

Calibration Checks and Your Test Track

As we say in Appendix VI of the operator's manual, always collect data using Moon Feet **We strongly recommend that you make yourself a test track and use it to verify that your Dipstick[®] is working correctly.** If you ever question the Dipstick, the test track will tell you if it's OK or not.

Making a Test Track:

1. Find a smooth hard surface with about 50 ft of clear space near your office to use as a permanent test track. You can use a concrete floor or sidewalk. Do not use a wooden floor. You want this to be conveniently located so you will use it often. Indoor floors are better than outdoor floors because they are affected less by temperature changes and you don't have to get wet when it's raining.
2. At one end of the floor surface you want to use as a test track, mark a circle around the BATTERY END moon foot.
3. Using a chalk line, snap a line tangent to the circle you made in step 2. Make the line about 50 ft long. You can do this successfully with a 25-ft or 35-ft line, but we recommend using a 50-ft line if you have the space.
4. Spray-paint the line with clear lacquer to preserve the line. You can use any clear spray paint you can get in a hardware store. Let it dry.
5. Starting with the battery-end Moon Foot on the circle, walk the Dipstick down the line *without collecting data*. Walk along the line so the front Moon foot always is tangent to the line. Do this very carefully, because this is the path you will always walk later. When you reach 50 ft, stop and draw a circle around the battery end Moon Foot. Since the 50th step is an even-numbered step, the battery end will be forward, and the Start end will be facing backwards.
6. Mark a circle around the BATTERY END moon foot. This is the 50-ft mark.

Start point

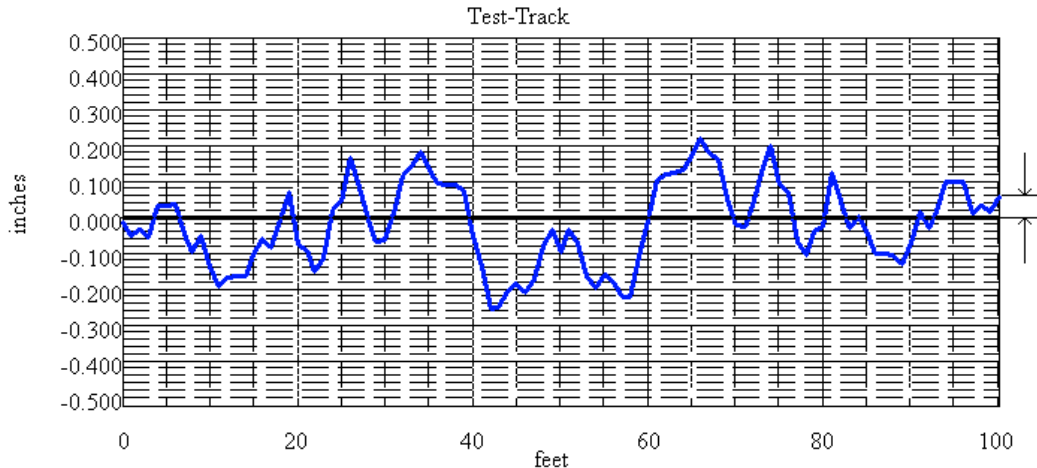


~ 50 ft

End point



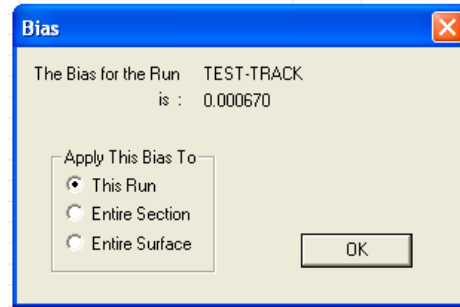
7. Now go back and **collect data** on this same line, starting with the battery end Moon Foot on the "start" circle, and ending with the battery end on the "50-ft" circle. For convenience, use a start point elevation of 0. (Zero) **DO NOT STOP** the program when you get to the 50-ft mark. At the 50-ft mark, you have collected 50 readings. Now we want to collect 50 more readings without stopping, going all the way back to the start point. When you get back to the start point, you should have 100 readings - 50 out, and 50 back. Many people have difficulty right at the 50-ft mark because they skip the 51st reading. Note that the first reading going back towards the start point (the 51st reading) will be exactly in the same place as the last reading going out away from the start point (the 50th reading). So after collecting the 50th reading, pick up the start end and set it down in the same place to get the 51st reading. Then swivel the Dipstick to get the 52nd reading, etc. until you get back to the start point. You should now have 100 readings, and the battery end Moon Foot should be exactly on the circle you used as the start point. Press <Enter> to stop collecting data. The computer will give you a graph of the profile and the F-Numbers for this run.



