

ACCOMPANIESSK. No. CLW/ES/SK-1/C-9
CLW/ES/SK-2/C-9
CLW/ES/SK-3/C-9
CLW/ES/SK-4/C-9SPECIFICATION
FOR
MULTIPLE INTERNAL COUPLERS
FOR
ACME LOCOMOTIVESOFFICE OF THE DY. CHIEF ELECTRICAL ENGINEER (DES & DEV)
CHITTARANJAN LOCOMOTIVE WORKS
CHITTARANJAN, BUREDMAN
INDIA

J	DY. CEE/D	SK-1 MODIFIED AND TYPE 2, C.D. DELETED. APPROVED BY CEE ON NOTE ELDB/3226/PSC DT. 17-6-94	AUG '94	S.d.
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K	CEE'S APPROVAL ON NOTE-ELDB/3226/ACG DT. 21-8-96.	M/S. SIROPLAST LTD/PUNE ADDED IN CL. NO. 8.4	AUG-96	Jhansiyar
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L	DY CEE/D	DRAWING NO. CLW/15/SK-4/C-9 FOR FEMALE COUPLER INTRODUCED.	JULY 97	NT-37
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M	DY CEE/D.	CLAUSE 14.0. ADDED	03.08.07	
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CHKD.

DRN.

SPECIFICATION
MULTIPLE INTERNAL
COUPLERS.

DY. CEE

CHITTARANJAN LOCOMOTIVE WORKS
WEST BENGAL INDIA.

NO. CLW/ES/C-9.

DATE Nov '96.

I	BY.CEE/D	NOTES ON SKETCH NO. CLW/ES/SK-2/ C-9 ANNEXURE-I ADDED	NOV'87	Sdf
	BY.CEE/D	SPECIAL CONDITION ADDED	MARCH'85	Sd/-
G	BY.CEE/D	CLAUSE 8.4 MODIFIED	JUNE'80	Sd/-
F	BY.CEE/D	CLAUSE 8.3 & TESTS MODIFIED	NOV'80	Sd/-
E	BY.CEE/D	CLAUSE 8.3 MODIFIED AND DRAWING SH.NO. 1 & 2	JUNE'80	Sd/-
D	BY.CEE/D	SK.NO.2 SHEET-1 MODIFIED	MARCH'79	Sd/-
C	BY.CEE/D	CLAUSE NO. 8.3 MODIFIED & BRGS. REVISED.	JAN'79	Sd/-
B	BY.CEE/D	CLAUSE NO. 11.2 MODIFIED	4.11.78	Sd/-
A	BY.CEE/D	GENERALLY REVISED	JULY'75	Sd/-
ALT.	AUTHY.	DESCRIPTION	DATE	INITIAL

SPECIFICATION FOR
MULTIPLE INTERNAL
COUPLERS

CHITTARANJAN LOCOMOTIVE WORKS
WEST BENGAL INDIA.

NO. CLW/ES/C-9
DATE NOV '80

Sdf
BY. C.E.E. (S)

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- 8.0 Technical Specification.
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- 11.0 Inspection.
- 12.0 Tests.

DRAWING	SPECIFICATION MULTIPLE INTERNAL COUPLERS		CHITTARANJAN LOCOMOTIVE WORKS WEST BENGAL, INDIA.
		DY. C.E.E.	NO. CLW/RS/O-8 DATE

1.0 Scope of the contract.

1.1 This specification covers the manufacture and supply of multiple internal couplers described in para 8 for installation on the 25 KV Single Phase 50 C/S, A.C. Electric Locomotives of the Indian Railways.

2.0 Service conditions.

2.1 As the equipment covered by the specification are mounted on locomotives, they shall be subject to considerable vibrational and buffing shocks during service.

2.2 The equipment shall be suitable for working satisfactorily in an ambient temperature varying from 0°C to 60°C and a maximum relative humidity of 100%. The locomotive shall be working in an Altitude upto a maximum of 1000 metres above mean sea level.

3.0 Submission of Tender quotations.

All tender quotations must be submitted in duplicate.

3.1 The tenderer shall inter-alia furnish the following along with the quotation.

- i) Detail Dimensional drawing in six copies.
 - ii) Full technical particulars of the offer
- Tender quotation shall be submitted in the proforma given in Annexure - I.

