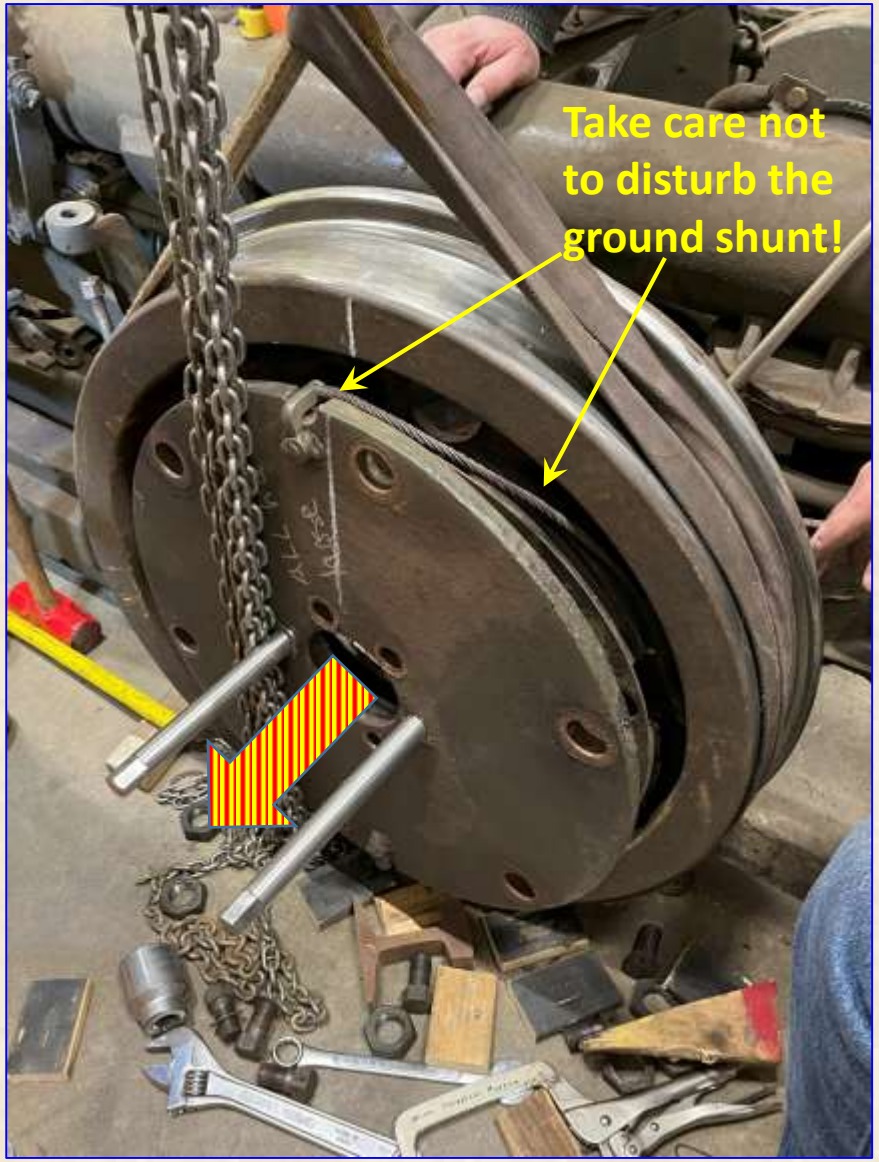
