UTA CONTRACT # 20-03236

LIGHT RAIL VEHICLE REPAIR SERVICES AGREEMENT

This Light Rail Vehicle Repair Services Agreement (the "**Contract**") is hereby entered into by and between UTAH TRANSIT AUTHORITY, a public transit district organized under the laws of the State of Utah ("**UTA**"), and SIEMENS MOBILITY INC., a Delaware corporation having an office located at 7464 French Road, Sacramento, California 95828 ("**Contractor**"). UTA and Contractor are hereinafter collectively referred to as "**parties**" and either may be referred to individually as a "**party**," all as governed by the context in which such words are used.

RECITALS

A. UTA Vehicle No. 1122 (the "**LRV**") sustained substantial physical damage and require comprehensive repairs;

B. Contractor has completed detailed damage assessment and prepared scope of work and bill of material for the LRV as set forth in Exhibit B; and

C. UTA and Contractor have agreed to not-to-exceed prices (based on materials unit prices and established labor rates) for the services described in Exhibit B; and

D. UTA and Contractor have agreed to the following terms and conditions regarding the manner in which the services set forth in Exhibit B (the "**Work**") will be performed.

AGREEMENT

Therefore, the parties agree as follows:

1. Scope of Work; Standard of Care. The "Work" is generally described in Exhibit B as to the condition of damage of the vehicle that falls outside of original manufacturer specifications. The final product will be the repair of the vehicle's structure and trucks to original manufacturer specifications and shall be further defined and detailed in complementary drawings, product data and descriptions and other submittals documents furnished by Contractor from time-to-time in accordance with the Contract and approved by UTA. Contractor shall perform the Work in accordance with the Contract Documents and applicable industry standards, and in full compliance with all applicable laws, regulations and permits.

2. Schedule. Contractor shall commence the Work after the execution of this Contract and shall achieve Substantial Completion of the Work in accordance with the agreed upon Schedule in Exhibit B. As used herein and in the General Conditions, the term "**Schedule**" shall refer to the dates set forth above, as well as any baseline critical path schedule, Gantt chart or other scheduling documentation prepared by Contractor (to describe Contractor's plan to complete the work by required dates) and approved by UTA. Time is of the essence with respect to the completion dates.

3. Price and Payment. As full compensation for completing the Work, UTA shall pay Contractor in accordance with the unit prices and labor rates detailed in Exhibit C, and subject to

the not-to-exceed caps set forth therein (the "**Contract Price**"). Payments shall be made in accordance with the following milestones:

Milestone 1 – Full Vehicle & Bogie Teardown and purchase order placement for complete bill of materials with all suppliers. 30% of the Estimated Contract Price.

Milestone 2 – Delivery and UTA approval of Repair Procedure: 10% of the Estimated Contract Price.

Milestone 3 – Vehicle structural repair completed, ready to start re-assembly: 30% of the Estimated Contract Price.

Milestone 4 – Completion of Final Assembly of LRV, including installation of completed power and center trucks: 25% of the Estimated Contract Price.

Milestone 5 – Vehicle and Bogie Delivery to UTA facility and final acceptance: 5% of the Estimated Contract price.

Payment terms shall be in accordance with the General Conditions.

4. **Contract Documents**. (a) The Contract Documents consist of the following:

(1) All written amendments and Change Orders to this Contract executed in accordance with the General Conditions attached as Exhibit A;

(2) The terms and conditions of this Contract, including the exhibits attached hereto; and

(3) Applicable provisions of UTA's Construction Safety and Security Program Manual attached as Exhibit D;

(b) The parties intend that the Contract Documents include and provide for all aspects of the Work that are necessary for the proper initiation, performance, and completion of the Work. The parties intend that the Contract Documents be interpreted in harmony so as to avoid conflict, with words and phrases interpreted in a manner consistent with construction and design industry standards.

(c) If any terms of the Contract Documents contradict any other terms, the terms contained in the more recent Contract Document will govern.

(d) Contractor acknowledges that, prior to the execution of this Contract, it has carefully reviewed the
Contract Documents for errors, omissions, conflicts or ambiguities (each, a "**Discrepancy**"), and is not aware of any Discrepancies as of the execution of this Contract. If the Contractor becomes aware of a Discrepancy, the Contractor shall immediately notify UTA's Engineer of that Discrepancy in writing. UTA's Engineer shall promptly resolve the Discrepancy in writing. Contractor's failure to promptly notify UTA of an apparent discrepancy will be deemed a waiver of Contractor's right to seek an adjustment of the Contract Price and Schedule due to the discrepancy.

(e) The Contract Documents form the entire contract between UTA and the Contractor and by incorporation in this Contract are as fully binding on the parties as if repeated in this Contract. No oral representations or other agreements have been made by the parties except as specifically stated in the Contract Documents.

5. Representatives of the Parties. UTA designates Ryan Gardner as its Engineer. Contractor designates Bruno Meza its Project Manager.

6. Notices. (a) To be deemed valid, all notices, requests, claims, demands and other communications between the parties ("**Notices**") must be in writing and addressed as follows:

If to the Utah Transit Authority:

Utah Transit Authority
Attn: Ryan Gardner
Counsel 2264 South 900 West
West 200 South Salt Lake City, UT 84119
Salt Lake City, UT 84101.

With a required copy to:

Utah Transit Authority
Attn: General
669

If to the Contractor

Bruno Meza
5301 Price Ave.
McClellan, CA 95652

(b) To be deemed valid, Notices must be given by one of the following methods: (i) by delivery in person (ii) by a nationally recognized next day courier service, (iii) by first class, registered or certified mail, postage prepaid.

(c) Either party may change the address at which that party desires to receive written notice by delivery of Notice of such change to the party as set forth above. Notices will be deemed effective on delivery to the notice address then applicable for the party to which the Notice is directed, provided, however, that refusal to accept delivery of a Notice or the inability to deliver a Notice because of an address change that was not properly communicated shall not defeat or delay the effectiveness of a Notice.

7. Audit Rights. Contractor shall retain all books, papers, documents, accounting records and other evidence to support any cost-based billings allowable under the Contract. Contractor shall also retain other books and records related to the performance, quality or management of this Contract and/or Contractor's compliance with this Contract. Records shall be retained by Contractor for a period of at least six (6) years, or until any audit initiated within that six-year period has been completed (whichever is later). During this six-year period, such cost records shall be made available at all reasonable times for audit and inspection by UTA and other authorized auditing parties including, but not limited to, the Federal Transit Administration. Copies of requested cost records shall be furnished to UTA or designated audit parties upon request.

Contractor agrees that it shall flow-down (as a matter of written contract) these records requirements to all subcontractors utilized in the performance of this Contract at any tier.

8. Governing Law. The Contract and all Contract Documents are governed by the laws of the State of Utah, without giving effect to its conflict of law principles. Actions to enforce the terms of this Contract may only be brought in the Third District Court for Salt Lake County, Utah.

9. Severability. If any provision or any part of a provision of the Contract Documents is finally determined to be superseded, invalid, illegal, or otherwise unenforceable pursuant to any applicable legal requirements, such determination shall not impair or otherwise affect the validity, legality, or enforceability of the remaining provision or parts of the provision of the Contract Documents, which shall remain in full force and effect as if the unenforceable provision or part were deleted.

10. No Waiver. The failure of either Contractor or UTA to insist, in any one or more instances, on the performance of any of the obligations required by the other under the Contract Documents shall not be construed as a waiver or relinquishment of such obligation or right with respect to future performance.

11. Assignment. Contractor acknowledges that the Work to be performed by Contractor is considered personal by UTA. Contractor shall not assign or transfer its interest in the Contract Documents without prior written approval by UTA.

12. Successors. Contractor and UTA intend that the provisions of the Contract Documents are binding upon the parties, their employees, agents, heirs, successors and permitted assigns.

13. Counterparts. The parties may execute this Contract in any number of counterparts, each of which when executed and delivered will constitute a duplicate original, but all counterparts together will constitute a single agreement.

14. Effectiveness; Date. This Contract will become effective when all parties have fully signed it. The date of this Contract will be the date it is signed by the last individual to sign it (as indicated by the date associated with that individual's signature).

Each individual is signing this Contract on the date stated opposite that individual's signature.

UTAH TRANSIT AUTHORITY:

By: _____ Date: _____
Jay Fox
Executive Director

By: _____ Date: _____
Patrick Preusser
Chief Operating Officer

Approved as to form and content

DocuSigned by:
Mike Bell
70E33...
Michael Bell
Assistant Attorney General
UTA Counsel

SIEMENS MOBILITY INC.:

Signed by:
By: Ash Evans Date: 4/10/2025
A7ED182F6E1B4C1...
Ash Evans
Accident Repair Segment Lead

DocuSigned by:
By: Charles Hollman Date: 4/10/2025
C21A5B8F93174B5...
Charlie Hollman
Segment Controller

Exhibit A

UTAH TRANSIT AUTHORITY

669 West 200 South
Salt Lake City, UT 84101

[Title]

LRV #1122
20-03236

September 13, 2024

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GC 1.00 Terms and Definitions

A. "**Change Order**" - A written document signed by UTA, issued to the Contractor which alters the scope of the Work to be performed by the Contractor, changes the Schedule of the Work, increases or decreases the Contractor's compensation, or makes any other change to the Contract.

B. "**Change Request**" - A document issued by the Contractor requesting that a Change Order be issued.

C. **"Conditional Acceptance"** - A written certificate issued by UTA, acknowledging that an LRV delivered by the Contractor has reached Substantial Completion and is accepted by UTA, subject to the completion of the open items identified in such notice. Such notice shall include owner supplied materials.

D. "**Contract**" - The written agreement covering the performance of the work and the furnishing of shipping, labor, materials, tools and equipment in the construction of the work.

E. "**Contractor**" - Any individual, partnership, corporation, or combination, thereof, entering into this Contract for the performance of the Work required by the Contract.

F. **"Engineer**" - UTA's authorized representative charged with the administration of this Contract.

G. "**Final Acceptance**" - With respect to any individual LRV, a written certificate issued by UTA acknowledging that the Contractor has completed all open items and fulfilled all of its obligations with respect to such LRV.

H. "**Final Completion**" - Final Completion of the Work will occur when each of the LRVs has reached Final Acceptance and when the Contractor has delivered written releases of liens from all subcontractors and suppliers.

I. "**LRV**" - Each UTA light rail vehicle to be repaired in accordance with the Contract.

J. "**Materials**" - All materials, equipment, systems, components, parts, and other items to be incorporated into the LRV by Contractor as part of the Work.

K. "**Product Data**" - Written or printed descriptions, illustrations, standard schedules, performance charts, instructions, brochures, diagrams, software or other information furnished by the Contractor to describe Materials to be used for some portion of the Work.

L. "**Scope of Work**" - The attachment to the Contract which defines the scope and requirements for the Work to be performed by Contractor

M. **"Substantial Completion"** - The completion of all Work in accordance with all the conditions specified in the Scope of Work as included in Annex B subject to punch-list items agreed between the parties.

UTA will acknowledge the Substantial Completion of each LRV by issuing a separate certificate of Conditional Acceptance.

N. "**UTA**" - Utah Transit Authority.

O. **"Work"** - Furnishing of all of the supervision, labor, Materials, equipment, software, services, and incidentals necessary to complete any individual repair item identified in the Scope of Work.

GC 2.00 Scope of Work

GC 2.01 General

A. The Contractor shall perform the Work described in the Scope of Work in strict accordance with the Contract. Except for items specified to be provided by UTA under the Contract, the Contractor shall provide and pay for all supervision, labor, Materials, tools, equipment, machinery and any other costs necessary to complete the Work.

GC 2.02 Relationship of Contract Documents

A. The Contract Documents referenced in the Contract are essential and a requirement occurring in one is as binding as though occurring in all.

B. The Contractor shall notify UTA immediately of any ambiguity or conflict, within or between documents, any error, omission, lack of necessary detailed description, or a detail which is a potential code violation which is discovered in the Contract Documents and request clarification and direction. UTA will provide clarification and direction as required to fulfill the intent of the Contract Documents.

C. Proceeding without the required notification and request for clarification or instruction shall be at the Contractor's risk and any work performed may be determined to be non-conforming.

GC 2.03 Changes to Scope of Work

GC 2.03.01. Contractor Responsibility

A. UTA acknowledges that during the course of performance there may be deviations between the Work actually required and the Work specified in the Scope of Work.

B. After inspection and/or testing and before any additional or differing Work is performed, the Contractor shall provide immediate written notice to UTA of any latent, unknown conditions that were not reasonably identifiable during prior damage inspections performed with respect to the LRVs.

C. UTA shall investigate the latent, unknown conditions promptly after receiving the notice. If the conditions cause an actual and demonstrable increase or decrease in the Contractor's cost of, or the time required for performing any part of the work under this Contract, an equitable adjustment shall be made under this Section and the Contract modified in writing accordingly.

D. No request by the Contractor for an equitable adjustment to the Contract for latent, unknown conditions shall be allowed if made after final payment under this Contract.

GC 2.03.02. Change Orders

A. UTA may order additions, deletions, or revisions to the Work. Prior to ordering an addition, deletion, or revision, UTA may request that the Contractor submit a proposal for the change. The Contractor shall submit a proposal for the change within 30 calendar days after receipt of UTA's request or such shorter reasonable time as UTA may set forth in its request. The Contractor's proposal for the change must provide UTA with an itemized breakdown of any effects to the Contract Price including, without limitation effects to the following aspects of the Contract Price:

1. Engineering costs;
2. Labor costs;
3. Equipment costs;
4. Overhead and profit; and
5. Materials quantities and unit prices.

B. The Contractor's proposal for the change must also identify any changes to the Schedule that result from the proposed modification. If UTA orders the Contractor to proceed with the modification, UTA will issue a Change Order modifying the Contract Price, the Schedule, and/or other aspects of the Contract Documents. UTA may order the Contractor to proceed in advance of the execution of a Change Order. In such event, the Contractor shall proceed with the changed Work upon receipt of written notice from UTA to do so. UTA and the Contractor will thereafter negotiate a settlement of the time and cost related impacts of the changed Work.

C. The Contractor shall promptly notify UTA, by a written Change Request, when the Contractor receives any direction, instruction, comment, interpretation, or determination

from any source which the Contractor believes to constitute a change to the Contract. Such a Change Request must state the following information:

1. The date, circumstances, and source of the direction, instruction, comment, interpretation, or determination; and

2. That Contractor regards the direction, instruction, comment, interpretation, or determination as a change to the Contract.

D. Such notice must be given to UTA before the Contractor acts on said direction, instruction, comment, interpretation, or determination, and within 10 calendar days after the Contractor becomes aware of the asserted change. The Contractor may request additional time, additional compensation, or both, through a Change Request issued under this Section. For any Change Request which UTA agrees to have merit, UTA will make an equitable adjustment and modify the Contract Documents by written Change Order. The execution of a Change Order by both parties will be deemed as an accord and satisfaction of all potential Claims of any nature arising from or relating to the asserted change.

E. Any Change Orders issued on a cost reimbursement basis must, at a minimum, comply with the federal cost principles set forth in 48 CFR Part 31. In addition to the general rights to audit and inspect records as set forth in the Contract Documents, UTA will have the specific right to audit all expenditures, payrolls, audited overhead, and other records related to a Change Order issued on a cost reimbursement basis. The Contractor shall use its best efforts to facilitate any such audit of cost records.

F. Nothing in this provision shall be deemed to require a Change Order when the Contractor performs additional Work as the result of its own estimating, contracting, or engineering error.

G. In no event shall the Contractor be entitled to compensation for loss of anticipated profits resulting from deletions to the Work.

GC 2.04 Warranty of Work

A. The warranties set forth in the Contract are in lieu of any warranties set forth in statute or implied by law, including any implied warranties of merchantability or fitness for a particular purpose"

B. The Contractor provides the following warranties:

1. All Work will conform to the Scope of Work and other requirements of the Contract Documents;

2. Incorporated Materials will fulfill their design function;

3. All Work will be free of all patent and latent defects;

C. Unless a longer warranty period is identified elsewhere in the Contract, the Contractor will warranty all labor performed and Materials furnished to be free of defects and faults for a period of two years from the date of Conditional Acceptance on a per LRV basis (except that, with respect to components, systems, major assemblies, subassemblies, products, parts, apparatuses, articles and other Materials with identified open items at Conditional Acceptance, the warranty period on such items will not commence until Final Acceptance).

D. The Contractor's warranties and guarantees will apply regardless of any lesser period of warranty provided by the manufacturer of Materials.

E. If UTA detects a defect with respect to any Work or Materials supplied pursuant to this Contract within the applicable warranty period, UTA will notify the Contractor within a reasonable time after detection. Within seven calendar days of notification, the Contractor's Project Manager and the Engineer will meet to determine the most appropriate course for the corrective Work and the exact scope of the corrective Work to be performed under the warranty. The Contractor shall redesign, repair, or replace the defect or malfunction to meet the Contract requirements as soon as reasonably possible. The Contractor shall also perform such tests as UTA may require verifying that such redesign, repair, or replacement complies with the requirements of the Contract Documents. In addition to other warranties that may be in effect, the Contractor warrants the redesigned, repaired, or replaced work for a period of one year after the acceptance of the completed corrective work by UTA or for the remainder of the original warranty period, whichever is greater. All costs incidental to such corrective Work will be borne by the Contractor.

F. To the extent practicable, UTA will allow the Contractor or its designated representative to perform the repair work. All repair work must be performed at a LRV maintenance facility approved by UTA. At its discretion, UTA may perform warranty work if UTA determines the need to do so based on transit needs or other requirements. Any work so performed by UTA must be reimbursed by the Contractor, including the cost of any force account labor supplied by UTA. If UTA performs the warranty-covered repairs, it may correct or repair the defect and any related defects utilizing parts supplied by the Contractor. At its discretion, UTA may also use parts available from UTA's stock-on-hand if deemed in UTA's best interest. Reports of all repairs performed by UTA and covered by the warranty must be submitted to the Contractor for reimbursement and replacement of parts on a periodic basis determined by UTA.

G. The Contractor shall obtain all subcontractor and supplier warranties in the name of UTA and shall deliver the same to UTA; provided, however, that the delivery of such subcontractor and supplier warranties will in no respect relieve the Contractor of its

obligations under the preceding warranty provisions. Unless expressly waived in writing by UTA, no subcontractor and supplier warranty will expire prior to the date of expiration of the warranty provided by the Contractor for such item under the Contract Documents. Nor will any subcontractor or supplier warranty contain terms substantially different than as required under this Section. UTA, by accepting the subcontractor and supplier warranties provided by the Contractor, in no respect waives any rights against the Contractor and, should there be a failure of the applicable subcontractor or supplier to honor the guarantee or warranty, UTA may, at its discretion, enforce any such rights against the Contractor. UTA will not be required to perform unusual or extraordinary maintenance or overhauls to keep the warranties in effect. UTA will not be required to purchase spare parts or other replacement Materials from a sole source if such Materials are otherwise available from equal or superior sources.

H. Nothing in the preceding provisions intends or implies that the Contractor shall be required to warranty items that do not perform satisfactorily because of misuse, abuse, repairs not conducted in accordance with Contractor's clear written recommendations, Contractor's published manuals or because repairs were not performed by personnel adequately trained in accordance with recognized industry standards, or lack of routine maintenance by UTA or from vandalism or accidents.

GC 3.00 Control of the Work

GC 3.01 UTA Inspectors

A. UTA may designate in writing and utilize one or more inspectors who shall be representatives of the Engineer and who shall have access to the Work at all times wherever it is in preparation or progress.

B. Inspectors are utilized solely for UTA's benefit and are not intended as a source of advice for the Contractor's employees or subcontractors.

C. The inspector has UTA authority to reject defective Work or Work not in conformance with Contract requirements.

D. UTA will, when practical, conduct all inspections jointly with the Contractor in a manner that does not unreasonably disrupt the progress of the Work.

GC 3.02 UTA Inspection, Sampling and Testing

A. UTA may inspect and test all or any part of the Work at any time over and above any testing by the Contractor. Inspection and testing by UTA does not relieve the Contractor of responsibility for the quality and conformance of the Work with Contract requirements.

B. The Contractor shall give UTA sufficient notice of the location and availability of

elements of the Work to allow for inspection, sampling and testing prior to incorporation of Materials or covering of the Work.

C. UTA may at any time prior to Final Acceptance require the Contractor to uncover portions of the Work for inspection and testing. The Contractor shall restore these portions of Work to the standard required by the Contract. If the Work uncovered does not comply with the Contract, was done without required documentation, or if UTA was given insufficient notice to allow adequate time for inspection, sampling or testing, the uncovering and restoration shall be done at the Contractor's expense. If the Work uncovered meets Contract requirements and was done with sufficient notice to UTA, the costs of uncovering and restoration shall be paid by UTA.

GC 3.03 Project Manager

A. The Contractor shall have competent foremen present on the Work at all times during its progress.

B. The Contractor shall appoint one competent Project Manager who shall have full authority to act on behalf of the Contractor and any or all subcontractors in all matters within the scope of the Contract including execution of Change Orders. The Project Manager or a designated assistant, competent to direct the Work and authorized to act on behalf of the Contractor, shall be present on the job site at all times when work is being performed by the Contractor or a subcontractor of any tier. The Contractor shall furnish UTA with a written confirmation of the Project Manager's authority to act for the Contractor.

C. If the Contractor wishes to replace its Project Manager at any time during the performance of this Contract, it shall first submit the resume of its new candidate to UTA for UTA's approval and shall not make the substitution without UTA's approval, which shall not be unreasonably withheld.

GC 3.04 Contractor Submitted Drawings, Product Data, Samples and Submittals

A. The Contractor shall prepare and deliver to UTA such working drawings, shop drawings, Product Data, samples, or submittals as necessary for performance of the Work or as required by the Contract. All such drawings, documents and samples shall be submitted to UTA in a timely manner and in a sequence that facilitates review and causes no delay in the Work. All submittal documents shall be created in English or be provided with a complete translation.

B. Prior to submitting drawings, Product Data, samples, and other documents, the Contractor shall ensure all information upon which a submittal is based complies with all Contract requirements. The Contractor shall also check, coordinate and verify the compatibility of the various required submittals prior to transmitting them to UTA.

C. Drawings, Product Data, samples, and similar submittals shall not modify any Contract requirement, except as expressly allowed by this Contract. The purpose of their submittal is to demonstrate details that are not fully developed by the Contract Documents or the manner in which Contractor proposes to comply with the Contract.

D. The Contractor shall not be relieved of responsibility for any deviation or non-compliance from the requirements of this Contract by UTA's review or approval of shop drawings, Product Data, samples, or submittals. The Contractor shall not be relieved of responsibility for errors or omissions in shop drawings, Product Data, samples, or submittals by UTA's review of the submittal. The Contractor shall not deviate from a reviewed shop drawing, Product Data, samples, or submittals without submitting the proposed deviation for UTA's review.

E. Submittals offered to demonstrate methods, procedures, sequence or durations for performing the Work or to detail temporary elements shall be checked by UTA for compliance with applicable requirements of the Contract. Such checking will not include a detailed analysis of the design or an evaluation of the adequacy of the method, procedure, resource commitments or time allocated for performance.

F. Submittals which demonstrate that Materials to be used or incorporated in the Work comply with Contract requirements or which establish a level of quality and performance will be reviewed for approval by UTA.

GC 3.05 Contract Records

A. The Contractor shall keep and maintain comprehensive records and documentation relating to the Work under this Contract, all of which shall be subject to audit in accordance with the Contract. The records shall include, but are not limited to Contract documents, subcontracts, purchase orders, employment records, plans, specifications, addenda, shop drawings, Change Orders, quality control documents, submittals and as-built drawings and records.

GC 3.06 Claims

A. It is an express condition of the Contractor's right to make a claim or to receive any recovery or relief under or in connection with the Contract, that the Contractor submit a written Notice of Intent to Claim to UTA in accordance with the provisions of this Section. Failure to comply with the provisions hereof shall constitute a waiver by the Contractor of any right, equitable or otherwise, to bring any such claim against UTA.

B. The written Notice of Intent to Claim shall set forth:

1. The reasons for which the Contractor believes additional compensation will or may be due;

2. The nature of the costs involved;

3. The Contractor's plan for mitigating such costs; and

4. The amount of the potential claim, or estimate thereof.

C. The Notice provided above shall be given within 14 calendar days after the happening of the event or occurrence giving rise to the potential claim. If the event or occurrence is claimed to be an act or omission of UTA, notice shall be given prior to commencing the portion of the Work to which such alleged act or omission relates.

D. The notice requirements of this Section are in addition to any other notice requirements set forth in the Contract.

E. Within 30 calendar days of the event or occurrence giving rise to the claim, Contractor shall provide any additional detail required for UTA to reasonable ascertain the basis and estimated magnitude of said claim. It will be the responsibility of the Contractor to furnish, when requested by UTA, such further information and details as may be required to determine the facts or contentions involved in said claim.

F. The Contractor's failure to submit any claim in writing within the relevant time and in the manner prescribed above shall waive any relief that might otherwise be due with respect to such claim. Depending upon the grounds for relief and the nature of relief sought, additional submittals and conditions upon submitting claims may be required elsewhere in the Contract.

G. Each claim the Contractor may submit for an adjustment on account of delay for any cause shall be accompanied by a revised Schedule reflecting the effects of the delay and Proposals to minimize these effects. If no Schedule has been submitted to UTA reflecting conditions prior to the delay for which relief is sought, then a Schedule so reflecting these conditions shall be prepared and submitted with the claim.

H. UTA shall be entitled to a reasonable time, in no case more than 90 calendar days, after it receives each claim in writing and accompanied by supporting documents and evidence, in which to investigate, review and evaluate such claim. When UTA has completed its investigation, review, and evaluation, it will advise the Contractor of the relief, if any, to which it has found the Contractor to be entitled.

I. In no event shall claims be made after Final Payment is made.

J. A claim will cease to be a claim if, at any time, a change order or Contract amendment resolving the issue is signed by all parties.

GC 4.00 Materials

GC 4.01 General

A. The Contractor has submitted to UTA, a bill of Materials identifying all Materials to be furnished by Contractor in conjunction with the Work (see Exhibit B). Unless a substitution is specifically approved by UTA, all Materials shall comply with the approved bill of Materials.

GC 4.02 UTA-Furnished Materials

A. Materials listed in the Contract as UTA-furnished will be available to the Contractor free of charge at the times and locations indicated in Contract.

B. With respect to UTA furnished Materials, the Contractor shall:

1. Install and make the Material fully operational, in accordance with the Contract and manufacturer's requirements, including furnishing all incidental parts and Materials, and scheduling inspections and tests.

2. Notify UTA immediately upon discovery of any deficiency or defect in Materials furnished.

C. All Materials furnished by UTA will remain the property of UTA. All Material will be required to be tracked through the Engineer or designated representative.

GC 4.03 Handling and Storage of Materials

A. Materials shall be securely stored, so as to preserve their quality and fitness for the Work. Stored Materials, even though determined acceptable before storage, may again be inspected prior to their use in the Work.

B. Stored Materials shall be arranged so as to facilitate their prompt inspection.

C. Approved portions of the right of way or other UTA property may be available for use by the Contractor at the Contractor's own risk. Any additional space required therefore must be provided by the Contractor at the Contractor's expense.

D. Private property shall not be used for storage purposes without written permission of the owner or lessee. Any use of private property by the Contractor shall comply with all applicable zoning, land use restrictions, and other regulatory requirements. Copies of such written permission shall be furnished to UTA upon request.

E. All Materials shall be handled and transported in such a manner as to preserve their quality and fitness for the Work.

GC 5.00 Legal Relations and Responsibility to Public

GC 5.01 Compliance with Laws and Regulations

A. The Work performed and LRVs returned by the Contractor must conform and comply with all applicable federal, state, and local laws and regulations. The Contractor acknowledges that it has familiarized itself with all applicable legal requirements and the Contractor agrees to perform the Work in full compliance with such requirements.

B. The Contractor shall comply with all applicable laws and regulations in effect as of the date of Contractor's price proposal without any increase in the Contract Price or adjustment to the Schedule on account of such compliance.

C. To the extent any change to applicable laws and regulations after the date of Contractor's price proposal requires an increase in the Contract Price or adjustment to the schedule, UTA shall issue a Change Order to account for such change. The Contractor shall substantiate any claim under this provision by submitting to UTA sufficient documentation demonstrating that the change to applicable laws or regulations caused the increase in time or cost of performance. If the Contractor seeks reimbursement under this clause, they must submit a proposal showing how each line-item cost increased due to a change in law. The Contractor must also provide proof that the increase relates only to that legal change and does not include any markup or profit.

D. The Contractor shall adhere to all applicable federal, state, and local laws and regulations. The Contractor shall be liable for and shall pay all fines, assessments, and other costs resulting from the Contractor's violation of any applicable federal, state, or local laws or regulations.

E. The Contractor shall not be entitled to any additional compensation or extension of time as a result of the Contractor's violation of applicable legal requirements. If a delay results from such a violation, the Contractor shall be responsible for all costs including, but not limited to, overtime premium associated with regaining the time lost as a result of such delay, and any damages, including liquidated damages, which may result from the Contractor's failure to comply with the Schedule as a result of such delay.

GC 5.02 Taxes

A. Unless otherwise provided in the Contract, the Contractor shall pay all sales, use, and other similar taxes that are enacted as of the effective date of the Contract.

GC 5.03 Liens Prohibited

A. The Contractor shall not permit any lien or claim to be filed or prosecuted against UTA, its property or its right-of-way on account of any labor or Materials furnished or any other reason for Work arising out of this Contract. If any lien shall be filed, the

Contractor shall satisfy and discharge or cause such lien to be satisfied and discharged immediately.

B. Payment of Claims by UTA. If the Contractor fails, neglects, or refuses to make prompt payment of any claim for labor or services furnished to the Contractor or a subcontractor by any person in connection with this Contract as the claim becomes due, UTA may pay the claim to the person furnishing the labor or services and charge the amount of the payment against funds due or to become due to the Contractor pursuant to this Contract. UTA's payment of a claim under this paragraph shall not relieve the Contractor from responsibility for such claims.

GC 5.04 Indemnification

A. The Contractor shall protect, defend, release, indemnify and hold UTA and its officers, employees and agents, including consultants, (collectively "Indemnitees") harmless from and against any and all liabilities, damages, claims, demands, liens, encumbrances, judgments, awards, losses, costs, expenses and suits or actions or proceedings asserted against UTA by third parties, including reasonable expenses, costs and attorneys' fees incurred by the Indemnitees, in the defense, settlement or satisfaction thereof, for any injury, death, loss or damage to persons or property of any kind whatsoever, arising out of or resulting from the intentional misconduct or negligent acts, errors or omissions of the Contractor in the performance of the Contract, including intentional misconduct, negligent acts, errors or omissions of its officers, employees, servants, agents, subcontractors and suppliers.

GC 5.05 Insurance

A. The Contractor is an independent Contractor and is responsible to provide and pay the cost of all its employees' benefits. For the duration of this Agreement, the Contractor shall maintain at its own expense, and provide proof of said insurance to UTA, the following types of insurance:

1. Occurrence type Commercial General Liability Insurance ISO CG001, with an edition date of 11-88 or later, covering the indemnity and other liability provisions of this Agreement, with no exclusions of explosion, collapse, underground hazards, or contractual liability for railroads. The limits shall be $2,000,000 per occurrence with an annual aggregate of $5,000,000. This coverage shall be amended to show Utah Transit Authority as an Additional Insured by the use of ISO form CG 2033 with an edition date of 07-04.

2. Professional Liability insurance with the following limits and coverage:

    a. Minimum Limits:

        $2,000,000 each claim

$5,000,000 annual aggregate

b. Coverage:

i. Insured's interest in joint ventures

ii. Punitive damages coverage (where not prohibited by law)

iii. Limited Contractual liability

iv. Retroactive date prior to date

v. Extended reporting period of 36 months

vi. Coverage which meets or exceeds the minimum requirements will be maintained, purchased annually in full force and effect until 3 years past completion of the Scope of Services unless such coverage becomes unavailable to the market on a commercially reasonable basis, in which case the Contractor will notify UTA. If UTA agrees, such coverage is not commercially reasonably available, the Contractor may elect not to provide such coverage.

3. Automobile insurance covering owned, non-owned, and hired automobile with limits not less than $1,000,000 combined single limit of coverage.

4. Workers' Compensation insurance conforming to the appropriate states' statutory requirements covering all employees of the Contractor, and any employees of its subcontractors, representatives, or agents as long as they are engaged in the work covered by this Agreement or such subcontractors, representatives, or agents shall provide evidence of their own Worker's Compensation insurance. The policy shall also cover Employers Liability with limits no less than $500,000 each accident, and each employee for disease.

B. The Contractor warrants that this Contract has been thoroughly reviewed by its insurance agent, broker or consultant, and that said agent/broker/ consultant has been instructed to procure for the Contractor the insurance coverage and endorsements required herein.

C. UTA, as a self-insured governmental entity, shall not be required to provide additional commercial insurance coverage for the risk of loss to UTA property and improvements or equipment owned by UTA.

GC 5.06 Intellectual Property

A. UTA, including its successors in interest, shall have the right, within the scope of the Contract, or for the purposes of operating and maintaining LRVs, to use, duplicate and

disclose all technical data, including computer software and documentation, developed under this Contract, and the information conveyed therein in whole or in part, in any manner and for any purpose whatsoever, and to have or permit others to do so. This does not include trade secret of proprietary information developed at private expense outside this contract or a former UTA contract.

B. The Contractor warrants that the Materials used on or incorporated in the Work shall be delivered free of any rightful claim of any third party for infringement of any patent or copyright. If notified promptly in writing and given authority, information, and assistance, the Contractor shall defend, or may settle, at its expense, any suit or proceeding against UTA, its staff, consultants and their staffs, so far as it is based on a claimed patent or copyright infringement which would result in a breach of this warranty and the Contractor shall pay all costs, damages, and attorneys' fees awarded therein against UTA, its staff, consultants, and their staffs due to such breach. The Contractor shall promptly report to UTA in writing in reasonable detail, each notice or claim of patent or copyright infringement, arising out of the performance this Contract, of which the Contractor has knowledge. In the event of any claim or suit against UTA on account of any alleged patent or copyright infringement arising out of the performance of this Contract, the Contractor shall furnish to UTA all evidence and information in the possession of the Contractor pertaining to such suit or claim. Such evidence and information shall be furnished at the expense of the Contractor.

C. The Contractor shall bear all costs arising from the use of patented or proprietary Materials or processes used on or incorporated in the Work. If the use of such Materials or processes is held to constitute an infringement and is enjoined, the Contractor shall, at its own expense:

1. Secure for UTA the right to continue using said Materials or processes by lifting the injunction or by procuring a license or licenses; or

2. Replace the infringing Materials or processes with non-infringing Materials or processes; or

3. Modify the Materials or processes so that they become non-infringing or remove the enjoined Materials or processes and refund the sum paid by UTA therefor without prejudice to any other rights of UTA.

D. The preceding paragraphs of this Section shall not apply to any Materials or processes specified by UTA or its consultants; and as to such Materials and processes the Contractor assumes no liability whatsoever for patent or copyright infringement.

GC 5.07 Ownership of Materials

A. As security for partial, progress, or other payments, title to Work for which such

payments are made shall pass to UTA at the time of the payment. To the extent that title has not previously been vested in UTA by reason of payments, full title shall pass to UTA at delivery of the Work at the location specified in the Contract.

B. Unincorporated work to which UTA has received title by reason of progress, partial or other payments shall be segregated from other Contractor or subcontractor materials and clearly identified as UTA property.

C. The title transferred as above shall in each case be good, and free and clear of any and all security interests, liens, or other encumbrances. The Contractor promises and agrees that it will not pledge, hypothecate, or otherwise encumber the items in any way that would result in any lien, security interest, charge, or claim upon or against said items.

D. The transfer of title as provided above shall not imply acceptance by UTA, nor relieve the Contractor from the responsibility to strictly comply with the Contract, and shall not relieve the Contractor of responsibility for any loss of or damage to such items while they are in the possession of the Contractor.

E. The Contractor shall insert provisions in its subcontracts sufficient to ensure compliance with the content of this Section.

GC 5.08 Conflict of Interest

A. An organizational conflict of interest means that because of other activities, relationships, or Contracts, a contractor is unable, or potentially unable, to render impartial assistance or advice to UTA; a contractor's objectivity in performing the work identified in the Contract is or might be otherwise impaired; or a contractor has an unfair competitive advantage. If the Contractor ascertains that it has, or may have, a real or perceived organizational conflict of interest, it must disclose such real or perceived organizational conflict of interest exists and the appropriate measures that will be taken in response to such determination, including a plan to mitigate the real or perceived organizational conflict of interest.

B. The Contractor shall not use any consultant who concurrently is employed by UTA or by UTA's consultants, including, but not limited to, surveyors, engineers, architects, and testing laboratories without first obtaining UTA's approval in writing.

GC 5.09 Safety and Protection

A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Contractor shall take necessary precautions for the safety of, and shall provide necessary protection to prevent damage, injury or loss to the following: (i) all Contractor, Subcontractor, UTA employees, the public and other persons who may be affected thereby; (ii) all Work and all Materials to be incorporated into the Work; and (iii) any property of UTA affected

by the Work. In conjunction with any Work to be performed on UTA property, Contractor shall comply with the minimum standards imposed by UTA's Construction Safety and Security Program Manual, as updated from time to time (UTA's Construction Safety and Security Program Manual is incorporated into the Contract Documents by reference). However, Contractor shall be responsible for all additional as necessary to comply protect persons and property and comply with applicable legal requirements related to safety.

B. All Contractor employees working on UTA property will be required to undertake a training needs assessment and complete the necessary training. Where UTA is the provider of the training, instructors, classrooms and training documentation will be provided at no cost to the Contractor. All training that is provided by an external vendor shall be arranged and provided by the Contractor and at the Contractor's cost.

C. UTA's Safety Coordinator may perform random checks to ensure that all Contractor employees on UTA property have training certification applicable to the work they are performing.

D. Training may include, but is not limited to, the following:

Training	Computer Based Training	Classroom training	Provider
Roadway Worker Protection	X	X	UTA
Blue Flag Signal Protection		X	UTA
Lock out / Tag out	X		UTA
Forklift Certification		X	Vendor
Crane Certification		X	Vendor
Welding Certification		X	Vendor
Respirator Training	X	X	UTA
Duramix Product Cert Adhesives		X	Vendor
Paint Certification		X	Vendor
Positive Respiratory System		X	UTA

Table 1 Worker Training

GC 5.10 Time of Completion

A. The Contractor shall proceed with performance of the Work under this Contract upon the effective date of each Notice to Proceed, and shall continuously and diligently prosecute the Work and specified portions thereof to completion on or before the time or times set forth in this Contract.

GC 5.11 Delays and Extension of Time

A. The Contractor shall be granted an extension of time for any delay on the critical path to completion of the Work, based on the Schedule, arising from acts of God, acts of the public enemy, acts of the government in either its sovereign or contractual capacity, fires, floods, earthquake, epidemics, quarantine restrictions, strikes, freight embargoes, unusually or severe weather, provided that:

1. The aforesaid causes were not foreseeable and did not result from the fault or negligence of the Contractor

2. That the Contractor has taken reasonable precautions to prevent further delays owing to such causes

B. If the Contractor is delayed in the progress of the Work by an act, omission, or neglect of UTA, its agents or representatives, or an act or omission of another Contractor in the performance of a Contract with UTA, the Contractor shall, within 3 calendar days after the commencement of such delay, file with UTA a written notice of delay together with a request for an extension of the Contract period for the portion of the Work so delayed. The notice shall set forth in detail the reasons for the delay, and the period for which an extension is requested.

GC 5.12 Suspension of Work

A. UTA may order the Contractor, in writing, to suspend, delay, or interrupt all or any part of the Work of this Contract for the period of time that UTA determines appropriate for its own convenience.

B. If the performance of all or part of the Work is, suspended, delayed, or interrupted for an unreasonable period of time:

1. By an act of UTA in the administration of this Contract, if not attributable to actions, inactions or defaults of the Contractor; or

2. By UTA's failure to act within the time specified in this Contract (or within a reasonable time if not specified),

Then (in either case) an adjustment will be made for any increase in the cost of performance of this Contract (including profit and home office overhead) necessarily

caused by the unreasonable suspension, delay, or interruption, and the Contract modified by issuance of a Change Order. However, no adjustment shall be made under this Section for any suspension, delay, or interruption to the extent that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the Contractor, or for which an equitable adjustment is provided for or excluded under any other term or condition of this Contract.

GC 5.13 Subcontractors and Suppliers

A. No subcontract shall relieve the Contractor of any of the Contractor's obligations or liabilities under the Contract. The Contractor shall be fully responsible and liable for the acts or omissions of all subcontractors and suppliers including persons directly or indirectly employed by them, their guests and invitees. The Contractor shall have sole responsibility for managing and coordinating the operations of its subcontractors and suppliers, including the settlement of disputes with or between them.

B. Nothing contained in this Contract shall be deemed to create a contractual relationship between any subcontractor or supplier and UTA.

GC 5.14 Subcontract Provisions

A. The Contractor shall include in each subcontract and require each subcontractor to include in any lower tier subcontract, all of the provisions necessary to make this Contract fully effective. The Contractor shall provide all necessary plans, specifications, and instructions to its suppliers and subcontractors to enable them to properly perform their work.

GC 5.15 Dispute Resolution

A. UTA and the Contractor agree to use their best efforts to resolve disputes arising out of or related to the Contract using good faith negotiations and the principles of project partnering by engaging in the following dispute escalation process should any such disputes arise:

1. Level One - The UTA Engineer and the Contractor's Project Manager, who will meet to discuss and attempt to resolve the dispute in a timely manner. If they cannot do so, they will pass the dispute to Level Two.

2. Level Two- The Director of Fleet Engineering, for UTA and the Director of Projects for the Contractor will meet to discuss and attempt to resolve the dispute in a timely manner. If they cannot do so, they will pass the dispute to Level Three.

3. Level Three – Chief Operating Officer for UTA and the General Manager - Rolling Stock Division for the Contractor will meet to discuss and attempt to

resolve the dispute in a timely manner. If they cannot do so, they will pass the dispute to Level Four.

4. Level Four - The Executive Director for UTA and the President for the Contractor will meet to discuss and attempt to resolve the dispute, in a timely manner.

B. Any dispute arising out of the Contract that cannot be resolved to the mutual satisfaction of the parties as set forth above may proceed to litigation in the forum established by the Contract. "Any court review shall be conducted de novo."

GC 5.16 Termination in the Public Interest

A. UTA may terminate performance of work under this Contract, in whole or in part, at any time and without cause. UTA shall terminate this Contract for convenience upon delivery to the Contractor a Notice of Termination specifying the extent of termination and the effective date thereof.

B. After receipt of a Notice of Termination, and except as directed by UTA, the Contractor shall: (i) stop work as specified in the notice; (ii) place no further subcontracts or orders (referred to as subcontracts in this clause) for Materials, services, or facilities, except as necessary to finally complete the continued portion of the Contract; (iii) terminate all subcontracts or orders to the extent they relate to the Work terminated; (iv) transfer possession and to all completed Work and Work in process, completed work, supplies, and other Materials produced or acquired for the work terminated as of the date of termination; (v) continue the performance of the Work not terminated; and (vi) use its best efforts to mitigate the potential damages arising from the termination.

C. UTA shall pay Contractor its costs, including contract close-out costs, and profit on work performed up to the effective date of the termination notice, plus costs reasonably and necessarily incurred by Contractor to effect such termination. UTA shall not be responsible for anticipated profits based on Work not performed as of the effective date of termination. Contractor shall promptly submit a termination claim to UTA.

GC 5.17 Termination for Default

A. UTA may terminate this Contract for default by the Contractor if:

1. Except as provided below, the Contractor is in material breach of any material provision of the Contract and has not remedied the breach within 10 calendar days after receiving written notice from UTA (provided; however, that with respect to a material breach that is not subject to cure within ten calendar days, the Contractor shall not be deemed in default if it commences appropriate curative actions within the ten-day period and thereafter diligently prosecutes such actions to completion);

2. The Contractor abandons the Contract;

3. The Contractor makes a general assignment of this Contract for the benefit of creditors;

4. The Contractor repeatedly fails to make prompt payment to subcontractors or for Material or labor;

5. The Contractor disregards laws, regulations, ordinances, the orders of a legal authority, or the instructions of UTA;

B. In addition to its right to terminate the Contract for the reasons set forth in Paragraph A of this Section, if the Contractor refuses or fails to prosecute the Work or any separable part, with reasonable diligence, UTA may, by written notice to the Contractor, terminate the right to proceed with the Work (or the separable part of the Work) that has been delayed. In this event, UTA may take over the Work and complete it by Contract or otherwise, for which UTA has already paid through milestone payments. The Contractor and its sureties shall be liable for any damage to UTA resulting from the Contractor's refusal or failure to complete the Work in accordance with the contract completion date. This liability includes any increased costs incurred by UTA in completing the Work.

C. If, after termination of the Contractor's right to proceed, it is determined that the Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if the termination had been issued in the Public Interest.

D. The rights and remedies of UTA in this Section are in addition to any other rights and remedies provided by law or under this Contract. HOWEVER, NOTWITHSTANDING THE FORGOING CONTRACTOR SHALL NOT BE LIABILE TO UTA FOR ANY INDIRECT, INCIDENTAL AND CONSEQUENTIAL DAMAGES INCURRED BY INCLUDING BUT NOT LIMITED TO, LOST PROFITS OR REVENUE AND BUSINESS INTERRUPTION. ", AND THE TOTAL AGGREGATE LIABILITY OF CONTRACTOR TO UTA SHALL NOT EXCEED THE CONTRACT PRICE.

E. THE FORGOING LIMITATION SHALL NOT BE CONSTRUED SO AS TO LIMIT CONTRACTOR’S OBLIGATION TO INDEMNIFY UTA WITH RESPECT TO THIRD PARTY CLAIMS OR FOR CONTRACTOR’S GROSS NEGLIGENCE OR WILLFUL DISREGARD.

GC 6.00 Payment

GC 6.01 Payment Procedures

A. UTA shall pay to the Contractor, at the times and in the manner hereinafter provided, the amount set forth in the Schedule for the Work satisfactorily performed, contingent upon the Contractor's satisfactory compliance with the terms and conditions of the Contract. The Contractor agrees to accept that amount as full and final payment for all labor, Materials, supplies, equipment, overhead, profit, taxes, duties, and charges of whatever nature incurred by the Contractor in performing its obligations under the Contract.

B. UTA will not accept more than one invoice in any 30 calendar day period, unless prior approval is granted by UTA.

C. Invoices shall be submitted in triplicate and shall include a cover summary sheet provided to UTA. The form and content of invoices are subject to review and approval by UTA. All of the Contractor's invoices shall be sent directly to the attention of the Engineer and shall contain a reference to the Contract Number.

D. UTA shall have the right to disapprove specific elements of each invoice, to address non-conforming or incomplete Work or invoicing deficiencies. Approval by UTA shall not be unreasonably withheld. UTA shall also have the right to offset any amounts payable to UTA under the Contract against Contractor invoices.

E. The Contractor warrants that:

    1. Title to all Materials furnished by the Contractor or incorporated into the Work by the Contractor and covered by the progress payment shall pass to UTA at the time the Contractor receives the progress payment;

    2. All Materials are free and clear of all liens, claims, security interests, or encumbrances; and

    3. No Materials have been acquired by the Contractor, or by any other person performing Work at the site or furnishing Materials for the Work under this Contract, that are subject to an agreement under which an interest in, or encumbrance on, the materials or equipment is retained by the seller or otherwise imposed. Notwithstanding the provisions of this Paragraph, the risk of loss of all Materials incorporated in the Work shall remain with the Contractor until delivery of the Work at the location specified in the Contract and acceptance by UTA.

    4. All invoices shall be accompanied by certificate that all Materials, workmanship, etc. are in accordance with Contract documents.

F. No approval for payment, nor any payment, nor any partial or entire use or occupancy of any portion of the Work by UTA, shall constitute an acceptance of any Work that is not in accordance with the Contract.

G. UTA will pay all undisputed amounts of each invoice within 30 calendar days after receipt and successful verification of completion of the invoiced work by UTA's Engineer.

GC 6.02 Final Completion and Final Payment

Whenever the Contractor deems its obligations under the Contract have been fulfilled, the Contractor shall notify UTA in writing. Upon receipt of the Contractor's notice, UTA shall inspect the Work and within 15 calendar days after receiving the Contractor's notice either finally accept the Work or notify the Contractor in writing of Work yet to be performed on the Contract. Upon receipt of UTA's written final acceptance of the Work, the Contractor shall invoice UTA for any amounts due under the Contract. UTA shall pay the Contractor within 30 calendar days after receipt of the approved final invoice

Exhibit B

Scope of Work

The Scope of Work is to remove and repair both power trucks and center truck, disassemble vehicle, repair structural elements, vehicle reassembly and truck re-installation, and full vehicle paint due to current paint condition. The scope will include the following:

Phase 1: Vehicle Repair – disassembly, structural repair, and reassembly

- Complete teardown of LRV 1122 damaged components.
- Procurement, installation, and testing of materials listed in the agreed upon accident repair bill of materials.
- The damage is concentrated on the A-car (right), B-car (left) and adjoining C-car. Structurally, the door portals, sidewall assemblies and door thresholds will be replaced in kind with manufactured assemblies from the French Road factory.
- Structural damage above the C-car windows will be repaired.
- Deflections in the subfloor structure will require repair. Subsequently, all low-floor subfloor and tiles will be replaced in the A and B-car.
- All door leaves, operators, and door glass on the accident side of the vehicle will be replaced in kind. Door leaves were identified as a long lead time item. To accelerate the project schedule, door leaves will be provided by UTA.
- Two ramps were damaged in the accident, and two ramps were removed by UTA. UTA will provide 4 ramps for installation into LRV 1122.
- 8 door leaves were damaged in the accident. Replacement door leaves will be provided by UTA to replace the damaged door leaves.
- Cladding will be replaced in kind and subsequently, all vehicle glass where cladding was removed will be replaced.
- Fiberglass and composite interior panels at the damaged section will be replaced in kind.
- C-car high voltage cabling for the latent heat system will be replaced.
- Reassemble all removed components.
- Prepare surface, paint, and buff complete vehicle in preparation for application of vehicle wrap and decals.
- Following the vehicle repair, static testing of ADA ramps, doors and c-car latent heat will be completed.

Phase 2: Bogie Set -disassembly, repair structural elements, reassembly and testing.

- Disassembly and cleaning
- Engineering Analysis
- Drive units overhaul and testing
- Repair frames and bolsters;
- Quality Assurance (Non-Destructive Test – NDT);
- Painting of affected areas
- Reassembly
- Static and load testing
- Re-installation of trucks onto LRV 1122

- Previously missing materials will be handled by UTA. Previously missing materials are as follows:

  Serial Number: US00102
  Missing Axle 1 Caliper
  Missing Axle 2 Caliper
  Track Brake Canister Holder
  Right Side Track Brake
  Wheel 2 Ground

  Serial Number: US00043
  Missing Axle 1 Caliper
  Missing Axle 2 Caliper

- All the rework procedures and material lists are attached to this exhibit. Work will be according to the technical assessment performed for each truck. Based on that, the specific repair scope will be the following:

Platform:	S/N Affected:	Repair Scope (highlights)	Drawing(s)	Rework Procedure	Material List
Bogie	US00102	[1] Rework of PT Head Beam Console Bracket [2] Rework of Bolster Rotation Stops [3] Rework of Bolster Lateral Buffer Bracket [4] Miscellaneous Damage	A2V00001441496 A2V00397258998	RW-SLC4-PT-US00102 - Rev A	US00102 BOM Rev001
Bolster	US00195				
Bogie	US00043	[1] Rework of Bolster Lateral Buffer Bracket	A2V00001441496 A2V00397258998	RW-SLC4-PT-US00043 - Rev A	US00043 BOM Rev001
Bolster	US00612				
Bogie	US00138	[1] Rework of CT Lifting Device Bracket [2] Rework of track brake Bracket	A2V00397218495	RW-SLC4-CT-US00138 - Rev A	US00138 BOM Rev001

  - For the drive units overhaul and testing, the scope is as follows:
    - Separate traction motor from gearbox
    - Disassemble traction motor
    - Clean all parts
    - Balance rotor to Siemens specifications
    - Overhaul motor to Siemens specifications using new bearing, hardware and seals
    - Disassemble gearbox
    - Replace gearbox bearings and required hardware
    - Reaffix gearbox to traction motor
    - Final electrical and vibration testing
    - Touch up paint
    - Install transport lock

Bogie SN	Item	Manuf.	Serial #	Preliminary Tests Findings
US00043	Gearbox; Axle 1	Voith	1264774	w/ transport lock w/o motor terminal box cover results were with specification
US00043	Motor; Axle 1	Siemens	N-1244428-230-001	
US00043	Gearbox; Axle 2	Voith	1263264	w/ transport lock w/o motor terminal box cover excessive vibrations were observed.
US00043	Motor; Axle 2	Siemens	N-1244428-230-003	
US00102	Gearbox; Axle 1	Voith	1273126	w/ transport lock w/o motor terminal box cover above normal vibrations were observed.
US00102	Motor; Axle 1	Siemens	N-1244428-550-004	
US00102	Gearbox; Axle 2	Voith	1273999	w/ transport lock w/o motor terminal box cover excessive readings noted. Vibration test stopped.
US00102	Motor; Axle 2	Siemens	N-1244428-600-001	

Phase 3: Additional Materials and Installation, Vehicle Preparation, and Shipment to UTA

- It is recognized that certain materials have been removed from the vehicle by UTA personnel prior to shipment.
- In general, missing materials are not included in this scope of work unless the materials are required to complete the scope of work as described in this Contract, and purchase and installation has previously been negotiated and agreed upon.
- Missing materials shall be handled as follows:
    - UTA furnished material stock shipped to Contractor for installation.
    - Purchase of materials from Contractor for Contractor installation; or
    - UTA personnel will install missing materials following completion of repair work and return of LRV to UTA's facility and acceptance of the LRV.
    - The Contractor shall notify UTA of all missing materials at the earliest possible opportunity to allow UTA to determine the necessary course of action.
    - All additional materials and installation shall be subject to UTA review and approval.
    - All currently known additional materials to be covered under this Contract have been identified separately in the attached project bill of material.
- Vehicle preparation for return shipment to UTA.
- Return shipment of LRV to UTA

Program Management Requirements:

1. The Contractor shall develop a Project Management Plan (PMP) describing their approach. The PMP shall describe management approaches to provide UTA insight into the project management structure and to describe the mechanisms that ensure the project requirements will be met. The approaches described in the Project Management Plan shall be tailored to fit this project.

    CDRL 1 Project Management Plan (PMP)

2. The Contractor shall enter discussions with UTA to agree on the concept of the PMP. Contractor shall draft the detailed plan including the information listed below. It shall be

used to guide and track the project through to successful completion. The Project Management Plan shall as a minimum provide the following:

- Detailed Project Organization chart
- Identifies key individuals and their roles in the project
- Includes both UTA and Contractor
- Describes the major activities as well as the roles and responsibilities by individual to accomplish them
- Authority level and decision process definition
- Schedule/time management
- Project schedule showing key milestones for project phases, deliverables, critical action points, decision hold points, UTA and Contractor reviews, major action points.

The PMP shall be kept up to date and shall be re-submitted to UTA when details of the plan change, such as a change in personnel assigned to the project.

3. A monthly progress report shall be submitted no later than 10 working days after the end of the reported month. Reports shall be based upon actual progress of the work, including any problems that have been identified and material affecting the project schedule. The monthly progress report shall include the baseline project schedule in the form of a Gantt chart with all current project schedule deviations shown, and a current and up-to-date schedule. The monthly progress report shall include photographic progress of the work and include all work sign-offs, engineering activities, quality inspection documentation, and other work completed during the reporting period. The monthly progress reports will serve as the basis for the Final Repair Report. Completion status of monthly progress reports will be reviewed prior to each milestone payment. In the event of missing progress reports, UTA may request documentation to fulfill any missing information prior to payment of milestone payments.

CDRL 2 Monthly Progress Reports

4. Project Review Meetings shall be held as required to review progress, respond to open action items, discuss design problems and issues, to witness tests and discuss their results, to review fabrication and assembly status, and to conduct vehicle inspections. Meetings shall be held monthly at a minimum, unless otherwise directed by UTA. Progress meetings may be held as frequently as weekly if requested by UTA. The Contractor shall submit meeting minutes including the meeting agenda, discussion notes, and actions and assignments at a minimum.

CDRL 3 Project Review Meetings

5. The Contractor shall develop and submit a repair procedure for UTA review and approval prior to commencement of the work.

CDRL 4 Repair Procedure

6. The Contractor shall develop and submit a Final Repair Report upon completion of the work for UTA review and approval. The report shall contain a certification of conformance to original specifications, and all supporting repair, quality assurance, and other documentation developed throughout the project. The report shall include photo documentation of each phase of the repair processes, essentially organizing and combining the deliverables developed for the monthly progress reports chronologically into

a single document. The final repair report shall be submitted to UTA a minimum of 15 days prior to the vehicle final inspection, which is to be conducted at the Contractor's facility.

CDRL 5 Final Repair Report

Siemens Mobility, Inc.

Damage Report

Utah Transit Authority, S70 Type 4

Engineering Review

Document Number: A4D10000089059	**Release Date:** **07/19/2022**
Title: LRV Damage Report UTA S70 Vehicle 1122, Engineering Review	**Revision: A**

Table of Contents

Table of Figures

1 Overview/Purpose

This document is to give an engineering review of the damage that occurred to the Utah Transit Authority's Light Rail Vehicle number 1122 and a high-level overview of the required repairs. LRV 1122 was involved in a collision with another UTA LRV, the collision resulted in a derailment along with major structural damage to the A, B, and C cars. The Inspection was performed at the Jordan River UTA Maintenance facility in Salt Lake City, Utah on Friday July 8th, 2022. Some bogie components are mentioned in this report but were not individually inspected as they will require removal and evaluation later. Laser scanning was performed using a faro Focus X130 laser scanner and data was compiled using Polyworks software. The scope of this evaluation only covers the damage due to the accident and not the components that were robbed and are missing due to use on other vehicles.

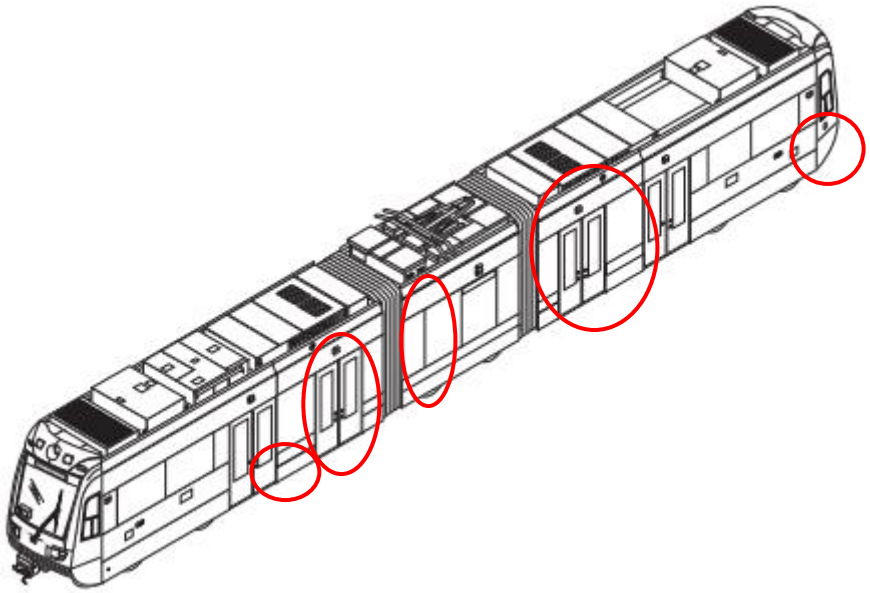


Figure 1: Overview of Damages

2 Acronyms/Definitions

3D	3-Dimensional
CAD	Computer-Aided Design
LH	Left Hand
LRV	Light Rail Vehicle
MPI	Magnetic Penetrant Inspection
NDT	Non-Destructive Testing
RH	Right Hand
SMI	Siemens Mobility Inc.
UT	Ultrasonic Testing
VT	Visual Testing

3 Damages Evaluation

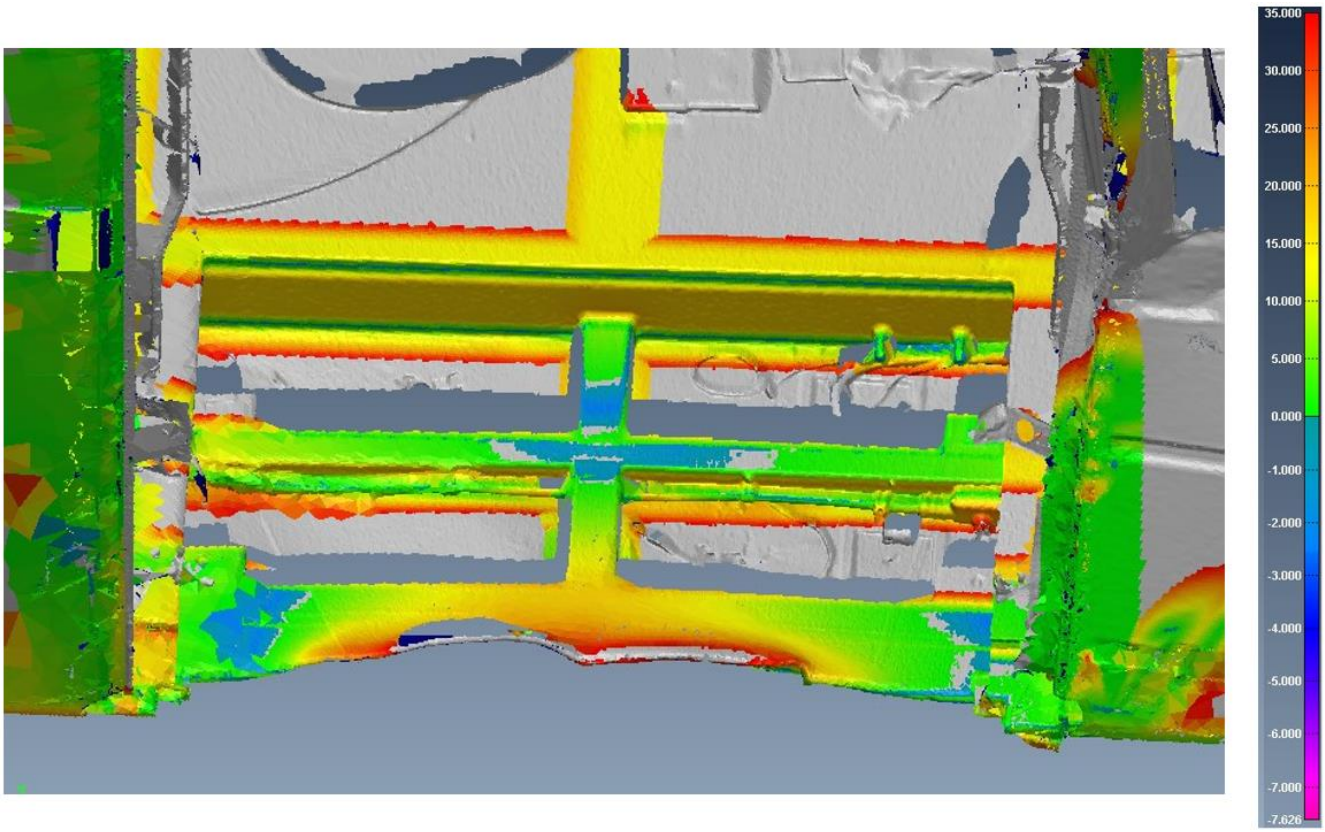
3.1 Scanning Evaluation

3.1.1 Alignment

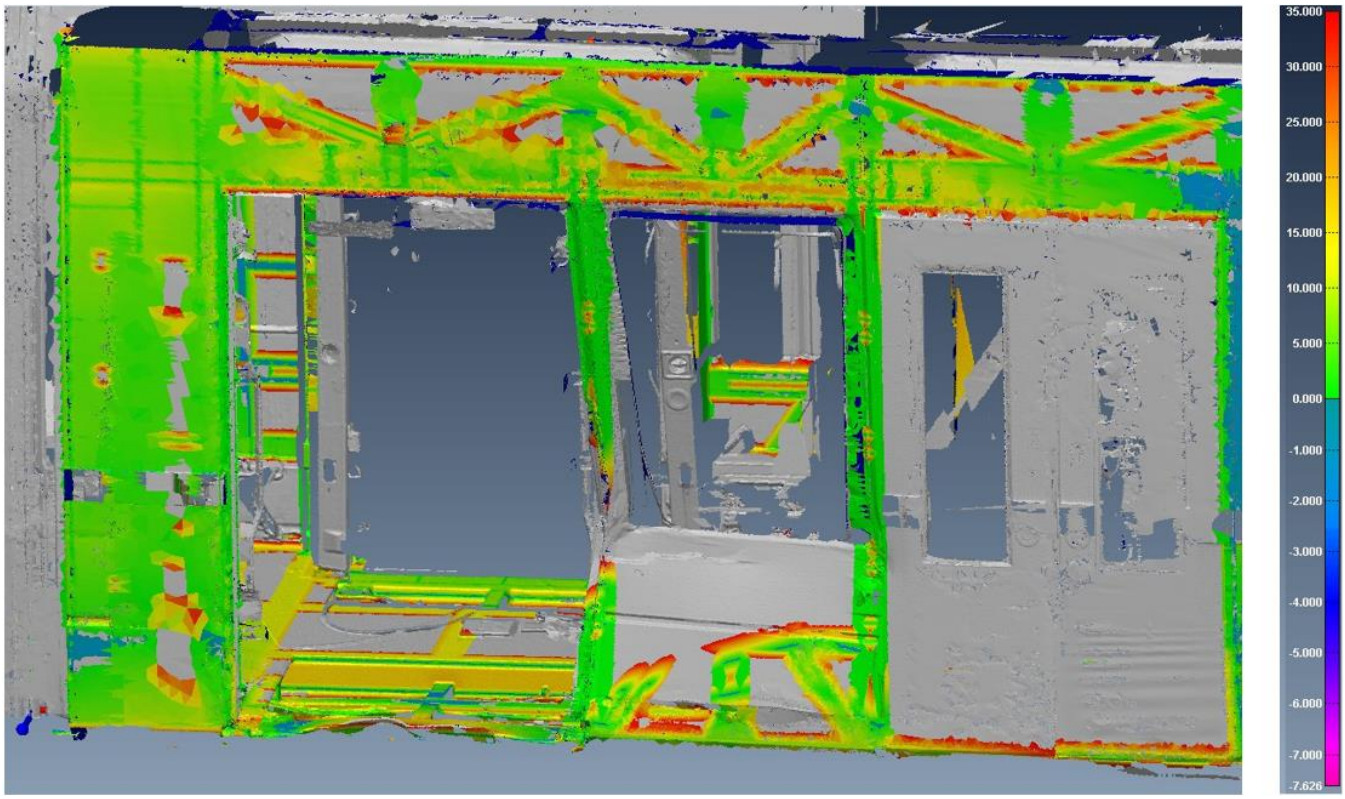
See scanning images in next section.

