

SPECIFICATION FOR STEEL PIPE FITTINGS FOR 3Ø A.C. FREIGHT ELECTRIC LOCOMOTIVE (WAG/9 LOCO)

SPECIFICATION NO. CLW/MS/3/068 ALT.15

ISSUE DATE: 29.05.1997

ISSUED BY:

**DY. CHIEF ELECTRICAL ENGINEER/D/CONV.
CHITTARANJAN LOCOMOTIVE WORKS
P.O. CHITTARANJAN - 713331
DIST. BARDHAMAN (WEST),
WEST BENGAL (INDIA)**

Signature Not
Verified
Digitally signed by
ALOK KUMAR
CHAKRABORTY
Date: 2023.04.06
16:26:19 IST
Reason: IREPS-CRIS
Location: New Delhi

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ALOK KUMAR CHAKRABORTY Digitally signed by ALOK KUMAR CHAKRABORTY Date: 2022.12.02 15:52:21 +05'30'	MANOJ KUMAR SAGAR Digitally signed by MANOJ KUMAR SAGAR Date: 2022.12.02 16:25:41 +05'30'	SYAMA PRASAD PATRA Digitally signed by SYAMA PRASAD PATRA Date: 2022.12.02 16:54:56 +05'30'
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1. **SCOPE** : This specification covers the manufacture and supply of Steel Pipe Fittings for compressed air transmission system viz. pneumatic brake system in WAG-9 class locomotive. Operating air pressure may be as high as 11.5 Kg/Cm². Normal working pressure is 10 Kg/Cm².
2. **SCOPE OF SUPPLY** : As per revised Annexure-A.
3. **CLIMATIC & ENVIRONMENTAL CONDITIONS** :
 - a) Maximum atmospheric temperature : Under Sun 70°C.
In shade.: 50°C.
 - b) Humidity : 100% saturation during rainy season.
 - c) Reference site conditions :
 - i) Ambient Temperature : Max. 47°C Min. 0°C
 - ii) Humidity : 60%
 - iii) Altitude : 160 m above sea level.
 - d) Rain fall : Very heavy in certain areas. The locomotive will be designed to permit its running at 10 Km/Hr in flood water level of 102 mm above rail level.
 - e) Atmosphere during hot weather : Extremely dusty and desert terrain in certain areas.
 - f) Coastal area : Locomotive and equipment will be designed to work in coastal areas in humid and salt laden atmosphere.
 - g) Vibration : The equipment, sub-system and their mounting arrangement will be designed to withstand vibration and shocks encountered in service as specified in corresponding IEC publications unless otherwise prescribed.
4. **STANDARDS** : Standards used in this specification are -
 - i) ASTM A108 Gr.1018 ii) ISO 7/1 iii) ISO 228/1
5. **GENERAL & TECHNICAL DATA** :
 - 5.1 All pipe fittings shall be made from carbon steel.
 - 5.2 Minimum Allowable stress value of all pipe fittings shall be 1378 bar.
 - 5.3 Safety factor shall be in 3:1
 - 5.4 Minimum Ultimate tensile strength shall be 4140 bar.
6. **MANUFACTURING** :
 - 6.1 Pipe fittings shall be made from forged/steel and properly machined.
 - 6.2. Pipe fittings shall conform to accompanying drawings.

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- 6.3. Pipe fittings shall not have any cracks/shrink holes/cold sets/pits/ sloppy edges/machining mark.
- 6.4. Pipe fittings shall have a safe, reliable, torque free and leak proof performance at all pipe connections.
- 6.5. Tapered and parallel threads shall conform to ISO 7/1 & ISO 228/1 respectively.

7. INSPECTION AND ACCEPTANCE :

7.1 Type Test

- a) The manufacturers shall indicate along their offer type tests to be carried out at the time of inspection at their works premises for approval of the purchaser. They shall have complete test equipments to conduct such tests.
- b) The manufacturers shall submit one prototype sample of each set (loco) for the purpose of inspection and other tests at their works premises to be witnessed by an authorised representative of the purchaser.

7.2 Routine Test

Routine inspection will be carried out by one authorised representative of the purchaser as per approved routine test programme, supplied by the manufacturer.

7.3 INSPECTION PLAN

The tenderer shall indicate the sample size including minimum size for routine inspection of each lot and the acceptance criteria. Acceptance shall be entirely based on drawings & standards.

8. SUPPLY OF DOCUMENTS (Apart from those indicated in BID documents)

8.1 Along with tender offer




- (a) Material specification
- (b) Standards
- (c) Complete type test, routine test and inspection plan.
- (d) Documentary proof if they have supplied similar pipe fittings to Railways /Industry.
- (e) Any deviation from the specified values shall be spelled out clearly by the tenderer.

