



Kenya Power

TITLE:

**SPECIFICATION FOR
OVERHEAD LINES
LOAD HANDLING DEVICES**

Part 4: Chain Sling and Snatch
Block

79

Doc. No.

KP1/3CB/TSP/09/060-4

Issue No.

1

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0.1 Circulation List

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0.2 Amendment Record

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FOREWORD

This specification has been prepared by the Research and Development Department in collaboration with Distribution Division, both of The Kenya Power and Lighting Company Limited (KPLC) and it lays down requirements for chain sling and snatch block for use on power lines. It is intended for use by KPLC in purchasing the chain sling and snatch block.

1. SCOPE

This specification is for chain sling and snatch block for use by the KPLC teams in the operation and maintenance of power lines.

- 1.1. The specification also covers inspection and test of the chain sling and snatch block as well as schedule of Guaranteed Technical Particulars to be filled, signed by the manufacturer and submitted for tender evaluation.
- 1.2. The specification stipulates the minimum requirements for chain sling and snatch block; acceptable for use in the company and it shall be the responsibility of the supplier to ensure adequacy of the design, good engineering practice, adherence to the specification and applicable standards and regulations as well as ensuring good workmanship in the manufacture of the chain sling and snatch block for The Kenya Power & Lighting Company.

The specification does not purport to include all the necessary provisions of a contract.

2. REFERENCES

The following standards contain provisions which, through reference in this text constitute provisions of this specification. Unless otherwise stated, the latest editions (including amendments) apply:

ISO 3077:	Short link chain for lifting purposes - Grade T (Types T, DAT and DT), fine-tolerance hoist chain.
ISO 1461:	Hot dip galvanizing coatings on fabricated iron and steel articles. Specification and test methods
ISO 643:	Steels -- Micrographic determination of the apparent grain size
ISO 185:	Grey cast irons -- Classification

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BS 1449-1.1: Steel plate, sheet and strip. Carbon and carbon-manganese plate, sheet and strip. General specification

PD 970: Wrought steels for mechanical and allied engineering purposes. Requirements for carbon, carbon manganese and alloy hot worked or cold finished steels

3. TERMS AND DEFINITIONS

For the purposes of this specification the definitions given in the reference standards shall apply.

4. REQUIREMENTS

4.1. SERVICE CONDITIONS

The chain sling and snatch block shall be tropicalized, designed and constructed for continuous outdoor operation in tropical areas and harsh climatic conditions including areas exposed to:

- a) Sea spray (along the coast),
- b) Humidity of up to 95% and
- c) Average ambient temperature of +30°C with a minimum of -1°C and a maximum of +40°
- d) Altitude of up to 2000m above the sea level.

4.2. PARTICULAR REQUIREMENT

4.2.1. Steel Chain Sling

4.2.1.1. The chain sling in this specification shall be designated as a single-leg sling assembly consisting of chains joined suitably to upper and lower terminal fittings for attaching loads to be lifted by the hook of a crane or other lifting machines.

4.2.1.2. The chains shall be manufactured from steel Grade T as per ISO 3077: 2001. The steel used shall be produced by the electric process or by an oxygen-blown process and shall be fully killed in conformity with a suitable deoxidation process in order to obtain an austenitic grain size of 5 or finer when tested in accordance with ISO 643

NOTE: Ferrous parts shall be hot dip galvanized to ISO 1461.

4.2.1.3. The size of the material in finished master and intermediate links shall be as per the Table 1 and 2 whereas the tolerances of the nominal diameter up to and including 18 mm shall be +2 % and - 6 % and for nominal diameter above 18 mm and tolerance of more than ± 5 % except at the weld.

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- 4.2.1.4. The diameter at the weld shall be in no case less than the diameter of the steel from which the link is made or exceed it by more than the tolerances given in individual standards on chains for different grades.
- 4.2.1.5. The chain sling shall be supplied complete with all the components as shown in Fig. 1 and 2.