3.1.2 Damages

As seen in Scanning Eval (Begin Next Page)



Laser Scan (Top) and View of Scanned Damaged Area (Bottom)



Door 2 Structural Damage Scan

3.2 Visual Evaluation

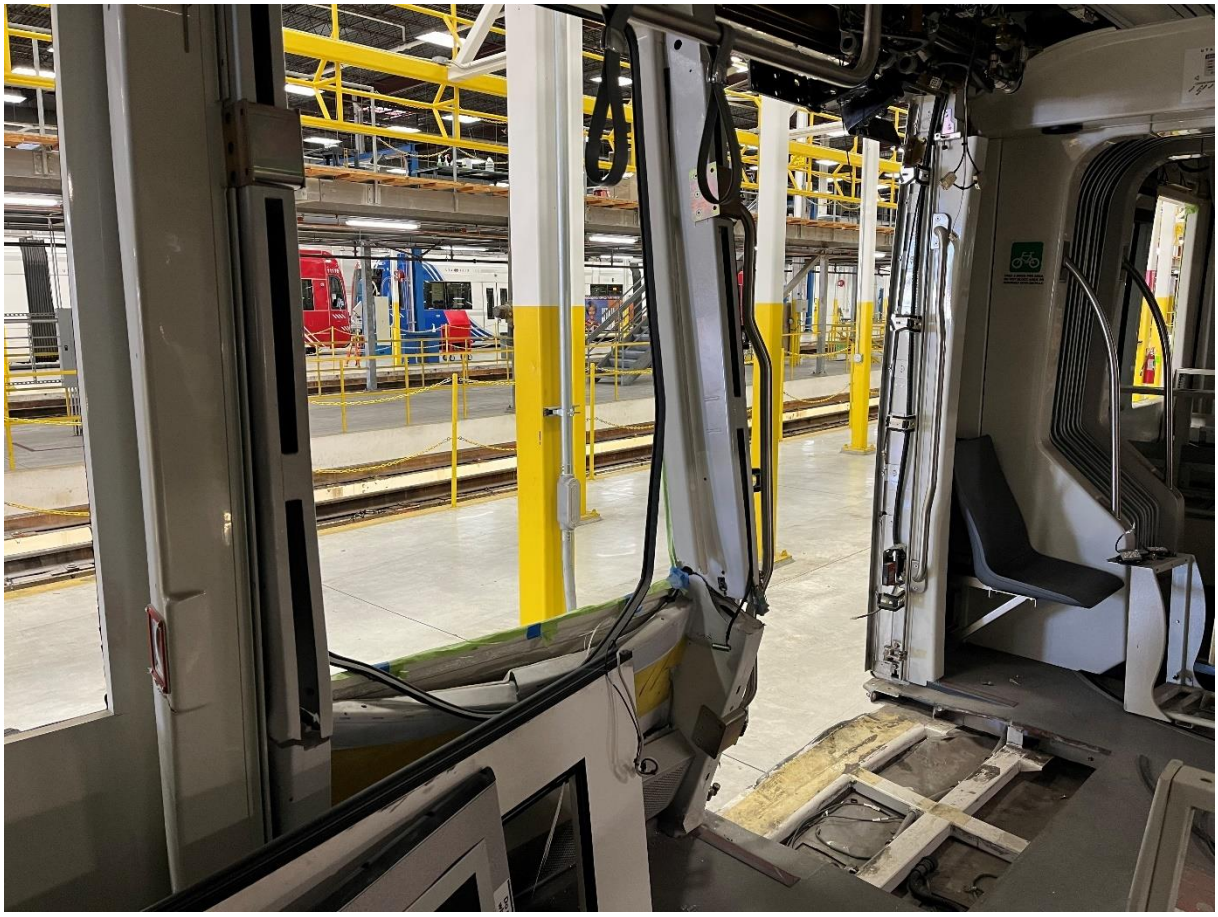
Documentation of damages through Images

Right Hand Side Door 2 Primary Impact Area of “A” Car

RH Side Door 2 threshold/Ramp Impact Area of “A” Car

RH Side Door 2 Frame and Window

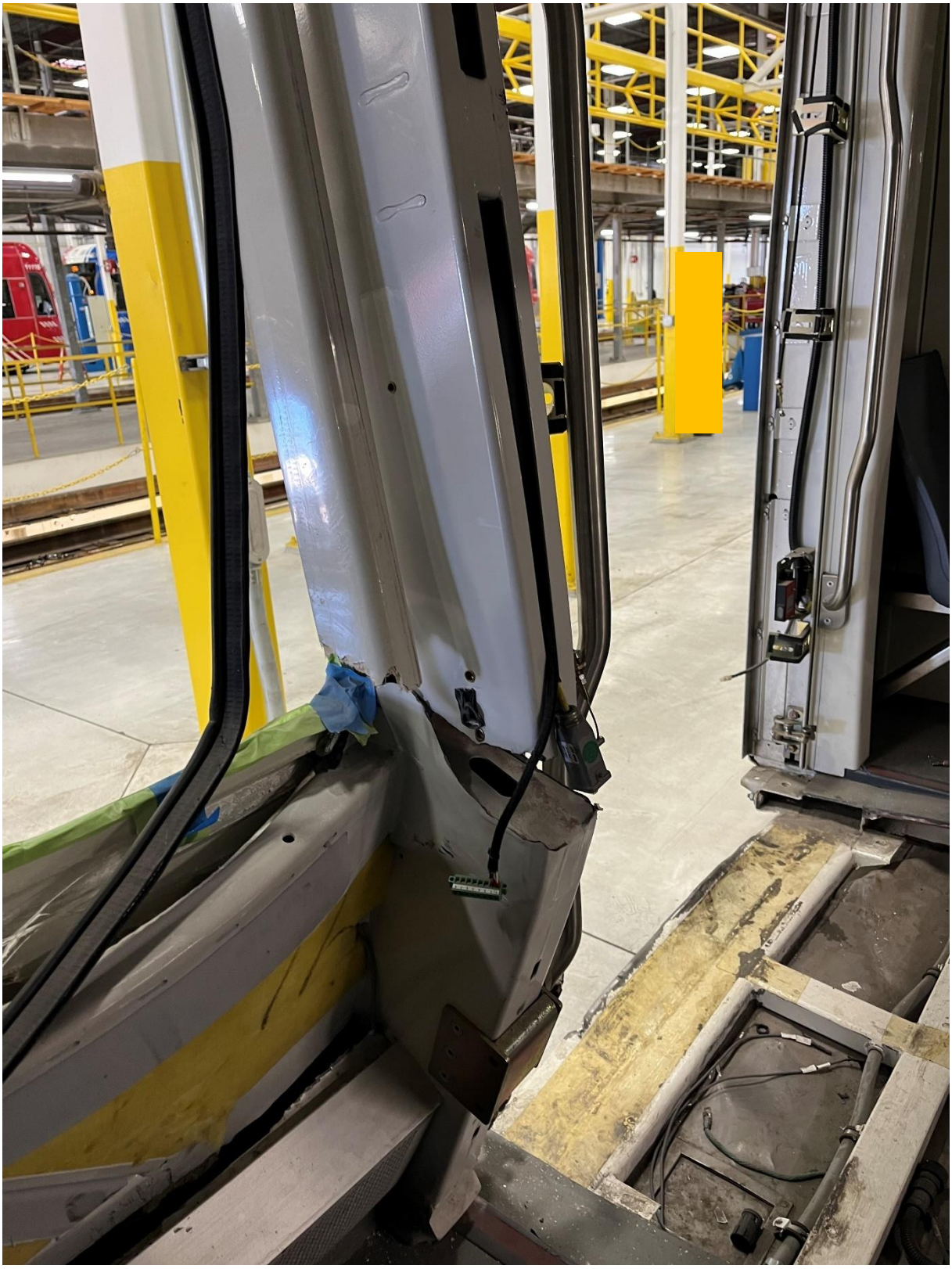
RH Side Door 1 and Carshell minor scrapes to “A” Car coatings – cosmetic damage



RH Side Door 2 Interior View of Impact Damage

RH Side Door 1 Interior Frame/Trim Damaged Adjacent to Window in Between Door 1 and 2

Window in Between Door 1 and 2 Interior View of Impact Damage



Door 2 Frame Interior View of Impact

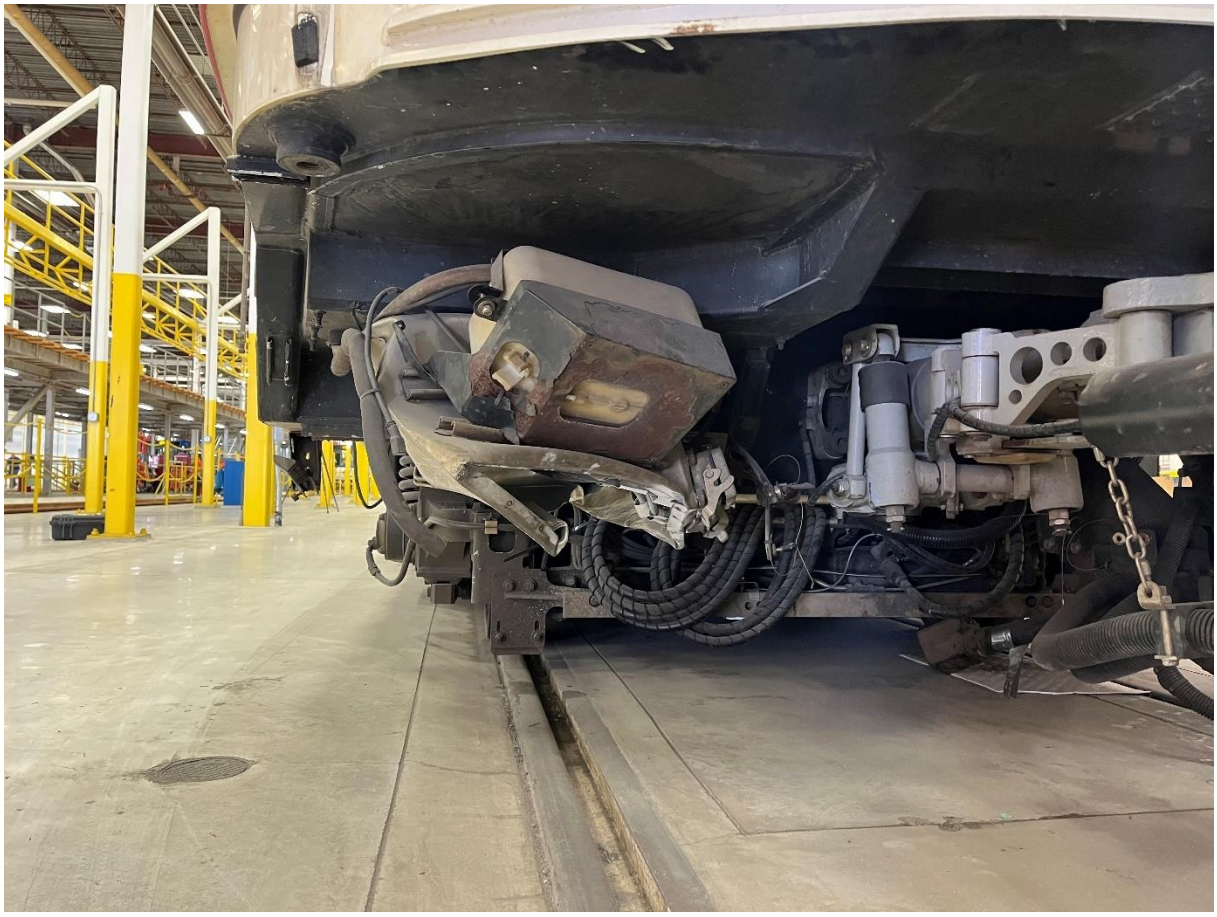
Door 2 Threshold and exposed frame

Door 2 Ramp/Threshold Impact Side

Impact Side View of Car body Between Doors 1-2

“A” Car Overall view of Impact Side

RH side 162 Box – damaged, including windshield washer reservoir



RH side 162 Box – damaged, including windshield washer reservoir FWD View

RH side 162 Box – damaged, including windshield washer reservoir

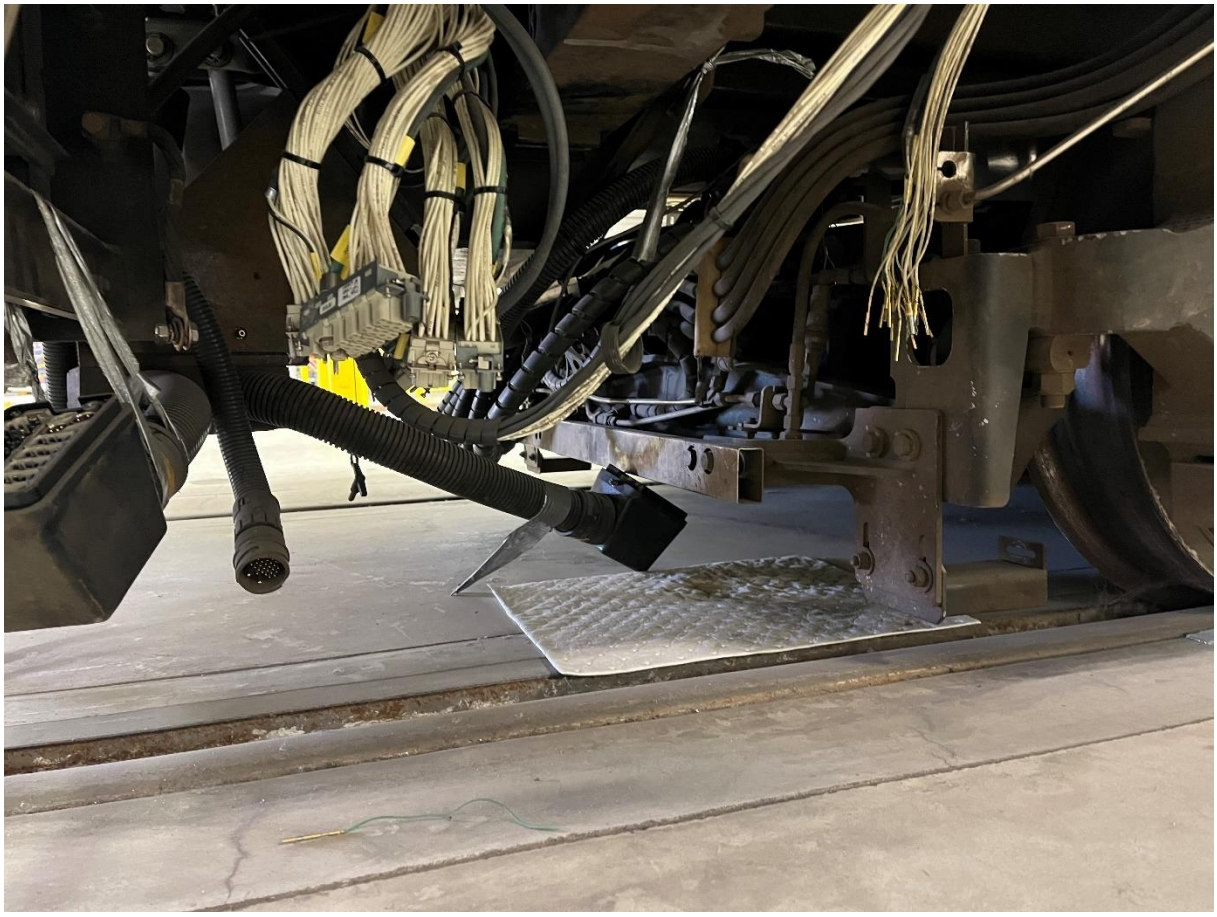
LH side “B” Car Minor Cosmetic Damage to Doors and Carshell

LH side “B” Car Damage to Doors and Carshell

LH side “A” Car Damage to Door Threshold/Ramp A

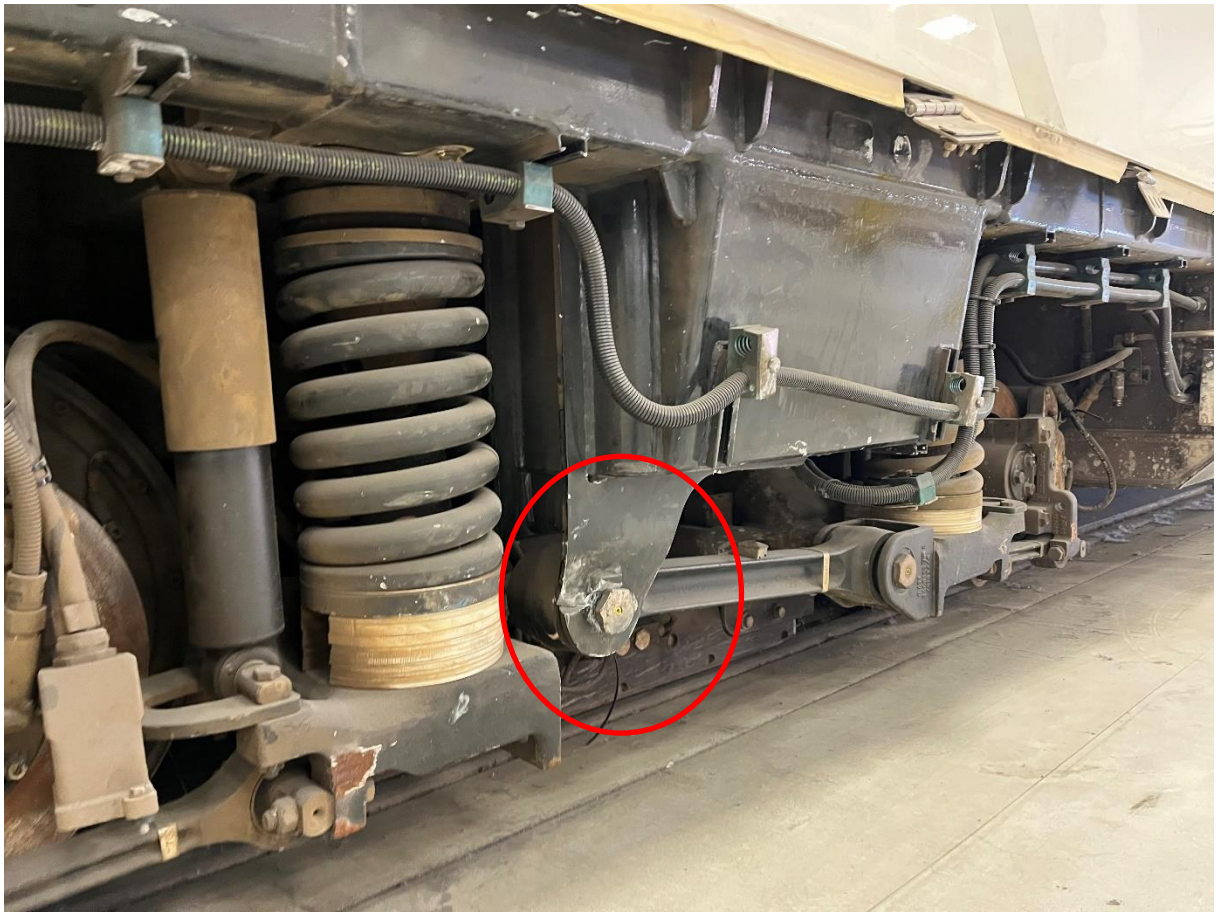
Slight Bending Observed Due to Impact on the Opposite Side

LH side “A” Car Damage to Door 11 Area Underside Bellypans



LH side 172 Box – damaged and removed

Truck traction rod RH bracket eye has a large crack/torn metal visible where the attachment bolt installs through the rod eye.



Truck traction rod RH bracket eye has a large crack/torn metal visible where the attachment bolt installs through the rod eye.

4 Observations

Summary of visual damage assessment observations

Derailment:

Due to derailment, cars will require new articulation area bearings. A-C car upper bearings as well as all lower area articulation bearings.

A Car Damage:

Door 11 damage to threshold transition area (LH side)

Damage to belly pans(LH/RH side)

LH side 172 Box – damaged and removed

RH side 162 Box – damaged, including windshield washer reservoir

Main impact area between doors 1-2 on RH side car shell. This area has major structural damage protruding inward to the passenger area. Window section in between A car RH side doors will need to completely removed and replaced.

Door 2 threshold/ramp area is severely damaged at the frame (Door plate and angle frame) and will require removal and replacement. Cross girders will require straightening.

Door 2 frame and trim pieces around door opening are damaged, including door motors and track

Roof area: A-C car Summing Link Bracket is bent and will require replacement, RH side roof battery box lid damaged (damaged from Pantograph falling and impacting it as a result of the accident.

Damaged car shell/body skirts and hinges need to be replaced.

C Car Damage:

Truck/bogie will need to be removed and inspected, visible damage

Truck traction rod RH bracket eye has a large crack/torn metal visible where the attachment bolt installs through the rod eye.

Structural damage on cladding and carshell body and windows.

Body skirt and hinges damaged and require replacement.

B Car Damage:

Door 3 operating equipment(motors) damaged as well as door frame and track. Carbody and structural damage in between doors 3-4, Door 3 and 4 threshold/ramp area damaged due to impact.

4.1 Next Steps

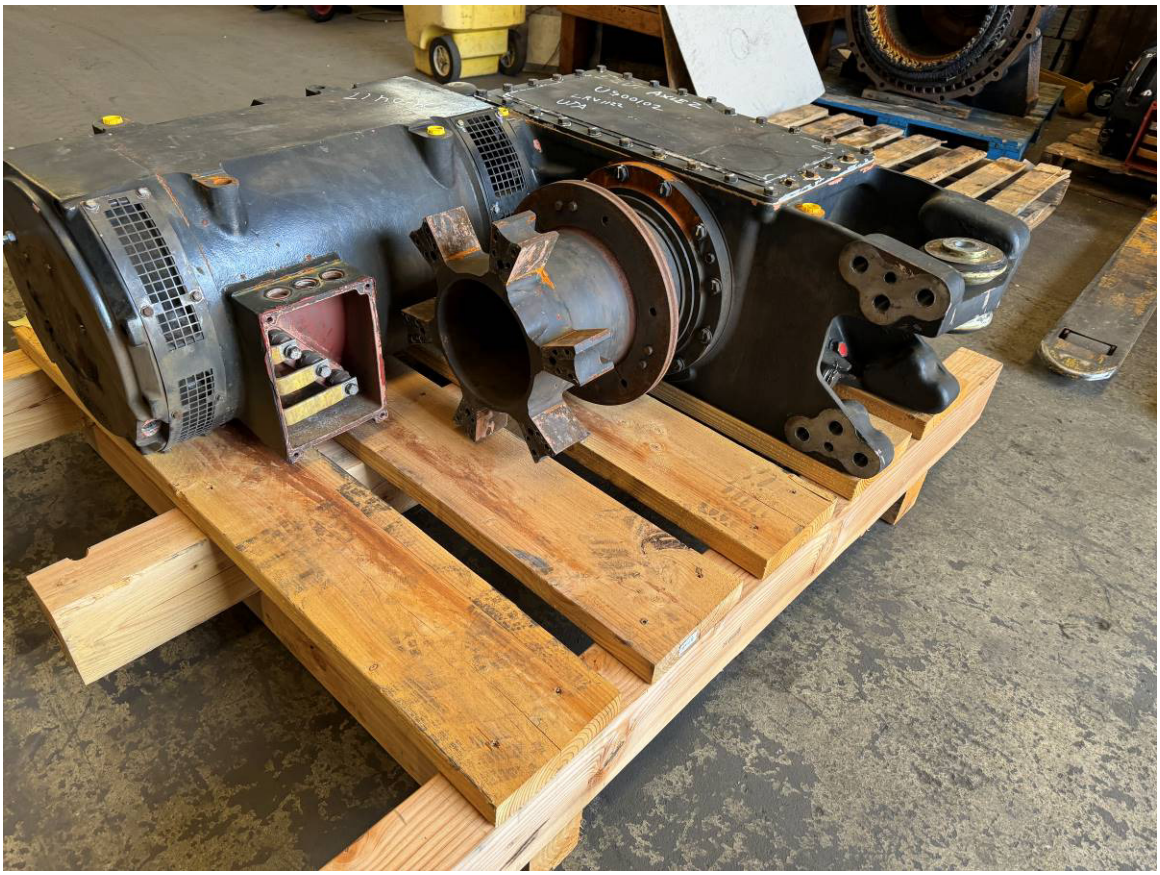
Siemens recommends that due to the extent of cannibalized components, that commissioning level testing should be performed prior to returning to service.

NOTE: The scope of this evaluation only covers the damage due to the accident and not the components that were robbed and are missing due to use on other vehicles.

Siemens Mobility
Traction Drives
West Coast Service Center

Drive Unit Report

Siemens AC Traction Motor S70 – Voith Gearbox



MOTOR S/N	**N-124426-600-001**		
Gearbox S/N	**1273999**		
Date	**6/12/2024**		
MOTOR TYPE	1TB1622-0JG03	**VEHICLE TYPE**	S70
CUSTOMER	UTA 1122 Accident	**Rep.-Shop JOB No**	RJ24-0416 & RJ24-0417

Image 1: Motor Serial Number

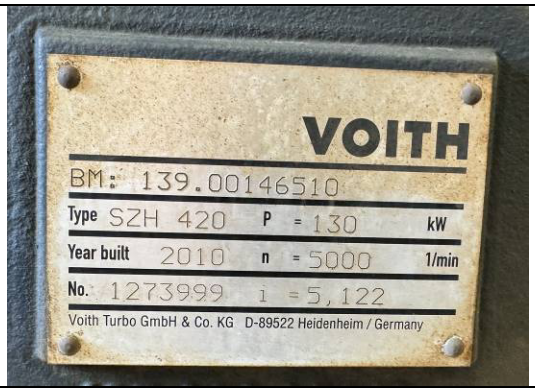


Image 2: Gearbox Serial Number

Image 3: Stator condition

Image 4: Stator condition

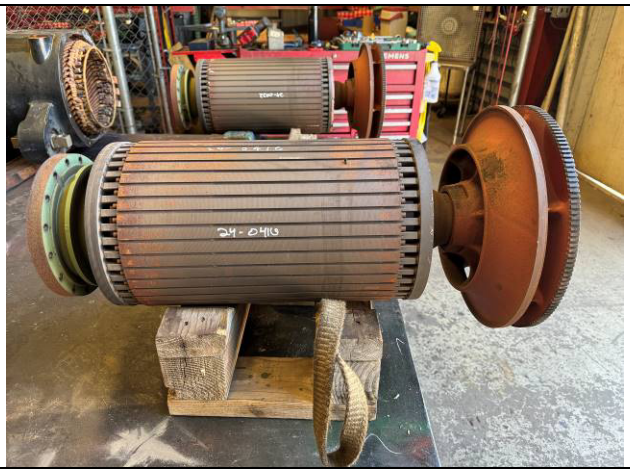


Image 5: Rotor condition

Image 6: Endshield condition

Image 7: Bearing condition

Image 8: Gearbox condition

Equipment Test Report
Customer: SIEMENS SALT LAKE CITY

Equipment Information			
Motor ID	N-124426-006-001	**Operating Volts**	600
Equipment Tag	Stator	**RPM**	1588
Location	DB	**Power**	145 kW
Manufacturer	Siemens	**AC/DC**	AC

Test Information Test Date/Time: 6/6/2024 - 08:36:36 Winding Temp: 20 °C	
Job #	RJ24-0416
Test Description	Surge and Hipot Stator
Test Stage	As Found
Operator	ZK
Test Equipment #	Electrom # 780105
PP ID#	

Off-line Test Data Winding Resistance @20 °C			
Lead 1-2 Ohms			0.035
Lead 2-3 Ohms			0.035
Lead 1-3 Ohms			0.035
Max Delta R (%)			0.0
	Volts	µAmps	MOhms@40°C
Meg. Test	520	1.15	113
	Volts	µAmps	
Hipot	1505	0.51	

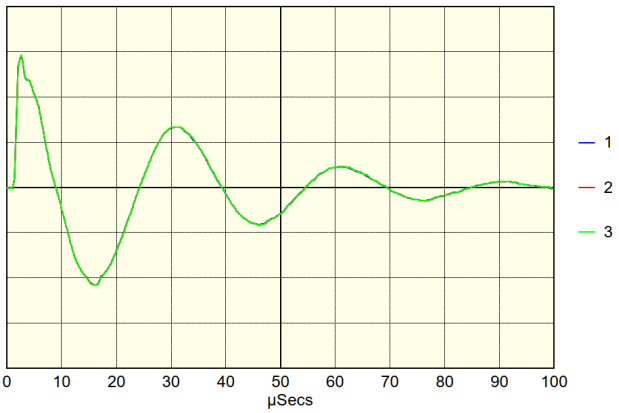
Pass/Fail Results	
Surge	PASS
MegOhm	PASS
Hipot	PASS
Hipot Step Test	
Ohms Balance	PASS
Off-line Equip. Rating	PASS

Equipment Test Report

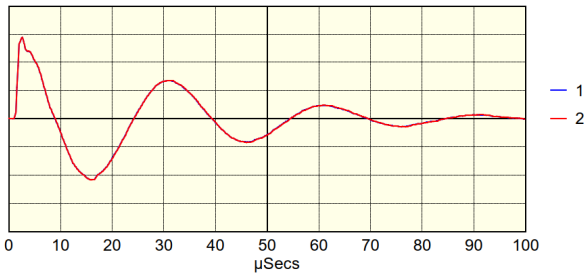
AC Off-line Surge - Summary

Recommended Voltage: 1500
Voltage Reached:
1490 / 1490 / 1497
Wave Difference L1-L2: 1.0%
Wave Difference L2-L3: 0.6%
Wave Difference L3-L1: 1.0%

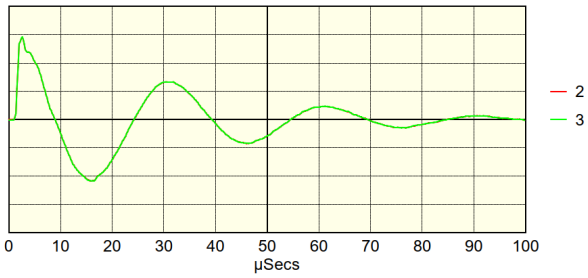
Surge Result: **PASS**



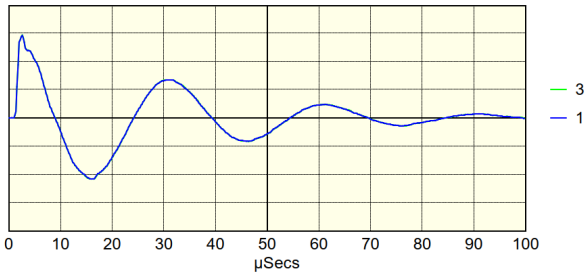
Lead 1-2



Lead 2-3



Lead 3-1



RJ24-0416 & RJ24-0417

SIEMENS Mobility, Inc **Salt Lake City (UTA)**

Vibration test Results for S70 Drive Unit:

Motor Job Number: 24-0416
Motor SN: N-124426-600-001
Gear Job Number: RJ 24-0417
Gear SN: 1273999
Date: 5/21/24

Allowable Drive Unit Vibration Limits

Hz	Motor RPM	in/sec	mm/sec
90	1800	0.14	3.5
180	3600	0.14	3.5
250	5000	0.21	5.25

Warm Up Run: 15 minutes at 60 Hz - Across the line

Clockwise Rotation (Motor - looking at DE) Measured in inches per second

			Motor NDE			Motor DE		Gear Unit Output Shaft		
Hz	**Motor rpm**	⟹	⇩	⊗	⟹	⇩	⊗	⟹	⇩	⊗
90	**1800**	0.19	0.095	0.185	0.116	0.081	0.144	0.163	0.103	0.156
180	**3600**	**Technician suspended test due to high readings**								
250	**5000**									

Duration of each speed run no more than 10 minutes:

Summary:

It was reported that the drive unit was involved in an accident. It was sent to the repair shop for investigation. The motor arrived at the repair shop with the transport lock installed. The unit arrived without the motor terminal box cover installed.
The motor has been visually inspected and initial electrical testing has been performed. During the as-found vibration test, the technician noted excessive readings. The vibration test was stopped at that time.

Proposed repair scope:

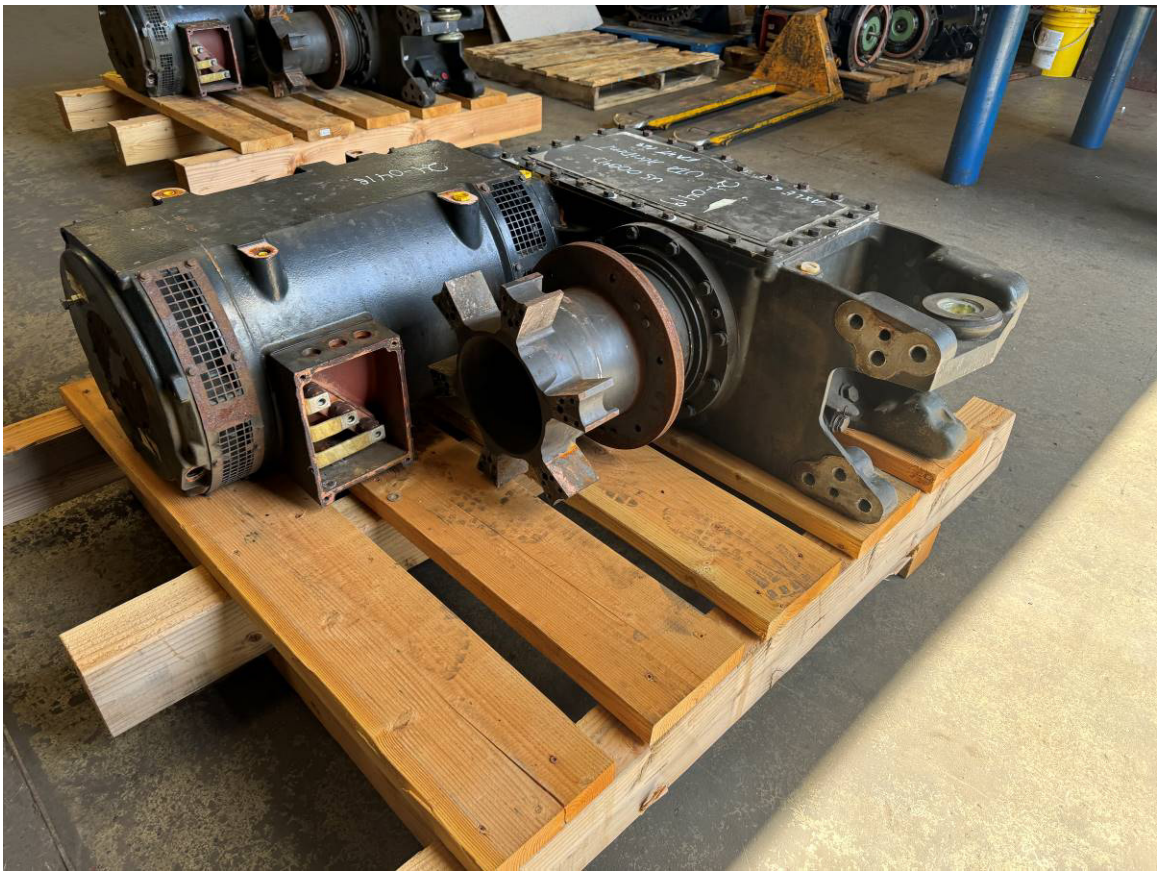
1) Separate traction motor from gearbox
2) Disassemble traction motor
3) Clean all parts
4) Balance rotor to Siemens specifications
5) Overhaul motor to Siemens specifications using new bearing, hardware and seals
6) Disassemble gearbox
7) Replace gearbox bearings and required hardware (Gearbox OH-Kit to be supplied by SMO CS)
8) Reaffix gearbox to traction motor
9) Final electrical and vibration testing
10) Touch up paint
11) Install transport lock
12) Package for shipment

Report prepared by:
Gabi Ostrander

Siemens Mobility
Traction Drives
West Coast Service Center

Drive Unit Report

Siemens AC Traction Motor S70 – Voith Gearbox



MOTOR S/N	**N-124428-230-001**		
Gearbox S/N	**1264774**		
Date	**6/12/2024**		
MOTOR TYPE	1TB1622-0JG03	**VEHICLE TYPE**	S70
CUSTOMER	UTA 1122 Accident	**Rep.-Shop JOB No**	RJ24-0418 & RJ24-0419

Image 1: Motor Serial Number

Image 2: Gearbox Serial Number

Image 3: Stator condition

Image 4: Stator condition

Image 5: Rotor condition

Image 6: Endshield condition

Image 7: Bearing condition

Image 8: Gearbox condition

Equipment Test Report
Customer: SIEMENS SALT LAKE CITY

Equipment Information			
Motor ID	N-124428-230-001	**Operating Volts**	600
Equipment Tag	Stator	**RPM**	1588
Location	DB	**Power**	145 kW
Manufacturer	Siemens	**AC/DC**	AC

Test Information Test Date/Time: 6/6/2024 - 08:56:35 Winding Temp: 20 °C	
Job #	RJ24-0418
Test Description	Surge and Hipot Stator
Test Stage	
Operator	
Test Equipment #	Electrom # 780105
PP ID#	

Off-line Test Data Winding Resistance @20 °C			
Lead 1-2 Ohms			0.035
Lead 2-3 Ohms			0.035
Lead 1-3 Ohms			0.035
Max Delta R (%)			0.0
	Volts	µAmps	MOhms@40°C
Meg. Test	510	0.48	266
	Volts	µAmps	
Hipot	1515	0.69	

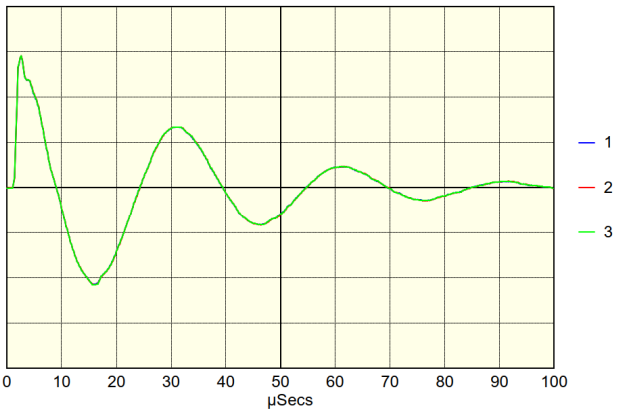
Pass/Fail Results	
Surge	PASS
MegOhm	PASS
Hipot	PASS
Hipot Step Test	
Ohms Balance	PASS
Off-line Equip. Rating	PASS

Equipment Test Report

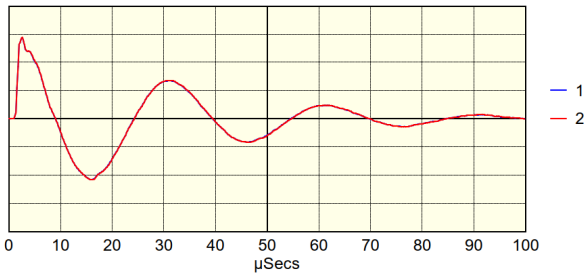
AC Off-line Surge - Summary

Recommended Voltage: 1500
Voltage Reached:
1490 / 1490 / 1490
Wave Difference L1-L2: 1.0%
Wave Difference L2-L3: 0.8%
Wave Difference L3-L1: 0.6%

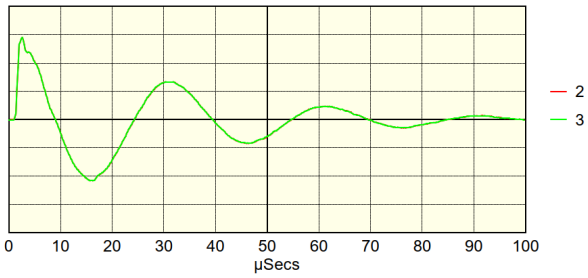
Surge Result: **PASS**



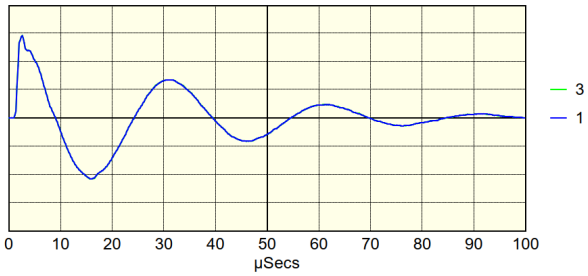
Lead 1-2



Lead 2-3



Lead 3-1



RJ24-0418 & RJ24-0419

SIEMENS Mobility, Inc **Salt Lake City (UTA)**

Vibration test Results for S70 Drive Unit:

Motor Job Number: 24-0418
Motor SN: n-1244428-230-001
Gear Job Number: RJ 24-0419
Gear SN:1264774
Date: 5/21/24

Allowable Drive Unit Vibration Limits

Hz	Motor RPM	in/sec	mm/sec
90	1800	0.14	3.5
180	3600	0.14	3.5
250	5000	0.21	5.25

Warm Up Run: 15 minutes at 60 Hz - Across the line

Clockwise Rotation (Motor - looking at DE) Measured in inches per second

			Motor NDE			Motor DE		Gear Unit Output Shaft		
Hz	**Motor rpm**	⟹	⇩	⊗	⟹	⇩	⊗	⟹	⇩	⊗
90	**1800**	0.055	0.048	0.066	0.049	0.042	0.032	0.047	0.065	0.076
180	**3600**	0.085	0.089	0.085	0.067	0.079	0.073	0.065	0.078	0.081
250	**5000**									

Duration of each speed run no more than 10 minutes:

Summary:

It was reported that the drive unit was involved in an accident. It was sent to the repair shop for investigation. The motor arrived at the repair shop with the transport lock installed. The unit arrived without the motor terminal box cover installed.
The motor has been visually inspected and initial electrical tests have been performed. The unit has been vibration tested and the results were with specification.

Proposed repair scope:

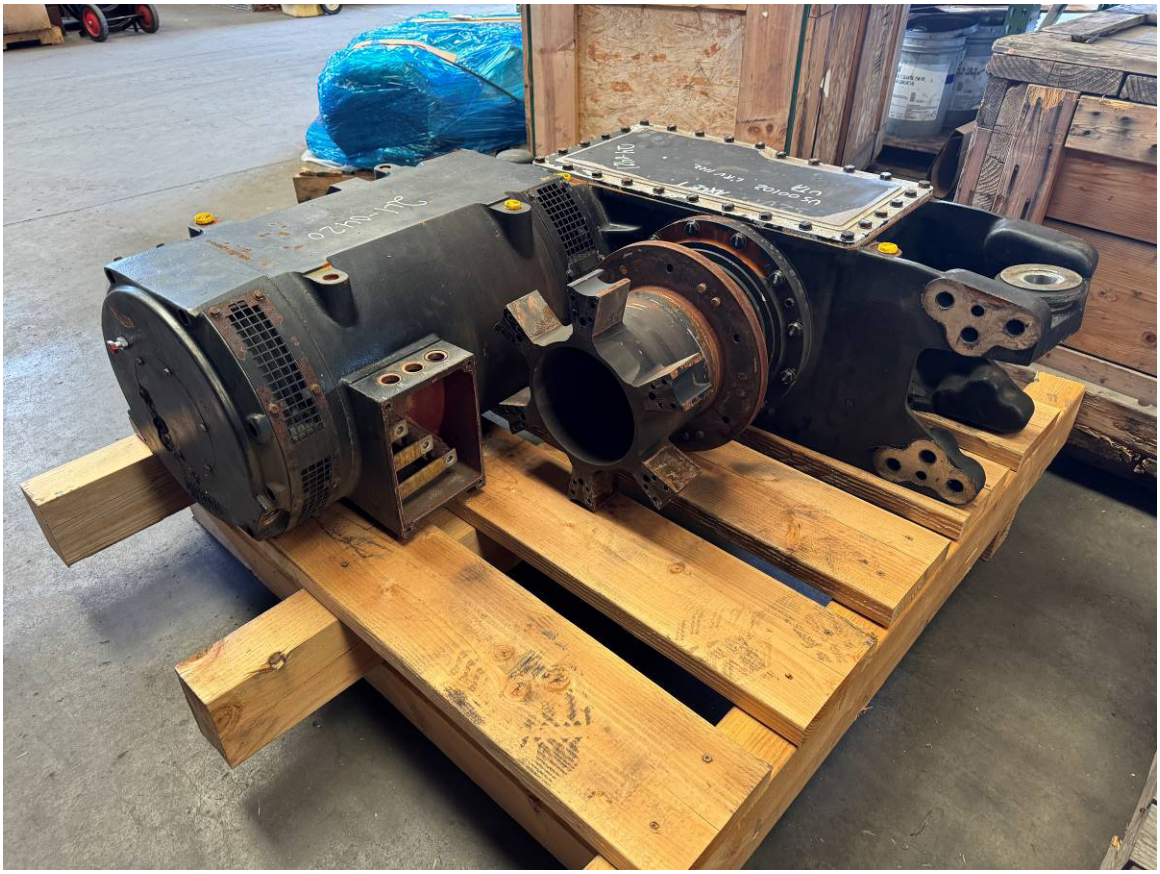
1) Separate traction motor from gearbox
2) Disassemble traction motor
3) Clean all parts
4) Balance rotor to Siemens specifications
5) Overhaul motor to Siemens specifications using new bearing, hardware and seals
6) Disassemble gearbox
7) Replace gearbox bearings and required hardware (Gearbox OH-Kit to be supplied by SMO CS)
8) Reaffix gearbox to traction motor
9) Final electrical and vibration testing
10) Touch up paint
11) Install transport lock
12) Package for shipment

Report prepared by:
Gabi Ostrander

Siemens Mobility
Traction Drives
West Coast Service Center

Drive Unit Report

Siemens AC Traction Motor S70 – Voith Gearbox



MOTOR S/N	**N-124428-550-004**		
Gearbox S/N	**1273126**		
Date	**6/12/2024**		
MOTOR TYPE	1TB1622-0JG03	**VEHICLE TYPE**	S70
CUSTOMER	UTA 1122 Accident	**Rep.-Shop JOB No**	RJ24-0420 & RJ24-0421

Image 1: Motor Serial Number

Image 2: Gearbox Serial Number

Image 3: Stator condition

Image 4: Stator condition

Image 5: Rotor condition

Image 6: Endshield condition

Image 7: Bearing condition

Image 8: Gearbox condition

Equipment Test Report
Customer: SIEMENS SALT LAKE CITY

Equipment Information			
Motor ID	N-124428-550-004	**Operating Volts**	600
Equipment Tag	Stator	**RPM**	1588
Location	DB	**Power**	145 kW
Manufacturer	Siemens	**AC/DC**	AC

Test Information Test Date/Time: 6/6/2024 - 08:24:06 Winding Temp: 20 °C	
Job #	RJ24-0420
Test Description	Surge and Hipot Stator
Test Stage	As Found
Operator	ZK
Test Equipment #	Electrom # 780105
PP ID#	

Off-line Test Data Winding Resistance @20 °C			
Lead 1-2 Ohms			0.036
Lead 2-3 Ohms			0.036
Lead 1-3 Ohms			0.036
Max Delta R (%)			0.0
	Volts	µAmps	MOhms@40°C
Meg. Test	510	0.99	129
	Volts	µAmps	
Hipot	1505	0.79	

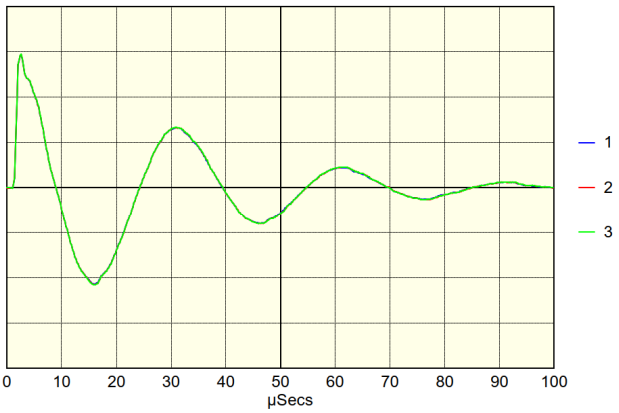
Pass/Fail Results	
Surge	PASS
MegOhm	PASS
Hipot	PASS
Hipot Step Test	
Ohms Balance	PASS
Off-line Equip. Rating	PASS

Equipment Test Report

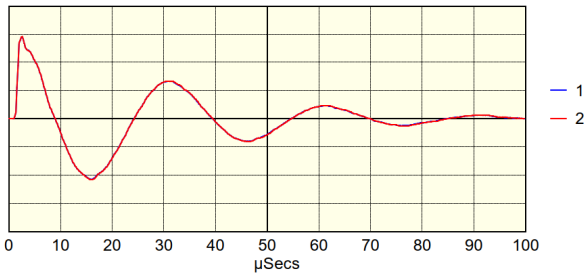
AC Off-line Surge - Summary

Recommended Voltage: 1500
Voltage Reached:
1493 / 1497 / 1500
Wave Difference L1-L2: 1.0%
Wave Difference L2-L3: 0.6%
Wave Difference L3-L1: 1.1%

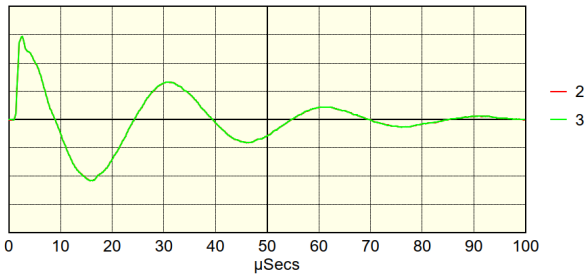
Surge Result: **PASS**



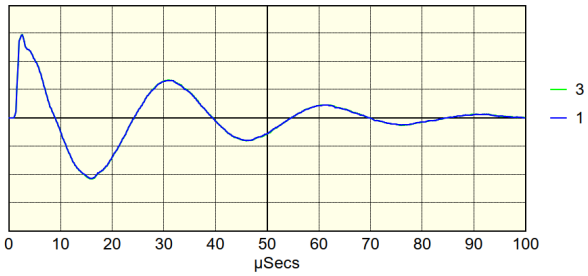
Lead 1-2



Lead 2-3



Lead 3-1



RJ24-0420 & RJ24-0421

SIEMENS Mobility, Inc **Salt Lake City (UTA)**

Vibration test Results for S70 Drive Unit:

Motor Job Number: 24-0420
Motor SN: N124428-550-004
Gear Job Number: RJ 24-0421
Gear SN: 1273126
Date: 5/21/24

Allowable Drive Unit Vibration Limits

Hz	Motor RPM	in/sec	mm/sec
90	1800	0.14	3.5
180	3600	0.14	3.5
250	5000	0.21	5.25

Warm Up Run: 15 minutes at 60 Hz - Across the line

Clockwise Rotation (Motor - looking at DE) Measured in inches per second

			Motor NDE			Motor DE		Gear Unit Output Shaft		
Hz	**Motor rpm**	⟹	⇩	⊗	⟹	⇩	⊗	⟹	⇩	⊗
90	**1800**	0.12	0.066	0.05	0.08	0.054	0.099	0.069	0.084	0.081
180	**3600**	0.2	0.3	0.26	0.16	0.23	0.18	0.22	0.26	0.25
250	**5000**									

Duration of each speed run no more than 10 minutes:

Summary:

It was reported that the drive unit was involved in an accident. It was sent to the repair shop for investigation. The motor arrived at the repair shop with the transport lock installed. The unit arrived without the motor terminal box cover installed.
The motor has been visually inspected and initial electrical tests have been performed. The unit has been vibration tested and above normal vibrations were observed.

Proposed repair scope:

1) Separate traction motor from gearbox
2) Disassemble traction motor
3) Clean all parts
4) Balance rotor to Siemens specifications
5) Overhaul motor to Siemens specifications using new bearing, hardware and seals
6) Disassemble gearbox
7) Replace gearbox bearings and required hardware (Gearbox OH-Kit to be supplied by SMO CS)
8) Reaffix gearbox to traction motor
9) Final electrical and vibration testing
10) Touch up paint
11) Install transport lock
12) Package for shipment

Report prepared by:
Gabi Ostrander

Siemens Mobility
Traction Drives
West Coast Service Center

Drive Unit Report

Siemens AC Traction Motor S70 – Voith Gearbox

MOTOR S/N	**N-124428-230-003**		
Gearbox S/N	**1263264**		
Date	**6/12/2024**		
MOTOR TYPE	1TB1622-0JG03	**VEHICLE TYPE**	S70
CUSTOMER	UTA 1122 Accident	**Rep.-Shop JOB No**	RJ24-0422 & RJ24-0423

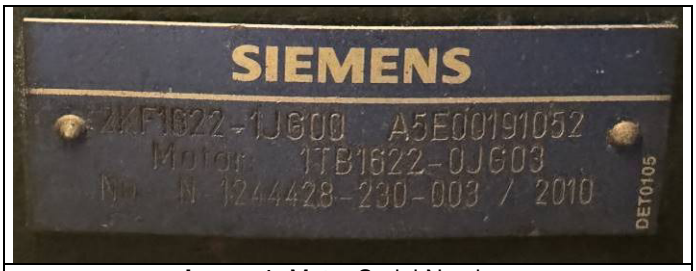


Image 1: Motor Serial Number

Image 2: Motor Serial Number

Image 3: Stator condition

Image 4: Stator condition

Image 5: Rotor condition

Image 6: Endshield condition

Image 7: Bearing condition

Image 8: Gearbox condition

Equipment Test Report

Customer: SIEMENS SALT LAKE CITY

Equipment Information			
Motor ID	N-124428-230-003	**Operating Volts**	600
Equipment Tag	Stator	**RPM**	1588
Location		**Power**	145 kW
Manufacturer	Siemens	**AC/DC**	AC

Test Information Test Date/Time: 6/6/2024 - 08:47:36 Winding Temp: 20 °C	
Job #	RJ24-0422
Test Description	Surge and Hipot Stator
Test Stage	As Found
Operator	ZK
Test Equipment #	Electrom # 780105
PP ID#	

Off-line Test Data Winding Resistance @20 °C			
Lead 1-2 Ohms			0.035
Lead 2-3 Ohms			0.035
Lead 1-3 Ohms			0.035
Max Delta R (%)			0.0
	Volts	µAmps	MOhms@40°C
Meg. Test	505	1.05	120
	Volts	µAmps	
Hipot	1515	1.34	

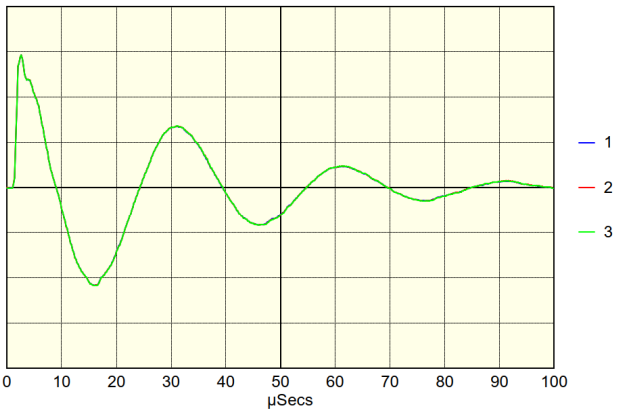
Pass/Fail Results	
Surge	PASS
MegOhm	PASS
Hipot	PASS
Hipot Step Test	
Ohms Balance	PASS
Off-line Equip. Rating	PASS

Equipment Test Report

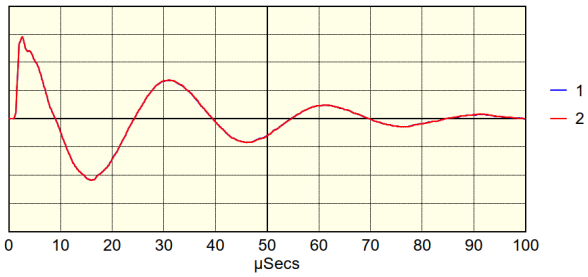
AC Off-line Surge - Summary

Recommended Voltage: 1500
Voltage Reached:
1497 / 1503 / 1497
Wave Difference L1-L2: 0.7%
Wave Difference L2-L3: 0.5%
Wave Difference L3-L1: 0.8%

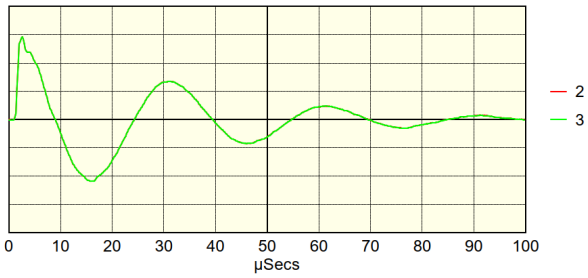
Surge Result: **PASS**



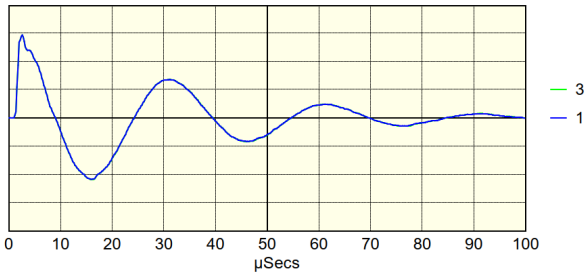
Lead 1-2



Lead 2-3



Lead 3-1



RJ24-0422 & RJ24-0423

SIEMENS Mobility, Inc **Salt Lake City (UTA)**

Vibration test Results for S70 Drive Unit:

Motor Job Number: 24-0423
Motor SN: N-1244428-230-003
Gear Job Number: RJ 24-0423
Gear SN:1263264
Date: 5/21/24

Allowable Drive Unit Vibration Limits

Hz	Motor RPM	in/sec	mm/sec
90	1800	0.14	3.5
180	3600	0.14	3.5
250	5000	0.21	5.25

Warm Up Run: 15 minutes at 60 Hz - Across the line

Clockwise Rotation (Motor - looking at DE) Measured in inches per second

			Motor NDE			Motor DE		Gear Unit Output Shaft		
Hz	**Motor rpm**	⟹	⇩	⊗	⟹	⇩	⊗	⟹	⇩	⊗
90	**1800**	0.094	0.12	0.11	0.059	0.067	0.071	0.1	0.1	0.12
180	**3600**	1.42	0.14	0.22	0.097	0.098	0.08	0.154	0.155	0.199
250	**5000**									

Duration of each speed run no more than 10 minutes:

Summary:

It was reported that the drive unit was involved in an accident. It was sent to the repair shop for investigation. The motor arrived at the repair shop with the transport lock installed. The unit arrived without the motor terminal box cover installed.
The motor has been visually inspected and initial electrical tests have been performed. The unit has been vibration tested and excessive vibrations were observed.

Proposed repair scope:

1) Separate traction motor from gearbox
2) Disassemble traction motor
3) Clean all parts
4) Balance rotor to Siemens specifications
5) Overhaul motor to Siemens specifications using new bearing, hardware and seals
6) Disassemble gearbox
7) Replace gearbox bearings and required hardware (Gearbox OH-Kit to be supplied by SMO CS)
8) Reaffix gearbox to traction motor
9) Final electrical and vibration testing
10) Touch up paint
11) Install transport lock
12) Package for shipment

Report prepared by:
Gabi Ostrander

SIEMENS

RW-SLC4-CT-00138

Rework Procedure	**Project:**	SLC4 S70 CT

Distribution:

☒ ATM	☒ Prod. Mgr	☒ Prod. Engr	☒ PM	☒ QA
☐ Calculations	☐ Prod. Ctrl.	☒ QM	☒ Customer	☐ Subcontractor

Responsible Function: Bogie Service Center

Platform:	S/N Affected:	ECN#:	NCR#:	Drawing(s)/Part Number(s)
☒ Bogie	US00138	N/A	200176587	A2V00397218495
☐ Bolster				

Implementation/Inspection Sign-off:

1. Production to inform Quality Assurance (QA) Inspector before repair work starts.
2. If Required Parent Material to be NDT Tested by ACFM, MT, or PT, prior to start of welding.

Problem Report Number: _____

Production Signature: _____ **Date:** _____

QA/CWI Signature: _____ **Date:** _____

Preparation:

1. Welder and Inspector shall be qualified in the rework process and required inspection methods (MT/PT/RT/VT). Reference QAI-057, QAI-043, BGI-002, BGI-003.
2. Part should be placed in a position that allows for base material repairs if required.

Rework Procedure:

NOTE:

- Production and Inspector shall sign off Implementation/ Inspection section above upon completion of their work.
- Where applicable adhere to SII-MNP-007 Workmanship Standard at all times.

APPROVALS:

Production Engineer _____ Originator

PQM _____ Project Quality Manager

Project Manager _____

Customer (if required) _____

Table of Contents

References:

a) SII CT bogie frame shell drawing A6Z00375103203
b) SII CT lifting device bracket drawing A6Z00375080006.
c) SII track brake bracket drawing A6Z00375101644.
d) SII CT measurement drawing A6Z00375105933.
e) SII CT measurement report S70-CT-US00138-MA_REF.
f) SII CT frame ACFM report

INTENDED USE

Rework of SLC4 S70 CT US00138 and bolster.

1. Measurement Taken:

- Measurements report S70-CT-US00138-MACH.pdf was NOT approved.

2. Visual Inspection

- See separate Quality Inspection Report for details.

3. Non-Destructive Test (NDT)

- ACFM has been performed and passed for center truck frame.

4. Rework of SLC4 S70 Center Truck

4.1 Rework of CT Lifting Device Bracket

1. During receiving inspection, Siemens production team found that wheel 1 lifting device bracket was bent inward.

2. Place CT frame on a fixture which allows for heat to be applied to required areas.

3. The lifting device bracket at first quadrant was bent. Manually straighten lifting device bracket using heat or porta power to within the tolerance according to drawing A6Z00375080006 and QAP-042 Flame straightening procedure.

Note- Heat may be applied as an aide to the Straightening process, the following is provided for guidance:

- Line Heat is employed to repair a bend in a plate about its weak axis.
- Line heat consists of a single straight pass of the torch.
- Line heat is applied to the underside of a plate element subjected to bending.
- Only one heat cycle is allowed.
- The maximum temperature of material is 500 Deg C (932 Deg F)
- The use of heat sticks or equivalent method of determining temperature during straightening is required.

Figure 1: Track Clearer Bent Lifting Device Bracket

4.2 Rework of track brake Bracket

1. During receiving inspection, the first and second quadrant track brake brackets were found to be bent upward. In the frame measurement report, X6.1.2/4 dimension out of tolerance is also suggesting that these brackets need straightening before returning to service.

2. Place CT frame on a fixture which allows for heat to be applied to required areas.

Figure 2: Damaged track brake brackets.

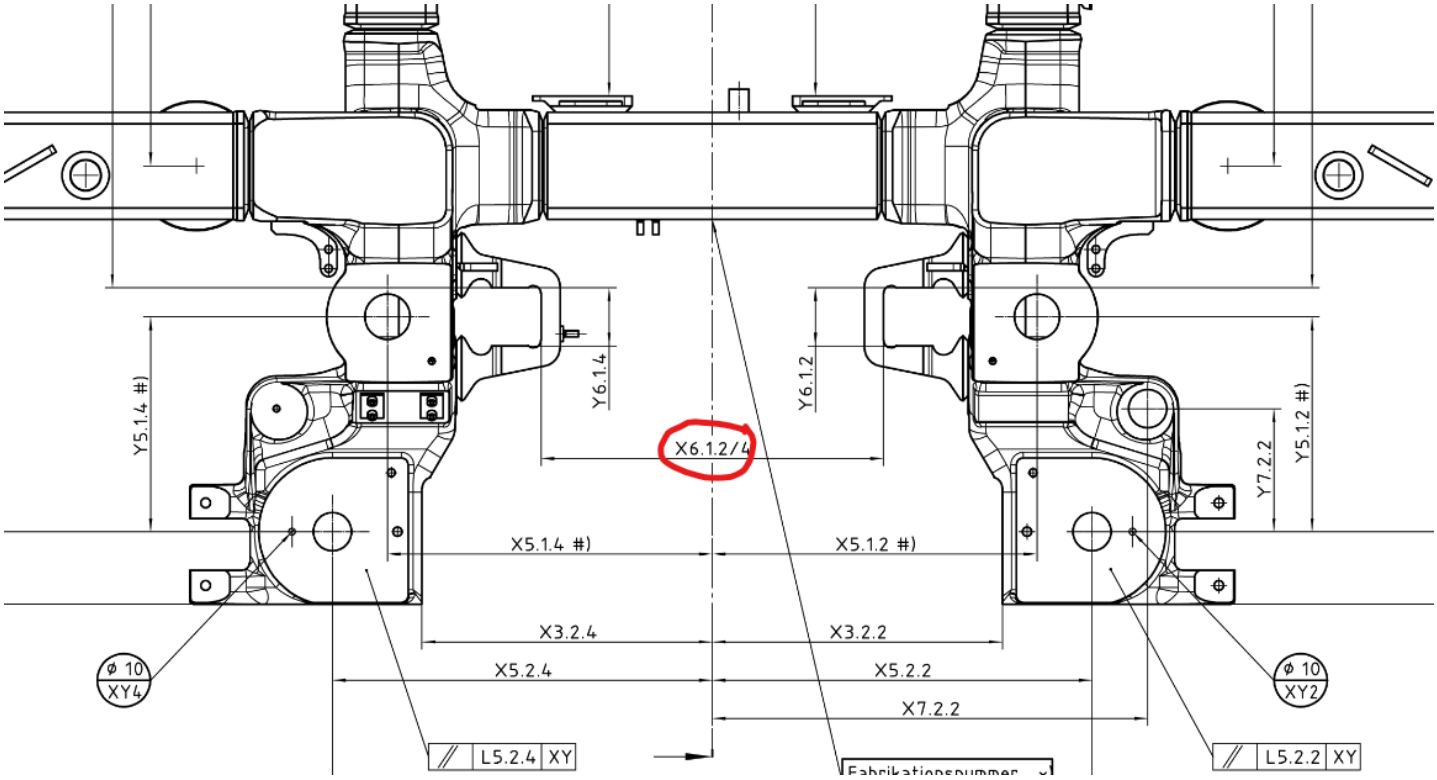


Figure 3: Affected dimensional measurement locations.

Table 1: Affected dimensional measurements and out of tolerance value.

	Nominal (MM)	+ (MM)	- (MM)	Actual (MM)	OoT
X6.1.2/4	456.0	0.5	-0.5	453.94	-1.56

3. The track brake brackets were bent upward. Manually straighten the bracket using heat or porta power according to frame shell drawing A6Z00375103203 and track brake bracket drawing A6Z00375101644. Refer to QAP-042 for flame straightening work instruction.

Note- Heat may be applied as an aide to the Straightening process, the following is provided for guidance:

- Line Heat is employed to repair a bend in a plate about its weak axis.
- Line heat consists of a single straight pass of the torch.
- Line heat is applied to the underside of a plate element subjected to bending.
- Only one heat cycle is allowed.
- The maximum temperature of material is 500 Deg C (932 Deg F).
- The use of heat sticks or equivalent method of determining temperature during straightening is required.
- Oxy-acetylene torch to be set to a neutral flame.
- Only cooling with still air is allowed. Forced cooling is not allowed.

5. Post Repair Non-Destructive Test (NDT)

- After all repairs are completed, perform ACFM test to check all new welds.

6. Painting

- After repairs and NDT are completed and found to be satisfactory, paint affected areas using ENS-333 most current rev for guidance.

7. Document Review

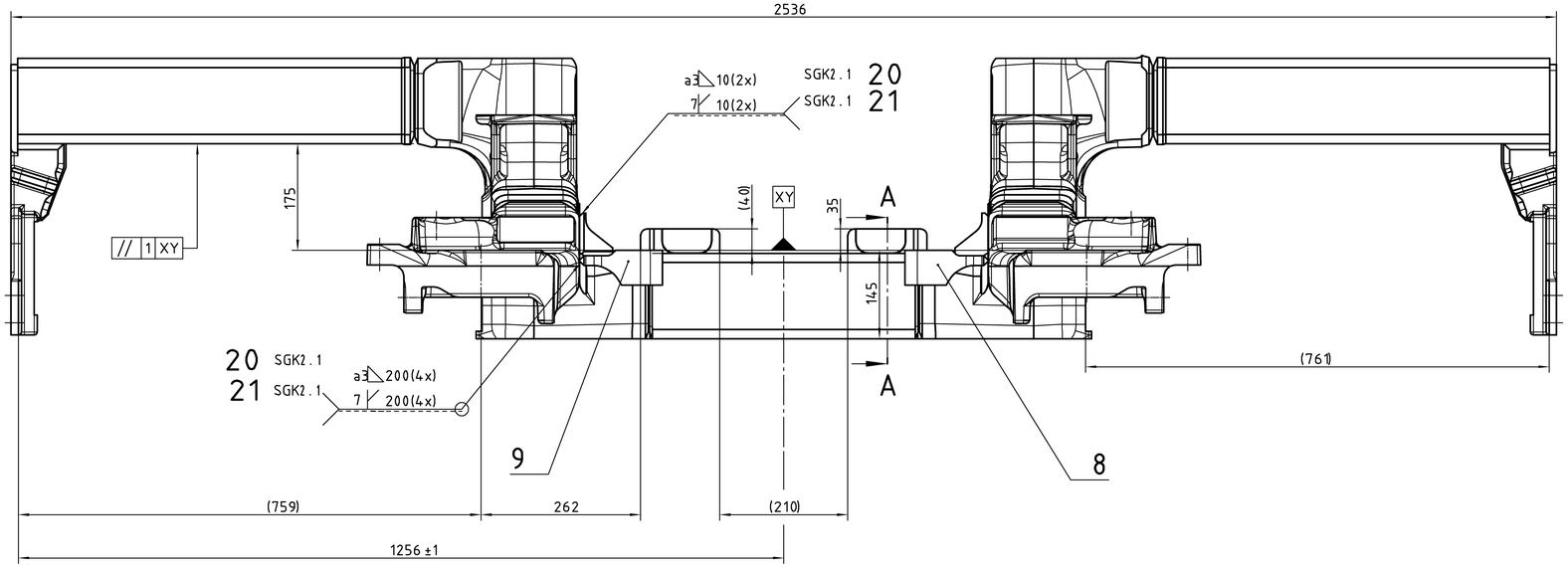
- QA review documentation for completeness and verify rework is complete.

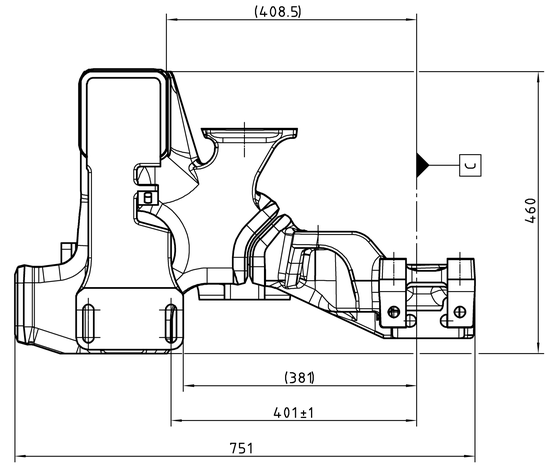
Verification Sign-off Sheet

NOTE: Separate sign-off sheet must be provided for each part being reworked using this procedure.