8.2 Along with supply

- (a) Pressure ratings and tubing information
- (b) Installation information if any
- (c) Test certificates
- (d) Material certificate from approved test house.

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9. **QUALITY ASSURANCE** : As per ISO 9000
10. **MARKING** : Each pipe fitting shall have legible and indelible markings of (a) Size (b) Manufacturer's name/trade work (c) Max. working pressure (d) Month and year of manufacture.
11. **GUARANTEE** : 6 (six) years from date of supply or 5 (five) years from loco entering revenue service whichever is earlier. The materials/components which fail during the guarantee period should be replaced by the manufacturer/supplier free of cost.
12. **PACKING** : All pipe fittings shall be properly packed to avoid damage during transit and storage. A minimum storage period of 24 months shall be considered.
13. **REFERENCE** : All pipe fittings used by M/s. ABB Transportation for WAG-9 class (Co-Co) Electric Locomotive are supplied by
- (i) M/s Norden Hydraulics Connections
60-62 Benett Street
Dandenong 3175 (Australia)
 - (ii) M/s Baker A.E. & Co.
P.O. Box 744
795 Springvale Road (Australia)
 - (iii) M/s Duffield Frederick Pty Ltd.
Greens Road
Dandenong 3175 (Australia)
 - (iv) M/s Flexcon Pty Ltd. T/AS ENZED
P.O. Box 1296
CNR Princes H'way & Linley St.
Dandenong 3175 (Australia)
 - (v) M/s Vickers Systems Pty Ltd.
65-67 Glenvale crescent
Mudgrave, Victoria 3170 (Australia)

