
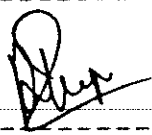



MOTSolo


S.no. 10

SPECIFICATION FOR BOGIE SECONDARY SUSPENSION HANGER

Name	Designation	Signature	Date	Level
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SH. S.K. GUPTA	CDE		19/12/95	APPROVAL


ISSUE	DETAILS OF CHANGE	DATE
0.0	FIRST ISSUE	19-12-95

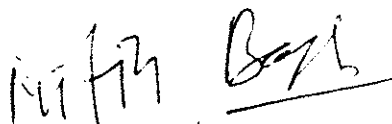
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1. SCOPE: This STR lays down the requirements regarding the material, inspection and testing of the hangers for the bogie secondary suspension for all coil ICF type bogies.

2. RAW MATERIAL:

2.1. Material Specification - Steel to IS:1875-92 class I.

2.2. Size of raw material - Either billets or flats can be used:

2.2.1 Billets of suitable size may be used while ensuring a reduction of 4:1 minimum from the billet to the final product.

2.2.2 Alternatively flats of 35 mm or more thick and of suitable width may be used ensuring an overall minimum reduction ratio of 4:1.

PROCESS:

3.1. Saw cut or shear the billets or flats to the required length.

3.2. In case billets are used:

3.2.1. Preheat them in a furnace to the required temperature (about 1200°C) and fuller the billets.

3.2.2. Forge in closed dies ensuring grain flow as per figure 1 of this STR.

3.2.3. Trim outer and inner fins.

3.3. In case flats are used:

3.3.1. Hot punch a rectangular slot at the center so that 2.5 to 3 mm extra material is left out on all the sides.

3.3.2. Stamp in the dies to the required size ensuring grain flow as per fig-1 of this STR.

3.3.3 Trim outer and inner fins.

3.4 Normalize by heating to a temperature of 870°C to 950°C soaking at the above temperature for fifteen minutes and cooling in air.

3.5 Grind blast the hangers so as to remove scales etc.

3.6 Finish machine and dress the wearing faces and the adjacent grooves at the corners while maintaining the specified radii, inner length and width and horizontal arm thickness of hanger.

3.7 Punch in raised letters the type code, manufacturer's initial, month and year of manufacture on the face at one end.

3.7.1 Types of codes to be used are ;

3.7.1.1 BG Main line coaches - T

3.7.1.2 BG EMU Motor coaches - E

3.7.1.3 BG EMU Trailer coaches - D

3.7.1.4 MG EMU MOTOR coaches - D

3.7.1.5 MG main line coaches - M

3.7.1.6 MG EMU Trailer coaches - M

3.8 Case carburize and case harden for a minimum depth 1.5 mm on the wearing surfaces of the horizontal arms, while

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achieving a hardness value of 50 - 60 HRC.

3.8.1 To ensure that only wearing surfaces of the hanger are case carburized, a suitable masking compounds should be applied on the remaining surfaces (other than wearing surfaces) before case carburization. Allow the coated surface to dry. Ensure before coating that the surfaces to be coated are free of grease / oil.

3.8.2. Apply the first coat of masking compound and allow to dry in still air.

3.9 Temper the Hangers at temperature of 150 - 200 degree centigrade for one hour followed by cooling in air, ensuring that the hardness of the wearing ends is maintained between 50-60 HRC.

3.10 If the carbon potential is greater than 0.7 the method of induction hardening must not be used.

3.11 Grit blast the Hangers.

3.12 Check the Hangers for distortion if any and carry out straightening operation by a suitable

3. APPROVAL

4.1 Process approval : The complete manufacturing process shall be approved in advance as per clause 3 of this STR.

4.2 Any further change in process shall require to be approved in advance.

5. APPROVAL OF ADVANCE SAMPLES

5.1 In case of supply by a contractor for the first time the inspection of complete supply shall be carried out as per this clause.

5.2 The approval of advance sample by the purchaser is mandatory in case where the contractor is supplying the material for first time against this specification.

