



<i>Employer:</i> 	<i>Originator:</i> London Underground 5th Floor Victoria Station House 191 Victoria Street London SW1E 5NE
<i>Location:</i> General	<i>Project:</i> L & E Generic

Title:

**Manufacture and testing of
escalator step chains**

Format	Document Number	Revision
A4	SPC-LAE-TM00-0585434	02

The original master of this document is retained on the Document Management & Collaboration Database.
Copies produced from the master, by whatever means, are deemed uncontrolled.
You must confirm that you hold the latest version, before using this document for its intended purpose.

Contents	Page	Contents	Page
1. Scope	2	8.4. Measurement	3
2. References	2	8.5. Marking and labelling	4
3. Abbreviations	2	8.6. Match pairing	4
4. Definitions	2	9. Testing and inspection	4
5. Safety considerations	2	9.1. Step chain tensile test	4
6. Dimensions and Tolerances	2	9.2. Quality Submission	5
7. Procurement	3	9.3. Audit	5
8. Manufacture	3	10. Delivery	5
8.1. Pins, bushes, rollers	3	Document history	6
8.2. Link plates	3	Appendix 1 - References	7
8.3. Assembly	3		

1. Scope

1.1. This specification covers the manufacture and supply of replacement step chains for escalators used on the London Underground network.

2. References

2.1. The text of this specification cites other documents that provide information or guidance. These are listed in Appendix 1.

3. Abbreviations

3.1. The following abbreviations are used in this specification:

C of C	Certificate of Conformity
LU	London Underground
QA/QC	Quality Assurance/Quality Control

4. Definitions

4.1. The following terms are used in this specification:

Ladder chain - Two step chains, joined together by their chain axles and delivered to site as a unit.

Strand - A single simplex chain assembly, two such strands being required per escalator.

5. Safety considerations

5.1. Escalator step chains form a safety critical component in the whole machine and, whilst LU escalators are fitted with safeguards against chain failure.

5.2. The potential for injury or even loss of life exists should chain failure occur. Escalator step chains must therefore be manufactured to the highest possible standards to minimise the possibility of failure.

5.3. The Employer requires evidence that the manufacturer is able to achieve the required breaking load for each chain design manufactured.

6. Dimensions and Tolerances

6.1. The Contractor is advised that some LU design drawings are still dimensioned in Imperial units. In this instance, the Contractor is permitted to substitute equivalent Metric values providing that equivalent drawing tolerances are maintained.

6.2. Due care shall be exercised when converting dimensions from Imperial to Metric, to ensure that cumulative errors are not introduced.



7. Procurement

7.1. All materials shall be supplied with a C of C, confirming that the material properties (including any heat treatment) stated on the drawings have been met in full. All C of C's shall be made available to the Employer as part of the quality submission.

7.2. Where chain wheels are indicated on the drawings as being part of the step chain assembly, the Contractor is responsible for their procurement. These are to be manufactured to LU specification SPC-LAE-TM00-0585435 and relevant drawings.

8. Manufacture

8.1. Pins, bushes, rollers

8.1.1. Where components require heat treatment, this shall be carried out by a suitable process to achieve the properties stated on the relevant drawings. All items shall be examined visually for cracking following heat treatment, and any parts found to be defective shall be rejected.

8.1.2. Where necessary, markings shall be applied to the ends of bushes to indicate the alignment of lubrication holes. Such markings shall not be proud of the surface.

8.1.3. Care shall be taken to flush all swarf out of lubrication ways prior to assembly.

8.1.4. Final machining of bushes (with or without polymer inserts) shall not be carried out as part of the inner link assembly.

8.1.5. Where bushes are fitted with a polymer insert, the final machining of the insert bore shall take place after the insert has been pressed into the steel outer sleeve.

8.2. Link plates

8.2.1. Link plates shall not be flame cut.

8.2.2. Link plate holes shall not be punched.

8.3. Assembly

8.3.1. The chains shall be assembled into nominal even number step lengths as required by the purchase order. Odd number-step lengths incorporating cranked links shall be configured, such that the chain length has male and female ends similar to the equivalent even number-step chain length.

8.3.2. Ladder chains shall comprise two chains complete with axles, fittings and wheels and shall be delivered fully assembled.

8.3.3. All chains shall be assembled complete with all ancillary items as indicated on the assembly drawing. It is accepted that joining components and loose items can be supplied separately for site assembly.

8.3.4. If the chain is of a grease-lubricated design, all bearing surfaces shall be pre-lubricated with grease as specified in LU drawing 26-01-015.

8.3.5. When assembling pins and bushes, care shall be taken to ensure that any lubrication holes are aligned strictly as shown on the relevant drawings.

8.3.6. If the chain is of a grease-lubricated design, it shall be charged with the specified grease (see 8.3.4) during and after assembly. Any protruding grease nipples shall then be replaced by plastic plugs for transit (flush fitting concave grease nipples may be left in situ). The grease nipples shall be supplied separately, for fitting on site by others.

8.4. Measurement

8.4.1. Each chain length shall be given a unique identity number and shall be measured between the first and last hole centres. To ensure that no kinks are present and all clearances are taken up in the chain, a tensile load of 10 to 20kN shall be applied, whilst the measurements are taken. Measurements shall be taken to the nearest 0.02mm and shall be recorded in the quality records.