4.0 Approval of samples.

4.1 The supplier shall make available at least two prototypes for each type of coupler and rubber protector to be supplied by him for inspection and tests at his works and advise the Dy.Chief Electrical Engineer(Design), Chittaranjan and Controller of Stores, Calcutta as and when he is ready with the prototype and necessary testing and measuring apparatus and facilities for carrying out the tests.

4.2 After the above tests, if it is considered necessary by the Dy.Chief Electrical Engineer(Design) or his authorised representative to carry out any further tests or trials of the prototypes at Chittaranjan, the supplier will arrange for the same by the quickest means.

4.3 Any short comings or defects in the design and workmanship of the equipments, shall be pointed out after the tests, to enable the manufacturer to incorporate the necessary improvements before bulk manufacture is commenced, without affecting the guaranteed deliveries or guaranteed performance characteristics.

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DATE.

SPECIFICATION MULTIPLE INTERNAL COUPLERS.

CHITTARANJAN LOCOMOTIVE WORKS
WEST BENGAL INDIA.

NO. 1212/20-9

- 4.4 Any testing and approval by the purchaser of the design, working drawing and prototype shall in no way absolve the supplier of his responsibilities under the terms of the contract for the equipment supplied.
- 4.5 The supplier shall not offer any consignment of series production to the Inspector authorised under the contract until the prototype has been finally approved.
- 5.0 Conditions of contracts.
- 5.1 The standard I.R.S. conditions of contract will be applicable for the supply of the equipment.
- 6.0 Technical Documents and Drawings to be furnished by the supplier as part of the contract.
- 6.1 The following drawings and documents shall be supplied by the supplier.

I. TYPE TEST REPORT OR CERTIFICATE.

This shall be supplied in standard 'A4' size of sheets with punched holes for filing. It shall be suitably enclosed in a cover. Type test reports shall have to be signed both by the suppliers engineers and CLW's engineers or the Director of Inspection as the case may be. 5 copies of the report shall be supplied.

II. ROUTINE TEST CERTIFICATE.

This shall be supplied in standard 'A4' size of sheets with punched holes for filing. Routine test certificates shall be submitted along with each batch of couplers in 5 copies.

7.0 Guarantee:

7.1 The supplier shall give a guarantee of clear 24 months for the couplers from the date of supply. Any damage or defect noticed during the period due to defective material or workmanship, will be replaced by the supplier free of cost.

8.0 Technical Specification.

8.1 The multiple unit couplers (internal type) covered by this specification shall be of the 19 pin type suitable for loco motive application. These are fitted inside the locomotive. The couplers of internal type is further classified into four types - ~~was~~ 'A', 'B', 'C' & 'D'.

8.2 All the couplers shall be manufactured in accordance with the General Design shown in the drawings attached to this specification.

SPECIFICATION MULTIPLE INTERNAL COUPLERS

CHITTARANJAN LOCOMOTIVE WORKS
WEST BENGAL, INDIA.

NO. CLW/ES/S-9

DY, C.E.E.

DATE

- 8.3 The cable couplers shall consist of 19 pins/19 sockets with crimping sleeves of annealed copper and suitable for inserting a stranded conductor of 3mm² (45/9.3) and crimping with the use of a hand crimping plier. The pins and sockets shall be suitably arranged in cast aluminium housing and marked with identity numbers.
- 8.4 Insulating discs shall be made of Hymels Deugh Moulding Compound Grade D3110 Grey Colour of M/S. Bakelite Hylam Ltd/ or equivalent polyester deugh moulding compound conform to BS 5734 part 2 1979. / M/S GIRDPLAST LTD, PUNE - ④
- 8.5 These couplers shall be suitable for use in the locomotive of central circuit where the voltage is 110 Volts DC and each of the pins/sockets shall be capable of carrying a current of 15 amps. continuously.
- 8.6 Types (A, B, C etc) shall have to be clearly punched on each coupler (male and female).

9.0 Standards.

Relevant Indian Standard specification shall apply in respect of all materials used in the manufacture of couplers & its constituents.

10.0 Drawings:

The following drawings are enclosed with this specification.

- i) CLW/ES/SK-1/C-9
- ii) CLW/ES/SK-2/C-9
- iii) CLW/ES/SK-3/C-9

Material for each part component has been indicated in the drawings. Dimensions indicated in the drawings are in millimeter.