5.3 For this purpose contractor shall furnish 12 advance samples as per contract drawing of hanger for testing and approval.

5.4 Manufacturer of hangers shall be commenced only after the approval of advance samples by the purchaser.

6. INSPECTION:

6.1 : By Manufacturers

6.1.1 Inspection of the raw material shall be carried out as per Clauses 6.1, 6.2, 7, 9.1, 9.2, of IS:1675-82 clause 1.

6.1.2 In addition to the tests specified in the specification mentioned under para 5.1.1 of this STR the following standards shall apply :

6.1.2.1 Inclusion rating shall be as per IS:4163-82 and shall not be worse than 2.5 A, B, C, D, of fig-2 for both thick and thin series.

6.1.2.2 Grain size - Grain size shall not be coarser than 5 as per IS:4743-88.

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6.1.3 Raw material testing - The manufacturer shall maintain steel mill certificates with details of cast number, chemical composition, steel making process etc. of raw material. They shall carry out the following tests-

- 6.1.3.1 Chemical composition.
- 6.1.3.2 Tensile yield and elongation.
- 6.1.3.3 Bend test.
- 6.1.3.4 Macroscopic examination for cracks /

porosity.

- 6.1.3.5 Inclusion rating.
- 6.1.3.6 Grain size.
- 6.1.3.7 Magnetic particle test for checking

surface and sub surface cracks.

6.1.4 Stage inspection - The manufacturer shall carry out stage inspection during operation and record details of the same. These must be produced to the inspecting authorities whenever needed .

6.1.5 Finished product inspection - The percentage of components to be inspected for various type of inspection is as under :

6.1.5.1 Dimensional accuracy, straightness and radius on wearing surface - 100%

6.1.5.2 Hardness - 100%

6.1.5.3 Magnaflex testing 100%

6.1.5.4 Proof load test - No permanent set is permitted after the test load detailed below:

6.1.5.4.1 BG EMU Motor coach at 10 tons
100%

6.1.5.4.2 BG Main line coaches at 8 tons
100%

6.1.5.4.3 BG EMU Trailer coaches at 8 tons
100%

6.1.5.4.4 MG EMU Motor coaches at 8 tons
100%

6.1.5.4.5 MG Main line coaches at 8 tons
100%

6.1.5.4.6 MG EMU Trailer coaches at 8 tons
100%

6.1.5.5 Case depth - On sample pieces loaded along with hangers - 100%.

6.2 By inspection authorities:

6.2.1 Inspection authorities should satisfy himself in respect of the following -

6.2.1.2 Manufacturing process and quality control followed by the firm is acceptable.

6.2.1.3 Raw material used is to correct specification and size. He may carry out test detailed above.

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6.2.1.4 He shall check the records of stage and final inspection and satisfy himself regarding their accuracy by carrying out random checks as per sampling given below.

6.2.1.4.1 Lot size	Sample size	Acceptance no
2-8	3	0
9-15	5	0
16-25	8	0
26-50	13	0
51-100	20	0
101-150	32	0
151-300	50	1
301-500	80	1
501-1000	125	2

The acceptance no. is the maximum no. of hangers to get rejected in a specified sample size.

6.2.2 : Inspection of finished product

6.2.2.1 5% of hangers in a lot, picked up at random, shall be checked for the following -

- 6.2.2.1.1 Dimensional accuracy.
- 6.2.2.1.2 Surface defects by magnaflux.
- 6.2.2.1.3 Hardness values.
- 6.2.2.1.4 Proof load.

6.2.2.2 One hanger from each batch which has been heat-treated together shall also be checked for the following -

- 6.2.2.2.1 Case depth.
- 6.2.2.2.2 Grain flow at all corners of the same piece.
- 6.2.2.2.3. Absence of carburising on other than wearing surfaces: traces of carburising on other than condition only will be acceptable.

