ABSTRACT

A center brace for a railway vehicle is provided with a detachable center plate having a boss disposed in a socket or recess in the center brace and a base of greater cross-section. The separable center plate may be of a more wear resistant material than that of the center brace.

13 Claims, 3 Drawing Figures
CAR BODY CENTER BRACE AND CENTER PLATE

This invention relates generally to railway vehicles having a body supported on a pair of trucks and, more particularly, to a vehicle body center plate which forms the swivel connection between the body bolster and the truck bolster.

The body center plate on railway cars is integral with the center brace in many cases. It is usually a "bowl-like" protrusion from the bottom wall of the center brace with a radius between the vertical wall of the center plate and its surrounding flange at the base of the center brace. It has been found in practice that fatigue cracks develop in this radius. Moreover, the body center plate wears in service. The center brace is usually integral with the rear draft lugs and may often be integral with draft arms or the entire underframe end of the car's body. Consequently, replacement of cracked or worn center plates which are integral with the center brace may require the replacement of large and expensive castings.

It is therefore an object of this invention to provide an improved body center plate and center brace for a railway vehicle. Another object of the invention is to provide a center brace and center plate which is less likely to wear or crack in use and can be replaced without replacing a large expensive casting if it should malfunction in use. Still another object of the invention is to provide a center brace and center plate of improved design in which the center plate is rigidly but detachably secured to the center brace. A more specific object of the invention is to provide a center plate forged or cast from a high strength or wear resistant steel having a configuration which reduces fatigue cracking and is adapted to be rigidly but detachably secured to the center brace.

Other objects will become apparent from the following description with references to the accompanying drawing in which

FIG. 1 is a plan view, partially in section, of an embodiment of the invention in which the center brace is integral with rear draft lugs;

FIG. 2 is a section along the line 2—2 of FIG. 1 of the center brace and center plate combined with a truck center plate; and

FIG. 3 is a section along the line 3—3 of FIG. 1 of the center brace and center plate illustrated with a center sill and a truck center plate.

Generally speaking, the objects of the invention are accomplished by providing a body center plate having a configuration which is not prone to fatigue cracking and which may be rigidly but detachably secured to the center brace. A socket is provided in the bottom wall of the center brace. The center plate has a base of greater cross-section than that of the socket and a boss having dimensions and a configuration such that it may be disposed snugly in the socket. An intermediate shoulder increases gradually in cross-section from the boss to the base to provide an external sloping surface and to strengthen the center plate. In other words, the preferred embodiment of the body center plate has a cylindrical base and a cylindrical top portion or boss and a frusto-conical intermediate portion. The body center plate may be detachably secured to the center brace by any suitable means such as, for example, high strength bolts, rivets, hook bolts, welding or the like. The center plate may be cast separately from the same metal as the center brace or from a high tensile strength steel or other wear resistant metal. For example, the center brace may be made from an AAR Grade B cast steel and the center plate from a more wear resistant steel of say AAR Grade C,D,E cast steel or the like.

Referring now to the drawing, a center brace 1 has transversely spaced side walls 2 which are disposed along the vertical walls 3 of a center sill (FIG. 3) and are rigidly secured, such as by welding thereto, to increase the strength of the central load supporting area. Center brace 1 may have rear draft lugs 4 and inboard extensions 5 (FIGS. 1 and 2) each having instanding flanges 6 at the top which may be welded or riveted to the top web of the center sill.