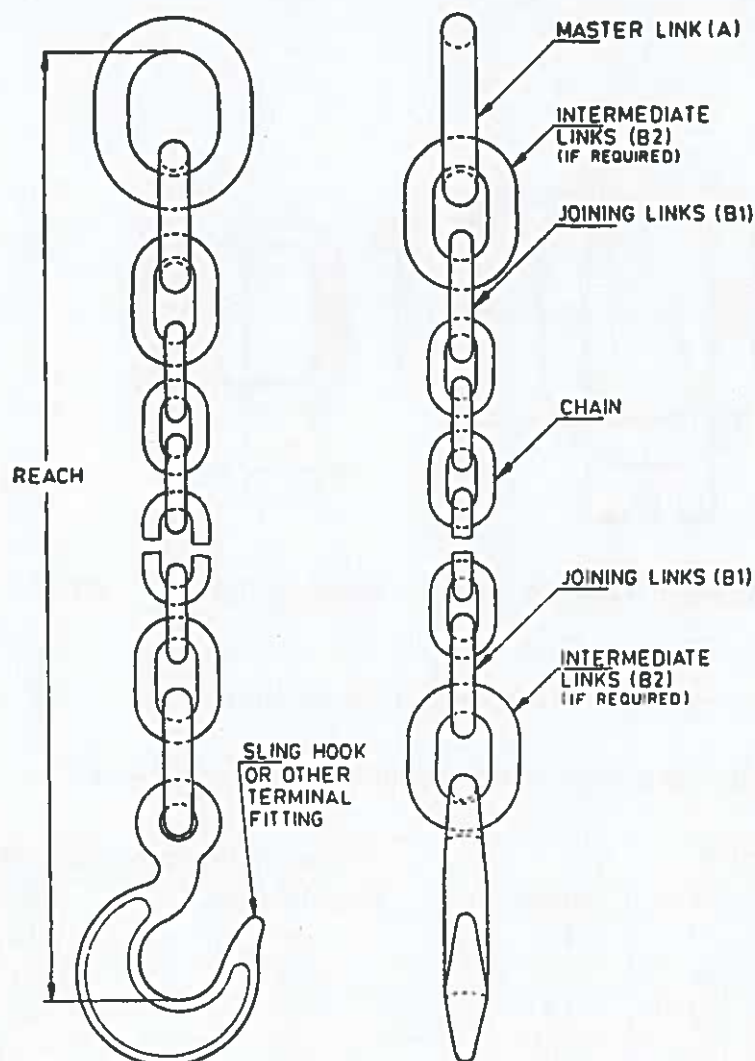


Fig. 1: Single Leg Chain Sling

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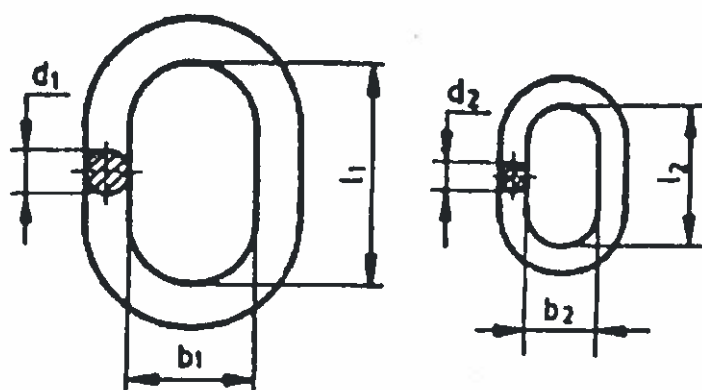
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Table 1: Material Dimensions and Loading of Master, Joining and Intermediate Links as per ISO 3077

Nominal size,	Working Load Limit	Master Link	Joining Link B1, d2	Nominal Reach, L
mm	Tons	mm	mm	mm
16	8	25	18	1,500
22	16	40	25	
25	20	45	28	2,000



Master Link A

Joining Link B1

Fig. 2: Dimensions for Master and Joining Links

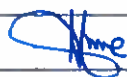
Table 2: Nominal size, pitch and width of links and diameters of O-rings

Master Link A			Joining or Intermediate Links – B1, B2,		
Nominal size, d1	Pitch l1	Width b1	Nominal size, d2	Pitch l2	Width b2
mm	mm	mm	mm	mm	mm
25	135	75	18	80	40
40	200	110	25	120	60
45	250	125	28	120	60

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4.2.2. Snatch blocks

The snatch block in this specification shall be a hinged strap type as shown in Fig. 3a to enable insertion of a rope on to the sheave at any position on the length of the rope. It shall be suitable for use with fibre ropes for working loads of up to 4 900 N (500kgf).