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Revised Annexure-A

Sl. No.	Drg. No.	Alt. No.	Description	Remarks
1	1209-18.406-209 Sl. 1	Alt. 2	Nipple 1 ¼" ISO Taper x 1 ¼" ISO Taper	
2	1209-18.406-209 Sl. 2	Alt. 2	Nipple 3/4" ISO Taper x 3/4" ISO Taper	
3	1209-18.406-209 Sl. 3	Alt. 2	Nipple 1/2" ISO Taper x 3/8" ISO Taper	
4	1209-18.406-209 Sl. 4	Alt. 2	Nipple 1/2" ISO Taper x 1/2" ISO Taper	
5	1209-18.406-209 Sl. 5	Alt. 2	Nipple 1" ISO Taper x 3/4" ISO Taper	
6	1209-18.406-209 Sl. 6	Alt. 2	Nipple 3/8" ISO Taper x 3/8" ISO Taper	
7	1209-18.406-209 Sl. 8	Alt. 2	Nipple 3/8" ISO Taper x 1/4" ISO Taper	
8	1209-18.406-077 Sl. 1	Alt. 4	Elbow M/F 3/4" ISO Taper x 3/4" ISO Parallel	
9	1209-18.406-077 Sl. 2	Alt. 4	Elbow M/F 1" ISO Taper x 1" ISO Parallel	
10	1209-18.406-077 Sl. 3	Alt. 4	Elbow M/F 1 ¼" ISO Taper x 1 ¼" ISO Parallel	
11	1209-18.406-077 Sl. 4	Alt. 4	Elbow M/F 1/4" ISO Taper x 1/4" ISO Parallel	
12	1209-18.406-214 Sl. 1	Alt. 2	Elbow M/F 1" NPT x 1" BSPP (Female)	
13	1209-18.406-203 Sl. 2	Alt. 3	Elbow M/F 3/8" NPT x 3/8" Pipe	
14	1209-18.406-074 Sl. 8	Alt. 3	Reducing Bush 3/4" ISO Taper x 3/8" ISO Parallel	
15	1209-18.406-080 Sl. 3	Alt. 6	Threaded Tee 3/4" x 3/4" x 3/4" (Female/ISO Parallel)	
16	1209-18.406-073 Sl. 1	Alt. 2	Elbow F/F 1/2" (15 mm) ISO Parallel	
17	1209-18.406-073 Sl. 2	Alt. 2	Elbow F/F 1" (25 mm) ISO Parallel	
18	1209-18.406-208 Sl. 1	Alt. 1	M/F Adapter 3/4" ISO Taper x 3/4" ISO Parallel	
19	1209-18.406-095	Alt. 2	Coupling Quick Disconnect 1/2" ISO Parallel	
20	1209-18.406-143 Sl. 1	Alt. 2	Elbow 45° Hose Tail 1" NPT x 1" Pipe	
21	1209-18.406-207 Sl. 2	Alt. 3	Elbow M/M 1/2" ISO Taper x 1/2" ISO Parallel (M)	
22	1209-18.406-144 Sl. 1	Alt. 4	Elbow 45° M/M 3/8" ISO Taper x 3/8" ISO Parallel	
23	1209-18.406-073 Sl. 3	Alt. 2	Elbow F/F 1/4" ISO Parallel x 1/4" ISO Parallel	
24	1209-18.406-207 Sl. 3	Alt. 3	Male Elbow 3/8" ISO Taper x 3/8" ISO Parallel	
25	1209-18.406-207 Sl. 1	Alt. 3	Male Elbow 1/4" ISO Taper x 1/2" ISO Parallel	
26	1209-18.406-082 Sl. 3	Alt. 5	Male Elbow 3/4" ISO Taper x 3/4" ISO Parallel	
27	1209-18.406-204 Sl. 1	Alt. 4	Elbow M/F 1/2" ISO Parallel x 1/2" ISO Parallel	
28	1209-18.406-204 Sl. 2	Alt. 4	Elbow M/F 3/8" ISO Parallel x 3/8" ISO Parallel	
29	1209-18.406-074 Sl. 3	Alt. 3	Reducing Bush 1 ¼" ISO Taper x 1" ISO Parallel	
30	1209-18.406-074 Sl. 2	Alt. 3	Reducing Bush 1 ¼" ISO Taper x 3/4" ISO Parallel	
31	1209-18.406-074 Sl. 4	Alt. 3	Reducing Bush 3/4" ISO Taper x 1/2" ISO Parallel	
32	1209-18.406-074 Sl. 5	Alt. 3	Reducing Bush 1 ½" ISO Taper x 1" ISO Parallel	
33	1209-18.406-074 Sl. 6	Alt. 3	Reducing Bush 1" ISO Taper x 3/4" ISO Parallel	
34	1209-18.406-074 Sl. 7	Alt. 3	Reducing Bush 1/2" ISO Taper x 3/8" ISO Parallel	
35	1209-18.406-073 Sl. 4	Alt. 2	Elbow F/F 3/4" ISO Parallel	
36	1209-18.406-199 Sl. 1	Alt. 1	4 way equal tee (Female) 3/8" ISO Parallel	
37	1209-18.406-206 Sl. 1	Alt. 3	Nipple 1/2" ISO Taper x 3/8" ISO Parallel	
38	1209-18.406-206 Sl. 2	Alt. 3	Nipple 1/2" ISO Taper x 1/2" ISO Parallel	
39	1209-18.406-206 Sl. 3	Alt. 3	Nipple 3/4" ISO Taper x 3/4" ISO Parallel	
40	1209-18.406-206 Sl. 4	Alt. 3	Nipple 1" ISO Taper x 3/4" ISO Parallel	
41	1209-18.406-021 Sl. 1	Alt. 4	Male Adapter 1 ¼" ISO Taper x 1 ½" Pipe	
42	1209-18.406-021 Sl. 2	Alt. 4	Male Adapter 1" ISO Taper x 1" Pipe	
43	1209-18.406-021 Sl. 3	Alt. 4	Male Adapter 3/4" ISO Taper x 1" Pipe	
44	1209-18.406-080 Sl. 5	Alt. 6	Female Tee 1/2" BSPP x 1/2" BSPP x 1/2" BSPP	
45	1209-18.406-083 Sl. 1	Nil	Male Elbow 1/2" BSPT x 1/2" BSPT	
46	1209-18.406-204 Sl. 3	Alt. 4	Female Elbow 3/4" BSPP x 3/4" BSPP (M/F)	

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47	1209-18.406-021 Ref. 2	Alt. 4	Male Adapter 1 ½" Tube × 1" BSPT	
48	1209-18.406-206 Sl. 7	Alt. 3	Nipple 1/2" ISO Taper x 3/4" ISO Taper	
49	1209-18.406-079 Ref. 5	Alt. 7	M/F Adapter 1/2" BSPT × 3/4" BSPP	
50	1209-18.406-209 Ref.10	Alt. 2	Nipple 1" ISO Taper x 3/4" ISO Taper	
51	1209-18.406-074 Sl. 1	Alt. 3	Reducing Bush 1" BSPT x 1/2" BSPP	
52	1209-18.406-075	Alt. 8	Socket	
53	1209-18.406-215	Nil	Hex. Socket (BSPP)	




