

PRODUCTION CONTROL SECTION

NO. 03187/PC/GEN/10-71/98

DT: 7th OCT '98

Subj:- Requirement of Assy. Drg. for Chain and Joining link.

Ref:- DGM (CA)'s Lr. No. 07271/CA-PLG/PDO/98 dt. 1.10.98.

With reference to the above, it is requested to reproduce a set of Assy. drawing with H.V.F. Drg. No. for the subject item in order to facilitate in Assembly as well as in procurement action please.

[Handwritten Signature]
WM (PC)

DGM (PDO)

COPY TO:-

DGM (CA)

DGM (PA-C-TP)

WM (PC)

EXPLANATORY NOTE

SHOP TO UNDERTAKE ASSY - CA

IN ORDER TO AVOID MISMATCHING OF COMPONENTS CHAIN AND LINK TO SPECIFICATION NO.12.7-1820-1 TO GOST 13568-75 DURING ASSY A NEW SUB-ASSY DRG NO. HVF28.102SB1WITH NOMENCLATURE CHAIN ASSY IS ALLOTTED FOR PROCURING THE CHAIN AND LINK AS A SINGLE UNIT IN ASSEMBLED CONDITION SO AS TO FACILITATE EASY ASSY AND ALSO TO STOCK THE SAME UNDER SEPERATE LF.

THE ABOVE SUB ASSY WILL CONSIST THE FOLLOWING DETAILS AND HAVE A LENGTH OF 597MM. ITS USED ON HIGHER ASSY IS 175.28.003 SH. (M.I.)

PART LIST

SL.NO.	DRG/SPECIFICATION NO	NOMENCLATURE	UR	REMARK
01.	GOST 13568 - 75	PR LINK GC-12.7-1820-1	1	
02.	GCST 13568 - 75	CHAIN GC-12.7-1820-1 PR	1	

DRAWINGS ARE CONFIDENTIAL
DUPLICATION IS TO BE
UNAUTHORISED AND IS
TO INVITE PENALTY AS PER
OFFICIAL SECRETARY

BY ORDER
S. GM WVF

		HVF-28-102SB-1.CMI. (L-597MM)		USEL DN 175.28.003.50	
		CHAIN ASSY		SHEET	MASS
				SCALE	
ISSUE	DATE	REFERENCE	MATERIALS		
APPROVED			HEAVY VEHICLES FACTORY		
CHECKED	S.K. [Signature]	2013	AVADI		
DRAWN	E. SUBRAMANIAN	[Signature]			

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GOST

COPY:-2
copy 2 of 2

TRANSMISSION ROLLER AND BUSH CHAINS
GENERAL SPECIFICATIONS
GOST -13568-75

Note:- Please do not scribble in the specifications

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Translated by	Authenticated by	ARMoured VEHICLE PROJECT AVADI	
INSDOC	MAXIMOV		
Date	Compiled by	SPECIFICATION No. GOST - 13568-75	
5-3-86	Dinesh 16/5/86		
		Page No. 1 of 29	Approved by

TRANSMISSION ROLLER AND BUSH CHAINS

General specifications

GOST 13568 - 75

CTC ≥ B 2640-80

In replacement of GOST 10947 - 64 and GOST 13568 - 68

The present standard applies to single-row and multiple - row transmission roller and bush chains which are used in various machines and mechanisms in accordance with specialised requirements.

The standard is not applicable to the roller transmission chains used in drilling installations.

The standard complies with CTC ≥ B 2640 - 80. The standard takes into account the international requirements as laid down in the ISO document P 606.

(Revised edition, modification No. 2)

1. TYPES, MAIN PARAMETERS AND DIMENSIONS.

1.1 The roller and bush transmission chains are manufactured in the following types :

- η PA - roller transmission chains, light series (Fig. 1)
- η P - roller transmission chains, normal series
(Fig. 1 - 4)
- η PA - roller transmission chains with long links (Fig. 5)
- η B - bush transmission chains (Fig. 6 - 7)
- η PH - roller transmission chains with bent plates (Fig. 8)

1.2 The types, main parameters and dimensions of the Chains, connecting ^{links} and crank links must be in accordance with Fig. 1 - 8 and Table 1 - 8.

The ^{areas} magnitudes of the resting surfaces of the hinge in the chains are given in Appendix 2.

~~The notation of the chains, connecting and crank links for export to COMECON countries must be in accordance with Appendix 2.~~

Caption to Fig. 1 (See Page 22)

Single-row chains of type ηP and ηP .

- * - Reference dimensions ;
- 1 - Connecting link ; 2 - crank link ;
- 3 - double crank link

Caption to Fig. 2 (See Page 22)

Double-row Chains of Type ηP

- * - Reference dimensions
- 1 - Connecting link ; 2₀ - crank link ;
- 3 - double crank link

Caption to Fig. 3 (See Page 22)

Triple-row chains of Type ηP

- * - Reference dimensions
- 1 - connecting link ; 2 - crank link
- 3 - double crank link

Caption to Fig. 4 (See Page 22)

Four-row chains of type ηP

- * - Reference dimensions

1 - connecting link ; 2 - crank link

Caption to Fig. 5

Chains of type ПРА

(See Page 23)

* - Reference dimensions

1 - connecting link ; 2 - crank link

Caption to Fig. 6

(See Page 23)

Single-row chains of type ПБ

* - Reference dimensions

1 - connecting link

Caption to Fig. 7

(See Page 23)

Double-row chains of type ПБ

* - Reference dimensions

1 - connecting link

Caption to Fig. 8

(See Page 23)

Chains of type ППМ

* - Reference dimensions

1 - connecting link

Caption to Table 1

(See Page 23)

a - All dimensions are in mm; b - ^{Designation} notation of the chain ;

c - b_3 , not less than ; d - h, not more than ; e -

b_y , not more than ; f - b_6 , not more than ; g - Rupture

load, daN, not less than ; h - Mass of 1 m length of chain,

kg.

Remarks :

1. ~~(Omitted, modification No. 2)~~

2. It is permitted to reduce the rupture load of the crank

links by 20%.

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Caption to Table 2 (See page 24)

a - All dimensions are in mm; b - ^{Designation} Notation of the chain ;
 c - b_3 , not less than ; d - h, not more than ; e - b_7 ,
 not more than ; f - b_6 , not more than ; g - Rupture
 load, daN, not less than ; h - Mass of 1 m length of chain,
 kg.

Remark :

It is permitted to reduce the rupture load of the crank links
 (except the double crank links) by 20%.

Caption to Table 3 (See page 24)

a - All dimensions are in mm ; b - ^{Designation} Notation of the chain ;
 c - b_3 , not less than ; d - h, not more than ; e - b_7 ,
 not more than ; f - b_6 , not more than ; g - Rupture
 load, daN, not less than ; h - Mass of 1 m length of
 Chain, kg.

Remark :

It is permitted to reduce the rupture load of the crank links
 (except the double crank links) by 20%.

Caption to Table 4 (See page 24)

a - All dimensions are in mm; b - Notation of the Chain ;
 c - b_3 , not less than ; d - h, not more than ; e - b_7 ,
 not more than ; f - b_6 , not more than ; g - Rupture load
 daN, not less than ; h - Mass of 1 m length of chain, kg.

Remark :

It is permitted to reduce the rupture load of crank links
 (except the double crank links) by 20 %.

Caption to Table 5 (See Page -5)

a - All dimensions are in mm ; b - Notation of the Chain ; c - b_3 , not less than ; d - h, not more than ; e - b_6 , not more than ; f - b_7 , not more than ; g - Rupture load, daN, not less than ; h - Mass of 1 m length of chain, kg.

Remark :

It is permitted to reduce the rupture load of crank links by 20 %.

Caption to Table 6 (See Page 25)

a - All dimensions are in mm ; b - Notation of the chain ; c - b_3 , not less than ; d - h, not greater than ; e - b_7 , not greater than ; f - b_6 , not greater than ; g - Rupture load, daN, not less than ; h - Mass of 1 m length of chain, kg.

Remark :

It is permitted to reduce the rupture load of crank links by 20%.

Caption to Table 7 (See Page 25)

a - All dimensions are in mm, ^{Designation} b - Notation of the Chain ; c - b_3 , not less than ; d - h, not more than ; e - b_7 , not more than ; f - b_6 , not more than ; g - Rupture load, daN, not less than, h - Mass of 1 m length of chain.

Caption to Table 3 (See Page - 45)

Designation

a - All dimensions are in mm; b - Notation of the chain;
c - b_3 , not less than; d - h, not more than; e - b_7 -
not more than; f - b_5 , not more than; g - Rupture load,
daN, not less than; h - Mass of 1 m length of chain, kg.

Designation

Examples of Notation

1. Roller transmission chain, single row, normal series, pitch 19.05 mm with rupture load of 3180 daN.

Chain ПР - 19.05 - 3180 GOST 13568 - 75

2. Roller transmission chain, triple - row, normal series, pitch 44.45 mm with rupture load of 51720 daN.

Chain 3 ПР - 44.45 - 51720 GOST 13568 - 75

3. Connecting link of roller transmission chain, light series, pitch 25.4 mm with ^{rupture load of} ~~rupture load of~~ 5000 daN.

Link C - ПРЛ - 25.4 - 5000 GOST 13568 - 75.

4. Crank link of roller transmission chain, light series, pitch 25.4 mm with rupture load of 5000 daN

Link П - ПРЛ - 25.4 - 5000 GOST 13568 - 75

5. Roller transmission chain with long links, pitch 38.1 mm with rupture load of 2950 da N

Chain ПРД - 38.1 - 2950 GOST 13568 - 75.

6. Bush transmission chain, pitch 9.525 mm with rupture load of 1300 da N.

Chain ПВ - 9.525 - 1300 GOST 13568 - 75.

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7. Roller transmission chain with bent plates, pitch 103.2 mm with rupture load of 65000 daN.

Chain П ПИ - 103.2 - 65000 GOST 13568 - 75

8. Double crank link of double-row roller transmission chain, normal series, pitch 15.875 mm with rupture load of 4540 daN

Link П 2 - 2 П P - 15.875 - 4540 GOST 13568 - 75

Remarks

For П P type chains with a limiting deviation of length from the nominal within 0.225 %, the letter A is added at the end of the notation.

9. Single-row roller transmission chain, normal series, pitch 25.4 mm with rupture load of 6000 daN and limiting deviation of length from the nominal within 0.225 %.

Chain П P - 25.4 - 6000 A GOST 14568 - 75

10. Double-row roller transmission chain, normal series, pitch 25.4 mm with rupture load of 11400 daN and limiting deviation of length from the nominal within 0.225 %.

Chain 2 P - 25.4 - 11400 A GOST 13568 - 75.

(Revised edition, modifications No. 1 and 2).

2. TECHNICAL REQUIREMENTS

2.1 The chains ^{are to} ~~just~~ be manufactured in accordance with the requirements of the present standard and working drawings approved in the established procedure.

2.2 The plates must be made from ^{cold} rolled section of normal

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or high accuracy in respect of thickness while the rollers and rolled bushes should be made from cold-rolled sections of normal or high accuracy in respect of thickness and width or from laminated ^{band} ribbons as per GOST 2283 - 79, GOST 2284 - 79, GOST 503 - 81, GOST 19904 - 74, GOST 19581 - 74 and GOST 5632 - 73.

