

UNITED STATES RAILROAD ADMINISTRATION

DIRECTOR GENERAL OF RAILROADS

PENNSYLVANIA RAILROAD, EASTERN LINES

WEST JERSEY & SEASHORE RAILROAD
NEW YORK, PHILADELPHIA & NORFOLK RAILROAD
HUNTINGDON & BROAD TOP MOUNTAIN RAILROAD

Locomotive and Tender Maintenance Instructions No. 30-A

ISSUED ALTOONA, PA

JULY 23, 1919.

INSTRUCTIONS COVERING AUTOGENOUS WELDING

(SUPERSEDING LOCOMOTIVE AND TENDER MAINTENANCE INSTRUCTIONS No. 30, DATED APRIL 22, 1919.)

In welding, either by the use of gas or electricity, care and good judgment on the part of the operator are of prime importance.

The metal added is liable to be porous, and relatively brittle.

The heat at the surfaces welded affects other sections near the weld, tending to reduce strength and toughness.

GENERAL RULES:

The following general rules must be observed:

Welding cracks or fractures or building up worn surfaces will not be permitted on the following:

- Alloy steel, or heat-treated carbon steel.
- Pieces evidencing weakness of design.
- Pieces worn **beyond** set wear limits.
- Throats of wheel or tire flanges.
- Drawbar pins.
- Axles.
- Piston rods, crank pins, and bodies of valve rods.
- Main and side rods.
- Solid cast iron and steel wheels.
- Driving wheel tires.
- Rolled steel wheels and tires.
- Coupler bodies, knuckles, locks, lifters and throwers.
- Pressure vessels (such as steam boilers), or parts thereof, in which the stress is not carried by staybolts, or other stays.
- Tension side of equalizers.

2. **Building-up worn surfaces within set wear limits, but not the welding of cracks or fractures, will be permitted on the following:**

- Drawbars or draft irons.
- Spring hangers.

Bolsters and side frames of inferior strength must not be welded, but should be scrapped.

Any broken parts of castings may be re-attached, or replaced, by welding. If the stress on the piece is more than 50 per cent. of the safe stress it can carry, the area of the weld must be at least 50 per cent. greater than the original sectional area. See Figures 3 and 4.

Broken locomotive frames, also spokes of driving wheel centers with not more than two adjacent and less than one-fourth the total number of spokes in one wheel center, may be welded with at least 50 per cent. excess area in weld, but they need not be annealed.

Forged and rolled steel, except parts enumerated in Section 1, under General Rules, when cracked or broken, may be welded; but when the tension stress thereon is more than 50 per cent. of the safe stress it may carry, the area through the weld must be at least 50 per cent. greater than the original area; and after welding, the piece must be carefully annealed.

J. T. WALLIS,

Gen'l Sup't Motive Power,

Penna. Railroad Lines East of Pittsburgh.

A SHOULD BE SLIGHTLY GREATER THAN DIAMETER OF PENCIL.

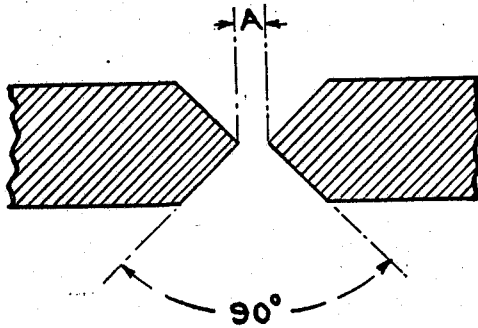


FIG. 1.

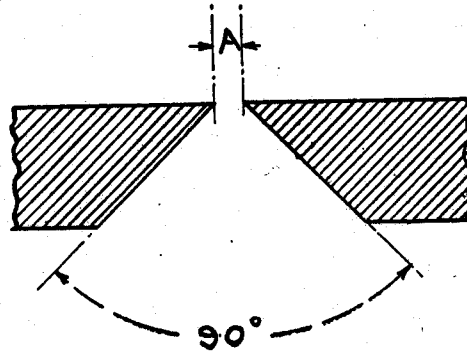


FIG. 2.

WHEN PIECE IS SUBJECT TO HIGH TENSION B MUST BE MORE THAN $1\frac{1}{2} T$.