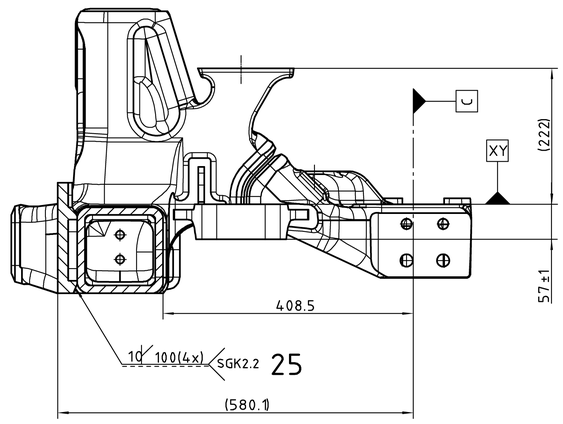
Serial Number: US00138

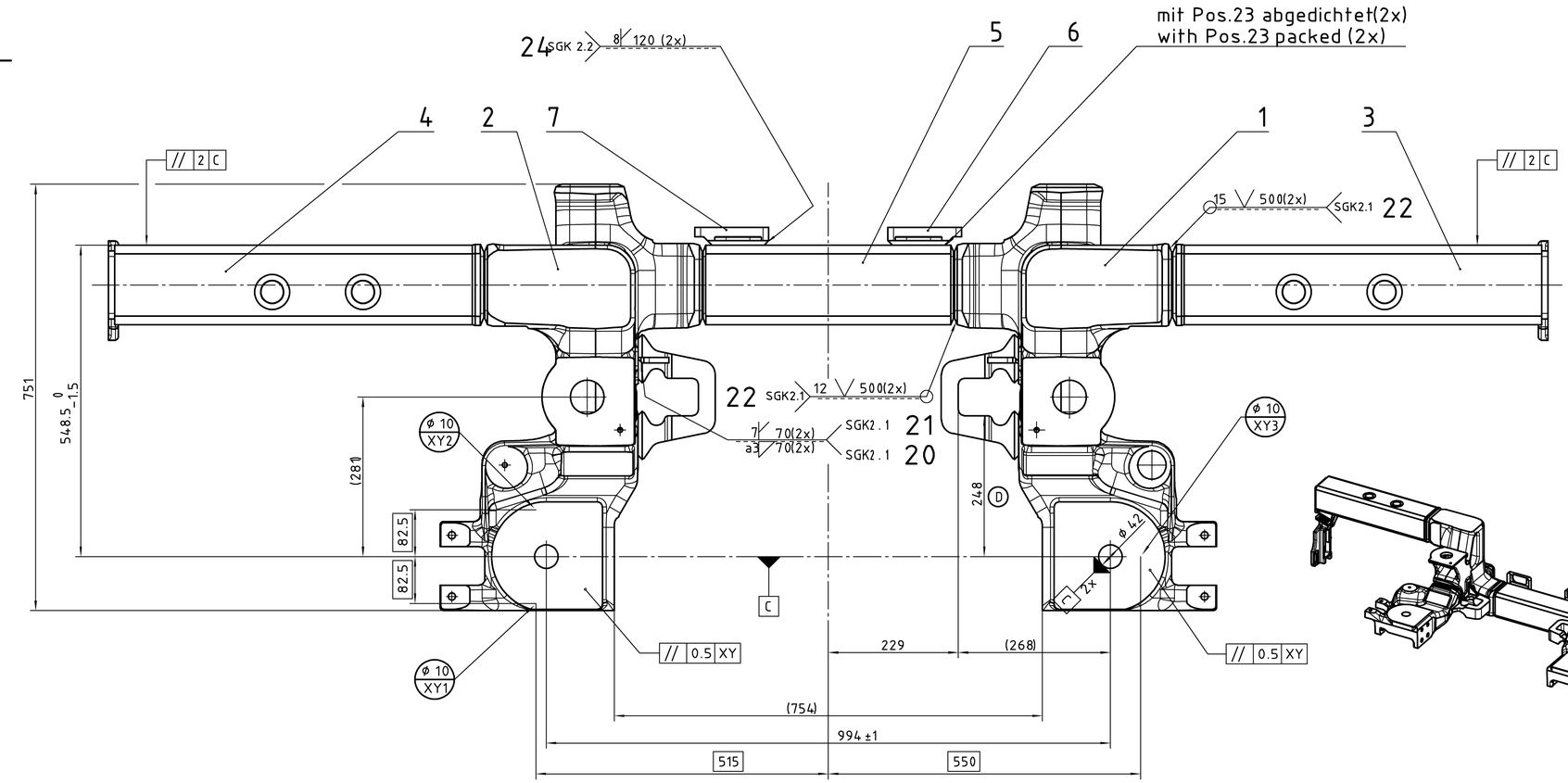
Step:	Description:	Signature:	Date:	Note/Comments:
4.1	Rework of CT Lifting Device Bracket			
4.2	Rework of track brake Bracket			
5	Post Repair NDT	QA:		
6	Painting	Prod:		
7	Document Review	QA:		
(Use space below if more room is needed for comments)				

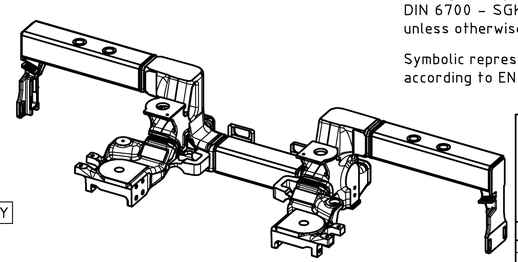




A-A
1:5







Gueteanforderungen an
Schweissverbindungen allgemein:
DIN 6700 – Schweissnahtgueteklasse 2.3
Anforderungen nach SGK2.2 oder SGK2.1
sind an der Schweissnaht angegeben.

Schweiss – Symbole nach EN 22553

welding quality class (SGK) generally:
DIN 6700 – SGK 2.3
unless otherwise stated

Symbolic representation of welding
according to EN 22553

(E)

Achtung:
Die Arbeitspapiere und/oder technischen Spezifikationen sind zu beachten!

Attention:
Refer to additional manufacturing instructions and/or technical specifications!

Bauteilklassifizierung nach DIN 6700 – 2 C1

classification of the components
according to DIN 6700 – 2 C1

Part no.	Siemens no.
A2V00397230933	G04_75103203

DRAWING SHALL BE REVISED BY THE CAD SYSTEM ONLY

Avanto/S70

Index	Revision no.	Date	Name
A	K333-625696	10-02	HOI
B	K333-627393	01-03	HOI
C	500000004656	02-05	SCH
D	500000010518	05-05	B
E	500000106460	06-09	P

ISO 2768-mK
ISO 13920-BF

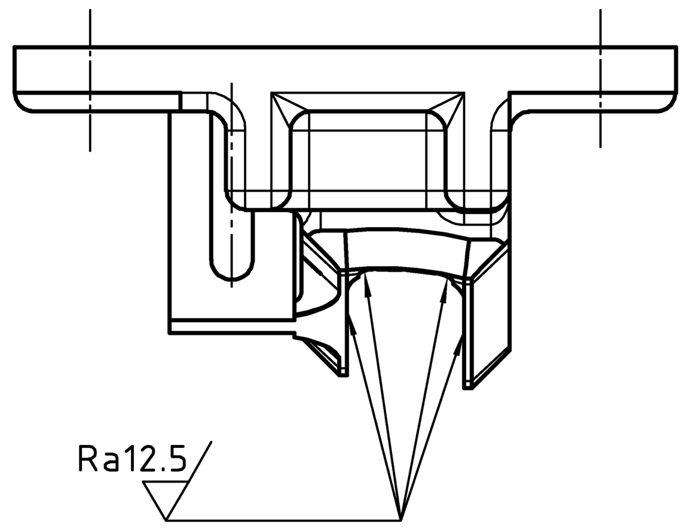
400.500KG | A1 | 1 MO
460X751X2536
MTB008
TS_REA03

1:5	Prepared	2002-10-04	SCHOBEG
	Checked	2002-10-16	DIEMLIN
	Approved	2002-10-16	SCHOENW
	Date		Name
	EN/DE		

Longitudinal beam
trailer bogie
LFW Langtraeger

SIEMENS

A6Z00375103203 | E | 01/01



A1-A3 Punkte zur Bestimmung der Bezugsebebne A

A1-A3 Points to define the main plane A

C1-C4 Punkte zur Bestimmung der Bezugsebebne C

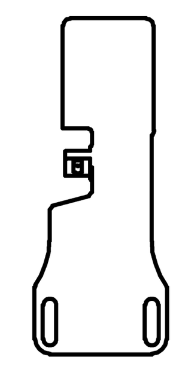
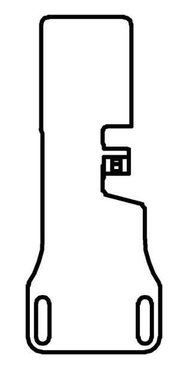
C1-C4 Points to define the main plane C

ALLE UNBEMASSTEN RADIEN R=5

RADII WITHOUT DIMENSIONS R=5

× genaue Abmasse und Position nach Wahl des Herstellers

× exact dimensions and positioning according to choice of supplier

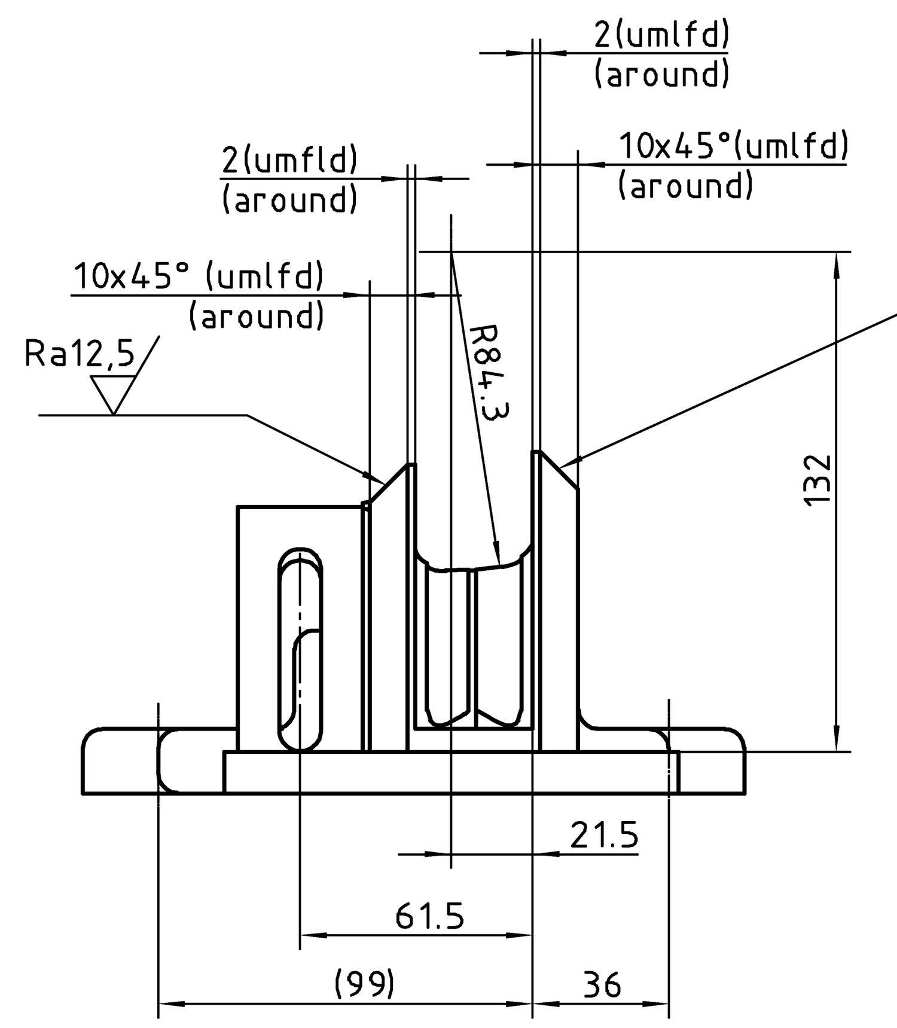
W.G. as drawn	97227034	SP.G opposite as drawn	97239654
 1:10		 1:10	

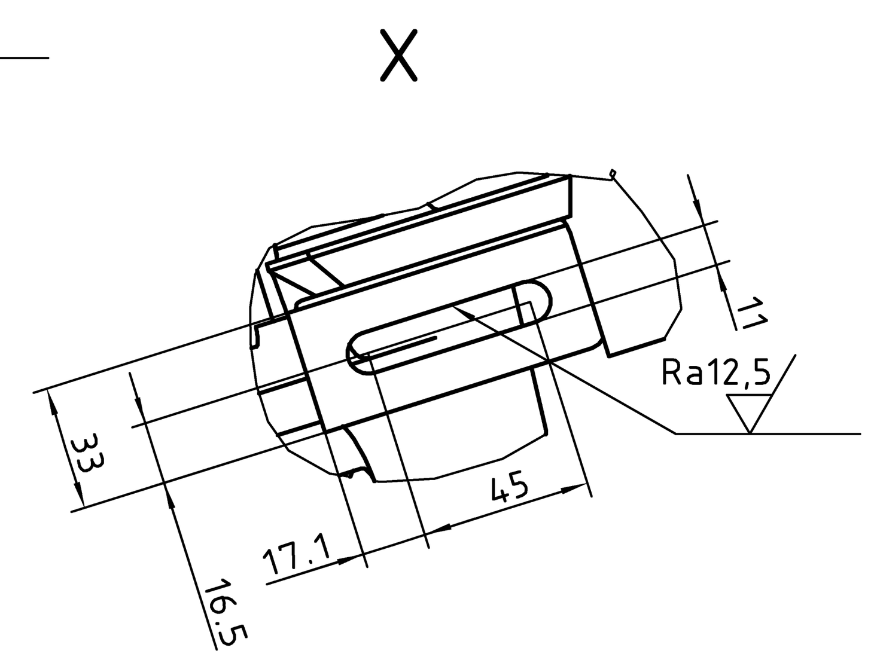
Achtung:
Die Arbeitspapiere und/oder technischen Spezifikationen sind zu beachten!

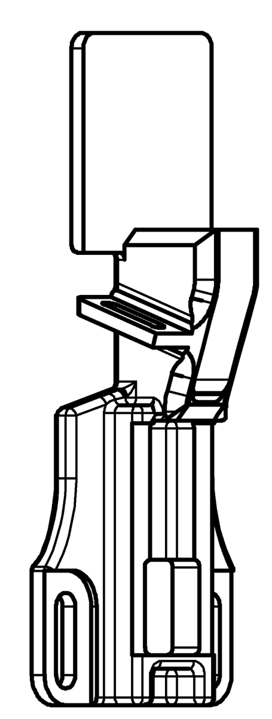
Attention:
Refer to additional manufacturing instructions and/or technical specifications!

Werkstoff / Norm Material / Standard	GS21Mn5N/SEW 685
Güteklasse 1) quality class 1)	B
Fertigungsschweissungen nicht erlaubt production welding not allowed	S
Feld fuer Kennzeichnung 1) marking area 1)	K
Bereiche die s3v3 abweichen areas differ from s3v3	S.V
Wandstaerkentoleranz fuer s<=16 tolerance of material thickness	-0 / +3
Allgemeintoleranzen ISO 8062 system of dimensional tolerances ISO 8062	CT 11
Massgeblicher Querschnitt limiting cross section	Q

1) nach technischer Spezifikation G04__75060312
according to technical specification G04__75060312







√ (Ra6,3 √ , Ra12,5 √)

Part no.	Siemens no.
A2V00397227034	G04__75080006

DRAWING SHALL BE REVISED BY THE CAD SYSTEM ONLY

Index	Revision no.	Date	Name
A	K333-627227	07-02	MAI
B	K333-631309	06-03	MAI
C	500000106460	06-09	!

ISO 2768-mK
ISO 1101

13.100 KG | A1 | I MO

90,2X175X444
G21MN5+N
1.1138+N
SEW685

MTB
TS_REA

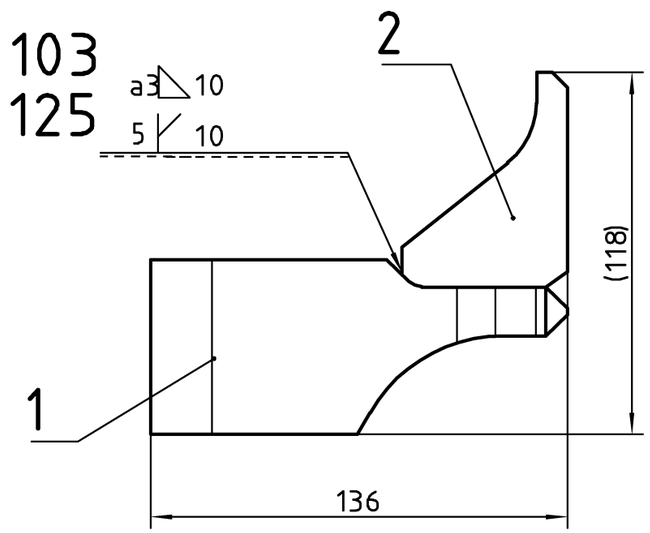
1:2		Date	Name
	Prepared	2002-07-09	SCHOBEG_GE
	Checked		
	Approved	2002-07-09	SCHOBEG_GE
		EN/DE	

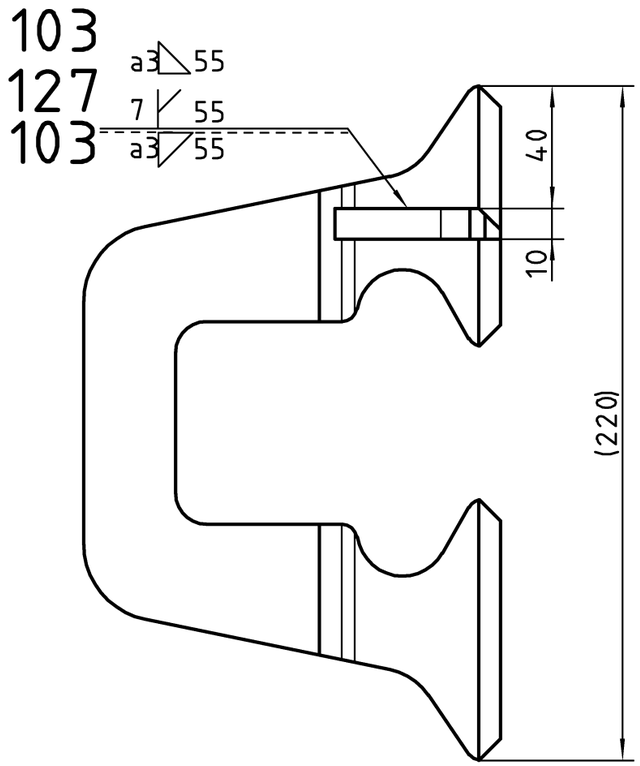
Lifting device

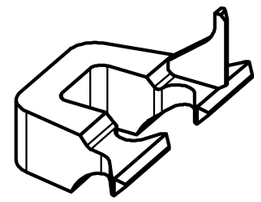
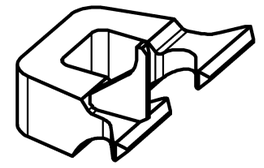
Abhebesicherung

SIEMENS

A6Z00375080006 | C | 01/01





W.G. as drawn	97239641	SP.G opposite as drawn	97239649
			

Gueteanforderungen an
Schweissverbindungen allgemein:
DIN 6700 – Schweissnahtgueteklasse 2.3
Anforderungen nach SGK2.2 oder SGK2.1
sind an der Schweissnaht angegeben.

Schweiss – Symbole nach EN 22553

welding quality class (SGK) generally:
DIN 6700 – SGK 2.3
unless otherwise stated

Symbolic representation of welding
according to EN 22553

Achtung:
Die Arbeitspapiere und/oder technischen
Spezifikationen sind zu beachten!

(A)

Attention:
Refer to additional manufacturing
instructions and/or technical specifications!

Bauteilklassifizierung nach DIN 6700 – 2 C1

classification according to DIN6700 – 2 C1

Part no. A2V00397239641

Siemens no. G04__75101644

DRAWING SHALL BE REVISED BY THE CAD SYSTEM ONLY

Index	Revision no.	Date	Name
A	500000106460	06-09	!

ISO 13920-BF
ISO 1101

4.106 KG | A3 | 1 MO

MTB
TS_REA

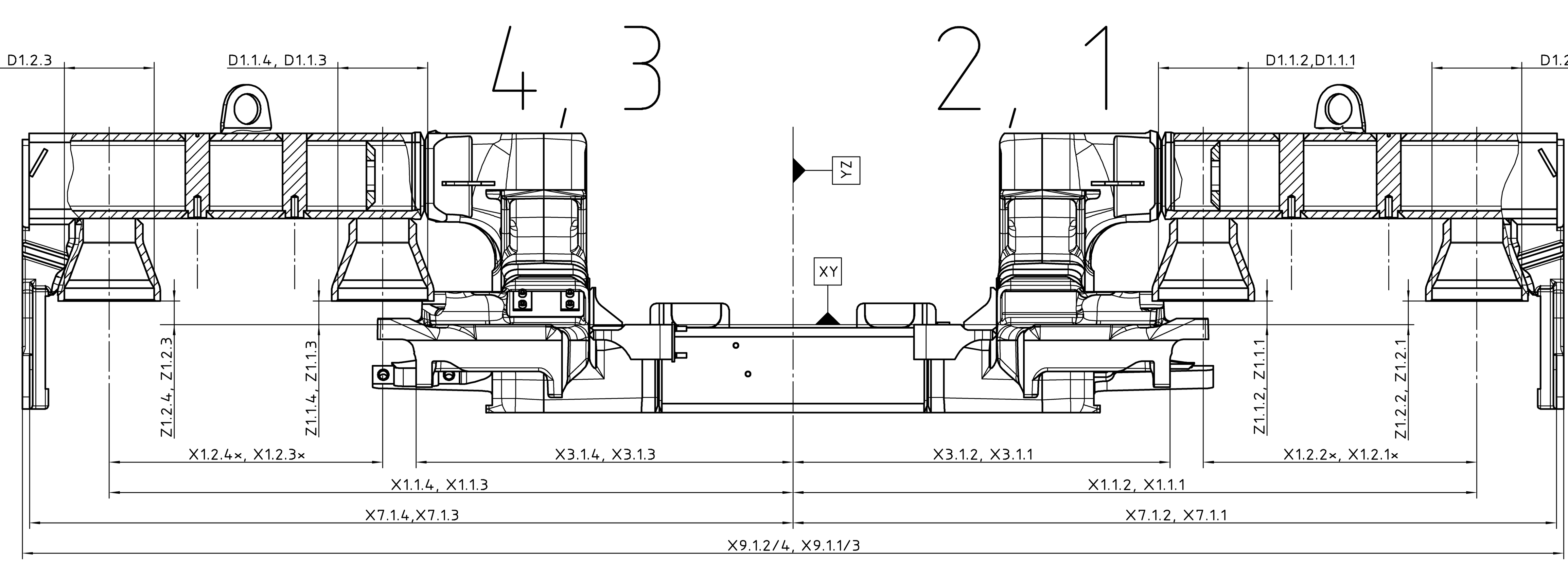
1:2	Prepared	2002-09-30	ROSSMAN_ER
	Checked		
	Approved	2002-09-30	ROSSMAN_ER
	Date		Name
	EN/DE		

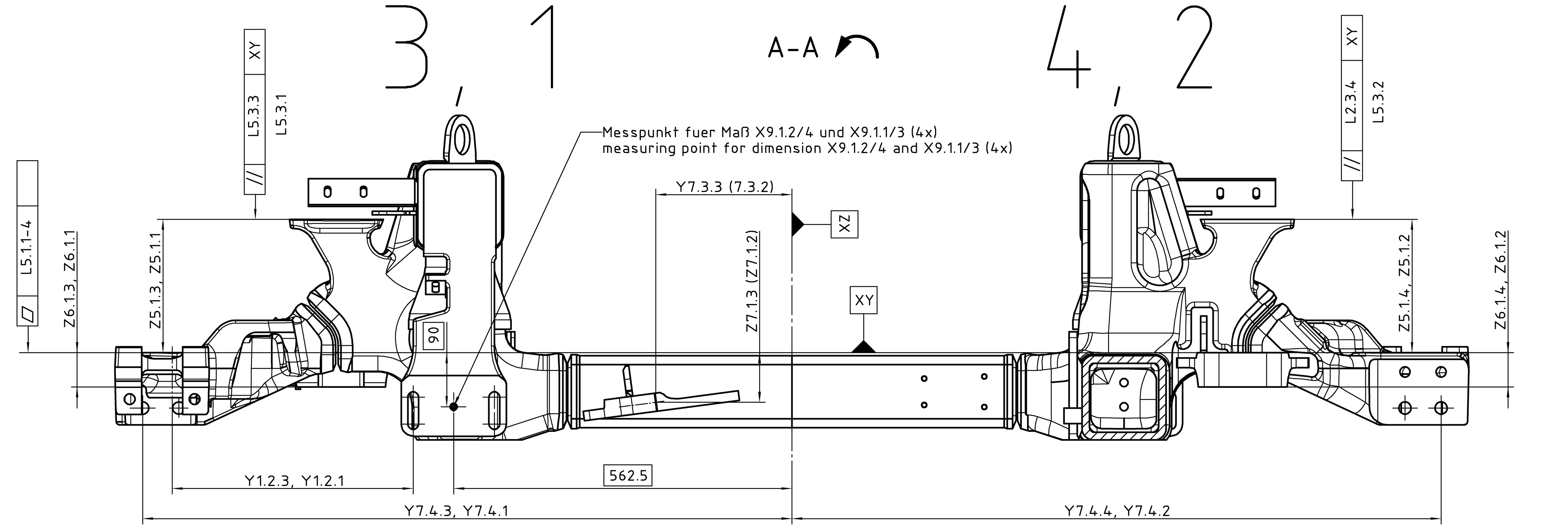
SIEMENS

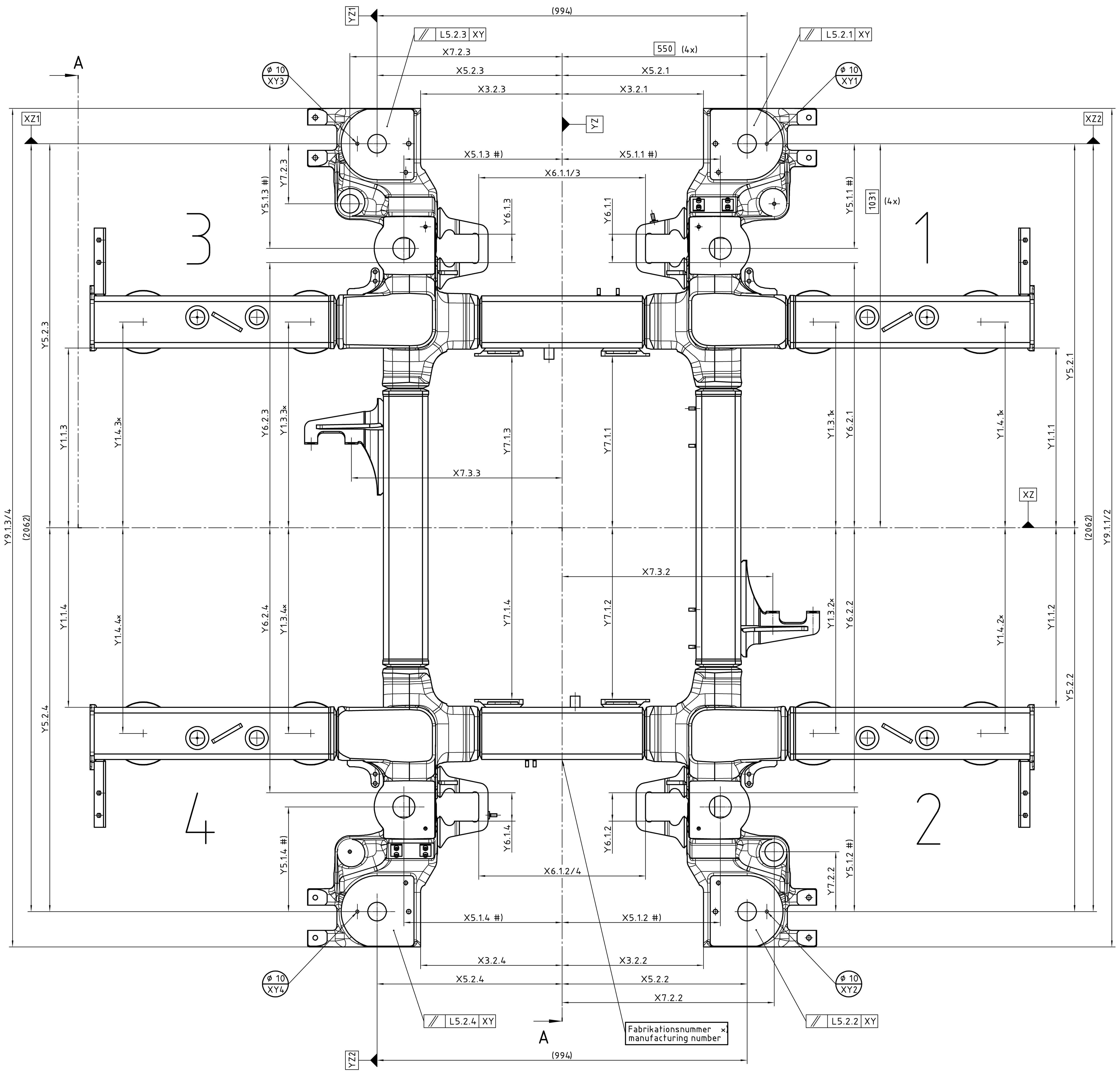
Bracket f. rail brake

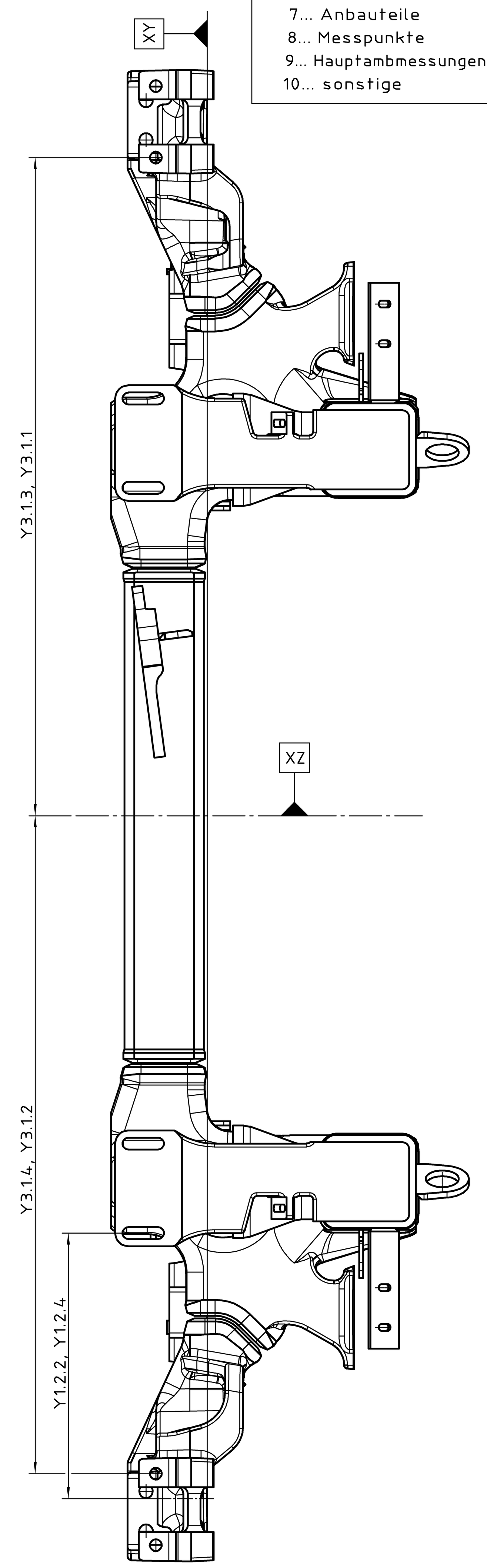
Konsole f. Magnetbremse

A6Z00375101644 | A | 01/01









Legende zu Baugruppen- Zuordnung (erste Zahl der Maßgruppe entspricht der Baugruppe)	legend of component allocation (first number of dimension group equivalent to component)
1... Radsatzführung	1... wheelset steering
2... Antrieb	2... traction unit
3... Laengsmitnahme	3... traction link
4... Bremse	4... brake
5... Sekundaerfeder	5... secondary suspension
6... Schienenbremse	6... track brake
7... Anbauteile	7... assembly components
8... Messpunkte	8... measuring points
9... Hauptambmessungen	9... main dimensions
10... sonstige	10... miscelaneous

Form u. Lagetoleranzen

shape and positional tolerances

Baugruppe Assembly	Maßgruppe dimension-group	Toleranz tolerance
5	L5.1.1-4	2
	L5.2.1	1
	L5.2.2	1
	L5.2.3	1
	L5.2.4	1
	L5.3.1	1
	L5.3.2	1
	L5.3.3	1
	L5.3.4	1

Baugruppe Assembly		Maßgruppe dimension-group	Nennmaß nominal size (mm)	oberes Abmaß upper dev. (mm)	unteres Abmaß lower dev. (mm)
1	X	X1.1.1	1125	0.3	0.3
		X1.1.2	1125	0.3	0.3
		X1.1.3	1125	0.3	0.3
		X1.1.4	1125	0.3	0.3
		X1.2.1	450	0.1	0.1
		X1.2.2	450	0.1	0.1
		X1.2.3	450	0.1	0.1
		X1.2.4	450	0.1	0.1
	Y	Y1.1.1	482.5	2	2
		Y1.1.2	482.5	2	2
		Y1.1.3	482.5	2	2
		Y1.1.4	482.5	2	2
		Y1.2.1	401	2	2
		Y1.2.2	401	2	2
		Y1.2.3	401	2	2
		Y1.2.4	401	2	2
		Y1.3.1	552.5	0.3	0.3
		Y1.3.2	552.5	0.3	0.3
		Y1.3.3	552.5	0.3	0.3
		Y1.3.4	552.5	0.3	0.3
		Y1.4.1	552.5	0.3	0.3
		Y1.4.2	552.5	0.3	0.3
		Y1.4.3	552.5	0.3	0.3
		Y1.4.4	552.5	0.3	0.3
	Z	Z1.1.1	39	0.2	0.2
		Z1.1.2	39	0.2	0.2
		Z1.1.3	39	0.2	0.2
		Z1.1.4	39	0.2	0.2
		Z1.2.1	39	0.2	0.2
		Z1.2.2	39	0.2	0.2
		Z1.2.3	39	0.2	0.2
		Z1.2.4	39	0.2	0.2
	D	D1.1.1	ϕ 150	0.04	0
		D1.1.2	ϕ 150	0.04	0
		D1.1.3	ϕ 150	0.04	0
		D1.1.4	ϕ 150	0.04	0
		D1.2.1	ϕ 150	0.04	0
		D1.2.2	ϕ 150	0.04	0
		D1.2.3	ϕ 150	0.04	0
		D1.2.4	ϕ 150	0.04	0
3	X	X3.1.1	620.3	0.2	0.2
		X3.1.2	620.3	0.2	0.2
		X3.1.3	620.3	0.2	0.2
		X3.1.4	620.3	0.2	0.2
		X3.2.1	380	0.3	0.3
		X3.2.2	380	0.3	0.3
		X3.2.3	380	0.3	0.3
		X3.2.4	380	0.3	0.3
	Y	Y3.1.1	993.5	1.5	1.5
		Y3.1.2	993.5	1.5	1.5
		Y3.1.3	993.5	1.5	1.5
		Y3.1.4	993.5	1.5	1.5
5	X	X5.1.1	425	2	2
		X5.1.2	425	2	2
		X5.1.3	425	2	2
		X5.1.4	425	2	2
		X5.2.1	497	0.2	0.2
		X5.2.2	497	0.2	0.2
		X5.2.3	497	0.2	0.2
		X5.2.4	497	0.2	0.2
	Y	Y5.1.1	281	1	2
		Y5.1.2	281	1	2
		Y5.1.3	281	1	2
		Y5.1.4	281	1	2
		Y5.2.1	1031	0.3	0.3
		Y5.2.2	1031	0.3	0.3
		Y5.2.3	1031	0.3	0.3
		Y5.2.4	1031	0.3	0.3
(J)	Z	Z5.1.1	222	2	2
		Z5.1.2	222	2	2
		Z5.1.3	222	2	2
		Z5.1.4	222	2	2

Baugruppe Assembly		Maßgruppe dimension-group	Nennmaß nominal size (mm)	oberes Abmaß upper dev. (mm)	unteres Abmaß lower dev. (mm)
6	X	X6.1.1/3	456××	0.5	0.5
		X6.1.2/4	456××	0.5	0.5
	Y	Y6.1.1	76	0.3	0.3
		Y6.1.2	76	0.3	0.3
		Y6.1.3	76	0.3	0.3
		Y6.1.4	76	0.3	0.3
		Y6.2.1	712	0.5	0.5
		Y6.2.2	712	0.5	0.5
		Y6.2.3	712	0.5	0.5
		Y6.2.4	712	0.5	0.5
	Z	Z6.1.1	57	2	2
		Z6.1.2	57	2	2
		Z6.1.3	57	2	2
		Z6.1.4	57	2	2
7	X	X7.1.1	1256	1	1
		X7.1.2	1256	1	1
		X7.1.3	1256	1	1
		X7.1.4	1256	1	1
		X7.2.2	570	1	1
		X7.2.3	570	1	1
		X7.3.2	566	2	3
		X7.3.3	566	2	3
	Y	Y7.1.1	461	1	0
		Y7.1.2	461	1	0
		Y7.1.3	461	1	0
		Y7.1.4	461	1	0
		Y7.2.2	161	2	2
		Y7.2.3	161	2	2
		Y7.3.2	226.6	2	2
		Y7.3.3	226.6	2	2
		Y7.4.1	1080	2	2
		Y7.4.2	1080	2	2
		Y7.4.3	1080	2	2
		Y7.4.4	1080	2	2
	Z	Z7.1.2	82.6	2	2
		Z7.1.3	82.6	2	2
9	X	X9.1.1/3	2536	2	4
		X9.1.2/4	2536	2	4
	Y	Y9.1.1/2	2252	2	4
		Y9.1.3/4	2252	2	4

×... Maß bezieht sich auf Mitte Federtoepfe

×... dimension refers to center of suspension pots

××...Maß mit Verschleißplatte

××...Measure with wear plate

#) ..... Die Masze Y5.1.1 - Y5.1.4 / X5.1.1 - X5.1.4 und Z5.1.1 - Z5.1.4 gelten nicht bei der Schraubenfedervariante.

#) ..... The measures Y5.1.1 - Y5.1.4 / X5.1.1 - X5.1.4 and Z5.1.1 - Z5.1.4 do not apply at the coil spring type.

(G)

Index	Revision no.	Date	Name
J	500000184695	01-12	GOT
C	K333-632240	08-03	STS
D	K333-647464	05-04	STS
E	500000011314	05-05	SCM
F	500000133249	02-10	HOTH
G	500000137626	04-10	GOT
H	500000151931	10-10	TOC

Part no. A2V00375105933

Siemens no.

PDMLink | DRAWING SHALL BE REVISED BY THE CAD SYSTEM ONLY

ISO 2768-mK
ISO 1101

0.000 KG | A0

2252X2536X540

MTB008
TS_REB02

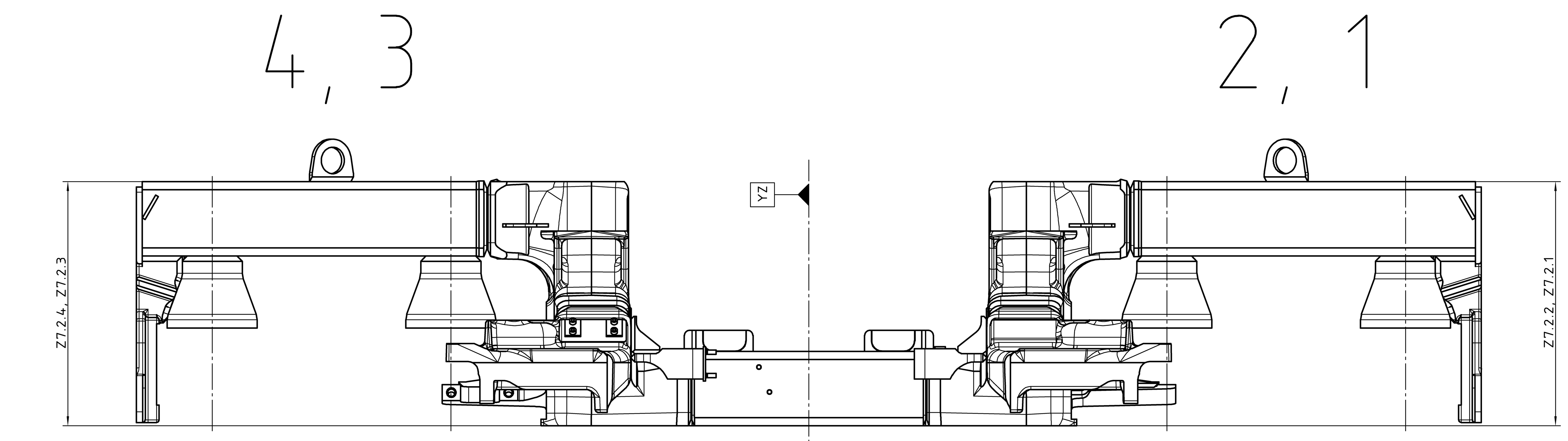
1:5		Date	Name
	Prepared	2002-12-12	STEGER
	Checked	2003-01-10	DIEMLIN
	Approved	2003-01-10	SCHOBEG
		EN/DE	

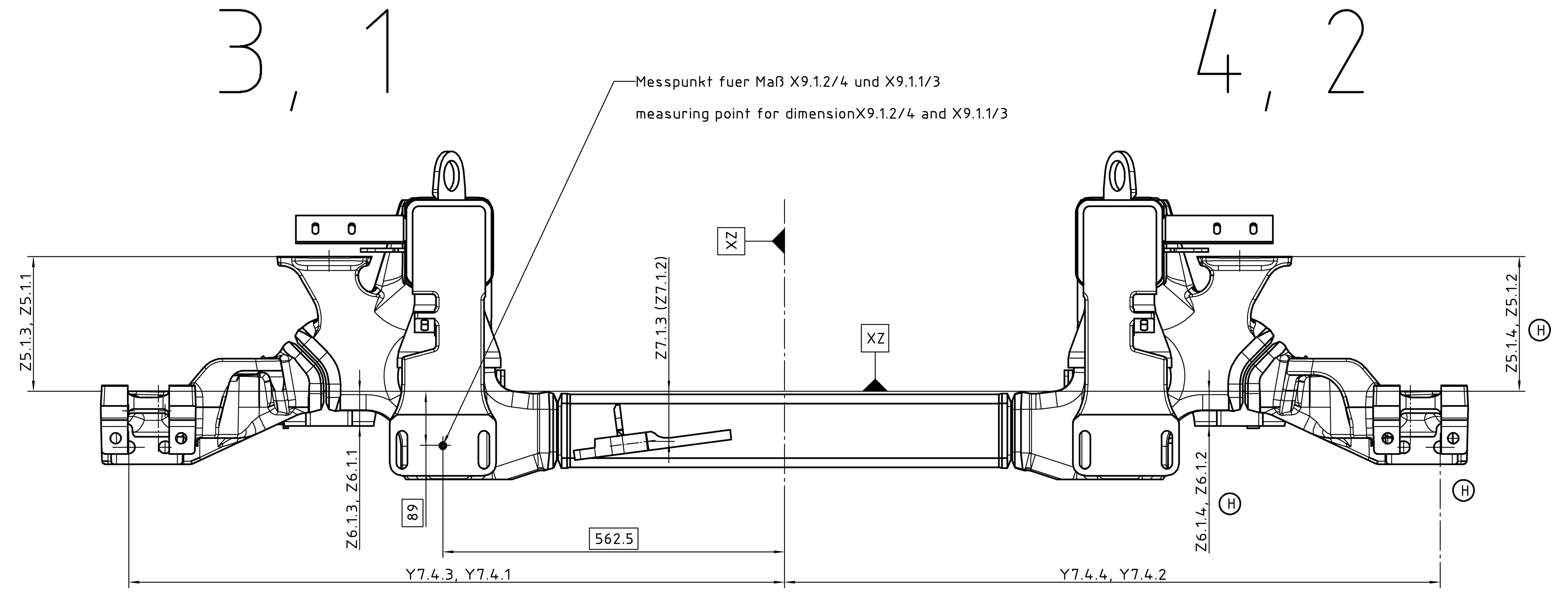
Trailer bogie frame
Measuring plan
LFW Rahmen Meszplan

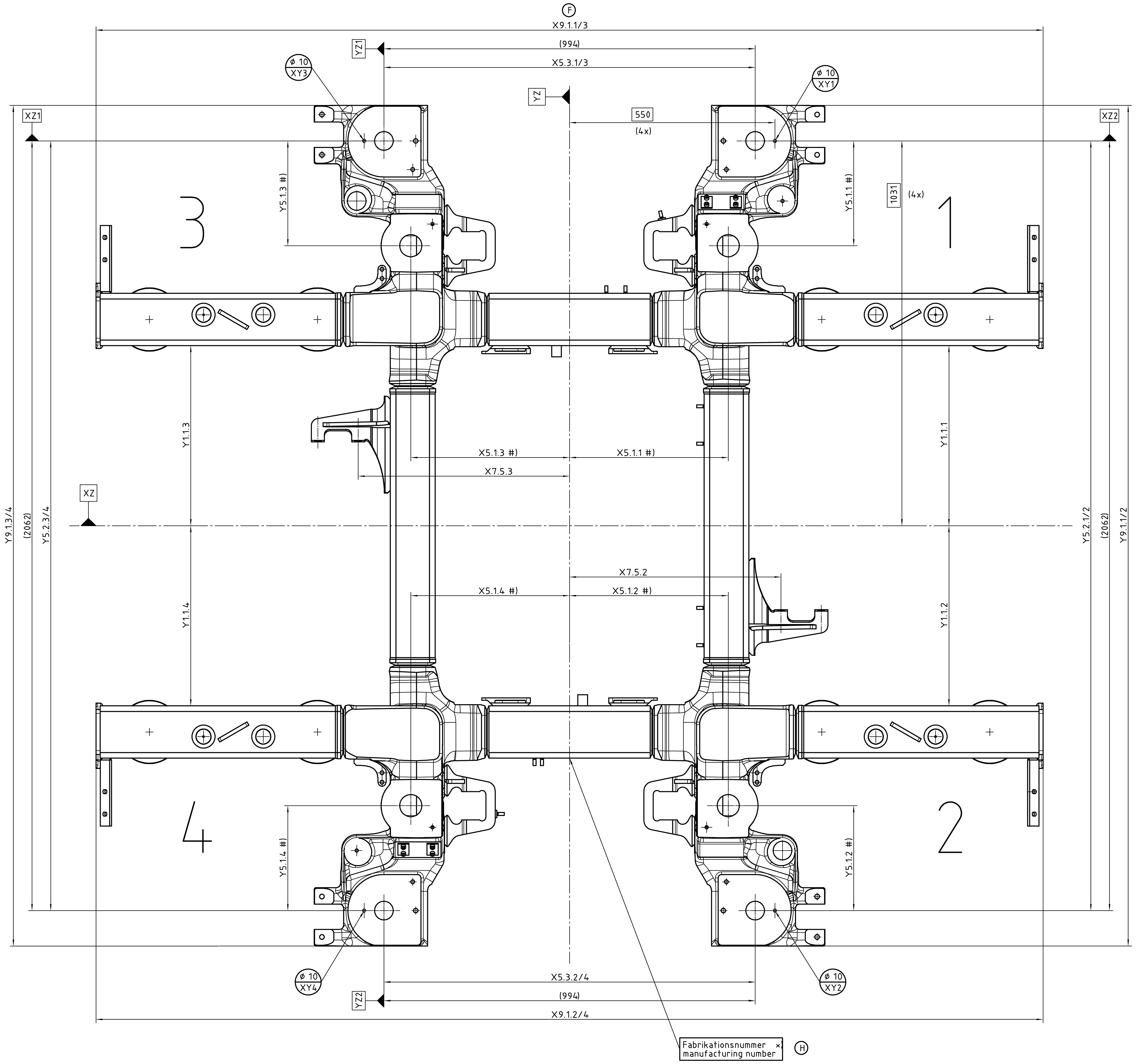
SIEMENS

A6Z00375105933 | J | 01/02

A0







Legende zu Baugruppen- Zuordnung (erste Zahl der Maßgruppe entspricht der Baugruppe)	legend of component allocation (first number of dimension group equivalent to component)
1... Radsatzführung	1... wheelset steering
2... Antrieb	2... traction unit
3... Laengsmitnahme	3... traction link
4... Bremse	4... brake
5... Sekundaerfeder	5... secondary suspension
6... Schienenbremse	6... track brake
7... Anbauteile	7... assembly components
8... Messpunkte	8... measuring points
9... Hauptambmessungen	9... main dimensions
10... sonstige	10... miscelaneous

Baugruppe Assembly		Maßgruppe dimension-group	Nennmaß nominal size (mm)	oberes Abmaß upper dev. (mm)	unteres Abmaß lower dev. (mm)
		Y1.1.1	482.5	2	2
		Y1.1.2	482.5	2	2
		Y1.1.3	482.5	2	2
		Y1.1.4	482.5	2	2
5	X	X5.1.1	425	2	2
		X5.1.2	425	2	2
		X5.1.3	425	2	2
		X5.1.4	425	2	2
		X5.3.1/3	994	2	2
		X5.3.2/4	994	2	2
	Y	Y5.1.1	281	1	2
		Y5.1.2	281	1	2
		Y5.1.3	281	1	2
		Y5.1.4	281	1	2
		Y5.2.1/2	2062	2	2
		Y5.2.3/4	2062	2	2
	Z	Z5.1.1	222	1	1
		Z5.1.2	222	1	1
		Z5.1.3	222	1	1
		Z5.1.4	222	1	1
6	Z	Z6.1.1	57	2	2
		Z6.1.2	57	2	2
		Z6.1.3	57	2	2
		Z6.1.4	57	2	2
7	X	X7.5.2	566	2	2
		X7.5.3	566	2	2
	Y	Y7.4.1	1080	2	2
		Y7.4.2	1080	2	2
		Y7.4.3	1080	2	2
		Y7.4.4	1080	2	2
	Z	Z7.1.2	82.6	2	2
		Z7.1.3	82.6	2	2
		Z7.2.1	460	3	3
		Z7.2.2	460	3	3
		Z7.2.3	460	3	3
		Z7.2.4	460	3	3
9	X	X9.1.1/3	2536	2	4
		X9.1.2/4	2536	2	4
	Y	Y9.1.1/2	2252	2	4
		Y9.1.3/4	2252	2	4

(F) – Z5.1.1 … Z5.1.4

#) ..... Die Masze Y5.1.1 – Y5.1.4 und X5.1.1 – X5.1.4 gelten nicht bei der Schraubenfedervariante.

#) ..... The measures Y5.1.1 – Y5.1.4 und X5.1.1 – X5.1.4 do not apply at the coil spring type.

Meszplan Rahmenrohbau

Part no. A2V00375105933

Siemens no.

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ISO 1101

0.000 KG | A0

2252X2536X540

MTB008
TS_REB02

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EN/DE

Trailer bogie frame
Measuring plan
LFW Rahmen Meszplan

SIEMENS

A6Z00375105933 | J | 02/02

A0

SIEMENS	PART NAME : S70 CENTER TRUCK, MACHINED REFURBISHMENT		May 24, 2024	08:13
	REV NUMBER : -	SER NUMBER : US00138	STATS COUNT : 1	

DRAWING NUMBER : A6Z00375105933
PART NUMBER : 75074334
INSPECTED BY : Michael Gonzalez
INSTRUMENT : FARO ARM 7 AXIS

⌖	MM	X1.1.1 - CIR1_150_Q1					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X		1125.00	0.30	-0.30	1124.52	-0.48	0.18
⌖	MM	X1.1.2 - CIR1_150_Q2					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X		1125.00	0.30	-0.30	1125.77	0.77	0.47
⌖	MM	X1.1.3 - CIR1_150_Q3					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X		1125.00	0.30	-0.30	1125.48	0.48	0.18
⌖	MM	X1.1.4 - CIR1_150_Q4					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X		1125.00	0.30	-0.30	1124.12	-0.88	0.58
⟷	MM	X1.2.1 - CIR2_150_Q1 TO CIR1_150_Q1 (XAXIS)					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M		450.00	0.10	-0.10	450.02	0.02	0.00
⟷	MM	X1.2.2 - CIR2_150_Q2 TO CIR1_150_Q2 (XAXIS)					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M		450.00	0.10	-0.10	449.99	-0.01	0.00
⟷	MM	X1.2.3 - CIR2_150_Q3 TO CIR1_150_Q3 (XAXIS)					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M		450.00	0.10	-0.10	450.00	0.00	0.00
⟷	MM	X1.2.4 - CIR1_150_Q4 TO CIR2_150_Q4 (XAXIS)					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M		450.00	0.10	-0.10	450.02	0.02	0.00
⌖	MM	X3.1.1 - CIR_18_Q1					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X		620.30	0.20	-0.20	620.35	0.05	0.00
⌖	MM	X3.1.2 - CIR_18_Q2					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X		620.30	0.20	-0.20	620.85	0.55	0.35

⌖	MM	X3.1.3 - CIR_18_Q3					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X		620.30	0.20	-0.20	620.67	0.37	0.17
⌖	MM	X3.1.4 - CIR_18_Q4					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X		620.30	0.20	-0.20	620.35	0.05	0.00
⌖	MM	X3.2.1 - PLN_2_Q1					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X		380.00	0.30	-0.30	379.81	-0.19	0.00
⌖	MM	X3.2.2 - PLN_2_Q2					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X		380.00	0.30	-0.30	380.53	0.53	0.23
⌖	MM	X3.2.3 - PLN_2_Q3					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X		380.00	0.30	-0.30	380.31	0.31	0.01
⌖	MM	X3.2.4 - PLN_2_Q4					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X		380.00	0.30	-0.30	379.94	-0.06	0.00
⌖	MM	X5.2.1 - CIR_Q1					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X		497.00	0.20	-0.20	496.94	-0.06	0.00
⌖	MM	X5.2.2 - CIR_Q2					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X		497.00	0.20	-0.20	497.36	0.36	0.16
⌖	MM	X5.2.3 - CIR_Q3					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X		497.00	0.20	-0.20	497.26	0.26	0.06
⌖	MM	X5.2.4 - CIR_Q4					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X		497.00	0.20	-0.20	497.00	0.00	0.00
⟷	MM	X6.1.1/3 - PLN_CIP_Q3 TO PLN_CIP_Q1 (XAXIS)					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M		456.00	0.50	-0.50	456.11	0.11	0.00
⟷	MM	X6.1.2/4 - PLN_CIP_Q2 TO PLN_CIP_Q4 (XAXIS)					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M		456.00	0.50	-0.50	453.94	-2.06	1.56
⌖	MM	X7.1.1 - PLN2_Q1					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X		1256.00	1.00	-1.00	1255.83	-0.17	0.00

⌗	MM	X7.1.2 - PLN2_Q2					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X		1256.00	1.00	-1.00	1256.95	0.95	0.00
⌗	MM	X7.1.3 - PLN2_Q3					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X		1256.00	1.00	-1.00	1256.49	0.49	0.00
⌗	MM	X7.1.4 - PLN2_Q4					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X		1256.00	1.00	-1.00	1255.68	-0.32	0.00

DIAMETER D1.1.1-4 AND D1.2.1-4 ARE MANUELY INPUTED

1	MM	D1.1.1					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M		150.000	0.040	0.000	150.010	0.010	0.000
1	MM	D1.1.2					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M		150.000	0.040	0.000	150.000	0.000	0.000
1	MM	D1.1.3					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M		150.000	0.040	0.000	150.020	0.020	0.000
1	MM	D1.1.4					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M		150.000	0.040	0.000	150.020	0.020	0.000
1	MM	D1.2.1					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M		150.000	0.040	0.000	149.990	-0.010	0.010
1	MM	D1.2.2					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M		150.000	0.040	0.000	150.010	0.010	0.000
1	MM	D1.2.3					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M		150.000	0.040	0.000	150.010	0.010	0.000
1	MM	D1.2.4					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M		150.000	0.040	0.000	149.990	-0.010	0.010
⌗	MM	Y1.1.1 - PLN3_Q1					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y		482.5	2.0	-2.0	485.2	2.7	0.7
⌗	MM	Y1.1.2 - PLN3_Q2					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y		482.5	2.0	-2.0	484.8	2.3	0.3

⌖	MM	Y1.1.3 - PLN3_Q3					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y		482.5	2.0	-2.0	485.7	3.2	1.2
⌖	MM	Y1.1.4 - PLN3_Q4					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y		482.5	2.0	-2.0	484.8	2.3	0.3
⌖	MM	Y1.3.1 - CIR2_150_Q1					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y		552.50	0.30	-0.30	552.90	0.40	0.10
⌖	MM	Y1.3.2 - CIR2_150_Q2					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y		552.50	0.30	-0.30	553.11	0.61	0.31
⌖	MM	Y1.3.3 - CIR2_150_Q3					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y		552.50	0.30	-0.30	552.81	0.31	0.01
⌖	MM	Y1.3.4 - CIR2_150_Q4					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y		552.50	0.30	-0.30	553.06	0.56	0.26
⌖	MM	Y1.4.1 - CIR1_150_Q1					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y		552.50	0.30	-0.30	552.84	0.34	0.04
⌖	MM	Y1.4.2 - CIR1_150_Q2					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y		552.50	0.30	-0.30	552.91	0.41	0.11
⌖	MM	Y1.4.3 - CIR1_150_Q3					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y		552.50	0.30	-0.30	552.69	0.19	0.00
⌖	MM	Y1.4.4 - CIR1_150_Q4					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y		552.50	0.30	-0.30	552.53	0.03	0.00
⌖	MM	Y3.1.1 - CIR_18_Q1					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y		993.50	1.50	-1.50	993.04	-0.46	0.00
⌖	MM	Y3.1.2 - CIR_18_Q2					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y		993.50	1.50	-1.50	991.91	-1.59	0.09
⌖	MM	Y3.1.3 - CIR_18_Q3					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y		993.50	1.50	-1.50	992.61	-0.89	0.00

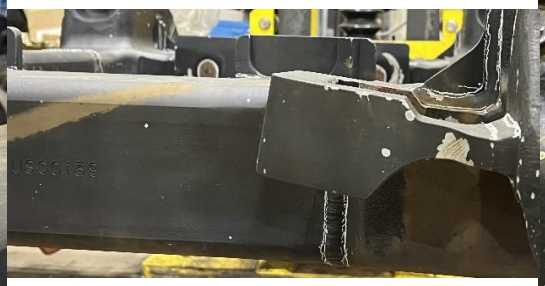
⌗	MM	Y3.1.4 - CIR_18_Q4					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y		993.50	1.50	-1.50	991.85	-1.65	0.15
⌗	MM	Y5.2.1 - CIR_Q1					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y		1031.00	0.30	-0.30	1030.79	-0.21	0.00
⌗	MM	Y5.2.2 - CIR_Q2					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y		1031.00	0.30	-0.30	1030.95	-0.05	0.00
⌗	MM	Y5.2.3 - CIR_Q3					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y		1031.00	0.30	-0.30	1030.75	-0.25	0.00
⌗	MM	Y5.2.4 - CIR_Q4					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y		1031.00	0.30	-0.30	1030.91	-0.09	0.00
⟷	MM	Y6.1.1 - PLN_CI_Q1 TO PLN_CO_Q1 (YAXIS)					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M		76.00	0.30	-0.30	76.43	0.43	0.13
⟷	MM	Y6.1.2 - PLN_CO_Q2 TO PLN_CI_Q2 (YAXIS)					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M		76.00	0.30	-0.30	76.59	0.59	0.29
⟷	MM	Y6.1.3 - PLN_CI_Q3 TO PLN_CO_Q3 (YAXIS)					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M		0.00	0.30	-0.30	76.29	76.29	75.99
⟷	MM	Y6.1.4 - PLN_CO_Q4 TO PLN_CI_Q4 (YAXIS)					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M		76.00	0.30	-0.30	76.57	0.57	0.27
⌗	MM	Y6.2.1 - PLN_CI_Q1					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y		712.00	0.50	-0.50	712.14	0.14	0.00
⌗	MM	Y6.2.2 - PLN_CI_Q2					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y		712.00	0.50	-0.50	712.66	0.66	0.16
⌗	MM	Y6.2.3 - PLN_CI_Q3					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y		712.00	0.50	-0.50	712.26	0.26	0.00
⌗	MM	Y6.2.4 - PLN_CI_Q4					
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y		712.00	0.50	-0.50	712.30	0.30	0.00

⌗	MM	Y7.1.2 - PLN_S_Q2						
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL	
Y		461.00	1.00	0.00	461.41	0.41	0.00	
⌗	MM	Y7.1.3 - PLN_S_Q3						
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL	
Y		461.00	1.00	0.00	461.23	0.23	0.00	
⌗	MM	Z1.2.1 - CIR1_150_Q1						
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL	
Z		39.00	0.20	-0.20	45.73	6.73	6.53	
⌗	MM	Z1.2.2 - CIR1_150_Q2						
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL	
Z		39.00	0.20	-0.20	38.55	-0.45	0.25	
⌗	MM	Z1.2.3 - CIR1_150_Q3						
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL	
Z		39.00	0.20	-0.20	37.30	-1.70	1.50	
⌗	MM	Z1.2.4 - CIR1_150_Q4						
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL	
Z		39.00	0.20	-0.20	47.78	8.78	8.58	
⌗	MM	Z6.1.1 - PLN_CT_Q1						
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL	
Z		57.0	2.0	-2.0	54.2	-2.8	0.8	
⌗	MM	Z6.1.4 - PLN_CT_Q4						
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL	
Z		57.0	2.0	-2.0	44.1	-12.9	10.9	
▱	MM	L5.1.1-4 - PLN_Z						
AX		NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL	
M		0.0	2.0	0.0	4.1	4.1	2.1	

ACFM INSPECTION REPORT

Customer: Utah Transit Authority **Project:** UTA 1122 Accident Inspection	**Inspection:** Andrew Conley **Cert No:** NTC2149 **Inspection:** N/A **Cert No:** N/A **Lizard Registered:** 25222
Unit: Center Truck	**Procedure:** QMP-005
Serial Number: US00138	**DWG:** N/A

Locations: 5301 Price Ave., McClellan Park, CA 95652



Inspection Results / Comments.

There were no reportable weld indications or defects at the time of inspection. Visible damage/deformation was found on one of the four lifting eyes, and on two of the four, track brake alignment blocks.

Inspection Signature: **Date:** 05/21/2024

Andrew Conley

Andrew Conley

cn=Andrew Conley, c=US, o=Siemens Mobility CS, ou=QA CWI Level II Inspector, email=andrew.conley@siemens.com
05/21/24

Lizard Registered : 25222

SIEMENS

RW-SLC4-PT-00043

Rework Procedure	**Project:**	SLC4 S70 PT

Distribution:

☒ ATM	☒ Prod. Mgr	☒ Prod. Engr	☒ PM	☒ QA
☐ Calculations	☐ Prod. Ctrl.	☒ QM	☒ Customer	☐ Subcontractor

Responsible Function: Bogie Service Center				
Platform:	**S/N Affected:**	**ECN#:**	**NCR#:**	**Drawing(s)/Part Number(s)**
☒ Bogie	US00043	N/A	200176452	A2V00001441496 A2V00397258998
☒ Bolster	US00612			

Implementation/Inspection Sign-off:

1. Production to inform Quality Assurance (QA) Inspector before repair work starts.
2. If Required Parent Material to be NDT Tested by ACFM, MT, or PT, prior to start of welding.

Problem Report Number: _____

Production Signature: _____ **Date:** _____

QA/CWI Signature: _____ **Date:** _____

Preparation:

1. Welder and Inspector shall be qualified in the rework process and required inspection methods (MT/PT/RT/VT). Reference QAI-057, QAI-043, BGI-002, BGI-003.
2. Part should be placed in a position that allows for base material repairs if required.

Rework Procedure:

NOTE:

- Production and Inspector shall sign off Implementation/ Inspection section above upon completion of their work.
- Where applicable adhere to SII-MNP-007 Workmanship Standard at all times.

APPROVALS:

Production Engineer _____ Originator

PQM _____ Project Quality Manager

Project Manager _____

Customer (if required) _____

Table of Contents

References:

Ref (a) SII PT Bolster shell drawing A2V00397259000.
Ref (b) SII PT Bolster lateral bumper stop drawing A6Z00375123112.
Ref (c) SII Bolster measurement drawing A6Z00375128344.
Ref (d) SII Bolster measurement report S70-BO_US00612-MA.pdf
Ref (e) SII PT bolster frame ACFM report

INTENDED USE

Rework of SLC4 S70 PT US00043 and bolster.

1. Measurement Taken:

- Measurements report S70-PT-US00043-MACH.pdf was approved.
- Measurements report S70-BO_US00612-MA.pdf was approved.

2. Visual Inspection

- See separate Quality Inspection Report SQ-015 for details.

3. Non-Destructive Test (NDT)

- ACFM has been performed and passed for power truck frame and bolster.

4. Rework of SLC4 S70 Power Truck

4.1 Rework of Bolster Lateral Buffer Bracket

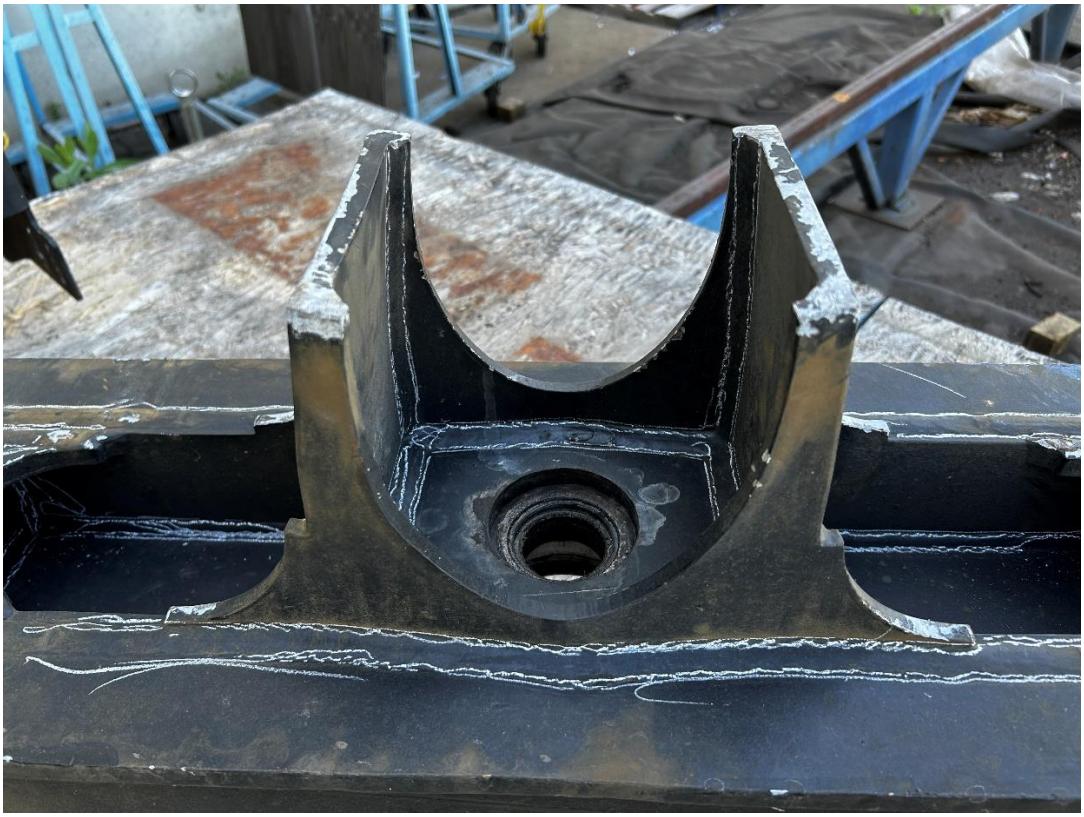


Figure 1: Damaged Bolster Lateral Bumper Stop.