The plates of type П ПА and П ПИ chains may also be made from hot rolled sections as per GOST 19903 - 74 and GOST 103 - 76.

(Revised edition, modification No. 1)

2.3 The chain components must be subjected to thermal or thermo-chemical heat treatment to achieve a hardness as per Table 9. ~~The ratio of the depth of diffused layer (eutectoid and half of transient state layer) to achieve a hardness as per Table 9.~~ The ratio of the depth of the diffused layer (eutectoid and half of the transient state layer) to the thickness of roller, bush or the diameter of the shaft in thermo-chemical treatment must correspond to the values given in Table 10.

~~(Revised edition, modifications No. 1 and 2)~~

2.4 The plates used in the chains must have a protective, ~~protective~~ decorative or a decorative coating. A coating on the plate holes is permitted. The type of coating should be decided by coordinating with the customer or on the basis of drawings approved in the established procedure.

2.5 The chain components must be free of scale, cracks, burrs, cavities and corrosion which adversely affect their operation worthiness.

~~(Revised edition, modification No. 2).~~

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2.6 The assembled chain must have a ^{smoothly} ~~smooth~~ relative motion (without any jamming) ^{bend} _^ at the hinged joints.

2.7 The total gap between the external and internal plates assembled in single-row chains must not exceed the values given in Table 11.

The total gap in multiple-row chains must not be more than 0.8 times the product of the gap of single-row chain ^{t₁} and the number of rows.

~~(Revised edition, modification No. 1)~~

2.8 The Chains of type ПР and ПВ having pitch between 8 - 15.875 mm should be subjected to tension under a load which is 15 - 33 % of the rupture load specified in Tables 2 - 7.

2.9 While testing ^{chains for turning of} ~~the propping-off for~~ the shaft and bush ^{relative to} in a single plate, the torque must not be less than the values given in Table 12.

It is permitted to mount the intermediate links on the shafts of multiple-row chains with clearance.

Caption to Table 9 (See Page 26)

a - Types ; b - Pitch t , mm ; c - Plates ; d - Hardness HRC ; e - Shafts ; f - Casehardened steels ; g - Non case hardened steels ; h - bushes ; i - Case hardened steels ; j - Non case hardened steels ; k - rollers ; l - Case hardened steels ; m - Non case hardened steels

Remarks :

1. The hardness of plates of ПР and ПВ chains having a pitch of 19.05 mm or more may be raised to HRC 45.

2. For non case hardened bushes of ПР type chains the

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hardness may be upto ^{HRC} 37 45, while for case hardened shafts and bushes of P and P type chains the hardness may be ^{HRC} 48 ... 55.

Caption to Table 10

(See page - 27)

a - Types ; b - Pitch t , mm ; c - Relative depth of diffused layer, % ; d - shafts ; e - bushes ; f - rollers.

Caption to Table 11

(See page 27)

a - All dimensions are in mm ; b - Pitch ; c - Gap ; d - Continuation of Table 11.

Remarks :

1. If the plates are made of cold rolled section of normal accuracy in respect of thickness or hot-rolled section the total gap may be increased by 50 %.

2. The chains of type ПРА have been marked with an asterisk.

Caption to Table 12

(See Page 27)

a - Pitch, mm ; b - Torque, daN.m ; c - shaft ;

d - Bush

* For ПРА type chains

** For chains ПР - 12.7 - 1000 - 1 and ПР - 12.7 - 900 - 2

*** For chains ПРА - 38 - 1000

Caption to Table 13

(See Page 27)

a - Types ; b - Pitch t , mm ; c - limiting deviation

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of length from the nominal, % ; d - 9.525 and more ; e - 78.1
and more

Remark :

In case of Π P type chains used in transmissions working at speeds of upto 5 m/sec, the limiting deviation of 0.225 % of a length of segment ^{equal to 0.225% value} from the nominal ^{value} is permitted.

2.10 The limiting deviation of a length of chain segment from the nominal length should be positive and its magnitude should correspond to the values given in Table 13. The number of links in the measured length of chain segment should be in accordance with Table 14.

Caption to Table 14

(See page 27)

a - Types ; b - Pitch, mm ; c - Number of links in the measured length of chain segment

2.11 The limiting deviation of pitch from the nominal value must not exceed the magnitudes given in Table 15.

Caption to Table 15

(See page 27)

a - Types ; b - Pitch, mm ; c - Limiting deviation of pitch from the nominal, %.

2.9 - 2.11 (Revised edition, modifications No. 1 and 2)

2.12 (Omitted, modification No. 2)

3a. COMPLETE SET

3a.1 The length of the chain and the number of connecting and crank links is decided on the basis of the order placed by the customer.

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3a.2 The chains may consist of :

- segments of a particular length (as ordered, in meters) without connecting links
- segments with a particular number of links (as ordered in respect of number of links) with connecting or connecting and crank links.
- segments with a particular number of links (as ordered in respect of number of links) with double crank links and two connecting links.

3a.3 The order must give the ^{designation.} notation of the chain, connecting links and crank links as per paragraph 1.2.

~~Section 3a (New addition, modification No. 2)~~

3. ACCEPTANCE RULES .

3.1 To check the conformance of the chains to the requirements of the present standard the manufacturing concern ^{must} ~~must~~ conduct acceptance and periodic bench tests ^{for} ~~in respect of~~ operation - worthiness (except the П П И type chains).

3.2 The acceptance tests must be carried out on each ^{batch} pitch of chains to check their conformance to the requirements of paragraphs 2.4, 2.5, 2.6, 2.7, 2.10, 2.11 and 3a.1. A batch consists of chains of a particular type and size. The batch size is decided by the manufacturing concern but it must not exceed 5000 m. The batch size of П П type chains and multiple-row chains of pitch 25,4 mm or more must not exceed 1000 m. In case of П П И and П П А type chains the batch size may be raised upto 10000 m.

~~(Revised edition, mod)~~

(Revised edition, modification No. 2).

3.3 If in the course of acceptance testing even a single parameter fails to meet the requirements of the present standard, the tests are repeated on doubled sample size in respect of the parameters in which the chains failed the tests. The results of the repeat test are treated as final and ^{pertaining} applied to the whole batch.

3.4 The consumer carries ^{out} ~~set~~ quality control tests to confirm that the chains meet the requirements of the present standard. The tests and their methods are described in paragraph 3.2, 3.3 and 4.2 - 4.7.

3.5 The operation-worthiness of the chains is tested once in six months (except chains of type Π PK). The results of these tests are optional.

(Revised edition, modifications No. 2).

3.6 Each batch of connecting and crank links must be subjected to acceptance tests to check their conformance ^{of these parts} to the requirements of paragraph 1.2.

A batch must consist of not more than 4000 connecting links and 2000 crank links. For the purpose of testing, links should be selected from each batch so that two specimens may be assembled.

3.7 If during the accepting ^{and} testing even a single parameter of the chains, connecting links and crank links fails to meet the requirements of the present standard, a repeat ^{ed} test must be conducted on doubled sample size. The results of the repeat ^{ed} test are treated as final and held valid for the whole batch.

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~~2.6, 2.7 (New addition, modification No. 2).~~

4. TESTING METHODS. Procedure.

4.1 The hardness and depth of hardened layer are monitored during the manufacture of components. The number of components to be monitored is decided by the manufacturing concern and the objective is to check the conformance of the chains to the requirements of paragraph 2.3.

4.2 All chains are visually inspected to check their conformance to the requirements of paragraphs 2.4, 2.5 and 5.1.

4.3 The mobility of the hinged joints as laid down in paragraph 2.6 is checked by rolling the chain having number of links as given in Table 14 over a sprocket with 15 - 21 teeth or by manually rotating the adjacent links and rollers of the chain lying in the horizontal plane.

4.4 The side gap between plates is measured on the chain lying horizontally by means of a universal measuring instrument or a special gauge. This check is conducted on 20 hinges in a batch. The gap must be in accordance with the requirements of paragraph 2.7.

4.5 The test to check the strength of the joints between the shafts and bushes with the plates is conducted on at least five hinges from a batch. The test is conducted on general purpose fixtures or on special machines.

The torque must meet the requirements of paragraph 2.9.

~~(Revised edition, modification No. 2)~~

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4.6 The length of segment and pitch must be measured under a load equal to 1 % of the rupture load as per paragraphs 2.10 and 2.11 ; during this test the chain must lie in the horizontal plane.

The number of measurements must be at least 10.

The length of chain segment is measured by a vernier calliper or by a special measuring instrument, while the pitch of the chain is measured by a device which has a measuring error not exceeding the norms laid down in GOST 8.051 - 73.

~~(Revised edition, modification No. 1 and 2)~~

4.7 The rupture strength test as per paragraph 1.2 is conducted on two specimens from a batch of chains ; the specimen length between the clamps must include at least 5 links.

The rupture strength is tested on universal testing machines. If the chain elements under the clamps get ruptured, the results of the test are invalidated.

~~(Revised edition, modification No. 2)~~

4.8 The chains of type ПРЛ , ПРД , ПР and ПВ must be subjected to bench tests to assess their operation - worthiness.

The test conditions during the bench tests must be as per the values given in Recommended Appendix 1.

5. MARKING, PACKING, TRANSPORTATION AND STORAGE

5.1 The brand mark or symbol of the manufacturing concern and the pitch of the chain in mm must be marked by a seal on at least 5% of the outer plates from exposed side. Marking of pitch is not obligatory for chains of pitch 8-15-875mm. The size and location of seal are indicated on the working drawings.

~~In case of chains meant for export, instead of the chain pitch in mm a notation as per Appendix 3 is marked without indicating the number of rows if it is a multiple-row chain.~~

~~(Revised edition, modification No. 2).~~

5.2 The long-term storage of chains is done in accordance with GOST 9.014 - 78 ^{provided storage conditions.} so that it ensures corrosion resistance for at least a year from the commencement of storage.

5.3 The chains may be transported by any mode of conveyance. While dispatching by rail, water or surface transport the chains must be packed in crates made of planks as per GOST 10198 - 78 or GOST 15841 - 77 ^{and lined on the inside.} after lining them with packing paper (bituminous or tar paper as per GOST 515 - 77) or some other water proof paper.

The crate should carry an inscription containing the following information :

- brand mark of the manufacturing concern
- ^{designation} notation of chain
- number of chains in the crate
- length of chain in terms of links

It is permitted to transport chains by automobiles and in covered wagons without packing or in containers provided ^{chains} they have been properly protected against corrosion, abrasive contamination and mechanical damage.

5.4 Each batch of chains of a particular type and size must be accompanied by a document (label, ^{tag} token) containing the following information :

- brand mark or symbol of the manufacturing concern

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- ~~number of chains in batch~~
- ^{designation} notation of the chains as per the present standard
- number of chains in batch
- ^{Stamp} ~~seal~~ of the ^{Quality Inspection} Technical Control Department
- batch No. (as per paragraph 3.2)

5.5 The chains must be stored in dry, properly ventilated premises with relative air humidity upto 75 %.

The stores must protect the chains from dust and the effect of gases. It is not permitted to store chemicals in the same premises.

