



NewArc™ Wheel Straightener

Reference and Qualifying Material

Essential Qualifying Material Explained

The photos on the following pages explain the qualifying components packaged with your NewArc™ Wheel Straightening Machine. These items include tools, instructions and reference materials required to perform SAE accepted wheel straightening repairs.

Included Items

The following items are included with your NewArc™ Wheel Straightening Machine.

- Dye Penetrant Kit
- Infrared Thermometer
- Reference Material
- Bend Assessment Tool
- Quality Assurance Reports
- Temporary Repair Labels



Dye Penetrant Kit

This is the state-of-the-art inspection system used both in the aerospace and automotive industries to detect cracks in critical components such as turbine blades and crankshafts.

The kit contains a proprietary fluorescent dye and an ultraviolet light, which is used for examination. Replacement items from the kit can be purchased directly at our website store.



Infrared Thermometer

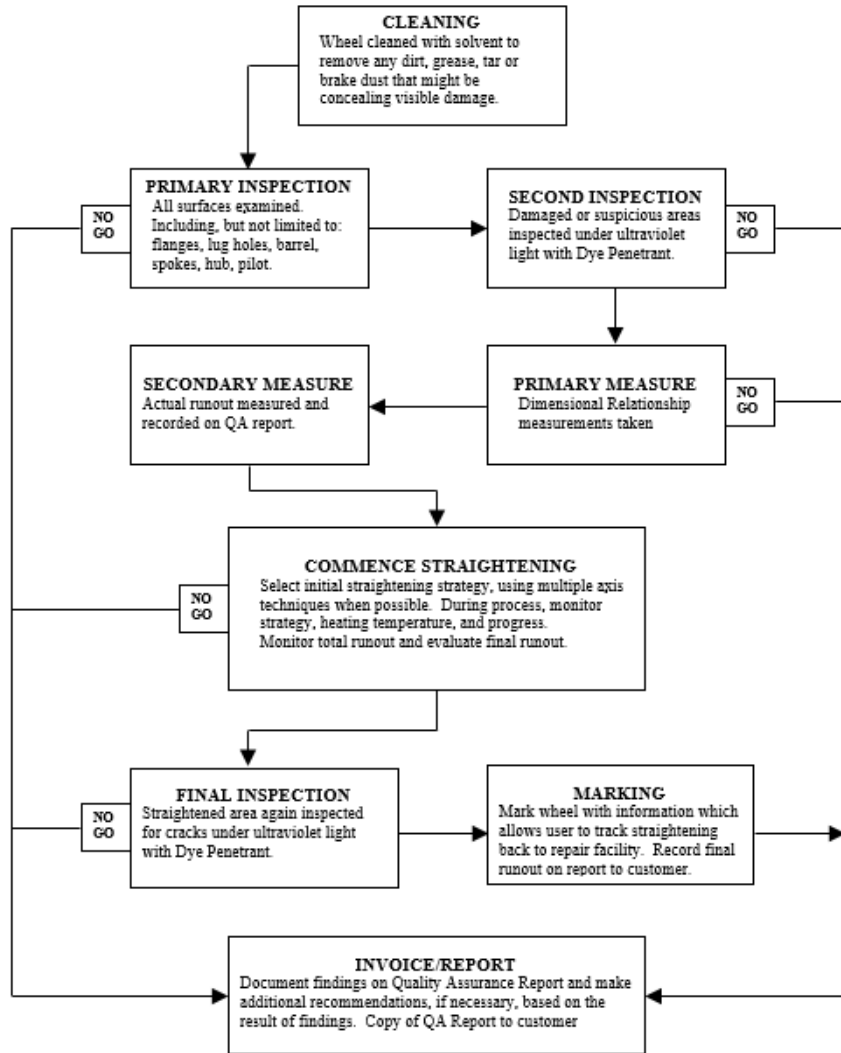
As you apply heat to the wheel, this device is used to monitor wheel temperature. A laser targets the heating area and displays the temperature on a screen. In order to monitor heat applications properly, this tool must be used. This monitoring method insures that the NewArc™ established limits recognized by the SAE are not exceeded.

Reference Material

Technician reference material is used in coordination with the Decision Flow Chart for approved methods, which include inspection, repair, marking and recording. This material is also used for bend evaluation to determine if it falls within the NewArc™ established acceptance criteria for straightening. The following reference material is included:

- Decision Flow Chart
- Do Not Straighten Formula
- Bend Ratio Chart
- Bend Assessment Tool
- Quality Assurance Reports
- Temporary Repair Labels

NewArc Tech, LLC
WHEEL STRAIGHTENING PROCESS DECISION TABLE
 For Wheel Straightening Using The NewArc™ SRS Series Machines



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Revised 10/10/16

Decision Flow Chart

This flow chart shows the patented NewArc™ procedures that must be used on every straightening repair to qualify or disqualify wheels. This process was certified by Independent Test Services and was subsequently presented to the Society of Automotive Engineers. In April 2016, this wheel straightening process was officially recognized by the Society of Automotive Engineers.