4.2.2.1. Design requirements

- 4.2.2.1.1. The head fitting of the block shall be trapezoidal hook and shanked, swivel head fitting shall be forged in one piece and machined.
- 4.2.2.1.2. The shank shall be threaded and fitted with screw collar or nut, the depth of either being not less than full diameter of the screwed shank.
- 4.2.2.1.3. The continuous length of shank engaged by the nut or collar on the load side shall be at least equal to two-thirds of the diameter of the screwed shank.
- 4.2.2.1.4. The shape and dimension of the hook shall conform to Fig. 3b. The cross-head shall be neatly dressed and hole for the shank of hook shall be machined finished and shall be in correct alignment at right angle to the axis of head fitting.
- 4.2.2.1.5. The shank shall turn freely by hand. The sheave shall be integrally casted and the width of the central boss shall be greater than the width of the rim by 2 to 3 mm.
- 4.2.2.1.6. The depth of the rope groove in the rim of the sheave shall be not less than one-third of the diameter of the rope and the profile of the groove shall be an arc of a circle having a radius of 15 mm and edges of the groove shall be rounded.
- 4.2.2.1.7. The axle pin shall be not less than 3 mm larger in diameter than the diameter of the bearing portion of the axle pin. The tail end of the pin shall project to allow it to be drilled and fitted with a split cotter pin.

4.2.2.2. Performance requirement

- 4.2.2.2.1. The snatch block as a whole shall be tested to a proof load of four times the safe working load of the block. The test load shall be maintained for a period of 5 minutes.
- 4.2.2.2.2. At the end of the test, the blocks shall be opened and all parts examined for permanent deformation or other defects. The blocks shall not show any permanent deformation.

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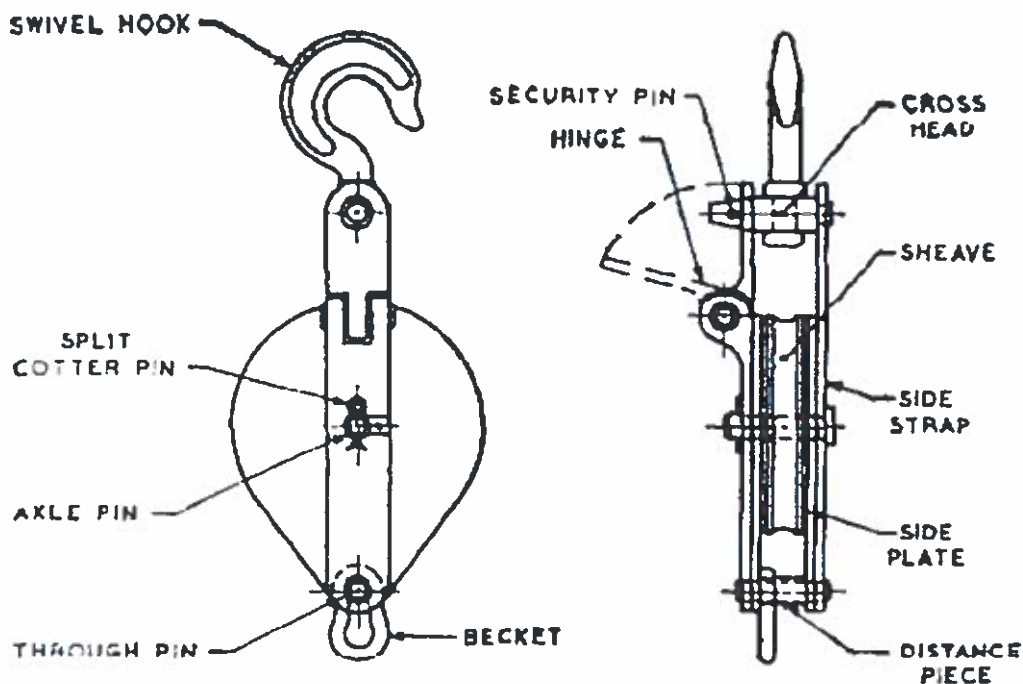


