NewArc™ Wheel Straightener

Bend Assessment Measurements

For Straightening Considerations

Before a straightening repair is considered, correct evaluation is vital. Wheels should not be straightened when the deformation has compromised the structural integrity. The following types of bends could compromise the structural integrity of a wheel and cannot be straightened on-site.

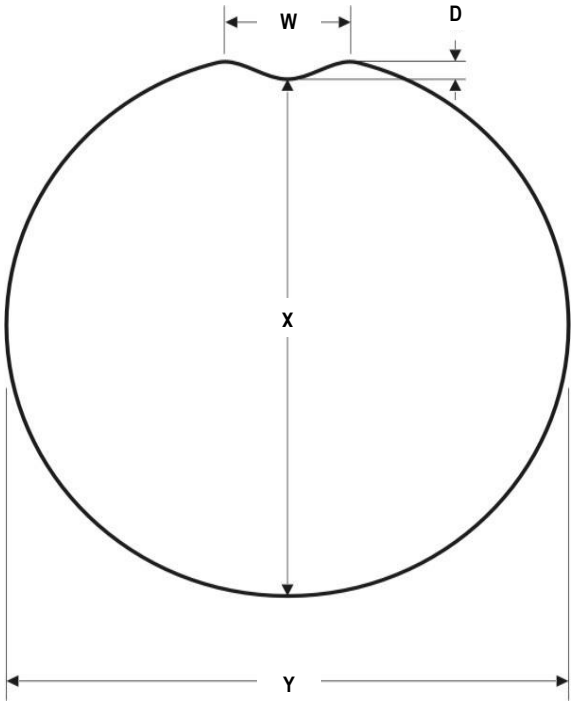
- Any wheel that is cracked
- Any bend in the spoke on a wheel

Recognize the Best Method

Only wheels straightened, using the NewArc™ process, have been successfully tested to SAE standards. This is true even if the tire is left on the wheel during the process. However, it is best practice to remove the tire as more aggressive and enhanced methods can be incorporated.

Dimensional Relationships Ratio

Bend depth and width measured as a ratio is used as acceptance criteria. Width of bend must be at least 14 times the depth to qualify for on-site straightening.



D = Depth of bend
W = Width of bend
X = Diameter under bend
Y = Normal diameter

DISQUALIFICATION FORMULA

If D > 14/W
Then
DO NOT STRAIGHTEN

NewArc™ Wheel Straightening System

BEND DEPTH RATIO REFERENCE CHART

BEND DEPTH

BEND WIDTH

	3/4	11/16	5/8	9/16	1/2	7/16	3/8	5/16	1/4	3/16	1/8	1/16
15.0	20	22	24	27	30	34	40	48	60	80	120	240
14.5	20	21	23	26	29	33	39	46	58	77	116	232
14.0	19	20	22	25	28	32	37	45	56	75	112	224
13.5	18	20	22	24	27	31	36	43	54	72	108	216
13.0	17	19	21	23	26	30	35	42	52	69	104	208
12.5	17	18	20	22	25	29	33	40	50	67	100	200
12.0	16	17	19	21	24	27	32	38	48	64	96	192
11.5	15	17	18	20	23	26	31	37	46	61	92	184
11.0	15	16	18	20	22	25	29	35	44	59	88	176
10.5	14	15	17	19	21	24	28	34	42	56	84	168
10.0	13	15	16	18	20	23	27	32	40	53	80	160
9.5	13	14	15	17	19	22	25	30	38	51	76	152
9.0	12	13	14	16	18	21	24	29	36	48	72	144
8.5	11	12	14	15	17	19	23	27	34	45	68	136
8.0	11	12	13	14	16	18	21	26	32	43	64	128
7.5	10	11	12	13	15	17	20	24	30	40	60	120
7.0	9	10	11	12	14	16	19	22	28	37	56	112
6.5	9	9	10	12	13	15	17	21	26	35	52	104
6.0	8	9	10	11	12	14	16	19	24	32	48	96
5.5	7	8	9	10	11	13	15	18	22	29	44	88
5.0	7	7	8	9	10	11	13	16	20	27	40	80
4.5	6	7	7	8	9	10	12	14	18	24	36	72
4.0	5	6	6	7	8	9	11	13	16	21	32	64
3.5	5	5	6	6	7	8	9	11	14	19	28	56
3.0	4	4	5	5	6	7	8	10	12	16	24	48
2.5	3	4	4	4	5	6	7	8	10	13	20	40
2.0	3	3	3	4	4	5	5	6	8	11	16	32
1.5	2	2	2	3	3	3	4	5	6	8	12	24
1.0	1	1	2	2	2	2	3	3	4	5	8	16