**INDEPENDENT
TEST
SERVICES**

Certificate # ITS SAE J2530 009
Wheel Part Number: Wheel Straightening Process
On PN: 5E298TRMAB

Date: 10/22/2009

Photo of Wheel



4.1 NBT Global
4.2 10/22/09
4.3 5E298TRMAB
4.4 Jeep
4.5 5x127

Manufacturer's Criteria

Manufacturer Name:	NBT Global Wheel Straightening
Rated Load by MFG:	1600 lb
Largest Overall Diameter Tire:	P245/70 R16
Wheel Size:	16x7
Bolt Circle Provided:	5x127
Bolt Circle(s) to be Certified:	
Nut Seat Description:	60° cone
Wheel Finish:	Clear coat / Straightened

ACCEPTANCE TEST	QTY TESTED:	YES/NO
4.0 MARKING CRITERIA MET	1	YES
6.0 DYNAMIC CORNERING FATIGUE	7	YES
7.0 DYNAMIC RADIAL FATIGUE	7	YES
8.0 LATERAL IMPACT TEST	2	YES

DOES WHEEL DESIGN MEET OR EXCEED ALL CRITERIA PER SAE J2530?



Independent Test Services certifies the information from items A-B. Independent Test Services is accredited by ACLASS for ISO/IEC 17025 under a defined calibration and/or testing scope.

SAE J2530 Certificate 009 NBT GLobal

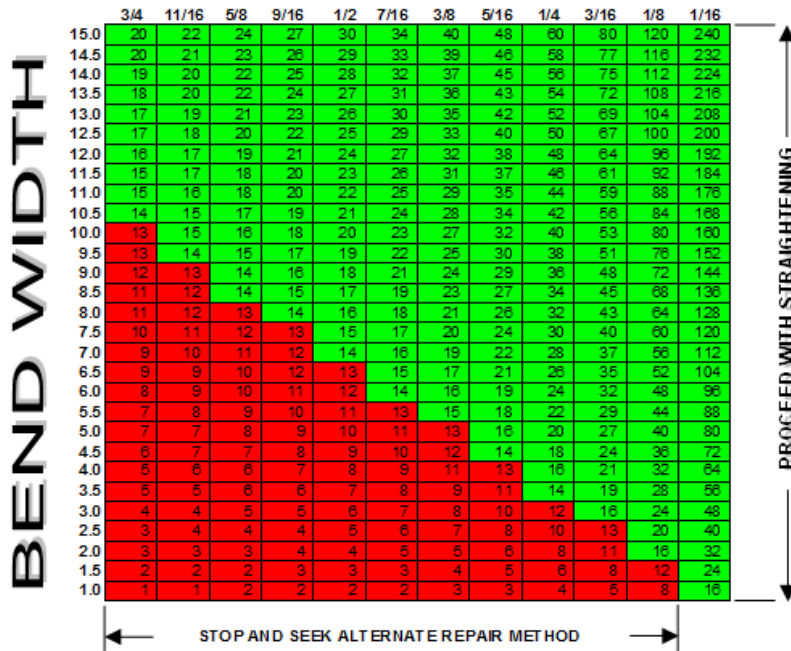
ITS Certificate

On the back of the Decision Flow Chart is a copy of the actual certificate issued by Independent Test Services. This document confirms that the patented NewArc™ repair process was scientifically certified and is now officially recognized by the Society of Automotive Engineers.

NewArc™ Wheel Straightening Technology

BEND DEPTH RATIO REFERENCE CHART

BEND DEPTH



Bend Ratio Chart

Studies have shown that the relationship between bend depth and width. The Bend Ratio chart is a guideline reference for assessing and qualifying wheel damage for repair in graph form. Once the bend is measured, the ratio of depth to width dimensions can be compared to determine if the wheel should be straightened. This chart will help to minimize chance of cracking a wheel during the straightening process.