Fig.3a: Snatch block

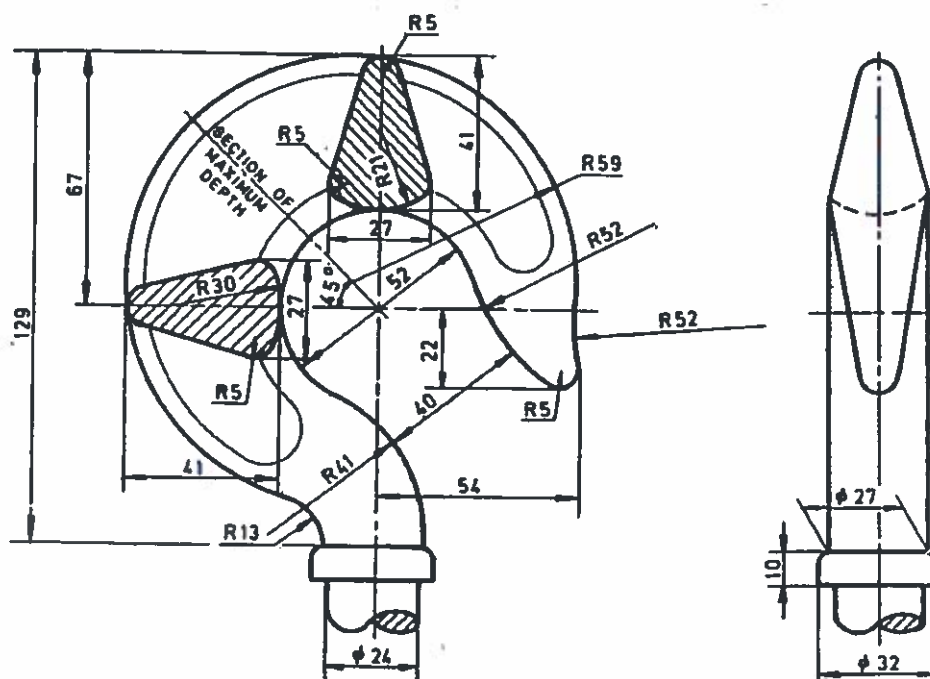


Fig.3b: Swivel hook

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4.2.2.3. Material and parts

The materials used for the various parts of snatch block shall be as shown in Table 3 below:

Table 3: Materials used for the various parts of snatch block

Name of Part	Material designation	Conforming to
Swivel hook	Steel forgings conforming to reference symbol P, steel grade designation 080M20	PD 970:2005
Distance piece and becket		
Hinge		
Cross-head for supporting strap,	Steel forgings conforming to reference symbol P, steel grade designation 070M20	PD 970:2005
Axle pin		
Pin for supporting hook		
Side straps and side plates	Steel plate conforming to grade 17	BS 1449-1.1:1991
Sheave	Grey iron casting conforming to grade FG 200	ISO 185:2005

4.3. Quality Management System

- 4.3.1. The supplier shall submit a quality assurance plan (QAP) that will be used to ensure that the design, material, workmanship, tests, service capability, maintenance and documentation of the chain sling and snatch block fulfil the requirements stated in the contract documents, standards, specifications and regulations. The QAP shall be based on and include relevant parts to fulfil the requirements of ISO 9001:2008.
- 4.3.2. The Manufacturer's Declaration of Conformity to applicable standards and copies of quality management certifications including copy of valid and relevant ISO 9001: 2008 certificate shall be submitted with the tender for evaluation.
- 4.3.3. The bidder shall indicate the delivery time of the load handling accessories, manufacturer's monthly & annual production capacity and experience in the production of the type and size of chain sling and snatch block being offered.