~~5.3 - 5.5 (Revised edition, modification No. 2)~~

6. MANUFACTURER'S GUARANTEE

6.1 The manufacturer must guarantee the conformance of the chains to the requirements of the present standard provided the operating, storage and transporting conditions are adhered to.

6.2 The guaranteed service life of the chains is 12 months from the date of commissioning.

~~6.1, 6.2 (Revised edition, modification No. 2).~~

Recommended Appendix 1

TEST CONDITIONS FOR BENCH TESTING IN RESPECT OF OPERATION WORTHINESS

1. The following groups of bench test are carried out :

A. for chains operating mainly in transmissions, motor cycles scooters, and bicycles using an oil bath or periodic lubrication.

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B. for chains operating mainly in open, low-speed transmissions with periodic lubrication (transmissions in agricultural and similar machines).

C. for chains operating mainly in general industrial equipment with periodic lubrication.

D. for chains operating mainly in high - speed transmission in an oil bath.

Remark :

The ΠP type chains with a limiting deviation of 0.225 % on segment length should be tested as per group D. For the chains $\Pi P - 19.05 - 3180 A$ and $\Pi P - 25.4 - 6000 A$, the ^{Speed} frequency of rotation of the driving sprocket is taken as per Group B. For the chains $\Pi P - 31.75 - 8900$ as ^{per} group C pertaining to chains of the corresponding pitch.

~~(Revised edition, modification No. 2)~~

2. The test conditions for determining the operation - worthiness of chains by bench testing should be in accordance with Tables 1 - 4.

3. The design load for multiple-row chains of type ΠP , tested under conditions specified in Tables 1 - 4. is determined by multiplying the design load of the corresponding single-row chain with a coefficient as given below :

- for two-row chain 1.8
- for three-row chain 2.5
- for four-row chain 3.0

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specified.

4. The duration of the test ~~should be taken in accordance with Tables 1 - 4, which also takes into account the running-in period.~~

(Revised edition, modification No. 2)

5. In Tables 1 - 4, the increase in the length of segment of chain with the number of links, as per Table 14, has been given without accounting for the wear during the running - in period.

Caption to Table 1 (See Page - 28)

Designation

a - Notation of chain ; b - Test group ; c - Chain length in terms of pitch ; d - Test conditions ; e - number of teeth on the sprocket ; f - driving ; g - driven ; h - Frequency of rotation of the driving sprocket min^{-1} ; i - Design load, daN ; j - Duration of the running in period, hrs. ; k - Test duration, hrs. ; l - Limiting increase in the length of chain segment, mm.

Caption to Table 2 (See Page 28)

Designation

a - Notation of chain ; b - Test group ; c - Chain length in terms of pitch ; d - Test conditions ; e - Number of teeth on the sprocket ; f - driving ; g - Driven ; h - ^{Speed} Frequency of rotation of the driving sprocket, min^{-1} ; i - Design load, daN ; j - Test duration ; hrs. ; k - Limiting increase in the length of chain segment, mm.

Caption to Table 3 (See Page 28)

Designation

a - Notation of chain ; b - Test group ; c - Chain length in terms of pitch ; d - Test conditions ; e -

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Number of teeth on the sprocket ; f - driving ; g - driven
 h - ^{Speed} Frequency of rotation of the driving sprocket, min^{-1} ;
 i - Design load, daN, j - Duration of running in period, hrs
 k - Test duration, hrs ; l - Limiting increase in the length
 of chain segment, mm.

Caption to Table 4

(See Page 28)
^{Designation chain}
 a - Notation of chain ; b - Test group ; c - Chain length
 in terms of pitch ; d - Test condition ; e - Number of
 teeth of the sprocket ; f - driving ; g - driven ; h -
^{Speed} Frequency of rotation of the driving sprocket, min^{-1} ; i -
 Design load, daN ; j - Duration of running in period ; k -
 Test duration, hrs ; l - Limiting increase in the length of
 chain segment, mm.

Reference Appendix 2

RESTING SURFACE OF HINGE

^{Designation}
 a - Notation of Chain ; b - Resting surface of the hinge
 in a single row chain, cm^2 .

Remarks :

1. The resting surface of the hinge of a multiple-row chain
 is equal to the product of the resting surface of a single-row chain
 and the number of rows in the chain.

2. The resting surface of ηP type chains with a limiting
 deviation of segment equal to 0.225 % of the nominal ^{value} (with letter A)
 is equal to the resting surface of the hinge of the ηP type chain
 of corresponding pitch.

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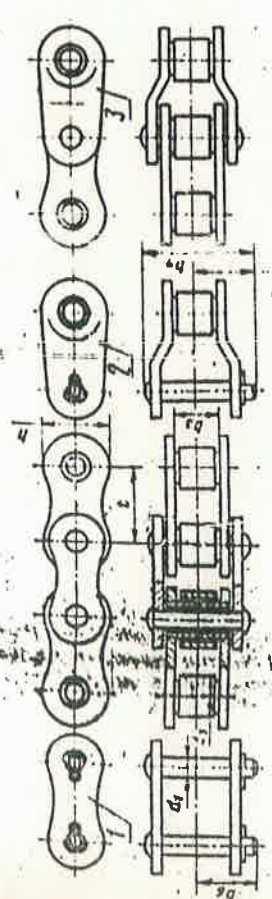
21 | 21

ГОСТ 18568-75

Величины опорной поверхности шарнира цепи приведены в приложении 2.
 Обозначение цепи, содержащей переходных звеньев при склепыве в страны, должно указываться в указанном в приложении 3.

Single-row chains of type ПРЛ and ПР

Цепи односторонние типа ПРЛ и ПР

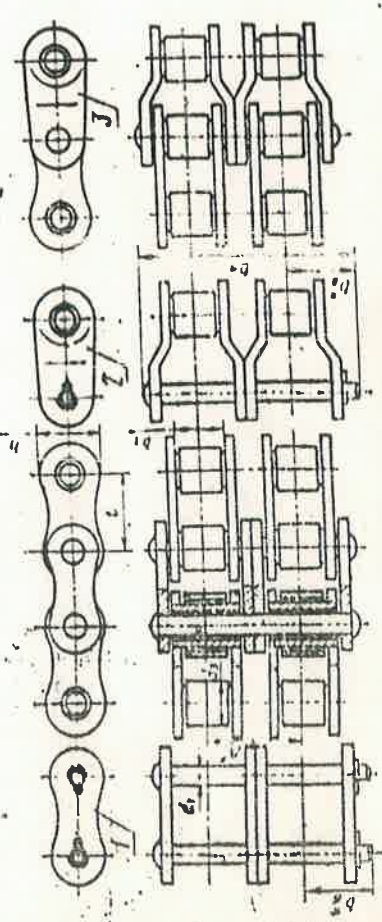


Reference for dimensions.

- 1 - Connecting link
- 2 - Double crank link
- 3 - Crank link

Double-row chains of type ПР

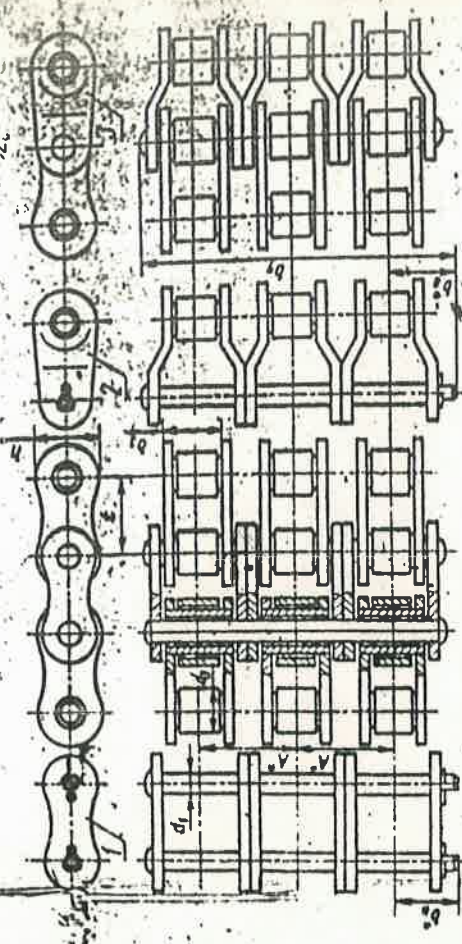
Цепи двусторонние типа ПР



- 1 - Connecting link
- 2 - Double crank link
- 3 - Crank link

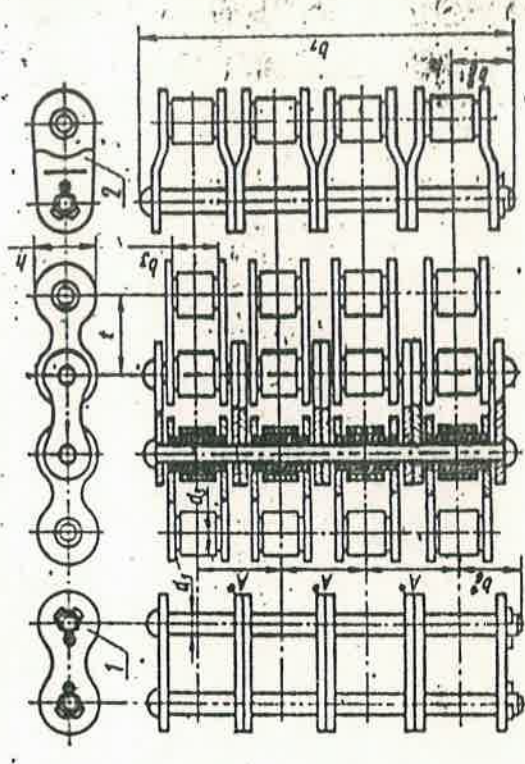
ГОСТ 18568-75

Цепи трехрядные типа ПР



Reference dimensions.
 1 - Connecting link
 2 - Crank link
 3 - Double crank link

Four-row chains Цепи четырехрядные типа ПР of type ПР

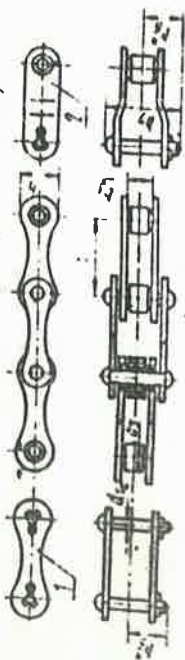


Reference dimensions.
 1 - Connecting link
 2 - Crank link
 3 - Double crank link

ГОСТ 18568-75

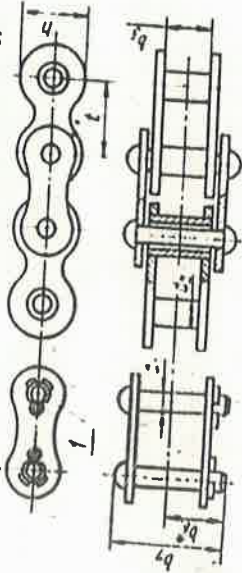
Chains of type ПРА

Цепи типа ПРА



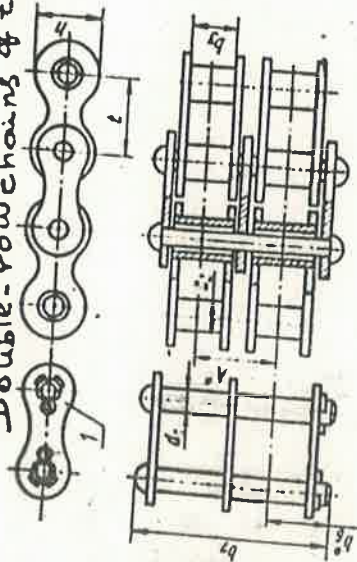
Reference dimensions
 ① Connecting link
 ② Crank link
 Drawing - 5

Цепи однорядные типа ПВ
 Single-row chains of type ПВ



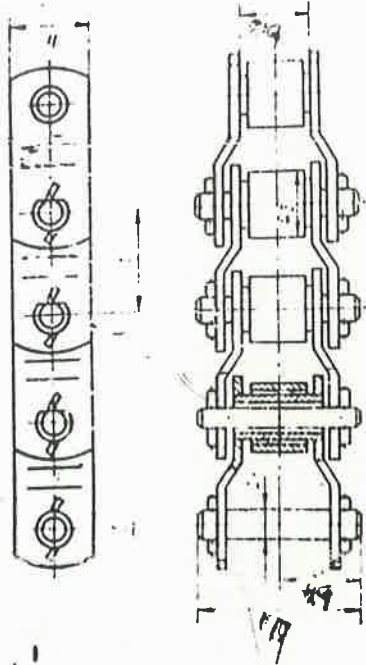
• Размер для справок. - Reference for dimensions
 - размер соединительное - Connecting link
 Черт. 6 - Drawing 6.