PROCEED WITH STRAIGHTENING

STOP AND SEEK ALTERNATE REPAIR METHOD

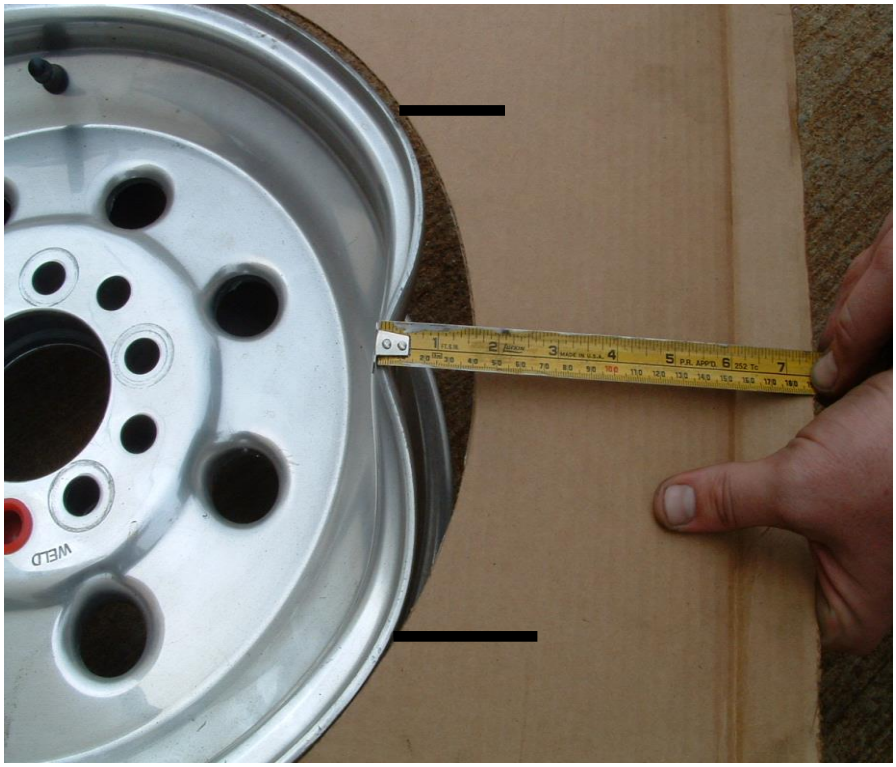
As the bend depth increases, the width becomes critical when straightening severe deformations.

Example: If a bend were 1/2" deep but only 4" wide, the ratio rounds to 8:1 and would be disqualified for straightening. As the width of the bend increases, the ratio also increases and the chances of successful straightening increase as well. Note that, if the width were 11", it would fall in the "Proceed with Straightening" category and should be a good repair opportunity with a 22:1 ratio.