5.0. TESTS AND INSPECTION

- 5.1. The chain sling and snatch block shall be inspected and tested in accordance with ISO 3077, ISO 1461, ISO 643, ISO 185, BS 1449-1.1 and PD 970 standards and all the provisions of

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this specification. It shall be the responsibility of the supplier to perform or to have performed the tests specified and whatever other tests he normally performs at works.

- 5.2. Copies of previous Type Tests Reports issued by a third party testing laboratory that is accredited to ISO/IEC 17025 shall be submitted with the tender for the purpose of technical evaluation. The accreditation certificate to ISO/IEC 17025 for the same third party testing laboratory used shall also be submitted with the tender document (all in English Language)
- 5.3. The chain sling and snatch block shall be subject to acceptance tests at the manufacturer's works before dispatch. Acceptance tests shall be witnessed by two Engineers appointed by The Kenya Power and Lighting Company Limited (KPLC). Routine and Sample Test Reports for the chain sling and snatch block to be supplied shall be submitted to KPLC for approval before delivery of the goods.
- 5.4. On receipt of the product, KPLC will perform any of the tests specified in order to verify compliance with this specification. The supplier shall replace without charge to KPLC the chain sling and snatch block which upon examination, test or use; fail to meet any of the requirements in the specification.

6.0. MARKING AND PACKING

6.1. MARKINGS

6.1.1. Chain Slings

The identification number and working load limit of the sling shall be marked on the master link in English Language. In addition, the following information shall be marked on a metal tag or label permanently attached to the master link or a link immediately adjacent to it:

- a) Working load limit in kg or tonne;
- b) Individual identification numbers;
- c) Grade L, M, S or T;
- d) Manufacturer's name or symbol;
- e) Year of Manufacture;
- f) Size of chain (optional);
- g) Reach of the sling; and
- h) Other information as agreed to between the user and the manufacturer.
- i) The letters "KPLC".

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6.1.2. Snatch block

The snatch block shall be permanently marked with a manufactures trademark and a serial number for traceability in English Language. All snatch blocks shall also be marked on the strap in a clear manner with the following:

- a) Proof load in newtons,
- b) Nominal size (safe working load in newtons),
- c) The inspecting authority's seal with date of test, and
- d) The manufacturer's identification mark and the letters "KPLC".

6.2. PACKAGING

6.2.1. The chain sling and snatch block shall be packed in such a manner so as to avoid damage during transportation and storage.

6.2.2. The chain sling and snatch block shall be packaged in a waterproof storage bags that help guard against contaminants and abrasion. The bags shall be of yellow heavy-duty vinyl-impregnated fabrics that last for years of rugged service.

6.2.3. The following information shall be printed on a suitable label firmly attached to each packaging:

- a) Purchase order number/tender
- b) Manufacturer's name
- c) Year of manufacture
- d) The words, "PROPERTY OF KENYA POWER & LIGHTING CO.

7. DOCUMENTATION

7.1 The bidder shall submit its tender complete with technical documents required by Annex A (Guaranteed Technical Particulars) for tender evaluation. The technical documents to be submitted (all in English language) for tender evaluation shall include the following:

- a) Fully filled clause by clause Guaranteed Technical Particulars (GTP) with the manufacturers offer and signed by the manufacturer;
- b) Copies of the Manufacturer's catalogues, brochures, drawings and technical data;
- c) Sales records for the last five years and at least four customer reference letters;
- d) Details of manufacturing capacity and the manufacturer's experience;
- e) Copies of required type test reports by a third party testing laboratory accredited to ISO/IEC 17025;

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- f) Copy of accreditation certificate to ISO/IEC 17025 for the third party testing laboratory;
- g) Manufacturers letter of authorization, ISO 9001:2008 certificate and other technical documents required in the tender.