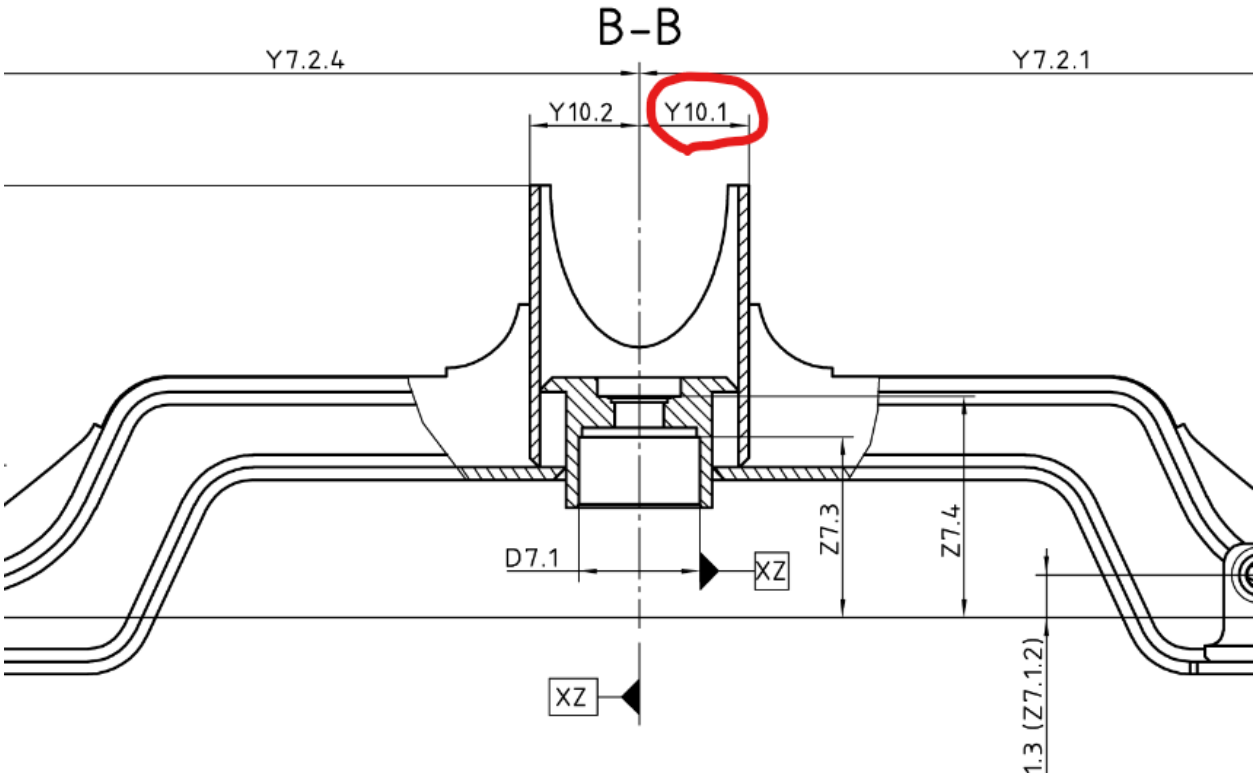


Figure 2: Affected dimensional measurement locations.

Table 1: Affected dimensional measurements and out of tolerance value.

	Nominal (MM)	+ (MM)	- (MM)	Actual (MM)	OoT
Y10.1	105.0	1.0	-1.0	100.1	-3.9
Y10.2	105.0	1.0	-1.0	96.9	-7.1

1. During receiving inspection, the bolster lateral bumper stop was found to be bent. In the bolster measurement report, Y10.1 and Y10.2 dimension out of tolerance is also suggesting that this bracket needs straightening before returning to service.

2. Place bolster on a fixture which allows for heat to be applied to required areas.

3. The bolster lateral bumper stop bracket was bent inward. Manually straighten the bumper bracket using heat or porta power according to bolster shell drawing A2V00397259000 and lateral bumper stop drawing A6Z00375123112. Refer to QAP-042 for flame straightening work instruction.

Note- Heat may be applied as an aide to the Straightening process, the following is provided for Guidance:

- Line Heat is employed to repair a bend in a plate about its weak axis.
- Line heat consists of a single straight pass of the torch.
- Line heat is applied to the underside of a plate element subjected to bending
- Only one heat cycle is allowed.
- The maximum temperature of material is 500 Deg C (932 Deg F).

- The use of heat sticks or equivalent method of determining temperature during straightening is required.
- Oxy-acetylene torch to be set to a neutral flame.
- Only cooling with still air is allowed. Forced cooling is not allowed.

5. Post Repair Non-Destructive Test (NDT)

- After all repairs are completed, perform ACFM test to check the affected welds.

6. Painting

- After repairs and NDT are completed and found to be satisfactory, paint affected areas using ENS-333 most current rev for guidance.

7. Document Review

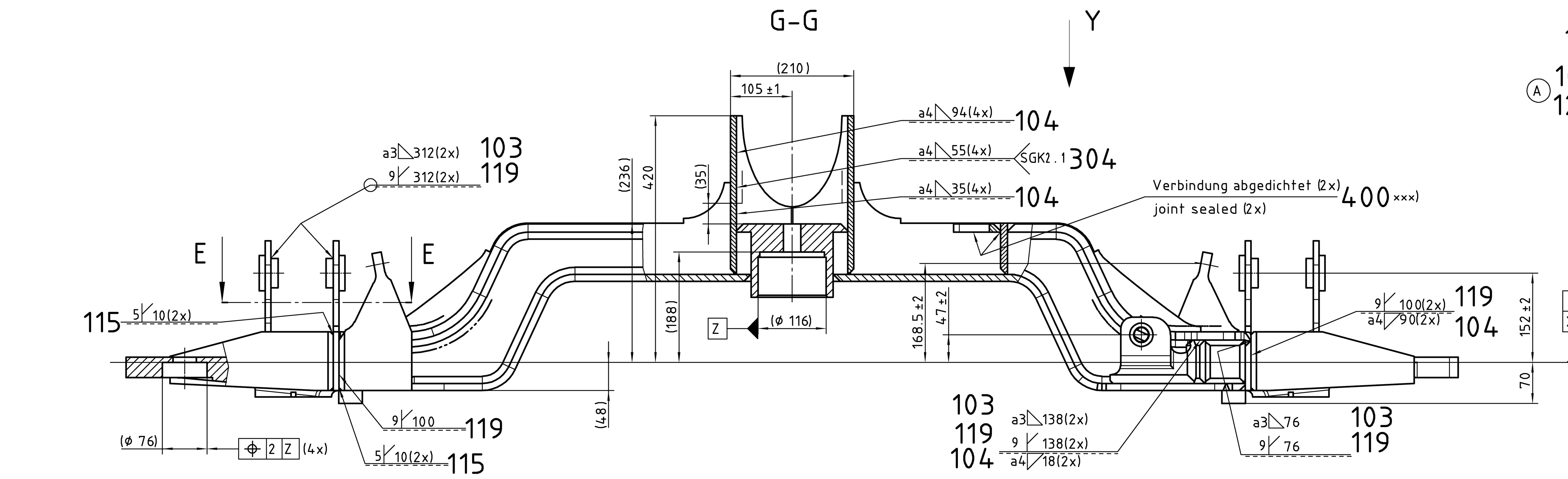
- QA review documentation for completeness and verify rework is complete.

Verification Sign-off Sheet

NOTE: Separate sign-off sheet must be provided for each part being reworked using this procedure.

Serial Number: US00043

Step:	Description:	Signature:	Date:	Note/Comments:
4.1	Rework of Bolster Lateral Buffer Bracket			
5	Post Repair NDT	QA:		
6	Painting	Prod:		
7	Document Review	QA:		
(Use space below if more room is needed for comments)				



×) Nummer mit Schlagzahlen einschlagen
(Schrift DIN 1451 – 1 C 10)

×) numbering beaten in with steel stamping numerals
(letters DIN 1451 –1 C 10)

××) Kontrollmaß

××) checking dimension

×××) Pos. 400 wird auf rost- und
fettfreier Flaeche aufgetragen

×××) Pos. 400 is spreaded on surface,
that are free of grease and rustless

... SGK 2.1
... SGK 2.2

Bauteilklassifizierung nach DIN 6700 – 2 C1
Classification according to DIN6700 – 2 C1

Schweissnahtgueteklassen nach DIN 6700 ff
allgemein: SGK 2.3
Anforderungen nach SGK2.2 oder SGK2.1
sind an der Schweissnaht angegeben.

Schweiss – Symbole nach EN 22553

Weldseam quality class acc. to DIN 6700 et seqq.
generally: SGK 2.3
Requirements for SGK 2.1 or SGK 2.2 are
shown by th weld symbol.

Weld-symbols according to EN 22553

Index	Revision no.	Date	Name
A	K333-637889	-0402	BRJ
B	500000232598	-1306	GOT

Part no. A2V00397259000
Siemens no.

PDMLink — DRAWING SHALL BE REVISED BY THE CAD SYSTEM ONLY

ISO 2768-mk
ISO 13920-BF
ISO 1101

306.200 KG | A0
2270X710,1X490
MTB
TS_REB20

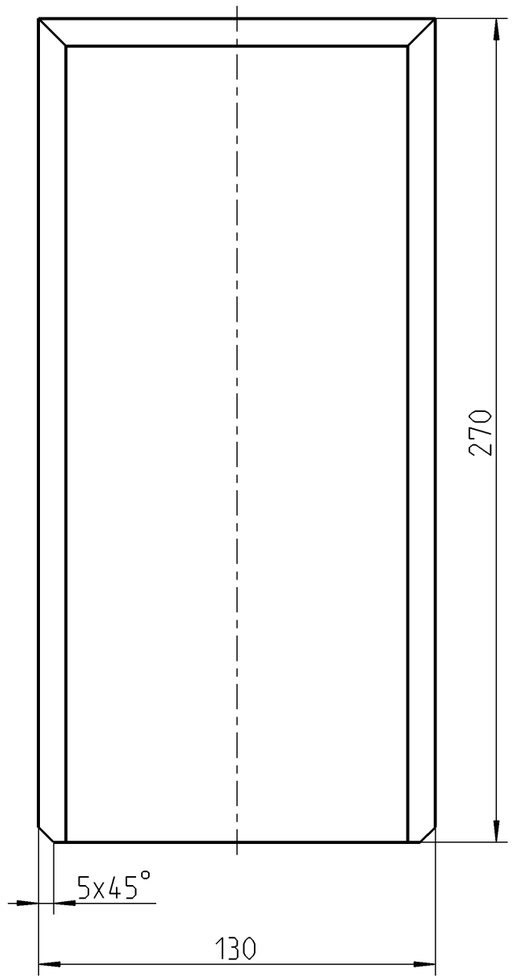
1:5		Date	Name
	Prepared	2013-06-18	TRINKAU_FR
	Checked	2013-06-18	SUMNITS_MI
	Approved	2013-06-19	GOTTSCH_MA

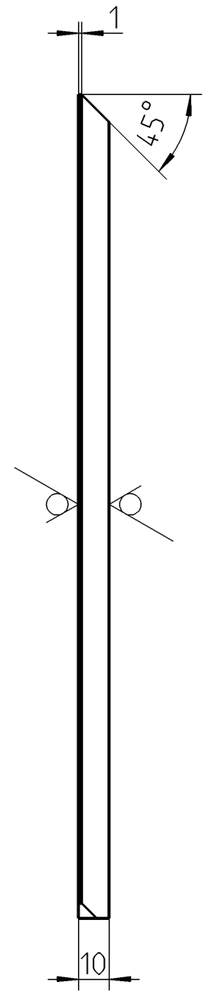
Bogie bolster,shell
Wiege,Rohbau

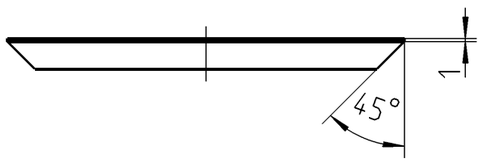
SIEMENS — EN/DE

A6Z00375123836 | B | 01/01

A0







Schnittkantenqualitaet fuer
thermisches Schneiden-Laser nach

Quality of cut edges for
laser beam cutting according to

ISO 9013-221

Unbemasste Werkstueckkanten
nach DIN ISO 13715.

Unmeasured edges of working parts
according to DIN ISO 13715.

+0,5
+0,3

-0,5
-0,3

Ra12,5

DRAWING SHALL NOT BE REVISED OUTSIDE CAD SYSTEM

Application:

Avanto/S70

	Edition	Date

General Tolerances
ISO 2768-mK
ISO 13920-BF
ISO 1101

Surface
ISO 1302

Scale: 1:2 | weight: 2.540 kg

EN 10029
Bl 10x130x270 | S355J2G1W C+N

	Date	Name
Prep.	2003-10-27	HOI
Check.	2003-10-27	SCHOBEG
Std-Ch	2003-10-27	PISCHLER

QUERPUFFER-
ANSCHLAGPLATTE

LATERAL BUMPER
STOP

97268242

SIEMENS
Siemens SGP Verkehrstechnik

G04_75123112

CAD | Blatt 1 | 1 Bl.

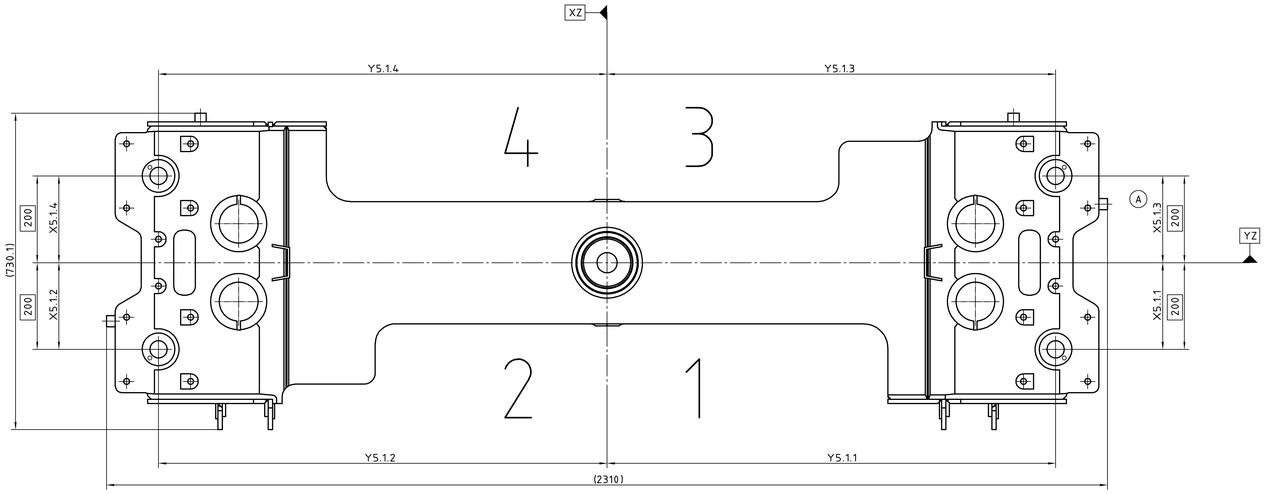
Issue	Revision	Date	Name

Based on:

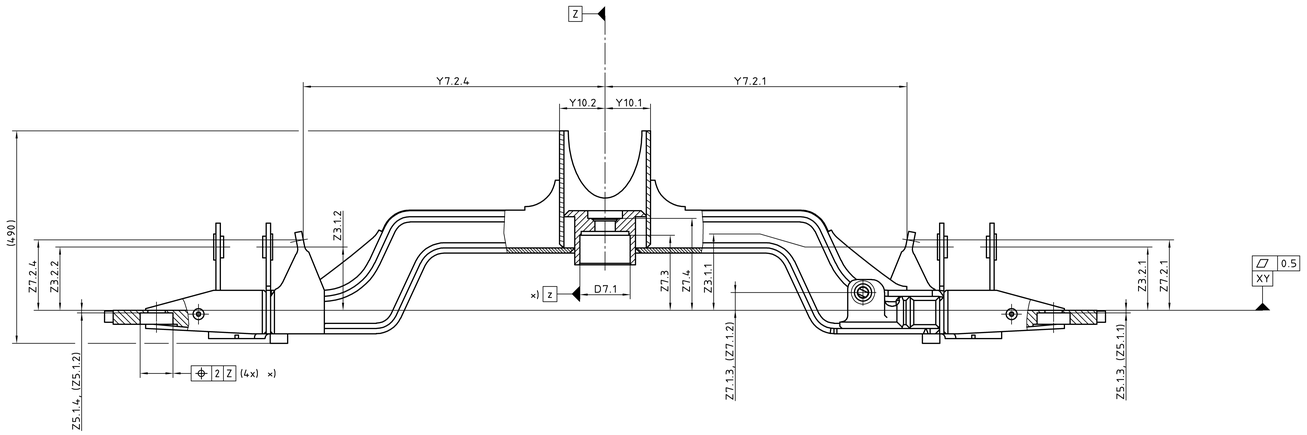
Repl. for:

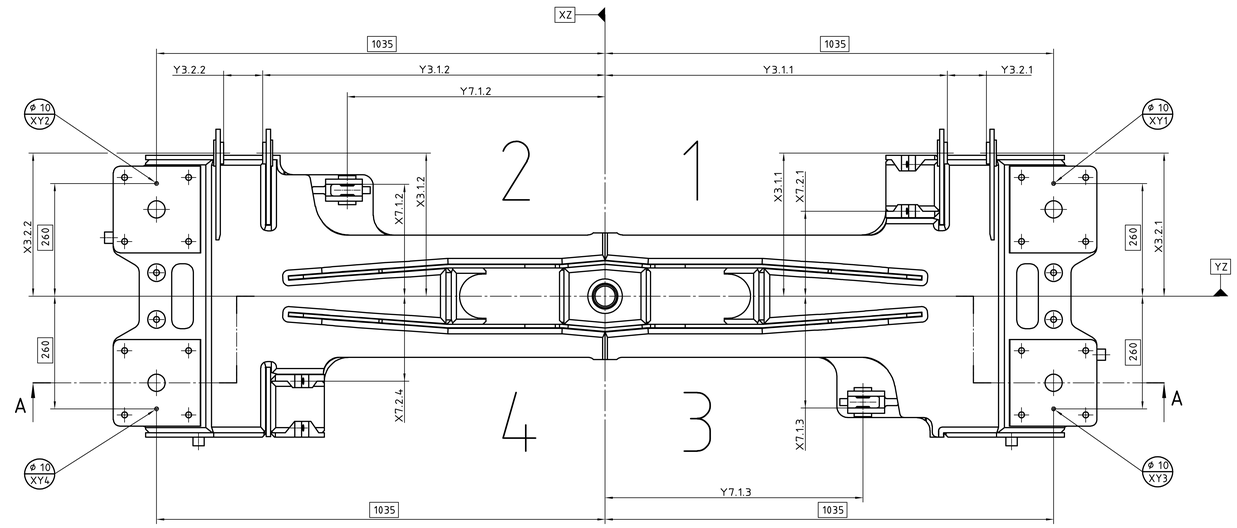
repl. by:

2003-10-27/A6J75123112_-_QPUFFERANSCHLAG: PROI_REVISION:d.PROI_VERSION:d/PROI_RELEASE:d / PART: A6J97268242_-_QPUFFERANSCHLAG: -.0/Verification

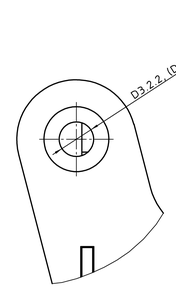


A-A





B 1:2



Baugruppe Assembly		Maßgruppe Dimension-Group	Nennmaß (mm) Nominal size (mm)	Obere Toleranz (mm) Upper tolerance (mm)	Untere Toleranz (mm) Lower tolerance (mm)	
3	X	X3.1.1	330	0.2	0.2	
		X3.1.2	330	0.2	0.2	
		X3.2.1	330	0.2	0.2	
		X3.2.2	330	0.2	0.2	A
	Y	Y3.1.1	790	1.5	1.5	
		Y3.1.2	790	1.5	1.5	
		Y3.2.1	90	0.3	0.3	
		Y3.2.2	90	0.3	0.3	
	Z	Z3.1.1	146	1	1	
		Z3.1.2	146	1	1	
		Z3.2.1	146	1	1	
		Z3.2.2	146	1	1	
	D	D3.1.1	32	0.16	0	
		D3.1.2	32	0.16	0	
		D3.2.1	32	0.16	0	
		D3.2.2	32	0.16	0	
5	X	X5.1.1	200	2	2	
		X5.1.2	200	2	2	
		X5.1.3	200	2	2	
		X5.1.4	200	2	2	
	Y	Y5.1.1	1035	2	2	
		Y5.1.2	1035	2	2	
		Y5.1.3	1035	2	2	
		Y5.1.4	1035	2	2	
	Z	Z5.1.1	6	1	1	
		Z5.1.2	6	1	1	
		Z5.1.3	6	1	1	
		Z5.1.4	6	1	1	
7	X	X7.1.2	258	3	3	
		X7.1.3	258	3	3	
		X7.2.1	196	3	3	
		X7.2.4	196	3	3	
	Y	Y7.1.2	595	3	3	
		Y7.1.3	595	3	3	
		Y7.2.1	696.6	3	3	
		Y7.2.4	696.6	3	3	
	Z	Z7.1.2	41	3	3	
		Z7.1.3	41	3	3	
		Z7.2.1	162.5	3	3	
		Z7.2.4	162.5	3	3	
		Z7.3	173	2	2	
		Z7.4	212	2	2	A
	D	D7.1	116	0.035	0	
10	Y	Y10.1	105	1	1	
		Y10.2	105	1	1	

Legende zu Baugruppen-Zuordnung
(erste Zahl der Maßgruppe entspricht der Baugruppe)

legend of component allocation
(first number of dimension group equivalent to component)

1.. Radsatzführung
2.. Antrieb
3.. Längsmitnahme
4.. Bremse
5.. Sekundärfeder
6.. Schienenbremse
7.. Anbauteile
8.. Messpunkte
9.. Hauptabmessungen
10.. Sonstige

1.. Wheelset steering
2.. Traktion unit
3.. Draw bar
4.. Brake
5.. Secondary suspension
6.. Track brake
7.. Assembly components
8.. Measuring points
9.. Main dimensions
10.. Miscellaneous

×) Bedingung zur Definition der Ebene YZ

×) Plain YZ is defined by these conditions

Part no. | Siemens no.

DRAWING SHALL BE REVISED BY THE CAD SYSTEM ONLY

A0 | TS

Index	Revision no.	Date	Name
A	K333-443558	04-04	SEG
B	5000000379B9	04-07	!

ISO 2768mk
ISO 13920-BF
ISO 1101

MTB
TS_REA

1:5	Prepared	2003-12-09	BRECKO_JOS
	Checked		
	Approved	2003-12-09	BRECKO_JOS
	Date	Name	
	EN/DE		

Measuring sheeet,
bogie bolster machined
Messplan, Wiege
mechan.Bearbeitung

SIEMENS

A6Z00375128344 | B | 01/01

SIEMENS	PART NAME : S70 BOLSTER, MACHINED REFURBISHMENT		May 21, 2024	07:53
	REV NUMBER : B	SER NUMBER : US0	STATS COUNT : 1	

DRAWING NUMBER : A6Z00375128344
PART NUMBER : 97258998
INSPECTED BY : Michael Gonzalez
INSTRUMENT : FARO ARM 7 AXIS

DIM X3.1.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	330.00	0.20	-0.20	330.03	0.03	0.00

DIM X3.1.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	330.00	0.20	-0.20	330.18	0.18	0.00

DIM X3.2.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	330.00	0.20	-0.20	330.13	0.13	0.00

DIM X3.2.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	330.00	0.20	-0.20	330.15	0.15	0.00

DIM Y3.1.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	790.00	1.50	-1.50	790.73	0.73	0.00

DIM Y3.1.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	790.00	1.50	-1.50	790.57	0.57	0.00

DIM Y3.2.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	90.00	0.30	-0.30	89.60	-0.40	0.10

DIM Y3.2.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	90.00	0.30	-0.30	89.53	-0.47	0.17

DIM X7.1.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	258.0	3.0	-3.0	257.1	-0.9	0.0

DIM X7.1.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	258.0	3.0	-3.0	259.1	1.1	0.0

DIM X7.2.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	196.0	3.0	-3.0	195.7	-0.3	0.0

DIM X7.2.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	196.0	3.0	-3.0	197.1	1.1	0.0

DIM Y5.1.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	1035.0	2.0	-2.0	1034.1	-0.9	0.0

DIM Y5.1.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	1035.0	2.0	-2.0	1034.1	-0.9	0.0

DIM Y5.1.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	1035.0	2.0	-2.0	1033.9	-1.1	0.0

DIM Y5.1.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	1035.0	2.0	-2.0	1035.1	0.1	0.0

DIM Y7.1.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	595.0	3.0	-3.0	596.0	1.0	0.0

DIM Y7.1.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	595.0	3.0	-3.0	597.0	2.0	0.0

DIM Y7.2.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	696.6	3.0	-3.0	694.4	-2.2	0.0

DIM Y7.2.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	696.6	3.0	-3.0	696.1	-0.5	0.0

DIM Y10.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	105.0	1.0	-1.0	100.1	-4.9	3.9

DIM Y10.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	105.0	1.0	-1.0	96.9	-8.1	7.1

DIAMETER D3.1.1, D3.1.2, D3.2.1 AND D3.2.2, ARE MANUELY INPUTED

DIM D3.1.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	32.000	0.160	0.000	32.040	0.040	0.000

DIM D3.1.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	32.000	0.160	0.000	32.050	0.050	0.000

DIM D3.2.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	32.000	0.160	0.000	32.010	0.010	0.000

DIM D3.2.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	32.000	0.160	0.000	32.030	0.030	0.000

DIAMETER D7.1 MANUELY INPUTED

DIM D1 (H7)

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	116.000	0.035	0.000	116.010	0.010	0.000

DIM Z3.1.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Z	146.0	1.0	-1.0	145.4	-0.6	0.0

DIM Z3.1.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Z	146.0	1.0	-1.0	145.5	-0.5	0.0

DIM Z3.2.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Z	146.0	1.0	-1.0	145.2	-0.8	0.0

DIM Z3.2.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Z	146.0	1.0	-1.0	145.5	-0.5	0.0

DIM Z7.1.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Z	41.0	3.0	-3.0	39.4	-1.6	0.0

DIM Z7.1.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Z	41.0	3.0	-3.0	38.3	-2.7	0.0

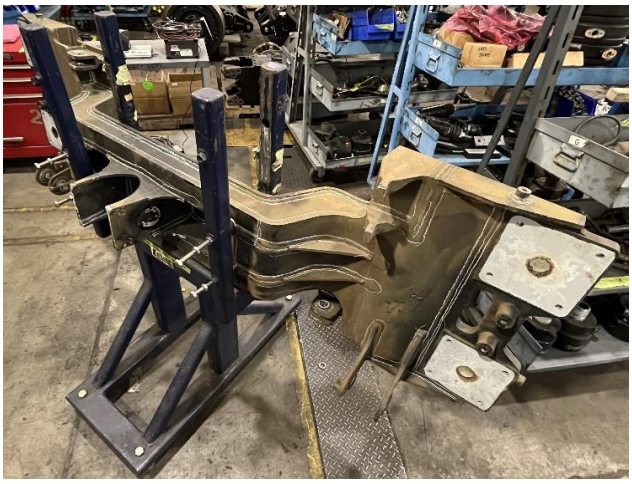
DIM Z7.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Z	212.0	2.0	-2.0	211.9	-0.1	0.0

ACFM INSPECTION REPORT

Customer: Utah Transit Authority **Project:** UTA 1122 Accident Inspection	**Inspection:** Andrew Conley **Cert No:** NTC2149 **Inspection:** N/A **Cert No:** N/A **Lizard Registered:** 25222
Unit: Bolster	**Procedure:** QMP-005
Serial Number: US00612	**DWG:** N/A

Locations: 5301 Price Ave., McClellan Park, CA 95652



Inspection Results / Comments.

There were no reportable weld indications or defects at the time of inspection. Damage to lateral hard stops noted in receipt inspection.

Inspection Signature: **Date:** 05/17/2024

Andrew Conley

Andrew Conley

cn=Andrew Conley, c=US, o=Siemens Mobility CS, ou=QA CWI Level II Inspector, email=andrew.conley@siemens.com
05/17/24

Lizard Registered : 25222

Rework Procedure	Project:	SLC4 S70 PT

Distribution:

☒ ATM	☒ Prod. Mgr	☒ Prod. Engr	☒ PM	☒ QA
☐ Calculations	☐ Prod. Ctrl.	☒ QM	☒ Customer	☐ Subcontractor

Responsible Function: Bogie Service Center

Platform:	S/N Affected:	ECN#:	NCR#:	Drawing(s)/Part Number(s)
☒ Bogie	US00102	N/A	200176520 200176339	A2V00001441496 A2V00397258998
☒ Bolster	US00195			

Implementation/Inspection Sign-off:

1. Production to inform Quality Assurance (QA) Inspector before repair work starts.
2. If Required Parent Material to be NDT Tested by ACFM, MT, or PT, prior to start of welding.

Problem Report Number: _____

Production Signature: _____ **Date:** _____

QA/CWI Signature: _____ **Date:** _____

Preparation:

1. Welder and Inspector shall be qualified in the rework process and required inspection methods (MT/PT/RT/VT). Reference QAI-057, QAI-043, BGI-002, BGI-003.
2. Part should be placed in a position that allows for base material repairs if required.

Rework Procedure:

NOTE:

- Production and Inspector shall sign off Implementation/ Inspection section above upon completion of their work.
- Where applicable adhere to SII-MNP-007 Workmanship Standard at all times.

APPROVALS:

Production Engineer _____ Originator

PQM _____ Project Quality Manager

Project Manager _____

Customer (if required) _____

Table of Contents

References:

Ref (a) SII PT bogie frame drawing A2V00001440995
Ref (b) SII PT headbeam console bracket drawing A6Z00375100966
Ref (c) SII PT Bolster shell drawing A2V00397259000.
Ref (d) SII PT Bolster rotation stop drawing A2V00397269122.
Ref (e) SII PT Bolster lateral bumper stop drawing A6Z00375123112.
Ref (f) SII PT measurement drawing A6Z00375122298.
Ref (g) SII Bolster measurement drawing A6Z00375128344.
Ref (h) SII PT measurement report S70-PT-US00102-MACH
Ref (i) SII Bolster measurement report 70-BO_US00195-MA.
Ref (j) SII PT bogie frame ACFM report
Ref (k) SII PT bolster frame ACFM report

INTENDED USE

Rework of SLC4 S70 PT US00102 and bolster.

1. Measurement Taken:

- Measurements report S70-PT-US00102-MACH.pdf was approved.
- Measurements report S70-BO_US00195-MA_20240520210925.725_X.pdf was not approved.

2. Visual Inspection

- See separate Quality Inspection Report SQ-015 for details.

3. Non-Destructive Test (NDT)

- ACFM has been performed and passed for power truck frame.
- Reportable indication was found on both bolster lateral stops.

4. Rework of SLC4 S70 Power Truck

4.1 Rework of PT Head Beam Console Bracket

Figure 1: Headbeam Console bracket 3D model.

Figure 2: Affected headbeam console bracket.

1. During receiving inspection, 1X headbeam console bracket was found to be bent outward.

2. Place PT on a fixture which allows for heat to be applied to required areas.

3. The head beam brackets at third quadrants were bent. Manually straighten head beam brackets using heat or porta power according to drawing A2V00001440995 and A6Z00375100966. Refer to QAP-042 for flame straightening work instruction.

Note- Heat may be applied as an aide to the Straightening process, the following is provided for Guidance:

- Line Heat is employed to repair a bend in a plate about its weak axis
- Line heat consists of a single straight pass of the torch
- Line heat is applied to the underside of a plate element subjected to bending
- Only one heat cycle is allowed
- The maximum temperature of material is 500 Deg C (932 Deg F)
- The use of heat sticks or equivalent method of determining temperature during straightening is required.

4.2 Rework of Bolster Rotation Stops

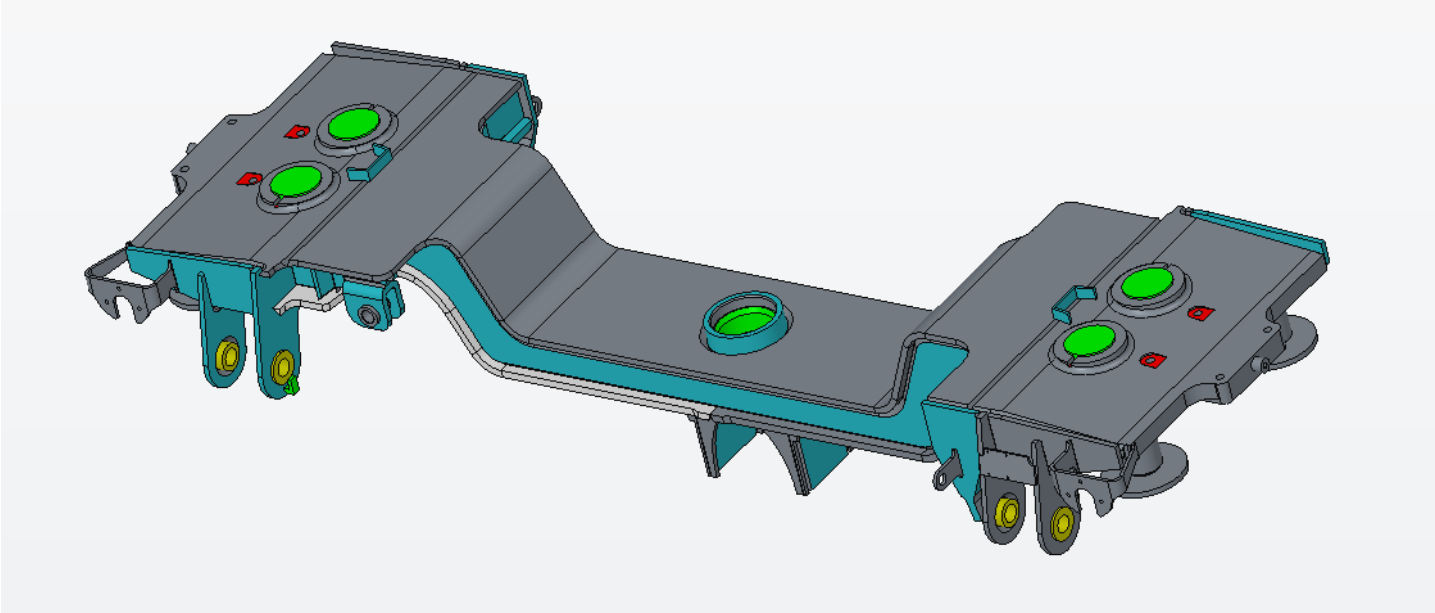


Figure 3: Power Truck Bolster 3D model.

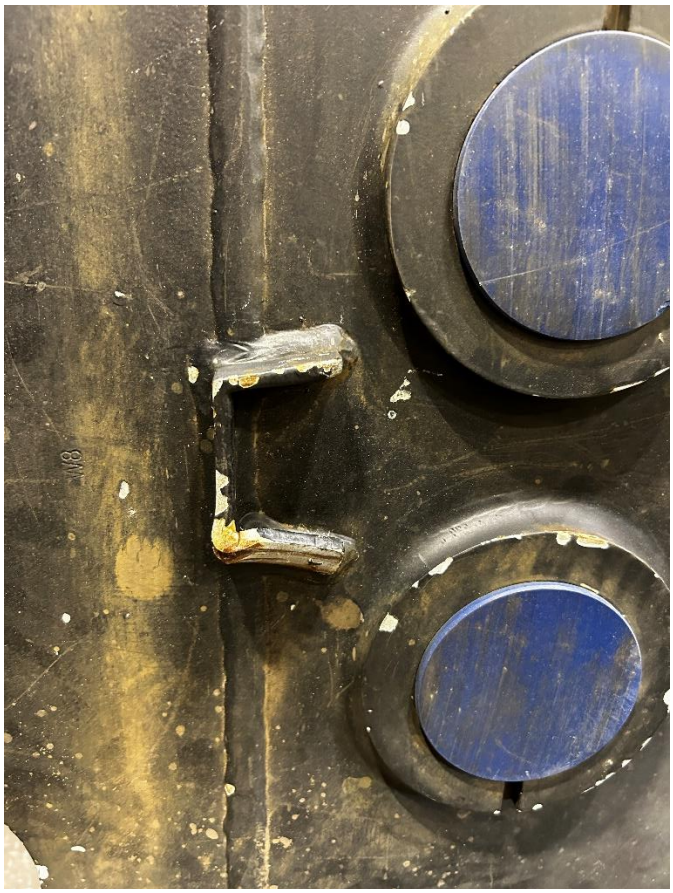


Figure 4: Damaged Bolster L/H Rotation Stop.

Figure 5: Damaged Bolster R/H Rotation Stop.

1. During receiving inspection, it was found that both bolster rotation stops was bent and had base metal damage during the accident. These rotation stop will need to be replaced per bolster shell drawing A2V00397259000.

2. Cut the remaining rotation stops off using appropriate air tool and remove any sharp edge. Remove paint with air tool to bare metal in the welding area and clean the surface with acetone to prepare for welding.

3. Follow WPS WD11GM-SC-SV-001 and bolster shell drawing AA2V00397259000 to weld new rotation stops to both sides of the bolster. After repair, the new weld seam will need to be inspected by Certified Welding Inspector.

Table 1: Bolster Repair Bill of Material

Part No.	Description	Qty.
A2V00397269122	ROTATION STOP	2

4.3 Rework of Bolster Lateral Buffer Bracket

Figure 6: Damaged Bolster Lateral Bumper Stop.

1. During receiving inspection, the bolster lateral bumper stop was found to be bent. In the bolster measurement report, Y10.1 and Y10.2 dimension out of tolerance is also suggesting that this bracket needs straightening before returning to service.

2. Place bolster on a fixture which allows for heat to be applied to required areas.

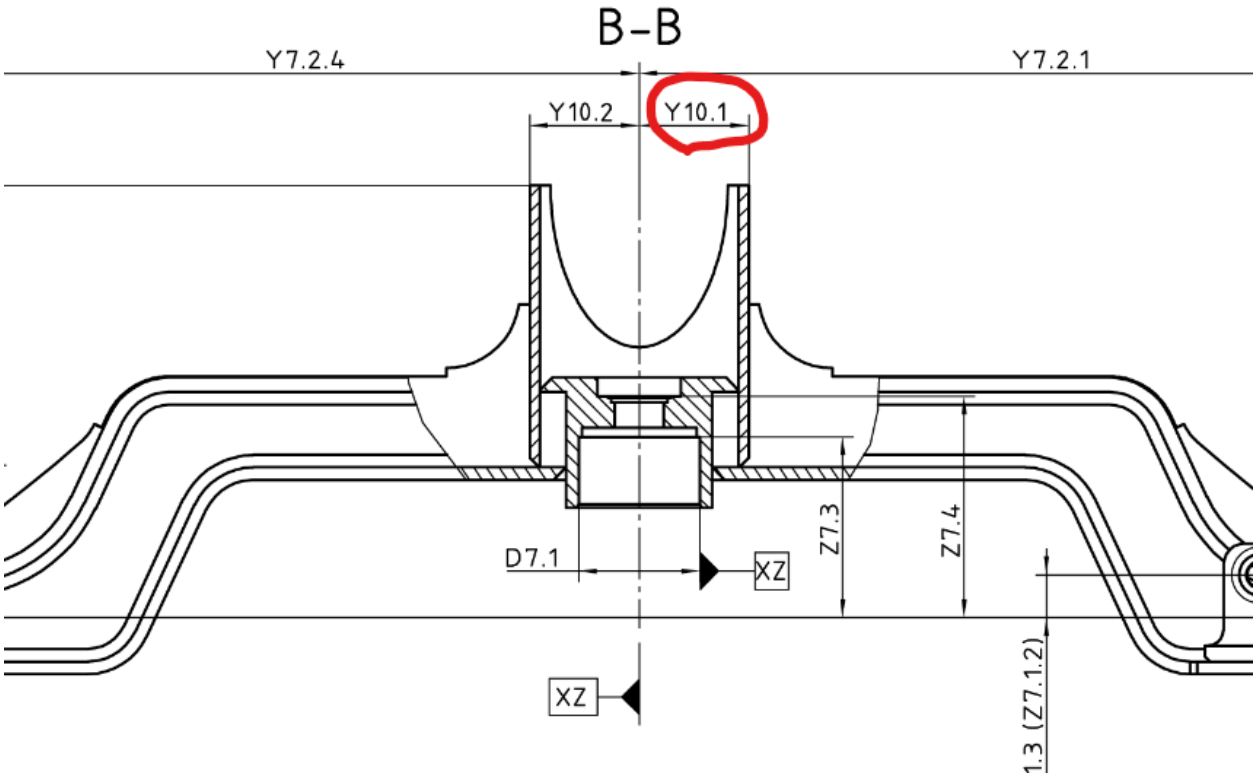


Figure 7: Affected dimensional measurement locations.

Table 2: Affected dimensional measurements and out of tolerance value.

	Nominal (MM)	+ (MM)	- (MM)	Actual (MM)	OoT
Y10.1	105.0	1.0	-1.0	92.1	-11.9
Y10.2	105.0	1.0	-1.0	103.2	-0.8

3. The bolster lateral bumper stop bracket was bent inward. Manually straighten the bumper bracket using heat or porta power according to bolster shell drawing A2V00397259000 and lateral bumper stop drawing A6Z00375123112. Refer to QAP-042 for flame straightening work instruction.

Note- Heat may be applied as an aide to the Straightening process, the following is provided for Guidance:

- Line Heat is employed to repair a bend in a plate about its weak axis.
- Line heat consists of a single straight pass of the torch.
- Line heat is applied to the underside of a plate element subjected to bending
- Only one heat cycle is allowed.
- The maximum temperature of material is 500 Deg C (932 Deg F).
- The use of heat sticks or equivalent method of determining temperature during straightening is required.
- Oxy-acetylene torch to be set to a neutral flame.
- Only cooling with still air is allowed. Forced cooling is not allowed.

4.4 Miscellaneous Damage

Figure 8: Damage to the corner of the frame.

1. During receiving inspection, base metal damage was found on the longitudinal beam corner. Also, the same damage was noted in the ACFM report.

2. The damage corner needs to be smooth ground out with the appropriate tool to erase any sharp edge.

4.5 PT US00102 Repair Bill of Material

Table 3: PT 00102 Repair Bill of Material.

Part No.	Description	Quantity
A2V00397269122	ROTATION STOP	2

5. Post Repair Non-Destructive Test (NDT)

- After all repairs are completed, perform ACFM test to check all new welds.

6. CWI Weld Inspection

- After all repairs are completed, an AWS certified weld inspector with current certificate is required to inspect new welds.

7. Re-measure PT Frame with Faro Arm

- After all repairs are completed, measure the PT frame with Faro arm to verify the repair work.

8. Painting

- After repairs and NDT are completed and found to be satisfactory, paint affected areas using ENS-333 most current rev for guidance.

9. Document Review

- QA review documentation for completeness and verify rework is complete.

Verification Sign-off Sheet

NOTE: Separate sign-off sheet must be provided for each part being reworked using this procedure.

Serial Number: US00102

Step:	Description:	Signature:	Date:	Note/Comments:
4.1	Rework of PT Head Beam Console Bracket			
4.2	Rework of Bolster Rotation Stops			
4.3	Rework of Bolster Lateral Buffer Bracket			
4.4	Miscellaneous damage			
5	Post Repair NDT	QA:		
6	CWI Weld Inspection	QA:		
7	Faro Measurement	QA:		
8	Painting	Prod:		
9	Document Review	QA:		
(Use space below if more room is needed for comments)				

Ⓑ Schweissnahtgueteklassen nach EN 15085-3
allgemein: CP C2
Anforderungen abweichend von CP C2
sind an der Schweissnaht angegeben.

Schweiss - Symbole nach ISO 2553 - System A

HY, HV und HU - Naehte an T - Stoessen sind
entsprechend EN ISO 5817 und
zugehoeriger Arbeitsanweisung auszufuehren.

Weldseam quality class acc. to EN 15085-3
generally: CP C2
Requirements notwithstanding to CP C2
are shown by the weld symbol.

Weld-symbols according to ISO 2553 - system A

Specification of HY, HV and HU - weld seams on
T - joints acc. to EN ISO 5817 and
related work instruction document.

Ⓑ Zertifizierungsstufe nach EN 15085-2 CL1
Certification level according to EN 15085-2 CL1

Achtung:
Die Arbeitspapiere und/oder technischen
Spezifikationen sind zu beachten!

Attention:
Refer to additional manufacturing
instructions and/or technical specifications!

Inspected in terms of bonding
Inspect./Date: /
Rev.Drawing:
Inspected in terms of welding
Inspect./Date:KOGLER_FRA /2018-07-20
Rev. Drawing: B

Part no. A2V00001440995
Siemens no.

PDMLink | DRAWING SHALL BE REVISED BY THE CAD SYSTEM ONLY

ISO 13920-BF
ISO 1101

855.000 KG | A0
608,4X2317,3X2952
MTB008
TS_REB02

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B	500000463448	-1807	GOT

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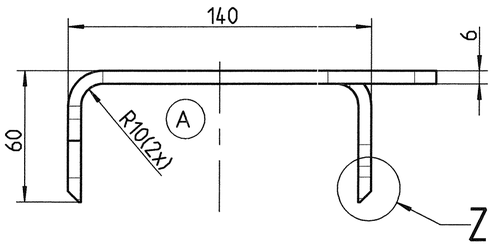
	Prepared	2018-07-19	TRINKAU_FR
	Checked	2018-07-20	PAYR_KAR
	Approved	2018-07-20	GOTTSCH_MA
		EN/DE	mm

Motor bogie frame
complete
Triebdrehgestellrahmen
vollstaendig

SIEMENS

A6Z00001063778 | B | 01/01

Restricted/Intern



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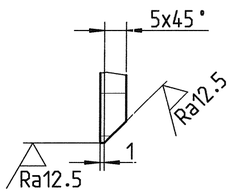
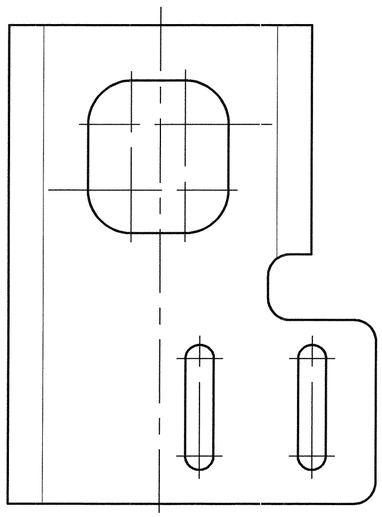
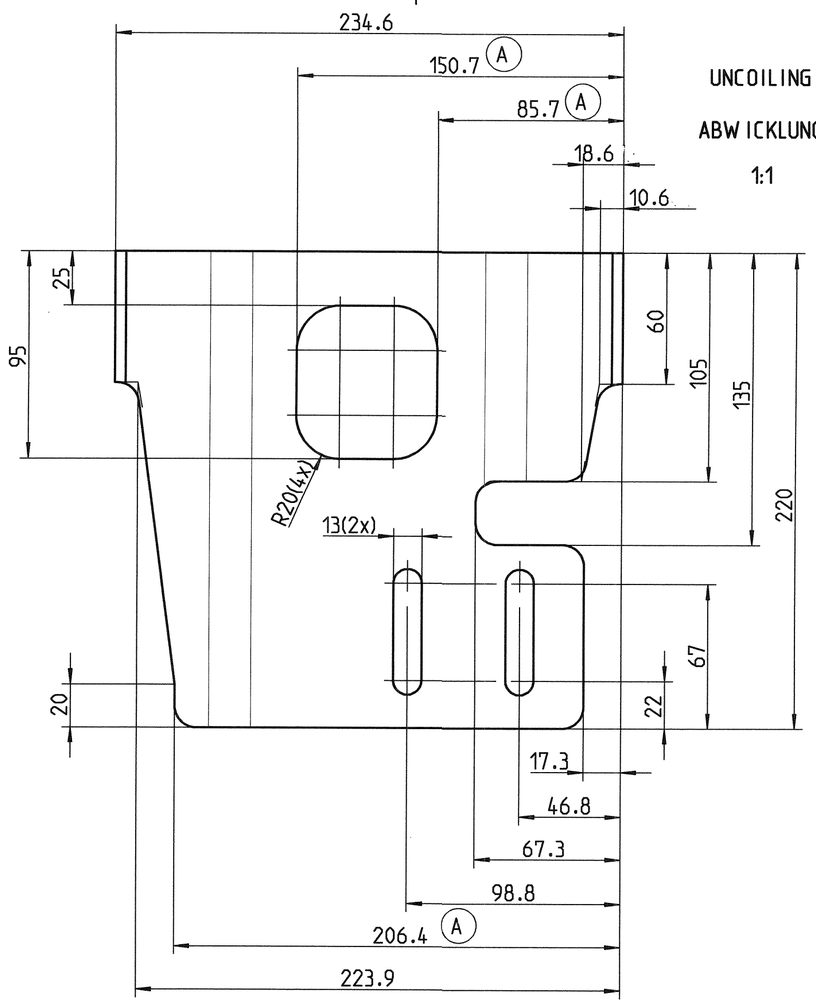






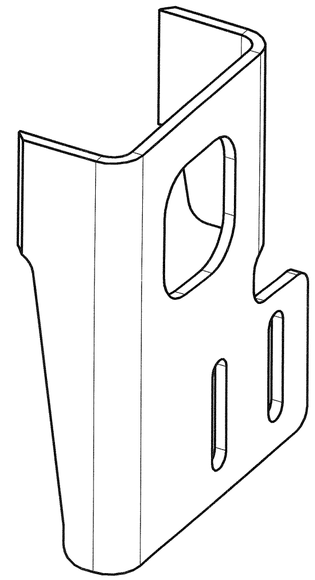
UNCOILING

ABWICKLUNG

1:1

TRUE LENGTH THEORETICALLY ACC. TO DIN6935

GESTECKTE LAENGE THEORETISCH NACH DIN6935



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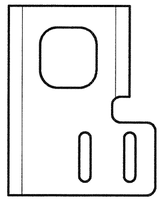
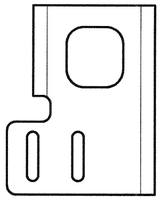
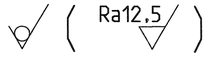
 1:5		 1:5	



Schnittkantenqualitaet fuer
Thermisches Schneiden-Laser nach DIN 2310-22K

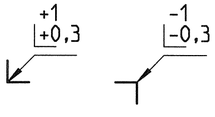
Quality of cut edges for
laser beam cutting according to DIN 2310-22K

Schnittkantenqualitaet fuer
Autogenes Brennschneiden ISO 9013-22A

Quality of cut edges for
autogeneous cutting according to ISO 9013-22A

unbemasste Werkstueckkanten
nach DIN ISO 13715

unmeasured edges of working parts
according to DIN ISO 13715.



ALLE UNBEMASSTEN RADIEN R=10

RADII WITHOUT DIMENSIONS R=10

DRAWING SHALL NOT BE REVISED OUTSIDE CAD SYSTEM

Application:

Edition
Date

General Tolerances
ISO 2768-mK
ISO 13920-BF
ISO 1101

Surface
ISO 1302

Scale: 1:2 weight: 1.810 kg

EN10029
BL 6X220X234 S235J2G3C

Issue	Revision	Date	Name
A	625204	2002-10-03	REU

	Date	Name
Prep.	2002-10-03	reumuel
Check.	2002-10-03	gottsch
Std-Ch	2002-10-03	sudy

Based on:

Konsole Console

97245369

SIEMENS
Siemens SGP Verkehrstechnik

G04_75100966

CAD

Blatt 1
1 Bl.

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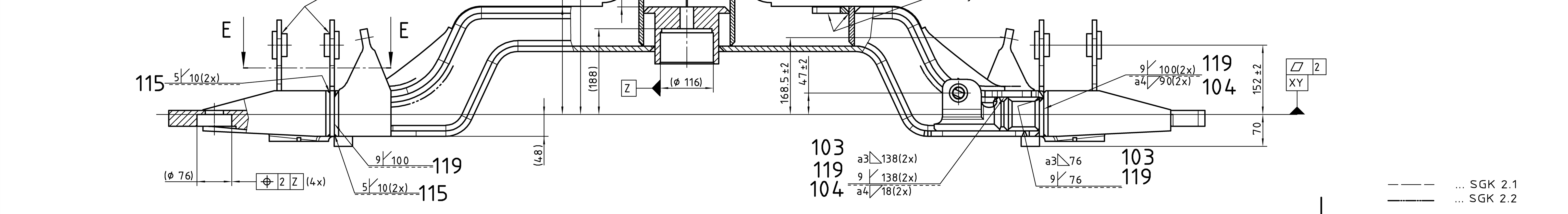

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×) numbering beaten in with steel stamping numerals (letters DIN 1451 –1 C 10)

××) Kontrollmaß

××) checking dimension

×××) Pos. 400 wird auf rost- und fettfreier Flaeche aufgetragen

×××) Pos. 400 is spreaded on surface, that are free of grease and rustless

Bauteilklassifizierung nach DIN 6700 – 2 C1
Classification according to DIN6700 – 2 C1

Schweissnahtgueteklassen nach DIN 6700 ff
allgemein: SGK 2.3
Anforderungen nach SGK2.2 oder SGK2.1
sind an der Schweissnaht angegeben.

Schweiss – Symbole nach EN 22553

Weldseam quality class acc. to DIN 6700 et seqq.
generally: SGK 2.3
Requirements for SGK 2.1 or SGK 2.2 are
shown by th weld symbol.

Weld-symbols according to EN 22553

Index	Revision no.	Date	Name
A	K333-637889	-0402	BRJ
B	500000232598	-1306	GOT

Part no. A2V00397259000
Siemens no.

PDMLink — DRAWING SHALL BE REVISED BY THE CAD SYSTEM ONLY

ISO 2768-mk
ISO 13920-BF
ISO 1101

306.200 KG | A0
2270X710,1X490
MTB
TS_REB20

1:5		Date	Name
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	Checked	2013-06-18	SUMNITS_MI
	Approved	2013-06-19	GOTTSCH_MA
		Date	Name
		EN/DE	

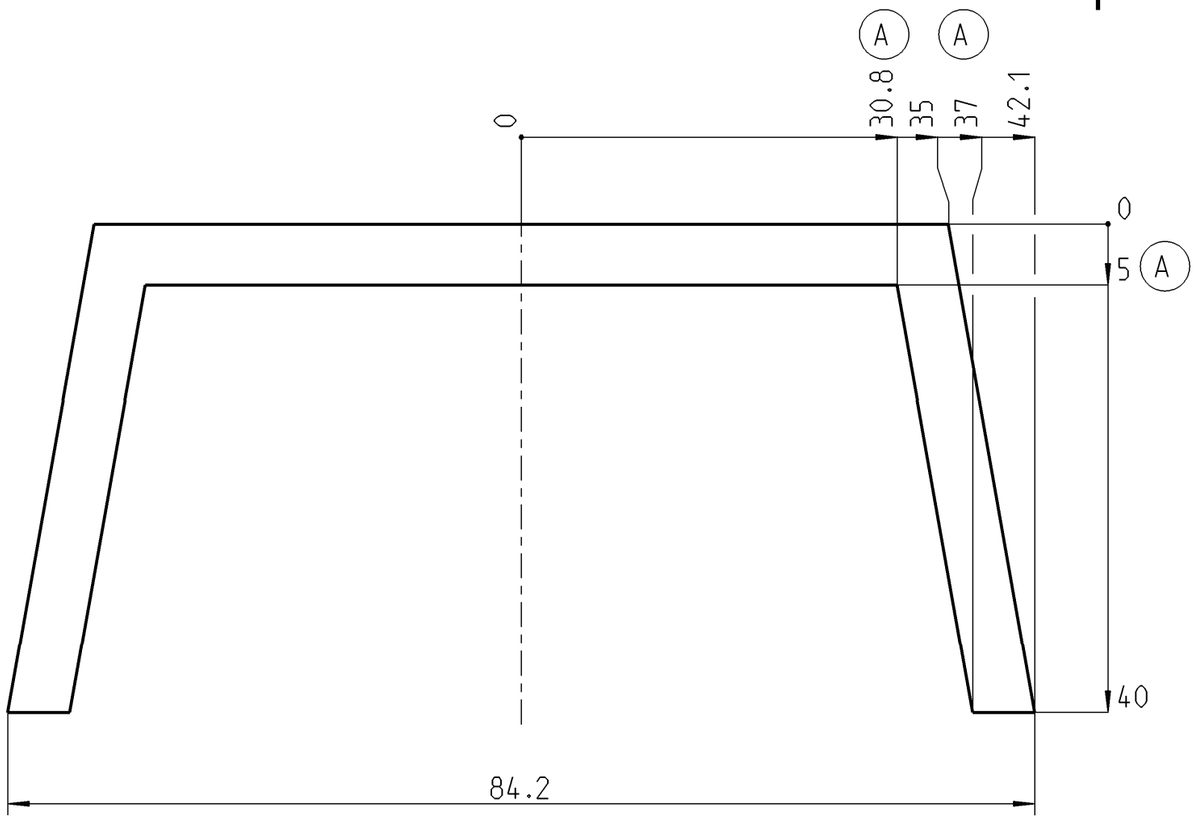
Bogie bolster,shell

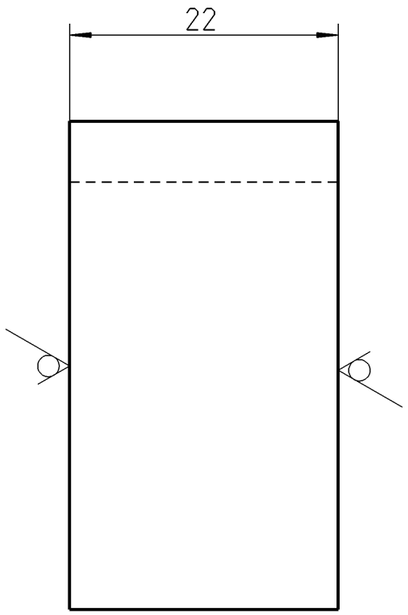
Wiege,Rohbau

SIEMENS

A6Z00375123836 | B | 01/01

A0





Schnittkantenqualitaet fuer
Autogenes Brennschneiden

Quality of cut edges for
autogeneous cutting according to

ISO 9013-332

Unbemasste Werkstueckkanten
nach DIN ISO 13715.

Unmeasured edges of working parts
according to DIN ISO 13715.

+0,5
+0,3

-0,5
-0,3

Ra12,5 ( )

DRAWING SHALL NOT BE REVISED OUTSIDE CAD SYSTEM

Application:
AVANTO/S70

					Edition	
					Date	

General Tolerances
ISO 2768-mK
ISO 13920-BF
ISO 1101

Surface
ISO 1302

Scale: 2:1 | weight: 0.120 kg

EN 10029
Bl 22x40x84.2 S355J2G3

Issue	Revision	Date	Name
A	637635	2004-02-10	bre

	Date	Name
Prep.	2003-10-28	HOI
Check.	2003-10-28	SCHOBEG
Std-Ch	2003-10-28	PISCHLER

AUSDREHANSCHLAG ROTATION STOP

97269122

SIEMENS
Siemens SGP Verkehrstechnik

G04_75123834 CAD

Blatt 1
1 Bl.

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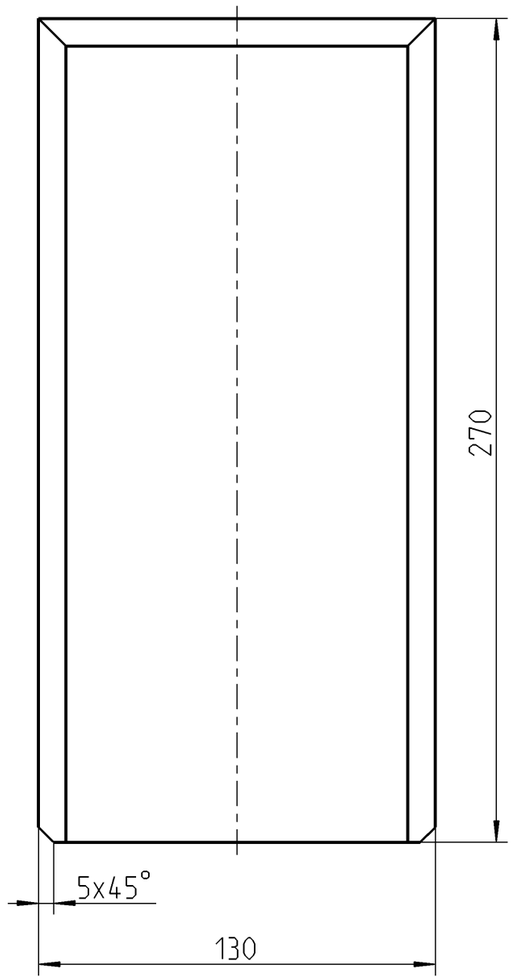
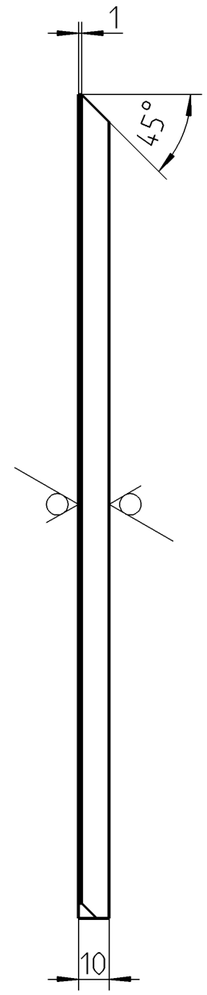
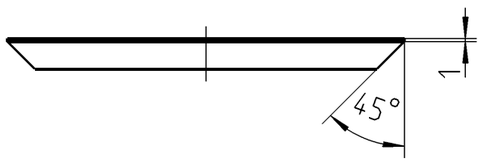






Schnittkantenqualitaet fuer
thermisches Schneiden-Laser nach

Quality of cut edges for
laser beam cutting according to

ISO 9013-221

Unbemasste Werkstueckkanten
nach DIN ISO 13715.

Unmeasured edges of working parts
according to DIN ISO 13715.

+0,5
+0,3

-0,5
-0,3

Ra12,5

DRAWING SHALL NOT BE REVISED OUTSIDE CAD SYSTEM

Application:

Avanto/S70

	Edition	Date

General Tolerances
ISO 2768-mK
ISO 13920-BF
ISO 1101

Surface
ISO 1302

Scale: 1:2 | weight: 2.540 kg

EN 10029
Bl 10x130x270 | S355J2G1W C+N

	Date	Name
Prep.	2003-10-27	HOI
Check.	2003-10-27	SCHOBEG
Std-Ch	2003-10-27	PISCHLER

QUERPUFFER-
ANSCHLAGPLATTE

LATERAL BUMPER
STOP

97268242

SIEMENS
Siemens SGP Verkehrstechnik

G04_75123112

CAD | Blatt 1 | 1 Bl.