Measuring Bends Accurately

Dimensional Relationships Illustration

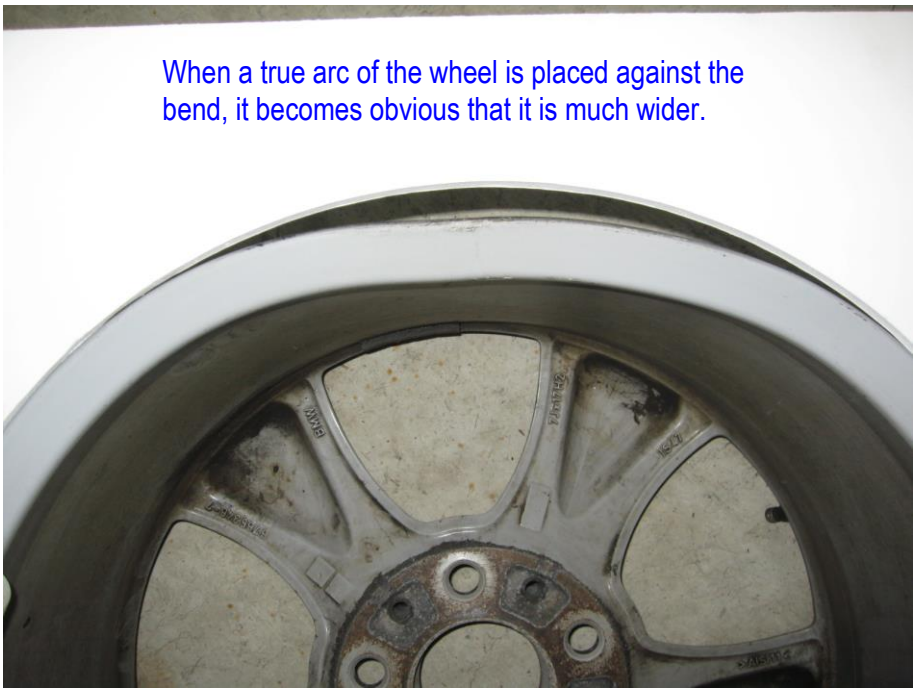
To obtain accurate acceptance criteria ratios, measurement of bend depth and width must be made correctly. It is difficult to obtain accurate readings of bend depth and width unless you can compare the damaged area with the normal arc of the wheel. Only then can accurate measurements be obtained.



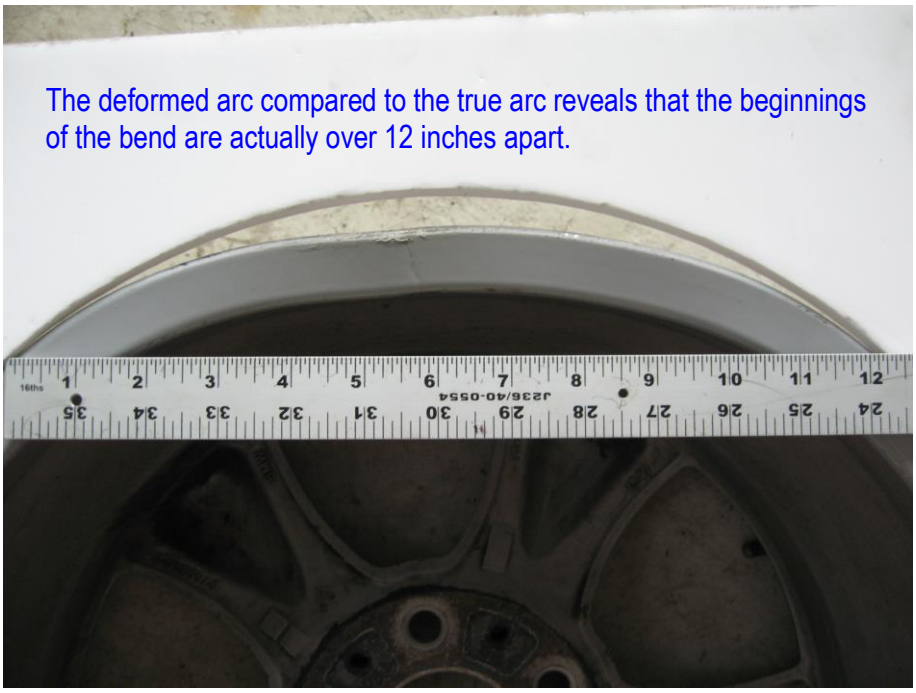
In the above example a piece of cardboard was cut to the true arc of the wheel and then placed against the bend area. The width and depth of the bend can then be easily measured. Without such a true comparison device, the measurements can result in false values and inaccurate acceptance criteria assessments. The most misleading measurement will frequently result while attempting to measure the width of a bend.