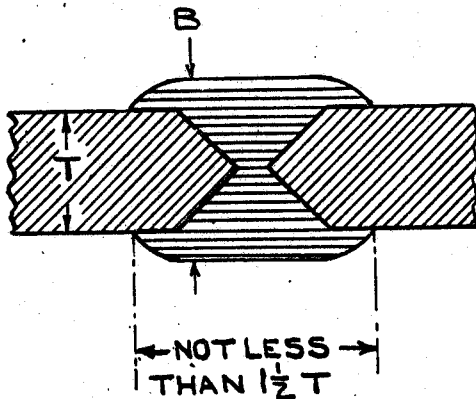


FIG. 3.

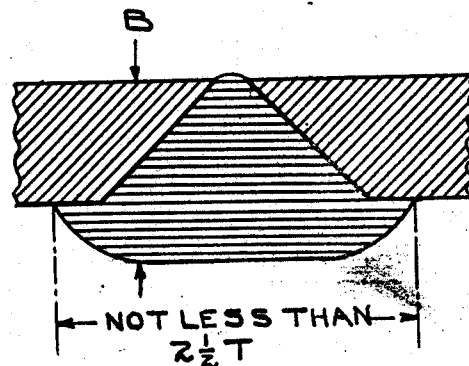
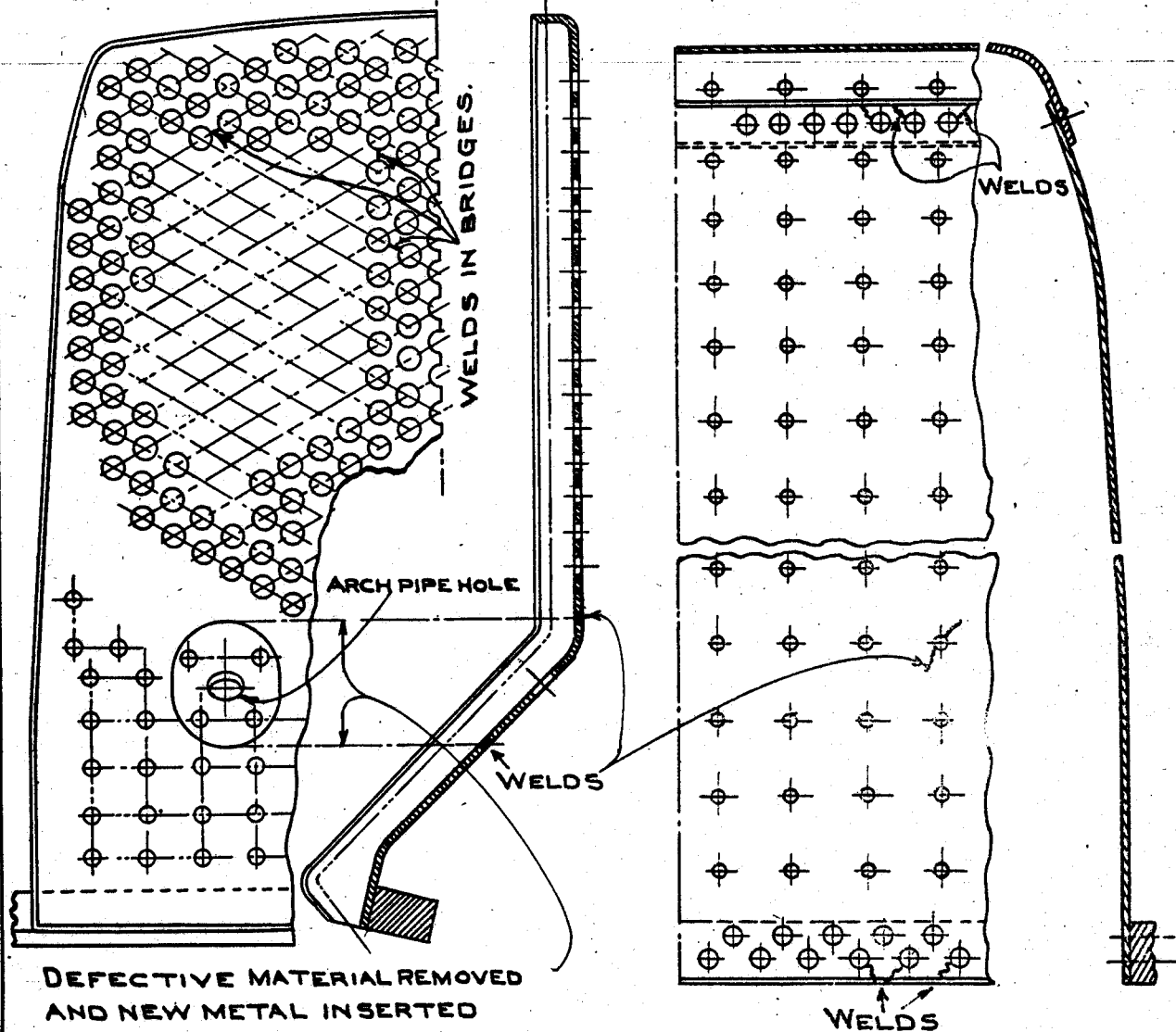