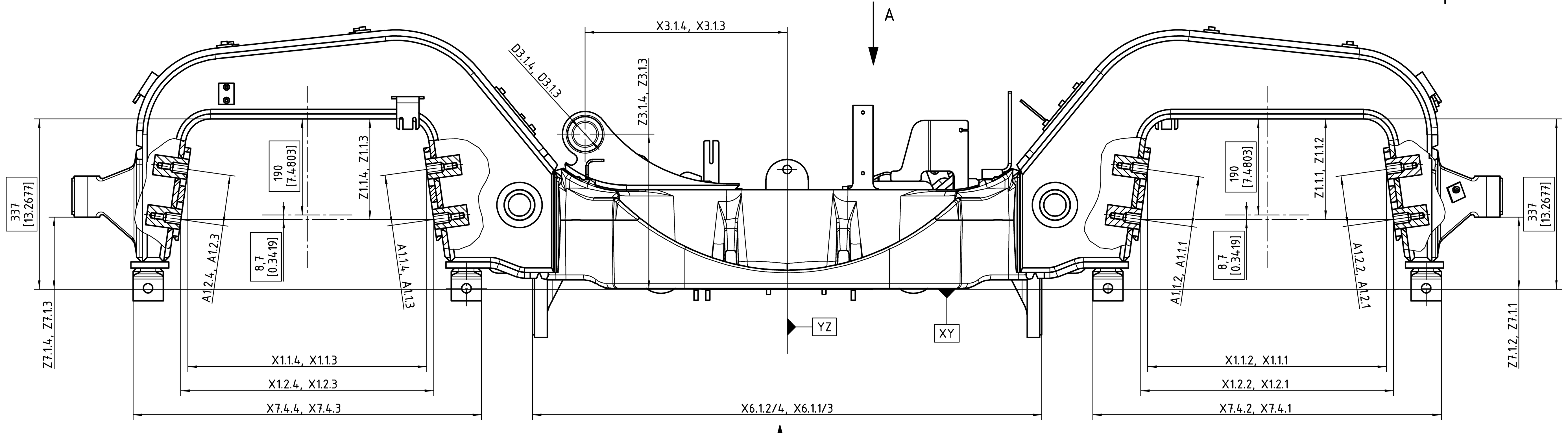
Issue	Revision	Date	Name

Based on:

Repl. for:

repl. by:

2003-10-27/A6J75123112_-_QPUFFERANSCHLAG: PROI_REVISION:d.PROI_VERSION:d/PROI_RELEASE:d / PART: A6J97268242_-_QPUFFERANSCHLAG: -.0/Verification



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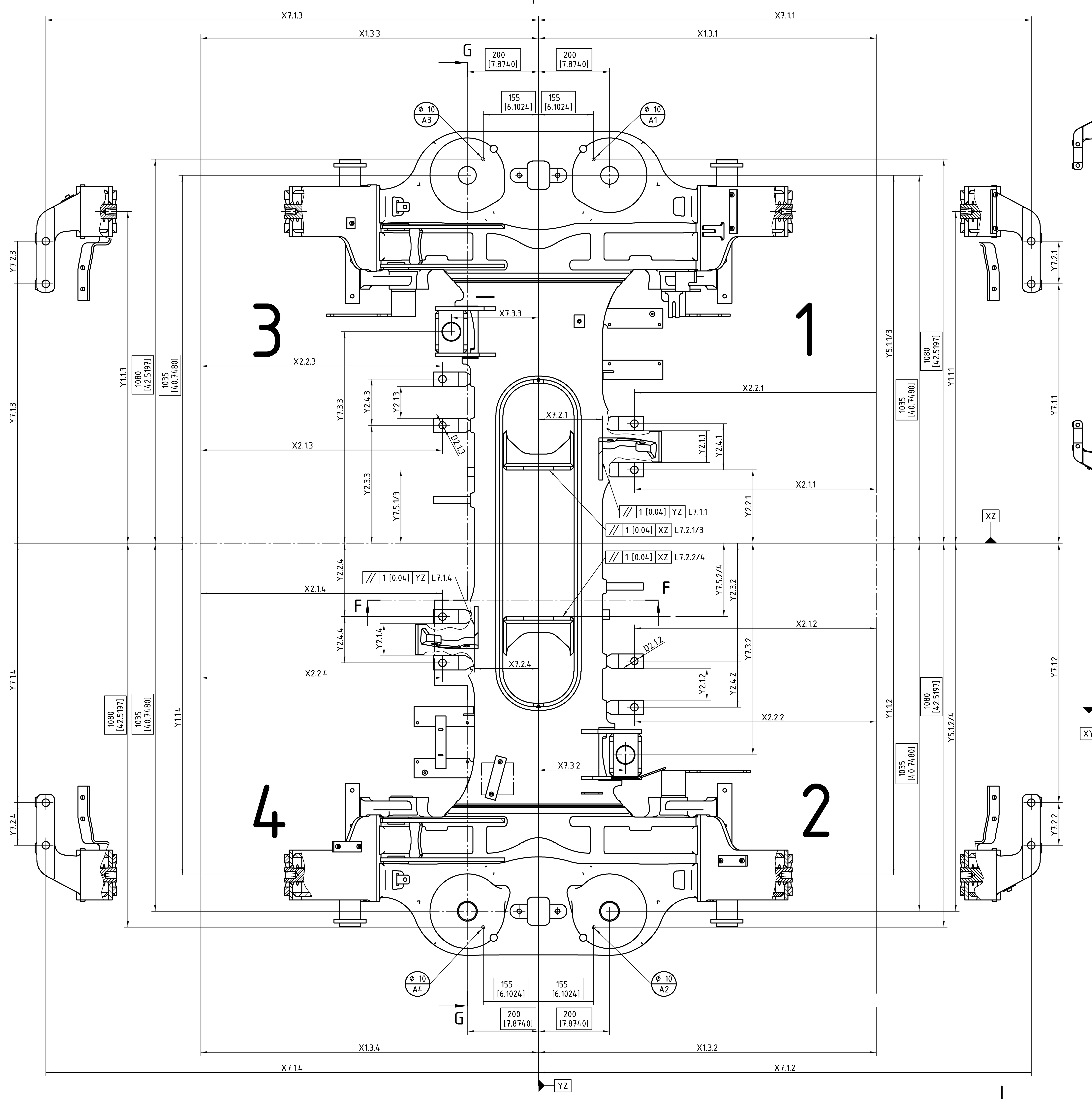

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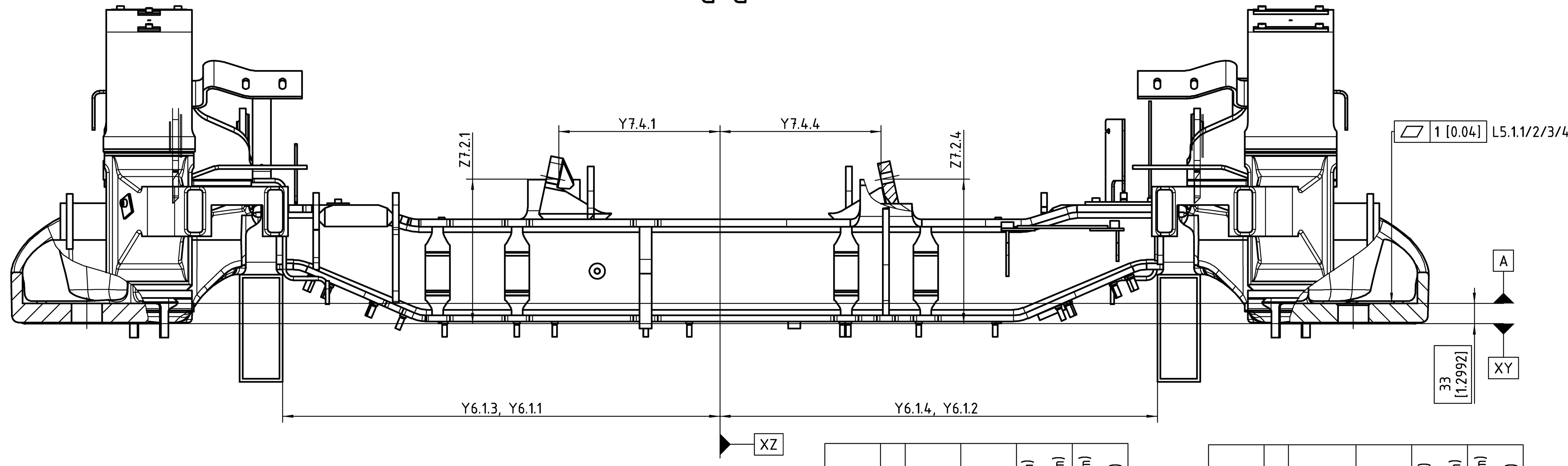

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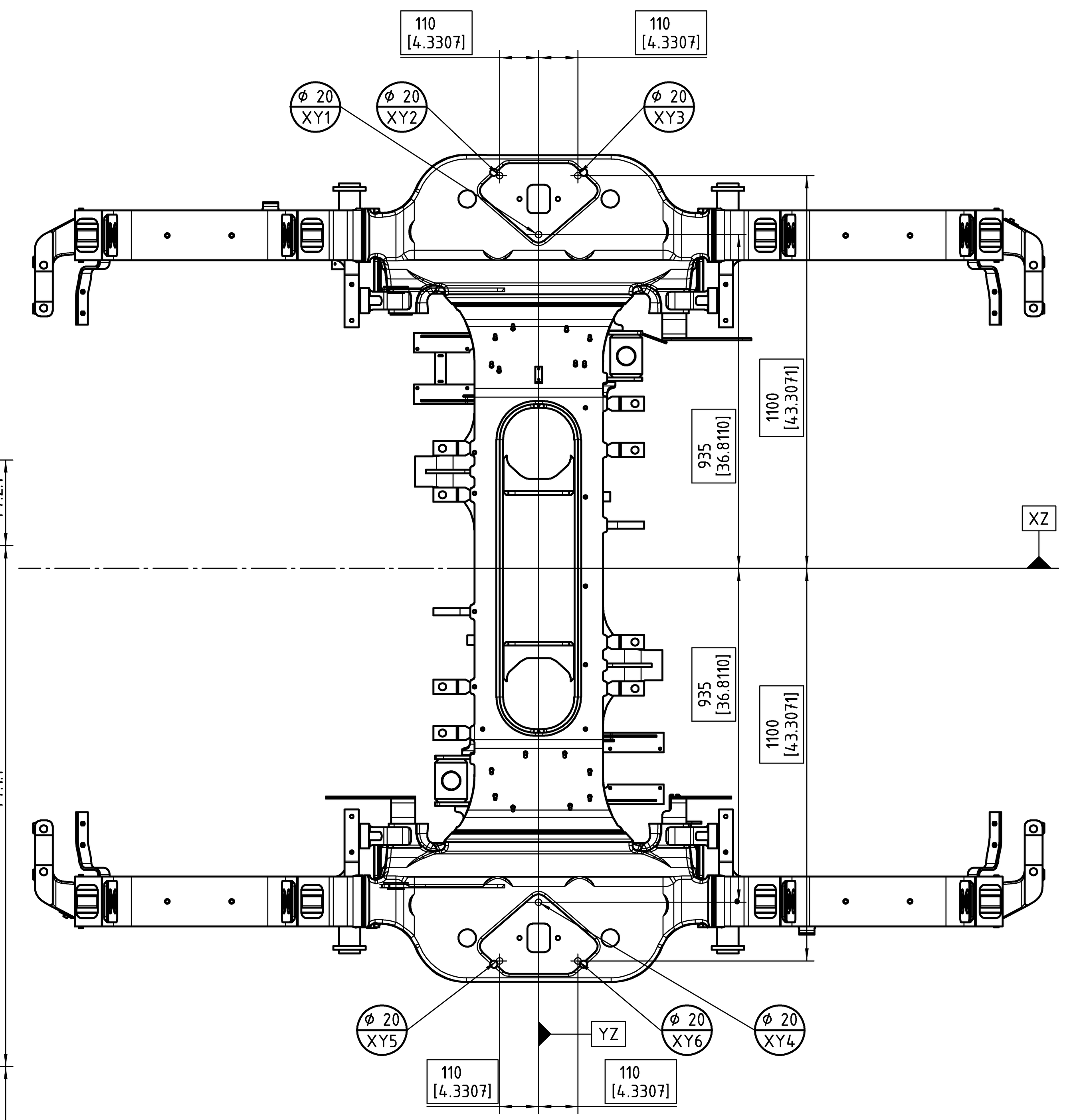

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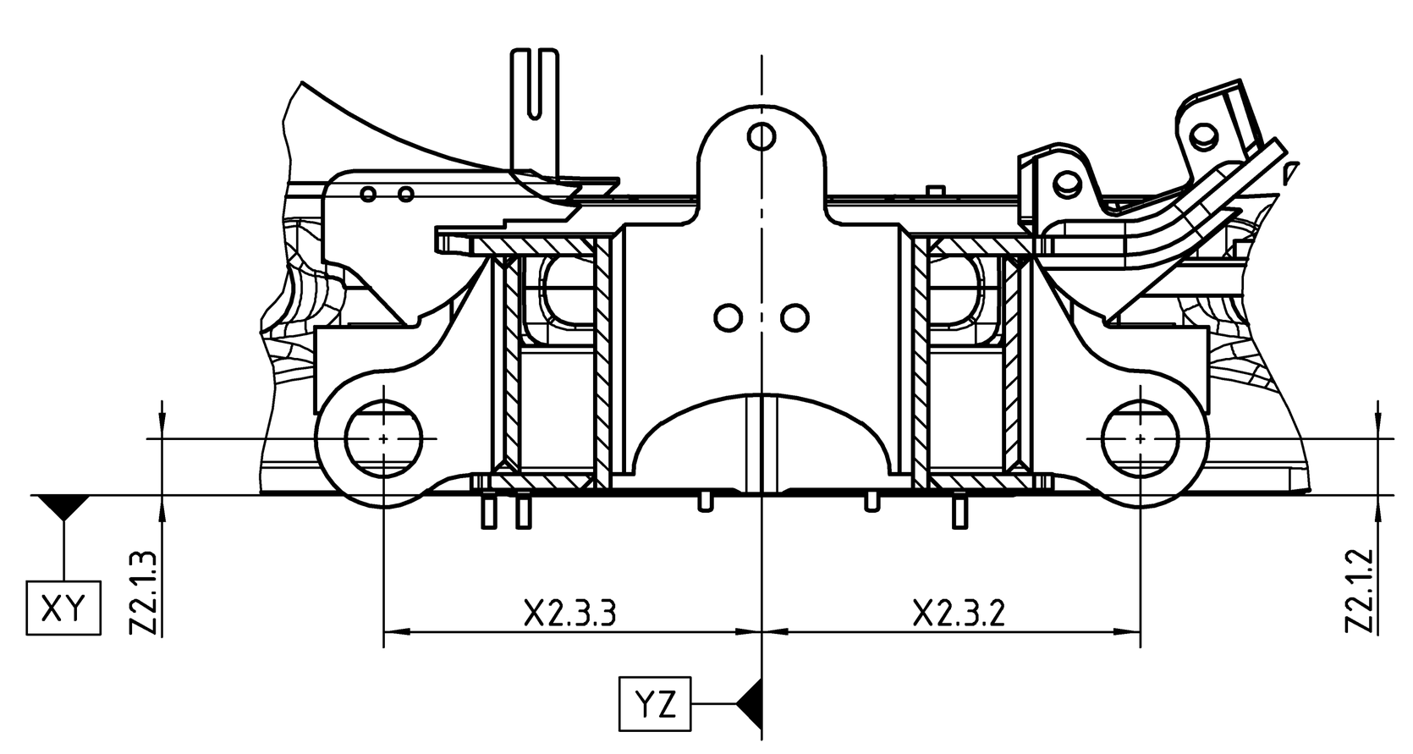

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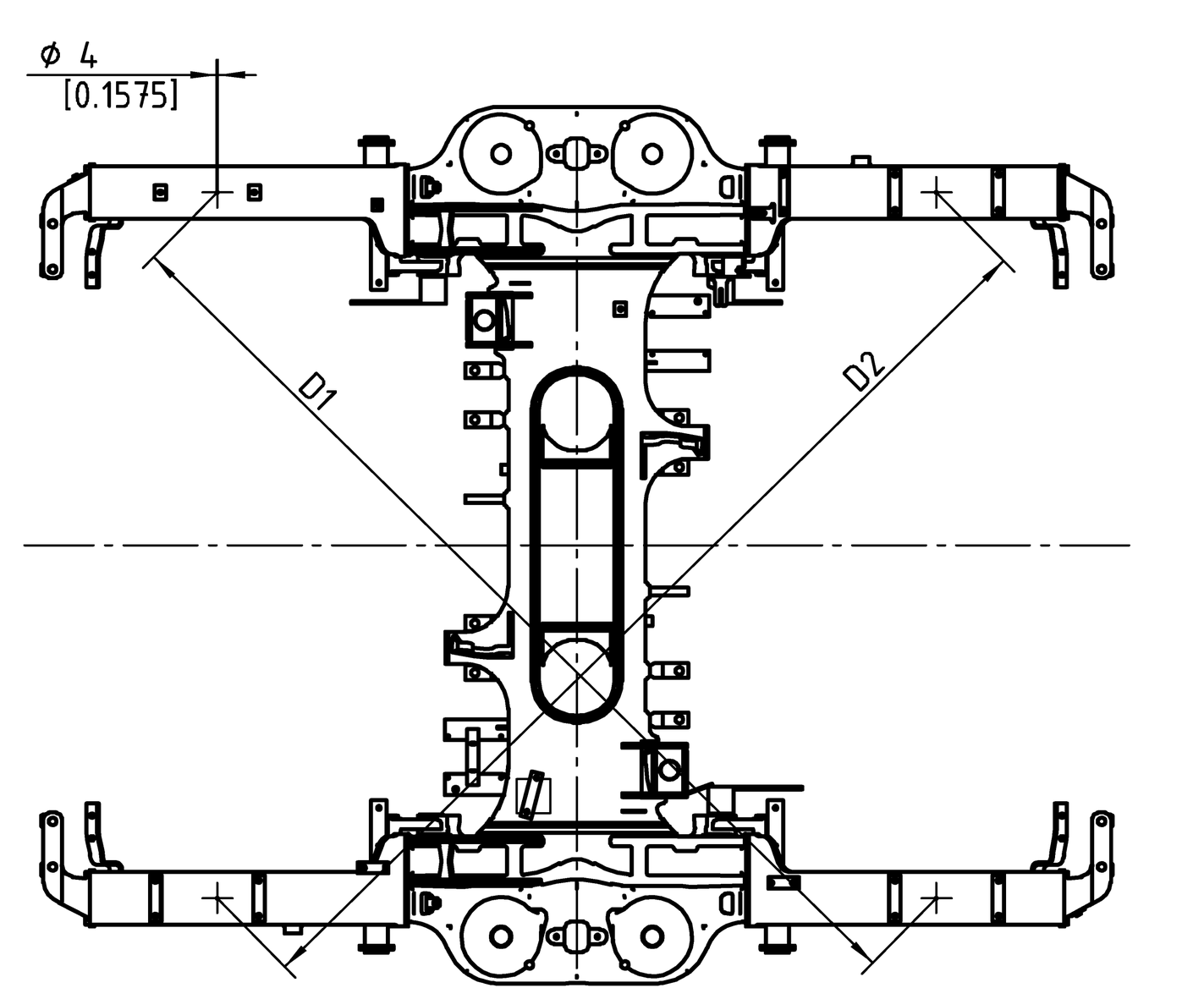

Baugruppe Assembly		Maßgruppe Dimension-Group	Nennmaß (mm) Nominal size (mm)	Obere Toleranz (mm) Upper tolerance (mm)	Untere Toleranz (mm) Lower tolerace (mm)
1	X	X1.1.1 X1.1.2 X1.1.3 X1.1.4	472.7	0.5	0.5
		X1.2.1 X1.2.2 X1.2.3 X1.2.4	500.5	0.5	0.5
		X1.3.1 X1.3.2 X1.3.3 X1.3.4	950	0.75	1
		X1.3.1 - X1.3.2	</= 1		
		X1.3.3 - X1.3.4	</= 1		
	Y	Y1.1.1 Y1.1.2 Y1.1.3 Y1.1.4	933	0.5	0.5
	Z	Z1.1.1 Z1.1.2 Z1.1.3 Z1.1.4	199	2	2
	A	A1.1.1 A1.1.2 A1.1.3 A1.1.4 A1.2.1 A1.2.2 A1.2.3 A1.2.4	100	0.02	0.02
2	X	X2.1.1 X2.1.2 X2.1.3 X2.1.4 X2.2.1 X2.2.2 X2.2.3 X2.2.4	680	0.5	0.5
		X2.3.2 X2.3.3	250	0.5	0.5
	Y	Y2.1.1 Y2.1.2 Y2.1.3 Y2.1.4	90	2	0
		Y2.2.1 Y2.2.4	206.5	0.3	0.3
		Y2.3.2 Y2.3.3	331.5	0.3	0.3
		Y2.4.1 Y2.4.2 Y2.4.3 Y2.4.4	130	0.2	0.2
	Z	Z2.1.2 Z2.1.3	37	0.5	0.5
	D	D2.1.2 D2.1.3	ϕ 21	0.02	0
3	X	X3.1.3 X3.1.4	400	0.2	0.2
	Z	Z3.1.3 Z3.1.4	307	0.5	0.5
	D	D3.1.3 D3.1.4	ϕ 32	0.16	0
5	Y	Y5.1.1/3 Y5.1.2/4	1035	1	1

Baugruppe Assembly		Maßgruppe Dimension-Group	Nennmaß (mm) Nominal size (mm)	Obere Toleranz (mm) Upper tolerance (mm)	Untere Toleranz (mm) Lower tolerace (mm)
6	X	X6.1.1/3 X6.1.2/4	1008	0	2
	Y	Y6.1.1 Y6.1.2 Y6.1.3 Y6.1.4	715	1.5	1.5
7	X	X7.1.1 X7.1.2 X7.1.3 X7.1.4	1386	0.5	0.5
		X7.2.1 X7.2.4	180	2	2
		X7.3.2 X7.3.3	245	2	2
		X7.4.1 X7.4.2 X7.4.3 X7.4.4	690	0	1
	Y	Y7.1.1 Y7.1.2 Y7.1.3 Y7.1.4	729.5	0.5	0.5
		Y7.2.1 Y7.2.2 Y7.2.3 Y7.2.4	120	0.3	0.3
		Y7.3.2 Y7.3.3	595	2	2
		Y7.4.1 Y7.4.4	263.4	2.5	2.5
		Y7.5.1/3 Y7.5.2/4	206	1.5	0
	Z	Z7.1.1 Z7.1.2 Z7.1.3 Z7.1.4	143	1	1
		Z7.2.1 Z7.2.4	236.4	2.5	2.5
	D	D1 D2	2663	0.7	0.7

Form und Lagetoleranzen

Shape and positional tolerances

Baugruppe Assembly	Maßgruppe Dimension-Group	Toleranz Tolerance
5	L5.1.1/2/3/4	1
7	L7.1.1 L7.1.4	1
	L7.2.1/3 L7.2.2/4	1

Maßtabellen in Inch siehe Blatt 3

Measure tables in inch see sheet 3

Legende zu Baugruppen-Zuordnung (erste Zahl der Maßgruppe entspricht der Baugruppe)

legend of component allocation (first number of dimension group equivalent to component)

1.. Radsatzführung
2.. Antrieb
3.. Längsmitnahme
4.. Bremse
5.. Sekundärfeder
6.. Schienenbremse
7.. Anbauteile
8.. Messpunkte
9.. Hauptabmessungen
10.. Sonstige

1.. Wheelset steering
2.. Traktion unit
3.. Draw bar
4.. Brake
5.. Secondary suspension
6.. Track brake
7.. Assembly components
8.. Measuring points
9.. Main dimensions
10.. Miscellaneous

Achtung:
Die Arbeitspapiere und/oder technischen Spezifikationen sind einzuhalten!

Attention:
Additional manufacturing instructions and/or technical specifications have to be adhered!

Part no. A2V00375122298

Siemens no.

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2832X2317,3X608,4

MTB
TS_REB02

Index	Revision no.	Date	Name
J	500000689952	-2312	GOT
C	500000037989	-0705	GOT
D	500000106460	-0905	GOT
E	500000133249	-1002	HOTH
F	500000226130	-1306	GOT
G	500000471830	-1810	GOT
H	500000485529	-1902	GOT

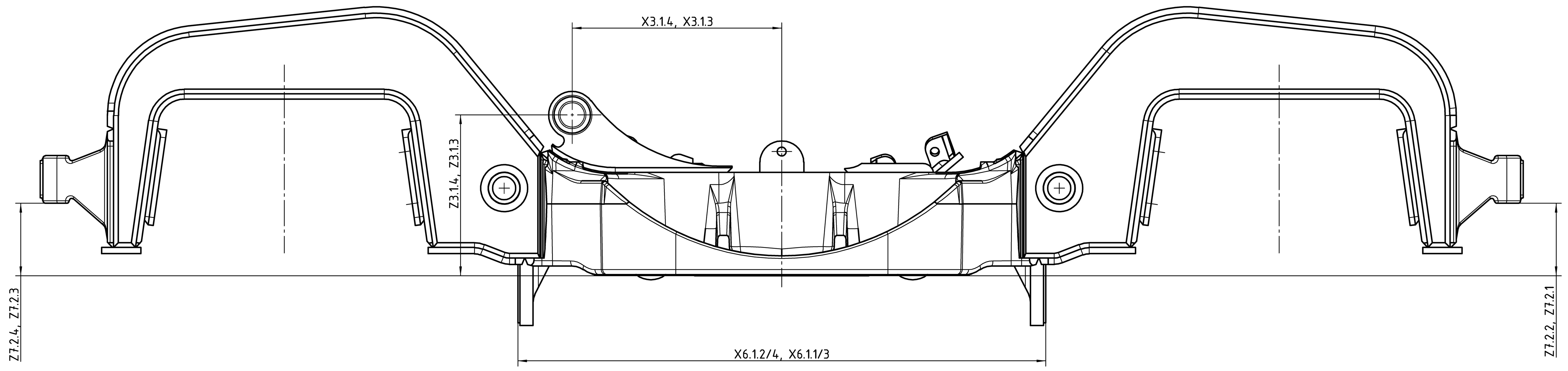
1:5		Date	Name
	Prepared	2023-12-05	STEIRER_HA
	Checked	2023-12-05	BECK_ROL
	Approved	2023-12-07	GOTTSCH_MA
		EN/DE	

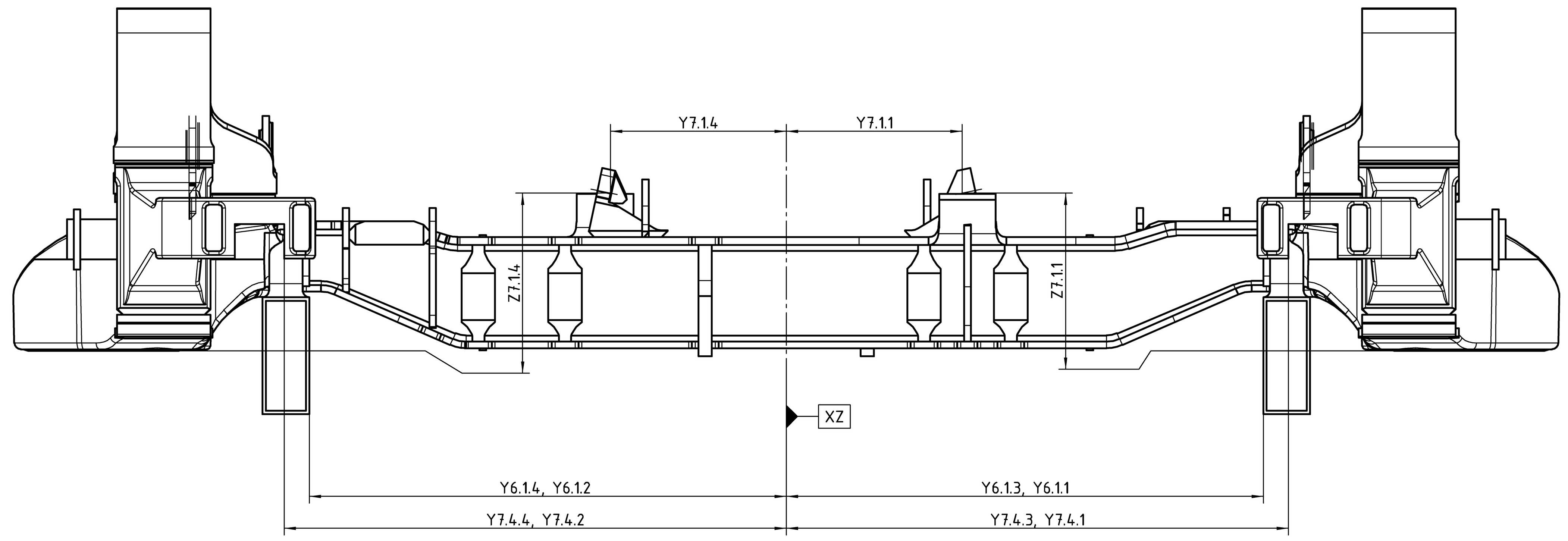
Motor bogie frame,
measuring sheet
TDG- Rahmen, Messplan

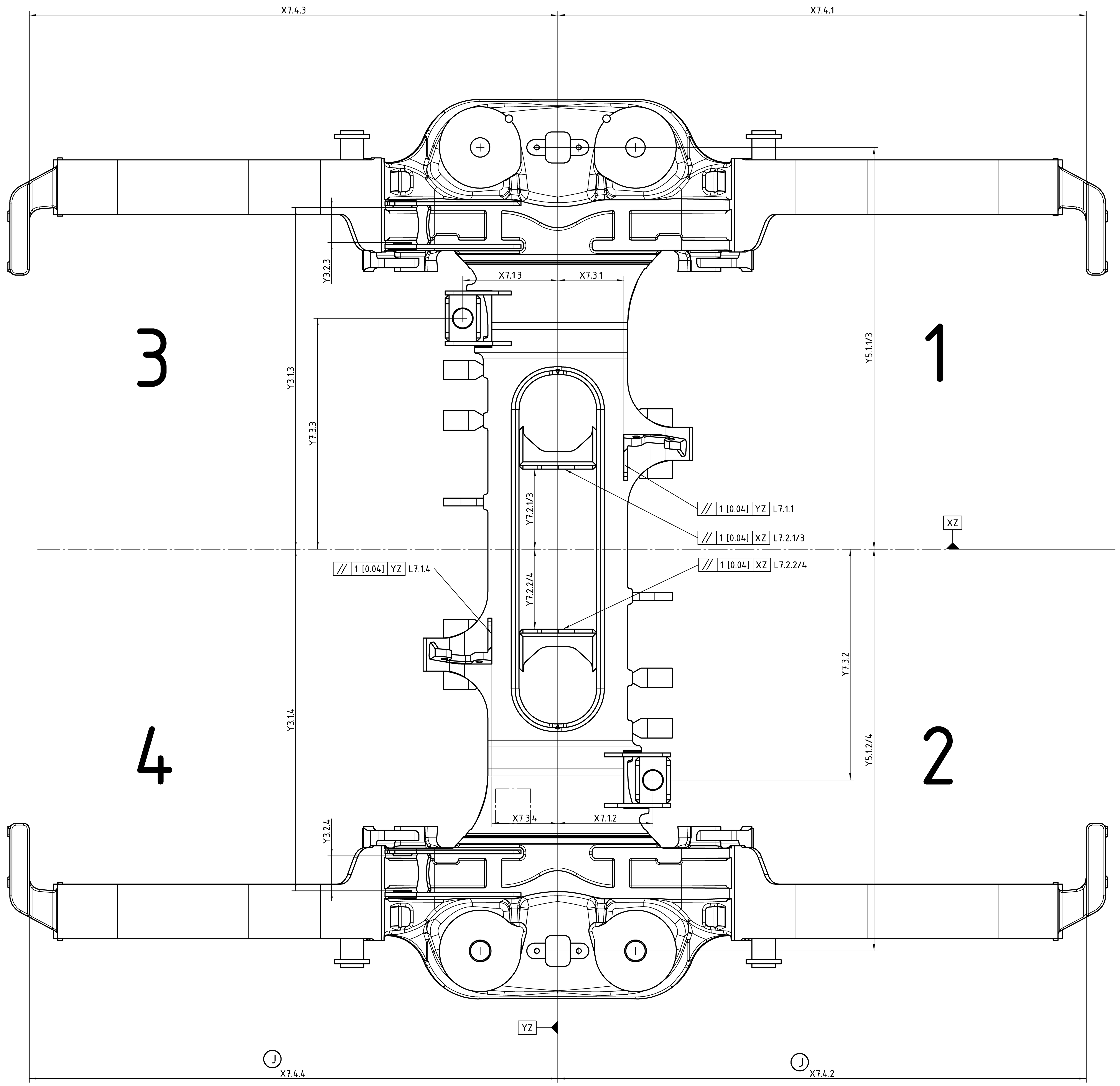
SIEMENS

A6Z00375122298 | J | 01/03

A0







Legende zu Baugruppen-Zuordnung
(erste Zahl der Maßgruppe
entspricht der Baugruppe)

legend of component allocation
(first number of dimension group
equivalent to component)

1.. Radsatzführung
2.. Antrieb
3.. Längsmitnahme
4.. Bremse
5.. Sekundärfeder
6.. Schienenbremse
7.. Anbauteile
8.. Messpunkte
9.. Hauptabmessungen
10.. Sonstige

1.. Wheelset steering
2.. Traktion unit
3.. Draw bar
4.. Brake
5.. Secondary suspension
6.. Track brake
7.. Assembly components
8.. Measuring points
9.. Main dimensions
10.. Miscellaneous

Baugruppe Assembly		Maßgruppe Dimension-Group	Nennmaß (mm) Nominal size (mm)	Obere Toleranz (mm) Upper tolerance (mm)	Untere Toleranz (mm) Lower tolerace (mm)
3	X	X3.1.3	400	1.5	1.5
		X3.1.4			
	Y	Y3.1.3	880	1	1
		Y3.1.4			
		Y3.2.3	90	0.5	0
		Y3.2.4			
	Z	Z3.1.3	307	1.5	1.5
		Z3.1.4			
5	Y	Y5.1.1/3	1035	1	1
		Y5.1.2/4			
6	X	X6.1.1/3	1008	0	2
		X6.1.2/4			
	Y	Y6.1.1	715	1.5	1.5
		Y6.1.2			
		Y6.1.3			
		Y6.1.4			
7	X	X7.1.2	245	2	2
		X7.1.3			
		X7.3.1	170	2	2
		X7.3.4			
		X7.4.1	1361	1.5	1.5
		X7.4.2			
		X7.4.3			
		X7.4.4			
	Y	Y7.1.1	263.4	2	2
		Y7.1.4			
		Y7.2.1/3	206	1.5	0
		Y7.2.2/4			
		Y7.3.2	595	2	2
		Y7.3.3			
		Y7.4.1	752.5	1.5	1.5
		Y7.4.2			
		Y7.4.3			
		Y7.4.4			
	Z	Z7.1.1	236.4	1.5	1.5
		Z7.1.4			
		Z7.2.1	138.2	1.5	1.5
		Z7.2.2			
		Z7.2.3			
		Z7.2.4			

Form und Lagetoleranzen

Shape and positional tolerances

Baugruppe Assembly	Maßgruppe Dimension-Group	Toleranz Tolerance
7	L7.1.1	1
	L7.1.4	
	L7.2.1/3	1
	L7.2.2/4	

Maßtabellen in Inch siehe Blatt 3

Measure tables in inch see sheet 3

Messplan Rahmenrohbau

Measuring sheet, bogie frame shell

Part no. A2V00375122298

Siemens no.

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MTB
TS_REB02

Index	Revision no.	Date	Name
J	500000689952	-2312	GOT
C	500000037989	-0705	GOT
D	500000106460	-0905	GOT
E	500000133249	-1002	HOTH
F	500000226130	-1306	GOT
G	500000471830	-1810	GOT
H	500000485529	-1902	GOT

1:5		Date	Name
	Prepared	2023-12-05	STEIRER_HA
	Checked	2023-12-05	BECK_ROL
	Approved	2023-12-07	GOTTSCH_MA

EN/DE

Motor bogie frame, measuring sheet
TDG- Rahmen, Messplan

SIEMENS

A6Z00375122298 | J | 02/03

A0

Maßtabellen in Inch fuer TDG-Rahmen mech.bearb.(Bl.1)

Measure tables in inch for MB-frame machined (sheet 1)

Legende zu Baugruppen-Zuordnung
(erste Zahl der Maßgruppe
entspricht der Baugruppe)

legend of component allocation
(first number of dimension group
equivalent to component)

1.. Radsatzführung
2.. Antrieb
3.. Längsmitnahme
4.. Bremse
5.. Sekundärfeder
6.. Schienenbremse
7.. Anbauteile
8.. Messpunkte
9.. Hauptabmessungen
10.. Sonstige

1.. Wheelset steering
2.. Traktion unit
3.. Draw bar
4.. Brake
5.. Secondary suspension
6.. Track brake
7.. Assembly components
8.. Measuring points
9.. Main dimensions
10.. Miscellaneous

Assembly		Dimension-Group	Nominal size (inch)	Upper tolerance (inch)	Lower tolerace (inch)
1	X	X1.1.1 X1.1.2 X1.1.3 X1.1.4	18.6102	0.0197	0.0197
1	X	X1.2.1 X1.2.2 X1.2.3 X1.2.4	19.7047	0.0197	0.0197
1	X	X1.3.1 X1.3.2 X1.3.3 X1.3.4	37.4016	0.0295	0.0394
1	X	X1.3.1 - X1.3.2	</= 0.0394		
1	X	X1.3.3 - X1.3.4	</= 0.0394		
1	Y	Y1.1.1 Y1.1.2 Y1.1.3 Y1.1.4	36.7323	0.0197	0.0197
1	Z	Z1.1.1 Z1.1.2 Z1.1.3 Z1.1.4	7.8346	0.0787	0.787
1	A	A1.1.1 A1.1.2 A1.1.3 A1.1.4 A1.2.1 A1.2.2 A1.2.3 A1.2.4	3.9370	0.0008	0.0008
2	X	X2.1.1 X2.1.2 X2.1.3 X2.1.4 X2.2.1 X2.2.2 X2.2.3 X2.2.4	26.2717	0.0197	0.0197
2	X	X2.3.2 X2.3.3	9.8425	0.0197	0.0197
2	Y	Y2.1.1 Y2.1.2 Y2.1.3 Y2.1.4	3.5433	0.0787	0
2	Y	Y2.2.1 Y2.2.4	8.1299	0.0118	0.0118
2	Y	Y2.3.2 Y2.3.3	13.0512	0.0118	0.0118
2	Y	Y2.4.1 Y2.4.2 Y2.4.3 Y2.4.4	5.1181	0.0079	0.0079
2	Z	Z2.1.2 Z2.1.3	1.4567	0.0197	0.0197
2	D	D2.1.2 D2.1.3	⌀ 0.8268	0.0008	0
3	X	X3.1.3 X3.1.4	15.7480	0.0079	0.0079
3	Z	Z3.1.3 Z3.1.4	12.0866	0.0197	0.0197
3	D	D3.1.3 D3.1.4	⌀ 1.2598	0.0063	0
5	Y	Y5.1.1/3 Y5.1.2/4	40.7480	0.0394	0.0394

Assembly		Dimension-Group	Nominal size (inch)	Upper tolerance (inch)	Lower tolerace (inch)
6	X	X6.1.1/3 X6.1.2/4	39.6850	0	0.0787
6	Y	Y6.1.1 Y6.1.2 Y6.1.3 Y6.1.4	28.1496	0.0591	0.0591
7	X	X7.1.1 X7.1.2 X7.1.3 X7.1.4	54.5669	0.0197	0.0197
7	X	X7.2.1 X7.2.4	7.0866	0.0787	0.0787
7	X	X7.3.2 X7.3.3	9.6457	0.0787	0.0787
7	X	X7.4.1 X7.4.2 X7.4.3 X7.4.4	27.1654	0	0.0394
7	Y	Y7.1.1 Y7.1.2 Y7.1.3 Y7.1.4	28.7205	0.0197	0.0197
7	Y	Y7.2.1 Y7.2.2 Y7.2.3 Y7.2.4	4.7244	0.0118	0.0118
7	Y	Y7.3.2 Y7.3.3	23.4252	0.0787	0.0787
7	Y	Y7.4.1 Y7.4.4	10.3701	0.0984	0.0984
7	Y	Y7.5.1/3 Y7.5.2/4	8.1102	0.0591	0
7	Z	Z7.1.1 Z7.1.2 Z7.1.3 Z7.1.4	5.6299	0.0394	0.0394
7	Z	Z7.2.1 Z7.2.4	9.3071	0.0984	0.0984
	D	D1 D2	104.8425	0.0276	0.0276

Form und Lagetoleranzen

Shape and positional tolerances

Assembly	Dimension-Group	Tolerance
5	L5.1.1/2/3/4	0.0394
7	L7.1.1 L7.1.4	0.0394
7	L7.2.1/3 L7.2.2/4	0.0394

Maßtabellen in Inch fuer TDG-Rahmen Rohbau (Bl.2)

Measure tables in inch for MB-frame shell (sheet 2)

Legende zu Baugruppen-Zuordnung
(erste Zahl der Maßgruppe
entspricht der Baugruppe)

legend of component allocation
(first number of dimension group
equivalent to component)

1.. Radsatzführung
2.. Antrieb
3.. Längsmitnahme
4.. Bremse
5.. Sekundärfeder
6.. Schienenbremse
7.. Anbauteile
8.. Messpunkte
9.. Hauptabmessungen
10.. Sonstige

1.. Wheelset steering
2.. Traktion unit
3.. Draw bar
4.. Brake
5.. Secondary suspension
6.. Track brake
7.. Assembly components
8.. Measuring points
9.. Main dimensions
10.. Miscellaneous

Assembly		Dimension-Group	Nominal size (inch)	Upper tolerance (inch)	Lower tolerace (inch)
3	X	X3.1.3 X3.1.4	15.7480	0.0591	0.0591
3	Y	Y3.1.3 Y3.1.4	34.6457	0.0394	0.0394
3	Y	Y3.2.3 Y3.2.4	3.5433	0.0197	0
3	Z	Z3.1.3 Z3.1.4	12.0866	0.0591	0.0591
5	Y	Y5.1.1/3 Y5.1.2/4	40.7480	0.0394	0.0394
6	X	X6.1.1/3 X6.1.2/4	39.6850	0	0.0787
6	Y	Y6.1.1 Y6.1.2 Y6.1.3 Y6.1.4	28.1596	0.0591	0.0591
7	X	X7.1.2 X7.1.3	9.6457	0.0787	0.0787
7	X	X7.3.1 X7.3.4	9.6929	0.0787	0.0787
7	X	X7.4.1 X7.4.2 X7.4.3 X7.4.4	53.5827	0.0591	0.0591
7	Y	Y7.1.1 Y7.1.4	10.3701	0.0787	0.0787
7	Y	Y7.2.1/3 Y7.2.2/4	8.1102	0.0591	0
7	Y	Y7.3.2 Y7.3.3	23.4252	0.0787	0.0787
7	Y	Y7.4.1 Y7.4.2 Y7.4.3 Y7.4.4	29.6260	0.0591	0.0591
7	Z	Z7.1.1 Z7.1.4	9.3071	0.0591	0.0591
7	Z	Z7.2.1 Z7.2.2 Z7.2.3 Z7.2.4	5.4409	0.0591	0.0591

Form und Lagetoleranzen

Shape and positional tolerances

Assembly	Dimension-Group	Tolerance
7	L7.1.1 L7.1.4	0.0394
7	L7.2.1/3 L7.2.2/4	0.0394

Part no. A2V00375122298
Siemens no.

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MTB
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Index	Revision no.	Date	Name
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E	500000133249	-1002	HOTH
F	500000226130	-1306	GOT
G	500000471830	-1810	GOT
H	500000485529	-1902	GOT

1:5		Date	Name
	Prepared	2023-12-05	STEIRER_HA
	Checked	2023-12-05	BECK_ROL
	Approved	2023-12-07	GOTTSCH_MA

EN/DE

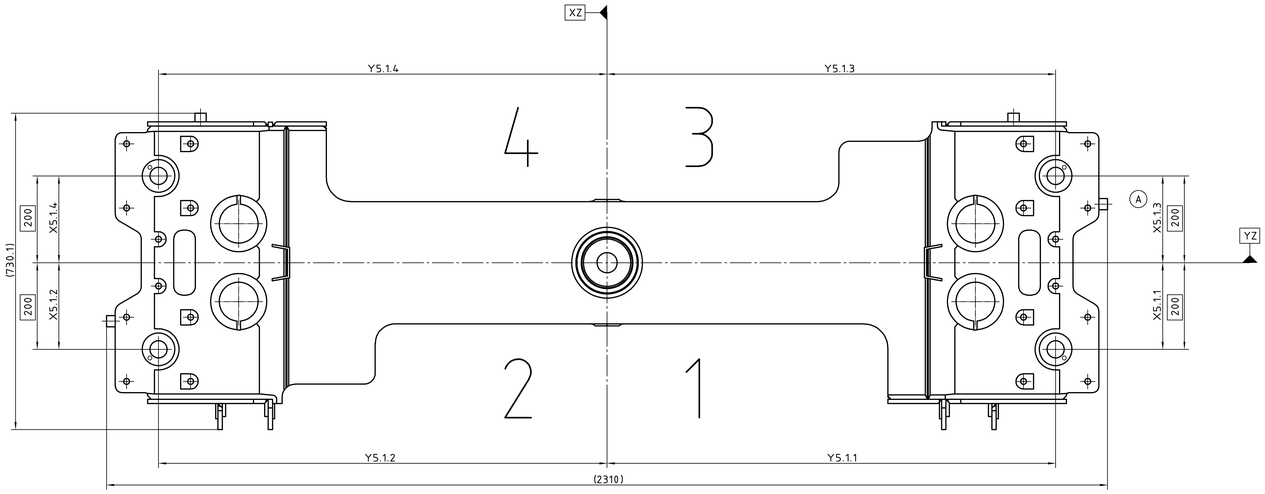
Motor bogie frame,
measuring sheet
TDG- Rahmen, Messplan

SIEMENS

A6Z00375122298 | J | 03/03

A0

Restricted/Intern



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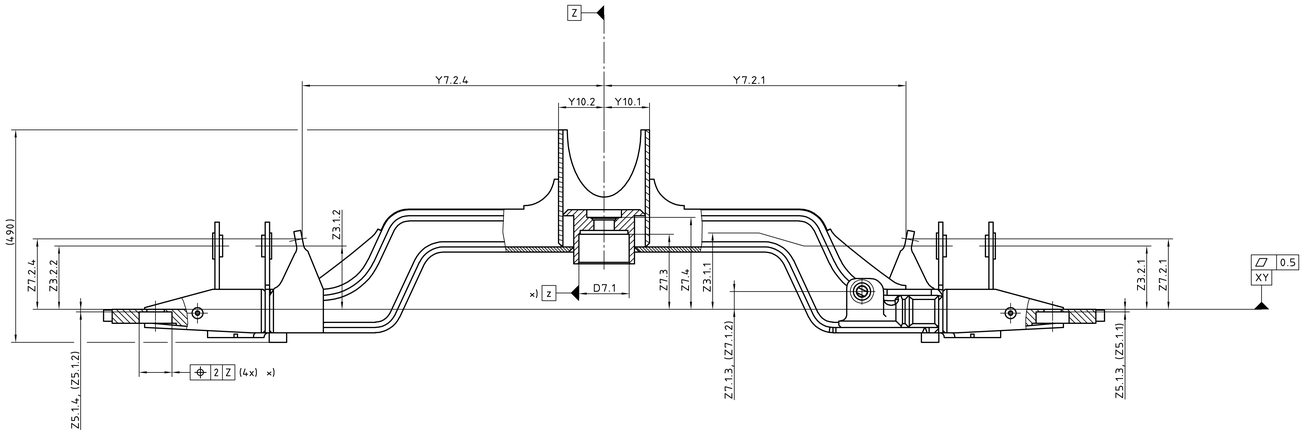

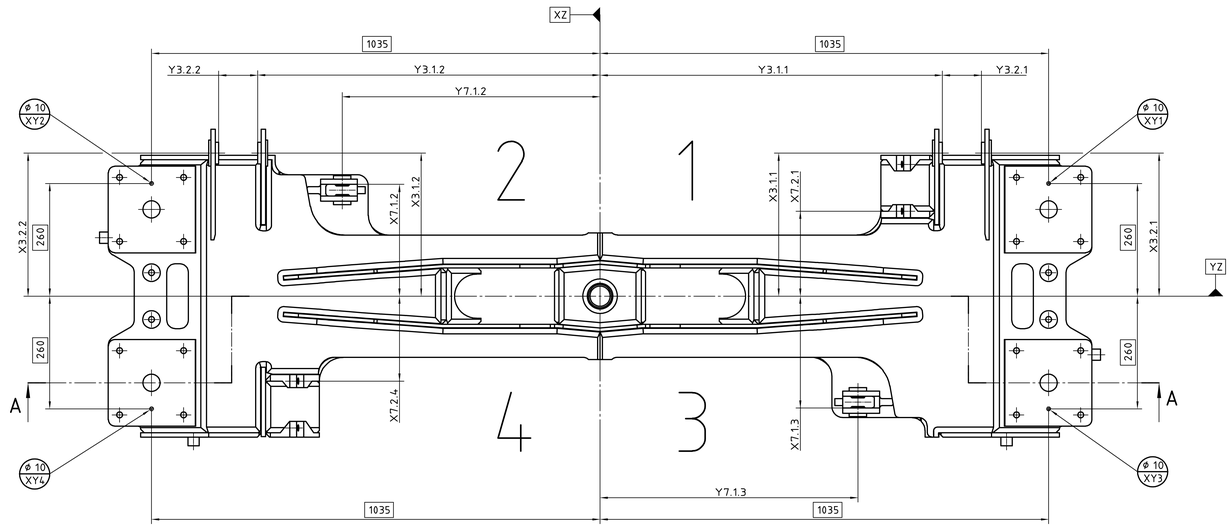

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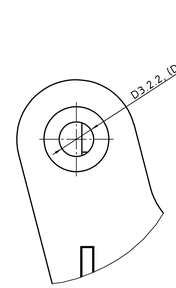


Baugruppe Assembly		Maßgruppe Dimension-Group	Nennmaß (mm) Nominal size (mm)	Obere Toleranz (mm) Upper tolerance (mm)	Untere Toleranz (mm) Lower tolerance (mm)	
3	X	X3.1.1	330	0.2	0.2	
		X3.1.2	330	0.2	0.2	
		X3.2.1	330	0.2	0.2	
		X3.2.2	330	0.2	0.2	A
	Y	Y3.1.1	790	1.5	1.5	
		Y3.1.2	790	1.5	1.5	
		Y3.2.1	90	0.3	0.3	
		Y3.2.2	90	0.3	0.3	
	Z	Z3.1.1	146	1	1	
		Z3.1.2	146	1	1	
		Z3.2.1	146	1	1	
		Z3.2.2	146	1	1	
	D	D3.1.1	32	0.16	0	
		D3.1.2	32	0.16	0	
		D3.2.1	32	0.16	0	
		D3.2.2	32	0.16	0	
5	X	X5.1.1	200	2	2	
		X5.1.2	200	2	2	
		X5.1.3	200	2	2	
		X5.1.4	200	2	2	
	Y	Y5.1.1	1035	2	2	
		Y5.1.2	1035	2	2	
		Y5.1.3	1035	2	2	
		Y5.1.4	1035	2	2	
	Z	Z5.1.1	6	1	1	
		Z5.1.2	6	1	1	
		Z5.1.3	6	1	1	
		Z5.1.4	6	1	1	
7	X	X7.1.2	258	3	3	
		X7.1.3	258	3	3	
		X7.2.1	196	3	3	
		X7.2.4	196	3	3	
	Y	Y7.1.2	595	3	3	
		Y7.1.3	595	3	3	
		Y7.2.1	696.6	3	3	
		Y7.2.4	696.6	3	3	
	Z	Z7.1.2	41	3	3	
		Z7.1.3	41	3	3	
		Z7.2.1	162.5	3	3	
		Z7.2.4	162.5	3	3	
		Z7.3	173	2	2	
		Z7.4	212	2	2	A
	D	D7.1	116	0.035	0	
10	Y	Y10.1	105	1	1	
		Y10.2	105	1	1	

Legende zu Baugruppen-Zuordnung
(erste Zahl der Maßgruppe entspricht der Baugruppe)

legend of component allocation
(first number of dimension group equivalent to component)

1.. Radsatzführung
2.. Antrieb
3.. Längsmitnahme
4.. Bremse
5.. Sekundärfeder
6.. Schienenbremse
7.. Anbauteile
8.. Messpunkte
9.. Hauptabmessungen
10.. Sonstige

1.. Wheelset steering
2.. Traktion unit
3.. Draw bar
4.. Brake
5.. Secondary suspension
6.. Track brake
7.. Assembly components
8.. Measuring points
9.. Main dimensions
10.. Miscellaneous

×) Bedingung zur Definition der Ebene YZ

×) Plain YZ is defined by these conditions

Part no. | Siemens no.

DRAWING SHALL BE REVISED BY THE CAD SYSTEM ONLY

A0 | TS

Index	Revision no.	Date	Name
A	K333-443558	04-04	SEG
B	5000000379B9	04-07	!

ISO 2768mk
ISO 13920-BF
ISO 1101

MTB
TS_REA

1:5	Prepared	2003-12-09	BRECKO_JOS
	Checked		
	Approved	2003-12-09	BRECKO_JOS
	Date	Name	
	EN/DE		

Measuring sheeet,
bogie bolster machined
Messplan, Wiege
mechan.Bearbeitung

SIEMENS

A6Z00375128344 | B | 01/01

SIEMENS	PART NAME : S70 POWER TRUCK, MACHINED		May 17, 2024	10:20
	REV NUMBER : H	SER NUMBER : US00102	STATS COUNT : 1	

DRAWING NUMBER : A6Z00375122298
INSPECTED BY : Michael Gonzalez
INSTRUMENT : FARO ARM 7 AXIS

DIM X1.1.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	472.70	0.50	-0.50	472.35	-0.35	0.00

DIM X1.1.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	472.70	0.50	-0.50	472.71	0.00	0.00

DIM X1.1.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	472.70	0.50	-0.50	472.70	0.00	0.00

DIM X1.1.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	472.70	0.50	-0.50	472.74	0.04	0.00

DIM X1.2.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	500.50	0.50	-0.50	499.74	-0.76	0.26

DIM X1.2.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	500.50	0.50	-0.50	500.54	0.04	0.00

DIM X1.2.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	500.50	0.50	-0.50	500.60	0.10	0.00

DIM X1.2.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	500.50	0.50	-0.50	500.55	0.05	0.00

DIM X1.3.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	950.00	0.75	-1.00	948.82	-1.18	0.18

DIM X1.3.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	950.00	0.75	-1.00	950.17	0.17	0.00

DIM X1.3.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	950.00	0.75	-1.00	950.68	0.68	0.00

DIM X1.3.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	950.00	0.75	-1.00	949.42	-0.58	0.00

DIM X1.3.1 - X1.3.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	0.0	1.0	-1.0	1.4	1.4	0.4

DIM X1.3.3 - X1.3.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	0.0	1.0	-1.0	1.3	1.3	0.3

DIM Y1.1.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	933.00	0.50	-0.50	932.90	-0.10	0.00

DIM Y1.1.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	933.00	0.50	-0.50	932.39	-0.61	0.11

DIM Y1.1.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	933.00	0.50	-0.50	932.69	-0.31	0.00

DIM Y1.1.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	933.00	0.50	-0.50	933.24	0.24	0.00

DIM Z1.1.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	199.0	2.0	-2.0	196.8	-2.2	0.2

DIM Z1.1.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	199.0	2.0	-2.0	199.9	0.9	0.0

DIM Z1.1.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	199.0	2.0	-2.0	199.8	0.8	0.0

DIM Z1.1.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	199.0	2.0	-2.0	196.9	-2.1	0.1

DIAMETER A1.1.1-4 AND A1.2.1-4 ARE MANUALLY INPUTED

DIM A1.1.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	100.000	0.020	-0.020	99.990	-0.010	0.000

DIM A1.1.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	100.000	0.020	-0.020	100.010	0.010	0.000

DIM A1.1.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	100.000	0.020	-0.020	100.010	0.010	0.000

DIM A1.1.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	100.000	0.020	-0.020	100.000	0.000	0.000

DIM A1.2.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	100.000	0.020	-0.020	100.000	0.000	0.000

DIM A1.2.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	100.000	0.020	-0.020	99.990	-0.010	0.000

DIM A1.2.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	100.000	0.020	-0.020	100.010	0.010	0.000

DIM A1.2.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	100.000	0.020	-0.020	100.000	0.000	0.000

DIM X2.1.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	680.00	0.50	-0.50	679.35	-0.65	0.15

DIM X2.1.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	680.00	0.30	-0.30	680.34	0.34	0.04

DIM X2.1.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	680.00	0.30	-0.30	680.11	0.11	0.00

DIM X2.1.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	680.00	0.50	-0.50	679.19	-0.81	0.31

DIM X2.2.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	680.00	0.50	-0.50	679.42	-0.58	0.08

DIM X2.2.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	680.00	0.50	-0.50	680.29	0.29	0.00

DIM X2.2.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	680.00	0.50	-0.50	680.24	0.24	0.00

DIM X2.2.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	680.00	0.50	-0.50	679.33	-0.67	0.17

DIM X2.3.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	250.00	0.50	-0.50	249.68	-0.32	0.00

DIM X2.3.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	250.00	0.50	-0.50	250.60	0.60	0.10

DIM Y2.1.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	90.0	2.0	0.0	90.6	0.6	0.0

DIM Y2.1.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	90.0	2.0	0.0	90.3	0.3	0.0

DIM Y2.1.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	90.0	2.0	0.0	90.2	0.2	0.0

DIM Y2.1.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	90.0	2.0	0.0	90.5	0.5	0.0

DIM Y2.2.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	206.50	0.30	-0.30	206.59	0.09	0.00

DIM Y2.2.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	206.50	0.30	-0.30	206.97	0.47	0.17

DIM Y2.3.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	331.50	0.30	-0.30	331.23	-0.27	0.00

DIM Y2.3.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	331.50	0.30	-0.30	331.28	-0.22	0.00

DIM Y2.4.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	130.00	0.20	-0.20	130.06	0.06	0.00

DIM Y2.4.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	130.00	0.20	-0.20	130.00	0.00	0.00

DIM Y2.4.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	130.00	0.20	-0.20	129.98	-0.02	0.00

DIM Y2.4.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	130.00	0.20	-0.20	129.79	-0.21	0.01

DIM Z2.1.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Z	37.00	0.50	-0.50	37.73	0.73	0.23

DIM Z2.1.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Z	37.00	0.50	-0.50	38.06	1.06	0.56

DIAMETER D2.1.2 AND D2.1.3 ARE MANUALLY INPUTED

DIM D2.1.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	21.000	0.020	0.000	21.010	0.010	0.000

DIM D2.1.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	21.000	0.020	0.000	21.020	0.020	0.000

DIM X3.1.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	400.00	0.20	-0.20	401.04	1.04	0.84

DIM X3.1.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	400.00	0.20	-0.20	399.41	-0.59	0.39

DIM Z3.1.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Z	307.00	0.50	-0.50	306.54	-0.46	0.00

DIM Z3.1.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Z	307.00	0.50	-0.50	307.64	0.64	0.14

DIAMETER D3.1.3 AND D3.1.4 ARE MANUALLY INPUTED

DIM D3.1.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	32.000	0.160	0.000	32.040	0.040	0.000

DIM D3.1.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	32.000	0.160	0.000	32.050	0.050	0.000

DIM Y5.1.1/3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	1035.0	1.0	-1.0	1035.5	0.5	0.0

DIM Y5.1.2/4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	1035.0	1.0	-1.0	1035.5	0.5	0.0

DIM X6.1.1/3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	1008.0	0.0	-2.0	1007.7	-0.3	0.0

DIM X6.1.2/4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	1008.0	0.0	-2.0	1007.7	-0.3	0.0

DIM Y6.1.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	715.00	1.50	-1.50	716.45	1.45	0.00

DIM Y6.1.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	715.00	1.50	-1.50	714.48	-0.52	0.00

DIM Y6.1.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	715.00	1.50	-1.50	716.13	1.13	0.00

DIM Y6.1.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	715.00	1.50	-1.50	714.96	-0.04	0.00

DIM X7.1.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	1386.00	0.50	-0.50	1384.23	-1.77	1.27

DIM X7.1.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	1386.00	0.50	-0.50	1385.93	-0.07	0.00

DIM X7.1.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	1386.00	0.50	-0.50	1386.65	0.65	0.15

DIM X7.1.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	1386.00	0.50	-0.50	1385.35	-0.65	0.15

DIM X7.2.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	180.0	2.0	-2.0	179.6	-0.4	0.0

DIM X7.2.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	180.0	2.0	-2.0	179.0	-1.0	0.0

DIM X7.3.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	245.0	2.0	-2.0	245.5	0.5	0.0

DIM X7.3.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	245.0	2.0	-2.0	246.2	1.2	0.0

DIM X7.4.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	690.0	0.0	-1.0	688.3	-1.7	0.7

DIM X7.4.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	690.0	0.0	-1.0	689.3	-0.7	0.0

DIM X7.4.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	690.0	0.0	-1.0	689.7	-0.3	0.0

DIM X7.4.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	690.0	0.0	-1.0	689.9	-0.1	0.0

DIM Y7.1.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	729.50	0.50	-0.50	728.79	-0.71	0.21

DIM Y7.1.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	729.50	0.50	-0.50	728.77	-0.73	0.23

DIM Y7.1.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	729.50	0.50	-0.50	729.00	-0.50	0.00

DIM Y7.1.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	729.50	0.50	-0.50	729.68	0.18	0.00

DIM Y7.2.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	120.00	0.30	-0.30	120.10	0.10	0.00

DIM Y7.2.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	120.00	0.30	-0.30	119.85	-0.15	0.00

DIM Y7.2.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	120.00	0.30	-0.30	119.97	-0.03	0.00

DIM Y7.2.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	120.00	0.30	-0.30	120.12	0.12	0.00

DIM Y7.3.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	595.0	2.0	-2.0	595.7	0.7	0.0

DIM Y7.3.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	595.0	2.0	-2.0	595.6	0.6	0.0

DIM Y7.4.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	263.40	2.50	-2.50	261.81	-1.59	0.00

DIM Y7.4.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	263.40	2.50	-2.50	262.30	-1.10	0.00

DIM Y7.5.1/3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	206.00	1.50	0.00	205.95	-0.05	0.05

DIM Y7.5.2/4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	206.00	1.50	0.00	205.96	-0.04	0.04

DIM Z7.1.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Z	143.0	1.0	-1.0	145.2	2.2	1.2

DIM Z7.1.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Z	143.0	1.0	-1.0	141.0	-2.0	1.0

DIM Z7.1.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Z	143.0	1.0	-1.0	141.0	-2.0	1.0

DIM Z7.1.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Z	143.0	1.0	-1.0	145.4	2.4	1.4

DIM Z7.2.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Z	236.40	2.50	-2.50	237.58	1.18	0.00

DIM L5.1.1/2/3/4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	0.0	1.0	0.0	0.3	0.3	0.0

DIM L7.1.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	0.0	1.0	0.0	0.7	0.7	0.0

DIM L7.1.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	0.0	1.0	0.0	0.6	0.6	0.0

DIM L7.2.1/3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	0.0	1.0	0.0	1.8	1.8	0.8

DIM L7.2.2/4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	0.0	1.0	0.0	0.3	0.3	0.0

DIM D1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	2663.0	0.7	-0.7	2663.1	0.1	0.0

DIM D2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	2663.0	0.7	-0.7	2663.2	0.2	0.0

SIEMENS	PART NAME : S70 BOLSTER, MACHINED REFURBISHMENT		May 20, 2024	13:03
	REV NUMBER : B	SER NUMBER : US0 0195	STATS COUNT : 1	

DRAWING NUMBER : A6Z00375128344
PART NUMBER : 97258998
INSPECTED BY : Michael Gonzalez
INSTRUMENT : FARO ARM 7 AXIS

DIM X3.1.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	330.00	0.20	-0.20	330.03	0.03	0.00

DIM X3.1.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	330.00	0.20	-0.20	330.38	0.38	0.18

DIM X3.2.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	330.00	0.20	-0.20	329.94	-0.06	0.00

DIM X3.2.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	330.00	0.20	-0.20	330.48	0.48	0.28

DIM Y3.1.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	790.00	1.50	-1.50	790.90	0.90	0.00

DIM Y3.1.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	790.00	1.50	-1.50	790.20	0.20	0.00

DIM Y3.2.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	90.00	0.30	-0.30	89.94	-0.06	0.00

DIM Y3.2.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	90.00	0.30	-0.30	89.87	-0.13	0.00

DIM X7.1.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	258.0	3.0	-3.0	257.4	-0.6	0.0

DIM X7.1.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	258.0	3.0	-3.0	258.1	0.1	0.0

DIM X7.2.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	196.0	3.0	-3.0	195.5	-0.5	0.0

DIM X7.2.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
X	196.0	3.0	-3.0	195.5	-0.5	0.0

DIM Y5.1.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	1035.0	2.0	-2.0	1035.2	0.2	0.0

DIM Y5.1.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	1035.0	2.0	-2.0	1036.1	1.1	0.0

DIM Y5.1.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	1035.0	2.0	-2.0	1034.4	-0.6	0.0

DIM Y5.1.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	1035.0	2.0	-2.0	1036.4	1.4	0.0

DIM Y7.1.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	595.0	3.0	-3.0	595.9	0.9	0.0

DIM Y7.1.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	595.0	3.0	-3.0	597.4	2.4	0.0

DIM Y7.2.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	696.6	3.0	-3.0	698.8	2.2	0.0

DIM Y7.2.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	696.6	3.0	-3.0	697.6	1.0	0.0

DIM Y10.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	105.0	1.0	-1.0	92.1	-12.9	11.9

DIM Y10.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Y	105.0	1.0	-1.0	103.2	-1.8	0.8

DIAMETER D3.1.1, D3.1.2, D3.2.1 AND D3.2.2, ARE MANUELY INPUTED

DIM D3.1.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	32.000	0.160	0.000	32.090	0.090	0.000

DIM D3.1.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	32.000	0.160	0.000	32.050	0.050	0.000

DIM D3.2.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	32.000	0.160	0.000	32.100	0.100	0.000

DIM D3.2.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	32.000	0.160	0.000	32.110	0.110	0.000

DIAMETER D7.1 MANUELY INPUTED

DIM D1 (H7)

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
M	116.000	0.035	0.000	116.021	0.021	0.000

DIM Z3.1.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Z	146.0	1.0	-1.0	145.6	-0.4	0.0

DIM Z3.1.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Z	146.0	1.0	-1.0	145.7	-0.3	0.0

DIM Z3.2.1

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Z	146.0	1.0	-1.0	145.4	-0.6	0.0

DIM Z3.2.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Z	146.0	1.0	-1.0	145.6	-0.4	0.0

DIM Z7.1.2

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Z	41.0	3.0	-3.0	42.3	1.3	0.0

DIM Z7.1.3

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Z	41.0	3.0	-3.0	39.3	-1.7	0.0

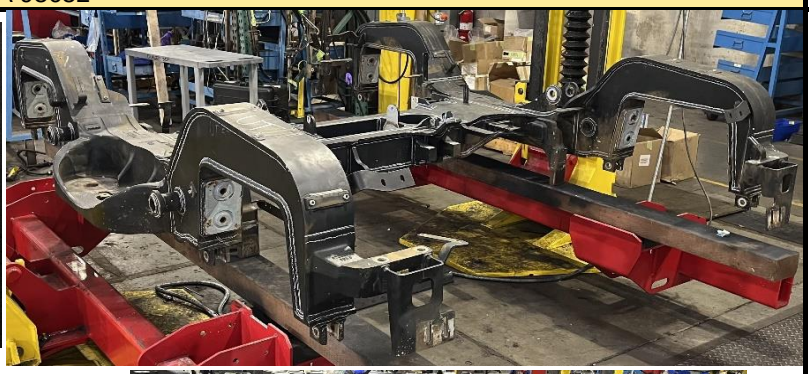
DIM Z7.4

AX	NOMINAL	+TOL	-TOL	MEAS	DEV	OUTTOL
Z	212.0	2.0	-2.0	211.9	-0.1	0.0

ACFM INSPECTION REPORT

Customer: Utah Transit Authority **Project:** UTA 1122 Accident Inspection	**Inspection:** Andrew Conley **Cert No:** NTC2149 **Inspection:** N/A **Cert No:** N/A **Lizard Registered:** 25222
Unit: Power Truck	**Procedure:** QMP-005
Serial Number: US00102	**DWG:** N/A

Locations: 5301 Price Ave., McClellan Park, CA 95652



Inspection Results / Comments.

There were no reportable weld indications or defects at the time of inspection. Damage to the corner of the frame was noted on the inspection report, and shown in the photos above.

Inspection Signature: **Date:** 05/16/2024

Andrew Conley

Andrew Conley

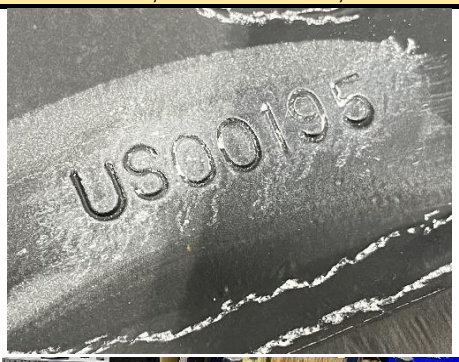
cn=Andrew Conley, c=US, o=Siemens Mobility CS, ou=QA CWI Level II Inspector, email=andrew.conley@siemens.com
05/16/24

Lizard Registered : 25222

ACFM INSPECTION REPORT

Customer: Utah Transit Authority **Project:** UTA 1122 Accident Inspection	**Inspection:** Andrew Conley **Cert No:** NTC2149 **Inspection:** N/A **Cert No:** N/A **Lizard Registered:** 25222
Unit: Bolster	**Procedure:** QMP-005
Serial Number: US00195	**DWG:** N/A

Locations: 5301 Price Ave., McClellan Park, CA 95652



Inspection Results / Comments.

There is one reportable indication on Bolster US00195. There is a crack located at the weld toe of one of the anti-rotation stops. There are two more tears/fins in the base metal of the anti-rotation stop. There is deformation/damage to the entirety of the lateral stop. Crack sizing, saved ACFM scans, and additional photos can be found in the ACFM folder.