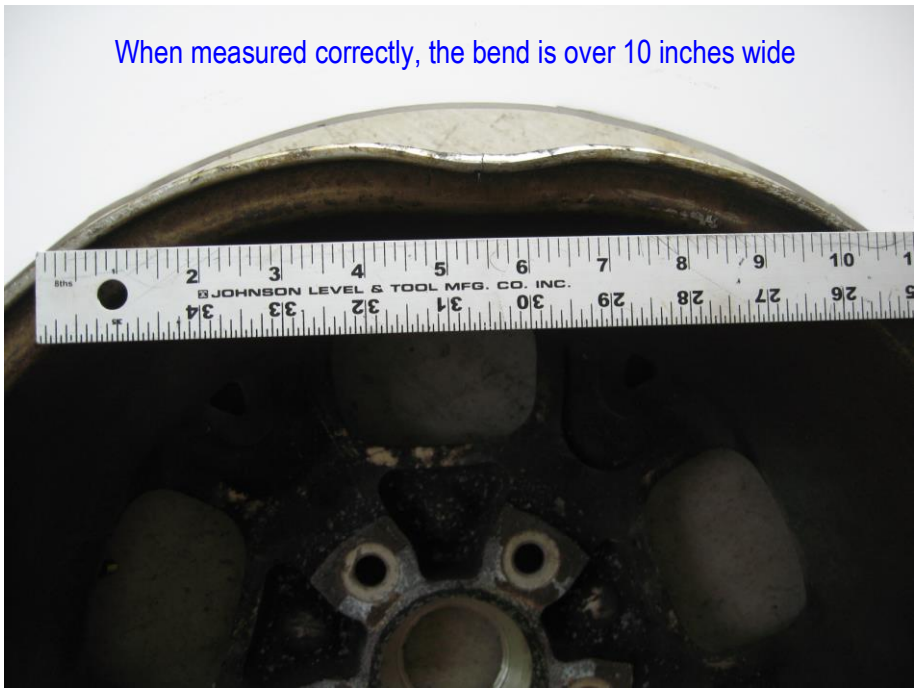
Misleading Assessments of Bend Width

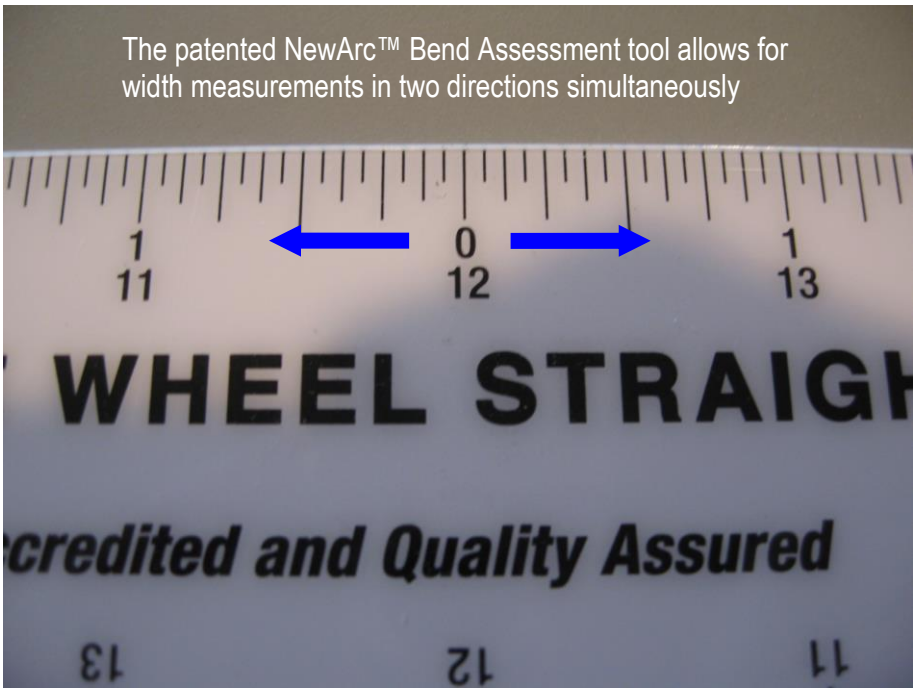
When a true arc of the wheel is placed against the bend, it becomes obvious that it is much wider.