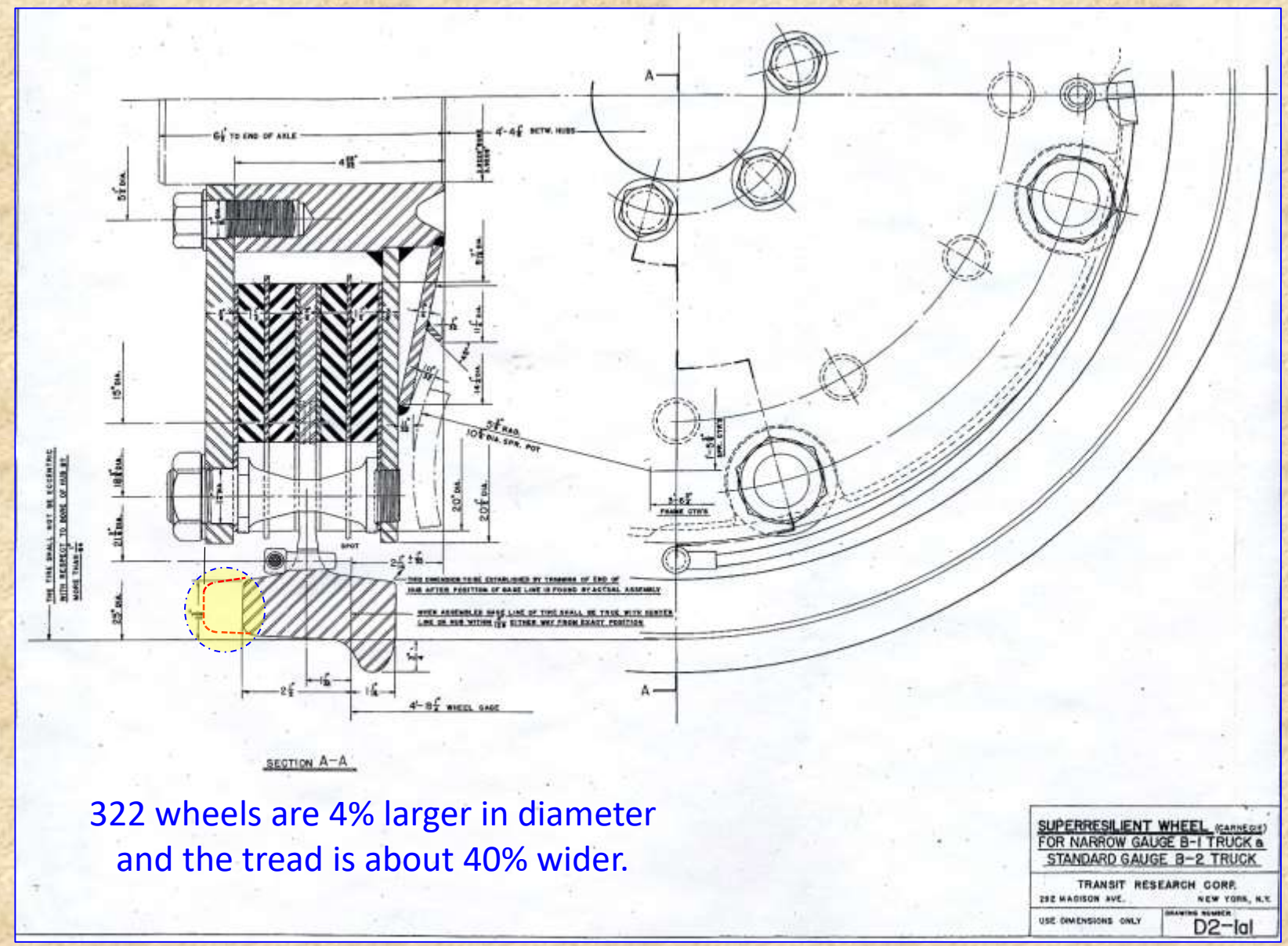