Inspection Signature: **Date:** 05/20/2024

Andrew Conley

Lizard Registered : 25222

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SIEMENS

							Description	Part Number	QTY	UOM
2	2	2	2	2	2	2	Power Truck Complete	A2V00001799526		Ea
	3	3	3	3	3	3	Wheelset Assembly	A2V00001827877		Ea
		4	4	4	4	4	Motor Wheelset, Complete	A2V00001827872		Ea
			5	5	5	5	Hexagon head screw	A2V00001721489	16	Ea
			5	5	5	5	WASHER, M16,SAFETY, SPRING ST	RS:A5442100	16	Ea
			5	5	5	5	SCREW, HEX HD, M16 X 50, ISO GR 8.8,ST	A2V00370031811	12	Ea
			5	5	5	5	WASHER, M16,RIBBED, SPRING ST	RS:A5442200	12	Ea
			5	5	5	5	SCREW, HEX HD, M8 X 25, ISO GR 8.8, ST	A2V00370025704	16	Ea
			5	5	5	5	WASHER, SAFETY, SPRING ST	RS:A5442300	16	Ea
			5	5	5	5	ASSEMBLY, BEARING,AXLE,POWER	RS:A8370800	4	Ea
			5	5	5	5	DISC,SHIM,SST,0.1MM	A6X30154132	16	Ea
			5	5	5	5	O-RING,RUBBER NITRILE,5.7MM,ID=163	A6X30154133	4	Ea
			5	5	5	5	BOLT, HEX HD, M16 X 180, ISO GR 8.8, ST	RS:A5442000	16	Ea
			5	5	5	5	WASHER, M16,SAFETY, SPRING ST	RS:A5442100	16	Ea
			5	5	5	5	SCREW, HEX HD, M16 X 50, ISO GR 8.8,ST	A2V00370031811	12	Ea
			5	5	5	5	WASHER, M16,RIBBED, SPRING ST	RS:A5442200	12	Ea
			5	5	5	5	SCREW, HEX HD, M8 X 25, ISO GR 8.8, ST	A2V00370025704	16	Ea
			5	5	5	5	WASHER, SAFETY, SPRING ST	RS:A5442300	16	Ea
		4	4	4	4	4	Primary suspension assembly	A2V00001827877		Ea
			5	5	5	5	Fit bolt DIN609-M16x90-8.8-A2C	A2V00370029437	8	Ea
			5	5	5	5	Spring washer	A2V00002148539	8	Ea
			5	5	5	5	Hexagon nut ISO 4032 M16 8 A3C	A2V00370036274	8	Ea
			5	5	5	5	clamping pin DIN7346-20x50-FSt	A2V00370068427	16	Ea
			5	5	5	5	Hexagon head screw	A2V00370036708	16	Ea
			5	5	5	5	WASHER ISO7093-1-12-200HV-A2	A2V00370068432	16	Ea
			5	5	5	5	Load washer SCHNORR HS	A2V00001745000	24	Ea
			5	5	5	5	Hexagon head screw	A2V00370022704	8	Ea
			5	5	5	5	Hexagon head screw	A2V00200429055	8	Ea
			5	5	5	5	Load washer SCHNORR HS	A2V00001744997	8	Ea
			5	5	5	5	SCREW,HEX HD,M8X20,DIN933,ZN	RS:A0707801	16	Ea
			5	5	5	5	Spring washer	A2V00001169513	16	Ea
		4	4	4	4	4	Traction unit assembly	A2V00397274675		Ea
			5	5	5	5	Hexagon nut	A2V00370037133	6	Ea
			5	5	5	5	Load washer SCHNORR HS	A2V00001745003	16	Ea
			5	5	5	5	Hexagon head screw	A2V00370036750	6	Ea
			5	5	5	5	Splint pin	A2V00370007610	2	Ea
			5	5	5	5	Hexagon head screw	A2V00002232490	2	Ea
			5	5	5	5	Spring washer	A2V00002148611	2	Ea
			5	5	5	5	Hexagon nut ISO 10513 M24 10	A2V00002121786	2	Ea
			5	5	5	5	Hexagon nut	A2V00397276482	2	Ea
			5	5	5	5	Fit bolt	A2V00370068624	2	Ea
			5	5	5	5	Hexagon head screw	A2V00100026174	2	Ea
			5	5	5	5	Load washer SCHNORR HS	A2V00001744999	2	Ea

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SIEMENS

	5	5	5	5	5	Hexagon nut	A2V00370025738	2	Ea
	5	5	5	5	5	WASHER	A2V00397264582	2	Ea
	5	5	5	5	5	HEX.NUT BN205107-A-M20-8-A3C	A2V00370030781	2	Ea
4	4	4	4	4	4	Drive Unit			Ea
	5	5	5	5	5	S70 GB KIT B-SZH 420,SEALS	A6X30181346		Ea
		6	6	6	6	Seal Ring, Copper	A6X30174310	6	Ea
		6	6	6	6	seal	A6X30174321	2	Ea
	5	5	5	5	5	S70 GB KIT C-SZH 420,BEARINGS	A6X30181348		Ea
		6	6	6	6	cyl.roller bg.	A6X30174322	2	Ea
		6	6	6	6	Angular Ball Bearing	A6X30174323	2	Ea
		6	6	6	6	Cylinder Roller Bearing	A6X30174324	2	Ea
		6	6	6	6	cyl.roller bg.	A6X30174325	2	Ea
		6	6	6	6	Cylinder Roller Bearing	A6X30174326	2	Ea
		6	6	6	6	taper roller bearing	A6X30174327	2	Ea
		6	6	6	6	taper roller bearing	A6X30174328	2	Ea
	5	5	5	5	5	S70 GB KIT C1-SZH 420,RINGS	A6X30181350		Ea
		6	6	6	6	breather filter	A6X30174329	2	Ea
		6	6	6	6	Retaining Pin	A6X30174339	4	Ea
		6	6	6	6	spacer ring	A6X30174330	2	Ea
		6	6	6	6	spacer ring	A6X30174331	2	Ea
		6	6	6	6	adjusting ring	A6X30174332	2	Ea
		6	6	6	6	adjusting ring	A6X30174333	2	Ea
		6	6	6	6	adjusting ring	A6X30174334	2	Ea
	5	5	5	5	5	S70 GB KIT G-SZH 420,MOTOR HARDWARE	A6X30181474		
		6	6	6	6	hexagon bolt	A2V00370031842	8	Ea
		6	6	6	6	washer	RS:A0718405	8	Ea
		6	6	6	6	hexagon bolt	RS:A0712200	56	Ea
		6	6	6	6	socket head screw	A6X30174340	12	Ea
		6	6	6	6	hexagon bolt	RS:A0712212	16	Ea
		6	6	6	6	spr.type str.pin	A6X30174341	2	Ea
		6	6	6	6	hexagon bolt	RS:A0712205	16	Ea
		6	6	6	6	washer	RS:A0718403	88	Ea
		6	6	6	6	screw plug	A6X30174342	2	Ea
		6	6	6	6	straight pin	A6X30174343	4	Ea
		6	6	6	6	hexagon bolt	RS:A0713204	46	Ea
		6	6	6	6	washer	A6X30174344	46	Ea
		6	6	6	6	socket head screw	A6X30174347	2	Ea
		6	6	6	6	circlip	A6X30174345	4	Ea
		6	6	6	6	SET OF COUPLING BOLT S70	A6X30229120	2	Ea
		6	6	6	6	Retaining Ring	A6X30174335	2	Ea
		6	6	6	6	Threaded plug	A6X30183199	2	Ea
	5	5	5	5	5	S70 GB KIT G-SZH 420,RUBBER WEDGE HARDW	A6X30181476		
		6	6	6	6	hexagon bolt	A6X30191170	48	Ea
		6	6	6	6	hexagon bolt	RS:A5209400	96	Ea
		6	6	6	6	Structural Washer	A6X30148051	48	Ea
	5	5	5	5	5	S70 GB KIT E-SZH 420,MOUNT SUPPORT	A6X30181472		

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SIEMENS

				6	6	6	6	Support	A6X30174336	4	Ea
				6	6	6	6	Spacer Sleeve	A6X30155218	2	Ea
				6	6	6	6	Spherical Bearing	A6X30174337	2	Ea
				6	6	6	6	Spherical Bearing	A6X30174338	2	Ea
3	3	3	3	3	3	3	3	Secondary Suspension Assembly	A2V00397257096		
	4	4	4	4	4	4	4	Hexagon nut ISO 7042 M12 8 A3C	A2V00370037131	4	Ea
	4	4	4	4	4	4	4	Load washer SCHNORR HS	A2V00001745000	48	Ea
	4	4	4	4	4	4	4	Hexagon nut ISO 4032 M12 8 A3C	A2V00370043563	24	Ea
	4	4	4	4	4	4	4	Hexagon head screw	A2V00370036706	4	Ea
	4	4	4	4	4	4	4	Hexagon head screw	A2V00370036711	4	Ea
	4	4	4	4	4	4	4	Sleeve	A2V00001221814	4	Ea
	4	4	4	4	4	4	4	Hexagon head screw	A2V00370035480	16	Ea
3	3	3	3	3	3	3	3	Lateral Suspension Assembly	A2V00397274673		
	4	4	4	4	4	4	4	Hexagon head screw	A2V00370036722	4	Ea
	4	4	4	4	4	4	4	Load washer SCHNORR HS	A2V00001745002	14	Ea
	4	4	4	4	4	4	4	Hexagon nut ISO 4032 M16 8 A3C	A2V00370036274	4	Ea
	4	4	4	4	4	4	4	Hexagon head screw	A2V00001420993	4	Ea
	4	4	4	4	4	4	4	Hexagon nut ISO 4032 M12 10	A2V00001684916	4	Ea
	4	4	4	4	4	4	4	Hexagon head screw	A2V00001421015	6	Ea
	4	4	4	4	4	4	4	Load washer SCHNORR HS	A2V00001745000	8	Ea
	4	4	4	4	4	4	4	HEX.NUT ISO4032-M16-10-A3P	A2V00370041468	6	Ea
3	3	3	3	3	3	3	3	Bogie bolster assembly	A2V00397258064		
	4	4	4	4	4	4	4	SLOT.CASTLE NUT DIN935-M36-8-A2C	A2V00370027222	1	Ea
	4	4	4	4	4	4	4	Wear Ring, painted	A2V00397239939	1	Ea
	4	4	4	4	4	4	4	SPLIT PIN ISO1234-6,3x63-ST-A3C	A2V00370025189	1	Ea
	4	4	4	4	4	4	4	Hexagon head screw	A2V00370036716	4	Ea
	4	4	4	4	4	4	4	Hexagon nut	A2V00370036276	4	Ea
	4	4	4	4	4	4	4	WASHER HS 20 FST EN10132-4 GEO321B+VL	A2V00002070581	4	Ea
	4	4	4	4	4	4	4	SEAL V-RING V-45A 11.5203.0045	A2V00370069475	1	Ea
	4	4	4	4	4	4	4	SLIDING PLATE	A2V00397239295	4	Ea
	4	4	4	4	4	4	4	Bush	A2V00397239150	1	Ea
	4	4	4	4	4	4	4	Bushing, sleeve feroform T11	A2V00397239151	1	Ea
	4	4	4	4	4	4	4	ROTATION STOP	A2V00397269122	2	Ea
	4	4	4	4	4	4	4	PE-rope, tin plated 70 10 10 800	A2V00397247541		Ea
		5	5	5	5	5	5	Tube terminal KRF 70-10	A2V00370062693	4	Ea
		5	5	5	5	5	5	Copper rope DIN46438-70-0,14-SN	A2V00370053179	1.56	**M**
3	3	3	3	3	3	3	3	Lifting stop assembly	A2V00397257120		Ea
	4	4	4	4	4	4	4	Hexagon socket head cap screw	A2V00001423011	2	Ea
	4	4	4	4	4	4	4	Hose clamp	A2V00370046890	4	Ea
	4	4	4	4	4	4	4	Load washer SCHNORR HS	A2V00001745003	2	Ea
	4	4	4	4	4	4	4	Hexagon nut ISO 7042 M20 8	A2V00001684570	2	Ea
	4	4	4	4	4	4	4	Spring lock washer	A2V00002673277	2	Ea
3	3	3	3	3	3	3	3	Traction link assembly	A2V00397257103		
	4	4	4	4	4	4	4	BOLT DM 51,5X188 42CRMO4+QT 1. 7225+Q...	A2V00397250803	4	Ea
	4	4	4	4	4	4	4	Screw plug GPN 700 M 10	A2V00370029451	4	Ea
	4	4	4	4	4	4	4	Spring washer	A2V00002148611	4	Ea

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	4	4	4	4	4	4	Hexagon nut	A2V00370037134	4	Ea
3	3	3	3	3	3	3	track clearer assembly	A2V00001846275		
	4	4	4	4	4	4	Hexagon head screw	A2V00001416050	8	Ea
	4	4	4	4	4	4	Washer DIN 7349 13 200HV	A2V00002025381	16	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00001416052	4	Ea
	4	4	4	4	4	4	Hexagon nut ISO 7042 M12 8	A2V00001674892	12	Ea
	4	4	4	4	4	4	Load washer SCHNORR HS	A2V00001745000	8	Ea
3	3	3	3	3	3	3	Head beam assembly	A2V00002356234		Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00370066691	8	Ea
	4	4	4	4	4	4	Hexagon nut	A2V00370037133	8	Ea
	4	4	4	4	4	4	Load washer SCHNORR HS	A2V00001745003	8	Ea
	4	4	4	4	4	4	WASHER HS 20 FST EN10132-4 GEO321B+VL	A2V00002070581	10	Ea
3	3	3	3	3	3	3	Axle-Mounted Disc Brake Assembly	A2V00001827876		Ea
	4	4	4	4	4	4	CLAMPING PLATE,24,DIN 6796	A2V00002274854	24	Ea
	4	4	4	4	4	4	BOLT N12005-P22 M24 X 90	A6X30173546	24	Ea
3	3	3	3	3	3	3	Track Brake Assembly	A2V00001827875		
	4	4	4	4	4	4	Fit bolt	A2V00370076351	4	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00370036722	4	Ea
	4	4	4	4	4	4	Schnorr HS - washer	A2V00370042023	8	Ea
	4	4	4	4	4	4	Hexagon nut ISO 7042 M16 8 A3C	A2V00370037132	8	Ea
3	3	3	3	3	3	3	Piping Assembly	A2V00001827874		
	4	4	4	4	4	4	Hexagon head screw	A2V00370026764	20	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00370060216	2	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00355102581	5	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00355103295	5	Ea
	4	4	4	4	4	4	WASHER DIN7349-6,4-140HV-A3C	A2V00370036525	45	Ea
	4	4	4	4	4	4	HEX.NUT ISO7042-M6-8-A3C-BN205107-A	A2V00370037128	25	Ea
	4	4	4	4	4	4	Washer ISO 7089 20 200HV A3C	A2V00370057123	2	Ea
3	3	3	3	3	3	3	Wiring Assembly	A2V00001827873		
	4	4	4	4	4	4	Hexagon socket head cap screw	A2V00100028754	18	Ea
	4	4	4	4	4	4	Hexagon socket head cap screw	A2V00200433867	6	Ea
	4	4	4	4	4	4	Hexagon socket head cap screw	A2V00370028434	10	Ea
	4	4	4	4	4	4	Hexagon socket head cap screw	A2V00370038788	13	Ea
	4	4	4	4	4	4	Hexagon socket head cap screw	A2V00370053426	8	Ea
	4	4	4	4	4	4	Hexagon socket head cap screw	A2V00370057904	8	Ea
	4	4	4	4	4	4	SCREW ISO4762-M3x12-4.8-A2S	A2V00370059577	8	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00100025925	2	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00370010719	2	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00100025984	5	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00001695360	2	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00100026166	2	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00100026182	1	Ea
	4	4	4	4	4	4	Hexagon screw	A2V00101125745	1	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00104569350	12	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00104568680	2	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00370043682	2	Ea

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4	4	4	4	4	4	Washer DIN 7349 6,4 200HV-A2	A2V00370066218	42	Ea
4	4	4	4	4	4	Washer ISO 7089 8 200HV A3C	A2V00370053579	5	Ea
4	4	4	4	4	4	Spring washer	A2V00002148536	5	Ea
4	4	4	4	4	4	Washer ISO 7089 5 200HV A3C	A2V00113040211	2	Ea
4	4	4	4	4	4	Spring washer	A2V00370069307	8	Ea
4	4	4	4	4	4	Spring washer	A2V00150267631	6	Ea
4	4	4	4	4	4	Spring washer	A2V00156004301	16	Ea
4	4	4	4	4	4	Spring washer	A2V00156004328	2	Ea
4	4	4	4	4	4	Hexagon nut ISO 4032 M8 8 A2C	A2V00001169472	23	Ea
4	4	4	4	4	4	Hexagon nut ISO 4032 M3 4 A2C	A2V00370079727	8	Ea
4	4	4	4	4	4	Hexagon nut ISO 7042 M6 8 A2C	A2V00001169499	38	Ea
4	4	4	4	4	4	Hexagon nut ISO 7042 M8 8 A2C	A2V00001169500	5	Ea
4	4	4	4	4	4	Hexagon nut ISO 7042 M6 A2-70	A2V00370037136	2	Ea
4	4	4	4	4	4	Hexagon nut ISO 7042 M10 A2-70	A2V00370037138	2	Ea
4	4	4	4	4	4	Cable tie	A2V00370066035	1	Ea
4	4	4	4	4	4	FITTING,GLAND,CABLE,MOTOR,M25" ,2/0 A...	RS:A3786500	2	Ea
4	4	4	4	4	4	CABLE GLAND,UNI EMC,PLITSCH	RS:A8123800	12	Ea
4	4	4	4	4	4	Tube terminal KRFN 70-10	A2V00002119582	6	Ea
4	4	4	4	4	4	LUG,RING,70MM2,M10	RS:A4324500	2	Ea
4	4	4	4	4	4	Inlay tag TM-I 18 NEUTRAL GE	A2V00370035681	16	Ea
4	4	4	4	4	4	SIENOPYR 120 (N)HXSGAFCHXOE 70 1,8/3kV	A2V00399101863	24	**M**
4	4	4	4	4	4	marking socket TM 6/18 HF	A2V00370043862	12	EA
4	4	4	4	4	4	Cable 120 (N)HXSGAFHXOE EN 1800V 70	A2V00001205745	4	**M**
4	4	4	4	4	4	Cable LUG 70-10-E-CU-SN	A2V00370058236	2	EA
4	4	4	4	4	4	Heat shrink tube RAUCROSS MOK	A2V00370064999	0.24	**M**
4	4	4	4	4	4	marking socket TM 6/18 HF	A2V00370043862	4	EA

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								Description	Part Number	QTY	UOM
2	2	2	2	2	2	2	2	Power Truck Complete	A2V00001799526		Ea
	3	3	3	3	3	3	3	Wheelset Assembly	A2V00001827877		Ea
		4	4	4	4	4	4	Motor Wheelset, Complete	A2V00001827872		Ea
			5	5	5	5	5	Wheelset bearing, compl.	A2V00370076547	1	Ea
			5	5	5	5	5	Wheelset bearing compl. w.ground brush	A2V00370079674	1	Ea
			5	5	5	5	5	Hexagon head screw	A2V00001721489	16	Ea
			5	5	5	5	5	WASHER, M16,SAFETY, SPRING ST	RS:A5442100	16	Ea
			5	5	5	5	5	SCREW, HEX HD, M16 X 50, ISO GR 8.8,ST	A2V00370031811	12	Ea
			5	5	5	5	5	WASHER, M16,RIBBED, SPRING ST	RS:A5442200	12	Ea
			5	5	5	5	5	SCREW, HEX HD, M8 X 25, ISO GR 8.8, ST	A2V00370025704	16	Ea
			5	5	5	5	5	WASHER, SAFETY, SPRING ST	RS:A5442300	16	Ea
			5	5	5	5	5	ASSEMBLY, BEARING,AXLE,POWER	RS:A8370800	2	Ea
			5	5	5	5	5	DISC,SHIM,SST,0.1MM	A6X30154132	8	Ea
			5	5	5	5	5	O-RING,RUBBER NITRILE,5.7MM,ID=163	A6X30154133	2	Ea
			5	5	5	5	5	BOLT, HEX HD, M16 X 180, ISO GR 8.8, ST	RS:A5442000	8	Ea
			5	5	5	5	5	WASHER, M16,SAFETY, SPRING ST	RS:A5442100	8	Ea
			5	5	5	5	5	SCREW, HEX HD, M16 X 50, ISO GR 8.8,ST	A2V00370031811	6	Ea
			5	5	5	5	5	WASHER, M16,RIBBED, SPRING ST	RS:A5442200	6	Ea
			5	5	5	5	5	SCREW, HEX HD, M8 X 25, ISO GR 8.8, ST	A2V00370025704	8	Ea
			5	5	5	5	5	WASHER, SAFETY, SPRING ST	RS:A5442300	8	Ea
		4	4	4	4	4	4	Primary suspension assembly	A2V00001827877		Ea
			5	5	5	5	5	Fit bolt DIN609-M16x90-8.8-A2C	A2V00370029437	8	Ea
			5	5	5	5	5	Spring washer	A2V00002148539	8	Ea
			5	5	5	5	5	Hexagon nut ISO 4032 M16 8 A3C	A2V00370036274	8	Ea
			5	5	5	5	5	clamping pin DIN7346-20x50-FSt	A2V00370068427	16	Ea
			5	5	5	5	5	Hexagon head screw	A2V00370036708	16	Ea
			5	5	5	5	5	WASHER ISO7093-1-12-200HV-A2	A2V00370068432	16	Ea
			5	5	5	5	5	Load washer SCHNORR HS	A2V00001745000	24	Ea
			5	5	5	5	5	Hexagon head screw	A2V00370022704	8	Ea
			5	5	5	5	5	Hexagon head screw	A2V00200429055	8	Ea
			5	5	5	5	5	Load washer SCHNORR HS	A2V00001744997	8	Ea
			5	5	5	5	5	SCREW,HEX HD,M8X20,DIN933,ZN	RS:A0707801	16	Ea
			5	5	5	5	5	Spring washer	A2V00001169513	16	Ea
		4	4	4	4	4	4	Traction unit assembly	A2V00397274675		Ea
			5	5	5	5	5	Hexagon nut	A2V00370037133	6	Ea
			5	5	5	5	5	Load washer SCHNORR HS	A2V00001745003	16	Ea
			5	5	5	5	5	Hexagon head screw	A2V00370036750	6	Ea
			5	5	5	5	5	Splint pin	A2V00370007610	2	Ea
			5	5	5	5	5	Hexagon head screw	A2V00002232490	2	Ea
			5	5	5	5	5	Spring washer	A2V00002148611	2	Ea
			5	5	5	5	5	Hexagon nut ISO 10513 M24 10	A2V00002121786	2	Ea
			5	5	5	5	5	Hexagon nut	A2V00397276482	2	Ea
			5	5	5	5	5	Fit bolt	A2V00370068624	2	Ea

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				5	5	5	5	5	Hexagon head screw	A2V00100026174	2	Ea
				5	5	5	5	5	Load washer SCHNORR HS	A2V00001744999	2	Ea
				5	5	5	5	5	Hexagon nut	A2V00370025738	2	Ea
				5	5	5	5	5	WASHER	A2V00397264582	2	Ea
				5	5	5	5	5	HEX.NUT BN205107-A-M20-8-A3C	A2V00370030781	2	Ea
4	4	4	4	4	4				Drive Unit			Ea
				5	5	5	5	5	S70 GB KIT B-SZH 420,SEALS	A6X30181346		Ea
					6	6	6	6	Seal Ring, Copper	A6X30174310	6	Ea
					6	6	6	6	seal	A6X30174321	2	Ea
				5	5	5	5	5	S70 GB KIT C-SZH 420,BEARINGS	A6X30181348		Ea
					6	6	6	6	cyl.roller bg.	A6X30174322	2	Ea
					6	6	6	6	Angular Ball Bearing	A6X30174323	2	Ea
					6	6	6	6	Cylinder Roller Bearing	A6X30174324	2	Ea
					6	6	6	6	cyl.roller bg.	A6X30174325	2	Ea
					6	6	6	6	Cylinder Roller Bearing	A6X30174326	2	Ea
					6	6	6	6	taper roller bearing	A6X30174327	2	Ea
					6	6	6	6	taper roller bearing	A6X30174328	2	Ea
				5	5	5	5	5	S70 GB KIT C1-SZH 420,RINGS	A6X30181350		Ea
					6	6	6	6	breather filter	A6X30174329	2	Ea
					6	6	6	6	Retaining Pin	A6X30174339	4	Ea
					6	6	6	6	spacer ring	A6X30174330	2	Ea
					6	6	6	6	spacer ring	A6X30174331	2	Ea
					6	6	6	6	adjusting ring	A6X30174332	2	Ea
					6	6	6	6	adjusting ring	A6X30174333	2	Ea
					6	6	6	6	adjusting ring	A6X30174334	2	Ea
				5	5	5	5	5	S70 GB KIT G-SZH 420,MOTOR HARDWARE	A6X30181474		
					6	6	6	6	hexagon bolt	A2V00370031842	8	Ea
					6	6	6	6	washer	RS:A0718405	8	Ea
					6	6	6	6	hexagon bolt	RS:A0712200	56	Ea
					6	6	6	6	socket head screw	A6X30174340	12	Ea
					6	6	6	6	hexagon bolt	RS:A0712212	16	Ea
					6	6	6	6	spr.type str.pin	A6X30174341	2	Ea
					6	6	6	6	hexagon bolt	RS:A0712205	16	Ea
					6	6	6	6	washer	RS:A0718403	88	Ea
					6	6	6	6	screw plug	A6X30174342	2	Ea
					6	6	6	6	straight pin	A6X30174343	4	Ea
					6	6	6	6	hexagon bolt	RS:A0713204	46	Ea
					6	6	6	6	washer	A6X30174344	46	Ea
					6	6	6	6	socket head screw	A6X30174347	2	Ea
					6	6	6	6	circlip	A6X30174345	4	Ea
					6	6	6	6	SET OF COUPLING BOLT S70	A6X30229120	2	Ea
					6	6	6	6	Retaining Ring	A6X30174335	2	Ea
					6	6	6	6	Threaded plug	A6X30183199	2	Ea
				5	5	5	5	5	S70 GB KIT G-SZH 420,RUBBER WEDGE HARDW	A6X30181476		
					6	6	6	6	hexagon bolt	A6X30191170	48	Ea
					6	6	6	6	hexagon bolt	RS:A5209400	96	Ea

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				6	6	6	6	Structural Washer	A6X30148051	48	Ea
			5	5	5	5	5	S70 GB KIT E-SZH 420,MOUNT SUPPORT	A6X30181472		
				6	6	6	6	Support	A6X30174336	4	Ea
				6	6	6	6	Spacer Sleeve	A6X30155218	2	Ea
				6	6	6	6	Spherical Bearing	A6X30174337	2	Ea
				6	6	6	6	Spherical Bearing	A6X30174338	2	Ea
3	3	3	3	3	3	3	3	Secondary Suspension Assembly	A2V00397257096		
	4	4	4	4	4	4	4	Hexagon nut ISO 7042 M12 8 A3C	A2V00370037131	4	Ea
	4	4	4	4	4	4	4	Load washer SCHNORR HS	A2V00001745000	48	Ea
	4	4	4	4	4	4	4	Hexagon nut ISO 4032 M12 8 A3C	A2V00370043563	24	Ea
	4	4	4	4	4	4	4	Hexagon head screw	A2V00370036706	4	Ea
	4	4	4	4	4	4	4	Hexagon head screw	A2V00370036711	4	Ea
	4	4	4	4	4	4	4	Sleeve	A2V00001221814	4	Ea
	4	4	4	4	4	4	4	Hexagon head screw	A2V00370035480	16	Ea
3	3	3	3	3	3	3	3	Lateral Suspension Assembly	A2V00397274673		
	4	4	4	4	4	4	4	Hexagon head screw	A2V00370036722	4	Ea
	4	4	4	4	4	4	4	Load washer SCHNORR HS	A2V00001745002	14	Ea
	4	4	4	4	4	4	4	Hexagon nut ISO 4032 M16 8 A3C	A2V00370036274	4	Ea
	4	4	4	4	4	4	4	Hexagon head screw	A2V00001420993	4	Ea
	4	4	4	4	4	4	4	Hexagon nut ISO 4032 M12 10	A2V00001684916	4	Ea
	4	4	4	4	4	4	4	Hexagon head screw	A2V00001421015	6	Ea
	4	4	4	4	4	4	4	Load washer SCHNORR HS	A2V00001745000	8	Ea
	4	4	4	4	4	4	4	HEX.NUT ISO4032-M16-10-A3P	A2V00370041468	6	Ea
3	3	3	3	3	3	3	3	Bogie bolster assembly	A2V00397258064		
	4	4	4	4	4	4	4	SLOT.CASTLE NUT DIN935-M36-8-A2C	A2V00370027222	1	Ea
	4	4	4	4	4	4	4	Wear Ring, painted	A2V00397239939	1	Ea
	4	4	4	4	4	4	4	SPLIT PIN ISO1234-6,3x63-ST-A3C	A2V00370025189	1	Ea
	4	4	4	4	4	4	4	Hexagon head screw	A2V00370036716	4	Ea
	4	4	4	4	4	4	4	Hexagon nut	A2V00370036276	4	Ea
	4	4	4	4	4	4	4	WASHER HS 20 FST EN10132-4 GEO321B+VL	A2V00002070581	4	Ea
	4	4	4	4	4	4	4	SEAL V-RING V-45A 11.5203.0045	A2V00370069475	1	Ea
	4	4	4	4	4	4	4	SLIDING PLATE	A2V00397239295	4	Ea
	4	4	4	4	4	4	4	Bush	A2V00397239150	1	Ea
	4	4	4	4	4	4	4	Bushing, sleeve feroform T11	A2V00397239151	1	Ea
3	3	3	3	3	3	3	3	Lifting stop assembly	A2V00397257120		
	4	4	4	4	4	4	4	Hexagon socket head cap screw	A2V00001423011	2	Ea
	4	4	4	4	4	4	4	Hose clamp	A2V00370046890	4	Ea
	4	4	4	4	4	4	4	Load washer SCHNORR HS	A2V00001745003	2	Ea
	4	4	4	4	4	4	4	Hexagon nut ISO 7042 M20 8	A2V00001684570	2	Ea
	4	4	4	4	4	4	4	Spring lock washer	A2V00002673277	2	Ea
3	3	3	3	3	3	3	3	Traction link assembly	A2V00397257103		
	4	4	4	4	4	4	4	BOLT DM 51,5X188 42CRMO4+QT 1. 7225+Q...	A2V00397250803	4	Ea
	4	4	4	4	4	4	4	Screw plug GPN 700 M 10	A2V00370029451	4	Ea
	4	4	4	4	4	4	4	Spring washer	A2V00002148611	4	Ea
	4	4	4	4	4	4	4	Hexagon nut	A2V00370037134	4	Ea
3	3	3	3	3	3	3	3	track clearer assembly	A2V00001846275		

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	4	4	4	4	4	4	Hexagon head screw	A2V00001416050	8	Ea
	4	4	4	4	4	4	Washer DIN 7349 13 200HV	A2V00002025381	16	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00001416052	4	Ea
	4	4	4	4	4	4	Hexagon nut ISO 7042 M12 8	A2V00001674892	12	Ea
	4	4	4	4	4	4	Load washer SCHNORR HS	A2V00001745000	8	Ea
3	3	3	3	3	3	3	Head beam assembly	A2V00002356234	0	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00370066691	8	Ea
	4	4	4	4	4	4	Hexagon nut	A2V00370037133	8	Ea
	4	4	4	4	4	4	Load washer SCHNORR HS	A2V00001745003	8	Ea
	4	4	4	4	4	4	WASHER HS 20 FST EN10132-4 GEO321B+VL	A2V00002070581	10	Ea
3	3	3	3	3	3	3	Axle-Mounted Disc Brake Assembly	A2V00001827876		Ea
	4	4	4	4	4	4	CLAMPING PLATE,24,DIN 6796	A2V00002274854	24	Ea
	4	4	4	4	4	4	BOLT N12005-P22 M24 X 90	A6X30173546	24	Ea
3	3	3	3	3	3	3	Track Brake Assembly	A2V00001827875		
	4	4	4	4	4	4	Fit bolt	A2V00370076351	4	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00370036722	4	Ea
	4	4	4	4	4	4	Schnorr HS - washer	A2V00370042023	8	Ea
	4	4	4	4	4	4	Hexagon nut ISO 7042 M16 8 A3C	A2V00370037132	8	Ea
	4	4	4	4	4	4	HOLDER F.TRACK BRAKE A.D. PAINTED	A2V00397239351	1	Ea
	4	4	4	4	4	4	HOLDER F. TRACK BR. OP.A.D. P.	A2V00397239352	1	Ea
3	3	3	3	3	3	3	Piping Assembly	A2V00001827874		
	4	4	4	4	4	4	Hexagon head screw	A2V00370026764	20	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00370060216	2	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00355102581	5	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00355103295	5	Ea
	4	4	4	4	4	4	WASHER DIN7349-6,4-140HV-A3C	A2V00370036525	45	Ea
	4	4	4	4	4	4	HEX.NUT ISO7042-M6-8-A3C-BN205107-A	A2V00370037128	25	Ea
	4	4	4	4	4	4	Washer ISO 7089 20 200HV A3C	A2V00370057123	2	Ea
3	3	3	3	3	3	3	Wiring Assembly	A2V00001827873		
	4	4	4	4	4	4	Hexagon socket head cap screw	A2V00100028754	18	Ea
	4	4	4	4	4	4	Hexagon socket head cap screw	A2V00200433867	6	Ea
	4	4	4	4	4	4	Hexagon socket head cap screw	A2V00370028434	10	Ea
	4	4	4	4	4	4	Hexagon socket head cap screw	A2V00370038788	13	Ea
	4	4	4	4	4	4	Hexagon socket head cap screw	A2V00370053426	8	Ea
	4	4	4	4	4	4	Hexagon socket head cap screw	A2V00370057904	8	Ea
	4	4	4	4	4	4	SCREW ISO4762-M3x12-4.8-A2S	A2V00370059577	8	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00100025925	2	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00370010719	2	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00100025984	5	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00001695360	2	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00100026166	2	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00100026182	1	Ea
	4	4	4	4	4	4	Hexagon screw	A2V00101125745	1	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00104569350	12	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00104568680	2	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00370043682	2	Ea

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			4	4	4	4	4	4	Washer DIN 7349 6,4 200HV-A2	A2V00370066218	42	Ea
			4	4	4	4	4	4	Washer ISO 7089 8 200HV A3C	A2V00370053579	5	Ea
			4	4	4	4	4	4	Spring washer	A2V00002148536	5	Ea
			4	4	4	4	4	4	Washer ISO 7089 5 200HV A3C	A2V00113040211	2	Ea
			4	4	4	4	4	4	Spring washer	A2V00370069307	8	Ea
			4	4	4	4	4	4	Spring washer	A2V00150267631	6	Ea
			4	4	4	4	4	4	Spring washer	A2V00156004301	16	Ea
			4	4	4	4	4	4	Spring washer	A2V00156004328	2	Ea
			4	4	4	4	4	4	Hexagon nut ISO 4032 M8 8 A2C	A2V00001169472	23	Ea
			4	4	4	4	4	4	Hexagon nut ISO 4032 M3 4 A2C	A2V00370079727	8	Ea
			4	4	4	4	4	4	Hexagon nut ISO 7042 M6 8 A2C	A2V00001169499	38	Ea
			4	4	4	4	4	4	Hexagon nut ISO 7042 M8 8 A2C	A2V00001169500	5	Ea
			4	4	4	4	4	4	Hexagon nut ISO 7042 M6 A2-70	A2V00370037136	2	Ea
			4	4	4	4	4	4	Hexagon nut ISO 7042 M10 A2-70	A2V00370037138	2	Ea
			4	4	4	4	4	4	Cable tie	A2V00370066035	1	Ea
			4	4	4	4	4	4	FITTING,GLAND,CABLE,MOTOR,M25" ,2/0 A...	RS:A3786500	2	Ea
			4	4	4	4	4	4	CABLE GLAND,UNI EMC,PLITSCH	RS:A8123800	12	Ea
			4	4	4	4	4	4	Tube terminal KRFN 70-10	A2V00002119582	6	Ea
			4	4	4	4	4	4	LUG,RING,70MM2,M10	RS:A4324500	2	Ea
			4	4	4	4	4	4	Inlay tag TM-I 18 NEUTRAL GE	A2V00370035681	16	Ea
			4	4	4	4	4	4	SIENOPYR 120 (N)HXSGAFCHXOE 70 1,8/3kV	A2V00399101863	24	**M**
			4	4	4	4	4	4	marking socket TM 6/18 HF	A2V00370043862	12	EA
			4	4	4	4	4	4	Cable 120 (N)HXSGAFHXOE EN 1800V 70	A2V00001205745	4	**M**
			4	4	4	4	4	4	Cable LUG 70-10-E-CU-SN	A2V00370058236	2	EA
			4	4	4	4	4	4	Heat shrink tube RAUCROSS MOK	A2V00370064999	0.24	**M**
			4	4	4	4	4	4	marking socket TM 6/18 HF	A2V00370043862	4	EA
2	2	2	2	2	2	2	2	PAINTING,PWR & NON PWR TRUCK, CATS 600K				
	3	3	3	3	3	3	3	MARTIN SENOUR 76 SERIES LOW GLOSS RAL..	RS:A9093500	1	**GAL**
	3	3	3	3	3	3	3	5220 NAPA PRIMER 2.1 DTM EPOXY	RS:A4943500	1	**GAL**
	3	3	3	3	3	3	3	5238 NAPA ACTIVATOR 2.1 DTM EPOXY PRI...	RS:A4943600	1	**QT**
	3	3	3	3	3	3	3	6496 NAPA HARDENER ACRYLIC URETHANE 2...	RS:A4085100	1	**GAL**
	3	3	3	3	3	3	3	CS30 NAPA COMPLIANT SOLVENT GA	RS:A3792700	1	**GAL**

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							Description	Part Number	QTY	UOM
2	2	2	2	2	2	2	Center Truck, Complete	A2V00001799527		Ea
3	3	3	3	3	3	3	Running Gear Assembly	A2V00001827861		Ea
4	4	4	4	4	4	4	Trailer Wheelset	A2V00001827858		Ea
5	5	5	5	5	5	5	tire kit	A2V00002216982	4	Ea
5	5	5	5	5	5	5	TAPERED ROLLER BEARING	A2V00001346995	4	Ea
5	5	5	5	5	5	5	KIT,SKF HARDWARE,RBI.LFAB.HDWR.S70	A6X30171846	2	Ea
5	5	5	5	5	5	5	FEY RING FK 6 ASD 217/8/2,4	A6X30185340	8	Ea
5	5	5	5	5	5	5	SU-O RING 120X2	RS:A8753700	4	Ea
5	5	5	5	5	5	5	Assembly brake, grounding, speed sensor			Ea
6	6	6	6	6	6	6	BRAKE PADS,S-70 (SET FOR 1 CENTER TRU...	RS:A4526800	3	Ea
6	6	6	6	6	6	6	Head cap screw	A2V00370061398	8	Ea
6	6	6	6	6	6	6	hexagon socket head cap screw	A2V00001748356	8	Ea
6	6	6	6	6	6	6	Washer	A2V00001748305	8	Ea
6	6	6	6	6	6	6	Hexagon socket head cap screw	A2V00001169467	4	Ea
6	6	6	6	6	6	6	BOLT,M16x2x30,10.9,ISO 898,DAC	RS:A5987600	16	Ea
6	6	6	6	6	6	6	BOLT MOUNTING	RS:A5672000	48	Ea
6	6	6	6	6	6	6	PIN, DOUBLE LOOP HAIR	RS:A5214400	4	Ea
5	5	5	5	5	5	5	SENSOR COVER	A2V00375104420	1	Ea
5	5	5	5	5	5	5	SEALANT,FLANGE, LOCTITE 574 TUBE 250M...	RS:A5240800	0.5	Ea
5	5	5	5	5	5	5	Grease Shell Gadus S2 V220 2	A2V00002224633	1	Ea
5	5	5	5	5	5	5	SILVER GRADE ANTI-SEIZE,1LB	RS:A8639600	0.1	Ea
5	5	5	5	5	5	5	DEGREASER,CITRUS,CRC,15 OZ CAN	RS:A5240700	12	Ea
4	4	4	4	4	4	4	Primary Suspension Assembly CT	A2V00397257203		ea
5	5	5	5	5	5	5	Hexagon head screw	A2V00370035772	8	ea
5	5	5	5	5	5	5	Load washer SCHNORR HS	A2V00001744997	8	ea
5	5	5	5	5	5	5	Hexagon head screw	A2V00370036273	8	ea
5	5	5	5	5	5	5	Load washer SCHNORR HS	A2V00001745002	24	ea
5	5	5	5	5	5	5	Hexagon head screw	A2V00370036727	8	ea
5	5	5	5	5	5	5	Hexagon head screw	A2V00370036272	8	ea
5	5	5	5	5	5	5	Hexagon nut ISO 7042 M16 8 A3C	A2V00370037132	16	ea
5	5	5	5	5	5	5	Hexagon head screw Verbus Ripp	A2V00002240506	8	ea
5	5	5	5	5	5	5	Hexagon head screw	A2V00370049207	8	ea
5	5	5	5	5	5	5	Load washer SCHNORR HS	A2V00001745000	8	ea
3	3	3	3	3	3	3	TRACTION LINK ASSEMBLY	A2V00397267111		Ea
4	4	4	4	4	4	4	Bolt	A2V00397233649	4	Ea
4	4	4	4	4	4	4	Screw plug GPN 700 M 10	A2V00370029451	4	Ea
4	4	4	4	4	4	4	Spring washer	A2V00002148611	4	Ea
4	4	4	4	4	4	4	HEX.NUT BN205107-A-M24-8-A3P	A2V00370024861	4	Ea
4	4	4	4	4	4	4	Hexagon head screw	A2V00370054417	8	Ea
4	4	4	4	4	4	4	Load washer SCHNORR HS	A2V00001745002	16	Ea
4	4	4	4	4	4	4	Hexagon nut ISO 4032 M16 8 A3C	A2V00370036274	8	Ea
4	4	4	4	4	4	4	PIN ISO13337-21x30-N-C	A2V00370067278	4	Ea
3	3	3	3	3	3	3	LATERAL SUSPENSION ASSEMBLY	A2V00397269863		Ea

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	4	4	4	4	4	4	Load washer SCHNORR HS	A2V00001745000	4	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00100022870	4	Ea
	4	4	4	4	4	4	Load washer SCHNORR HS	A2V00001745002	4	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00370022704	4	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00370036687	16	Ea
	4	4	4	4	4	4	Hexagon nut ISO 4032 M10 8 A3C	A2V00370019094	16	Ea
	4	4	4	4	4	4	Load washer SCHNORR HS	A2V00001744997	32	Ea
	4	4	4	4	4	4	Hexagon nut ISO 4032 M12 8	A2V00001811492	4	Ea
	4	4	4	4	4	4	Spring washer	A2V00002148538	4	Ea
3	3	3	3	3	3	3	Secondary Suspension Assembly	A2V00397267113		Ea
	4	4	4	4	4	4	Hexagon nut ISO 7042 M12 8 A3C	A2V00370037131	4	Ea
	4	4	4	4	4	4	Load washer SCHNORR HS	A2V00001745000	24	Ea
	4	4	4	4	4	4	Hexagon nut ISO 4032 M12 8 A3C	A2V00370043563	4	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00370026076	16	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00370022704	4	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00370036331	4	Ea
	4	4	4	4	4	4	Load washer SCHNORR HS	A2V00001744997	4	Ea
	4	4	4	4	4	4	Hexagon nut ISO 4032 M10 8 A3C	A2V00370019094	4	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00370055596	4	Ea
3	3	3	3	3	3	3	Lifting Stop Assembly	A2V00397274674		Ea
	4	4	4	4	4	4	Bolt	A2V00397129369	2	Ea
	4	4	4	4	4	4	THREADED BOLT	A2V00397233689	2	Ea
	4	4	4	4	4	4	Hexagon nut	A2V00370043805	2	Ea
	4	4	4	4	4	4	joint head GIR 25 UK	A2V00370026923	2	Ea
	4	4	4	4	4	4	HOSE DIN20018-DN25/39	A2V00370066657	0.134	**M**
	4	4	4	4	4	4	Hose clamp	A2V00370046890	4	Ea
	4	4	4	4	4	4	HOSE DIN20018-DN25/39	A2V00370066657	0.462	**M**
	4	4	4	4	4	4	Hexagon socket head cap screw	A2V00100196991	2	Ea
	4	4	4	4	4	4	Load washer SCHNORR HS	A2V00001745003	2	Ea
	4	4	4	4	4	4	Hexagon nut ISO 7042 M20 8 A3C	A2V00200506556	2	Ea
	4	4	4	4	4	4	Bushing	A2V00397131619	4	Ea
	4	4	4	4	4	4	Spring washer DIN 7980-10-FST-A2C	A2V00370026615	2	Ea
3	3	3	3	3	3	3	RAIL CLEARER ASSEMBLY	A2V00397267114		Ea
	4	4	4	4	4	4	RAIL CLEARER OPPOSITE A.DR.PAINTED	A2V00397257810	1	Ea
	4	4	4	4	4	4	SCREW DIN7991-M16x50-8.8-A3P	A2V00370064125	8	Ea
	4	4	4	4	4	4	Spring washer	A2V00002148539	8	Ea
	4	4	4	4	4	4	Hexagon nut ISO 7042 M16 8 A3C	A2V00370037132	8	Ea
3	3	3	3	3	3	3	PULL LUG ASSEMBLY	A2V00397267117		Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00370035480	4	Ea
	4	4	4	4	4	4	Load washer SCHNORR HS	A2V00001745000	4	Ea
	4	4	4	4	4	4	Hexagon nut ISO 4032 M12 8 A3C	A2V00370043563	4	Ea
3	3	3	3	3	3	3	Track brake assembly	A2V00001827860		Ea
	4	4	4	4	4	4	Hexagon head screw Verbus Ripp	A2V00002240507	8	Ea
	4	4	4	4	4	4	TRACK BRAKE SUSPENSION ASSY. COMPLETE	RS:A4528100	2	Ea
3	3	3	3	3	3	3	Piping Assembly	A2V00002066026		Ea
	4	4	4	4	4	4	COUPLING PARKER FF-371-6FB	A2V00370071491	4	Ea

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	4	4	4	4	4	4	Hose assembly F471ST 15.75	A2V00002459637	4	Ea
	4	4	4	4	4	4	Socket EO-EO2-RED10/08LOMDCF	A2V00370027394	4	Ea
	4	4	4	4	4	4	Socket EO-EO2-GEO10LMOMDCF	A2V00001889055	4	Ea
	4	4	4	4	4	4	Socket EO-EO2-GE08LR3/8EDOMDCF	A2V00001391196	4	Ea
3	3	3	3	3	3	3	Wiring	A2V00001673310		Ea
	4	4	4	4	4	4	Spring washer	A2V00002148485	16	Ea
	4	4	4	4	4	4	Hexagon nut ISO 4032 M6 8 A2C	A2V00001169471	16	Ea
	4	4	4	4	4	4	Hexagon socket head cap screw ISO 4762	A2V00355403750	8	Ea
	4	4	4	4	4	4	Spring washer	A2V00002148536	34	Ea
	4	4	4	4	4	4	Hexagon nut	A2V00370025738	40	Ea
	4	4	4	4	4	4	SPRING WASHER BN208012-06-A 10-NrFSt	A2V00370005987	4	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00370044517	4	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00370036833	4	Ea
	4	4	4	4	4	4	Spring washer	A2V00150267631	4	Ea
	4	4	4	4	4	4	Hexagon nut ISO 4032 M6 A2-70	A2V00370036883	4	Ea
	4	4	4	4	4	4	Washer DIN 7349 8,4 200HV-A2	A2V00370066219	4	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00370025704	4	Ea
	4	4	4	4	4	4	HEX.NUT ISO7042-M8-8-A3C-BN205107-A	A2V00370037129	4	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00370032025	8	Ea
	4	4	4	4	4	4	Washer DIN 7349 10,5 200HV A3C	A2V00200531223	24	Ea
	4	4	4	4	4	4	hexagon nut ISO 7042 M10 8 A3C	A2V00370037130	16	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00370027042	4	Ea
	4	4	4	4	4	4	Screw	A2V00370025171	16	Ea
	4	4	4	4	4	4	Hexagon head screw	A2V00370036372	8	Ea
	4	4	4	4	4	4	Load washer SCHNORR HS	A2V00001744997	8	Ea
	4	4	4	4	4	4	Washer ISO 7093-1 8 200HV-A4	A2V00001177061	2	Ea
	4	4	4	4	4	4	PE-rope, tin plated 70 10 10 300	A2V00397233523		Ea
		5	5	5	5	5	Tube terminal KRF 70-10	A2V00370062693	4	Ea
		5	5	5	5	5	Copper rope DIN46438-70-0,14-SN	A2V00370053179	0.8	**M**

UTA 1122 - Bill of Material (Compiled)

SIEMENS

Location	Part Number	Compnent desricpition	UOM	Accident Repair (qty)	Additional Items (qty)
A + B car Floor Insulation	RS:A8767200	KIT,UNDERFRAME,ASSY	PC	4	0
A + B car Floor Lining Tiles	RS:A0903300	560, 3M, SEALANT,ADHESIVE, POLYURETHA...	PC	2	0
	RS:A0905700	TAPE,FOAM,ADH,1/4"X1/2",CLOSED CELL ...	FT	40	0
	RS:A0920200	5766 DOLPHIN SEALANT FLOORSEAL GRAY 3...	PC	8	0
	RS:A2587900	INSULATION,FELT,1"X24"X48" 6 PCF	PC	3	0
	RS:A2666700	DP190, 3M, EPOXY, 2PART,50ML	PC	2	0
	RS:A4309600	FLOOR LINING,TILE,GRAY/RED	PC	220	0
	RS:A4309700	TRIM,NOSING W/ 1" RED STRIP	FT	160	0
	RS:A4309800	STRIP,RED,1-31/32"X60'	FT	20	0
	RS:A4320400	FOOTWELL,CAB,ASSY	PC	4	0
	RS:A4394000	PU310, NORA, EPOXY, FLOOR 1 GA	PC	16	0
	RS:A7853300	TRIM,ARTICULATION	PC	4	0
A + B Car Low Floor Panels	RS:A0253600	SPACER,FLOOR,10X30X4MM,RUBBER, F&S NE...	PC	1000	0
	RS:A0901900	5019H LOCTITE, ADHESIVE, INSTANT (SUP...	PC	225	0
	RS:A0903300	560, 3M, SEALANT,ADHESIVE, POLYURETHA...	PC	2	0
	RS:A0903400	540, 3M, SEALANT POLYURETHANE 600ML	PC	2	0
	RS:A0912800	01160 3M MAR-GLASS FILLER, REINFORCED...	GAL	4	0
	RS:A1400000	SPACER,FLOOR,10X30X1MM,RUBBER, F&S NE...	PC	80	0
	RS:A1400100	SPACER,FLOOR,10X30X2MM,RUBBER, F&S NE...	PC	120	0
	RS:A1927200	PLUG,BUTTON FLUSH,13/16"	PC	62	0
	RS:A2644800	CP 25WB+ 3M SEALANT FIRE BARRIER 20OZ	PC	70	0
	RS:A4280400	PANEL,FLOOR,LOW FLOOR,FRONT DOOR	PC	4	0
	RS:A4280500	PANEL,FLOOR,THRESHOLD	PC	8	0
	RS:A4281400	PANEL,FLOOR,LOW FLOOR,MID	PC	4	0
	RS:A4281500	PANEL, FLOOR, #14	PC	7	0
	RS:A4281600	PANEL, FLOOR, #15	PC	4	0
	RS:A4308500	PANEL,FLOOR,RAMP TRIM	PC	16	0
A + B Car Wall Insulation	RS:A0912700	TAPE,FOIL,.002"X2",ALUMINUM	FT	420	0
	RS:A1890700	CAP,RETAINING,INSULATION	PC	200	0
	RS:A1890801	HANGER,SPINDLE,INSULATION,2.5"	PC	200	0
	RS:A2529700	70-08 BOSTIK ADHESIVE WINDSHIELD HARD...	PC	18	0
	RS:A5044600	KIT,SDWL,INSUL,PRE-CLADDING, A/B-CAR	PC	4	0
	RS:A5044700	KIT,SDWL,INSUL,POST-CLADDING, A/B-CAR	PC	4	0
	RS:A5044800	KIT,SDWL,INSUL,FLOOR LEVEL,A/B CAR	PC	4	0
A Car belly Pans Compl.	RS:A0700402	NUT,LOCK,M8,DIN985,SST	PC	423	0
	RS:A0701800	WASHER,FL FNDR,M8,DIN9021B,SST	PC	453	0
	RS:A2644800	CP 25WB+ 3M SEALANT FIRE BARRIER 20OZ	PC	70	0
	RS:C2333400	U-PROFILE,SUBFLOOR,SHEETS,BL2X 57X690...	PC	16	0
	RS:C2334000	DISTANCE,WASHER,SUBFLOOR,RD25X 8,POLY...	PC	36	0
	RS:C2671800	U-PROFILE,BELLYPAN,CENTER	PC	8	0
	RS:C2693000	U-PROFILE,SUBFLOOR,SHEETS	PC	2	0
	RS:C2695600	SPACER,MID,BELLY PAN	PC	4	0

	RS:C2695700	SPACER,TAPERED,BELLY PAN	PC	16	0	
	RS:C2695800	SPACER,LONG,BELLY PAN	PC	4	0	
	RS:C2722600	SHEET,SUBFLOOR,U/F,LOWFLOOR	PC	4	0	
	RS:C2722700	SHEET,SUBFLOOR,ARTICULATION	PC	2	0	
	RS:C2722800	SHEET,SUBFLOOR,MID-PORTAL	PC	4	0	
	RS:C2722900	SHEET,SUBFLOOR,MID SECTION	PC	2	0	
	RS:C2728800	U-PROFILE,SUBFLOOR,SHEET,1515	PC	4	0	
	RS:C2728900	U-PROFILE,SUBFLOOR,SHEET,1020	PC	4	0	
	RS:C2729000	U-PROFILE,SUBFLOOR,SHEET,1580	PC	8	0	
	RS:C2729100	U-PROFILE,SUBFLOOR,SHEET,1735	PC	4	0	
	RS:C2729200	U-PROFILE,SUBFLOOR,SHEET,330	PC	4	0	
	RS:C2758201	ASSY,SUBFLOOR,U/F,LOWFLOOR	PC	4	0	
A/B Car Cladding	RS:A0912300	TAPE,VHB,1.1MMX25MM,ACRYLIC	FT	6	0	
	RS:A0918100	DP810, 3M, ACRYLIC, 2PART, ADHESIVE L...	PC	12	0	
	RS:A4245200	PANEL,CLADDING,#1	PC	2	0	
	RS:A4245300	PANEL,CLADDING,#2	PC	2	0	
	RS:A4253002	PANEL,CLADDING,RAMP,RH	PC	2	0	
	RS:C2231100	PULTRUSION 2	PC	4	0	
	RS:C2231200	PULTRUSION 3	PC	3	0	
	RS:C2232100	CLADDING,PANEL,MID,A/B-CAR	PC	2	0	
	RS:C2233700	ENDCAP,STRAIT	PC	2	0	
	RS:C2233800	ENDCAP,ANGLED	PC	12	0	
	RS:C2666200	PLATE,TUBELIGHT	PC	4	0	
	RS:C2703801	CLADDING,L-FL,UPPER ASSY,LH	PC	2	0	
	RS:C2703802	CLADDING,L-FL,UPPER ASSY,RH	PC	2	0	
	RS:C2703902	CLADDING,H-FL,MID ASSY,RH	PC	2	0	
	RS:C2704000	CLADDING,L-FL,MID ASSY	PC	4	0	
	RS:C2704101	CLADDING,ARTCLN,MID,LH	PC	2	0	
	RS:C2704102	CLADDING,ARTCLN,MID,RH	PC	2	0	
	RS:C2704200	CLADDING,L-FL,LWR	PC	2	0	
	RS:C2704300	CLADDING,END,LOWER,LH	PC	2	0	
	RS:C2704400	CLADDING,END,LOWER,RH	PC	2	0	
	RS:C2704500	CLADDING,PANEL,MID,A/B-CAR	PC	4	0	
	RS:C2705301	PULTRUSION,DOOR,INNER ASSY,LH	PC	4	0	
	RS:C2705302	PULTRUSION,DOOR,INNER ASSY,RH	PC	4	0	
	RS:C2705401	PULTRUSION,DOOR,OUTER ASSY,LH	PC	2	0	
	RS:C2705402	PULTRUSION,DOOR,OUTER ASSY,RH	PC	2	0	
	RS:C2744200	PLATE,SIGNAL,TURN	PC	2	0	
A/B Truck skirts and HW	RS:A0700006	WASHER,FL,M8,DIN125A,SST	PC	38	0	
	RS:A0700202	WASHER,SPR LK,M8,DIN127B,SST	PC	36	0	
	RS:A0700207	WASHER,SPR LK,M10,DIN127B,SST	PC	53	0	
	RS:A0700402	NUT,LOCK,M8,DIN985,SST	PC	664	0	
	RS:A0701800	WASHER,FL FNDR,M8,DIN9021B,SST	PC	701	0	
	RS:A0701802	WASHER,FL FNDR,M10,DIN9021B,SS T	PC	51	0	

	RS:A0702200	SCREW,HEX HD,M10X20,DIN933,SST	PC	12	0
	RS:A0703601	SCREW,HEX HD,M8X20,DIN933,SST	PC	36	0
	RS:A0703602	SCREW,HEX HD,M8X25,DIN933,SST	PC	24	0
	RS:A0703900	NUT,HEX,JAM,M6,DIN439B,SST	PC	18	0
	RS:A0718005	NUT,LOCK,M8,DIN985,ZN	PC	36	0
	RS:A0720700	WASHER,FL FNDR,M8,DIN9021B,ZN	PC	76	0
	RS:A0770802	NUT,CHANNEL,W/SPR,M8,ZN	PC	12	0
	RS:A1822500	BUMPER,STOP,3/4"ODX1/2" TALL M6 X 1-3...	PC	16	0
	RS:A1824500	CLIP,SAFETY,13MM BALL SOCKET	PC	32	0
	RS:A2130300	SPACER,CLADDING,10MM,MEDIUM	PC	12	0
	RS:A2130400	SPACER,CLADDING,5MM,MEDIUM	PC	12	0
	RS:A2192900	GAS SPRING,SKIRTS,A/B-CAR	PC	10	0
	RS:A2529700	70-08 BOSTIK ADHESIVE WINDSHIELD HARD...	PC	36	0
	RS:A2936300	STUD,BALL,M8X1.25x25MM lG STUD,ZN	PC	32	0
	RS:A4206900	LATCH,SAFETY,SKIRT WHITE RAIL 9016	PC	8	0
	RS:A4242600	NEOPRENE,SHEET,3MM THK X60MM WIDE,60...	PC	96	0
	RS:A4589600	ASSY,LOCK,8MM TRI STUD,19MM GRIP,SST	PC	24	0
	RS:A4613100	ASSY LOCK 8MM TRI STUD 19MM GRIP SSTC...	PC	6	0
	RS:A4628901	SKIRT,POWER TRUCK,FRP,LH	PC	2	0
	RS:A4628902	SKIRT,POWER TRUCK,FRP,RH	PC	2	0
	RS:A4629000	WELD,PLATE,SKIRT,FRONT	PC	5	0
	RS:A4629100	WELD,PLATE,SKIRT,REAR	PC	5	0
	RS:A4629200	BRACKET,STRUT,HORIZONTAL,FRONT	PC	5	0
	RS:A4629300	BRACKET,STRUT,HORIZONTAL,REAR	PC	5	0
	RS:A4629400	BRACKET,SKIRT,GAS SPRING,FRONT	PC	5	0
	RS:A4629501	BRACKET,LATCH,SAFETY,LH	PC	6	0
	RS:A4629502	BRACKET,LATCH,SAFETY,RH	PC	6	0
	RS:A7989200	HINGE,SKIRT,3"X4"X1/4 PIN	PC	45	0
	RS:A7989400	WELD PLATE,SKIRT,SHORT	PC	13	0
	RS:A7989601	BRACKET,SKIRT,GAS SPRING,A-CAR ,REAR,...	PC	6	0
	RS:A7989602	BRACKET,SKIRT,GAS SPRING,RH	PC	6	0
A/B/C Paint	RS:A3792500	6597 NAPA ACCELERATOR STANDARD QT	QT	47	0
	RS:A3792700	CS30 NAPA COMPLIANT SOLVENT GA	GAL	3	0
	RS:A4085100	PRISM, 6496, HARDENER SINGLE STAGE	GAL	2	0
	RS:A4587300	64-96551-A NAPA RAL9016 WHITE SLC PRI...	GAL	3	0
ADA ramp electrical power whip assembly	RS:A0396900	CONDUIT,CORRUGATED,PLASTIC,NW 17,21.2...	FT	0	0
	RS:A4539500	PMA ADAPTER UNEF1/2-28",NW17, IP68,BL...	PC	0	0
	RS:A4539600	PMA 90° NPT 1/2",NW17, IP68, BLACK	PC	0	0
Articulation Disk (Pie Plate)	A2V00107083211	GLUE,LOCTITE 243	PC	0	0
	RS:A0700402	NUT,LOCK,M8,DIN985,SST	PC	0	0
	RS:A0706406	SCREW,SCH,FLH,M6X20,DIN7991,SS T	PC	0	0
	RS:A0706602	SCREW,SCH,FLH,M8X30,DIN7991,SS T	PC	0	0
	RS:A0717700	WASHER,FL,THK,M8,DIN7349,SS	PC	0	0
	RS:A2731700	SHIM,RING,DIN988-8,4X24X1.0	PC	0	0

	RS:A2740000	SCREW,SCH,FLH,M8X45,DIN7991,SS T	PC	0	0
	RS:A2740300	FLOOR PLATE COMPLETE	PC	0	0
	RS:A3467500	BLOCK,TENON,ARTICULATION	LB	0	0
	RS:A3469800	SCREW,SCH,FLH,M8X20,DIN7991,SS T	PC	0	0
	RS:A4274000	TURN TABLE COMPLETE,7MM TRI,LH	PC	0	0
	RS:A4274100	TURN TABLE COMPLETE,7MM TRI,RH	PC	0	0
Articulation Bearing (lower)	A2V00109419236	ARTICULATION BEARING	PC	2	0
	RS:A8882000	COVER COMPLETE	PC	2	0
	RS:A4940600	FITTING,GREASE,M10X1,90 DEG,SS	PC	4	0
	RS:A2570600	PIN,SPRING,DIN1481,25X32,A2-70	PC	20	0
	RS:A2570700	SCREW,SCH,LWHD,M12X30,DIN7984, SST	PC	32	0
	RS:A2570800	SCREW,SCH,FLH,M12X20,DIN7991,S ST	PC	6	0
	RS:A2570900	WASHER,M12-19.5,DIN25201,A4	PC	32	0
Bridgeplates (ADA Ramps) A/B Cars	RS:A0700204	WASHER,SPR LK,M12,DIN127B,SST	PC	0	0
	RS:A0700207	WASHER,SPR LK,M10,DIN127B,SST	PC	0	0
	RS:A0701802	WASHER,FL FNDR,M10,DIN9021B,SS T	PC	0	0
	RS:A0701804	WASHER,FL FNDR,M12,DIN9021B,SS T	PC	0	0
	RS:A0704104	NUT,HEX,M12,DIN934,SST	PC	0	0
	RS:A0712206	SCREW,HEX HD,M10X16,DIN933,ZN	PC	0	0
	RS:A0712709	WASHER,SPR LK,M10,DIN127B,ZN	PC	0	0
	RS:A0718403	WASHER,FL,M10,DIN125A,ZN	PC	0	0
	RS:A0721101	SCREW,HEX HD,M3X10,DIN933,ZN	PC	0	0
	RS:A0902400	TAPE,FOAM,ADH,1/8"X1/2",CLOSED CELL N...	PC	0	0
	RS:A1230104	ASSY,GROUND,M10/M6,AWG5 COPPER	PC	0	0
	RS:A1491503	ASSY,GROUND,M10/M8,AWG5,COPPER	PC	0	0
	RS:A2883100	SCREW,SCH,M10X70,DIN912,SST	PC	0	0
	RS:A4116801	SHIM,LARGE,BRIDGEPLATE	FOZ	0	0
	RS:A4116802	SHIM,LARGE,BRIDGEPLATE	PC	0	0
	RS:A4265500	BRIDGEPLATE,W/HEATED THRESHOLD	PC	0	0
	RS:A4393400	TRIM,LINER,BRIDGEPLATE,TOP	PC	0	0
	RS:A4393501	TRIM,LINER,BRIDGEPLATE,LEFT	PC	0	0
	RS:A4393502	TRIM,LINER,BRIDGEPLATE,RIGHT	PC	0	0
	RS:A4497800	SCR,SCH,HEXALOBULAR HD,LWHD,M4 X12,SS...	PC	0	0
	RS:A4511601	SHIM,BRIDGEPLATE,1MM	PC	0	0
	RS:A4511602	SHIM,BRIDGEPLATE,2MM	PC	0	0
	RS:A4589100	PLUG,BUTTON FLUSH,1 3/8"	FOZ	0	0
C Car Cladding	RS:C2234000	CLADDING,PANEL,C-CAR	PC	2	0
	RS:C2666600	CLADDING, C-CAR, MID	PC	1	0
C car Insulation	RS:A0912700	TAPE,FOIL,.002"X2",ALUMINUM	FT	420	0
	RS:A2529700	70-08 BOSTIK ADHESIVE WINDSHIELD HARD...	PC	18	0
	RS:A2786900	INSULATION,FELT,2"X24"X48",3 P CF	PC	6	0
	RS:A4446000	KIT,SDWL,INSUL,C-CAR,PRE- CLADDING	PC	2	0
	RS:A4446200	KIT,SDWL,INSUL,C-CAR,POST- CLADDING	PC	2	0
C Car Speed Sensor Plugs/HW	RS:A0712608	NUT,HEX,M5,DIN934,ZN	PC	0	0

	RS:A0712705	WASHER,SPR LK,M5,DIN127B,ZN	PC	0	0
	RS:A0718405	WASHER,FL,M5,DIN125A,ZN	PC	0	0
	RS:A2139600	CONTACT,FEMALE,35-70MM SQ,35OA MP,HAN...	PC	0	0
	RS:A2139700	FRAME,1-POLE,HAN,MODULAR,SZ6B	PC	0	0
	RS:A2139800	HOUSING,BULKHEAD,HAN-MODULAR,S Z6B	PC	0	0
	RS:A2724200	CLAMP ASSY,2X 21.3MM,M8 MTD HR DWR	ML	0	0
	RS:A3545200	SCREW,PNH,PHH,M5X25,DIN7985A,Z N	PC	0	0
C car Truck Eye	RS:C2318700	EYE BAR, 10X416.5X494	PC	4	0
	RS:C2329800	RING 12X60X60	PC	4	0
C car Upper Pitching Joint	A2V0014213221	BOLT, MACHINE, HEX HD, M20 X 100	PC	2	0
	RS:09419227	UPPER PITCHING JOINT, C-CAR	PC	1	0
	RS:A2571300	WASHER, M20-39, DIN25201	PC	4	0
		WASHER, M20-39, DIN25201, A4	PC	4	0
	RS:A2571400	PIN, SLOTTED SPRING, 25 X 40	PC	2	0
		PIN, SLOTTED SPRING, 25 X 60	PC	2	0
	RS:A2571500	NUT, HEX, M20, DIN934	PC	4	0
	RS:A2571600	BOLT, MACHINE, HEX HD, M20 X 80	PC	2	0
	RS:C2375300	SUPPORT,BEARING PLATE, Middle	PC	1	0
	RS:C2375400	SUPPORT,BEARING PLATE,	PC	2	0
	RS:C2538100	A6MC2538100_-_.PRT PLATE,BEARING MNT,	PC	1	0
Cab Skirts and HW A-Car Only	RS:A0701800	WASHER,FL FNDR,M8,DIN9021B,SST	PC	658	0
	RS:A0701801	WASHER,FL FNDR,M6,DIN9021B,SST	PC	60	0
	RS:A0703602	SCREW,HEX HD,M8X25,DIN933,SST	PC	30	0
	RS:A0704800	SCREW,HEX HD,M6X16,DIN933,SST	PC	12	0
	RS:A0704801	SCREW,HEX HD,M6X20,DIN933,SST	PC	48	0
	RS:A0709200	WASHER,SPR LK,M8,DIN128A,SST	PC	12	0
	RS:A0709201	WASHER,SPR LK,M6,DIN128A,SST	PC	60	0
	RS:A0912200	TAPE,FOAM,ADH,1/16"X1",CLOSED CELL NE...	FT	45	0
	RS:A1983500	NUT,LOCK,M8,DIN985,SST	PC	6	0
	RS:A3676100	NUT,CHANNEL,W/SPR,M6,SST	PC	48	0
	RS:A4308401	SKIRT,SIDE,CAB,LH	PC	2	0
	RS:A4308402	SKIRT,SIDE,CAB,RH	PC	1	0
	RS:A4318101	BRACKET,SUPPORT,SKIRT,LH	PC	3	0
	RS:A4318102	BRACKET,SUPPORT,SKIRT,RH	PC	3	0
	RS:A4318201	BRACKET,SUPPORT,SKIRT,FRONT,LH	PC	3	0
	RS:A4318202	BRACKET,SUPPORT,SKIRT,FRONT,RH	PC	3	0
	RS:A4318400	L-BRACKET,SKIRT,HINGE	PC	12	0
	RS:A4484100	BRACKET,SKIRT,FRONT	PC	6	0
	RS:C2398100	SHIM,SHORT,5MM	PC	12	0
	RS:C2398900	SHIM,SHORT,1MM	PC	36	0
Cab Skirts and HW B-Car Only	RS:A0701800	WASHER,FL FNDR,M8,DIN9021B,SST	PC	658	0
	RS:A0701801	WASHER,FL FNDR,M6,DIN9021B,SST	PC	60	0
	RS:A0703602	SCREW,HEX HD,M8X25,DIN933,SST	PC	30	0
	RS:A0704800	SCREW,HEX HD,M6X16,DIN933,SST	PC	12	0

	RS:A0704801	SCREW,HEX HD,M6X20,DIN933,SST	PC	48	0	
	RS:A0709200	WASHER,SPR LK,M8,DIN128A,SST	PC	12	0	
	RS:A0709201	WASHER,SPR LK,M6,DIN128A,SST	PC	60	0	
	RS:A0912200	TAPE,FOAM,ADH,1/16"X1",CLOSED CELL NE...	FT	45	0	
	RS:A1983500	NUT,LOCK,M8,DIN985,SST	PC	6	0	
	RS:A3676100	NUT,CHANNEL,W/SPR,M6,SST	PC	48	0	
	RS:A4308401	SKIRT,SIDE,CAB,LH	PC	1	0	
	RS:A4308402	SKIRT,SIDE,CAB,RH	PC	2	0	
	RS:A4318101	BRACKET,SUPPORT,SKIRT,LH	PC	3	0	
	RS:A4318102	BRACKET,SUPPORT,SKIRT,RH	PC	3	0	
	RS:A4318201	BRACKET,SUPPORT,SKIRT,FRONT,LH	PC	3	0	
	RS:A4318202	BRACKET,SUPPORT,SKIRT,FRONT,RH	PC	3	0	
	RS:A4318400	L-BRACKET,SKIRT,HINGE	PC	12	0	
	RS:A4484100	BRACKET,SKIRT,FRONT	PC	6	0	
	RS:C2398100	SHIM,SHORT,5MM	PC	12	0	
	RS:C2398900	SHIM,SHORT,1MM	PC	36	0	
C-Car Truck Skirts LH	RS:A0700207	WASHER,SPR LK,M10,DIN127B,SST	PC	39	0	
	RS:A0700402	NUT,LOCK,M8,DIN985,SST	PC	423	0	
	RS:A0701800	WASHER,FL FNDR,M8,DIN9021B,SST	PC	453	0	
	RS:A0701802	WASHER,FL FNDR,M10,DIN9021B,SS T	PC	38	0	
	RS:A0702202	SCREW,HEX HD,M10X25,DIN933,SST	PC	13	0	
	RS:A0703601	SCREW,HEX HD,M8X20,DIN933,SST	PC	28	0	
	RS:A0703900	NUT,HEX,JAM,M6,DIN439B,SST	PC	12	0	
	RS:A0718005	NUT,LOCK,M8,DIN985,ZN	PC	24	0	
	RS:A0720700	WASHER,FL FNDR,M8,DIN9021B,ZN	PC	56	0	
	RS:A1822500	BUMPER,STOP,3/4"ODX1/2" TALL M6 X 1-3...	PC	12	0	
	RS:A1824500	CLIP,SAFETY,13MM BALL SOCKET	PC	24	0	
	RS:A2130300	SPACER,CLADDING,10MM,MEDIUM	PC	8	0	
	RS:A2130400	SPACER,CLADDING,5MM,MEDIUM	PC	8	0	
	RS:A2529700	70-08 BOSTIK ADHESIVE WINDSHIELD HARD...	PC	18	0	
	RS:A2644403	SHIM,DRIVE MOUNT,#2,90X1	PC	25	0	
	RS:A2936300	STUD,BALL,M8X1.25x25MM lG STUD,ZN	PC	24	0	
	RS:A4206900	LATCH,SAFETY,SKIRT WHITE RAIL 9016	PC	6	0	
	RS:A4242600	NEOPRENE,SHEET,3MM THK X60MM WIDE,60...	PC	72	0	
	RS:A4589600	ASSY,LOCK,8MM TRI STUD,19MM GRIP,SST	PC	16	0	
	RS:A4633201	SKIRT,NON-POWER TRUCK,C-CAR	PC	1	0	
	RS:A4633300	BRACKET,STRUT,HORIZONTAL,C-CA	PC	4	0	
	RS:A4633400	WELD,PLATE,SKIRT,C-CAR	PC	4	0	
	RS:A4939400	STRUT,GAS,780N	PC	4	0	
	RS:A7714200	BRACKET,LATCH,SAFETY,C-CAR	PC	2	0	
	RS:A7714300	BRACKET,SKIRT,GAS SPRING,C-CAR	PC	4	0	
	RS:A7989200	HINGE,SKIRT,3"X4"X1/4 PIN	PC	34	0	
	RS:A7989400	WELD PLATE,SKIRT,SHORT	PC	10	0	
C-Car Truck Skirts RH	RS:A0700207	WASHER,SPR LK,M10,DIN127B,SST	PC	92	0	