FIG. 4.

FIRE BOX BACK FLUE SHEET.

FIRE BOX SIDE SHEETS



CRACKS AT RIVETS AND STAY BOLTS AT ANY LOCATION MAY BE WELDED.

FIG.5.

UNITED STATES RAILROAD ADMINISTRATION

DIRECTOR GENERAL OF RAILROADS

PENNSYLVANIA RAILROAD, EASTERN LINES

WEST JERSEY & SEASHORE RAILROAD

NEW YORK, PHILADELPHIA & NORFOLK RAILROAD

HUNTINGDON & BROAD TOP MOUNTAIN RAILROAD

Locomotive and Tender Maintenance Instructions No. 30-A

ISSUED ALTOONA, PA

JULY 23, 1919.

INSTRUCTIONS COVERING AUTOGENOUS WELDING

(SUPERSEDING LOCOMOTIVE AND TENDER MAINTENANCE INSTRUCTIONS No. 30, DATED APRIL 22, 1919.)

In welding, either by the use of gas or electricity, care and good judgment on the part of the opera-

Copy of letter to HBS

Copy of letter from CBK to GJR dated Nov. 15, 1923 desk 2-j.

The metal added is liable to be porous, and relatively brittle.

We are informed that tracing F-64447-A showing the method of welding guide bar lugs to cast steel back cylinder heads, has been made obsolete, and no more cylinder heads should be repaired in this manner.

Will you please issue instructions accordingly, tying them up with the Locomotive Maintenance Instructions L-30-A, so that they will always be ready for instant reference.

Welding cracks or fractures in locomotives or tenders will not be permitted on the following:

To arrange.

Cast steel C.J.R.
Pieces evidencing weakness of design
Worn beyond set wear limits.

Throats of wheel or tire flanges.

Drawbar pins.

Axles.

Piston rods, crank pins, and bolts.

Main and side rods.

11-19-23 cast iron and steel wheels.

Driving wheel flanges.

Rolled steel wheels and tires.

Coupler bodies, knuckles, locks, lifters and throwers.

Pressure vessels (such as steam boilers), or parts thereof, in which the stress is not carried by staybolts, or other stays.

Tension side of equalizers.

H.B. Saylor
Foreman.

Building-up worn surfaces within set wear limits, but not the welding of cracks or fractures, will be permitted on the following:

Drawbars or draft irons.

Spring hangers.

REVISION OF FIRST PARAGRAPH OF DETAIL RULES OF LOCOMOTIVE MAINTENANCE
INSTRUCTIONS NO. L-30-A.

(Superseding all existing instructions on method of preparing edges of autogenous butt welds on locomotives and tenders.)

Authorized by the Chief of Motive Power in Circular Letter dated August 14, 1928.

The edges of the parts to be welded must be prepared as shown in Fig. 1 for the double V butt joint and as shown in Fig. 2 for the single V butt joint. Butt welds should be finished as per Figures 3 and 4, excepting those on parts where clearance will not permit the full thickness or those on boiler plates. The edges to be welded must be free from grease, rust, scale or other foreign substances and must be chipped or machined to clean bright metal. Surfaces adjacent to the weld must be cleaned to bright metal with sand blast or grinder for at least 1/2" from the outer edges of the V.

Office, Chief of Motive Power.
Altoona, Pa., Aug. 14th, 1928.

F. W. HANKINS
Chief of Motive Power.