Much prying and hoist adjustment moved the assembly despite guide rods binding.

Wheel supported by gantry crane
Jim Willmore pictured.

Guide rods used to facilitate wheel removal and replacement

Long guide rods caused binding; they were shortened from 16” to 5” OAL



322 wheels are 4% larger in diameter and the tread is about 40% wider.

P.C.C. CAR MAINTENANCE MANUAL

SECTION 2 BASIC TRUCK MECHANICS
C. Truck Drive Systems

WHEEL ASSEMBLY

From the axles, the weight of the car and the driving force are transfered to the wheel assembly.

Each wheel is mounted between two resilient **sandwiches**. Each sandwich is made of three metal plates separated by two layers of rubber. (See figure 2.42) Together, the sandwiches absorb the sound and shock as the wheel rides along the rail. The sandwiches and wheels are aligned using small projections, called **buttons**, on the sandwich which fit into matching holes on the wheels. (See figures 2.42 and 2.43)

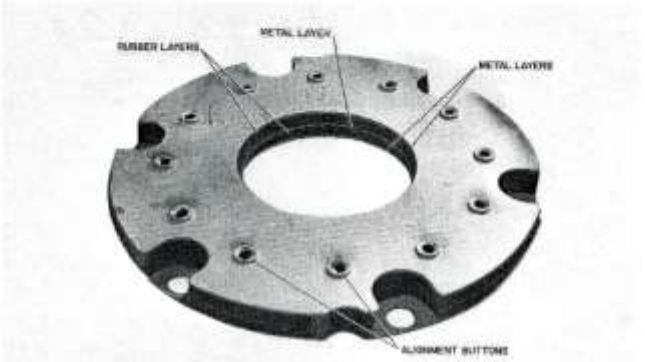


Figure 2.42 Wheel Sandwich

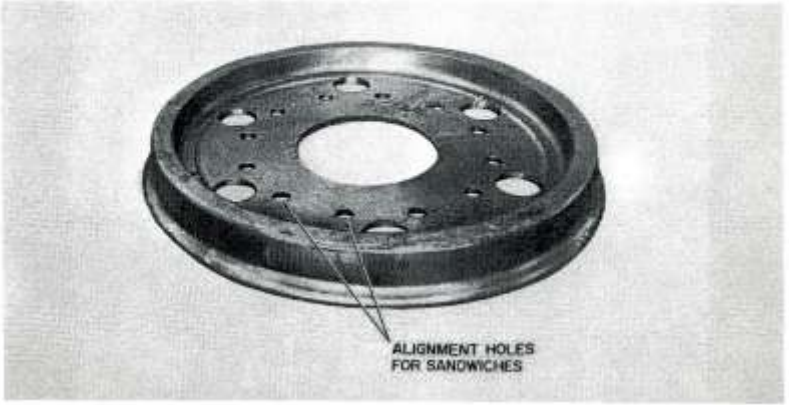
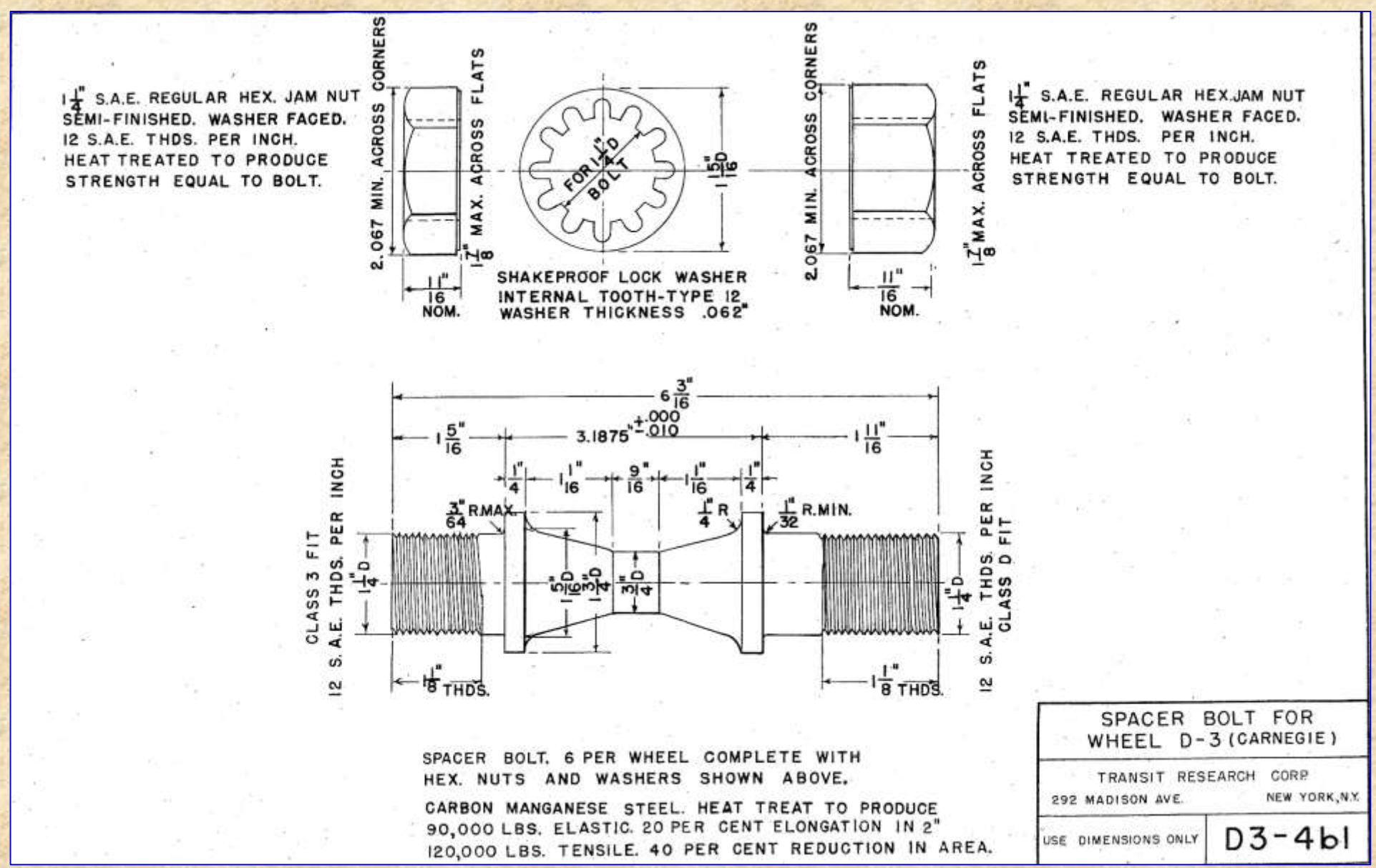


Figure 2.43 Wheel

PCC Wheel Construction



Spacer bolts fall between Grades 5 & 8. No torque is specified.