	RS:A0700402	NUT,LOCK,M8,DIN985,SST	PC	1087	0
	RS:A0701800	WASHER,FL FNDR,M8,DIN9021B,SST	PC	1154	0
	RS:A0701802	WASHER,FL FNDR,M10,DIN9021B,SS T	PC	89	0
	RS:A0702202	SCREW,HEX HD,M10X25,DIN933,SST	PC	34	0
	RS:A0703601	SCREW,HEX HD,M8X20,DIN933,SST	PC	64	0
	RS:A0703900	NUT,HEX,JAM,M6,DIN439B,SST	PC	30	0
	RS:A0718005	NUT,LOCK,M8,DIN985,ZN	PC	60	0
	RS:A0720700	WASHER,FL FNDR,M8,DIN9021B,ZN	PC	132	0
	RS:A1822500	BUMPER,STOP,3/4"ODX1/2" TALL M6 X 1-3...	PC	28	0
	RS:A1824500	CLIP,SAFETY,13MM BALL SOCKET	PC	56	0
	RS:A2130300	SPACER,CLADDING,10MM,MEDIUM	PC	20	0
	RS:A2130400	SPACER,CLADDING,5MM,MEDIUM	PC	20	0
	RS:A2529700	70-08 BOSTIK ADHESIVE WINDSHIELD HARD...	PC	54	0
	RS:A2644403	SHIM,DRIVE MOUNT,#2,90X1	PC	62	0
	RS:A2936300	STUD,BALL,M8X1.25x25MM lG STUD,ZN	PC	56	0
	RS:A4206900	LATCH,SAFETY,SKIRT WHITE RAIL 9016	PC	14	0
	RS:A4242600	NEOPRENE,SHEET,3MM THK X60MM WIDE,60...	PC	168	0
	RS:A4589600	ASSY,LOCK,8MM TRI STUD,19MM GRIP,SST	PC	40	0
	RS:A4633201	SKIRT,NON-POWER TRUCK,C-CAR	PC	2	0
	RS:A4633300	BRACKET,STRUT,HORIZONTAL,C-CA	PC	10	0
	RS:A4633400	WELD,PLATE,SKIRT,C-CAR	PC	10	0
	RS:A4939400	STRUT,GAS,780N	PC	10	0
	RS:A7714200	BRACKET,LATCH,SAFETY,C-CAR	PC	5	0
	RS:A7714300	BRACKET,SKIRT,GAS SPRING,C-CAR	PC	10	0
	RS:A7989200	HINGE,SKIRT,3"X4"X1/4 PIN	PC	79	0
	RS:A7989400	WELD PLATE,SKIRT,SHORT	PC	23	0
Door Operators	RS:A4263600	DOOR CONTROL UNIT,MASTER (A car door 1 only)	PC	1	0
	RS:A4263700	DOOR OPERATOR	PC	2	0
	RS:A4266000	DOOR CONTROL UNIT, COMMON	PC	1	0
Door Post Cover, Emitter (lights) A/B	RS:A4337400	Plate, Emitter, Door Post Cover	PC	0	0
Emergency release handle hatch	RS:A0701805	WASHER,FL FNDR,M4,DIN9021B,SST	PC	0	0
	RS:A0704106	NUT,HEX,M4,DIN934,SST	PC	0	0
	RS:A4307901	HINGE PLATE,ADJUSTABLE,EMR REL EASE/C...	PC	0	0
	RS:A4308001	ASSY,DOOR,EXT,EMR RELEASE/CREW KEY BO...LH	PC	0	0
	RS:A4308002	ASSY,DOOR,EXT,EMR RELEASE/CREW KEY BO...RH	PC	0	0
	RS:A4345100	8MM TRI,SST(EMKA 1000-U134/ U335/991)	PC	0	0
	RS:A4570100	CAM,SST, 1000-223	PC	0	0
	RS:A5075700	GROMMET,01/4"IDX05/8"OD,01/8"	PC	0	0
Exterior Doors	RS:A4263300	DOOR PANEL,RH, DS PB & DS ADA PB - ADA Door 13 – right	PC	0	0
	RS:A4263400	DOOR PANEL,LH, COMMON,DS PB & DS OOS - ADA Door 12 – left	PC	0	0
	RS:A4263500	DOOR PANEL,RH, DS PB - Door 11 – right	PC	0	0
HV 162 Box and HW	A2V00100096989	NUT,FITTING,MPG16,DIN46320,MS, NI PL	PC	1	0
	RS:A0679400	ROPE,COPPER,TINNED,AWG2/0	PC	2	0
	RS:A0700000	WASHER,FL,M10,DIN125A,SST	PC	5	0

	RS:A0700006	WASHER,FL,M8,DIN125A,SST	PC	25	0	
	RS:A0700202	WASHER,SPR LK,M8,DIN127B,SST	PC	24	0	
	RS:A0700207	WASHER,SPR LK,M10,DIN127B,SST	PC	39	0	
	RS:A0700402	NUT,LOCK,M8,DIN985,SST	PC	423	0	
	RS:A0700502	SCREW,SCH,M6X16,DIN912,SST	PC	24	0	
	RS:A0701800	WASHER,FL FNDR,M8,DIN9021B,SST	PC	453	0	
	RS:A0701802	WASHER,FL FNDR,M10,DIN9021B,SS T	PC	38	0	
	RS:A0702202	SCREW,HEX HD,M10X25,DIN933,SST	PC	13	0	
	RS:A0702211	SCREW,HEX HD,M10X50,DIN933,SST	PC	1	0	
	RS:A0704102	NUT,HEX,M8,DIN934,SST	PC	8	0	
	RS:A0704103	NUT,HEX,M10,DIN934,SST	PC	3	0	
	RS:A0709501	FITTING,CABLE,PG16/15,10.5-7.0 ,NI PL	PC	1	0	
	RS:A0717800	CLAMP,HOSE,9/16"X63.5-311.1MM, SST	PC	2	0	
	RS:A0784300	GUARD,EDGE,FLEX,0.52",.032-.12 5" PAN...	PC	2	0	
	RS:A0903400	540, 3M, SEALANT POLYURETHANE 600ML	PC	2	0	
	RS:A1230008	ASSY,GROUND,M10/M10,2/0 COPPER /TINNE...	PC	1	0	
	RS:A1894900	LABEL,METALIZED POLYESTER,0.5" H X 1....	PC	6	0	
	RS:A1895700	LABEL,WRAPAROUND WHITE,1X3.75"	PC	1	0	
	RS:A2587400	INSULATION,FELT,3"X24"X48",6 P CF	PC	2	0	
	RS:A2587900	INSULATION,FELT,1"X24"X48" 6 PCF	PC	3	0	
	RS:A2644800	CP 25WB+ 3M SEALANT FIRE BARRIER 20OZ	PC	70	0	
	RS:A2982200	ENDOTHERMIC,FIBER BLANKET ,24.5"X20'X...	PC	1	0	
	RS:A3138000	WRAP,FIRE BARRIER,2"X24"	PC	24	0	
	RS:A3138100	INSULATION,BLOWING WOOL	PC	1	0	
	RS:A3516200	HAN-48B,MOTOR QUICK DISCONNECT ,HOUSI...	PC	2	0	
	RS:A4254400	PLATE,LOWER,FIRESEAL,RACK RIGHT SIDE	PC	1	0	
	RS:A4254700	PLATE,INTERFACE,J-BOX,RIGHT SIDE	PC	1	0	
	RS:A4255000	PLATE,UPPER,FIRESEAL,RACK, RIGHT SIDE	PC	2	0	
	RS:A4255100	SLIDE,FIRESEAL,RACK,RIGHT SIDE	PC	2	0	
	RS:A4267400	WELDMENT,J-BOX,162	PC	1	0	
	RS:A4267500	COVER,J-BOX,162,BOTTOM	PC	1	0	
	RS:A5376900	LUG,RING,70mm2, AWG2/0 & ROPE M10,(13...	PC	2	0	
	RS:A5846000	GASKET,J-BOX,162,ADH BACKED	PC	1	0	
Roof Shrouds	RS:A0700200	WASHER,SPR LK,M6,DIN127B,SST	PC	16	0	
	RS:A0700402	NUT,LOCK,M8,DIN985,SST	PC	423	0	
	RS:A0701800	WASHER,FL FNDR,M8,DIN9021B,SST	PC	453	0	
	RS:A0704804	SCREW,HEX HD,M6X25,DIN933,SST	PC	16	0	
	RS:A0918100	DP810, 3M, ACRYLIC, 2PART, ADHESIVE L...	PC	12	0	
	RS:A2529700	70-08 BOSTIK ADHESIVE WINDSHIELD HARD...	PC	18	0	
	RS:A2544200	NUT,CAGE,M6X1.7-2.7,BN3307,SST	PC	16	0	
	RS:A2550000	WASHER,SEALING,1/4"X3/4"OD BONDED,SST	PC	16	0	
	RS:A2572400	WASHER,FL,.815 ID X 1.068 OD X .15" T...	PC	16	0	
	RS:A4242700	NEOPRENE,SHEET,3MM THKX350X100 60 DUR...	FT	2	0	
	RS:A4243301	SHROUD,ROOF,FRONT	PC	1	0	

UTA 1122 - Bill of Material (Compiled)

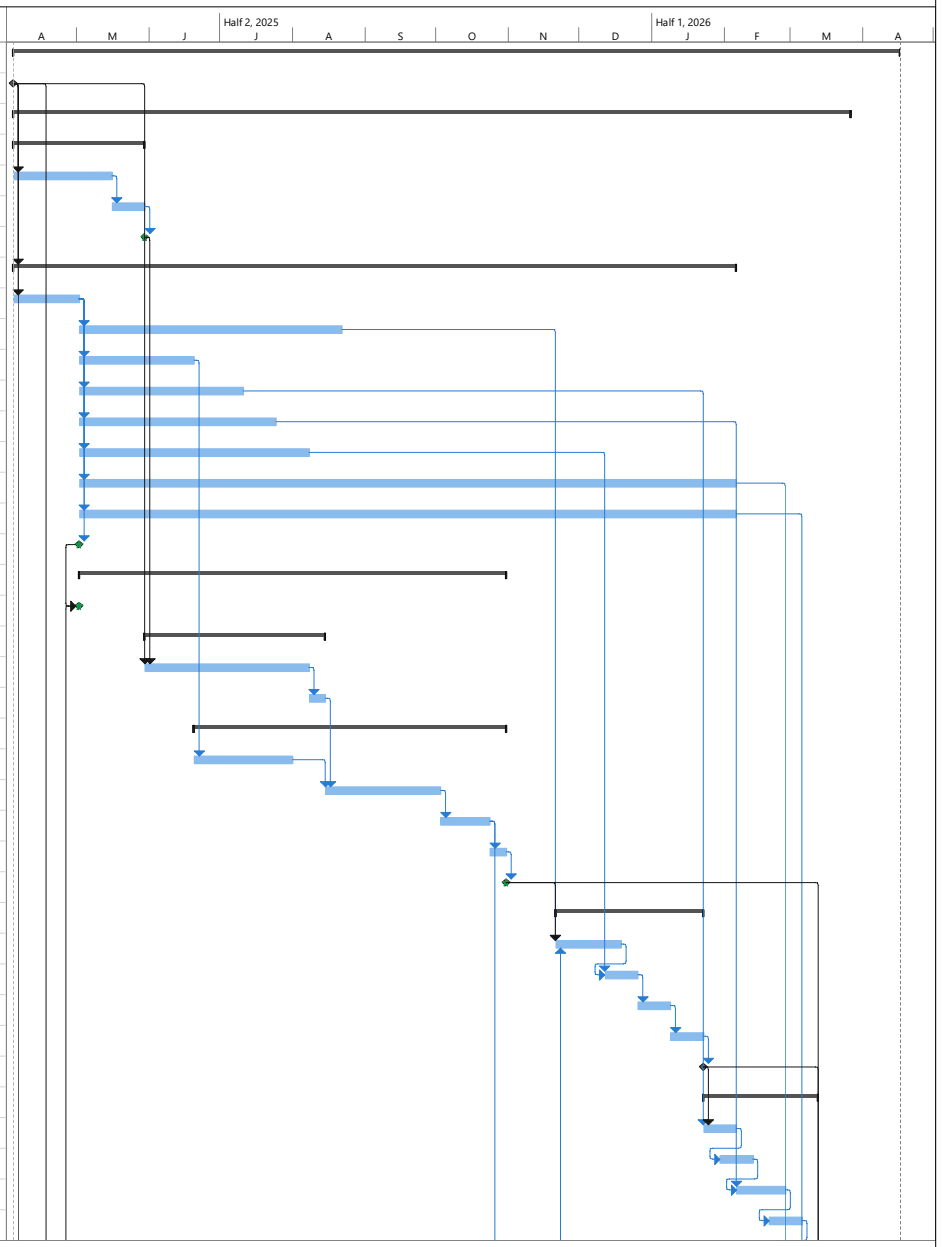
SIEMENS

	RS:A4243401	SHROUDS,ROOF,REAR,LH	PC	1	0
	RS:A4243402	SHROUDS,ROOF,REAR,RH	PC	1	0
	RS:A4940300	BRACKET,SHROUD,SHORT,SST	PC	2	0
	RS:A4940400	BRACKET,SHROUD,WIDE	PC	2	0
	RS:A4944200	PLATE,STUDS,SHROUDS	PC	15	0
	RS:A7788700	RUBBER,SHROUDS,BRACKET,SST	PC	9	0
	RS:C2662400	BAFFLE	PC	2	0
Swivel Ring	A2V00397248176	Swivel ring painted (97248176)	PC	2	0
	A2V00397239151	Bush (97239151)	PC	2	0
	A2V00397239805	BOLT (97239805)	PC	2	0
	A2V00370069475	SEAL V-RING V-45A (970069475)	PC	2	0
	A2V00397239939	Wear Ring, painted (97239939)	PC	2	0
	A2V00370027222	SLOT.CASTLE NUT DIN935-M36-8-A2C (70027222)	PC	2	0
Washer Bottle -Windshield	A6X30235255	INSTL,WINDSHIELD WASH BOTTLE,SLC	PC	2	0
Windows A/B Car	RS:A0901900	5019H LOCTITE, ADHESIVE, INSTANT (SUP...	PC	220	5
	RS:A2043600	SPACER,FLOOR,10X30X10MM,RUBBER 50 DUR...	PC	56	56
	RS:A2043700	SPACER,FLOOR,10X30X6MM,RUBBER, 50 DUR..	PC	12	12
	RS:A2529700	70-08 BOSTIK ADHESIVE WINDSHIELD HARD...	PC	18	0
	RS:A2529800	70-01 BOSTIK SEALANT SOFT 600 ML TUBE	PC	2	0
	RS:A4252500	WINDOW,PASSENGER,LOW FLOOR A/B	PC	2	2
	RS:A4270000	WINDOW PASSENGER HIGH FLOOR A/B	PC	4	4
Windows C Car	RS:A0901900	5019H LOCTITE, ADHESIVE, INSTANT (SUP...	PC	220	5
	RS:A2043600	SPACER,FLOOR,10X30X10MM,RUBBER 50 DUR...	PC	56	56
	RS:A2043700	SPACER,FLOOR,10X30X6MM,RUBBER, 50 DUR...	PC	12	12
	RS:A2529700	70-08 BOSTIK ADHESIVE WINDSHIELD HARD...	PC	18	0
	RS:A2529800	70-01 BOSTIK SEALANT SOFT 600 ML TUBE	PC	2	0
	RS:A4270100	WINDOW,PASSENGER,C-CAR	PC	2	2
Wiper ARM HW included	RS:A4621400	WIPER ARM, ASSY, W/AUX ARM,S70	PC	0	0
	RS:A5500700	BLADE,ASSY,WINDSHIELD WIPER	PC	0	0
	RS:A0704306	NUT,U-TYPE,SELF RETAINING,M5,Z N PL S...	PC	0	0
	RS:A4253201	HOUSING,HTR,SIDEWALL,MID	PC	0	0
	RS:A4274700	HEATER ASSY,SIDEWALL,1008	PC	0	0
	RS:A4275000	INSUL,GLASTIC,HEATER,HF	PC	0	0
	RS:A4296900	BRACKET,MOUNT,OPERATOR,DOOR,M	PC	0	0
	RS:A4557100	BRACKET, CABLE CROSSOVER HANG	PC	0	0

SIEMENS

UTA 1122 - Accident Repair (Phase 1, 2 & 3) Timeline

ID	Task Mode	% Complete	Task Name	Duration	Start	Finish	Predecessors
1		**0%**	**UTA 1122 - Accident Repair Complete**	**54 wks**	**Fri 4/4/25**	**Thu 4/16/26**	
2		***0%***	***NTP / PO***	***0 days***	***Fri 4/4/25***	***Fri 4/4/25***	
3		**0%**	**Phase 1 - Vehicle Repair**	**51 wks**	**Fri 4/4/25**	**Thu 3/26/26**	
4		**0%**	**Engineering**	**8 wks**	**Fri 4/4/25**	**Thu 5/29/25**	
5		0%	Repair Procedure	6 wks	Fri 4/4/25	Thu 5/15/25	2
6		0%	UTA Comments & Acceptance	2 wks	Fri 5/16/25	Thu 5/29/25	5
7		*0%*	*Repair Procedure Approved*	*0 wks*	*Thu 5/29/25*	*Thu 5/29/25*	*6*
8		**0%**	**Material Purchasing**	**44 wks**	**Fri 4/4/25**	**Thu 2/5/26**	**2**
9		0%	Quotes update and PO release	4 wks	Fri 4/4/25	Thu 5/1/25	2
10		0%	Electrical	16 wks	Fri 5/2/25	Thu 8/21/25	9
11		0%	Sidewall components	7 wks	Fri 5/2/25	Thu 6/19/25	9
12		0%	Windows	10 wks	Fri 5/2/25	Thu 7/10/25	9
13		0%	Cladding and Interior Panels	12 wks	Fri 5/2/25	Thu 7/24/25	9
14		0%	Flooring	14 wks	Fri 5/2/25	Thu 8/7/25	9
15		0%	DCU	40 wks	Fri 5/2/25	Thu 2/5/26	9
16		0%	Door Operator	40 wks	Fri 5/2/25	Thu 2/5/26	9
17		*0%*	*Purchase Order placement with all suppliers*	*0 days*	*Thu 5/1/25*	*Thu 5/1/25*	*9*
18		**0%**	**Structural Repair**	**26 wks**	**Thu 5/1/25**	**Thu 10/30/25**	
19		*0%*	*Full Vehicle Teardown*	*0 days*	*Thu 5/1/25*	*Thu 5/1/25*	*17SS*
20		**0%**	**Weld Repair - Phase 1**	**11 wks**	**Fri 5/30/25**	**Thu 8/14/25**	
21		0%	C-car repair	10 wks	Fri 5/30/25	Thu 8/7/25	2FS+4 wks,7
22		0%	QA Inspection	1 wk	Fri 8/8/25	Thu 8/14/25	21
23		**0%**	**Weld Repair - Phase 2**	**19 wks**	**Fri 6/20/25**	**Thu 10/30/25**	
24		0%	Sidewall production (FRD)	6 wks	Fri 6/20/25	Thu 7/31/25	11
25		0%	Door portal repair (remove damaged structure, insert fabricated wall)	7 wks	Fri 8/15/25	Thu 10/2/25	22,24
26		0%	Undercar repair	3 wks	Fri 10/3/25	Thu 10/23/25	25
27		0%	QA Inspection	1 wk	Fri 10/24/25	Thu 10/30/25	26
28		*0%*	*Structural Repair Work finished*	*0 days*	*Thu 10/30/2*	*Thu 10/30/25*	*27*
29		**0%**	**Re-Assembly**	**9 wks**	**Fri 11/21/25**	**Thu 1/22/26**	
30		0%	Electrical rework	4 wks	Fri 11/21/25	Thu 12/18/25	28,10,46
31		0%	Subfloor installation	2 wks	Fri 12/12/25	Thu 12/25/25	30FS-1 wk,14
32		0%	Sidewall heat	2 wks	Fri 12/26/25	Thu 1/8/26	31
33		0%	Floor finishing	2 wks	Fri 1/9/26	Thu 1/22/26	32
34		*0%*	*Re-Assembly Finished*	*0 days*	*Thu 1/22/26*	*Thu 1/22/26*	*33*
35		**0%**	**Final Assembly**	**7 wks**	**Fri 1/23/26**	**Thu 3/12/26**	
36		0%	Glass Instalation	2 wks	Fri 1/23/26	Thu 2/5/26	34,12
37		0%	Interior Panel Installation	2 wks	Fri 1/30/26	Thu 2/12/26	36FS-1 wk
38		0%	Cladding Installation	3 wks	Fri 2/6/26	Thu 2/26/26	37FS-1 wk,13
39		0%	Skirts / Roof shrouds	2 wks	Fri 2/20/26	Thu 3/5/26	38FS-1 wk

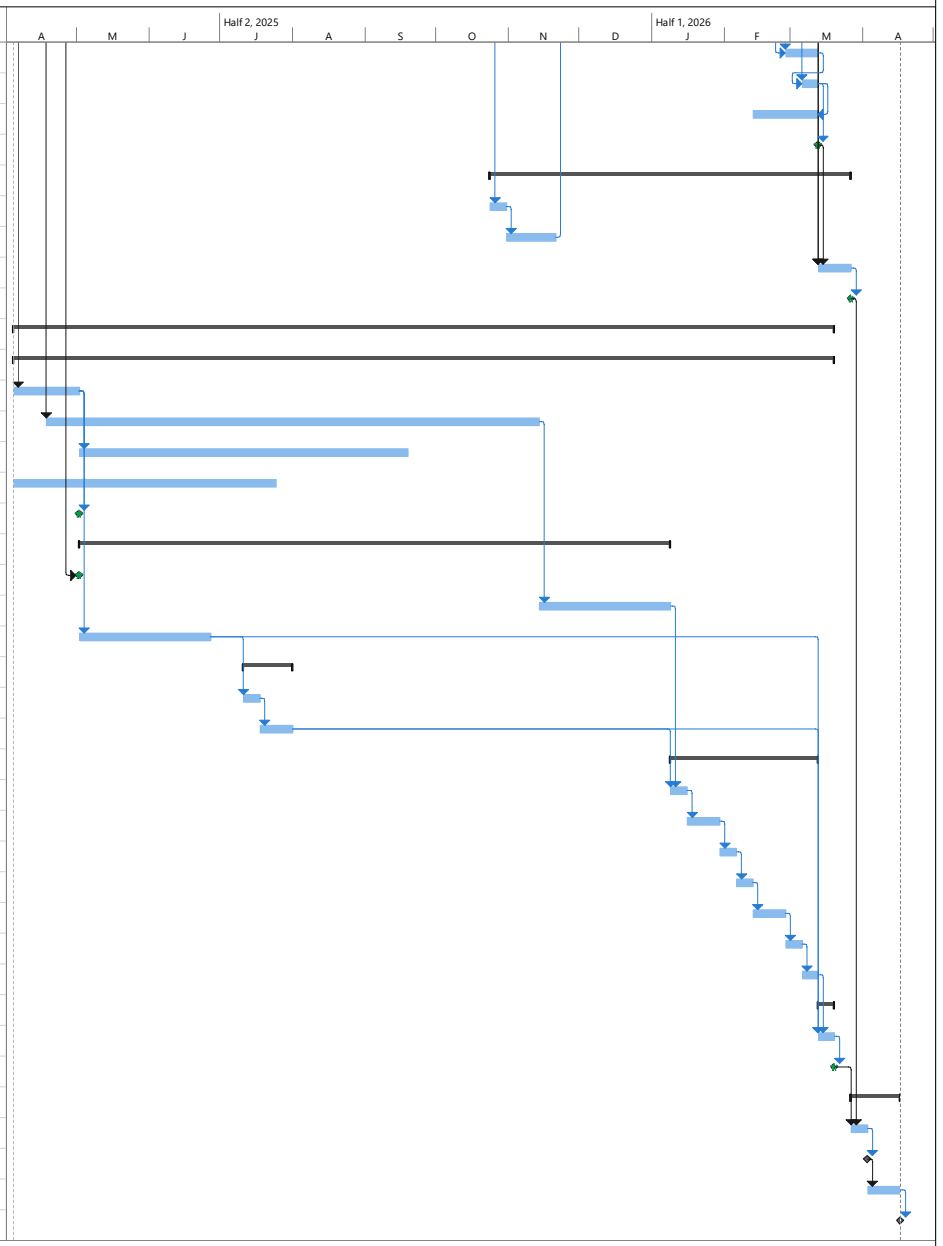


Task | Split | Milestone | Summary | Project Summary | Progress | Payment Milestones

SIEMENS

UTA 1122 - Accident Repair (Phase 1, 2 & 3) Timeline

ID	Task Mode	% Complete	Task Name	Duration	Start	Finish	Predecessors
40		0%	Door Installation	2 wks	Fri 2/27/26	Thu 3/12/26	39FS-1 wk,15
41		0%	ADA Ramp	1 wk	Fri 3/6/26	Thu 3/12/26	40FS-1 wk,16
42		0%	***Phase 3: Additional Material & Installation***	4 wks	Fri 2/13/26	Thu 3/12/26	41FF
43		*0%*	*Final Assembly Finished*	*0 days*	*Thu 3/12/26*	*Thu 3/12/26*	*41*
44		**0%**	**Finishing**	**22 wks**	**Fri 10/24/25**	**Thu 3/26/26**	
45		0%	Blast and Paint new structure	1 wk	Fri 10/24/25	Thu 10/30/25	26
46		0%	Exterior paint correction	3 wks	Fri 10/31/25	Thu 11/20/25	45
47		0%	QA Final Inspection	2 wks	Fri 3/13/26	Thu 3/26/26	28,34,43
48		*0%*	*Vehicle Final Acceptance*	*0 days*	*Thu 3/26/26*	*Thu 3/26/26*	*47*
49		**0%**	**Phase 2 - Bogie Repair**	**50 wks**	**Fri 4/4/25**	**Thu 3/19/26**	
50		**0%**	**Material Purchasing**	**50 wks**	**Fri 4/4/25**	**Thu 3/19/26**	
51		0%	Quotes update and PO release	4 wks	Fri 4/4/25	Thu 5/1/25	2
52		0%	Drive Units OH Kit	30 wks	Fri 4/18/25	Thu 11/13/25	2FS+2 wks
53		0%	Hardware (Screws,Washers,Nuts,Clamps)	20 wks	Fri 5/2/25	Thu 9/18/25	51
54		0%	Miscelaneous	16 wks	Fri 4/4/25	Thu 7/24/25	
55		*0%*	*Purchase Order placement with all suppliers*	*0 days*	*Thu 5/1/25*	*Thu 5/1/25*	*51*
56		**0%**	**BG Repair and Overhaul**	**36 wks**	**Thu 5/1/25**	**Thu 1/8/26**	
57		*0%*	*Full Bogie Teardown*	*0 days*	*Thu 5/1/25*	*Thu 5/1/25*	*19SS*
58		0%	Drive Units	8 wks	Fri 11/14/25	Thu 1/8/26	52
59		0%	Structural Repair (Welding)	8 wks	Fri 5/2/25	Thu 6/26/25	51
60		**0%**	**Painting**	**3 wks**	**Fri 7/11/25**	**Thu 7/31/25**	
61		0%	Frames / Bolsters Prep	1 wk	Fri 7/11/25	Thu 7/17/25	59FS+2 wks
62		0%	Frames / Bolsters Painting	2 wks	Fri 7/18/25	Thu 7/31/25	61
63		**0%**	**BG Re-Assembly**	**9 wks**	**Fri 1/9/26**	**Thu 3/12/26**	
64		0%	Re-Finishing	1 wk	Fri 1/9/26	Thu 1/15/26	58,62
65		0%	Electrical	2 wks	Fri 1/16/26	Thu 1/29/26	64
66		0%	Sub-Assembly	1 wk	Fri 1/30/26	Thu 2/5/26	65
67		0%	Frame Preparation	1 wk	Fri 2/6/26	Thu 2/12/26	66
68		0%	Frame Axle Integration	2 wks	Fri 2/13/26	Thu 2/26/26	67
69		0%	BG Press	1 wk	Fri 2/27/26	Thu 3/5/26	68
70		0%	Testing	1 wk	Fri 3/6/26	Thu 3/12/26	69
71		**0%**	**Finishing**	**1 wk**	**Fri 3/13/26**	**Thu 3/19/26**	
72		0%	QA Inspection	1 wk	Fri 3/13/26	Thu 3/19/26	59,62,70
73		*0%*	*Bogies Final Acceptance*	*0 days*	*Thu 3/19/26*	*Thu 3/19/26*	*72*
74		**0%**	**Transportation**	**3 wks**	**Fri 3/27/26**	**Thu 4/16/26**	
75		0%	*Trucks Installation*	1 wk	Fri 3/27/26	Thu 4/2/26	48,73
76		*0%*	*LRV Complete - Ready to ship*	*0 days*	*Thu 4/2/26*	*Thu 4/2/26*	*75*
77		0%	Shipment	2 wks	Fri 4/3/26	Thu 4/16/26	76
78		*0%*	*LRV Delivery - Salt Lake City*	*0 days*	*Thu 4/16/26*	*Thu 4/16/26*	*77*



Task | Split | Milestone | Summary | Project Summary | Progress | Payment Milestones

Exhibit C Price								
	Labor Rate	Hours	Total					
Project Management	$ 198.00	441	$ 87,318.00					
Engineering	$ 260.00	969	$ 251,940.00					
Quality Assurance	$ 260.00	271	$ 70,460.00					
Procurement	$ 198.00	353	$ 69,894.00					
Travel Expenses			$ 25,983.00					
Light Rail Activities			$ 1,147,082.00					
Materials			$ 593,297.00					
			$ 2,245,974.00					
Milestone Payments	Description					Payment %	Amount	
1st Payment	Due after Full Vehicle & Bogie Teardown and purchase order placement with all suppliers.					30%	$ 665,997.30	
2nd payment	due at the delivery and UTA approval of Repair Procedure					10%	$ 221,999.10	
3rd Payment	due at the end of structural repair work and before starting reassembly					30%	$ 665,997.30	
4th Payment	due at the completion of Final Assembly					25%	$ 554,997.75	
Final payment	due at Vehicle & Bogie Acceptance & Conditional Acceptance					5%	$ 110,999.55	
Milestone Payments Total							$ 2,219,991.00	
Travel Expenses							$ 25,983.00	Not To Exceed
Total							$ 2,245,974.00	
The above Milestone payments will be lump sum pricing, The Travel Expenses will be a Not To Exceed (NTE)								
Travel Expenses shall be paid 30 days after time of travel. All travel receipts must accompany Invoice for payment. Actual costs must follow the GSA Rates (www.gsa.gov site).								

UTAH TRANSIT AUTHORITY

Construction Safety and Security Program Manual

27 November 2018

Revision 12.0

Revision Table

Version	Date	Comments	Changes made by
8	20 January 2011		unknown
9.0	5 October 2012	Updated policies layout, and font.	Max Hanna
9.1	5 December 2012	Edited the safety shoe policy	Max Hanna
9.2	5 January 2013	Added table to track changes.	Max Hanna
10.0	15 August 2013	Added HASP standards to introduction. Added Lessons Learned.	Max Hanna
11.0	10 June 2016	Improved layout and organization. Added specific safety guidelines, PPE visual guide, and accident investigation guidelines.	Construction Safety Committee
12.0	27 Nov 2018	Added clarification to work preparation and demolition sections. Made adjustments to layout. Updated crane certification requirements and added section about hazardous waste.	Construction Safety Committee

Table of Contents

1

1.0 Introduction and Definitions

1.1 Introduction

Contractors and subcontractors are charged with the responsibility of adoption and use of this *UTA Construction Safety and Security Program Manual* (*CSSP*) and other safety programs administered by UTA. This will allow for a coordinated safety and security effort consistent with the CSSP on all project sites. Employee participation, proper supervision, and training at all tiers with the CSSP is required.

This manual provides general information and guidance to UTA project managers, engineers, and contractors on the requirements and procedures for accident prevention and safety for Utah Transit Authority projects. The UTA safety goal is to achieve an accident-free construction project.

This *CSSP* reflects minimal standards and best practices. All general contractors, contractors, and their sub-tiers will be expected to meet or exceed the standards and good safe practices outlined in this manual and their own safety program, whichever is more stringent. Variance from the accepted standards are acceptable when well developed, communicated, and documented.

Contractors must adopt this safety plan or exceed it with one of their own creation. A Health and Safety Plan (HASP) is required if there is a risk of chemical contamination on the site.

Additionally, UTA invites all who use this program to provide revision comments. Email your comments to the UTA Construction Safety Administrator for inclusion in the next version of this program manual.

1.2 Definitions

access control	Any combination of features designed to dissuade, prohibit, or prosecute illegal entry. May include CCTV, alarm systems, security guards, and/or key card entry
accident	An unexpected event that interrupts or interferes with the orderly progress of the construction activity or process, and could result in bodily injury or property damage.
bid	The offer of the bidder for the work when made out and submitted on the prescribed bid forms, properly signed, and guaranteed.
claim	A demand for compensation, including a benefit request for injuries or damages caused by a loss.
combustible	Globally Harmonized System of Classification and Labelling of Chemicals defines the flash point temperature of combustible liquids between 140 °F (60 °C) and 200 °F (93 °C)
competent person	A person designated by the contractor who is knowledgeable of safety standards and is capable of identifying workplace hazards, and has the authority to take action to eliminate the hazard.

construction manager	A resident engineer's general superintendent for a given project that has overall responsibility to see that the work or job is performed to specification.
construction safety program	The safety and loss control program established to minimize hazards and risks associated with construction projects.
CSSC	Construction Safety and Security Committee. See section 3.8 of this program manual.
construction work	Building a new item, facility, or component. Also the installation or replacement of parts or components of a system in which most of the parts are replaced. The question of construction or maintenance has no clear answer and must take into account all of the conditions at the site. However, OSHA has stated that if a determination cannot be made, then the more protective standard applies. [1]
consultant	The firm or firms under contract to UTA which are performing services, including but not limited to design, engineering, project control, construction management, surveying, environmental assessment and geotechnical investigations, in support of the overall project of which this contract is a part.
contract	The written agreement covering the performance of the work and the furnishing of labor, materials, tools, and equipment in the construction of the work. The contract shall include the invitation for bids, bid, general provision, plans and specifications, and contract bond; also any and all supplemental agreements amending or extending the work contemplated and which may be required to complete the work in a substantial and acceptable manner.
contractor	The person, persons, partnership, joint venture, company, or corporation entering into this contract for the performance of the work required by the contract. A contractor will normally report to a general contractor unless there is a reason for direct contact with a project manager or UTA's resident engineer.
contractor's safety supervisor	A contractor's employee hired or assigned to perform safety responsibilities and may perform other project tasks secondary to safety responsibilities.
contractor's superintendent	The individual for a given project who has the overall responsibility to see that the work or job is completed satisfactorily.
engineer	A registered professional, with a designation or academic degree in a specific technical discipline.

[1] UTA Internal Memorandum dated 13 January 2016. Subject: Construction vs. Maintenance under OSHA Regulations as Applied to Work Done by Facilities Personnel

flammable	Globally Harmonized System of Classification and Labelling of Chemicals which defines the flash point temperature of flammable liquids to be between 0 and 140 °F (60 °C). Antonyms of flammable/inflammable are non-flammable, non-inflammable, incombustible, non-combustible, ininflammable, not flammable or fireproof.
general contractor	A corporation, company, partnership, joint venture, person, or persons entering into contract for performance of work required by the contract.
general duty clause (GDC)	Is defined by section 5(a)(1) of the Occupational Safety and Health Act (OSHA). GDC would apply to any condition considered unsafe by competent persons for regulatory rules that have not been established, published, and distributed. Any such condition shall be brought to the attention of appropriate management and representative of UTA to determine corrective action. See Construction Work definition.
government requirements	Federal, state, and local statutes, ordinances, codes, regulations, orders, rules, directives, requirements, policies, procedures, and guidelines applicable to the project or the work to be performed under the contract.
inflammable	Synonym of flammable
lighting/illumination	Lighting at work sites, offices, and storage areas may be used to reduce vulnerability.
maintenance	Making or keeping a structure, fixture, or foundation in proper condition in a routine, scheduled, or anticipated fashion. The question of construction or maintenance has no clear answer and must take into account all of the conditions at the site. However, OSHA has stated that if a determination cannot be made, then the more protective standard applies.
manual	*UTA Construction Safety and Security Program Manual or CSSP*.
near miss	Any unplanned event having the potential for serious consequences, but resulting in no property damage or personal injury. Short for near mishap.
OSHA	Either the Occupational Safety and Health Act or the Occupational Safety and Health Administration. The Act established the Administration.
physical barriers	Perimeter fencing with lockable gates will be used for storage areas and may be used for vulnerable work areas or office locations. Other physical barriers may be used to prevent vehicle access to the site.

plans	The drawings, standard drawings, profiles, typical cross-sections, general cross-sections, elevations, diagrams, schedules, and details which show the locations, character, dimensions, and details of the work.
project engineer	The contractor's executive representative designated in accordance with project specifications.
project resident engineer	UTA's authorized representative charged with the professional administration of a particular contract.
safety stand down	Typically a full or half day taken to review specific safety practices. No work is performed during the stand down, but all personnel, including subs, are required to attend training. Used after an accident or near miss to prevent recurrences.
security	Those contracted or hired agents under the authority of UTA, serving in the interest of public safety and property control.
security guard service	On-site security guard service may include both patrolling guards to randomly cover all work, office, and storage areas and stationary guards (fixed post) to control key access points or observe significant vulnerabilities.
signage	Warning signs may be used both for security and safety reasons.
subcontractor	Any individual, partnership, or corporation undertaking construction or other services under contract with a contractor or general contractor.
sub-subcontractor	Any individual, partnership or corporation which performs sublet work with the consent of a subcontractor or its designee, excluding vendors, suppliers, material dealers, or others whose function is solely to supply materials, parts or equipment to and from the job site.
TASP	Transit Agency Safety Plan. An FTA mandated, overarching, all consuming, all knowing, safety plan for everything a transit agency does. This document replaces the Safety and Emergency Preparedness Plan.
UOSH	The Utah Occupational Safety and Health rules and regulations promulgated there under relating to the occupational safety and health requirements for the job site, including construction work.
UTA	Utah Transit Authority
UTA Construction Safety Administrator	A UTA employee who administers the Construction Safety Program

work	The furnishing of all supervision, labor, material, equipment, services, and incidentals necessary to complete any duties and obligations imposed on the contractor by the contract.
work site	The area enclosed by the limit of work indicated on the plans and the boundaries of local streets and public easements in which the contractor is to perform work under the contract. This is interchangeable with "job site".

2.0 Purpose, Scope, and Objectives

2.1 Purpose

The purpose of this policy is to establish the minimum safety and security guidelines for contractors of and visitors to UTA construction projects. And to promote consistency of purpose, compliance, and conduct on all UTA construction projects, regardless of size or cost.

Utah Occupational Safety and Health (UOSH) requires that UTA inform all contactors regarding the safety rules of UTA. UOSH also requires that contract employees are trained in the work practices necessary to safely perform their jobs.

Safety and security must be an integral part of each job. Full participation, cooperation, and support are necessary and required to ensure the safety and health of all persons and property involved in the project. Each Contractor is responsible to provide safe working conditions for their employees and Subcontractors, and to protect the public and all others who may come in contact with, or be exposed to, the project.

Contractors must adopt this plan or exceed it with one of their own creation. In the event that a contractor decides to adopt this safety plan, the adoption of this CSSP as the contractor's safety plan will be formalized in writing and signed by the Contractor. A Health and Safety Plan (HASP) is required if there is a risk of chemical contamination on the site.

Good partnering with other contractors on project sites is required to minimize the potential for exposure from external sources. Contractors are required to:

a. Plan and execute all work in order to prevent personal injury, property damage, and loss work time.

b. Comply with federal, state, and local laws, ordinances, codes, regulations, and industry standards, along with UTA's protocols and procedures.

2.1.1 Program Elements

An effective safety and security program contains the following elements:

a. Management leadership and employee involvement

    1. Top management personal involvement

    2. System to address safety, security, and health concerns

b. Worksite analysis

    1. Hazard analysis (SOP; JSA)

    2. Self inspection

    3. Security issues

c. Hazard prevention

    1. Hazard tracking

    2. Medical services

    3. Disciplinary program for all levels

d. Safety and health training

1. New employee
2. Managers and supervisors
3. Visitors

e. Lessons Learned

1. Collection of lessons learned
2. Analysis of incidents
3. Plan of improvement to prevent the same incident

2.1.2 Contractor's Construction Safety and Security Program

The contractor's safety and security program shall include, but is not limited to, the guidelines outlined in section 4 of this manual. The contractor is responsible to review the specific requirements of the contract, analyze the planned methods of operation, and incorporate any additional specific or unique safety requirements in the writing. The contractor is responsible to ensure that all applicable safety regulations are addressed as part of their safety program.

The contractor's program will acknowledge that the contractor is totally responsible for compliance with UOSH regulations and relevant state/local codes and requirements, which requires a place of employment that is free of unsanitary or hazardous conditions that would expose an employee's to unhealthy or unsafe environment.

The contractor's procedures for completing and forwarding to the resident engineer all on-site accident and incident reports is also to be included in the program.

2.2 Scope

This policy applies to all UTA employees, contractors, sub-contractors, and visitors to UTA construction projects. This also applies to companies providing goods and materials to the project.

It is not possible to include all specific instructions for every job condition, state, or federal regulation or other recognized procedures in this manual. This manual has been developed to provide guidelines for safe work practice. Each contractor is required under the contract, and in effect by law, to adhere to the *CSSP*.

Contractors and their subcontractors on the site bear the primary responsibility for safety and no liability is implied by the development of the *CSSP*.

The existence of this *CSSP* does not relieve the contractor of its safety responsibilities under applicable government requirements nor does it change the terms and conditions of the contract or any of the policies of insurance to be issued. Safety must be a primary consideration in all construction related activities to be undertaken on any project.

UTA reserves the right to add, delete, or modify sections of this *CSSP* from time to time as it deems necessary.

2.3 Program Objectives

The *CSSP* has been established to promote safety and to minimize and control hazards and risks associated with the on-site construction activities of the project. It is intended that the program manual will complement each contractor's safety program and will be coordinated toward a total safety effort. The overall *CSSP* goals are as follows:

a. Eliminate personal injuries and property damage.

b. Achieve greater administrative efficiency.

c. Develop a healthful and safe place to work.

The effectiveness of the *CSSP* depends on the active participation and cooperation of all levels of contractor's management, including supervisors and employees of each sub-contractor, and the coordination of their efforts with the project resident engineer, in carrying out the following basic procedures:

a. Adopt this manual and use it in conjunction with the contractors' own safety program, in preparation of the work or services to be performed on UTA sites.

b. Plan all work to minimize the potential for personal injury, property damage, and loss of productive time.

c. Maintain a system of prompt detection and correction of unsafe practices and conditions.

d. Establish and conduct training programs to stimulate and maintain interest and cooperation of all employees.

e. Prompt notification and investigation of all accidents or claims to determine the causes and to take corrective action.

f. Interface with the project resident engineer's emergency preparedness procedures and train all employees in protocol for communication in the event of an incident/injury.

NOTE: The existence of this *CSSP* does not relieve the contractor of its safety responsibilities under applicable government requirements or regulations, nor does it change the terms and conditions of the contract or any of the policies of insurance to be issued. Safety must be a primary consideration in all construction-related activities to be undertaken on any project.

UTA reserves the right to add, delete, or modify sections of this manual as necessary.

2.4 Right to Search

UTA reserves the right to search vehicles, toolboxes, lunch boxes and any other means of pilfering UTA owned materials from UTA properties.

3.0 Construction Safety and Security Responsibilities

3.1 General Contractor

The general contractor is responsible for accident prevention and jobsite safety on the overall project. This responsibility cannot be delegated to subcontractors, sub-subcontractors, insurance administrators, the resident engineer's representative, or other persons. Without limiting the generality of the foregoing, the contractor shall perform the following:

a. Comply with all government requirements and regulations, including, but not limited, to UOSH.

b. Participate in and support the general *CSSP*, CSSC, and other safety procedures specified in the contract.

c. If required by the appropriate contract, regulation, Construction Safety Administrator, or the UTA project engineer, prepare a formal safety and health program designed to address specific activities associated with the work. Examples of required written safety programs include, but are not limited to the following: confined space entry, hazard communication, lockout/tag out, steel erection, etc.

d. Abide by the general duty clause. (This clause is intended to clarify and reinforce UTA's posture in requiring contractors to provide a safe and healthy working environment for their employees).

e. Upon notification of the contract award, adopt this manual and also present contractor's safety program to the resident engineer. Contractors lacking a formal safety program will not receive schedule extensions or additional monies to develop such a safety program.

f. Appoint a competent contractor's superintendent and contractor's safety supervisor to carry out the duties and responsibilities of the safety program. The name of the contractor's superintendent and contractor's safety supervisor shall be given to the UTA Construction Safety Administrator in writing. Where the nature or the size of the contract warrants, the resident engineer may request the contractor to employ a qualified contractor's safety professional.

g. Maintain and promptly file accurate reports as required by the resident engineer, the insurers, government requirements, including accident and injury reports, and furnish to the resident engineer and UTA Construction Safety Administrator, a monthly summary of injuries (on the attached form, appendix C). The resident engineer reserves the right to audit any contractors or subcontractors OSHA Log 300.

h. Ensure subcontractor and sub-subcontractor compliance with jobsite safety requirements.

i. Ensure that all of its subcontractors and their sub-subcontractors are provided with a copy of this manual and are informed of their obligations with regard to safety.

j. Plan and execute all work to comply with the stated objectives and safety requirements including, but not limited to this manual, provisions of the contract, government requirements, and industry standards, including those listed in appendix A.

k. Hold safety meetings at least weekly. Documentation of topics discussed and attendees shall be maintained and provided to the UTA Construction Safety Administrator upon request.

l. Maintain an orientation and training program for new employees that will include training on the (1) hazards present in the area in which they will be working and (2) personal protective

equipment and apparel the workers will be required to use or wear as specified under applicable government requirements, including UOSH. The contractor shall provide and enforce the use of all personal protective equipment.

m. Provide tools, machinery, and equipment in safe working condition.

n. Promptly investigate and take corrective action when unsafe working conditions or methods are detected (e.g., lack of good housekeeping practice, use of equipment in obviously poor condition, failure to adhere to statutory construction regulations, etc.). First-time deficiencies should be corrected by prompt referral of the incident to the contractor's project safety supervisor or to the contractor's superintendent.

o. Be responsible for the proper execution by contractor's personnel of their obligations in the *CSSP*, including the obligations of the contractor's superintendent or contractor's safety representative.

p. Ensure that each crew has the ability to verbally communicate with any other member of UTA construction, inspection, and/or UTA management team.

q. Provide monthly reports to the UTA Construction Safety Admin. See Appendix B.

r. Maintenance of Traffic Control Employee - The contactor must name an employee and an alternate who will be on twenty-four hour call, with the authority to maintain construction barricades and signal flashers.

3.2 Construction Superintendent

The contractor's superintendent will ensure compliance with all provisions of the contract, including the CSSP and government requirements. Additional duties of the contractor's construction superintendent shall include the following:

a. Review and direct immediate action to correct all substandard safety conditions at the job site.

b. Take an active part in all supervisory safety meetings, including the discussion of observed unsafe work practices or conditions, a review of the accident experience and corrective actions, and encouragement of safety suggestions from employees.

c. Cooperate with the resident engineer representatives, UTA Construction Safety Administrator, the insurance administrators, and the insurers.

d. Require each subcontractor and sub-subcontractor to appoint a job superintendent and job foreman to ensure compliance with this manual.

3.3 Contractor's Safety Supervisor

The Contractor's safety representative or contractor's safety supervisor shall perform the following:

a. Provide timely reports in writing of any unsafe conditions or practices, and take corrective actions. Report all violations to the appropriate superintendent for corrective action.

b. Investigate all accidents and implement immediate corrective action.

c. Report all injuries and accidents in a timely manner in accordance with this manual and government requirements.

d. Conduct daily safety inspections of the job site and the work of the contractor, subcontractor, and sub-subcontractors to eliminate unsafe acts and/or conditions.

e. Review safety meeting reports submitted by job foremen and take necessary action to ensure that meaningful weekly safety meetings are held by the job foremen.

f. Assist in the preparation of all accident investigation and reporting procedures.

g. Implement safety-training programs for supervisors and employees applicable to specific responsibilities, including the steps to take in the event of an accident. Provide job foremen with appropriate training materials to conduct weekly "tool box" safety meetings, and attend those meetings for evaluation and follow through.

h. Be responsible for the control, availability, and use of necessary safety equipment, including personal equipment for the employees.

i. Coordinate safety activities with the UTA Construction Safety Administrator, the insurance administrator, and the insurers, and take necessary steps to promptly implement safety recommendations.

j. Coordinate the public relations aspects of this manual with the UTA Construction Safety Administrator.

k. Attend and participate in special safety meetings held or sponsored by the resident engineer, the insurers, or the insurance administrator.

l. Obtain and keep current knowledge of availability of first aid and emergency treatment for injured employees.

m. Maintain an active incident log containing a comprehensive record of all incidents on the project classifying them as near miss; utility hit; vehicle (on-site); first aid; recordable; lost time/restricted duty; and fatality. Such logs will be submitted to the Construction Safety Administrator quarterly, or in the event a project is finished within a quarter, at the completion of the project.

It should be noted that the *CSSP* reflects minimal standards. All general contractors, contractors, and their sub-tiers will be expected to meet or exceed the standards and good safe practices outlined in this manual and their own safety program, whichever is more stringent.

Additionally, smaller projects and smaller contractors may find it prudent to combine the responsibilities of the Superintendent and Safety Supervisor. This is the contractor’s discretion, however, the standards will be met regardless.

3.4 Foremen

The job foremen are an integral part of an effective safety program, and the amount of effort they put into accident prevention on their daily assignments determines whether or not a good accident record is established.

The job foreman's responsibilities shall include the following:

a. Instruct the personnel under his/her supervision in safe work practices and work methods at the time employees are given work assignments.

b. Provide employees under his/her supervision with use of the proper protective equipment and suitable tools for the Work.

c. Provide continuous monitoring to ensure that prompt action is taken to correct any unsafe practices or conditions on the job site.

d. Correct or report immediately to the job superintendent any unsafe conditions, practices, or violations of this manual or the contractor's safety manual.

e. Perform a complete investigation of all accidents and take corrective action to prevent a recurrence.

f. Set a good safety example for personnel

g. Hold weekly safety meetings with work crews to

- Discuss any observed unsafe work practices or conditions,
- Review the accident experience of the crew and discuss corrective action to prevent future accidents and,
- Encourage safety suggestions from the employees and report their recommendations to the contractor safety engineer or contractor safety supervisor.

h. Ensure that prompt first aid is administered to an injured employee.

3.5 Project Engineer Responsibilities

Insure that the contractor follows all applicable rules regarding safety and health and this manual. The project resident engineer is authorized to stop any construction activity or task which, in his judgment, constitutes an immediate or evolving situation of imminent danger. The resident engineer may perform the following:

a. Review all applicable contract documents for safety related issues.

b. Review contractor's safety programs, descriptions of the hazards peculiar to their work, and their nominees for the contractor's safety professional (or contractor's safety supervisor) position.

c. Observe the contractor's application of its own safety program and the *CSSP*.

d. Any contractor, subcontractor or sub-subcontractor employee who is found to be in violation of safety rules or other resident engineer policies or procedures is subject to a stop work notice until differences are resolved or the contractor disciplines the employee.

PROVIDED, HOWEVER, that the project resident engineer shall have no duty or obligation to conduct continuous or exhaustive inspections or observations to check the safety of the project or the safety precautions and programs for the work since these are solely the responsibility of the contractor under the contract.

3.6 UTA Construction Safety Administrator

The UTA Construction Safety Administrator will observe the contractor's application of the *CSSP*. The UTA Construction Safety Administrator has the right to perform the following:

a. Stop any construction activity that constitutes an immediate threat of imminent danger, until such condition has been corrected.

b. Report any observed unsafe working condition to the contractor and the resident engineer.

c. Promptly notify the contractor and the resident engineer in writing of noncompliance with any of the safety requirements contained in the contract or this manual.

d. Maintain written documentation of communications, as necessary with the contractor concerning accident prevention.

e. Receive and review copies of the contractor's daily reports, equipment maintenance log, accident report forms, and other forms as they apply, upon request.

f. Enforce the recommendations of the resident engineer.

PROVIDED, HOWEVER, that the UTA Construction Safety Administrator shall have no duty or obligation to conduct continuous or exhaustive inspections or observations to check the safety of the project or the safety precautions and programs for the work since these are contractually required of the contractor.

In the event of a conflict and/or ambiguity between various statutes on safety provisions, the most stringent safety regulation or interpretation by the Construction Safety Administrator as to which provision applies or what is implied in a given situation will be final.

3.7 UTA Employees Engaged in Construction Activities

UTA Employees engaged in construction activities will meet the applicable UTA, City, County, State, and Federal requirements. UTA Managers and Supervisors will notify the Construction Safety Administrator of construction activity in their area.

3.8 UTA Construction Safety and Security Committee

UTA has chartered a Construction Safety and Security Committee (CSSC) since 2005. Chaired by the UTA Construction/Design Safety Administrator, this committee meets at least every other month and includes the following members:

- 1st Tier Contractor Project Managers, Safety Managers, Superintendents, and Foremen
- UTA Chief of Safety and Security
- UTA Chief of Development
- UTA Capital Development Senior Program Managers
- UTA Capital Development Project Managers and Engineers
- UTA Civil Eng/Quality/Bridge Manager and designees
- UTA Safety Manager
- UTA Security Manager
- UTA Facility Maintenance Manager
- UTA Strategic Planners with projects nearing transition to CapDev
- UTA Transit Oriented Development Manager
- UTA Claims and Insurance Manager
- All UTA Safety Administrators
- UDOT State Safety Oversight
- Union Pacific Representative

Invitees as determined by the UTA Construction Safety Administrator

The CSSC's primary responsibility is to share best construction safety practices across trades and contractors in order to prevent injuries. Additionally, this committee meeting serves as an update to multiple departments within multiple agencies on construction progress and issues. The CSSC is the approving authority for this program manual.

4.0 Safety Requirements

4.1 General Safety Provisions

The general contractor shall provide for the health and safety of employees, the public, and other persons; prevent damage to property, materials, supplies, and equipment. Without limiting the generality of the foregoing, to achieve these purposes, the contractor shall perform at least the following:

a. Comply with all government requirements, industry standards (see appendix A) including, but not limited to, the application of OSHA Construction Safety and Health Regulations 29 CFR 1926 and 29 CFR 1910. Adhere to their contractor safety program and the *CSSP*. The contractor shall require compliance of the foregoing by all subcontractors and sub-subcontractors at every tier. UTA has adopted in full, 49 CFR 214, Railway Worker Protection Act.

b. The contractor shall not receive additional payment or reimbursement for safety items and procedures which have been identified as required by the contract, or the *CSSP*, or any government requirements.

c. All contractors shall have a written safety and health policy where required by OSHA unless they adopt the safety and health policy of the general contractor in writing.

d. Require the wearing of reflective vests, safety glasses, and hard hats on all UTA construction sites. Work inside a building, without hazards from falling objects may preclude the wearing of a hard hat.

4.2 Employee Communication

Occupational safety and health matters will be promptly communicated with employees. This will be done by:

- SAFETY COMMITTEE: Safety Committees will communicate with employees on inspections and abatement activities, accident investigation findings, and general committee activities.
- BULLETIN BOARDS: A safety bulletin board will be located in each work area. The UOSH Poster and the company's Safety Policy will be permanently posted on all bulletin boards.
- TOOLBOX/TAILGATE TALKS: Supervisors will give Tailgate talks at least once each week to all employees. Provisions must be made to ensure that employees who were not present are given the information presented during the talk. This may be done by presenting the talk at a later time for the missing employees or by posting an outline of the talk on the safety bulletin board. Tailgate talks must be documented on the SAFETY MEETING REPORT.
- EMPLOYEE SAFETY HANDBOOK: An Employee Safety Handbook will be issued to each employee. This handbook covers basic safety rules, guidelines for safe work performance, company policy, etc. (Note: supervisors will be provided a SUPERVISOR'S SAFETY HANDBOOK, which will include the Employee's Safety handbook and appropriate additional information for supervisors).

- SAFETY POSTERS: Safety Posters, either purchased from a vendor or produced by the Safety and Environmental Coordinator, will be posted on the bulletin board and at other appropriate locations.

SAFETY PERFORMANCE ANALYSIS: On a monthly basis, the UTA Safety Department publishes a dashboard. The Construction safety metrics are: lost time accidents in the past 12 months, recordable accidents in the past 12 months, and first aid incidents per month. See Appendix B for report formats.

4.3 Contractor Personnel Requirements

It is UTA's desire to maintain a safe place to work. To do this, the project manager must have the active participation and cooperation of all contractors, subcontractors, sub-subcontractors, and their employees. The contractor and each subcontractor and sub-subcontractor are responsible for orienting employees on the specific safety rules that must be followed by all persons working on the project.

The following items are not intended to be all inclusive. Refer to 29 CFR 1926 and UOSH requirements for clarification of any of the following.

4.3.1 Personal Protective Equipment

- The contractor shall be responsible for providing and requiring the use of required personal protective equipment for its employees.
- Approved hard hats shall be worn at all times on the job site. Individual company name/logo identification shall be shown on each hard hat. (Hats shall meet the requirements outlined by 29 CFR 1910.135). Those performing steel erection, welding, rigging, surveyors, and equipment operators may wear hard hats with beaks facing rear for clear (unrestricted) vision while the harness is properly oriented. All others shall be worn as designed by the manufacturer. Hard hats inspected periodically for damage to the shell and suspension system. Hard hats are **not** required during finish work (i.e. case and base) within facilities where there is no danger of falling items, at the discretion of UTA.
- Eye protection by means of goggles or eyeglasses with side shields shall be worn at all times on the job site.
- Protection against the effects of occupational noise exposure provided when sound levels exceed those of the OSHA noise standard.
- Clothing Requirements:
    - A serviceable, over the ankle, leather shoe or work boot with a heavy sole is to be worn. Protective steel or composite toe boots with a non-slip sole are recommended.
    - Full length trousers.
    - Shirts with a minimum of tee-shirt length sleeve.
    - Gloves shall be worn where protection is needed against: concrete, rough edges, sharp objects, hot or abrasive materials, and caustic or other chemicals.
    - Tank tops, shirts cut off at the midriff, cutoff shorts, sweat pants, moon boots, sandals, sneakers, loafers, jogging shoes, clogs, flip-flops, etc., are prohibited. Visitors are required to maintain the same dress code.

- Long hair shall be contained under a hard hat or net if individual is working near an exposure where hair may become entangled.
- High visibility vests (orange with reflective surfaces are required when working on or near the UPRR right of way) shall be worn at all times while working/visiting the railway, roadway, or public right of way. Safety vests are required on any site where there is heavy equipment present. Class 2 Level 2 vests are required in accordance with the Roadway Worker Protection Program. UTA reserves the right to require safety vests on other job sites.
- Protective goggles or face shields provided and worn where there is any danger of flying particles or corrosive materials.
- Employees who need corrective lenses (glasses or contacts lenses) in working environments with harmful exposures, required to wear only approved safety glasses, protective goggles, or use other medically approved precautionary procedures.
- Protective gloves, aprons, shields, or other means provided against cuts, corrosive liquids and chemicals. Appropriate foot protection required where there is the risk of foot injuries from hot, corrosive, poisonous substances, falling objects, crushing or penetrating actions.
- Approved respirators provided for regular or emergency use where needed.
- Have eye wash facilities and a quick drench shower within the work area where employees are exposed to injurious corrosive materials.
- Special equipment needed for electrical workers is required when working with voltages over 120 AC/DC.
- When lunches are eaten on the premises, they are eaten in areas where there is no exposure to toxic materials or other health hazards.

4.3.1.1 Working in the Heat

- Cooling pads inserted into hardhats or around the neck can help keep the head and neck cooler. Vented hardhats are also available to prevent heat buildup by allowing air to pass through. Neckbands soaked in cold water and worn during the day may also keep workers more comfortable. These measures will reduce the likelihood of heat injuries.
- Protective eyewear offering sufficient ventilation or special lens coatings can help reduce lens fogging in hot conditions. Sweatbands can be worn to absorb perspiration on the forehead before it drips into the eyes.
- Gloves used for hand protection can be cumbersome and also increase workers' heat complaints. Breathable products, employing nylon mesh or containing perforations, are available to reduce heat buildup. Select a glove that has a liner to absorb sweat.
- Maintaining proper hydration is essential. In some settings, workers can produce two or more gallons of sweat in a day. The National Institute for Occupational Safety and Health (NIOSH), recommends drinking five to seven ounces of fluids (excluding coffee, tea, soda, or alcohol) every 15-20 minutes to replenish the body. Workers must simultaneously be aware of hyponatremia caused by the consumption of too much water. The best guideline is to drink when thirsty.

- Physically demanding tasks should be limited to the coolest part of the shift and workers should take frequent breaks in cool areas.

4.3.1.2 Working in the Cold

- Wearing the proper clothes may be the most significant precaution to reducing cold stress/injuries. Wearing appropriate clothes for cold weather involves using layers of clothing. Also use layering to protect the head, hands, and feet.
- Drink plenty of fluids, preferably warm beverages. Thirst is suppressed in a cold environment and dehydration may occur when fluid intake is reduced.
- Increase caloric intake when working in cold environments. Workers in cold environments who wear heavy, protective clothing expend more energy and so require 10-15 percent more calories.
- A work warm-up schedule should be used to provide periodic times for warm-up breaks. Additional breaks should be provided as the wind velocity increases and/or the temperature drops.
- Avoid taking certain drugs such as alcohol, nicotine, caffeine, and medication that inhibits the body's response to cold or impairs judgment.
- Avoid the cold if you are becoming exhausted or immobilized. These conditions can accelerate the effects of cold weather.
- Shield work areas from drafty or windy conditions. Provide a heated shelter for workers with prolonged exposure to equivalent wind-chill temperatures of 20◦ F or less.
- Select the warmest hours of the day when braving the cold. Minimize activities that reduce circulation.
- Educate employees on symptoms of cold-related stresses: heavy shivering, uncomfortable coldness, severe fatigue, drowsiness, and/or euphoria.
- Use the buddy system. Always work in pairs when working in extreme weather conditions so partners can monitor one another and obtain help quickly in an emergency.

4.3.1.3 Sanitizing Equipment & Clothing

- Personal protective clothing or equipment, that employees are required to wear or use, is of a type capable of being easily cleaned and disinfected.
- Employees are prohibited from interchanging personal protective clothing or equipment, unless it has been properly cleaned.
- Machines and equipment, which processes, handle or apply materials that could be injurious to employees, cleaned and/or decontaminated before being overhauled or placed in storage.
- Employees prohibited from smoking or eating in any area where contaminates are present.
- When employees are required to change from street clothing into protective clothing, a clean change room with separate storage facility for street and protective clothing is provided.

- Employees required to shower and wash their hair as soon as possible after a known contact has occurred with a carcinogen.
- When equipment, materials, or other items are taken into or removed from a carcinogen regulated area, is done in a manner that will not contaminate non-regulated areas or the external environment.

4.3.2 General Work Environment and Housekeeping

- Office areas are to be kept neat and orderly.
- Storage areas will be maintained orderly at all times. When supplies are received, the supplies will be stored properly.
- Spills will be cleaned-up immediately and wastes disposed of properly.
- All waste receptacles will be lined with a plastic trash bag to avoid direct contact while handling. Custodial employees will use rubber gloves and compaction bar when handling wastes.
- Keep file and desk drawers closed when not attended to avoid injuries. Open only one drawer at a time to prevent tipping of file cabinets.
- At the end of the business day, turn off all office equipment (area heaters, lamps, coffee-maker, PCs, etc.) and lights to save energy and prevent fires. All space heaters must be un-plugged at the end of the day to assure they have been turned-off.
- Work areas will be kept neat and orderly, during operations and as follows:
- All aisles, emergency exits, fire extinguishers, eye wash stations, etc., will be kept clear (a minimum of three feet in front of and to either side) of product storage, material storage, fork trucks and pallet jacks at all times.
- Utility employees will be responsible to keep aisles and work floors clear of excessive debris and waste materials during shift operation, between breaks and at shift change when necessary or directed by supervision; however, all Employees are responsible to communicate slippery floors to supervision for immediate clean-up.
- All refuse and waste materials will be placed in the recognized waste containers for disposal.
- Restrooms and break areas are provided as a convenience for all Employees. The following rules will apply:
- Employees are expected to clean-up after themselves as a common courtesy to fellow Employees.
- Flammable materials (fireworks, explosives, etc.) may not be stored in break areas or brought on UTA property.

4.3.2.1 Maintenance Areas

- Housekeeping, including the removal of trash and debris from site, shall be provided by the contractor. This pertains to all areas occupied by or worked in, including parking lots.
- The contractor shall provide sanitation facilities (porta-potties) and, when number of workers regularly exceeds 20 personnel per day, hand wash stations.

- No employee shall possess, use, or be under the influence of illegal drugs, alcohol, or any mind-altering substance while on the project.
- Gambling, fighting, or horseplay shall not be tolerated.
- Use of water trucks, sweeping, and other additional means will treat areas in need of dust control.
- All persons shall follow these safe practices rules, render every possible aid to safe operations, and report all unsafe conditions or practices to managers or supervisors.
- All aisles, emergency exits, fire extinguishers, etc., will be kept clear (a minimum of three feet of either side) of material storage (temporary and permanent) at all times.
- Storage Areas will be maintained orderly at all times:
- Pipe stock stored horizontally on racks and sorted by size
- Metal stock stored horizontally on racks and sorted by size
- Sheet metal stock stored vertically in racks and sorted by type
- All fittings, etc., stored in bins on shelves and sorted by type and use
- All flammables stored in OSHA-approved Fire Cabinets and self-closing cans where necessary
- Spills will be cleaned-up immediately by the person responsible and wastes disposed properly.
- All refuse and waste materials will be placed in the recognized waste containers for disposal.
- The grounds surrounding the facility and worksites are an extension of the work place.
- Keep all doors and loading docks completely free of debris or other obstructions.
- Maintain visibility through all windows by washing at regular intervals.
- Keep doors and windows properly maintained in good working order.
- Repair any damage to doors and windows at regular intervals.
- All trash will be discarded only in the waste containers provided.
- Park only in the designated assigned area.
- Provide any stairs or platforms adjacent to or leading into the building(s) with adequate rails, adequate treads to climb, and an area clean and free of materials.
- Keep grounds neat and orderly, free of refuse and unnecessary materials.
- Store materials outdoors only in designated areas of the grounds.
- Provide designated walkways through grounds, preferably paved and kept clear of snow, ice, materials, or any other physical hazards.
- Provide a lighting system that is adequate to allow employees to navigate around the grounds as necessary at dusk and after dark or restrict access to daylight hours only. All work areas adequately illuminated.

- Work surfaces kept dry or appropriate means taken to assure the surfaces are slip-resistant.
- Combustible scrap, debris and waste stored safely and removed from the worksite promptly.
- Accumulated combustible dust routinely removed from elevated surfaces, including the overhead structure of buildings.
- Combustible dust cleaned up with a vacuum system to prevent the dust going into suspension.
- Metallic or conductive dust prevented from entering or accumulation on or around electrical enclosures or equipment.
- Covered metal waste cans used for oily and paint-soaked waste.
- All oil and gas fired devices equipped with flame failure controls that will prevent flow of fuel if pilots or main burners are not working.
- Paint spray booths, dip tanks and the like cleaned regularly.
- All toilets and washing facilities clean and sanitary.
- Pits and floor openings covered or otherwise guarded.
- Managers and supervisors shall insist on employee's observing and obeying every rule, regulation, and order as is necessary to the safe conduct of the work, and shall take such action as is necessary to obtain observance.
- Running, jumping, horseplay, scuffling, and other acts which tend to have an adverse influence on the safety or well-being of the employees shall be prohibited.
- Work shall be well planned and supervised to prevent injuries in the handling of materials and in working together with equipment.
- Employees shall be instructed to ensure that all guards and other protective devices are in proper places and adjusted, and shall report deficiencies promptly to the manager or supervisor.
- Observe and obey all safety signs and procedures in any area you are assigned to work in.
- Report all damaged or faulty equipment to your supervisor unless you are authorized to make repairs.
- No unauthorized person shall make electrical or mechanical repairs or adjustments on equipment.
- Maintain adequate access to electrical panels.
- Approach doors slowly and open them with caution; someone may be on the other side.
- Fire doors must not be blocked open or locked in such a way that they cannot be opened in the exit direction.
- When using stairs, do not carry loads so large that the view of stair treads is obscured. Keep one hand free for the hand rail.

- Keep stairs clear of all objects. Pick up anything you find on the stairs and store or dispose of it properly.
- Know where the fire extinguisher in your area is, how to use it, and for what types of fires it is rated. Do not block or cover fire extinguishers, fire alarms, or sprinkler heads.
- Burning of decorative candles is not permitted without specific permission from the fire marshal.
- Do not run cords, computer cables, or telephone wires across walkways creating a tripping hazard.
- Do not use extension cords as a substitute for permanent electrical wiring. The only exception to this are “fused” multi-outlet strips which are “UL listed.” If extension cords are necessary for short-term use, use only heavy-duty cords.
- Report unsafe conditions or behavior to your supervisor or to the RSO.
- All personnel will be required to attend a Safety Meeting as required by Project Requirements.
- Drinking water containers are for drinking water and ice only. The "common drinking cup" is not allowed. Only disposable cups will be used.
- Do not remove, displace, damage, destroy or carry off any safety device, safeguard, notice, or warning.
- Never use a box, bucket, chair, shelf, etc., as a ladder. Use only approved step-stools or ladders.