11.0 Inspection.

11.1 Inspection.

The following routine checks will be exercised on each piece of coupler, and rubber protector.

- 1) Conformity to design and dimensions indicated in the drawings mentioned above.
- 11) Appropriate matching of male and female couplers.
- ⑦ 111) Type (A, B, C etc) and identity number punchings (1,2,3,14 etc) Number punching shall be checked in both pieces for correct matching.

12.0 TESTS.

The test specimens of 8.4 required for the determination of physical properties shall be moulded under conditions recommended by the manufacturer for production moulding.

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SPECIFICATION MULTIPLE
INTERNAL COUPLERS.

DY. C.E.E.

CHITTARANJAN LOCOMOTIVE WORKS
WEST BENGAL, INDIA.

NO. CLW/ES/C-9/4

DATE

12.1 The following tests shall be carried out on the Couplers.

- a) Type tests.
- b) Routine tests.

12.2 Type Tests.

TESTS FOR INSULATING DISC.

12.2.1 Cross breaking strength:

The strength of the insulating disc shall be carried out in accordance with method 304 of BS 2782, except that radius of supports and loading block may be 3mm. The test value should not be less than 600 kg/cm².

12.2.2 Impact Strength:

The test on insulating discs shall be carried out in accordance with method 306A of BS:2782 except that :

1. The specimen shall be rectangular bars at least 62.6 cms long x 12.7 ± 0.25 cm thick and 9.5 ± .25 in wide. The specimen shall be obtained by first moulding the specimen specified in Cl.12.2.1 and cutting them in half. The specimen shall have V-Notch machined by milling or shaping as shown in fig. (a) of Drawing No. CLM/ES/SK-3/C-9.

fig. (b)
of

The specimen shall be placed in the jaws of vice of a pendulum(Izod) type impact testing machine as shown in drawing CLM/ES/SK-3/C-9. Three specimen should be used and value of impact strength should not be less than 12 kg.cm.

12.2.3 Tensile Strength:

This test on Insulating discs shall be carried out in accordance with method 301A of BS:2782. The value of tensile strength shall not be less than 250 kg/cm².

12.2.4 Surface Resistivity: The test shall be carried on the moulded insulating disc of 100-125mm in diameter and 3±0.5 mm in thickness in accordance with method 203A of BS:2782. Before determining the surface resistivity the specimen shall be immersed in distilled water at 35 ± 5°C for 24 hours ± 30 min. and then taken from water and surface moisture removed with filter paper or blotting paper on a clean absorbent cloth.

The surface resistivity shall be determined at a temp. of 35 ± 5°C in an atmosphere of relative humidity not exceeding 80% and within 10-15 min. of the time of removal from the water. This shall not be less than 9 log₁₀ ohms.

12.2.5 Volume Resistivity:

This test shall be carried out on moulded insulating disc. of 100-125 mm in diameter, 3± 0.5mm in thickness in accordance with method 202A of BS:2782 and value of the test sample shall not be less than 13 log₁₀ ohm.cm.

SPECIFICATION MULTIPLE INTERNAL COUPLERS.	DY. C.E.E	CHITTARANJAN LOCOMOTIVE WORKS WEST BENGAL, INDIA. NO. CLM/ES/30-9/78 DATE
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D.M.K. SINDO.

12.2.6 Comparative Tracking Index:
This test shall conform to IS:2824 - 1964 and numerical value of the voltage which will cause tracking shall not be less than 500 volts.

12.2.7 Electrical Strength:
To check the electrical strength of the insulating disc two test specimen of 53± 1mm diameter and 0.5 to 2.5mm thickness shall be moulded under the condition recommended by the manufacturer. These shall be heated in a oven upto temp. of 90°C and then subjected to a high voltage of 11 kv/mm. for a duration of one minute. The specimen should be capable of with standing the same.

12.2.8 Water absorption:
The specimen shall be 50 ± 1 mm in dia and 3-112mm thick and shall be moulded to shape under the conditions recommended by the manufacturer. This shall be wholly immersed in distilled water at a temp. of 35 ± 5°C.

12.2.9 Flammability:
The test specimen shall be 152 mm square and cut from a sheet not exceeding 51mm in thickness. The specimen will be subjected to a flame produced by burning a specified Qty. of alcohol in a small cup, the flame impinging on the middle of the lower side of the sheet in accordance with method 508D of BS:2782. It should have low flammability or very low flammability.

