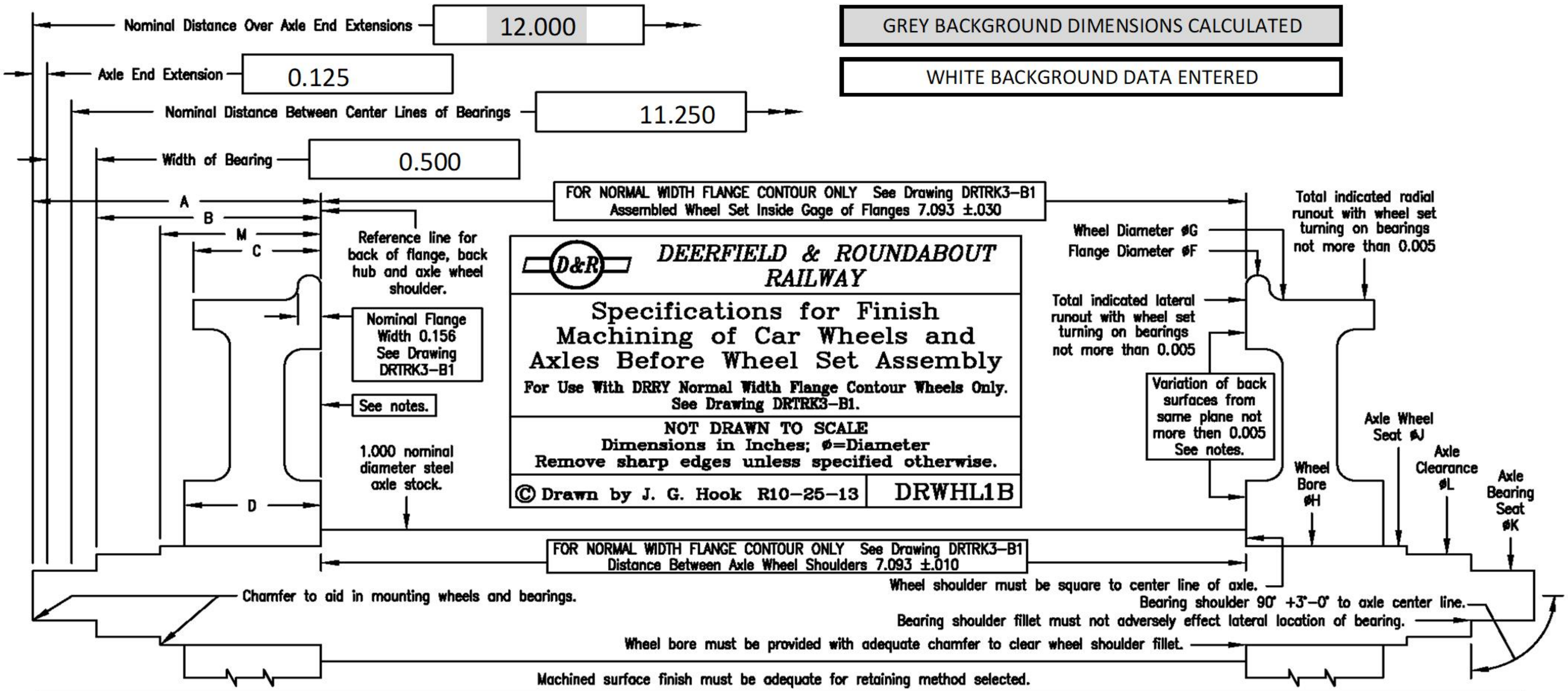


THIS DRAWING APPLIES TO:	DRRY Eng No 284 Trailing Truck Front Axle with 1.625 OD 0.625 ID 0.500 WD Ball Bearings				
AXLE END LENGTH A. 2.454	TOLERANCE ±.005	FLANGE DIAMETER ØF. From DRTRK3-B1	TOLERANCE From DRTRK3-B1	AXLE BEARING SEAT DIAMETER ØK. Measured Bearing Bore +0.0015	TOLERANCE / RETAINING METHOD +0.000 -0.0005 / Press
AXLE BEARING SHOULDER LENGTH B. 1.829	TOLERANCE ±.005	WHEEL DIAMETER ØG. Stock 4.500	TOLERANCE +/- 0.010	AXLE CLEARANCE DIAMETER ØL. 0.650	TOLERANCE ±.015
WHEEL WIDTH C. 0.960	TOLERANCE ±.010	WHEEL DRILLING 21/32	Typ. 2 Flute Twist Drill	AXLE WHEEL SEAT LENGTH M. 1.085	TOLERANCE ±.015
HUB WIDTH D. 0.960	TOLERANCE ±.010	WHEEL BORING 0.735	TOLERANCE ±.005	ROUGH AXLE BLANK LENGTH 12.094	TOLERANCE +.063 −.000
MINIMUM DISTANCE BETWEEN LATERAL THRUST SURFACES OF AXLE BOXES OR SIDE FRAMES WITH TRUCK AND AXLES SQUARE AND LEVEL:	9.500	WHEEL REAMING ØH. 0.750	Typ. Strt. Flute Reamer	Note: Dimension "A" shall provide for the end of the axle to extend