7.2 The successful bidder (supplier) shall submit the following documents/details to The Kenya Power & Lighting Company for approval before manufacture:

- a) Guaranteed Technical Particulars signed by the manufacturer;
- b) Design Drawings with details of chain sling and snatch block to be manufactured for KPLC.
- c) Quality assurance plan (QAP) that will be used to ensure that the design, material; workmanship, tests, service capability, maintenance and documentation will fulfill the requirements stated in the contract documents, standards, specifications and regulations. The QAP shall be based on and include relevant parts to fulfill the requirements of ISO 9001:2008
- d) Detailed test program to be used during factory testing;
- e) Marking details and method to be used in marking the chain sling and snatch block;
- f) Manufacturer's undertaking to ensure adequacy of the design, good engineering practice, adherence to the specification and applicable standards and regulations as well as ensuring good workmanship in the manufacture of the chain sling and snatch block for The Kenya Power & Lighting Company;
- g) Packaging details (including packaging materials).

7.3 The supplier shall submit recommendations for use, care, storage and routine inspection/testing procedures, all in the English Language, during delivery of the chain sling and snatch block to KPLC stores.

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ANNEX A: Guaranteed Technical Particulars (to be filled and signed by the Supplier and submitted together with copies of manufacturer's catalogues, brochures, drawings, technical data, sales records, customer reference letters and copies of certificates/test reports for tender evaluation)

Tender No.

Clause number	Bidder's offer (indicate full details of the offered item for each requirement of the tender & specification)									
Bidder's Name										
Manufacturer's Name, address and country										
Type reference/model number of item(s) offered										
Scope: 1.1										
1.2 Load Handling Accessories										
a) Chain Sling										
b) Snatch Block										
1.3										
1.4										
2.0 Applicable Standards (References)										
3.0 Terms & definitions										
4.0 Requirements										
4.1 Service conditions										
4.2 Particular requirements										
4.2.1 Chain Sling										
4.2.1.1. -4.2.1.5.										
4.2.2 Snatch Block										
Description										
4.2.2.1 Design requirements										
4.2.2.1.1 – 4.2.2.1.7										
4.2.2.2 Performance requirements										
4.2.2.2.1 - 4.2.2.2.2										
4.2.2.3 Material parts										
<table border="1"><thead><tr><th>Name of Part</th><th>Material designation</th><th>Conforming to</th></tr></thead><tbody><tr><td>Swivel hook</td><td>Steel forgings</td><td>PD 970:2005</td></tr><tr><td>Distance piece</td><td>conforming to reference</td><td></td></tr></tbody></table>	Name of Part	Material designation	Conforming to	Swivel hook	Steel forgings	PD 970:2005	Distance piece	conforming to reference		
Name of Part	Material designation	Conforming to								
Swivel hook	Steel forgings	PD 970:2005								
Distance piece	conforming to reference									

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and becket	symbol P, steel grade		
Hinge	designation 080M20		
Cross-head for supporting strap,	Steel forgings	PD 970:2005	
Axle pin	conforming to reference		
Pin for supporting hook	symbol P, steel grade		
	designation 070M20		
Side straps and side plates	Steel plate conforming to grade 17	BS 1449-1.1:1991	
Sheave	Grey iron casting conforming to grade FG 200	ISO 185:2005	
4.3 Quality Management System			
5.0 Tests and Inspection			
5.1 – 5.4			
6.0 Marking and Packing			
6.1 Marking			
6.1.1 Chain Slings			
6.1.2 Snatch Block			
6.2 Packing			
6.2.1 – 6.2.3			
7.0 Documentation			
7.1 Completed tender document			
7.2 Catalogues, brochures, drawings & technical data submitted with offer			
8.0. Manufacturer's Guarantee and Warranty			
9.0 List catalogues, brochures, technical data and drawings submitted to support the offer.			
10.0 List customer sales records and reference letters submitted to support the offer.			
11.0 List Test Certificates submitted with tender			
12.0 List test reports of chain sling and snatch block to be submitted to KPLC for approval before shipment			
13.0 Statement of compliance to specification (indicate deviations if any & supporting documents)			

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Supplier's Name, Signature, Stamp and Date

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