TEST ON COMPLETE COUPLER

12.2.10 Capacity Test:
The male and female coupler having been rated current of 15 Amps. DC shall be passed through ~~steady state~~ each of 5 Pin/Socket in one row for sufficient time until steady temperature is reached. The voltage drop across the contacts while carrying current shall not exceed 0.1 volt. There shall be no damage/deterioration of any part in anyway due to heating caused by the flow of this current.

12.2.11 Dielectric test:
The complete assembled couplers shall be tested between terminals and between terminals and body(at earth) at voltage 2.5 kV, 50 c/s. for 1 min.

12.3.0 Routine Test:

12.3.1 Capacity Test:
A test similar to test specified in para 12.2.10 but on one percent of the couplers offered in one batch. The selection of samples shall be made by the inspecting authority on random basis.

12.3.2 Dielectric test: A test same as described in para 12.2.11.

DIN.	CHNO.	SPECIFICATION MULTIPLE INTERNAL COUPLERS.	CHITTARANJAN LOCOMOTIVE WORKS WEST BENGAL, INDIA.
			NO. CIM/PSAC-9/11 DATE

DY, C.E.E.

13.D. SPECIAL CONDITION - Once a prototype is approved no contractor shall change his source of supply or sub-contractor for purchased components and sub-assemblies without CLW's approval.

14.D. CLW reserves the right to Procure materials only from ISO certified firms.

3. Internal Coupler Type (Male & Female).
4. Internal Coupler Type 'D' (Male & Female).
5. Rubber Protector.

DELETED

The tenderer should also furnish the following information clearly in their offer.

1. Date by which prototypes will be offered for inspection & tests.
2. Commencement of bulk supply.
3. Rate of supply per month.
4. Completion of delivery.

CHKD.

DRS.

SPECIFICATION MULTIPLE
INTERNAL COUPLERS.

CHITTARANJAN LOCOMOTIVE WORKS

CHITTARANJAN LOCOMOTIVE WORKS
WEST BENGAL INDIA.

NO. CLW/ES/C-9

f. DY. C. & E. (C) DATE

ANNEXURE - I.

Sl. No.	Description.	Rate	Remarks if any.
1.	Internal Coupler Type 'A' (Male & Female)		
2.	Internal Coupler Type 'B' (Male & Female).	}	DELETED
3.	Internal Coupler Type 'C' (Male & Female).		
4.	Internal Coupler Type 'D' (Male & Female).		
5.	Rubber Protector.		

The tenderer should also furnish the following information clearly in their offer.

1. Date by which prototypes will be offered for inspection & tests.
2. Commencement of bulk supply.
3. Rate of supply per month.
4. Completion of delivery.

CHKD.
DRK.

CHITTARANJAN LOCOMOTIVE WORKS
 WEST BENGAL, INDIA.
 NO. CLW/ES/C-9
 DATE

DY, C.E.E.

SPECIFICATION FOR RUBBER PROTECTOR OF COUPLER(MALE)
(BASED ON RDSO/W&C/RP-158/1987)

1. Material

- 1.1 The rubber used in the manufacture of the rubber protector of coupler shall be Polychloroprene suitably compounded as to conform to the requirements stipulated in the standard.

2. Construction and finish

- 2.1 The rubber protector for coupler shall be manufactured as per the relevant drawing and shall be uniform in thickness, smooth, free from pin holes and other visual flaws.

3. Physical properties

Note: Methods of tests shall be as per IS:3400. The tests shall be carried out where practicable from the finished products or from prepared test slabs of approximately same degree of vulcanisation and using the same compound.

<u>Property</u>	<u>Value</u>
(i) Hardness (Shore 'A')	60 ± 5
(ii) Tensile strength (Kg/cm ²), Min.	170
(iii) Elongation at break (%), Min.	400
(iv) Compression set(%) at 100 ± 2°C for 24 + 0 hrs., Max. - 2	30

3.1 Accelerated ageing

After ageing at 100 ± 1°C in an air oven for 72 + 0 hrs.
- 2

the hardness, tensile strength and elongation at break (%) shall not vary from the values obtained with the unaged specimens by more than the following : -

(i) Hardness (Shore 'A')	+ 5° - 0°
(ii) Tensile strength	± 15%
(iii) Elongation at break (%)	+ 10% - 25

***** Contd.,/2

SPECIFICATION FOR
MULTIPLE INTERNAL
COUPLERS.