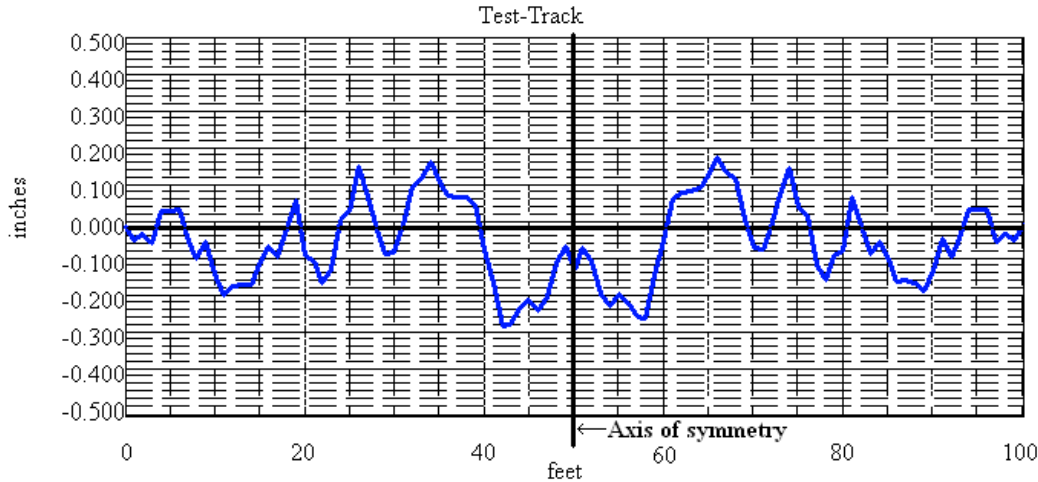
The end of the run should be slightly higher than the start, as shown above.

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8. Clear the Combined Section F-Number screen, select the run you just collected, and use CALCULATE/BIAS to calculate the Data Collection Bias of this Run.
9. The Bias should be small, between 0.0005 and 0.002, but certainly not more than 0.003. The value of the Bias will depend on the surface texture of the floor you are walking on, as well as how clean it is. Smoother texture, less dust = smaller Bias. More texture (like a sidewalk) and/or more dust, grit, etc, on the floor = higher Bias. The Bias should always be positive, not negative, unless it is less than 0.0005. Apply the Bias only to this Run.

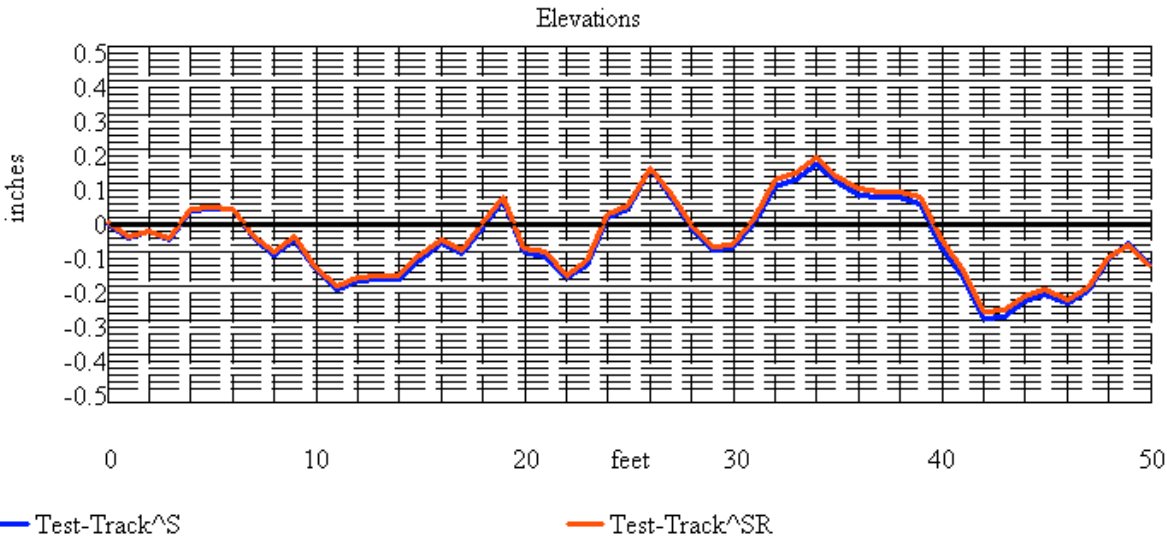


10. Now use REPORT/GRAPH to look at it again. The profile will start and end at 0.00", and it will be symmetric about the 50-ft point. It may look like a butterfly or a gull-wing, or just sloped one way and then back up. Whatever it



looks like, the left half will be a mirror image of the right half. The fact that it is symmetric shows you that the Dipstick is collecting the data exactly the same out and back.

11. To examine it even more closely, close the graph and use EDIT/SEGMENT to segment the Run from 1 to 50. select the original 100-ft Run again, and segment it again, from 51 to 100. Now use EDIT/REVERSE to reverse the last run you made (from 51 to 100).
12. Now select both of the 50-ft runs and use REPORT/GRAPH to show both of them together. They should ideally form a single line, with one of the Runs overlapping the other line.



