

583/0

**SPECIFICATION FOR RUBBER PAD FOR PRIMARY SUSPENSION  
OF FIAT-SIG HIGH SPEED BOGIE**

MDTS-098

DATED -17-02-2001

Name	Designation	Signature	Date	Level
Mr. Rajiv kumar	J.E. II	<i>Rajiv kumar</i>	16-02-2001	Prepare
Mr. Ramnik Singh	SME/BD	<i>Ramnik Singh</i>	16/2/01	Agree
Mr. Sanjeev Sharma	Dy.CME/Dev.	<i>Sanjeev Sharma</i>	17/2/2001	Review
Mr. R.S. Chugh	CDE	<i>R.S. Chugh</i>		Approved

Issue	Details of change	Date
0.0	First issue	16-02-2001

*Rajiv kumar*

PREPARED BY

*Rajiv kumar*

AGREED BY

583/1

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MDTS-098

14/02/01  
PAGE 1 OF 5

**FOREWORD**

- 0.0 This specification is issued under the mechanical design technical specification-
- 0.1 These rubber pads are to be used in primary suspension of FIAT-SIG bogies above primary springs for better shock and noise isolation.
- 0.2 This specification intends to cover the technical provisions relating to supply of the materials and does not include all commercial provisions of a contract.

**1. SCOPE**

- 1.1. This specification covers the technical requirements, methods of sampling and tests for rubber pad used in the primary suspensions of FIAT-SIG bogies.

**2. MATERIAL.**

- 2.1. The rubber compound used for the manufacture of rubber pads shall be of oil resistant quality.  
Accordingly, the rubber compound shall be a suitable Acrylonitrile, Butadiene Co-polymer or a blend with other synthetic rubber of oil resistant type, so as to conform the provisions of this specification.

**3 CONSTRUCTION**

The rubber pads shall be moulded with smooth finish as per the dimension and tolerances stipulated in the relevant drawings supplied by the purchaser

**4. WORKMANSHIP AND FINISH**

The rubber pad shall be free from manufacturing defects like laminations, blow holes, cracks etc

**5. SAMPLING AND CRITERIA FOR CONFORMITY**

- 5.1 The prototype samples to be got approved from consignee before bulk supply/manufacturing.

*[Signature]*  
PREPARED BY

*[Signature]*  
14/2/01  
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583/2

583/2  
SPECIFICATION FOR RUBBER PAD USED IN THE PRIMARY SUSPENSION  
OF FIAT - SIG HIGH SPEED BOGIES

MDTS-098

14/02/01  
PAGE 2 OF 5

- 5.2 The pads shall be offered for inspection within three months of their manufacture.
- 5.3 For acceptance, inspection and testing, a lot shall consist of 160 nos. of the rubber pads of one design or part thereof and made out of same composition of the rubber compound and processed and vulcanised in the similar manner and to the same degrees.
- 5.4 For carrying out the tests as indicated in clause 6, five samples shall be drawn per lot by sample random sampling method as per IS:4905. Should the test samples fail to meet the requirements, additional ten samples from the same lot shall be drawn for re-testing. Should any of the retest samples fail to meet the requirements, the entire lot shall be rejected and made unusable in the presence of the Inspecting Officer/purchaser.
- 5.5 The selection of a test sample, for a particular test shall be at the discretion of the Inspecting officer/purchaser.
- 5.6 For the purpose of deciding whether a particular requirement of this schedule is complied with, the final value observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS:2. The number of significant places retained in the rounded off value should be the same as what of the specified value in this schedule.

6. TESTS

- 6.1 All the test procedures shall be as per IS:3400. Methods of Test for Vulcanised Rubbers.
  - 6.1.1. The test specimens shall be as per requirements of IS: 3400 and shall be from same lot as of the finished product.  
N.B : The samples after or during the compression test shall not show the presence of any crack.
- 6.2 Properties of the rubber compound of rubber pad used in primary suspension of FIAT-SIG bogies

Properties.	Values.
6.2.1 Tensile strength N/sq. mm.), min.	12.0
6.2.2 Elongation at break (%) min.	300