DETAILS OF ALTERATIONS

ALT. NO.	DATE	DESCRIPTION	SIGNATURE	REMARKS
1	22.8.98	ITEMS AT SL. NOS. 3, 23 & 24 DELETED. ITEMS AT SL. NOS. 46, 47, 48 ADDED. DRGS. MENTIONED AGAINST SL. NOS. 1, 2, 4 TO 18, 27 TO 30, 34 TO 42 ALTERED. QUANTITIES AT SL. NOS. 2, 7 & 16 WERE 1, 14 & 1 RESPECTIVELY. ALTERATION SHEET NO. 1 (SHEET-1) ADDED. DRG. NO. OF ITEM AT SL. NO. 36 WAS 1209-18.406-010. NOTE-1 (SHEET-6) ADDED. CLAUSE-2 OF THIS SPECIFICATION MODIFIED.	Sd/-	
2	06.3.2000	ITEM AT SL. NO. 2 DELETED. ITEMS AT SL. NOS. 49 & 50 ADDED. QTY. AT ITEM SL. NO. 39 WAS 1/LOCO SET.	Sd/-	
3	23.8.2001	ANNEXURE-A (SHEETS- 5, 6) DELETED. REVISED ANNEXURE-A (SHEETS -8 & 9) ADDED. SL. NOS. (ii) & (iii) UNDER CLAUSE 4 & CLAUSE 6.5 ADDED. (45 NOS) DELETED UNDER SCOPE OF SUPPLY. THE WORD 'CAST' IN CLAUSE 6.1 DELETED. 'REVISED' ADDED IN CLAUSE 2.	Sd/-	
4	26.4.02	SHEETS 8 & 9 ARE DELETED & DETACHED FROM AND SHEETS 8A & 9A (REVISED ANNEXURE-A) INCLUDED IN THE SPECIFICATION.	Sd/-	BASED ON JOINT NOTE MADE BY SHOP-16 & C-D&D ON 18.4.02 AND COUNTERSIGNED BY WM/ELA-II & AME/D&D-II.
5	22.12.02	LATEST ALT. NOS. OF DRGS. FOR ITEMS AT SL. NOS. 13, 14, 23, 24, 26 TO 30, 39 TO 45 ADDED. DESIGNATION OF ITEM AT SL. NO. 24 WAS ELBOW 45° M/M 3/8" ISO TAPER X 3/8" ISO TAPER. ITEM AT SL. NO. 28 WAS MALE ELBOW 3/4" ISO TAPER X 3/4 " ISO TAPER.	Sd/-	BASED ON JOINT NOTE MADE BY SHOP-16 & C-D&D ON 9.12.02 AND COUNTERSIGNED BY AME/D&D-II.
6	18.02.03	QTY. OF ITEMS AT SL. NOS. 4, 24, 26 & 36 WERE 3, 6, 6 & 6 RESPECTIVELY.	Sd/-	BASED ON JOINT NOTE MADE BY SHOP-16 & C-D&D ON 09.12.02 AND COUNTERSIGNED BY AME/D&D-II.
7	2.3.06	QTY. OF ITEM AT SL. NO. 5 WAS 4. ITEMS AT SL. NOS. 46, 47 & 48 ADDED. ITEM AT SL. NO. 1 DELETED.	Sd/-	DUE TO CHANGE IN 1/2 " DRAIN LINE & PANTO DRAIN LINE.

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8	27.11.09	ITEM SL. NO. 16 DELETED DUE TO ABOLISH OF K PORT FROM U/F.	Sd/-	
9	16.11.11	REVISED ANNEXURE 'A' PAGE NO. 8A & 9A DELETED FROM THE SPEC.	Sd/-	TO AVOID MISMATCH BETWEEN CAT. BOOK AND SPEC.
10	14.2.12	IN SHEET NO. 2 SL. NO. 4 GR. 1018 ADDED.	Sd/-	
11	17.1.14	IN SHEET 9A SL. NO. 49, 50, 51 ADDED.	Sd/-	
12	16.07.14	IN SHEET 8A SL. NO. 6 AND 19 QTY. CHANGED AND IN SHEET 9A SL. NO. 52 ADDED.	Sd/-	IMPLEMENT RDSO MS, UNLOADER VALVE VIDE L/NO. RDSO/2012/EL/MS/0412 REV.0 DT. 22.08.12
13	14.10.14	NOTE-1 ADDED IN SHEET 9A.	Sd/-	
14	29.07.15	ITEM SL. NO. 53 ADDED IN SHEET 9A.	Sd/-	APPROVED BY CEE/LOCO ON NOTE NO. ELDD/3606 DT 16.05.2015.
15	10.7.17	CLAUSE-2 IN SHEET-2 MODIFIED. ITEM NOS. 54 & 55 ADDED IN SHEET 9A.	Sd/-	

Specification have been digitized and all alterations have been incorporated.

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