Цепи двухрядные типа ПВ
 Double-row chains of type ПВ



• Размер для справок. - Reference dimensions
 - размер соединительное - Connecting link
 Черт. 7
 Drawing 7.

Цепи типа ПРИ
 Chains of type ПРИ



• Размер для справок. - Reference dimensions
 - размер соединительное - Connecting link
 Черт. 8 - Drawing 8.

Table 1
 Dimensions in mm

Designation of the chain	b ₃ , not less than	d ₂	d ₃	h, not less than	by not more than	rupture load kg	Mass of 1 m length of not less than
ПРЛ-15,875-2270	9,65	5,08	10,16	14,8	24	2270	0,90
ПРЛ-19,05-2950	12,70	5,94	11,91	18,2	33	2950	1,6
ПРЛ-25,4-5000	15,88	7,92	15,88	24,2	39	5000	2,6
ПРЛ-31,75-7000	19,05	9,53	19,05	30,2	46	7000	3,8
ПРЛ-38,1-10000	25,4	11,10	22,23	36,2	58	10000	5,5
ПРЛ-44,45-13000	31,75	12,70	25,40	42,4	62	13000	7,3
ПРЛ-50,8-16000	38,1	14,27	28,58	48,3	72	16000	9,7

Примечания - Remarks -

1. (Исключено, Изм. № 2).
 2. Допускается увеличение разрушающей нагрузки на 20%.
- It is permitted to reduce the rupture load of the Crank links by 20%.

- Примеры условных обозначений:
 Цепи приводной роликовой однокорданной нормальной серии шага 19,05 мм с разрушающей нагрузкой 3180 даН:
 1. Цепь ПР-19,05-3180 ГОСТ 13568-75
 Цепи приводной роликовой трехрядной нормальной серии шага 44,45 мм с разрушающей нагрузкой 5720 даН:
 2. Цепь ЗПР-44,45-5720 ГОСТ 13568-75
 Соединительного звена приводной роликовой цепи легкой серии с шагом 25,4 мм с разрушающей нагрузкой 5000 даН:
 3. Звено С-ПРЛ-25,4-5000 ГОСТ 13568-75
 Переходного звена приводной роликовой цепи легкой серии шага 25,4 мм с разрушающей нагрузкой 5000 даН:
 4. Звено П-ПРЛ-25,4-5000 ГОСТ 13568-75

All dimensions are in mm. Table 6

Designation of the chain	t	Roller diam. d_1	Pin diam. d_3	h, not more than	b7, not more than	b6, not more than	Rupture load, daN	Mass of link, kg
ПРД-31,75-2300	31,75	9,65	10,16	14,8	24	13	2300	0,60
ПРД-38,1-2950	38,1	12,70	11,91	18,2	31	17	2950	1,10
ПРД-38-3000	38,0	22,00	15,88	21,3	42	23	3000	1,87
ПРД-38-4000	38,0	22,00	7,92	15,88	47	26	4000	2,10
ПРД-50,8-5000	50,8	15,88	7,92	15,88	24,2	39	5000	1,90
ПРД-63,5-7000	63,5	19,05	9,53	19,05	46	24	7000	2,60
ПРД-76,2-10000	76,2	25,4	11,10	22,23	57	30	10000	3,80

It is permitted to reduce the rupture load of crank links by 20%.
 Примечание. Допускается снижение разрушающей нагрузки переходных звеньев на 20%. By 20%.

Пример условного обозначения
 Цепи приводной роликовой длиннозвенной с шагом 38,1 мм, с разрушающей нагрузкой 2950 даН:

Цепь ПРД-38,1-2950 ГОСТ 13568-75

All dimensions are in mm. Table 7

Designation of the chain	t	Roller diam. d_1	Pin diam. d_3	A	h, not more than	b7, not more than	b6, not more than	Rupture load, daN	Mass of link, kg	Link length of chain
ПВ-9,525-1150	9,525	7,60	3,59	5,00	8,80	18,5	10,0	1150	0,50	
ПВ-9,525-1300	9,525	9,52	4,45	6,00	9,85	21,2	12,0	1300	0,65	
2ПВ-9,525-2000	9,525	5,20	4,45	6,00	9,85	27,5	8,5	2000	1,00	

Пример условного обозначения
 Цепи приводной втулочной шага 9,525 мм с разрушающей нагрузкой 1300 даН:

Цепь ПВ-9,525-1300 ГОСТ 13568-75

All dimensions are in mm. Table 8

Designation of the chain	t	Roller diam. d_1	Pin diam. d_3	h, not more than	b7, not more than	b6, not more than	Rupture load, daN	Mass of link, kg	Link length of chain
ПРИ-78,1-36000	78,1	38,1	17,15	33,3	45,5	102	51	36000	14,5
ПРИ-78,1-40000	78,1	38,1	19,00	40,0	56,0	102	51	40000	19,5
ПРИ-103,2-65000	103,2	49,0	24,00	46,0	60,0	135	73	65000	28,8
ПРИ-140-120000	140,0	80,0	36,00	65,0	90,0	182	94	120000	63,0

Пример условного обозначения
 Цепи приводной роликовой с изогнутыми пластинами шага 103,2 мм с разрушающей нагрузкой 65000 даН:

Цепь ПРИ-103,2-65000 ГОСТ 13568-75

Двойного переходного звена приводной роликовой двухрядной цепи нормальной серии шага 15,875 мм с разрушающей нагрузкой 4540 даН:

Звено П2-2ПР-15,875-4540 ГОСТ 13568-75

Примечание. Для цепей типа ПР с предельным отклонением длины отреза от номинала 0,225% в кодах обозначения цепи добавляется буква А.

Цепи приводной роликовой однокорданной нормальной серии шага 25,4 мм с разрушающей нагрузкой 6000 даН и предельным отклонением длины отреза от номинала 0,225%:

Цепь ПР-25,4-6000А ГОСТ 13568-75

Цепи приводной роликовой двухрядной нормальной серии шага 25,4 мм с разрушающей нагрузкой 11400 даН и предельным отклонением длины отреза от номинала 0,225%:

Цепь 2ПР-25,4-11400А ГОСТ 13568-75

(Измененная редакция, Изм. № 1, № 2)

Table 9.

Types	Pitch, mm.	Hardness HRC.				Bushes		Rollers	
		Plates		Non-Case hardened Steels		Case hard. and Steels	Non-Case hardened Steels	Case hardened Steels	Non-Case hardened Steels
		Case hardened Steels	Non-Case hardened Steels	Case hard. and Steels	Non-Case hardened Steels	Case hardened Steels	Non-Case hardened Steels	Case hardened Steels	Non-Case hardened Steels
ПРЛ	15,875	40...50	48...55	54...62	48...55	54...62	48...55	47...55	42...50
	19,05	32...40							
	25,4	32...40							
	31,75...50,8	26...40							
ПР и ПРЛ	8...15,875	40...50	48...55	59...65	48...55	59...65	48...55	51...62	42...50
	31,75								
ПР	19,05	32...40	48...55	54...62	48...55	54...62	48...55	47...55	42...50
	25,4	32...40							
	31,75...53,5	38...45							
ПРЛ	38...76,2	32...40	48...55	54...62	48...55	54...62	48...55	47...55	42...50
ПРЛ	78,1...140	35...45	45...55	—	45...55	45...55	45...55	—	35...45

Remarks: 1. The hardness of plates of ПРЛ and ПР chains having a pitch of 19.05 mm or more may be raised to HRC 45.

2. For non-case hardened bushes of ПРЛ type chains the hardness may be up to HRC 37...45, while for case hardened sheets and bushes of ПРЛ and ПРЛ type chains the hardness may be HRC 48...55.

Table 10

Types	Pitch t, mm	Relative depth of diffused layer %	
		Shafts	Rollers
ПРД, ПР = ПВ ПРД, ПР = ПРД ПРИ	8...15,875 19,05...76,2 78,1...140	4,0...11,0	8...30
		3,5...11,0	12...30
		12...30	10...25

Таблица 10

Pitch шаг	t	mm	
		Шаг	Зазор
38	9,55	15,875 31,75	25,4 50,8
	12,7	19,05 38,1	31,75 63,5
Зазор Gap	0,4	0,5	0,8
	0,5	0,8	1,0
Шаг	1,0	1,2	1,4
	1,2	1,3	1,4
Зазор Gap	1,0	1,3	1,4
	1,2	1,3	1,4

1. If the plates are made of cold rolled section of normal accuracy in respect of thickness, or hot-rolled section the total gap be increased by 50%
 2. The chains of type ПРА have been marked with an asterisk.

Pitch, mm	Шаг, мм	Torque, daN·m	
		Shaft	Bush
9,525	12,7	0,05	0,03
12,7		0,08	0,05
15,875		0,25	0,15
19,05	31,75	0,35	0,20
25,4		0,60	0,35
31,75		1,50	0,90
38	38	2,90	1,79
		1,20	0,70
		1,44	0,85
44,5	76,2	4,00	2,40
		5,50	3,30
		7,50	4,20
50,8	120	12,00	7,20

Для цепей типа ПРД
 Для цепей ПР-12,7-1000-1 и ПР-12,7-900-2
 Для цепей ПРД-38-4000 xx для цепей ПРА-38-4000

For ПРА type chains
 For chains ПР-12,7-1000-1 and ПР-12,7-900-2
 For chains ПРД-38-4000

Limiting deviation of the nominal length from nominal %

Table 13 Таблица 13

Types	Типы	Pitch t, mm	Шаг t, мм	Предельное отклонение длины отрезка от номинала, %
ПР, ПРД, ПРД и ПРИ	ПР, ПРД, ПРД и ПРИ	8,0-63,5	8,0-63,5	0,15
		9,525 и более	9,525 и более	0,225
		78,1 и более	78,1 и более	0,50

Примечание. Для цепей типа ПР, применяемых в цепях, передающих со скоростью движения до 5 м/с, допускается предельное отклонение длины отрезка 0,225% от номинала.
 2.10. Предельное отклонение длины отрезка цепи от номинального значения должно быть только положительным и соответствовать указанному в табл. 13. Число звеньев в измеряемом отрезке цепи должно соответствовать указанному в табл. 14.