beyond the bearing 0.100 ±0.010 inches. Note: Buker pattern freight cars wheels with "flat back" wheel flange and hub are illustrated. Other wheels not of "flat back" design may be used if distance between axle wheel shoulders is adjusted to provide for proper assembled wheel set inside gage of flanges and dimension D is adjusted accordingly.	
MINIMUM TOTAL LATERAL MOTION WITH MAXIMUM WHEEL AND AXLE TOLERANCES WITH TRUCK AND AXLES SQUARE AND LEVEL:	0.457	AXLE WHEEL SEAT DIAMETER ØJ. Measured Wheel Bore +0.0025	TOLERANCE / RETAINING METHOD +0.000 -0.001 / Press		

Image below shows typical work bench set up for testing total indicated radial runout of tread surface of wheel.

Left wheel results proved to be not more than 0.0012 inches.
Right wheel results proved to be not more than 0.0010 inches.

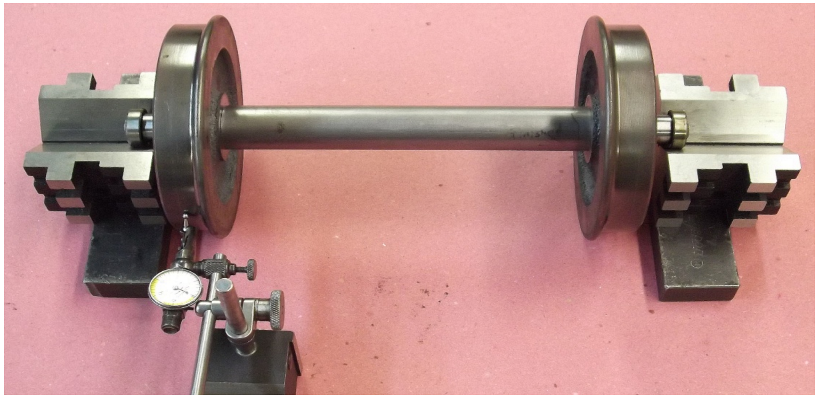
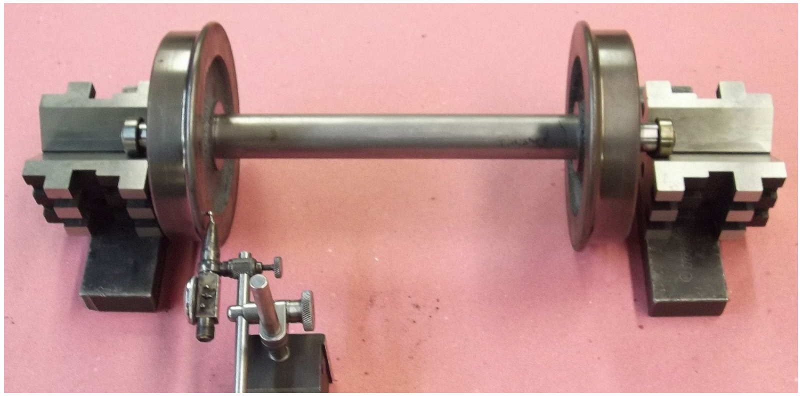


Image below shows typical work bench set up for testing total indicated lateral runout of back of flange surface of wheel.