A bottom wall 7 spans the space between side walls 2. King post 8 has a cylindrical center bore 10 and is strengthened with four circumferentially spaced radial ribs 9 which may be integral with bottom wall 7. Bottom wall 7 has a cylindrical socket 12 therein and an opening 11 therethrough centrally disposed in socket 12 and aligned with the bore 10 to accept the conventional king pin (not shown). A separable body center plate 17 having a cylindrical base 13 and a cylindrical boss 14 disposed in socket 12 has an intermediate shoulder 15 with sloping outer walls. Shoulder 15 is frusto-conically shaped. The center plate 17 is rigidly but detachably secured to the center brace in socket 12 by means of four bolts 16 spaced about bore 10 and aligned with holes 18 through the center plate 17 and bottom wall 7 of center brace 1. Holes 18 are countersunk to provide for the heads of bolts 16 to be above the surface of the base. The center brace 1 reinforces the center plate 17 in resisting the stresses applied thereto as it supports the load of the car. A cylindrical bore 20 in truck center plate 21 is aligned with cylindrical bore 24 in body center plate 17 and with bore 10 of center brace 1. The rim 22 of center plate 21 may be protected with a wear resistant ring 19 and liner 23, if desired. As illustrated in the drawing the base 12 of body center plate 17 is preferably of greater cross-section than that of the boss 14 and that of socket 12.

The novel center plate provided by this invention may be used with various types of castings which conventionally include a center brace and body center plate. For example, the center brace may be an integral part of a cast section of a center sill. However, instead of casting the center plate as an integral part of the center sill, a detachable center plate of the kind described herein may be used. Likewise, the center brace combined with the detachable center plate may also be in integral only with draft lugs as illustrated or it may be part of a single casting known in the industry as a draft arm. Moreover, the center brace may be a part of an underframe end casting which includes body bolster arms and a draft arm. The larger the casting, the more important it is to provide the detachable center plate of this invention.

Although this invention has been described in detail for the purpose of illustration, it is to be understood that such detail is solely for that purpose and that variations can be made by those skilled in the art without departing from the spirit and scope of the invention except as it may be limited by the claims.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:
1. In a railway vehicle having a body center plate for connecting the vehicle body to a truck, the improvement which comprises a center brace having spaced side walls, a bottom wall and a hollow king post adapted to receive a king pin, a depression in the said bottom wall forming a socket having a side wall, an open end and an opposite top wall, a centrally disposed opening through the top wall of the socket and aligned with the bore of the king pin, and a body center plate having a base of greater cross-section than that of the socket and adapted to be disposed in a truck bolster center bowl, a solid boss disposed in said socket and a shoulder of gradually increasing cross-section joining the base and boss, said body center plate having an opening therethrough aligned with the opening through the said top wall of the socket, and means detachably connecting the center plate to the center brace.

2. The center brace and body center plate of claim 1 wherein the said boss is completely enclosed by the socket and fits snugly therein.

3. The center brace and body center plate of claim 1 wherein the center plate is more wear resistant than the center brace.

4. The center brace and body center plate of claim 1 wherein the means for securing the center plate to the center brace comprises bolts spaced about the king post.

5. The center brace and body center plate of claim 1 wherein the said base and boss of the center plate are cylindrical and the intermediate shoulder is frustoconical shaped in cross-section.

6. The center brace and body center plate of claim 1 wherein the center plate is a high strength steel.

7. The center brace and body center plate of claim 1 wherein the center brace is one part of a casting which includes rear draft lugs.

8. The railway vehicle of claim 1 wherein the center brace is an integral part of a draft arm.

9. The railway vehicle of claim 1 wherein the center brace is an integral part of an underframe end casting.

10. The railway vehicle of claim 1 wherein the center brace is an integral part of a cast center sill.

11. A railway vehicle comprising a center brace and a body center plate carried by a body bolster and a truck center bowl carried by a truck bolster, said truck center bowl having a bottom and an upstanding annular rim, said center brace comprising a king pin post and a bottom wall having a socket therein, said body center plate having a cylindrical base disposed in the truck center bowl and a cylindrical top disposed in said socket with an intermediate frusto-conically shaped portion of greatest cross-section where it joins said cylindrical base, said body center plate being rigidly but detachably secured to the center brace.

12. The vehicle of claim 11 wherein the truck center bowl has a substantially flat surface enclosed by the rim and a cylindrical opening therethrough aligned with a bore in the king pin post, and said body center plate has a substantially flat bottom and a cylindrical opening therethrough aligned with the bore of the king post and the opening in the truck center bowl.

13. The improvement of claim 1 wherein the body center plate is a solid casting.