Note how the two runs overlap each other. Since you are now showing only the first half of the run, it will no longer end at an elevation of zero. (The end point elevation is the elevation of the 50-ft point.)

13. Close the program and save the data where you can find it easily.

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14. Any time you want to check the Dipstick, collect a run on the test track and compare the data to the data you collected above. If you do it right, and if the floor has not changed because of temperature or humidity or curling, the F-Numbers will be the same, and the profiles will be the same. If you do step 11 above with your new data, you can use TOOLS/MERGE from the Dipfloor 6.1 program to merge the old data with the new data. When you overlay today's two 50-ft runs on top of the original two 50-ft runs, you should have a single profile instead of 4 profiles. They will all lie on top of each other.

This is the best way for you to check your Dipstick®. This "Test Track" method is easier than trying to use the calibration shim and gives you confidence that the Dipstick is working right.

Checking Calibration with the Calibration Shim

The Dipstick® 2272 is calibrated at the factory. The calibration constant is very stable, so during a normal lifetime of Dipstick® use, it normally never needs recalibration. Occasionally, we run across a Dipstick® that we built in 1986. When we check one of them, it almost always is still calibrated correctly. Please note that the Dipstick® 2272 is calibrated on a special table under controlled conditions. Unless you have similar equipment, your check will not be as accurate as the Dipstick®. We calibrate the Dipstick® to an expected error of less than 0.001". We are almost always able to achieve an expected error of less than 0.0005". You will probably only be able to check to an error within about 0.002". The "Calibration Shim" we provide in the kit is for your peace of mind. Since you cannot actually calibrate the Dipstick® yourself, it is only used for you to check calibration. If you feel that you must check the Dipstick, we recommend the use of a test track as explained above. But if you really feel that you must check the Dipstick by using a calibration shim, here's how to use it:

To Check Calibration with the Shim

1. Remove the Moon feet (2.5" diameter pads) and install spike feet in the same holes. (Pointed spikes that screw into the bottom of the Dipstick®) BE SURE to get the spike feet into the proper holes on the bottom of the Dipstick®. If you are in the USA, and use inches and feet, put the spike feet in the holes that are marked "12" meaning "12 inches".
2. Place the Dipstick® on a smooth, hard surface that will not move. (A machinist's table, optical table, or similar) Don't attempt to do this on a desk. If you don't have a machinist's table, you can use a burnished concrete floor. (not a sidewalk with broom finish) Wipe the surface with a barely damp rag to remove any dust. Don't leave the surface wet.
3. Zero the Dipstick® following the procedures in Chapter 2 of the Dipstick® operator's manual. In this case, since you are now using spike feet instead of "Moon" feet, you should make a small dot with a permanent marker under each pointed foot. The dots should be tiny - as small as you can make them, and PRECISELY under the point of each foot.
4. After Zeroing, and WITHOUT MOVING THE DIPSTICK®, record the number you see in the "start" end window.
5. Lift up the "Start" end of the Dipstick® unit and place the "calibration shim" under the foot and directly on top of the mark. Lower the Dipstick® unit onto the shim, with the foot being placed directly in the middle of the shim. Record the reading in the start end window, which will be different now that the Dipstick® is sitting on the shim.
6. The second reading should be the sum of the first reading plus the thickness of the shim. The shim is 0.125" thick.
7. Add the thickness of the shim (+.125" or 3.2mm) to the reading you got in step 4. above. Be sure to take any negative signs into account. Compare this number to the reading you see in the start end window when the Dipstick® is sitting on the shim. They should be the same. Since you probably don't have a machinist's table or an optical table, you may not be able to get the exact reading. If the numbers match within + or - 0.003", you are close enough. A human hair is about 0.003" thick. Remember that we calibrate to less than 0.001".
8. When you are finished, change back to the Moon Feet and *be sure to re-zero the Dipstick®* after you have re-installed the moon feet. Leave the Moon Feet on the Dipstick® except when you are checking calibration.

If you have problems when you check calibration:

- Ensure that the shim is clean and free of corrosion.
- Be sure the feet are in the proper holes.
- Check to see if the zeroing is still correct. (Be sure to warm up for 5 minutes before zeroing)
- Ensure that the calibration shim is not "bridging" over irregularities on the surface. This can cause calibration readings to be high.

If the zeroing is still correct and calibration is still off:

- Recharge the batteries in the Dipstick unit.
- Re-zero the Dipstick and check calibration again.

If the Dipstick still does not calibrate within 0.003" tolerance, it must be returned to the Face Company for internal adjustment.

Because this procedure is a bit tedious and requires special care to do it correctly, and because the Dipstick 2272 has been shown to hold its calibration for years, we do not recommend that you do this often. Do it just often enough for you to become satisfied that it is still correct. Use the "Test Track" method instead.