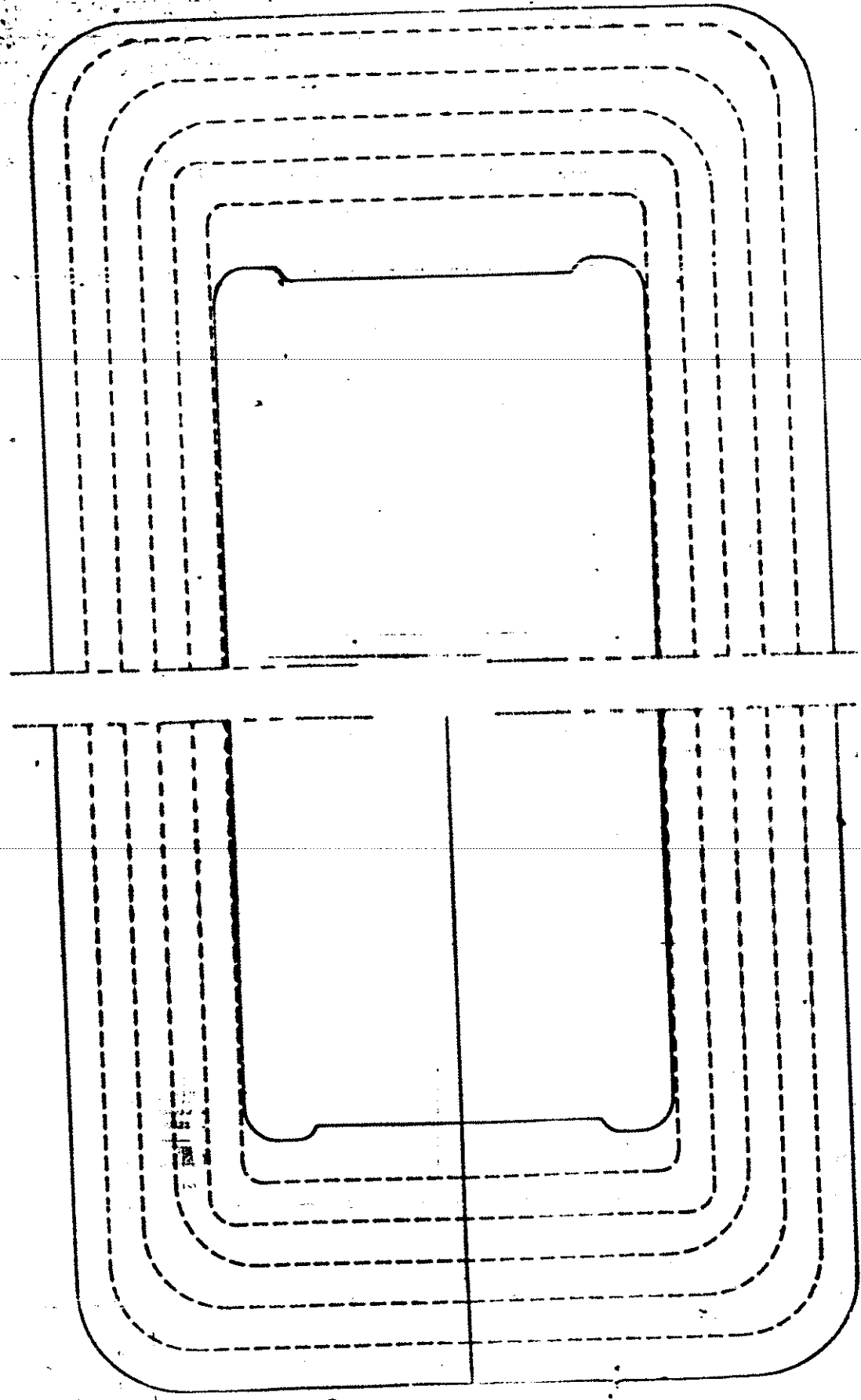
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FIG NO. 1



EXPECTED GRAIN FLOW ON CLOSE DIE FORGED HANGER

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