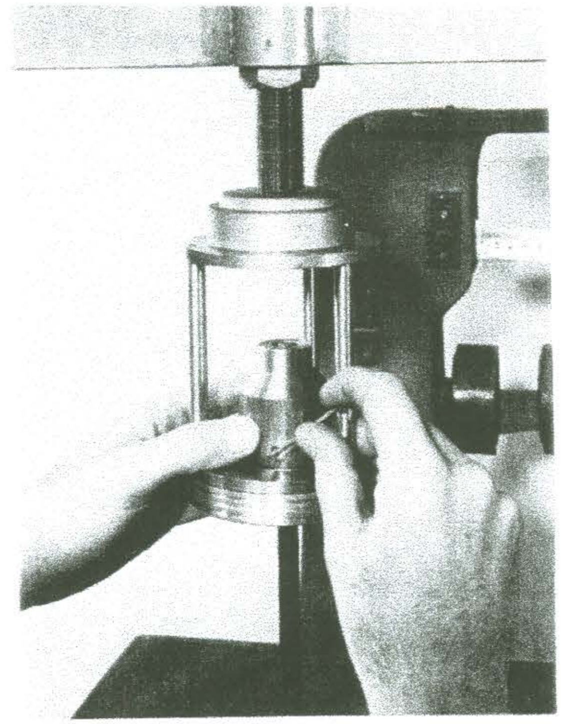


FIGURE 22 - ADJUSTING THE FLUSH GAGE LOCK SCREW

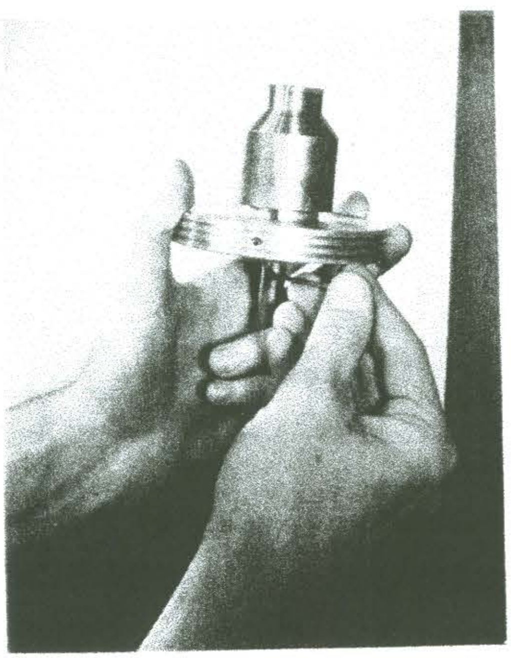


FIGURE 23 - ALIGNING THE DIAPHRAGM CLAMPING BASE

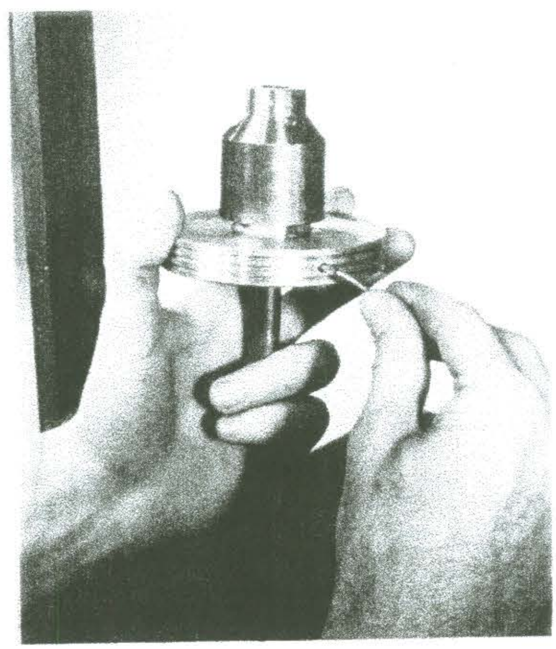


FIGURE 24 - TIGHTENING THE SET SCREW (DIAPHRAGM CLAMPING BASE)

I. PROCEDURE FOR MEASURING DIAPHRAGM TENSIONCALIBRATION

Except for obvious malfunctions such as oil leaks and excessive wear, a device called the Stabilometer Diaphragm Tension Tester must be used (see figure 25) to measure the elasticity of rubber at the mid front, left, back and right of Stabilometer. If the elasticity reading is below 30 or above 60 the diaphragm must be replaced.

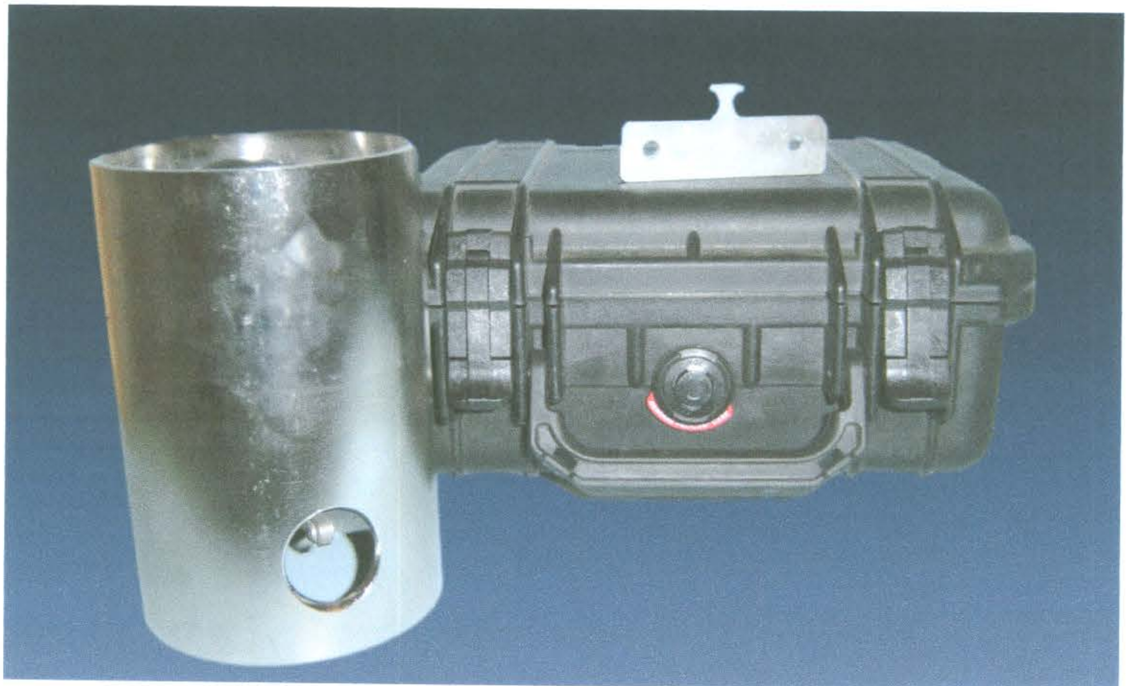


Figure 25- Stabilometer Diaphragm Tension Tester

I. HEALTH AND SAFETY

It is the responsibility of the user of this test method to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. Prior to handling, testing or disposing of any materials, testers must be knowledgeable about safe laboratory practices, hazards and exposure, chemical procurement and storage, and personal protective apparel and equipment.

Caltrans Laboratory Safety Manual is available at:

http://www.dot.ca.gov/hq/esc/ctms/pdf/lab_safety_manual.pdf

End of Text
(California Test 102 contains 23 pages)