However, SAE J429 Grade 5, 1-1/8”-12 UNF torque limit for lubricated threads is 668 ft-lbs

Wheel Spacer Bolt Detail

TORQUE ARMS

Each trolley truck has two torque arms, one on each side. Torque arms reverse position on opposite sides of the truck; one torque arm bolts to one axle housing, and the other torque arm bolts to the other axle housing. (See figure 2.56)

In addition to acting as a stabilizer for the truck's axles and their housings, torque arms are used to carry the track brake and its cradle, (discussed in the next section). Since each brake shoe weighs 370 lbs. and the cradle another 150 lbs., a total of 445 lbs. hangs on each torque arm.

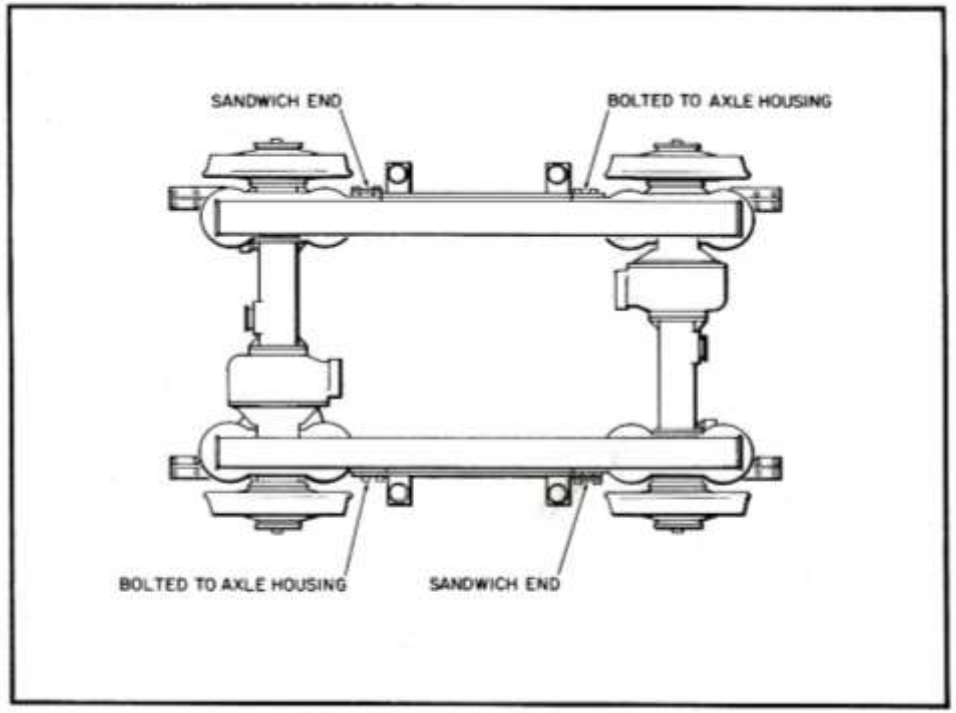


Figure 2.56 Torque Arm Placement

P.C.C. CAR MAINTENANCE MANUAL
SECTION 2 BASIC TRUCK MECHANICS
C. Truck Drive Systems

TORQUE ARMS

Two types of torque arms are currently in use on SEPTA trolley cars. (NOTE: Neither type follows the original design. Both types now in use are later modifications.) On older torque arms, the springs holding the track brake shoe are suspended from spindles on the torque arm. (See figure 2.54) Unfortunately, these torque arms tended to break at the sandwich end. Therefore, the newer torque arms are designed differently. They have a thicker body, with a reinforcing plate welded to the bolted end. (See figure 2.55) In addition, the track brake springs are not suspended, but sit on bracket platforms. The platform, welded near the sandwich end of the torque arm also acts as a reinforcing plate where the torque arm narrows.