Table 14 Таблица 14

Types	Типы	Pitch, mm	Шаг, мм	Число звеньев в измеряемом отрезке
ПРД, ПР, ПРД и ПРИ	ПРД, ПР, ПРД и ПРИ	8,0...25,4	8,0...25,4	49
		31,75	31,75	47
		38 и 38,1	38 и 38,1	39
		44,45	44,45	33
ПРИ	ПРИ	50,8	50,8	29
		63,5	63,5	23
		76,2	76,2	19
		78,1	78,1	19
		103,2	103,2	15
		140,0	140,0	11

The limiting deviation of pitch from the nominal value must not exceed the magnitudes given in table 15.

Table 15 Таблица 15

Types	Типы	Pitch, mm	Шаг, мм	Предельное отклонение шага от номинала, %
ПРД, ПР и ПРИ	ПРД, ПР и ПРИ	8...15,875	8...15,875	±0,90
		19,05...140	19,05...140	+0,90
ПР	ПР	19,05	19,05	-0,40
		25,4	25,4	+0,70
		31,75	31,75	-0,40
		38,1 и 44,45	38,1 и 44,45	+0,60
		50,8 и 63,5	50,8 и 63,5	-0,20
				+0,50
				-0,20
				+0,36
				-0,20

Limiting deviation of pitch from the nominal %

2.9-2.11. (Измененная редакция, Изм. № 1, № 2).
 2.12. (Исключен, Изм. № 2).

ПРИЛОЖЕНИЕ I
Рекомендуемое

УСЛОВИЯ СТЕНДОВЫХ ИСПЫТАНИЙ ЦЕПЕЙ НА РАБОТОСПОСОБНОСТЬ

1. Устанавливаются следующие группы испытаний цепей:
 А — для цепей, работающих преимущественно в передачах, мотоциклов, мотороллеров и велосипедов, в масляной ванне или при периодической смазке;
 Б — для цепей, работающих преимущественно в открытой тихоходных передачах при периодической смазке (передачи сельскохозяйственных и им подобных машин);
 В — для цепей, работающих в приводах машин общепромышленного назначения в условиях периодической смазки;
 Г — для цепей, работающих преимущественно в быстроходных передачах в масляной ванне.
- Примечание. Цепитипа ПР с предельным отклонением длины отрезка 0,225% испытываются по группе Г. Для цепей ПР-19,05—3180А и ПР-25,4—6000А частота вращения ведущей звездочки принимается по группе Б. Для цепей ПР-31,75—8900А — по группе В для цепей соответствующего шага.
- (Измененная редакция, Изм. № 2).
2. Условия стендовых испытаний цепей на работоспособность должны соответствовать указанным в табл. 1—4.
3. Расчетная нагрузка для многорядных цепей типа ПР, испытываемых по режимам табл. 1 и 4, определяется путем умножения расчетной нагрузки для соответствующих однорядных цепей на коэффициент, равный:
 для двухрядной цепи — 1,8;
 для трехрядной цепи — 2,5;
 для четырехрядной цепи — 3,0.
4. Продолжительность испытания согласно табл. 1—4 указана с учетом времени периода приработки.

(Измененная редакция, Изм. № 2).
 Б. В табл. 1—4 увеличение длины отрезка цепи с числом звеньев согласно табл. 14 дано без учета износа в период приработки.

Table 1 Таблица 1

Designation of chain	Test Conditions				Chain length, Terms of Pitch	Driving	Driven	Speed of rotation of the driving sprocket, min ⁻¹	Design load, da.N	Duration of turning in hrs.	Test duration, hrs.	Limiting increase in the length of chain, mm.
	Number of teeth on sprocket	Speed of rotation of the driven sprocket, min ⁻¹	Design load, da.N	Duration of turning in hrs.								
A	120	21	21	3200	25	10	660	1,2				
	120	21	21	3000	60	15	700	1,4				
	66	15	31	2600	36	40	700	2,8				
	66	24	52	2600	53	40	700	2,8				
	66	24	52	2600	65	40	700	3,7				
	112	19	48	1200	40	20	600	1,9				
	112	19	48	1200	50	20	600	1,9				
	110	17	40	1280	125	60	700	5,0				
	110	17	44	1280	140	40	700	5,0				
	100	16	42	1180	175	40	700	6,2				
100	16	42	1180	220	40	700	6,2					

Designation of chain

Table 2 Таблица 2

Test group	Test Conditions					
	Chain length, Terms of Pitch	Driving	Driven	Speed of rotation of the driving sprocket, min ⁻¹	Design load, da.N	Duration of turning in hrs.
Б	110	19	19	600	155	200
	110	19	19	500	250	200
	110	19	19	600	250	200
	110	19	19	500	430	200
	100	17	17	300	140	200
	100	17	17	200	300	200
	100	17	17	200	360	200
	100	17	17	275	135	200
	100	17	17	275	135	200
	100	17	17	275	135	200

Designation of Chain

Table 3 Таблица 3

Test group	Test Conditions					
	Chain length, Terms of Pitch	Driving	Driven	Speed of rotation of the driving sprocket, min ⁻¹	Design load, da.N	Duration of turning in hrs.
B	100	17	17	500	630	200
	100	17	17	400	1020	200
	100	17	17	300	1180	200
	94	17	17	240	1580	200
	94	17	17	200	370	200
	94	17	17	160	550	200
	94	17	17	120	630	200
	94	17	17	120	630	200
	94	17	17	120	630	200
	94	17	17	120	630	200

Designation of chain

Table 4 Таблица 4

Test group	Test Conditions					
	Chain length, Terms of Pitch	Driving	Driven	Speed of rotation of the driving sprocket, min ⁻¹	Design load, da.N	Duration of turning in hrs.
Г	110	19	19	1200	200	40
	110	19	19	800	400	65
	100	17	17	600	605	150
	100	17	17	450	945	150
	100	17	17	350	1025	200
	94	17	17	280	1470	250
	94	17	17	220	2320	300
	94	17	17	220	2320	300
	94	17	17	220	2320	300
	94	17	17	220	2320	300

Resting surface of hinge.

ОПОРНАЯ ПОВЕРХНОСТЬ ШАРНИРА

Designation of chain	Resting surface of the hinge in a single row chain cm^2	Designation of chain	Resting surface of the hinge in a single row chain cm^2
ПР-8-460	0,11	ПРД-50,8-5000	1,79
ПВ-9,525-1150	0,4	ПРЛ-31,75-7000	2,62
ПВ-9,525-1300	0,56	ПР-31,75-8900	2,62
ПР-9,525-910	0,28	ПРД-63,5-7000	2,62
ПР-12,7-1000-1	0,13	ПРД-38-3000	2,24
ПР-12,7-900-2	0,22	ПРД-38-4000	2,37
ПР-12,7-1820-1	0,39	ПРЛ-38,1-10000	3,95
ПР-12,7-1820-2	0,50	ПР-38,1-12700	3,94
ПР-15,875-2300-1	0,51	ПРД-76,2-10000	3,95
ПРЛ-15,875-2270	0,67	ПРЛ-44,45-13000	4,73
ПР-15,875-2300-2	0,67	ПР-44,45-17240	4,72
ПРД-31,75-2300	0,67	ПРЛ-50,8-16000	6,37
ПРЛ-19,05-2950	1,05	ПР-50,8-22700	6,45
ПР-19,05-3180	1,05	ПР-63,5-35400	10,89
ПРД-38,1-2950	1,05	ПРИ-78,1-36000	10,20
ПРЛ-25,4-5000	1,79	ПРИ-78,1-40000	11,31
ПР-25,4-6000	1,79	ПРИ-103,2-65000	19,68
		ПРИ-140-120000	43,20

Примечания:

- Опорная поверхность шарнира многорядной цепи равна произведению опорной поверхности шарнира однорядной цепи на число рядов в цепи.
- Опорная поверхность шарнира для цепей типа ПР с предельным отклонением длины отрезка от номинала 0,225% (с буквой А) равнозначна опорной поверхности шарнира для цепей типа ПР соответствующего шага.

- Remarks: The resting surface of the hinge of a multiple-row chain is equal to the product of the resting surface of a single-row chain and the number of rows in the chain.
- The resting surface of PR type chains with a limiting deviation of segment equal to 0,225% of the nominal value with letter A) is equal to the resting surface of the hinge of the PR type chain of corresponding pitch.

RESTRICTED
(DRAFT/PROVISIONAL)
QUALITY ASSURANCE PLAN
FOR
(CHAIN ASSY L=597MM)
DRG. NO. HVF.28.102SB-1(M1) (L-597mm)
(LF NO: 6206890344)

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QUALITY ASSURANCE (RIG-ASSEMBLY)
HEAVY VEHICLES FACTORY
AVADI, CHENNAI – 600 054

QUALITY ASSURANCE PLAN (QAP)

FOR

(CHAIN ASSY L=597MM)

DRG. No: HVF.28.102SB-1(M1)(L-597mm)


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1) IMPORTANT NOTES:

Note-1

This is only a provisional and will be amended from time to time according to the requirement. No addition, deletion and reproduction will be done without the permission of The Sr. General Manager, Heavy Vehicles Factory, Avadi, Chennai – 54.

Note-2

Any instruction contained in this does not prejudice the terms and conditions of the contract what so ever. In case of any contradiction between the contents of this QAP and the clause in the contract, the latter will prevail.

Note-3

The stores should be manufactured strictly as per the drawings supplied by the Inspection Authority only and not as per the samples, if any received by the manufacturer for guidance purpose.

Note-4

Any amendment issued by the Inspection Authority shall be incorporated in the QAP and the records for the amendments carried out should be maintained as per the Performa at Appendix-"A".

Note-5

In case of any contradiction between the contents of this QAP and drawings issued along with the contract, the latter will prevail.

2. INTRODUCTION:

- a) This quality plan lays down the inspection and testing procedure to be carried out on the **CHAIN ASSY L=597MM. TO DRG.NO. HVF.28.102SB-1(M1) (L-597mm)** being procured indigenously. This is prepared, based on the acceptance standards and inspection parameters laid down in collaborators documents and on the inspection test standards followed in respect of similar indigenous items.
- b) This QAP is the property of Government of India and is liable for amendments as and when required. The Sr. General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054, is the inspecting Authority for this assembly. Any query / clarification on the content of this QAP shall be referred to this Factory. Any departure from these instructions is allowed only after written approval from the above authority. Notwithstanding the tests indicated in this QAP, the inspecting Officer has the right to carry out any test to check conformance to the paper particulars quoted in the Supply Order, which he may consider necessary to satisfy himself about the stores which he has to accept.

3. AIM:

The QAP is aimed at standardizing the Inspection procedure and acceptance norms for **CHAIN ASSY L=597MM TO DRG.NO. HVF.28.102SB-1(M1) (L-597mm)**. It also aims at giving adequate information to the manufacturer on the quality requirements so that the required quality control methods are established. This is also meant to guide authorized Inspection Officer in his routine inspection and to set out main points to which his attention must be drawn to ensure that the accepted stores meet the stipulated standards.