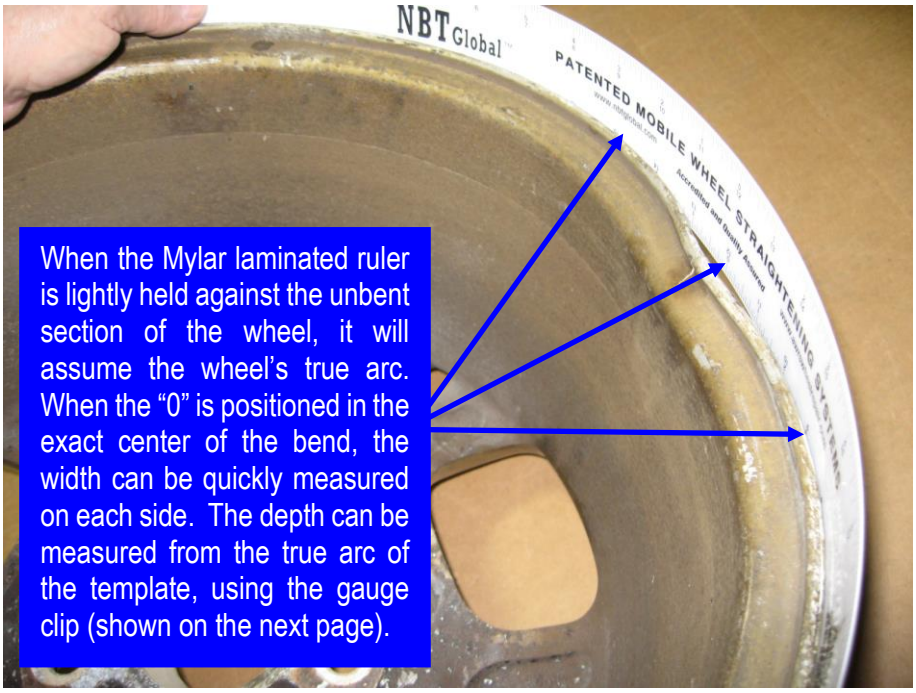


The deformed arc compared to the true arc reveals that the beginnings of the bend are actually over 12 inches apart.