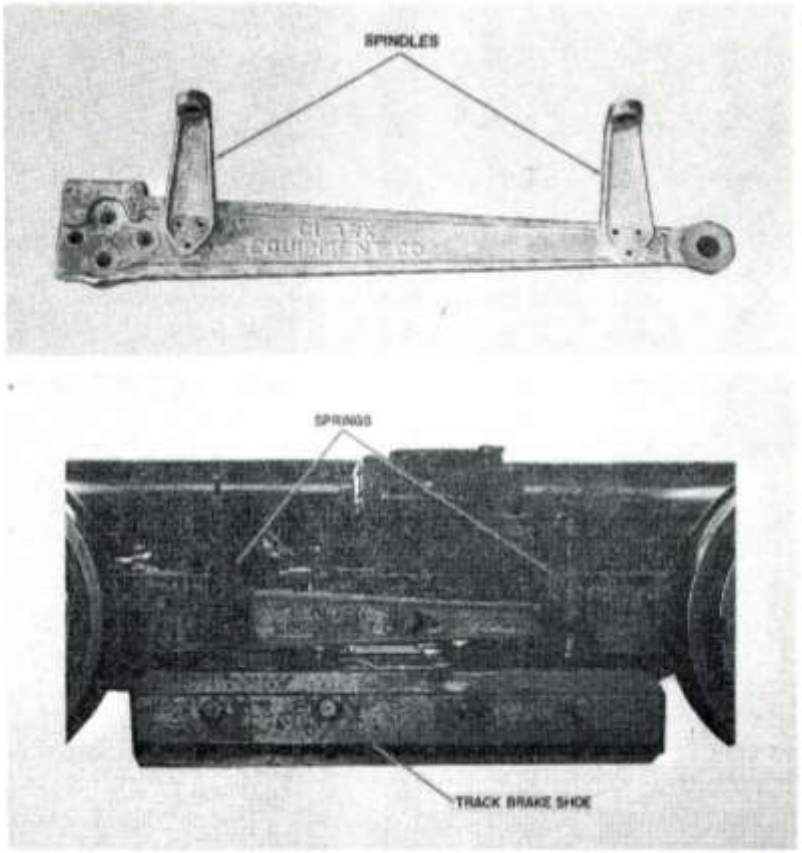


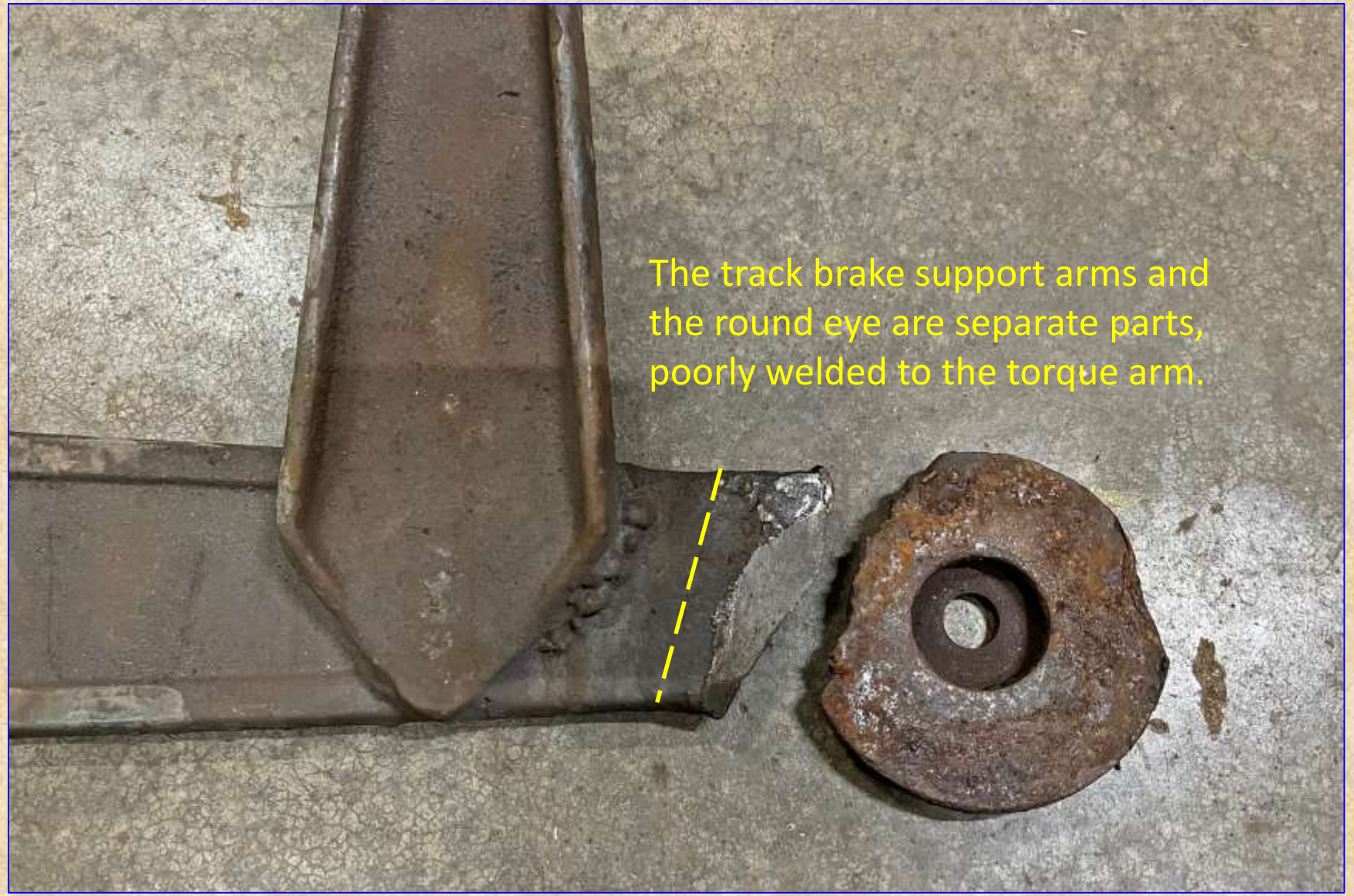
Figure 2.54 Torque Arm (Old Design)