4. SCOPE:

This QAP outlines in general terms, the checks and methods to be used during inspection of **CHAIN ASSY L=597MM TO DRG.NO. HVF.28.102SB-1(M1) (L-597mm)** including the technical requirements of the drawings. The recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to.

Note:

- i. Tender enquiry (TE) and supply order (S.O) will be issued with QAP stating that inspection will be done as per QAP.
- ii. In case of TE, It is responsibility of the vendor to obtain the copy of QAP and give the statement of compliance that vendor will abide by the QAP in case supply order is placed.
- iii. In case of S.O, it is the responsibility of the vendor to obtain copy of QAP and give the statement of compliance that the vendor will follow QAP. However, GM/HVF reserves the right to revise/update the QAP from time to time.

5. DOCUMENTS:

- a) On placement of firm supply order, one set of certified drawings will be forwarded to the Contractor. One set of relevant specification and technical instructions on the subject item can be obtained from AHSP through DDO/HVF.
- b) Any clarification required on these documents should be obtained from the Inspecting Authority i.e. The Sr. General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054. Equivalent to the collaborators specifications and standards will be decided only by the Inspecting Authority and should not be unilaterally decided.
- c) The process instruction sheets supplied by the collaborators are available with the DDO/HVF, Avadi, Chennai for reference (i.e. Forging, casting, machining, extrusion, forming, manufacturing, heat treatment and plating process etc.) Where ever applicable.
- d) The supplier after scrutiny of the concerned process sheets and connected paper particulars should establish the necessary production and inspection facilities. Particularly the inspection test rigs, stands, fixtures, templates, gauges etc should be provided as recommended in these process sheets.

6. USED ON HIGHER ASSY;

The CHAIN ASSY L=597MM TO DRG.NO. HVF.28.102SB-1(M1)(L-597mm) is used on following higher assemblies are Used on : 175.28.003SB.

7. BILL OF MATERIAL:

SL. NO	DRG.NO	NOMENCLATURE	MATERIAL SPECIFICATION	QTY	REMARKS
	HVF.28.102SB-1(M1)	CHAIN ASSY L=597MM	CHAIN PR-12.7-1820-1 GOST:13568-75 LINK PR-12.7-1820-1 GOST:13568-75		
1	GOST 13568-75	LINK PR-12.7-1820-1	GOST 13568-75	1	--
2	GOST 13568-75	CHAIN PR-12.7-1820-1	GOST 13568-75	1	--

Note: Vendor/Contractor may use approved alternate material issued by the tender/ supply order issuing authority in writing (if available).

8. CONDITIONS OF USE/STORAGE INSTRUCTIONS:

This assy should be properly packed to protect from transit / handling damage and influence of atmospheric precipitations. In addition, the following parameters should be ensured: -

- a) The threaded parts are to be covered with suitable plastic caps to prevent Injury & damages.
- b) Each assy. shall be separately packed properly.
- c) The stores are to be suitably covered for preventing ingress of dust and Dirt/entry of sunlight and moisture.
- d) The packaging slip shall contains
 - (i) Certificate of testing (NABL)
 - (ii) Guarantee/ Warranty Certificate
 - (iii) Service and maintenance instructions
 - (iv) Delivery Slip with Inspector's Acceptance Mark
 - (v) Under taking certificate/certificate of conformance

- e) The stores are not permitted to be stored together with oils. Petrol, acids, alkaline and other substances to avoid damage to the metal / rubber components.

9. SAMPLING PLAN:

Sl. No.	Sampling Plan	Pilot *	Bulk
(i)	Visual Inspection	100%	100%
(ii)	Dimensional Check	100%	General Inspection level II, single sampling, Normal Inspection, AQL 1.5 as per IS 2500 (Part-I)-2000
(iii)	Material Check	1 No	1 No For each batch of raw material or heat treatment lot as required by specification.
(iv)	Fitment/Performance test/trial	1 No	1 No as and when required
(v)	Interchangeability Test	2 No's	2 No's on 100 no's, except selective assy.
(vi)	Test stands/jigs/ fixtures/ gauges and calibration checks	100%	100%
(vii)	Marking/ Identification	100%	100%
(viii)	Packing/ preservation	100%	100%

* This clause is applicable if mentioned in supply order or project sanction order in case of Make-II.

Note:- A New supplier should supply bulk only after pilot sample inspection/ evaluation by HVF and obtain bulk production clearance from HVF.

10. VISUAL INSPECTION [SAMPLING PLAN AS PER PARA- 9(i)]

- a) The stores are to be visually examined on 100 % of pilot /bulk and same should be free from any defects and all the finishing requirements shall satisfy as indicated in technical conditions/requirements of the assy / components drawing respectively.
- b) The components shall be checked for the following and should be free from the defects:
- Defects in construction
 - Fitment of all components
 - Dents, scratches and cracks etc
 - Presence of foreign particles
 - Moisture and dust

- Corrosion of metal parts
 - Mechanical imperfections & distortion
 - Any form of deterioration of material and finishing.
- c) Packing and preservation should be ensured as per drawings/relevant TY specification (To be ensured on receipt at consignee end).

11. DIMENSIONAL CHECKS [SAMPLING PLAN AS PER PARA- 9(ii)]

The dimensions of individual component, sub assy and major assy shall be checked and ensured as per respective drawings. Dimensional checks should be carried out as per sampling plan. However, the inspecting authority/rep. may at his discretion, tighten the inspection level and acceptance quality level on the critical items and adopt check point during manufacture.

11.1 ПР-ROLLER TRANSMISSION CHAINS, NORMALSERIES (GOST 13568-75-FIG. 1-4)

- a) The types, main parameters and dimensions of the chains, connection links and crank links must be in accordance with fig.1-8 and table 1-8.
- b) The areas of the resting surfaces of the hinge in the chain are given in appendix 2.

11.2 CAPTION TO FIG.1 (GOST 13568 SEE PAGE 22);

Single – row chains of type $\pi\pi\pi$ and $\pi\pi$

*--Reference dimensions

1- Connecting link

2-Crank link

3-Double crank link

11.3 CAPTION TO TABLE -1(GOST 13568 SEE PAGE 23);

- a) All dimensions are in mm
- b) Designation of the chain
- c) b_3 , not less than
- d) h , NOT MORE THAN
- e) b_y , not more than
- f) b_6 , not more than
- g) Rupture load, daN, not less than
- h) Mass of 1m length of chain, kg.

REMARKS;

It is permitted to reduce the rupture load of the crank.

11.4 CAPTION TO TABLE -2(GOST 13568 SEE PAGE 24);

- a) All dimensions are in mm
- b) Designation of the chain
- c) b3, not less than
- d) h, not more than
- e) b7, not more than
- f) b6, not more than
- g) Rupture load, daN, not less than
- h) Mass of 1m length of chain, kg.

11.5 TECHNICAL REQUIREMENTS;

- 1) The chains are to be manufactured in accordance with the requirements of the present standard and working drawings approved in the established procedure.
- 2) The plates must be made from cold rolled section of normal or high accuracy in respect of thickness while the rollers and rolled bushes should be made from cold-rolled sections of normal or high accuracy in respect of thickness and width of from laminated band. As per GOST 2283.-79, GOST 2284-79, GOST 503-81, GOST 19904-74, GOST 19581-74 and GOST 5632-73.
The plates of type ПРД and ПРП chains may also be made deem from hot rolled sections as per GOST 19903-74 and GOST 103-76.

(Revised edition, modification no.1)

- 3) The chain components must be subjected to thermal or thermo-chemical heat treatment to achieve a hardness as per table 9, the ration of the depth of the diffused layer (eutectoid and half of the transient state layer) to the thickness of roller, bush or the diameter of the shaft in thermo-chemical treatment must correspond to the values given in table10.
- 4) The plates used in the chains must have a protective, protective cum decorative or a decorative coating. A coating on the plate holes is permitted. the type of coating should be decided by coordinating with the customer or on the basis of drawings approved in the established procedure.
- 5) The chain components must be free of scale, cracks, burrs, cavities and corrosion which adversely affect their operation worthiness.
- 6) The assembled chain must smoothly (without any jamming} bend at the hinged joints.
- 7) The total gap between the external and internal plates assembled in single-row chains must not exceed the values given in table 11.(GOST 13568-75)
The total gap in multiple-row chains must not be more than 0.8 times the product of the gap of single-row chain to the number of rows.

- 8) The chains of type ПР and ПБ having pitch between 8-15.875 mm should be subjected to tension under a load which is 15-33% of the rupture load specified in table 2-7.
- 9) While testing chains for turning of the shaft and bush relative to a single plate, the torque must not be less than the values given in table 12.
It is permitted to mount the intermediate links on the shafted of multiple-row chains with clearance. Caption to table 9 (GOST 13568-75)

a-types, b-pitch t, mm, c-plates, d-hardness arc, e-shifts, f-case hardened steels, g-non case hardened steels, h-hushes, i-case hardened steel, j-non case hardened steels, k-rollers, l-case hardened steels, m-non case hardened steels.

REMARKS:

- 1) The hardness of plates of ПРП and ПР chains having a pitch of 19.05 mm or more may be raised to hrc45.
- 2) For non case hardened hushes of ПРП type chains the hardness may be upto HRC 37----45, while for case hardened shafts and bushes of П and П type chains the hardness may be HRC 48---55.

11.6 CAPTION TO TABLE 10 (GOST 13568-SEE PAGE -27)

a) Types, b) Pitch t, mm , c) Relative depth of diffused layer, %, d) Shafts, e) Bushes, f) Rollers.

11.7 CAPTION TO TABLE 11

a) All dimensions are in mm. b) PITCH, c) GAP, d) Continuation of table 11.

REMARKS:

- 1) If the plates are made of cold rolled section of normal accuracy in respect of thickness or hot-rolled section the total gap may be increased by 50%.
- 2) The chains of type ПРД have been marked with an astrick.

CAPTION TO TABLE 12(GOST 13568-SEE PAGE 27)

a) Pitch, mm, b) torque, dan,m, c) Shaft, d) Bush
 *FOR ПРД TYPE CHAINS
 **FOR CHAINS ПР-12.7-1000-1 AND ПР-12.7-900-2
 *** FOR CHAINS ПРД -38-1000.

CAPTION TO TABLE 13(GOST 13568-SEE PAGE 27)

- a) Types, b) Pitch t , mm, c) Limiting deviation of length from the nominal, %
- d) 9.525 and more, e) 78 and more.

REMARKS:

In case of ПР type chains used in transmissions working at speeds of upto 5m/sec, the limiting deviation of 0.225% of a length of segment equal to 0.225% from the nominal value is permitted.

The limiting deviation of a length of chain segment from the nominal length should be positive and its magnitude should correspond to the values given in table13. The number of links in the measured length of chain segment should be in accordance with table14.

CAPTION TO TABLE 14

- a) Types, b) Pitch, mm, c-Number of links in the measured length of chain segment.
- b) The limiting deviation of pitch from the nominal value must not exceed the magnitudes given in table15.

CAPTION TO TABLE 15 (GOST 13568-75 SEE PAGE 27)

- a) Types, b) Pitch mm, c) Limiting deviation of pitch from the nominal, %.