Signature

Signature
DR. G. S. R. (SFR.)
DY. CEE. (D)

चितरंजन रेल इंजन कारखाना
एच. एम. वर्क
CHITTARANJAN LOCOMOTIVE WORKS
WEST BENGAL INDIA

ड्राइंग नं. : CLW/ES/C-9

DATE/ALT

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DRN.

अनुमोदित
DRN.

4. Sampling and criteria for conformity

- 4.1 A minimum of six samples or 1% of the lot offered for inspection whichever is more, shall be drawn for the tests indicated in this standard. Should the samples fail to meet the requirements, an additional two sets of samples from the same lot shall be drawn for re-testing. Should the retest samples fail to meet the requirements, the entire lot shall be rejected.
- 4.2 In the event of rejection of the lot after the re-test of samples, the entire lot offered for inspection shall be made unusable in the presence of the Inspecting Officer/Purchaser.

5. Marking

- 5.1 Each rubber protector of coupler shall be embossed in raised letters on a recess as follows : -

- (i) Drawing number.
 (ii) Manufacturer's name/initial/trade mark.
 (iii) Quarter/year of manufacture.

6. Packing

- 6.1 The rubber protector of coupler shall be dusted with French chalk to IS:380 and securely packed in wooden boxes to avoid any distortion and to prevent any damage during transit and storage. The boxes shall be suitably sealed by the Inspecting authority and shall carry markings similar to clause 4.

7. Storage

- 7.1 The rubber protector of coupler shall be stored in a cool dry place in their original packings.

8. Code of practice for quality control and inspection.

- 8.1 As per IRG R-48

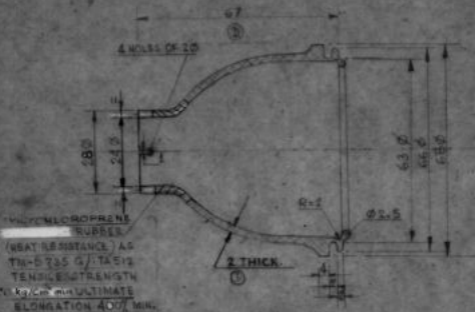
Prepared
by
CHKD.Checked
by
DRN.SPECIFICATION FOR
MULTIPLE INTERNAL
COUPLERS

 J. S. Chatterjee (Signature)
 Dy. C.E. (D)

 চিত্তরঞ্জন রেল লocomotive কারখানা
 গুলশান ষ্টেশন, কলকাতা
 CHITTARANJAN LOCOMOTIVE WORKS
 WEST BENGAL INDIA

ড্রইং নং. : CLW/ES/C-9

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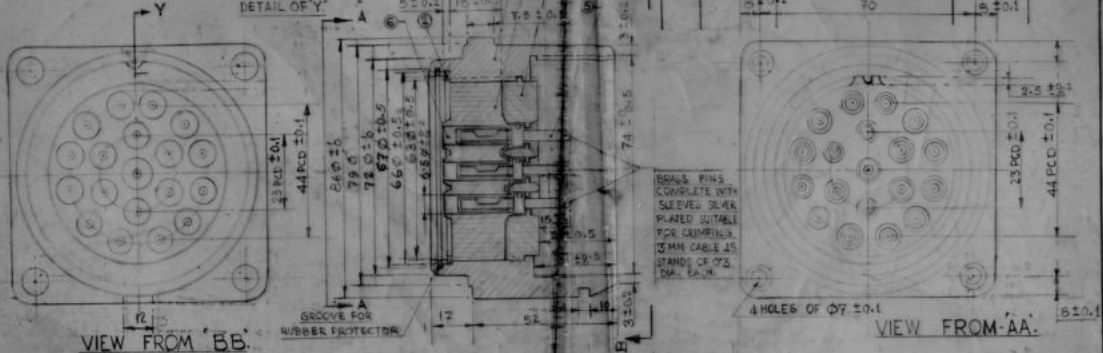
RUBBER PROTECTOR.

- NOTE (i) The I.D. of narrow neck of the Rubber Protector should be within 10% of the maximum expansion.
- (ii) The thickness of the rubber protector should be maintained to 2mm at all places.
- (iii) The rubber protectors should be applied strictly in accordance with data sheet in our Annexure II of this specification.