Torque Arm function and description

Severely deformed torque arm, rear truck, pole side. See also slide #3.

This torque arm may be salvageable but it is bent in both planes.

Broken torque arm, front truck, pole side



A replacement, plasma cut eye section has been ordered for repair.

Salvaged Clark Torque Arms, procured through Bill Wall at Shore Line Trolley Museum

As-salvaged

Cleaned by Brighton Sandblasting, Inc., Blaine, MN

The sandwich at left is badly corroded and the rubber is degraded.

Torque Arm Sandwiches are used in pairs; see next slide.

P.C.C. CAR MAINTENANCE MANUAL

SECTION 2 BASIC TRUCK MECHANICS
C. Truck Drive Systems

TORQUE ARMS

Each of the rubber and metal sandwiches has a raised portion in the center called a **button**. (See figure 2.52) (Originally these buttons were an integral part of the sandwich itself, but later they became bushings pressed through the center of the sandwich.) The button on each sandwich fits into the torque arm on one side, and into the outer plate on the other side. (See figure 2.53) The entire assembly clamps together with studs, bolts, and spacer bushings.

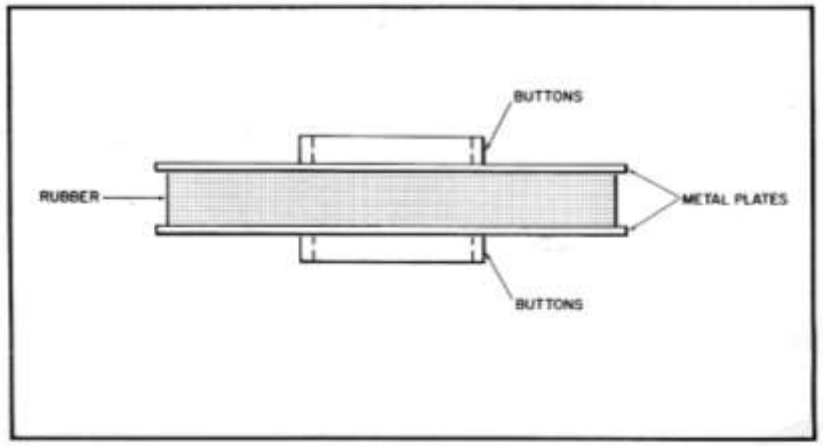


Figure 2.52 Torque Arm Sandwich

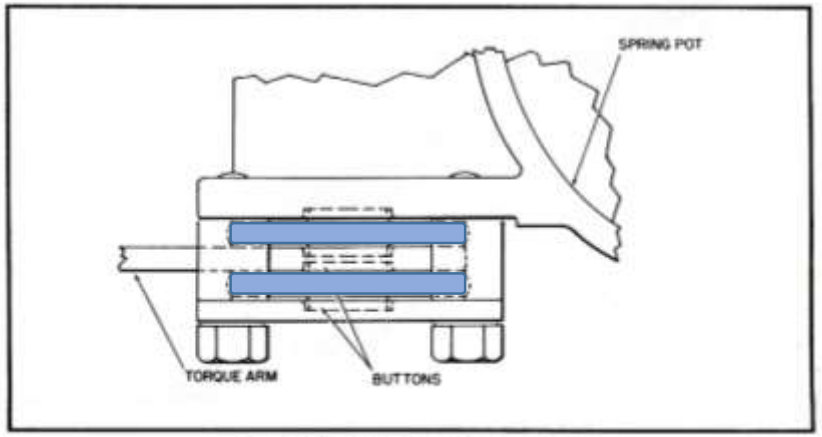


Figure 2.53 Torque Arm Sandwich (Interior)

