PENN MACHINE COMPANY RESILIENT WHEELS: RESISTANCE TESTING PROCEDURE

PURPOSE

The purpose of this procedure is to reemphasize the required regular monitoring of tire to center and tire to tire resistance when using either external or internal shunt resilient wheels.

WARNING

LOSS OF CONTINUITY CAN AFFECT TRAIN CONTROL, SYSTEM SIGNALING, VEHICLE GROUNDING, AND TIRE INTEGRITY. A COMPLETE TIRE FAILURE COULD CAUSE A VEHICLE DERAILMENT. THUS, IMMEDIATE ACTION IS REQUIRED.

PROCEDURE

A Thompson Bridge, AEMC Corporation Model # 141.100 or Rhopoint Corporation M210 Resistance Meter is recommended. PMC's preference is the Rhopoint M210.

The following procedures, values, and actions should be taken for testing on all transit vehicles using resilient wheels.

Resistance readings should be checked from tire to center and from tire to tire on the same axle semiannually or at recontouring, whichever occurs first. These service checks should include each and every wheel and axle set on a car.

continued

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In order to perform resistance testing, the wheel and/or wheel set should be either raised or electrically isolated from the rail. Isolation may not be required. Check your individual rail isolation.

Isolation from the rail can be done by rolling the wheel set up onto a rubber mat or similar nonconductor. ***Also, isolation at wheel recontouring can be considered.***

The tire and center should be cleaned with 80 grit emery cloth and mild solvent in an area where readings are to be taken. Good contact is essential to getting an accurate reading. At least two (2) tests should be performed to verify your reading.

Resistance testing should be done at least **once a year** and is recommended at tire recontouring **and any time a new tire is installed**.

WARNING

GRINDING OR TURNING OF WHEEL CONTOURS TO REESTABLISH PROFILE CAN CAUSE REVULCANIZATION OF RUBBER BLOCKS CONTRIBUTING TO PREMATURE SHUNT FAILURE. CARE SHOULD BE GIVEN NOT TO EXCEED 100°C IN THE BLOCK AREA AT ANY TIME.

Although the addition of temporary and/or permanent external shunts provides a visual assurance of tire/center continuity, the operating transit authority should consider periodic meter checks of resistance.

Also, resistance testing should be increased for wheels, ***with internal shunts***, in service in excess of 400,000 kilometers and/or five (5) years. Each user must establish monitoring schedules based on actual experience and history.

Maximum Recommended Isolated Resistance Value Tire to Center

< 0.005 ohms

At 0.005 ohms and greater, add temporary external shunts, continue to monitor.

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Maximum Recommended Isolated Resistance Value
Tire to Tire on a Single Wheel Set

< 0.010 ohms

At 0.010 ohms and greater,
add temporary external shunts.
Wheelset greater than 0.010 ohms should be
removed from service if the wheel diameter
is within *1/2*" of condemning limit.

Also, PMC has developed a detailed procedure for ultrasonic inspection of assembled wheel sets which is available upon request if further inspection is preferred.

WARNING

NO TIRE/WHEEL ASSEMBLY SHOULD BE IN SERVICE AT LESS THAN IT'S DESIGNED CONDEMNING DIAMETER.

PLEASE REVIEW AND CONFIRM CONDEMNING LIMIT AND SHOP MEASUREMENT PROCEDURE.

See "External Shunt Installation" Procedure #998-0002, for application of temporary external shunts for high resistance.

If you have any questions regarding this Service Bulletin, please contact **Penn Machine** at **724.459.0302** or **pmcsales@pennmach.com**

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