COUPLER
INDOOR TYPE

CHITTARANJAN LOCOMOTIVE WORKS
WEST BENGAL, INDIA.
NO. CLW/ES/5X-2/0-9
DATE 16/4-79 SHT-1001 SEE SHT-2

BY, C.E.E. (C)



MALE TYPE

NOTE

1. IN ALTERATION 'E' 6.5 INSTEAD OF 6.2 HAS BEEN INCORPORATED.
2. NUMBER MARKING 122A, C/C ARE TO BE MARKED ON BOTH PIECES OF MATERIAL AND THEY SHOULD BE CORRECTLY MATCHED.

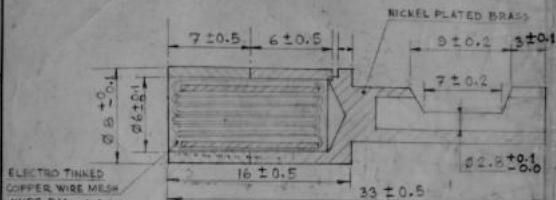
TYPE A (19 PIN)

TYPE B (19 PIN)

TYPE C (13 PIN)

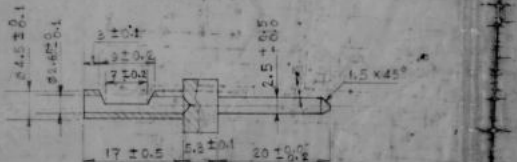
TYPE D (19 PIN)

CRD NO.	REV.	DATE	REV. Dwg No.	NAME	DESCRIPTION	QTY/	MATL. SPECN.	WT.
DRN		14/78			INDOOR TYPE		CHITTARANJAN LOCOMOTIVE WORKS WEST BENGAL, INDIA.	
DRN								
CHK								
TRD								
COMP								
SCALE :-								
REP.							APPROVED :- <i>[Signature]</i>	
							SK/NO.CLV/ES/SK/IC/57	

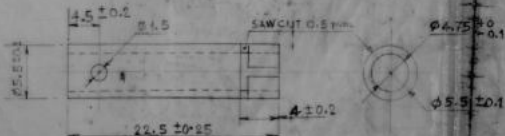


DETAILS OF REF. 10

ELECTRO TINNED
COPPER WIRE MESH
WIRE DIA. - 0.4 MM.
NO. OF WIRE - 10 NOS.



DETAILS OF REF. 5



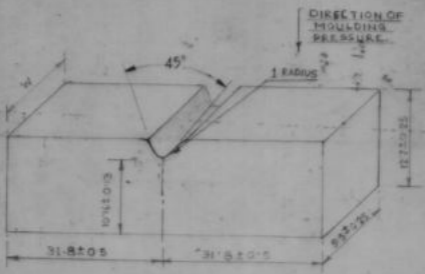
DETAILS OF REF. 6

NOTE : SLEEVE SHOULD BE OF SILVER RELATED HIGH
CONDUCTIVITY ELECTROLYTIC COPPER AND
ANNEALED.

ALT. No.	AUTHORITY	DESCRIPTION	INITIAL	DATE

21		RUBBER PROTECTOR.	1	CYTHRE 04.74	SEE 511	04.74
20		SPRINGS RING TYPE-II.	1	SPRINGS STEEL	612255	04.74
19		SPECIAL STUD.	1	STEEL	71	71
18		SPRINGS.	1	SPRINGS STEEL	19727	71
17		SPRING RETAINER.	1	STEEL	18265	71
16		CIRCLIP.	1	SW SLEE.		71
15		FIXING LEVER.	1	STEEL	18226	71
14		SPECIAL LOCKNUT.	1	71	182258	71
13		LOCKING SCREW.	1	71	18225	71
12		SOCKET RO. HD. SCREW ALLEN SCREW	2	71	182269	71
11		CABLE CLEAT.	1	71	18226	71
10		SOCKET ASSLY.	19	SEE DETAILS CALC		
9		MOVABLE COUPLER BODY.	1	BRASS 15 617 CALC		
8		INSULATING DISC TYPE-IV	1	DHCHO	182774	
7		INSULATING DISC TYPE-III	1	71	18277	
6		SLEEVE.	38	ELECTRO ANNEALED COPPER	191 18277	SEE NOTE 191
5		PIN	19	BRASS		191
4		INSULATING DISC TYPE-II	1	DHCHO	18277	
3		INSULATING DISC TYPE-I	1	BRASS	18277	
2		SPRINGS RING TYPE-I.	1	STEEL		
1		FIXED COUPLER BODY.	1	CAST IRON	15 617 CALC	SEE NOTE 15 617