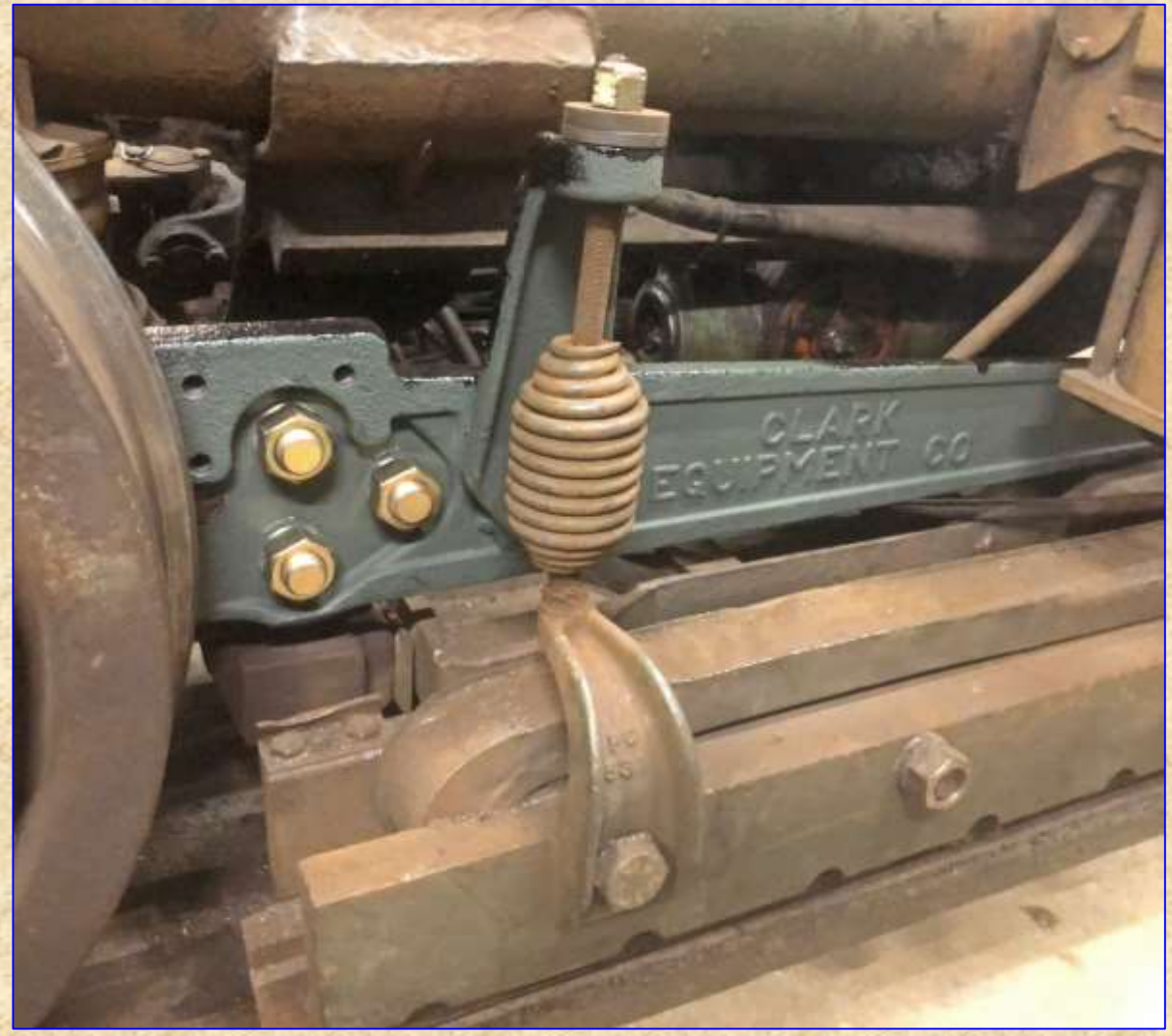
2-36

Torque Arm Sandwich Function and Source

Wheel replacement with the aid of the gantry crane was cumbersome

John Prestholdt, Jim Willmore, Russ Isbrandt, Mark Digre and Miles Anderson (not shown)