COMPLETE SET;

The length of the chain and the number of connecting and crank links is decided on the basis of the order placed by the customer. The chains may consist of:

- a) Segments of a particular length (as ordered, in meters) without connecting links.
- b) Segments with a particular number of links (as ordered in respect of number of links) with connecting or connecting and crank links.
- c) Segments with a particular number of links (as ordered in respect of number of links) with double crank links and two connecting links.

The order must give the designation of the chain, connecting links and crank links as per paragraph 1.2 (GOST 13568).

ACCEPTANCE RULES:

To check the conformance of the chains to the requirements for the present standard the manufacturing concern must conduct acceptance and periodic bench tests for operation-worthiness (except the ПРИ chains).

The acceptance tests must be carried out on each batch of chains to check their conformance to the requirements of paragraphs 2.4, 2.5, 2.6, 2.7, 2.10, 2.11 and 3a.1. A batch consists of chains of a particular type and size. The batch size is decided by the manufacturing concern but it must not exceed 5000m. The batch size of ПР type chains and multiple-row chains of pitch 25,4mm or more must not exceed 1000m. In case of ПРП and ПРД type chains the batch size may be raised upto 10000m.

If in the course of acceptance testing even a single parameter fails to meet the requirements of the present standard, the tests are repeated on doubled sample size in respect of the parameters in which the chains failed the tests. The results of the repeat test are treated as final and pertaining to the whole batch.

The consumer carries out quality control tests to confirm that the chains meet the requirements of the present standard. The tests and their methods are described in paragraph 3.2, 3.3 and 4.2-4.7 GOST 13568)

The operation-worthiness of the chains is tested once in six months (except chains of type ПРК) the result of these tests are optional.

Each batch of connecting and crank links must be subjected to acceptance tests to check conformance of these parts to the requirements of paragraph 1.2.

A batch must consist of not more than 4000 connecting links and 2000 crank links. For the purpose of testing, Links should be selected from each batch so that two specimens may be assembled.

If during the acceptance testing even a single parameter of the chains, connecting links and crank links fails to meet the requirements of the present standard, a repeated test must be conducted on doubled sample size. The results of the repeated test are treated as final and held valid for the whole batch.

TESTING PROCEDURE:

The hardness and depth of hardened layer are monitored during the manufacture of components. The number of components to be monitored is decided by the manufacturing concern and the objective is to check the conformance of the chains to the requirements of paragraph 2.3 GOST 13568-75)

All chains are visually inspected to check their conformance to the requirements of paragraphs 2.4, 2.5 and 5.1.

The mobility of the hinged joints as laid down in paragraph 2.6 is checked by rolling the chain having number of links as given in table 14 over a sprocket with 15-21 teeth or by manually rotating the adjacent links and rollers of the chain lying in the horizontal plane

The side gap between plates is measured on the chain lying horizontally by means of a universal measuring instrument or a special gauge. This check is conducted on 20 hinges in a batch. The gap must be in accordance with the requirements of paragraph 2.7 GOST 13568-75.

The test to check the strength of the joints between the shafts and bushes with the plates is conducted on at least five hinges from a batch. The test is conducted on general purpose fixtures or on special machines.

The torque must meet the requirements of paragraph 2.9 GOST 13568-75.

The length of segment and pitch must be measured under a load equal to 1% of the rupture load as per paragraphs 2.10 and 2.11 GOST 13568-75, during this test the chain must lie in the horizontal plane.

The number of measurements must be at least 10.

The length of chain segment is measured by a vernier caliper or by a special measuring instrument, while the pitch of the chain is measured by a device which has a measuring error not exceeding the norms laid down in GOST 8.051-73.

The rupture strength is tested on universal testing machines. If the chain elements under the clamps got ruptured the results of the test are invalidated.

The chains of type ПРП, ПРД, ПР and ПВ must be subjected to bench tests to assess their operation – worthiness.

The test conditions during the bench tests must be as per the values given in recommended appendix 1.

MARKING, PACKING, TRANSPORTATION AND STORAGE;

The brand mark or symbol of the manufacturing concern and the pitch of the chain in mm must be marked by a seal on at least 5% of the outer plates from exposed side, marking of pitch is not obligatory for chains of pitch 8-15.875mm, the size and location of seal are indicated on the working drawings.

The long-term storage of chains is done in accordance with GOST 9.014-78 provided storage conditions that it ensured corrosion resistance for at least a year from the commencement of storage.

The chains may be transported by any mode of conveyance. While dispatching by rail, water or surface transport the chains must be packed in crates made of planks as per GOST 10198-78 OR GOST 15841-77 and lined on the inside with packing paper (Bituminous or tar paper as per GOST 515-77) or some other water proof paper.

The crate should carry an inscription containing the following information;

- a) Brand mark of the manufacturing concern.
- b) Designation of chain
- c) Number of chains in the crate
- d) Length of chain in terms of links.

It is permitted to transport chains by automobiles and in covered wagons without packing or in containers provided they chains have been properly protected against corrosion, abrasive contamination and mechanical damage.

Each batch of chains of a particular type and size must be accompanied by a document (label, tag) containing the following information:

- a) Brand mark or symbol of the manufacturing concern.
- b) Designation of the chains as per the present standard.
- c) Number of chains in batch.
- d) Stamp of the quality inspection department.
- e) Batch no.(as per paragraph 3.2 GOST 13568-75)

The chains must be stored in dry, properly ventilated premises with relative air humidity upto 75%.

The stores must protect the chains from dust and the effect of gases. It is not permitted to store chemicals in the same premises.

MANUFACTURER'S GUARANTEE;

The manufacturer must guarantee the conformance of the chains to the requirements of the present standard provided the operating, storage and transporting conditions are adhered to.

The guaranteed service life of the chains is 12 months from the date of commissioning.

RECOMMENDED APPENDIX1;

Test conditions for bench testing in respect of operation worthiness.

The following groups of bench test are carried out:

- a) For chains operating mainly in transmissions, motor cycles, scooters, and bicycles using an oil bath or periodic lubrication.
- b) For chains operating mainly in open, low-speed transmissions with periodic lubrication (transmissions in agricultural and similar machines).
- c) For chains operating mainly in general industrial equipment with periodic lubrication.
- d) For chains operating mainly in high-speed transmission in an oil bath.

REMARKS:

- 1) The ПП type chains with a limiting deviation of 0.225% on segment length should be tested as per group d. for the chains ПП-19.05-3180a and ПП -25.4-6000a, the speed of rotation of the driving sprocket is taken as per group b. for the chains ПП -31.75-8900 as per group c pertaining to chains of the corresponding pitch.
- 2) The test conditions for determining the operation-worthiness of chains by bench testing should be in accordance with table 1-4.
- 3) The design load for multiple-row chains of type ПП, tested under conditions specified in tables 1-4 is determined by multiplying the design load of the corresponding single-row chain with a coefficient as given below;
 - a) For two row chain 1.8
 - b) For three row chain 2.5
 - c) For four row chain 3.0
- 4) The duration of the test specified tables 1-4 takes into account the running-in period.
- 5) In tables 1-4, the increases in the length of segment of chain with the number of links, as per table 14, has been given without accounting for the wear during the running-in period.

CAPTION TO TABLE 1;

a) Designation of chain, b) Test group, c) Chain length in terms of pitch, d) Test conditions, e) Number of teeth on the sprocket, f) Driving, g) Driven, h) Frequency of rotation of the driving sprocket min⁻¹, i) Design load, daN, J) Duration of the running in period, HRS., k) Test duration, HRS, l) Limiting increase in the length of chain segment, MIN.

CAPTION TO TABLE 2:

a) Designation of chain, b) Test group, c) Chain length in terms of pitch, d) Test conditions, e) Number of teeth on the sprocket, f) Driving, g) Driven, h) Speed of rotation of the driving sprocket, MIN-1, i) Design load, daN, j) Test duration, Hrs. K) Limiting increase in the length of chain segment, mm.

CAPTION TO TABLE 3(GOST 13568-75 SEE PAGE 28)

a) Designation of chain, b) Test group, c) Chain length in terms of pitch, d) Test conditions, e) Number of teeth on the sprocket, f) Driving, g) Driven, h) Frequency of rotation of the driving sprocket min-1, i) Design load, daN, J) Duration of the running in period, HRS., k) Test duration, HRS, l) Limiting increase in the length of chain segment, MIN.

CAPTION TO TABLE 4(GOST 13568-75 SEE PAGE 28)

a) Designation of chain, b) Test group, c) Chain length in terms of pitch, d) Test conditions, e) Number of teeth on the sprocket, f) Driving, g) Driven, h) Frequency of rotation of the driving sprocket min-1, i) Design load, daN, J) Duration of the running in period, HRS., k) Test duration, HRS, l) Limiting increase in the length of chain segment, MIN.

REFERENCE APPENDIX (GOST 13568-75 SEE PAGE 29)

Resting surface of hinge

a) Designation of chain, b) Resting surface of the hinge in a single row chain, cm².

REMARKS:

- 1) The resting surface of the hinge of a multiple-row chain is equal to the product of the resting surface of a single-row chain and the number of rows in the chain.
- 2) The resting surface of ПP type chains with a limiting deviation of segment equal to 0.225% of the nominal value (with letter a) is equal to the resting surface of the hinge of the ПP type chain of corresponding pitch.

11.8) GOST 13568-75 (LINK PR-12.7-1820-1)

a) All the dimensions and geometrical parameters should be confirmed as per GOST 13568-75.

All dimensions are in mm
Designation of LINK: ПР-12.7-1820-1

- a) Thickness of the link: 12.7
- b) B3 not less than 5, 40
- c) Diameter of the link d1 : 4, 45
- d) Diameter of the link d3 : 8, 51
- e) n not more than: 11,8
- f) b7 not more than: 19
- g) b8 not more than: 10
- h) Rupture load daN not less than: 1820
- i) MASS OF 1m LENGTH OF CHAIN (kg): 0,65

REMARKS:

It is permitted to reduce the rupture load of the crank links (except the double crank links) by 20%.

NOTE:

(All other parameters should be confirmed to GOST 13568)

11.9) GOST 13568-75 (CHAIN PR-12.7-1820-1)

- a) All the dimensions and geometrical parameters should be confirmed as per GOST 13568-75.

Designation of chain: ПР-12.7-1820-1

Test group: A

Changing length in term of pitch C 110

TESTING CONDITIONS;

Number of teeth on the sprocket driving: 17

Number of teeth on the sprocket driven: 40

Speed of rotation of the driving sprocket min-1(1280)

Design load daN: 125

Duration of the running in per n x HRS. 60

Test duration HRS: 700

Limiting increase in the length of chain segment mm (5,0)

RESTING SURFACE OF HINGE;

Designation of chain: ПР-12.7-1820-1

Resting surface of the hinge in a single row chain cm² 0,39

REMARKS:

- 1) The resting surface of the hinge of a multiple –row chaining is equal to the product of the resting surface of a single-row chain and the number of rows in the chain.
- 2) The resting surface of ПР type chains with a limiting deviation of segment equal to 0.225% of the nominal value with letter a, is equal to the resting surface of the hinge of the ПР type chaining of corresponding pitch.