S.D. NO.	REF.	PART DRG NO.	DESCRIPTION	QTY.	MATL.	SPECN	WT.
DGR							
DRN							
CHD							
TRD							
CDMP							
SCALE :-			CHITTARANJAN LOCOMOTIVE WORKS WEST BENGAL, INDIA.				
REF.			COUPLER INDOOR TYPE.				
			(SHEET NO. 2 SHEET END)		APPROVED :- SUNOCLW/LS/20/09		

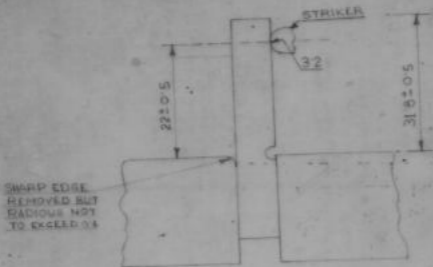


CHKD.
DATE

COUPLER IN DOOR
OUT DOOR TYPE.

f. DY, C.E.E(D)

CHITTARANJAN LOCOMOTIVE WORKS
WEST BENGAL, INDIA.
NO. CW/EG/SK-3/C-9
DATE 17-11-80

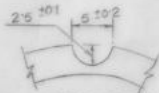


CHKD.
 8/11/80

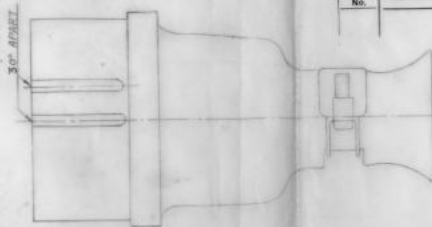
COUPLER
 IN DOOR/OUTDOOR
 TYPE.

f. DY. C.E.E.(D)

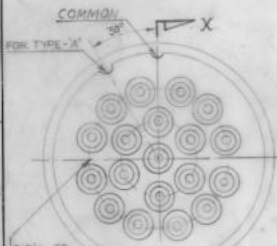
CHITTARANJAN LOCOMOTIVE WORKS
 WEST BENGAL, INDIA.
 NO. SK NO. CW/ES/SK-2/C-5
 DATE: 17-11-80



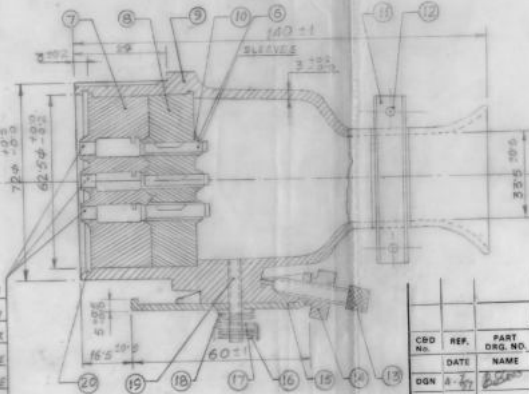
DETAIL OF X



PLAN



BACK SIDE VIEW



FEMALE TYPE

NOTE - FOR MATERIAL SCHEDULE REFER SHEET No-14.

DRD'S TO
MATCH WITH MALE
COUPLERS & TO
ENSURE INTER
CHANGEABILITY WITH
OTHER MAKE.

BRASS FIN
COMPLETE WITH
SLEEVES SAVER
PLATED SUITABLE
FOR 3MM. CABLE
45 STRAND OF
0.3 DIA EACH.

CBD No.	REF.	PART DRG. NO.	DESCRIPTION	QTY.	MATL.	SPECN.	WT.
DGN	A-77						
DRN							
CHD							
TRD							
COMP							
SCALE - N.T.S.							
REF.							

COUPLER
INDOOR TYPE
(FEMALE)

CHITTARANJAN
LOCOMOTIVE WORKS
WEST BENGAL, INDIA



APPROVED - *[Signature]*
No. CLW/ES/SK-4/C-9