*Rajiv Kumar*  
PREPARED BY

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*[Signature]*  
16/2/01

183/3

SPECIFICATION FOR RUBBER PAD USED IN THE PRIMARY SUSPENSION OF FIAT - SIG HIGH SPEED BOGIES

MDTS- 098

14/02/01  
PAGE 3 OF 5

- 6.2.3 Compression set(%) at 100 ± 2 deg.C for 24 + 0 hrs., max. -2 30
- 6.2.4 Indicative Hardness ( Shore 'A') 65 to 70 (Shore 'A')
- 6.2.5 Ash content ( %) max. 5% (max.)
- 6.2.6 Accelerated Ageing at 100 ± 1 deg. C for 72 + 0 hrs. - 2  
Change in properties
  - i) Hardness ( Shore 'A' ) + 7
  - 0
  - ii) Tensile strength(%age) +10
  - 25
  - iii) Elongation at break(%) +10
  - 30
- 6.2.7 Swelling/Oil Absorption Test-Immersion in reference oil 'B' To IS : 3400 Pt. VI at 27 +/- 2 deg.C for 24 hrs. .Percentage change in volume. 35

6.2.8 Compressive Load Deflection Test for FIAT-SIG bogies

Compressive load deflection test of rubber pad for primary suspension shall be carried out as per shown in drg.no. LW01101

6.2.9 Endurance test :-

The rubber pad would be subjected to a one cycle per second compressive load in the range of 57KN to 65 KN for 50,000 cycle. After completion of 50,000 cycle, there should not be any permanent set and damage to rubber or steel components. The rubber pad shall satisfy compressive load test 24 hours after it has undergone endurance test.

*Rajiv Kumar*  
PREPARED BY

AGREED BY  
*[Signature]*  
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583/4

SPECIFICATION FOR RUBBER PAD USED IN THE PRIMARY SUSPENSION  
OF FIAT - SIG HIGH SPEED BOGIES

MDTS- 098

14/02/01  
PAGE 4 OF 5

**Note:-**

- (a) The manufacturer should have necessary facilities for carrying out all the tests mentioned under clause no. 6.2.8 and 6.2.9 .
- (b) Endurance test shall be conducted as a type test during first manufacturing by a supplier and the test certificate have to be shown to the inspecting authority as and when required.

**7. Inspection and Testing Facilities.**

- 7.1 The manufacturer shall arrange for the preparation of requisite test pieces and supply free of charge all equipment, labour and apparatus for all the tests at his premises. Should the manufacturer fail to provide facilities at his own works for carrying out the prescribed tests, he shall arrange for carrying out these tests by an approved testing agency as agreed to by the Inspecting Authority.
- 7.2 The manufacturers shall furnish to the purchasing/Inspecting Authorities , at all reasonable times the details of tests and other information and records in respect of Quality Assurance Plan (QAP) in force at their works for the material and processes used for the manufacture of rubber pads.
- 7.3 The purchasers or the Inspecting Officer shall have access at all reasonable times to the works where the material or the fittings are being manufactured/stored.

**8. MARKING**

The letters IRS, the month/year of manufacture, the drawing No. and the manufacturer's name or initial or trade mark shall be clearly moulded on each pad as per size and location indicated in the relevant drawing.

**9. PACKING**

The rubber pad shall be dusted with French Chalk to IS: 380 and suitably protected against damage during transit and storage.

*For*  
*Prepared*  
PREPARED BY

AGREED BY  
16/2/01

583/5

SPECIFICATION FOR RUBBER PAD USED IN THE PRIMARY SUSPENSION  
OF FIAT - SIG HIGH SPEED BOGIES

MDTS- 098

14/02/01  
PAGE 5 OF 5

**10. STORAGE**

The rubber pads shall be stored in a covered shed protected from direct sunlight in the original packing. During storage, they shall not be allowed to come in contact with liquids or semi solid materials, solvents, oils and greases.

**11. SHELF LIFE**

Shelf life of the rubber pads, without any deterioration in their characteristics, shall be minimum fifteen months from the date of supply.

**12. GUARANTEE**

The tenderer shall give guarantee against failing or providing unsatisfactory in service due to defective design, material or workmanship within 36 months from the date of supply or 24 months from the date of issue.

*Rajiv*  
*14/02/01*  
PREPARED BY

AGREED BY  
*[Signature]*  
16/02/01