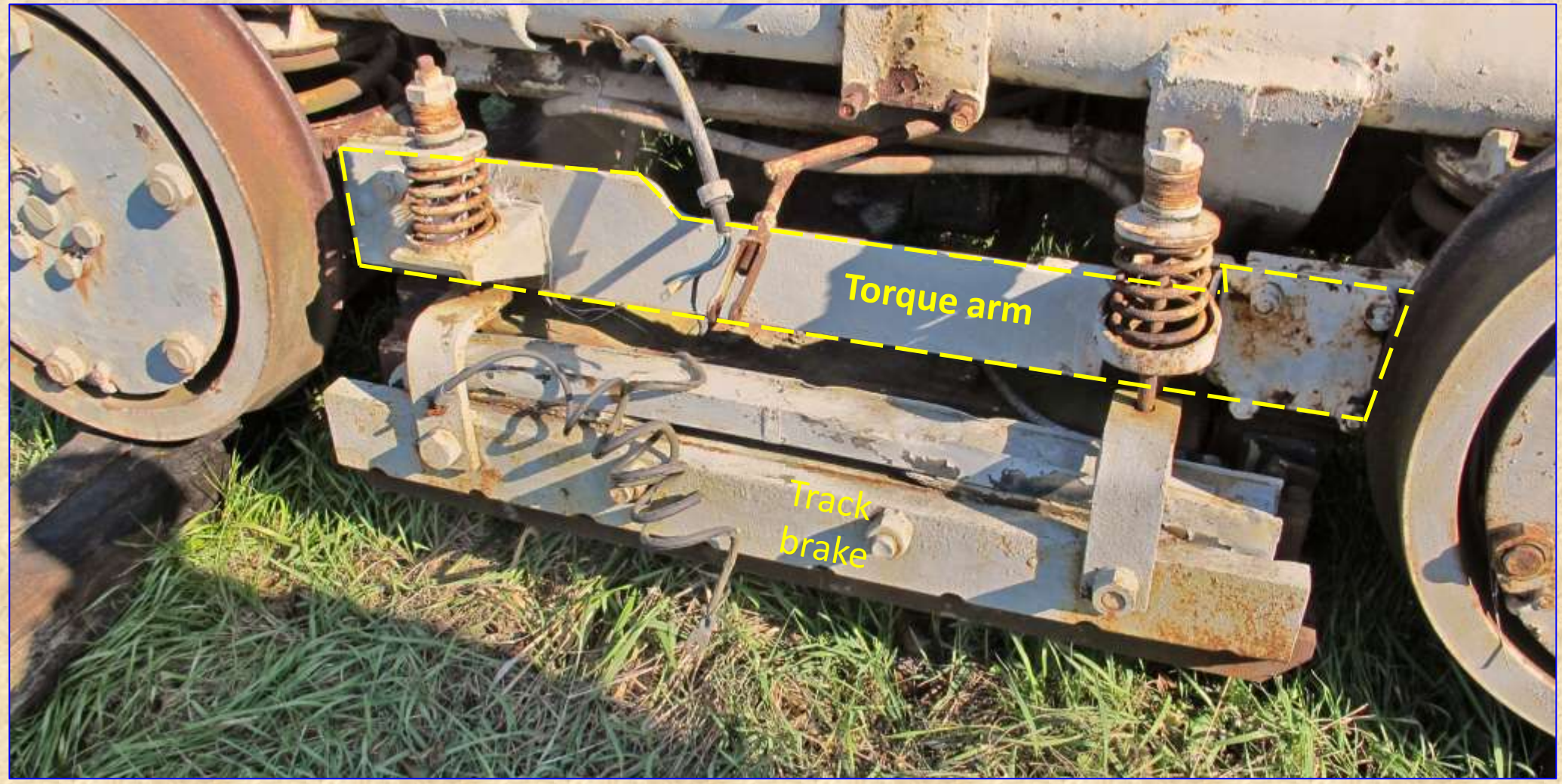
Replacement torque arm installed, rear truck, pole side (Russ Isbrandt photos)



Forward end; L-bracket (slide 16) discarded

Aft end; L-bracket replaced by a simple plate

Improved (SEPTA) torque arm (Bill Wall photo)



This steel plate design is more robust but unoriginal. Track brake suspension now involves replacement of extension springs with compression springs.

Wheel re-installation made easier with engine hoist; axle 2, front truck, pole side

Mark Digre, John Prestholdt and Russ Isbrandt manipulate the wheel

Wheel Re-installation, forward truck

Bars and clamps maintain wheel assembly alignment; Tom Schramm and Mark Digre

Rolling in the front truck after torque arm repair

Let’s go! All we need is an anticlimber and paint touch-up.