11.10) SHAFT AND BUSH

- a) Pitch 12.7mm
- b) Shaft 0, 25
- c) Bush 0,15
- d) For chain ПР-12.7- 1000-1 AND ПР-12.7- 900-2

12) MATERIAL CHECKS [SAMPLING PLAN AS PARA – 9 (iii)]

Material specimen /test bars of the components shall be in conformity as per the material mentioned in the relevant documents/drawings as per the bill of materials (BOM). NABL test reports for all the parameters as per relevant specifications to be submitted. Test samples to be submitted by the vendor to HVF, if required. The material check will be carried out as per sampling plan. However, if the manufacturer proposes any alternative material at the stage of tender enquiry, the same has to be approved and a written concurrence should be obtained from AHSP through DDO/HVF, before usage of such materials.

12.1) GOST 13568-75 (LINK PR-12.7-1820-1)

- a) The component should be manufactured from GOST 13568-75.
- b) Chemical composition and mechanical properties should be conformed as per GOST 13568-75.

12.2) GOST 13568-75(CHAIN PR-12.7-1820-1)

- a) The component should be manufactured from GOST 13568-75.
- b) Chemical composition and mechanical properties should be conformed as per GOST 13568-75.

13) FITMENT/PERFORMANCE TEST/TRIAL:

- a) Pilot samples should be checked for fitment and Performance test to ascertain the efficacy of the system under different operating conditions by fitting in higher assembly and repeating it for functional checks & performance to be monitored, wherever required.
- b) Bulk supply may be subjected to performance trial in higher assembly in case of repeated failure/defects during exploitation.

14) INTERCHANGEABILITY:

The assemblies should be interchangeable component wise and assembly wise, except the Component are to be supplied as a set and to be assembled selectively.

15) TEST STANDS/JIGS/FIXTURES/GAUGES & CALIBRATION CHECKS:

- a) The supplier / Contractor should manufactured a suitable Test Stand, jigs, fixture & mandrels and gauges as per process sheet to carry out quality checks/performance test and to ensure conformance of components/assy as per drawing specification / T.R points.
- b) The supplier/contractor should submit calibration reports for instruments/fixtures/gauges etc., which are used during inspection activities.

16) MARKING/IDENTIFICATION CHECKS:

For traceability, marking of part No., Manufacturer name, supply order No, Serial No/Qty, batch No. and manufacture date & year are to be carried out in all components. Suitable method of marking can be adopted, provided the above details are legible. Inscription if any as called for in the relevant drawing is also to be carried out.

17) PRESERVATION CHECKS:

- a) Preservative coatings are to be strictly adhered to as called for in the drawing/T.R points. However, equivalent BIS Standards can also be followed, subject to the thickness of the coating is maintained as per the drawing.
- b) Other preservations as necessary to prevent damages due to moisture and dust during process, storage and transit are to be carried out as per drawing/T.R points. Conventional methods can also be resorted to.

18) PACKING CHECKS:

- a) Components / Assemblies are to be packed separately to avoid damages during transit / handling of the same. Part No. and No. of sets are to be marked on the packing.
- b) Packing and preservation should be ensured as per drawings/relevant TY specification (To be ensured on receipt at consignee end).
- c) Finished products shall be wrapped / packed using black and opaque polyethylene sheet or bags.

19) DOCUMENTATION:

- a) Firm has to maintain all the documents as per QAP with respect to the SI.No.to have traceability.
- b) Vendor has to submit Bill of materials, Material test reports, Class 'C' /Endurance test reports (wherever specified in drg/TY specification/QAP) and Complete PIR (pre-inspection report) at the time of offering the item for inspection. HVF will commence the inspection only after scrutiny of these documents.
- c) Pre inspection reports (PIR) of firm like,
 - 1) Chemical analysis, Mechanical properties obtained from NABL as per bill of material (BOM) with respect to material specifications.
 - 2) Pre-forming process report as per process sheets.
 - 3) Coating certificates, hardness reports and heat treatment certificates (Wherever applicable)
 - 4) Calibration reports of instruments and gauges.
 - 5) 100% Dimensional inspection reports (including T.R points) as per bill of material are to be submitted.
- d) The testing/inspection responsibility to test all the parameters as per QAP and drawing specifications as mentioned in Annexure -A (enclosed).

20) REFERENCE:

- a) Refer all drawings to HVF.28.102SB-1(M1).
- b) Refer all material specifications like GOST, IS, OST & TY... etc. Refer to dimensional and material checks clauses in this QAP.

CHAIN ASSY HVF.28.102SB-1(M1) (L-597mm)

ANNEXURE-A;

SL. NO	CATEGORY	TESTS/INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
					Firm	HVF	DGQA	
1.	Pre inspection reports (PIR) of firm	Firm has to produce all the document as per QAP	As per the relevant drawing and QAP.	Conform to drawing and QAP as per bill of material	P	V	R	100% by firm/ vendor.
2.	Bill of material (BOM)	Firm has to prepare the BOM as per QAP	Refer QAP Para no: 7 or item list.	Conform to QAP	P	V	R	100% by firm/ vendor.
3.	Dimensional checks	Dimensions as per the drawing	Refer drawing/QAP Para no: 11	Conform to drawing and QAP	P	W/P	R	100% by firm/ vendor, SP followed by HVF.
4.	Material tests	Chemical composition & Mechanical Properties	As per the relevant drawing and QAP	All the values to conform with QAP and Drawings	P	W/V	R	Refer note.
5.	Marking / traceability checks	Marking / traceability	Refer QAP Para no 16	Conform to QAP Para no 16	P	V	R	100% by firm/ vendor.
6.	Preservation & packing checks	Preservation & packing	Refer QAP Para no 17 & 18	Conform to QAP Para no 17 & 18	P	V	R	100% by firm/ vendor.

Note:

- One sample per heat/batch shall be tested under NABL Lab/Govt. Approved lab by firm. In case of non-compliance to standards entire lot will be rejected or not to use in production further.
- For cross conformation, manufacturer has to submit test samples /HVF will draw samples from supplied lot on receipt for Witnessing (W) at HVF premises. In case of non-compliance to standards entire lot will be rejected.

P - Perform W - Witness V - Verify R - Review SP - Sampling Plan

RECORD OF AMENDMENTS

Sl. No	Amendment No. & date	Amended by	Date of Insertion	Initial

COMPLETING ARTICLES SHOP (69)
Vendor Qualification Criteria (VQC)

NOMENCLATURE & DRAWING No. CHAIN ASSY L = 597MM to Drg. No. HVF.28.102SB-1(M1), I.F No. 6206890344

1	2	3	4	5	6
	MANUFACTURING TECHNOLOGY & TESTING / INSPECTION FACILITIES REQUIRED TO PRODUCE THE ITEM	MUST BE POSSESSED BY THE VENDOR IN HIS OWN PREMISES - (P&M LIST & TESTING/INSPECTION EQUIPMENT LIST TO BE SUBMITTED)	PROVIDE DETAILS OF THE FACILITIES ASKED IN COLUMN (3) THAT ARE AVAILABLE IN-HOUSE (SELF-DECLARED P&M LIST (Nomenclature of machine, Make/Model, Capacity/Size & accuracy, Date of installation, Vintage of Manufacturing of machine) AND TESTING/INSPECTION EQUIPMENT LIST (Nomenclature of the Testing/Inspection Equipment, Make/Model, Size & Range, Date of calibration) ALSO TO BE SUBMITTED)	MAY BE POSSESSED BY THE VENDOR IN HIS OWN PREMISES OR OUT SOURCED - (MOU/TIE-UP WITH THE OUTSOURCING VENDOR/SUB-VENDOR AND THEIR P&M LIST & TESTING/INSPECTION EQUIPMENT LIST TO BE SUBMITTED)	PROVIDE DETAILS OF THE FACILITIES ASKED IN COLUMN (5) THAT ARE AVAILABLE IN-HOUSE OR OUT-SOURCED FIRMS (NAME AND ADDRESS OF THE OUTSOURCING VENDOR TO BE DECLARED BY THE FIRM IN FIRM'S LETTERHEAD, SELF-DECLARED P&M LIST (Nomenclature of machine, Make/Model, Capacity/Size & accuracy, Date of installation, Vintage of machine/Year of Manufacturing of machine) AND TESTING/INSPECTION EQUIPMENT LIST (Nomenclature of the Testing/Inspection Equipment, Make/Model, Size & Range, Date of calibration) AND MOU/TIE-UP ALSO TO BE SUBMITTED)
Technology 1	LINK PLATE INNER, OUTER & JOINT LINK PLATE & SPRING CLIPS CUTTING	*POWER/HYDRAULIC PRESS SUITABLE FOR SHEETMETAL CUTTING AND PLATE THICKNESS 01 TO 02 MM MASS PRODUCTION REQUIREMENTS CAP. MIN. 100 TON.			
Technology 2	BUSH FORMING	*FORMING MACHINE CAP. MIN. 100 TON			
Technology 3	PIN CUTTING	*RIVET PIN CUTTING MACHINE			
Technology 4	ROLLER EXTRUSION	*EXTRUSION MACHINE CAP. MIN. 100 TON			
Technology 5	DEBURRING			VIBRATION/BARRELLING FACILITY	
Technology 6	HEAT TREATMENT			HARDENING	
Technology 7	SURFACE COATING			PROTECTIVE-DECORATIVE COATING FACILITY	

Technology 8	RIVETING	RIVETING MACHINE			
Technology 9	JOINT LINK PIN TURNING	ANVIL WITH SPECIAL PROFILE AND TOOLS FOR ASSY AND JOINT LINK CHAIN			CNC TURNING, CAP. 4MM MIN.
Test/ Inspection 1	TESTING MACHINE	1. LOAD TEST, 2. WEIGHING MACHINE, 3. TORQUE TESTER			1. HARDNESS TESTER.
Test/ Inspection 2	STAND TEST	**STAND TEST FACILITY, INSPECTION FACILITY WITH ACCURACY AS PER COMPONENT AND ASSY. TEST SETUP AS PER GOST 13568			MANUFACTURING TOOLS/DIE/PUNCH AND GAUGES REQUIRED FOR THE COMPLETE ASSY.
Test/ Inspection 3	TESTING MACHINE				SPECTROSCOPY/ANALYTICAL LAB REPORT FOR CHEMICAL COMPOSITION, MECHANICAL PROPERTIES SPECIFIED AS PER MATERIAL SPECIFICATION TO BE PRODUCED

Note: (1) Facilities must be available with vendors own premises - including facilities available with **Sister / Parent Concerns / Strategic Partners** shall be Considered for Capacity Verification subjected to documentary evidence to prove the relationship / ownership.

- (2) *The firm may indicate the alternate machines/process by which the component can be manufactured as per technical specification/drawing.
- (3) Firm should give undertaking that they will develop the all the testing facility if they get order.
- (4) Firm should be capable to arrange the raw material like Sheets, Pin, etc., as per drawing/specification.
- (5) BO items required for assembly may procure from the established suppliers of HVF/AVNL.

M. GNANASEKARAN
WM/CA-1

NEERAJ KUMAR
DGM/QA-RNG-(OE)

ANTHONYAMI PRADHAN
JWM/QA-(OE) CA

ANMESH PAIK
DGM/CA. TRG & RG

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