Left wheel results proved to be not more than 0.0015 inches.
Right wheel results proved to be not more than 0.0012 inches.



Notes on Deerfield and Roundabout Railway Car Wheel Set Manufacturing

Cast iron 4.5 inch finished diameter car wheels (36 inch diameter in full scale practice) are machined from castings produced using wooden match plate pattern originally designed by Edward "Bud" Buker, circa 1960's.

Wheel bore produced using two flute twist drill to establish hole in wheel blank casting, then bored to establish circular hole, then reamed with straight flute reamer to establish finished hole diameter having a typical variation in diameter greater than the reamer of between 0.0015 and 0.0030 inches. Nominal wheel bore diameter currently produced 0.750 inches.

Back of wheel hub and back of flange surfaces machined by facing cut in turret lathe without removing wheel blank casting from setup used for wheel boring thereby providing for maximum practical perpendicularity between axis of wheel bore and back of wheel hub and back of flange surfaces.

Steel axle blank machined one end at a time in lathe using precision spindle collet and collet closer with internal stop instead of turning axle between centers.

Axle bearing seat diameter typically finished to provide for interference fit of between 0.0010 and 0.0015 inches to inner race bore of selected ball bearing.

Axle wheel seat diameter typically finished to provide for interference fit of between 0.0015 and 0.0025 inches to wheel bore. Typical variation in reamed wheel bore diameters requires that each axle wheel seat diameter be sized specifically for each wheel to provide for interference fit within specified tolerances.

Axle bearing and wheel seat diameters typically completed in lathe in two steps. First using a sharp single point brazed carbide tool bit to produce a diameter between 0.003 and 0.001 inches greater than the finished diameter required. Second using a No. 2 cut safety edge pillar file by hand to reduced the diameter to within tolerances specified. Extra care being taken to avoid producing a conical seat.

See the following link for detailed description of Deerfield and Roundabout Railway car wheel manufacturing procedures with illustrations:

DRRY Car Wheel Manufacturing Explanation.

Deerfield and Roundabout Railway Drawing DRWHL1B, Additional Information 1-11-2014 (PDF Page 3 of 3)

Car Wheel Set Axle Bearing Grease Lubrication

Composite image below illustrates set up in lathe used for applying grease lubrication to Deerfield and Roundabout Railway car wheel set axle bearings. The purpose of the lathe is to provide a means for placing the cup centers, held in the head stock and tail stock chucks, in the same axial line. Each cup center is fabricated with an internal conical surface facing the axle bearing and passageways to the grease fitting installed on the side of the cup center. The lubrication procedure begins with the wheel set being held by hand so the left axle bearing is against and within the cup center in the head stock. Using the tail stock spindle feed the right hand cup center is brought to bear against and encircle the right axle bearing. A moderate pressure is applied using the tail stock spindle feed to ensure that a minimal amount of grease escapes past the outer races of the bearings while avoiding damage to the ball bearing races and balls. A conventional grease gun is then applied in turn to each cup center grease fitting and grease is forced from the grease gun into the cup center and then between the inner and outer races of the bearing. Adequate bearing lubrication has been achieved when a quantity of grease appears to exit on the side of the bearing toward the wheel. Grease appearing at any point along the outer race of the bearing indicates a failure in the seal between the cup center and the outer race of the bearing that must be corrected. Extra precautions must be taken by hand to prevent the wheel set from dropping out from the cup centers when the tail stock spindle is moved to release the wheel set from the set up. The axle bearings must be sealed or shielded only on the side toward the wheel.