NewArc™ Wheel Straightening Acceptance Criteria Guidelines For Standard Repair Services

Refer to NewArc™ Dimensional Relationship Chart for Additional Criteria

DO NOT STRAIGHTEN ANY MOTORCYCLE WHEELS

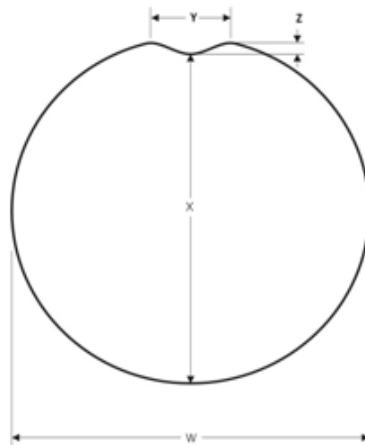
DO NOT STRAIGHTEN AUTOMOBILE WHEELS UNDER THE FOLLOWING CIRCUMSTANCES

Any deformation that appears to have compromised the structural integrity of a wheel. The following types of bends could compromise the structural integrity of a wheel and should not be straightened.

- Any wheel that is cracked
 - *Either visible or discovered during Dye Pen inspection (see Decision Flow Chart)*
- Any bend in the spoke on a wheel
- Any severe bend extending laterally through the hub of a wheel

DIMENSIONAL RELATIONSHIPS AND DO NOT STRAIGHTEN FORMULA

Dimensional comparison criteria can be used to determine severity.



The dimensions shown in the drawing on the left are defined as follows:

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

DISQUALIFICATION FORMULA

If $Y < 14Z$
Then
DO NOT STRAIGHTEN

See Bend Ratio Chart For Additional Examples

RECOMMENDATIONS TO CUSTOMERS ON CRACKED WHEELS

If primary, secondary or final inspections reveal cracks, the information must be documented on your invoice or on an official report to your customer and the wheel will not be repaired. If a wheel is cracked in such a way that would damage its structural integrity, it should not be repaired under any circumstances. This includes but is not limited to cracks in the following locations:

- Spokes
- Lug Holes
- Bead Seat
- ~~Centerbore~~
- Barrel
- Hub

NOTE: Depending on the type and location of the crack, it is possible that the wheel might still be repaired to a serviceable condition by a *qualified repair facility*. If a crack in a wheel is limited to the flange area, it *could be* safe to weld. If crack extends down into the bead seat, the wheel must never be repaired. Although the possibility of welding cracked wheels is feasible, more testing needs to be done. At the present time it is the policy of NewArc Tech, LLC that all cracked wheels be immediately taken out of service.

Acceptance Criteria

On the flip side of the Bend Ratio chart is the NewArc™ criteria for wheel straightening. This material includes a mathematic equation which reflects the same information shown in the graph. Other important compliance guidelines are provided as well.

In any case, it is imperative that the bend be measured accurately, which can be done with the Bend Assessment Tool. This template is also included in the components shipped with the machine.



Bend Assessment Template

Since it is difficult to determine the true width of a bend, NewArc Tech developed this tool to simultaneously measure the true width and depth of a bend. The accuracy of this tool can be validated. Validation method is explained on the Technical Pages of the NewArc™ website.

Once this ratio is established, you can use the previously described reference material to determine if the wheel can be straightened. A record of your assessment should be included with every repair.

Wheel Straightening Quality Assurance Report

NewArc™ Process Checklist
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Primary Inspection..... Pass Fail

Secondary Inspection..... Pass Fail

Number of Bend (s)..... _____

Location of Bend (s)..... _____

Maximum Deflection..... _____

Dimensional Relationship..... : Pass
 Fail

Final TIR..... _____

Date of Repair..... _____

Time of Repair..... _____

Heat Treat Control..... Pass Fail

Final Inspection..... Pass Fail

Marking Standard..... Pass NA

NewArc™ Machine Serial Number..... _____

Invoice Number..... _____

Comments _____

Technician Name: _____

Company Name: _____

Company Phone: _____

Completion of a repair record is required to meet the criteria established by the Society of Automotive Engineers. Please maintain a copy of all repair records associated with your vehicle.

Quality Assurance Reports

Professional repair standards dictate that all repairs be properly documented. One copy of this carbonless two page report is intended for the customer and the other is to be attached to company invoice as a permanent and traceable record. Instructions on how to complete this report can be found on the Technical Pages of the NewArc Tech website.

Wheel Straightening Repair Information	Wheel Straightening Repair Information
Company Name: _____	Company Name: _____
Contact Info: _____	Contact Info: _____
Date of Repair: _____	Date of Repair: _____
Repair Number: _____	Repair Number: _____
Wheel Straightening Repair Information	Wheel Straightening Repair Information
Company Name: _____	Company Name: _____
Contact Info: _____	Contact Info: _____
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Repair Labels

Every NewArc™ machines comes with repair labels that can be used until you get your own made. SAE standards dictate that repaired wheels be marked in a way that is traceable to those providing the repair. The best marking method is with a permanent that contains the essential information shown here on these temporary labels. Engraving is also an acceptable marking alternative as long as the engraving contains enough information to contact the repair facility, such as a company phone number.