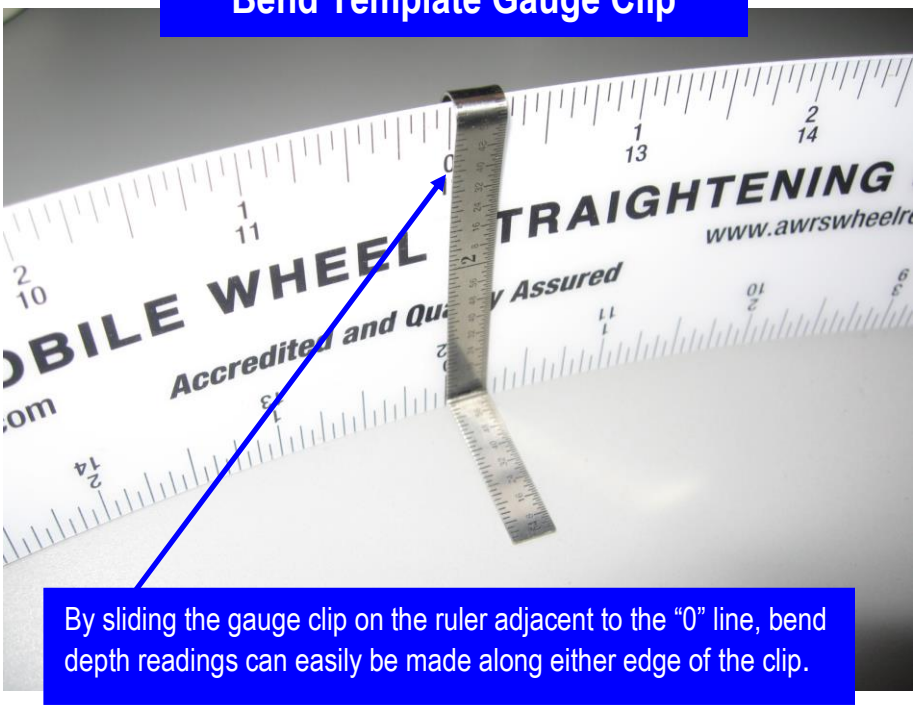




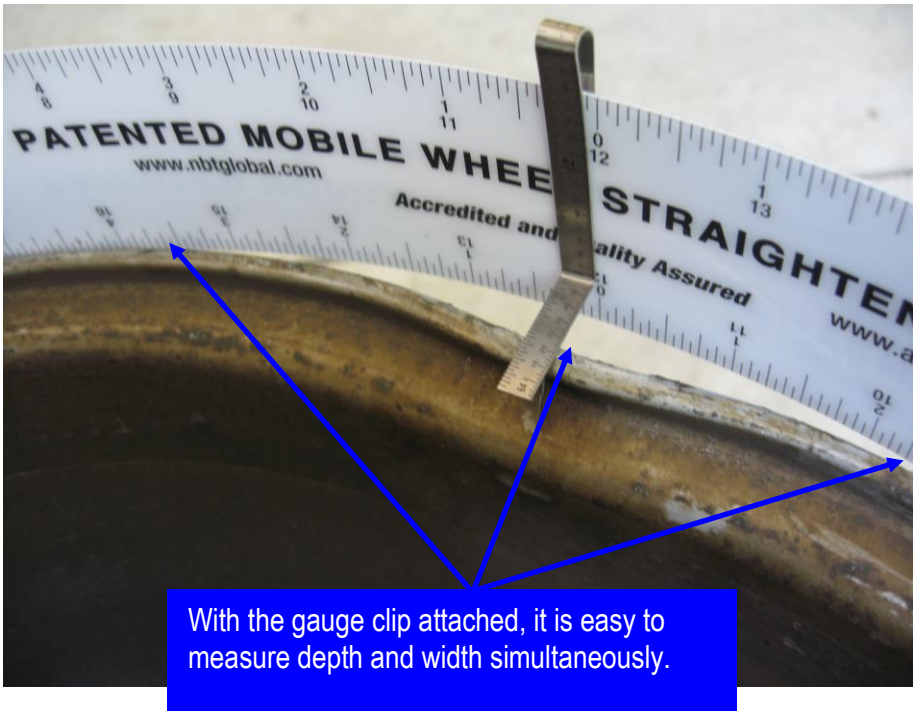




Bend Template Gauge Clip



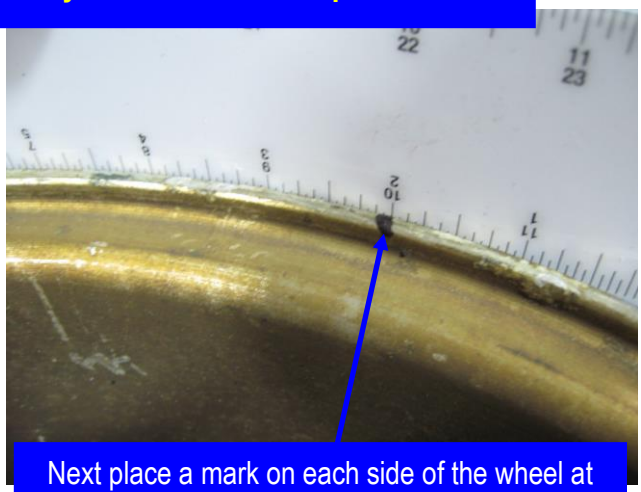
By sliding the gauge clip on the ruler adjacent to the “0” line, bend depth readings can easily be made along either edge of the clip.



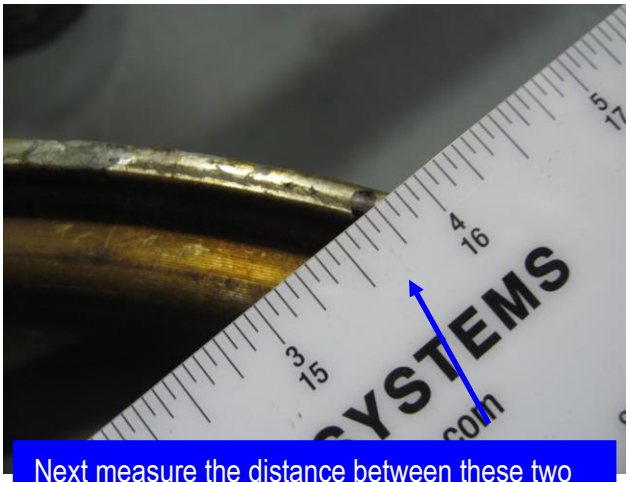
With the gauge clip attached, it is easy to measure depth and width simultaneously.

If you are unsure about the accuracy of the arc when measuring very wide bends, you can double-check it by using the **Accuracy Validation Technique**.

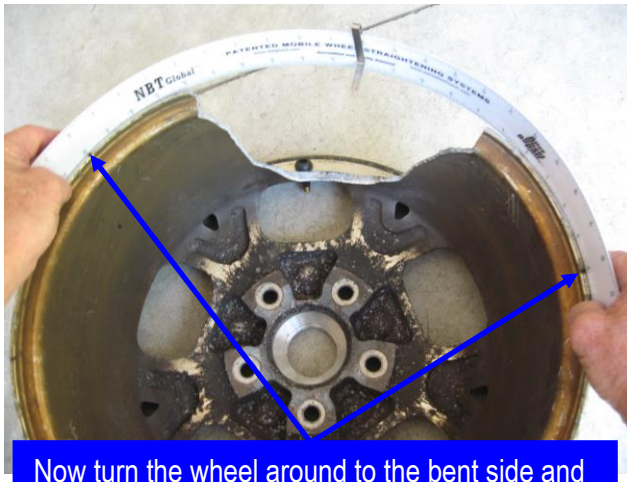
First, place the template tightly against the unbent side of the wheel, as shown here.



Next place a mark on each side of the wheel at the 10-inch measurement on the template.



Next measure the distance between these two marks straight across the wheel. The distance shown here measures out at 15 ¾".



Now turn the wheel around to the bent side and make two marks straight across the bend site 15 ¾" apart, as shown here.

The last step is to place the 10-inch measurements on the template at those marks. The template will automatically assume the true arc of the wheel.

- *The broken wheel seen here is beyond repair. It was simply used to illustrate how the true arc of a wheel can be replicated with this tool, even across a gap this large.*