4.3.2.2 Walkways

- Aisles and walkways marked as appropriate.
- Wet surfaces covered with non-slip materials.
- Holes in the floor, sidewalk or other walking surface repaired properly, covered or otherwise made safe.
- There is safe clearance for walking in aisles where motorized or mechanical handling equipment is operating.
- Spilled materials cleaned up immediately.
- Materials or equipment stored in such a way that sharp projectiles will not interfere with the walkway.
- Changes of direction or elevations readily identifiable.
- Aisles or walkways that pass near moving or operating machinery, welding operations or similar operations arranged so employees will not be subjected to potential hazards.
- Adequate headroom provided for the entire length of any aisle or walkway. If low headroom is a byproduct of the construction process, place appropriate signage.
- Bridges provided over conveyors and similar hazards.

4.3.2.3 Floor & Wall Openings

- Floor openings guarded by a cover, guardrail, or equivalent on all sides (except at entrance to stairways or ladders).
- Toe boards installed around the edges of a permanent floor opening where persons may pass below the opening.
- Skylight screens of such construction and mounting that they will withstand a load of at least 200 pounds.
- The glass in windows, doors, glass walls that are subject to human impact, of sufficient thickness and type for the condition of use.
- Grates or similar type covers over floor openings such as floor drains, of such design that foot traffic or rolling equipment will not be affected by the grate spacing.
- Unused portions of service pits and pits not actually in use either covered or protected by guardrails or equivalent.
- Manhole covers, trench covers and similar covers, plus their supports, designed to carry a truck rear axle load of at least 20,000 pounds when located in roadways and subject to vehicle traffic.
- Floor or wall openings in fire resistive construction provided with doors or covers compatible with the fire rating of the structure and provided with self-closing feature when appropriate.

4.3.2.4 Stairs & Stairways

- Standard stair rails or handrails on all stairways having four or more risers. The most common violation of this rule is the construction of stairs for access to construction trailers.
- All stairways at least 22 inches wide.
- Stairs have at least a 6'6" overhead clearance.
- Stairs angle no more than 50 and no less than 30 degrees.
- Stairs of hollow-pan type treads and landings filled level with solid material.
- Step risers on stairs uniform from top to bottom, with no riser spacing greater than 7-1/2 inches.
- Steps on stairs and stairways designed or provided with a surface that renders them slip resistant.
- Stairway handrails located between 30 and 34 inches above the leading edge of stair treads.
- Stairway handrails have a least 1-1/2 inches of clearance between the handrails and the wall or surface they are mounted on.
- Stairway handrails capable of withstanding a load of 200 pounds, applied in any direction.

- Where stairs or stairways exit directly into any area where vehicles may be operated, adequate barriers and warnings provided to prevent employees stepping into the path of traffic.
- Stairway landings have a dimension measured in the direction of travel, at least equal to width of the stairway.
- The vertical distance between stairway landings limited to 12 feet or less.

4.3.2.5 Elevated Surfaces

- Signs posted, when appropriate, showing the elevated surface load capacity.
- Surfaces elevated more than 30 inches above the floor or ground provided with standard guardrails.
- All elevated surfaces (beneath which people or machinery could be exposed to falling objects) provided with standard 4-inch toe boards.
- A permanent means of access and egress provided to elevated storage and work surfaces.
- Required headroom provided where necessary.
- Material on elevated surfaces piled, stacked or racked in a manner to prevent it from tipping, falling, collapsing, rolling or spreading.
- Dock boards or bridge plates used when transferring materials between docks and trucks or rail cars.

4.3.3.6 Exiting or Egress

- All exits marked with an exit sign and illuminated by a reliable light source.
- The directions to exits, when not immediately apparent, marked with visible signs.
- Doors, passageways or stairways, that are neither exits nor access to exits and which could be mistaken for exits, appropriately marked "NOT AN EXIT", "TO BASEMENT", "STOREROOM", and the like.
- Exit signs provided with the word "EXIT" in lettering at least 5 inches high and the stroke of the lettering at least 1/2 inch wide.
- Exit doors side-hinged.
- All exits kept free of obstructions.
- At least two means of egress provided from elevated platforms, pits or rooms where the absence of a second exit would increase the risk of injury from hot, poisonous, corrosive, suffocating, flammable, or explosive substances.
- Provide sufficient exits to permit prompt escape in case of emergency.
- Special precautions taken to protect employees during construction and repair operations.
- The number of exits from each floor of a building, and the number of exits from the building itself, appropriate for the building occupancy load.

- Ramps are used as part of required exiting from a building, with the ramp slope limited to 1- foot vertical and 12 feet horizontal.
- Exiting will be through frameless glass doors, glass exit doors, storm doors, and such are the doors fully tempered and meet the safety requirements for human impact.

4.3.3.7 Exit Doors

- Doors that are required to serve as exits designed and constructed so that the way of exit travel is obvious and direct.
- Windows that could be mistaken for exit doors, made inaccessible by means of barriers or railings.
- Exit doors openable from the direction of exit travel without the use of a key or any special knowledge or effort, when the building is occupied.
- A revolving, sliding or overhead door prohibited from serving as a required exit door.
- Where panic hardware is installed on a required exit door, it will allow the door to open by applying a force of 15 pounds or less in the direction of the exit traffic.
- Doors on cold storage rooms provided with an inside release mechanism that will release the latch and open the door even if it's padlocked or otherwise locked on the outside.
- Exit doors open directly onto any street, alley or other area where vehicles may be operated, are adequate barriers and warnings provided to prevent employees stepping into the path of traffic.
- Doors that swing in both directions and are located between rooms where there is frequent traffic, provided with viewing panels in each door.

4.3.4 Confined Spaces

In accordance with the most recent change to 29 CFR 1926, the general contractor is responsible communicating confined space hazards to all employees and subcontractors on the site. Any vessel, manhole or pit including trenches, or any structure not meant for human occupancy is considered a confined space. Confined spaces that require permits must meet the following criteria:

1. Not designed for human occupation
2. Limited access and egress
3. Large enough to access
4. Contain a hazard such as engulfment, poor atmosphere, etc.

A completed Confined Space Permit by competent person is required prior to entry into permit required confined spaces. Contact your Supervisor prior to starting any Confined Space work for copies of permit required and a list of required Safety Equipment. The following guidelines are generally applicable to all confined spaces:

- Confined spaces thoroughly emptied of any corrosive or hazardous substances, such as acids or caustics, before entry.

- Before entry, all lines to a confined space, containing inert, toxic, flammable, or corrosive materials are valved off and blanked or disconnected and separated.
- It is required that all impellers, agitators, or other moving equipment inside confined spaces be locked-out if they present a hazard.
- Either natural or mechanical ventilation is provided prior to confined space entry.
- Before entry, appropriate atmospheric tests are performed to check for oxygen deficiency, toxic substance and explosive concentrations in the confined space before entry.
- Adequate illumination is provided for the work to be performed in the confined space.
- The atmosphere inside the confined space is frequently tested or continuously monitored during conduct of work.
- There is an assigned safety standby employee outside of the confined space, whose sole responsibility is to watch the work in progress, sound an alarm if necessary, and render assistance.
- The standby employee or other employees are prohibited from entering the confined space without lifelines and respiratory equipment if there is any questions as to the cause of an emergency.
- In addition to the standby employee, there is at least one other trained rescuer in the vicinity.
- All rescuers appropriately trained and using approved, recently inspected equipment. While calling 911 is prudent, this may not constitute the entire rescue plan.
- All rescue equipment allows for lifting employees vertically from a top opening.
- Personnel trained in First Aid and CPR immediately available.
- Approved respiratory equipment is required if the atmosphere inside the confined space cannot be made acceptable. There is an effective communication system in place whenever respiratory equipment is used and the employee in the confined space is out of sight of the standby person.
- All portable electrical equipment is used inside confined spaces either grounded and insulated, or equipped with ground fault protection.
- Before gas welding or burning is started in a confined space, hoses are checked for leaks, compressed gas bottles forbidden inside of the confined space, torches lighted only outside of the confined area and the confined area tested for an explosive atmosphere each time before a lighted torch is to be taken into the confined space.
- If employees will be using oxygen-consuming equipment such as torches, furnaces, in a confined space, sufficient air is provided to assure combustion without reducing the oxygen concentration of the atmosphere below 19.5 percent by volume.
- Whenever combustion-type equipment is used in confined space, provisions are made to ensure the exhaust gases are vented outside of the enclosure.
- Each confined space is checked for decaying vegetation or animal matter, which may produce methane.

- The confined space is checked for possible industrial waste, which could contain toxic properties.
- If the confined space is below the ground and near areas where motor vehicles will be operating, it is possible for vehicle exhaust or carbon monoxide to enter the space.

4.3.5 Excavations

- The "2 for 25" rule:
    - All spoils, materials and equipment shall be a minimum of **2'** from the edge or excavation.
    - Trenches **4'** or deeper require shoring, except in solid rock.
    - A ladder, stairway, or ramp must be no further than **25'** from an employee in the trench.
- All floor openings or excavations shall be barricaded on all sides to ensure employees are aware of the hazard.
- Excavations can accumulate noxious gasses and fumes. Trenches and manholes with live sewage must be well ventilated and tested before entry, in accordance with confined space rules.

4.3.6 Tools

- Lasers—Only continuous wave (CW) lasers with output power levels of $10mW/cm^2$ (10 milliwatts per square centimeter) or less and installed and operated in accordance with the manufacturer's instructions shall be used on construction sites. The use of lasers exceeding $5mW/cm^2$ requires the use of anti-laser eye protection devices.
- All tools whether company or personal, must be in good working condition. Defective tools will not be used. Examples: chisels with mushroomed heads, hammers with loose or split handles, any tool missing a guard, etc.
- All extension cords, drop cords and electrical tools shaIl be checked (to include presence of GFI's) and color coded by a designated competent person each month. This shall be part of the assured grounding program. Electrical cords and equipment must be properly grounded with GFI's in place and checked by a competent person. Cords and equipment which do not meet requirements shall be immediately tagged and removed from service until repairs have been made.
- Hand tools shall be used only for the purpose for which they were designed and shall be kept in good repair.
- Pneumatic power tools shall be secured to the hose by some positive means to prevent the tool from becoming accidentally disconnected.
- Any tool found not in proper working order, or that develops a defect during use, shall be removed from service until properly repaired.
- All tools and equipment (both, company and employee-owned) used by employees at their workplace in good condition.
- Worn or bent wrenches replaced regularly.

- Appropriate handles used on files and similar tools.
- Appropriate safety glasses, face shields, and similar equipment used while using hand tools or equipment that might produce flying materials or be subject to breakage.
- Check jacks periodically to assure they are in good operating condition.
- Tool handles wedged tightly in the head of all tools.
- Tool cutting edges kept sharp so the tool will move smoothly without binding or skipping.
- Tools stored in dry, secure location where they won't be tampered with.
- Eye and face protection used when driving hardened or tempered spuds or nails.

4.3.6.1 Portable (Power Operated) Tools & Equipment

- No power tool shall be operated without a properly adjusted guard in place.
- Grinders, saws, and similar equipment provided with appropriate safety guards.
- Power tools used with the correct shield, guard or attachment recommended by the manufacturer.
- Portable circular saws equipped with guards above and below the base shoe.
- Circular saw guards checked to assure they are not wedged up, thus leaving the lower portion of the blade unguarded.
- Rotating or moving parts of equipment guarded to prevent physical contact.
- All cord-connected, electrically operated tools and equipment effectively grounded or of the approved double insulated type.
- Effective guards in place over belts, pulleys, chains, and sprockets, on equipment such as concrete mixers, air compressors, and the like.
- Portable fans provided with full guards or screens having openings 1/2 inch or less.
- Hoisting equipment available and used for lifting heavy objects, and are hoist ratings and characteristics appropriate for the task.
- Ground-fault circuit interrupters provided on all temporary electrical 15 and 20 ampere circuits, used during periods of construction.
- Pneumatic and hydraulic hoses on power-operated tools checked regularly for deterioration or damage.

4.3.6.2 Abrasive Wheel Equipment Grinders

- The work rest used and kept adjusted to within 1/8 inch of the wheel.
- The adjustable tongue on the top side of the grinder used and kept adjusted to within 1/4 inch of the wheel.
- Side guards cover the spindle, nut, and flange and 75 percent of the wheel diameter.
- Bench and pedestal grinders permanently mounted.

- Goggles or face shields always worn when grinding. **Gloves may not be worn when using a bench grinder or wire wheel.**
- The maximum RPM rating of each abrasive wheel compatible with the RPM rating of the grinder motor.
- Fixed or permanently mounted grinders connected to their electrical supply system with metallic conduit or other permanent wiring method.
- Each grinder have an individual on and off control switch.
- Each electrically operated grinder effectively grounded.
- Before new abrasive wheels are mounted, they are visually inspected and ring tested.
- Dust collectors and powered exhausts provided on grinders used in operations that produce large amounts of dust.
- Splashguards mounted on grinders that use coolant, to prevent the coolant reaching employees.
- Cleanliness maintained around grinder.

4.3.6.3 Powder Actuated Tools

- Only trained, certified employees will be allowed to operate powder-actuated tools.
- Employees who operate powder-actuated tools trained in their use and carry a valid operator's card, issued by the employer.
- Each powder-actuated tool stored in its own locked container when not being used.
- A sign at least 7" by 10" with bold type reading "POWDER-ACTUATED TOOL IN USE" conspicuously posted when the tool is being used.
- Powder-actuated tools left unloaded until they are actually ready to be used.
- Powder-actuated tools inspected for obstructions or defects each day before use.
- Powder-actuated tools operators have and use appropriate personal protective equipment such as hard hats, safety goggles, safety shoes and hearing protection.

4.3.6.4 Machine Guarding

- Employers will provide
    - a training program to instruct employees on safe methods of machine operation.
    - adequate supervision to ensure that employees are following safe machine operating procedures.
    - a regular program of safety inspection of machinery and equipment.
- All machinery and equipment kept clean and properly maintained.
- Sufficient clearance provided around and between machines to allow for safe operations, set up and servicing, material handling and waste removal.
- Equipment and machinery securely placed and anchored, when necessary to prevent tipping or other movement that could result in personal injury.

- There is a power shut-off switch within reach of the operator's position at each machine.
- Electric power to each machine be locked out for maintenance, repair, or security.
- The noncurrent-carrying metal parts of electrically operated machines bonded and grounded.
- Foot-operated switches guarded or arranged to prevent accidental actuation by personnel or falling objects.
- Manually operated valves and switches controlling the operation of equipment and machines clearly identified and readily accessible.
- All emergency stop buttons colored red.
- All pulleys and belts that are within 7 feet of the floor or working level properly guarded.
- All moving chains and gears properly guarded.
- Splashguards mounted on machines that use coolant, to prevent the coolant from reaching employees.
- Methods provided to protect the operator and other employees in the machine area from hazards created at the point of operation, ingoing nip points, rotating parts, flying chips, and sparks.
- Machinery guards secure and so arranged that they do not offer a hazard in their use.
- Special hand tools are used for placing and removing material protect the operator's hands.
- Revolving drums, barrels, and containers required to be guarded by an enclosure that is interlocked with the drive mechanism, so that revolution cannot occur unless the guard enclosure is in place, so guarded.
- Arbors and mandrels have firm and secure bearings and are free from play.
- Provisions made to prevent machines from automatically starting when power is restored after a power failure or shutdown.
- Machines constructed so as to be free from excessive vibration when the largest size tool is mounted and run at full speed.
- Machinery is cleaned with compressed air, is air pressure controlled and personal protective equipment or other safeguards used to protect operators and other workers from eye and body injury.
- Fan blades protected with a guard having openings no larger than 1/2 inch, when operating within 7 feet of the floor.
- Saws used for ripping, equipped with anti-kick devices and spreaders.
- Radial arm saws so arranged that the cutting head will gently return to the back of the table when released.

4.3.7 Fall Protection

- When a walking surface is six feet or higher, the contractor will select from the following methods of fall protection based on the type of fall hazard in accordance with the applicable OSHA standard:
    1. Guardrail systems that meet 1926.502(b) or
    2. A safety net system that meets 1926.502(c) or
    3. A personal fall arrest system that meets 1926.502(d) or
    4. A positioning device that meets 1926.502(e) or
    5. A cover for holes or skylights through which a worker may fall that meets 1926.502(i) or
    6. A warning line system and safety monitor that meets 1926.502(f) and (h) or
    7. A Controlled Access Zone and safety monitor that meets 1926.502(g) and (h).
- Variation from the above OSHA regulatory guidance for fall protection requires a documented hazard evaluation and a fall protection plan that meets 1926.502(k) signed by a foreman or superintendent.
- When using a personal fall arrest system, one-hundred percent tie-off is required when working six feet or more above any adjacent working surface.
    1. Workers using an articulating boom lift or man lift must put on a fall protection harness and attach the lanyard to the lift as soon as they enter the lift and before the lift is started. Employees are not required to wear a harnesses on scissor lifts.
    2. Workers using their lanyards to access the work or position themselves on a wall or column, etc., must use an additional safety lanyard for fall protection.
    3. Lifelines shall be erected to provide fall protection where work is required in areas where permanent protection is not in place. Horizontal lifelines shall be a minimum of 1/2" diameter wire rope. Vertical lifelines shall be 3/4" manila rope or equivalent and shall be used in conjunction with an approved rope grab.
    4. Structural steel erectors are required to "Hook Up" with full body harness and lanyard.
- Employees working over or near water, where danger of drowning exists, shall be provided with U.S. Coast Guard approved life jacket or buoyant work vests.
- Contractors are responsible to assess the job site to determine if a walking working surface has the structural integrity to safely support workers.

4.3.8 Electrical

- Workplace electricians must be familiar with the OSHA Electrical Safety Regulations and the local code requirements.
- Specify compliance with OSHA for all contract electrical work.
- All employees required to report as soon as practicable any obvious hazard to life or property observed in connection with electrical equipment or lines.

- Employees instructed to make preliminary inspections and/or appropriate tests to determine what conditions exist before starting work on electrical equipment or lines.
- When electrical equipment or lines are to be serviced, maintained or adjusted, necessary switches are opened, locked-out and tagged whenever possible.
- Portable electrical tools and equipment grounded or of the double insulated type.
- Electrical appliances such as vacuum cleaners, polishers, vending machines grounded.
- Extension cords being used have a grounding conductor.
- Multiple plug adapters prohibited.
- Ground-fault circuit interrupters installed on each temporary 15 or 20 ampere, 120 volt AC circuit at locations where construction, demolition, modifications, alterations or excavations are being performed.
- All temporary circuits protected by suitable disconnecting switches or plug connectors at the junction with permanent wiring.
- Exposed wiring and cords with frayed or deteriorated insulation shall be repaired or replaced promptly.
- Flexible cords and cables free of splices or taps.
- All cord, cable and raceway connections intact and secure. All electrical raceways and enclosures securely fastened in place.
- In wet or damp locations, electrical tools and equipment are appropriate for the use or location or otherwise protected.
- The location of electrical power lines and cables (overhead, underground, underfloor, other side of walls) is determined before digging, drilling or similar work is begun.
- Metal measuring tapes, ropes, handlines or similar devices with metallic thread woven into the fabric prohibited where they could come in contact with energized parts of equipment or circuit conductors.
- The use of metal ladders is prohibited in area where the ladder or the person using the ladder could come in contact with energized parts of equipment, fixtures or circuit conductors.
- All disconnecting switches and circuit breakers labeled to indicate their use or equipment served.
- Disconnecting means always opened before fuses are replaced.
- All interior wiring systems include provisions for grounding metal parts of electrical raceways, equipment and enclosures.
- All energized parts of electrical circuits and equipment guarded against accidental contact by approved cabinets or enclosures.
- Sufficient access and working space is provided and maintained about all electrical equipment to permit ready and safe operations and maintenance.

- All unused openings (including conduit knockouts) in electrical enclosures and fittings closed with appropriate covers, plugs or plates.
- Electrical enclosures such as switches, receptacles, junction boxes, etc., provided with tight-fitting covers or plates.
- Low voltage protection is provided in the control device of motors driving machines or equipment, which could cause probably injury from inadvertent starting.
- Each motor disconnecting switch or circuit breaker is located within sight of the motor control device.
- Each motor not located within sight of its controller or the controller disconnecting means is capable of being locked in the open position or is a separate disconnecting means installed in the circuit within sight of the motor.
- The controller for each motor is in excess of two horsepower, rated in horsepower equal to or in excess of the rating of the motor is serves.
- Employees who regularly work on or around energized electrical equipment or lines shall be instructed in the cardiopulmonary resuscitation (CPR) methods.
- Employees are prohibited from working alone on energized lines or equipment over 600 volts.

4.3.8.1 Lockout Tag Out: Control of Hazardous Energy

All equipment shall be locked out or tagged out to protect against accidental or inadvertent operations when such operations could cause injury to personnel. Contractors must provide a Lockout Tag Out procedure that meets the following:

- Lockout Tag out will be used to ensure that the machine or equipment is stopped, isolated from all potentially hazardous energy sources, and locked out before employees perform any servicing or maintenance where the unexpected energization or start-up of the machine or equipment or release of stored energy could cause injury such as minor to serious shock, burns (chemical or thermal), cuts, or abrasions.
- All employees are required to comply with the restrictions and limitations imposed upon them during the use of lockout.
- The locking-out of control circuits in lieu of locking-out main power disconnects prohibited.
- Appropriate employees provided with individually keyed personal safety locks.
- Employees required to keep personal control of their key(s) while they have safety locks in use.
- It is required that employees check the safety of the lock out by attempting a start up after making sure no one is exposed.
- The power disconnecting means for equipment does not also disconnect the electrical control circuit.
- Servicing is to be done only by trained, authorized employees.

- Each new or transferred affected employee and other employees whose work operations are or may be in the area shall be instructed in the purpose and use of the lockout tag out procedures.
- All employees, upon observing a machine or piece of equipment which is locked out to perform servicing or maintenance, shall not attempt to start, energize, or use the machine or equipment.
- In the event a piece of equipment is to be isolated for a period of time exceeding one normal shift and the isolating means is not capable of being locked out, a reasonable effort will be made to affix a device to the isolating means to make capable of being locked out.
- All authorized employee engaging in lockout tag out activities will follow the written procedure and the guidelines set forth in the contractor's Lockout Tag Out Program.

4.3.9 Hot Work

Further guidance for UTA employees is provided in UTA OSH 4.33 Hot Work (Welding and Cutting) Plan

- Adequate precautions must be taken to protect employees and equipment from hot work such as welding or burning. Fire extinguishing equipment shall be no further away than 50 ft. from all hot work. Used extinguishers to be re-charged immediately.
- Ensure that no welding or cutting operations which may generate an open flame or hot surface around combustibles /flammable liquids are performed until contractor's superintendent or resident engineer has been notified and written authorization is obtained to conduct such operations.
- Have anti-flashback devices installed on the fuel side of all fuel gas and oxygen cutting torches.
- Use of welding blinds are required in high traffic areas.
- Secure compressed gas cylinders in upright position at all times. Valve caps shall be in place when not in use. Cylinders shall be transported and stored in accordance with applicable government requirements.
- Provide safety devices on all air compressors with hoses exceeding one and one-half-inch inside diameter at the source of supply or branch line to reduce pressure in case of hose failure.
- Burning and cutting equipment shall be checked daily before being used. Flash back arresters shall be installed at the regulators on both oxygen and L.P. bottles. All gas shall be shut off and hoses disconnected from bottles and manifolds at the end of the day. Caps shall be replaced on bottles when gauges are removed. When gauges are removed and caps replaced, the oxygen and L.P. bottles shall be separated into storage areas not less than 20' apart with a "No Fire or Smoking" sign posted and a fire extinguisher readily available. Makeshift field repairs will not be allowed.

4.3.9.1 Welding, Cutting & Brazing

Contractors may require welders to be certified through a nationally recognized program such as the American Welding Society.

- Only authorized and trained personnel permitted to use welding, cutting or brazing equipment.
- All operator have a copy of the appropriate operating instructions and are they directed to follow them.
- Compressed gas cylinders regularly examined for obvious signs of defects, deep rusting, or leakage.
- Carefully handle cylinders, safety valves, relief valves, and the like, to prevent damage.
- Precautions taken to prevent the mixture of air or oxygen with flammable gases, except at a burner or in a standard torch.
- Only approved apparatus (torches, regulators, pressure-reducing valves, acetylene generators, manifolds) used.
- Cylinders kept away from sources of heat.
- It is prohibited to use cylinders as rollers or supports.
- Empty cylinders appropriately marked their valves closed and valve-protection caps on.
- Signs reading: DANGER NO-SMOKING, MATCHES, OR OPEN LIGHTS, or the equivalent posted.
- Cylinders, cylinder valves, couplings, regulators, hoses, and apparatus keep free of oily or greasy substances.
- Do not drop or strike cylinders.
- Unless secured on special trucks, regulators are removed and valve-protection caps put in place before moving cylinders.
- Cylinders without fixed hand wheels have keys, handles, or non-adjustable wrenches on stem valves when in service.
- Liquefied gases stored and shipped valve-end up with valve covers in place.
- Employees instructed to never crack a fuel-gas cylinder valve near sources of ignition.
- Before a regulator is removed, the valve is closed and gas released form the regulator.
- Hoses will be color coded: red used to identify the acetylene (and other fuel-gas) hose, green for oxygen hose, and black for inert gas and air hose.
- Pressure-reducing regulators used only for the gas and pressures for which they are intended.
- Open circuit (No Load) voltage of arc welding and cutting machines as low as possible and not in excess of the recommended limits.

- Under wet conditions, automatic controls for reducing no-load voltage are used.
- Grounding of the machine frame and safety ground connections of portable machines checked periodically.
- It is required that electric power to the welder be shut off when no one is in attendance.
- Suitable fire extinguishing equipment available for immediate use.
- The welder is forbidden to coil or loop welding electrode cable around his body.
- Wet machines thoroughly dried and tested before being used.
- Work and electrode lead cables frequently inspected for wear and damage, and replaced when needed.
- Means for connecting cables' lengths have adequate insulation.
- Use shields to confine heat, sparks, and slag if he object to be welded cannot be moved and fire hazards cannot be removed.
- Firewatchers assigned when welding or cutting is performed, in locations where a serious fire might develop.
- Combustible floors kept wet, covered by damp sand, or protected by fire-resistant shields.
- When floors are wet, personnel are protected from possible electrical shock.
- When welding is done on metal walls, precautions are taken to protect combustibles on the other side.
- Before hot work is begun, are used drums, barrels, tanks, and other containers so thoroughly cleaned that no substances remain that could explode, ignite, or produce toxic vapors.
- It is required that eye protection helmets, hand shields and goggles meet appropriate standards.
- Employees exposed to the hazards created by welding, cutting, or bracing operations protected with personal protective equipment and clothing.
- A check made for adequate ventilation where welding or cutting is performed.

4.3.9.2 Arc Welders

- Keep your head out of the fumes or use the appropriate respirator.
- Use enough ventilation or exhaust to remove fumes and gases from the work area. Mechanical equipment should exhaust at least 2000 cfm of air for each welder, except where individual exhaust hoods, booths, or air-line respirators are used.
- Natural ventilation may be used under certain conditions. For welding or cutting mild steel, natural ventilation is usually sufficient if a room has at least 10,000 cubic feet per welder, with a ceiling height of at least 16 feet. Cross-ventilation should not be blocked, and welding should not be done in a confined space.
- Don't get too close to the arc ("Avoid the plume"). Use corrective lenses to help you maintain the proper distance if necessary.

- Electrodes removed from the holders when not in use. Electrodes are considered a hazardous item by UOSH and require an SDS be maintained onsite.
- Read and understand the Safety Data Sheets (SDS) for the product.
- Use a smoke extractor-type welding gun for semiautomatic welding processes.
- Protect your body from welding spatter and arc flash with clothing made from durable, flame-resistant material, such as woolen fabrics, and gear that includes flame-proof apron and gloves, leather leggings, and high boots.
- Avoid clothing made of synthetic materials, which can melt when exposed to extreme heat or sparks, or cotton unless it is specially treated for fire protection.
- Keep your clothes free of grease and oil, which may ignite.
- Protect others from spatter, flash, and glare with non-flammable protective screens or curtains.
- Be sure to wear safety glasses with side shields when in a welding area. Safety glasses shall be worn underneath the
- Be sure you are insulated from the work piece and ground, as well as other live electrical parts.
- Don't lean on the work piece.
- Use plywood, rubber mats or other dry insulation to stand on, and wear dry, hole-free gloves.
- Stay dry, and do not weld when you are wet. Never dip the electrode in water to cool it.
- Check equipment to be sure it is properly grounded, in good repair, and installed according to prevailing codes.
- Be sure equipment is turned off when not in use.
- Electric current flowing through a conductor causes Electric and Magnetic Fields (EMF), which can interfere with pacemakers and may effect health in other ways. Consult your physician before arc welding if you have a pacemaker. To avoid excessive exposure to EMF, keep the electrode and work cables together, never place your body between the two cables or coil the electrode lead around your body, and do not work directly next to the welding power source.
- Do not remove labels from chemical containers unless the containers are empty and have been thoroughly cleaned. Clean, empty containers may be used for other materials if proper new labels are affixed.

4.3.10 Scaffolding

- Green tags are to be placed on 100% complete scaffolds with all braces, locks and hand, mid & toe rails in place before use.
- Yellow tags are for incomplete scaffolds. If scaffold is missing a hand, mid or toe board, it must have a yellow tag and employees on it must be tied off at all times.
- Red tags are for scaffolds that are in the process of either being erected or disassembled. These scaffolds are not to be used at any time.

- Scaffold tags should be placed in a highly visible location on the scaffolds for all employees to see.
- All scaffolding and work platforms must be in accordance with OSHA specifications. UTA corporate Policy OSH 4.22 also contains some guidance on the use of scaffolding.

4.3.11 Portable Ladders

When ladders are used on train, streetcar, or BRT platforms, contractors and UTA employees must abide by UTA Corporate Policy OSH 4.22. The intent of this policy is to prevent an individual from falling off the ladder and into the path of an oncoming revenue vehicle.

The use of any device to gain height, ladders included, within the ROW creates the potential to foul the track. The Roadway Worker Protection Program (RWPP) Manual provides further guidance and requirements.

Fixed ladders have other requirements directed by 29 CFR 1926.1053(a)(19).

Within the confines of construction, the following apply:

- All ladders maintained in good condition, joints between steps and side rails tight, all hardware and fittings securely attached, and moveable parts operating freely without binding or undue play.
- Ladders shall be secured at the top and bottom and extend 3 feet past the working surface.
- Metal ladders around electrical work are prohibited. The only exception is a properly constructed wooden ladder built by a contractor on a job site. In this case, UTA employees may use the ladder to inspect the job site.
- Never use a step ladder as an extension ladder. A step ladder must only be used when fully opened with braces locked.
- Non-slip safety feet provided on each ladder.
- Keep ladder rungs and steps free of grease and oil.
- It is prohibited to place a ladder in front of doors opening toward the ladder except when the door is blocked open, locked or guarded.
- It is prohibited to place ladders on boxes, barrels, or other unstable bases to obtain additional height.
- Face the ladder when ascending or descending.
- Maintain three points of contact while ascending or descending the ladder.
- Employees are prohibited from using ladders that are broken, missing steps, rungs, or cleats, broken side rails or other faulty equipment.
- Employees may not to use the top 2 steps of ordinary stepladders as a steps.
- It is required that when portable rung or cleat type ladders are used the base is so placed that slipping will not occur, or it is lashed or otherwise held in place.
- Portable metal ladders legibly marked with signs reading "CAUTION" "Do Not Use Around Electrical Equipment" or equivalent wording.

- Employees prohibited from using ladders as guys, braces, skids, gin poles, or for other than their intended purposes.
- Employees instructed to only adjust extension ladders while standing at a base (not while standing on the ladder or from a position above the ladder).
- The rungs of ladders uniformly spaced at 12 inches, center to center.

4.3.12 Compressors & Compressed Air

- Compressors equipped with pressure relief valves, and pressure gauges.
- Compressor air intakes installed and equipped to ensure that only clean uncontaminated air enters the compressor.
- Air filters installed on the compressor intake.
- Compressors operated and lubricated in accordance with the manufacturer's recommendations.
- Safety devices on compressed air systems checked frequently.
- Before any repair work is done on the pressure system of a compressor, the pressure is bled off and the system locked-out.
- Signs posted to warn of the automatic starting feature of the compressors.
- The belt drive system is totally enclosed to provide protection for the front, back, top, and sides.
- It is strictly prohibited to direct compressed air towards a person.
- Employees prohibited from using highly compressed air for cleaning purposes.
- If compressed air is used for cleaning off clothing, the pressure is reduced to less than 10 psi.
- When using compressed air for cleaning, employees use personal protective equipment.
- Safety chains or other suitable locking devices used at couplings of high pressure hose lines where a connection failure would create a hazard.
- Before compressed air is used to empty containers of liquid, the safe working pressure of the container is checked.
- When compressed air is used with abrasive blast cleaning equipment, the operating valve is a type that must be held open manually.
- When compressed air is used to inflate auto tires, a clip-on chuck and an inline regulator preset to 40 psi is required.
- It is prohibited to use compressed air to clean up or move combustible dust if such action could cause the dust to be suspended in the air and cause a fire or explosion hazard.
- Compressed air may not be transferred or piped through any non-metal pipe such as PVC, HDPE or LDPE.
- Claw type connections on air hoses require locking pins and whip checks.

4.3.13 Compressed Air Receivers

- Every receiver is equipped with a pressure gauge and with one or more automatic, spring-loaded safety valves.
- The total relieving capacity of the safety valve capable of preventing pressure in the receiver from exceeding the maximum allowable working pressure of the receiver by more than 10 percent.
- Every air receiver provided with a drainpipe and valve at the lowest point for the removal of accumulated oil and water.
- Compressed air receivers periodically drained of moisture and oil.
- All safety valves tested frequently and at regular intervals to determine whether they are in good operating condition.
- The inlet of air receivers and piping systems is kept free of accumulated oil and carbonaceous materials.

4.3.14 Compressed Gas & Cylinders

- Cylinders with a water weight capacity over 30 pounds equipped with means for connecting a valve protector device, or with a collar or recess to protect the valve.
- Cylinders legibly marked to clearly identify the gas contained.
- Compressed gas cylinders stored in areas which are protected from external heat sources such as flame impingement, intense radiant heat, electric arcs, or high temperature lines.
- Cylinders located or stored in areas where they will not be damaged by passing or falling objects, or subject to tampering by unauthorized persons.
- Cylinders stored or transported in a manner to prevent them creating a hazard by tipping, falling or rolling.
- Cylinders containing liquefied fuel gas, stored or transported in a position so that the safety relief device is always in direct contact with the vapor space in the cylinder.
- Valve protectors always placed on cylinders when the cylinders are not in use or connected for use.
- All valves closed off before a cylinder is moved, when the cylinder is empty, and at the completion of each job.
- Low pressure fuel-gas cylinders checked periodically for corrosion, general distortion, cracks, or any other defect that might indicate a weakness or render it unfit for service.
- The periodic check of low pressure fuel-gas cylinders include a close inspection of the cylinders' bottom.

4.3.15 Material Handling

- Is there safe clearance for equipment through aisles and doorways?
- Aisle ways designated, permanently marked, and kept clear to allow unhindered passage.

- Motorized vehicles and mechanized equipment inspected daily or prior to use.
- Vehicles shut off and brakes set prior to loading or unloading.
- Containers or combustibles or flammables, when stacked while being moved, always separated by dunnage sufficient to provide stability.
- Dock boards (bridge plates) used when loading or unloading operations are taking place between vehicles and docks.
- Trucks and trailers secured from movement during loading and unloading operations.
- Dock plates and loading ramps constructed and maintained with sufficient strength to support imposed loading.
- Hand trucks maintained in safe operating condition.
- Chutes equipped with sideboards of sufficient height to prevent the materials being handled from falling off.
- Chutes and gravity roller sections firmly placed or secured to prevent displacement.
- At the delivery end of rollers or chutes, provisions are made to brake the movement of the handled materials.
- Pallets usually inspected before being loaded or moved.
- Hooks with safety latches or other arrangements used when hoisting materials so that slings or load attachments won't accidentally slip off the hoist hooks.
- Securing chains, ropes, chockers or slings are adequate for the job to be performed.
- When hoisting material or equipment, provisions are made to assure no one will be passing under the suspended loads.
- Safety Data Sheets available to employees handling hazardous substances.

4.3.15.1 Hoist & Auxiliary Equipment

- Each overhead electric hoist is equipped with a limit device to stop the hook travel at its highest and lowest point of safe travel.
- Each hoist automatically will stop and hold any load up to 125 percent of its rated load if its actuating force is removed.
- The rated load of each hoist is legibly marked and visible to the operator.
- Stops provided at the safe limits of travel for trolley hoist.
- The controls of hoists plainly marked to indicate the direction of travel or motion.
- Each cage-controlled hoist is equipped with an effective warning device.
- Close-fitting guards or other suitable devices installed on hoist to assure hoist ropes will be maintained in the sheave grooves.
- All hoist chains or ropes of sufficient length to handle the full range of movement for the application while still maintaining two full wraps on the drum at all times.

- Nip points or contact points between hoist ropes and sheaves which are permanently located within 7 feet of the floor, ground or working platform, guarded.
- It is prohibited to use chains or rope slings that are kinked or twisted.
- It is prohibited to use the hoist rope or chain wrapped around the load as a substitute for a sling.
- The operator is instructed to avoid carrying loads over people.
- Only employees who have been trained in the proper use of hoists allowed to operate them.

4.3.15.2 Cranes

- The crane is visually inspected for defective components prior to the beginning of any work shift.
- All electrically operated cranes effectively grounded.
- A crane preventive maintenance program is established.
- The load chart is clearly visible to the operator.
- Operating controls clearly identified.
- A fire extinguisher is provided at the operator's station.
- The rated capacity is visibly marked on each crane.
- An audible warning device is mounted on each crane.
- Sufficient illumination is provided for the operator to perform the work safely.
- Cranes of such design, that the boom could fall over backward, equipped with boomstops.
- Each crane has a certificate indicating that required testing and examinations have been performed.
- Crane inspection and maintenance records maintained and available for inspection.
- Alterations or modifications to the basic crane shall be prohibited, unless prior written authorization is obtained from the manufacturer.
- Crane shall be level during operations within one (1) degree. If crane is equipped with outriggers, they shall be fully extended and jack pads set on firm level terrain at all times.
- A qualified signal person shall be assigned and positioned, so that they are constantly visible to both the crane operator and load.
- The crane operator shall be thoroughly trained with related experience and shall be familiar with safe crane practices and also have a complete understanding of all manuals, including maintenance and operating instructions provided for specific crane in use.

4.3.15.3 Industrial Trucks - Forklifts

- Only trained personnel allowed to operate industrial trucks.

- Substantial overhead protective equipment is provided on high lift rider equipment.
- The required lift truck operating rules posted and enforced.
- Directional lighting is provided on each industrial truck that operates in an area with less than 2 foot candles per square foot of general lighting.
- Each industrial truck has a warning horn, whistle, gong or other device which can be clearly heard above the normal noise in the areas where operated.
- The brakes on each industrial truck capable of bringing the vehicle to a complete and safe stop when fully loaded.
- The industrial truck's parking brake will effectively prevent the vehicle from moving when unattended.
- Industrial trucks operating in areas where flammable gases or vapors, or combustible dust or ignitable fibers may be present in the atmosphere, are approved for such locations.
- Motorized hand and hand/rider trucks so designed that the brakes are applied, and power to the drive motor shuts off when the operator releases his/her grip on the device that controls the travel.
- Industrial trucks with internal combustion engine operated in buildings or enclosed areas, carefully checked to ensure such operations do not cause harmful concentration of dangerous gases or fumes.

4.3.15.4 Helicopters

- Do not approach or leave a helicopter while its engines are running unless in a crouched position and the pilot or pilot's designee signals that it is safe to do so.
- Always approach and leave the helicopter in plain view of the pilot or as directed by the pilot's designee; never from the rear.
- Never walk around the tail of a running helicopter. Not only will the tail rotor kill you, but it will be very painful.
- Approach and leave the helicopter on a level with the craft or a lower level, never from or to higher ground than that of the helicopter.
- Wear goggles and head protection with chin strap under the chin when in the vicinity of an operating helicopter. Loose-fitting clothing likely to flap in the downwash and possibly be snagged on the hoist line shall not be worn.
- Load all cargo and secure it to the satisfaction of the pilot or pilot's designee.
- Do not put tag lines on sling loads without the pilot's or pilot's designee's permission and limit their numbers, their placement, and their lengths to the pilot's satisfaction.
- Do not place explosives, flammables, or other dangerous materials on board any aircraft without the pilot's knowledge.
- Carry all materials to or from the helicopter in a horizontal position not above waist level.
- Do not smoke within 50 feet of a helicopter, fuel storage, or fueling operation.

- Do not stand directly under a hovering helicopter longer than necessary to hook-up or unhook the load.
- Always watch the helicopter, sling load, hook, or bottom end of the cable to avoid being hit.
- Know the escape procedure at each operation site.
- Wear appropriate ear protection while on or near helicopters.
- Keep landing and hovering areas clear of loose and lightweight materials.
- Notify the person in charge of the project when erecting a suspended line, tower or other navigational hazard.
- Turn off radio transmitter when in vicinity of explosives or explosive loading operations.
- Passengers transported by helicopter shall be instructed to:
    - Board and depart only on instruction from the pilot.
    - Use seat belts at all times.
    - Do not talk unnecessarily to the pilot.
    - Remain seated during the time you are aboard.
    - Watch for other airborne aircraft and navigational hazards and call them to the attention of the pilot.
    - Do not smoke unless permitted by the pilot.
- When performing as a crew member in external operations, listen to and be familiar with the normal sounds emitted by the helicopter in flight so that you will have the earliest notice of trouble and can avoid dangerous exposure.
- When visibility is reduced by dust or other conditions, ground personnel shall exercise special caution to keep clear of main and stabilizing rotors.

4.3.16 Spraying Operations

- Adequate ventilation is assured before spray operations are started.
- Mechanical ventilation is provided when spraying operation is done in enclosed areas.
- Mechanical ventilation is provided during spraying operations, so arranged that it will not circulate the contaminated air.
- The spray area is free of hot surfaces.
- The spray area is at least 20 feet from flames, sparks, operating electrical motors and other ignition sources.
- Portable lamps used to illuminate spray areas suitable for use in a hazardous location.
- Approved respiratory equipment is provided and used when appropriate during spraying operations.

- Fire control sprinkler heads kept clean.
- "NO SMOKING" signs posted in spray areas, paint rooms, paint booths, and paint storage areas.
- The spray area is kept clean of combustible residue.
- Spray booths constructed of metal, masonry, or other substantial noncombustible material.
- Spray booth floors and baffles noncombustible and easily cleaned.
- Infrared drying apparatus is kept out of the spray area during spraying operations.
- The spray booth is completely ventilated before using the drying apparatus.
- The electric drying apparatus is properly grounded.
- Lighting fixtures for spray booths located outside of the booth and the interior lighted through sealed clear panels.
- The electric motors for exhaust fans placed outside booths or ducts.
- Belts and pulleys inside the booth fully enclosed.
- Ducts have access doors to allow cleaning.
- All drying spaces have adequate ventilation.

4.3.17 Environmental Controls

- All work areas properly illuminated.
- Hazardous substances identified which may cause harm by inhalation, ingestion, skin absorption or contact.
- Employees aware of the hazards involved with the various chemicals they may be exposed to in their work environment, such as ammonia, chlorine, epoxies, and caustics.
- Employee exposure to chemicals in the workplace is kept within acceptable levels.
- Whenever possible a less harmful method or product shall be used.
- The work area's ventilation system is appropriate for the work being performed.
- Employee exposure to welding fumes is controlled by ventilation, use of respirators, exposure time, or other means.
- If forklifts and other vehicles are used in buildings or other enclosed areas, the carbon monoxide levels are kept below maximum acceptable concentration.
- There has been a determination that noise levels in the facilities are within acceptable levels.
- Steps being taken to use engineering controls to reduce excessive noise levels.
- Proper precautions being taken when handling asbestos and other fibrous materials.
- Caution labels and signs used to warn of asbestos.

- Wet methods used, when practicable, to prevent the emission of airborne asbestos fibers, silica dust and similar hazardous materials.
- Vacuuming with appropriate equipment is used whenever possible rather than blowing or sweeping dust.
- Grinders, saws, and other machines that produce respirable dusts vented to an industrial collector or central exhaust system.
- All local exhaust ventilation systems designed and operating properly such as airflow and volume necessary for the application.
- There written standard operating procedures for the selection and use of respirators where needed.
- All water provided for drinking, washing, and cooking is potable.
- All outlets for water not suitable for drinking clearly identified.
- Employees' physical capacities assessed before being assigned to jobs requiring heavy work.
- Employees instructed in the proper manner of lifting heavy objects.
- Where heat is a problem, all fixed work areas have been provided with spot cooling or air conditioning.
- Employees screened before assignment to areas of high heat to determine if their health condition might make them more susceptible to having an adverse reaction.
- Employees working on streets and roadways where they are exposed to the hazards of traffic, required to wear bright colored (traffic orange) warning vest.
- Exhaust stacks and air intakes located that contaminated air will not be recirculated within a building or other enclosed area.

4.3.18 Flammable & Combustible Materials

- "NO SMOKING" signs posted where appropriate in areas where flammable or combustible materials are used or stored.
- "NO SMOKING" signs posted on liquefied petroleum gas tanks.
- "NO SMOKING" rules enforced in areas involving storage and use of flammable materials.
- Combustible scrap, debris and waste materials (i.e. oily rags) stored in covered metal receptacles and removed from the worksite promptly.
- Proper storage practiced to minimize the risk of fire including spontaneous combustion.
- Approved containers and tanks used for the storage and handling of flammable and combustible liquids.
- Are all connections on drums and combustible liquid piping, vapor and liquid tight.
- Are all flammable liquids kept in closed containers when not in use (e.g. parts cleaning tanks, pans).

- Bulk drums of flammable liquids grounded and bonded to containers during dispensing.
- Storage rooms for flammable and combustible liquids have explosion-proof lights.
- Storage rooms for flammable and combustible liquids have mechanical or gravity ventilation.
- Liquefied petroleum gas stored, handled, and used in accordance with safe practices and standards.
- Liquefied petroleum storage tanks guarded to prevent damage from vehicles.
- All solvent wastes and flammable liquids kept in fire-resistant covered containers until they are removed from the worksite.
- Vacuuming used whenever possible rather than blowing or sweeping combustible dust.
- Fire separators placed between containers of combustibles or flammables, when stacked one upon another, to assure their support and stability.
- Fuel gas cylinders and oxygen cylinders separated by distance, fire resistant barriers or other means while in storage.
- Fire extinguishers selected and provided for the types of materials in areas where they are to be used.
    - Class A: Ordinary combustible material fires.
    - Class B: Flammable liquid, gas or grease fires.
    - Class C: Energized-electrical equipment fires.
- If a Halon 1301 fire extinguisher is used, employees can evacuate within the specified time for that extinguisher.
- Appropriate fire extinguishers mounted within 75 feet of outside areas containing flammable liquids, and within 10 feet of any inside storage area for such materials.
- The transfer/withdrawal of flammable or combustible liquids is performed by trained personnel.
- Fire extinguishers mounted so that employees do not have to travel more than 75 feet for a class "A" fire or 50 feet for a class "B" fire.
- Employees trained in the use of fire extinguishers.
- Are extinguishers free from obstructions or blockage.
- All extinguishers serviced, maintained and tagged at intervals not to exceed one year.
- All extinguishers fully charged and in their designated places.
- A record maintained of required monthly checks of extinguishers.
- Where sprinkler systems are permanently installed, the nozzle heads are directed or arranged so that water will not be sprayed into operating electrical switchboards and equipment.
- Safety cans used for dispensing flammable or combustible liquids at a point of use.

- All spills of flammable or combustible liquids cleaned up promptly.
- Storage tanks adequately vented to prevent the development of excessive vacuum or pressure as a result of filling, emptying, or atmosphere temperature changes.
- Storage tanks equipped with emergency venting that will relieve excessive internal pressure caused by fire exposure.
- Spare portable or butane tanks, which are sued by industrial trucks stored in accord with regulations.

4.3.19 Fire Protection

- Have a fire prevention plan.
- Plan describes the type of fire protection equipment and/or systems.
- Established practices and procedures to control potential fire hazards and ignition sources.
- Employees aware of the fire hazards of the material and processes to which they are exposed.
- Local fire department well acquainted with your facilities, location and specific hazards.
- Fire alarm system is tested at least annually.
- Fire alarm system is certified as required.
- Interior standpipes and valves are inspected regularly.
- Outside private fire hydrants are flushed at least once a year and on a routine preventive maintenance schedule.
- Fire doors and shutters in good operating condition.
- Fire doors and shutters unobstructed and protected against obstructions, including their counterweights.
- Fire door and shutter fusible links in place.
- Automatic sprinkler system water control valves, air and water pressures checked weekly/periodically as required.
- Maintenance of automatic sprinkler system is assigned to responsible persons or to a sprinkler contractor.
- Sprinkler heads protected by metal guards, when exposed to physical damage.
- Proper clearance is maintained below sprinkler heads.
- Portable fire extinguishers provided in adequate number and type.
- Fire extinguishers mounted in readily accessible locations.
- Are fire extinguishers recharged regularly and noted on the inspection tag.
- Employees periodically instructed in the use of extinguishers and fire protection procedures.

4.3.20 Hazardous Chemical Exposures

- Employees trained in the safe handling practices of hazardous chemicals such as acids, caustics, and the like.
- Employees aware of the potential hazards involving various chemicals stored or used in the workplace--such as acids, bases, caustics, epoxies, and phenols.
- Employee exposure to chemicals is kept within acceptable levels.
- Eye wash fountains and safety showers provided in areas where corrosive chemicals are handled.
- All containers, such as vats and storage tanks labeled as to their contents--e.g. "CAUSTICS".
- All employees required to use personal protective clothing and equipment when handling chemicals (i.e. gloves, eye protection, and respirators).
- Flammable or toxic chemicals kept in closed containers when not in use.
- Chemical piping systems clearly marked as to their content.
- Where corrosive liquids are frequently handled in open containers or drawn from storage vessels or pipelines, adequate means is readily available for neutralizing or disposing of spills or overflows properly and safely.
- Standard operating procedures have been established and are they being followed when cleaning up chemical spills.
- Where needed for emergency use, respirators are stored in a convenient, clean and sanitary location.
- Respirators intended for emergency use adequate for the various uses for which they may be needed.
- Employees prohibited from eating in areas where hazardous chemicals are present.
- Is personal protective equipment provided, used and maintained whenever necessary.
- There are written standard operating procedures for the selection and use of respirators where needed.
- Respirator protection program requires employees to be instructed on the correct usage and limitations of the respirators.
- Respirators shall be regularly inspected and cleaned.
- Control procedures have been instituted for hazardous materials, where appropriate, such as respirators, ventilation systems, handling practices, and the like.
- Whenever possible, hazardous substances are handled in properly designed and exhausted booths or similar locations.
- Use general dilution or local exhaust ventilation systems to control dusts, vapors, gases, fumes, smoke, solvents or mists which may be generated in your workplace.

- Ventilation equipment shall be provided for removal of contaminants from such operations as production grinding, buffing, spray painting, and/or vapor decreasing, and is it operating properly.
- If internal combustion engines are used, carbon monoxide is kept within acceptable levels.
- Vacuum, rather than blowing or sweeping, dusts whenever possible for cleanup.
- Materials, which give off toxic, asphyxiant, suffocating or anesthetic fumes, are stored in remote or isolated locations when not in use.
- There shall be a list of hazardous substances used in your workplace.
- There is a written hazard communication program dealing with Safety Data Sheets (SDS) labeling, and employee training.
- The contractor's superintendent is responsible for SDSs, container labeling, and employee training.
- Each container for a hazardous substance (i.e. vats, bottles, storage tanks,) is labeled with product identity and a hazard warning (communication of the specific health hazards and physical hazards).
- There is a Safety Data Sheet readily available for each hazardous substance used.
- There is an employee training program for hazardous substances. This program include:
    - An explanation of what an SDS is and how to use and obtain one.
    - SDS contents for each hazardous substance or class of substances.
    - Explanation of "Right to Know".
    - Identification of where employees can see the employer's written hazard communication program and where hazardous substances are present in their work area.
    - The physical and health hazards of substances in the work area, how to detect their presence, and specific protective measures to be used.
    - Details of the hazard communication program, including how to use the labeling system and SDSs.
    - How employees will be informed of hazards of non-routine tasks, and hazards of unlabeled pipes.

4.3.21 Hazardous Waste Management

- Contractors will identify all materials and/or chemicals they will use on UTA property (including welding rods), and provide a brief explanation of how they will be used and if any wastes will be generated as described in UTA's document CONTR 4.4.6-3 Contractor Environmental Activity Briefing Package.
- Documentation of licenses and certificates required for lead, asbestos abatement or other hazardous waste management activity that require licenses and/or permits shall be presented prior to commencing work.

- Hazardous materials brought on site or wastes generated on site will be handled according to UTA's CONTR 4.4.6-2: Contractor Environmental Management Procedure.

4.3.22 Noise

- Hearing protection is required if the continuous noise level exceeds 85 dBA or if the noise level peaks above 115 dBA.
- Noise levels are to be measured at regular intervals.
- Try isolating noisy machinery from the rest of your operation.
- Engineering controls been used to reduce excessive noise levels.
- Where engineering controls are determined not feasible, administrative controls (i.e. worker rotation) are being used to minimize individual employee exposure to noise.
- Work areas where noise levels make voice communication between employees difficult been identified and posted.
- Approved hearing protective equipment (noise attenuating devices) is available to every employee working in areas where continuous noise levels exceed 85 dBA.
- Employees are properly fitted and instructed in the use and care of ear protectors.
- Employees exposed to continuous noise above 85 dBA given periodic audiometric testing to ensure that you have an effective hearing protection system.
- Contractors may have to comply with local noise ordinances for the wellbeing of residents around the work area.

4.3.23 Emergency Action Plan

- Have an emergency action plan. "Call 911" should be part of the plan, but is not a plan unto itself.
- The emergency action plan complies with requirements of OSHA regulations.
- Emergency escape procedures and routes have been developed and communicated to all employees, contractors, and sub-contractors.
- The emergency action plan is reviewed and revised periodically.
- Employees know their responsibilities:
    - For reporting emergencies.
    - During an emergency.
    - For conducting rescue and medical duties.

4.3.24 Infection Control

- Contractors will provide a training and information program for employees exposed to or potentially exposed to blood and/or body fluids.
- Employees are aware of specific workplace practices to follow when appropriate (Hand washing, handling sharp instruments, handling of laundry, disposal of contaminated materials, reusable equipment.)

- Personal protective equipment is provided to employees, and in all appropriate locations
- Employers will offer, at no cost to the employee, Hepatitis B vaccinations to employees potentially exposed to blood borne pathogens.

4.3.25 Ergonomics

- The work can be performed without eyestrain or glare to the employees.
- Tasks will not require prolonged raising of the arms.
- The neck and shoulders will not have to be stooped to view the task.
- There are no pressure points on any parts of the body (wrists, forearms, back of thighs).
- The work can be done using the larger muscles of the body.
- The work can be done without twisting or overly bending the lower back.
- Sufficient rest breaks, in addition to the regular rest breaks, to relieve stress from repetitive-motion tasks.
- Tools, instruments and machinery shaped, positioned and handled so that tasks can be performed comfortably.
- All pieces of furniture adjusted, positioned and arranged to minimize strain on all parts of the body.

4.3.25.1 Back & Lifting Safety

Lifting things and moving them from one place to another is a very simple operation. However, if this operation is done incorrectly, it may cause many injuries. You can wrench your back or pull a muscle, or crush or pinch your hands or feet. Your general physical preparedness is your best defense against back injuries.

- Learn how to lift and prevent injuries.
- Use the right kind of personal protective gear.
- Hand protection and safety shoes are a must for most lifting jobs.
- Some jobs might call for hard hats and goggles.
- If it is too big or too heavy for you to handle alone, get help.
- Check the material for nails, splinters, rough stripping that might injure your hands.
- When lifting heavy objects, the large muscles of the leg instead of the smaller muscles of the back shall be used. Learn and practice the proper way to lift or carry material or any object.

Lifting Procedures:

1. Face the load.
2. Put one foot alongside the object, and one foot behind.
3. Bend at the knees. Let your legs do the work.

4. Keep back straight and the load as close as possible.
5. Get a good, firm grip with the palms of your hands while lifting by straightening your legs.
6. Avoid twisting as you turn with a load. Shift your feet instead.
7. Don't try to lift something above waist level in one motion. Set the load on a table or bench, then change your grip for lifting higher.
8. To put the object down, just follow the lifting procedure, but in reverse

4.3.26 Material Storage

Proper storage procedures are required for dry, raw materials, flammables and compressed gases storage to prevent fires, keep exits and aisles clear and avoid injuries and illnesses. General rules for material storage are as follows:

- Materials may not be stored any closer than 18 inches to sprinkler heads. A minimum of 3 feet side clearance will be maintained around doorways and emergency exits. Passageways and aisle will be properly marked and a minimum of six feet in width. Materials, fork lifts, pallet jacks, etc., may not be stored in aisles or passageways.
- Aisles and passageways will be kept clear of debris. All spills of materials will be immediately cleaned-up by the person responsible.
- All platforms and racks will have maximum load capacity displayed. The weight of stored material will not exceed the rated load capacity.
- All flammables will be stored in OSHA-approved flammable storage cabinets or stored outside (at least 50 feet from any structure)
- Fuels, solvents and other flammables (not stored in original shipping containers) will be stored in OSHA-approved self-closing containers with flame arresters. Flammables may not be stored in open containers (open parts baths, etc.).
- Flammable storage areas will be kept dry and well ventilated. No storage of combustible materials, open flames or exposed electrical components are permitted in the flammable storage area.
- Flammable or combustible materials may not be stored in electrical rooms. Electrical rooms must be kept clean and dry at all times.
- Inspect bottle for defects & proper marking/labels
- Ensure stamped date on bottle has not expired
- Inspect valve assembly and adapter thread area
- Ensure SDS is on file or with shipment
- Follow SDS requirements for storage
- Cylinder cap securely in place when not in use.
- Cylinders marked with contents and if empty/full.

- Cylinders stored up-right and secured to a stationary structure in a shaded and well ventilated area.
- Cylinders not stored within 50 feet of exposed electrical components or combustible materials.
- Cylinders are protected from accidental rupture.
- Chemically reactive gases not stored within 50 feet of each other.
- If a cart or cylinder trolley is used, the cylinders must be secured to the cart.
- Inspect valve adapter threads.
- Inspect all fasteners, hoses & regulators prior to hooking up to cylinder.
- Use only for approved purposes.
- Use in up-right position.
- Regulators must be of same rated pressure as cylinder
- Keep cylinder valve shut when not in use; don't depend on regulators

4.4 Construction near Railroad Operations

The contractor shall take all necessary steps to prevent the following hazards:

a. Mounds or piles of earth, construction materials, temporary structures, overnight storage of equipment, or other objects within seven feet of any operational railroad track or crossings.

b. Pavement drop-offs in excess of three inches, either permanent or temporary.

c. Barricades not properly highlighted for easy visibility.

d. Night work lighting directed in such a manner that it interferes with production.

e. Open holes that are not guarded.

f. All employees shall have roadway worker protection (RWP) training when working on or near any UTA rail system or any other active railroad entity.

4.4.1 Clearances

Standard clearances may not give enough protection where tracks pass doorways or corners of temporary buildings causing workers to walk directly into the path of moving railroad equipment. These locations must be safeguarded with fixed railings or other means of pedestrian control to detour employees from the hazard.

4.4.2 Speed Limits

Speed limits shall not exceed 15 mph; 10 mph in locations where workers are intermingled with motorized equipment. Speed limits will be established and enforced for all traffic, in accordance with UTA, UP, and UDOT motor vehicle authority.

4.4.3 Track Access Permit

A permit is required any time the tracks are occupied or there is the potential for fouling the tracks by machine, equipment, material, or worker. If a crew is found to be without a permit, the violators shall be removed from the track work site until a permit is obtained.

4.4.4 On-Track Safety

The contractor is responsible for compliance with the Federal Railroad Administration's Roadway Worker Protection (RWP) regulation (49 CFR 214, Subpart C) and UTA's on-track safety rules. Under 49 CFR 214, Subpart C, contractors are responsible for the training of their employees on these regulations. UTA provides RWP training upon request.

In addition, all contractor employees must participate in a job briefing that will specify the type of on-track safety requirements for the type of work being performed. Special note must be made of:

- Limits of track authority
- Track fouling limits (10' from center of UTA tracks)
- Adjacent track safety
- Clear zones
- Personal protective equipment (PPE)
- Work zone around machines
- Minimum distances between machines

4.4.4.1 Other Railroad Activity in Work Area

UTA provides RWP training for UTA track only. Contact the owning railroad for their policy and training. The UTA RWP Program provides further guidance for shared track operations.

4.5 Traffic Control

4.5.1 Flagging, Barricades, Signs, and Signals

Traffic controls are the responsibility of the contractor overseeing the completion of the contract. Public roads crossing the work site, and roadways on the work site used by equipment and motorized vehicles, will be the responsibility of the contractor.

Every effort will be made to prevent disruption of traffic flow by the motorized public and pedestrian traffic. Accident and injury prevention will be a top priority.

Flag persons shall be trained and qualified.

Contractors are required to adhere to the standards for work zone traffic control as printed in part VI of the MUTCD Book (latest edition). All standards of the manual on uniform traffic control devices will be required to be placed in effect during the contract. Traffic control ordinances of the local jurisdiction shall be complied with, where applicable.

4.5.2 Maintenance of Traffic Control Employee

The contactor must name an employee and an alternate, who will be on twenty-four hour call, with the authority to maintain construction barricades and signal flashers.

4.6 Substance Abuse Policy

The contractor’s substance abuse policy shall be in accordance with Chapter 38 of the Utah code, 49 CFR 655, and the DOL Drug Free Workplace Act of 1988. Testing procedures will follow 49 CFR 40.

Any possession, use, or distribution of a controlled substance, or alcohol on site is strictly forbidden. Pending company policy, termination may result for violation of this policy.

4.6.1 Drug Testing and Cost

Before allowing a "safety sensitive" employee (as defined by current US DOT regulations) to perform a safety sensitive function for the first time, the contractor must ensure that the employee passes a pre-employment drug test.

When a covered employee has not performed a safety sensitive function for ninety consecutive calendar days, and the employee has not been in the contractor's random testing selection pool during that time, the contractor shall ensure that the employee passes a pre-employment drug test before returning to safety sensitive duties.

The cost of all drug testing will be borne by the contractor / employer.

Tests may be performed on a periodic basis. All employees on site will be subject to random drug / alcohol testing.

Testing for cause (reasonable suspicion) will be initiated in accordance with the guidelines within chapter 38 of the Utah Code and 49 CFR part 655.

4.6.2 Post Accident Testing

A test for drug and alcohol use is required after an accident. The cost of these tests will be borne by the employer.

4.6.3 Legally Prescribed Drugs

Prescription medication may be permitted on site, provided the drugs are contained in the original prescription container and are prescribed by an authorized medical doctor for the current use of the person named on the container.

It is the responsibility of each employee/ consultant who is taking prescribed medication to inform his physician of his job duties and to inform his supervisor of any such medication, which would restrict the employee in performing work duties in a safe and efficient manner.

4.7 Work Preparation

Before commencing work, the project engineer/manager and the contractor shall meet with the representative of the project resident engineer and a UTA Safety Administrator to discuss and review the Contractors Safety Program in relation to the UTA CSSP.

4.8 Demolition and Removal Work

Demolition and removal work shall be conducted in accordance with 29 CFR 1926, Subpart T. Prior to initiating demolition activities, the following survey and plan shall be accomplished:

a. An engineering survey, by a competent person, of the structures to determine the layout, condition of framing, floors, walls, foundation, and underpinnings. The potential for building damage or collapse and existence of other potential or real demolition hazards shall be part of the survey.

b. All nearby utilities including electric, gas, water, steam, sewer, and other service lines within the structure or area to be demolished will be located and marked, shut-off, capped or otherwise controlled prior to beginning demolition work. If it is necessary to maintain any

power or utilities during demolition, the utility lines will be protected or temporarily relocated. For help, call 811 before you dig. Contractors will notify UTA facilities maintenance and the appropriate utility company in advance of any utility shut-down or relocation.

c. Demolition plan, by a competent person, based on the engineering survey shall be developed which shall include a detailed plan authorizing the procedures for safe demolition and removal of all building materials. Protocol for removal of any hazardous materials from the site shall be included in this plan, based on the hazardous materials survey outlined below.

d. A hazardous materials survey, by a competent person, shall be conducted. The purpose is to determine if any hazardous materials, chemicals, gases, explosives, flammable liquids, biological, ionizing, or other suspect substances require additional action during demolition. This would include any pipes, tanks, or other equipment containing hazardous materials requiring additional controls.

4.9 Motor Vehicle Operations

4.9.1 Driver's License

Each contractor, subcontractor, or sub-subcontractor or vendor-supplier employee driving a motor vehicle on a UTA job site shall have a valid driver's license and each such motor vehicle shall have a current inspection sticker; if required by the state of registration.

4.9.2 Parking

Employee parking shall be as designated by the Project Resident Engineer. All Contractor, Subcontractor or Sub-Subcontractor vehicles shall enter and exit the site only through authorized control points designated by the Resident Engineer or UTA.

4.9.3 Condition

All construction equipment windshields and side windows shall be cleaned and unbroken. Safety equipment such as head, tail, brake, and clearance lights, etc. shall be kept clean. Back up alarms shall be in working order on all vehicles with limited or restricted driver vision to the rear.

4.9.4 Guarding

Heavy equipment with rotating superstructure such as back hoes and power shovels shall be guarded in such a manner that rotation of the superstructure shall not present danger to pedestrians or infringe into any traffic lane.

4.9.5 Access

The resident engineer may designate access to the job site. The contractor shall have control of the work site during construction and may restrict access to provide safety to the job site, employees, and the public, and in the event of a negative impact on schedule.

4.9.6 Transporting

All passengers shall be transported to and from the site while sitting /riding in seating arranged and designed for passenger travel. All passengers shall wear passive restraints that will require mechanical fastening of seat belts.

4.9.7 Vehicles

- Observe all traffic rules and regulations when driving.
- Do not operate a piece of equipment unless you have been instructed in its use.
- Jobsite speed limit is 10 MPH.

4.9.8 Transporting Employees & Materials

- Employees who operate vehicles on public thoroughfares have valid operator's licenses.
- When seven or more employees are regularly transported in a van, bus or truck, the operator's license is appropriate for the class of vehicle being driven.
- Each van, bus or truck used regularly to transport employees, is equipped with an adequate number of seats.
- Vehicles used to transport employees, equipped with lamps, brakes, horns, mirrors, windshields and turn signals in good repair.
- Transport vehicles provided with handrails, steps, stirrups or similar devices, so placed and arranged that employees can safely mount or dismount.
- A full charged fire extinguisher, in good condition, with at least 4 B/C rating maintained is in each employee transport vehicle.
- When cutting tools with sharp edges are carried in passenger compartments of employee transport vehicles, they are placed in closed boxes or containers which are secured in place.
- Employees prohibited from riding on top of any load, which can shift, topple, or otherwise become unstable.

4.9.9 Company Vehicles

Contractors are expected to abide their corporate policy for company vehicles and their appropriate use. Utah law prohibits the manipulation of cell phones or any other electronic device while driving any vehicle.

4.9.10 Tire Inflation

- Where tires are mounted and/or inflated on drop center wheels a safe practice procedure is posted and enforced.
- Where tires are mounted and/or inflated on wheels with split rims and/or retainer rings a safe practice procedure is posted and enforced. A tire restraining device such as a cage, rack or other effective means is used while inflating tires mounted on split rims, or rims using retainer rings.
- Each tire inflation hose has a clip-on chuck with at least 24 inches of hose between the chuck and an in-line hand valve and gauge.
- The tire inflation control valve is automatically shut off the airflow when the valve is released.

- Employees strictly forbidden from taking a position directly over or in front of a tire while it's being inflated.

4.9.11 Fueling

- It is prohibited to fuel an internal combustion engine with a flammable liquid while the engine is running.
- Fueling operations done in such a manner that likelihood of spillage will be minimal.
- When spillage occurs during fueling operations, the spilled fuel is cleaned up completely, evaporated, or other measures taken to control vapors before restarting the engine.
- Fuel tank caps replaced and secured before starting the engine.
- In fueling operations there is always metal contact between the container and fuel tank.
- Fueling hoses of a type designed to handle the specific type of fuel.
- It is prohibited to handle or transfer gasoline in open containers.
- Open lights, open flames, or sparking or arcing equipment prohibited near fueling or transfer of fuel operations.
- Smoking prohibited in the vicinity of fueling operations.
- Fueling operations prohibited in building or other enclosed areas that are not specifically ventilated for this purpose.
- Where fueling or transfer of fuel is done through a gravity flow system, the nozzles are of the self-closing type.

4.10 Reporting Accidents, Incidents, and Injuries

All accidents that occur from operations or work performed for the project or other construction contracts on the job site must be verified, investigated, reported, and analyzed as prescribed by this manual.

All contractors, subcontractors, and sub-subcontractors shall instruct their employees and other personnel to follow these procedures if someone is injured; there is property damage or a near miss:

a. Seek medical assistance for anyone who is injured. The injured employee's supervisor will see that first aid is administered on site if possible.

b. Except for rescue and emergency procedures, secure the area tightly and quickly. The accident scene shall not be disturbed until the investigating authority officials release it.

c. Immediately report all accidents or conditions resulting in a fatality, the hospitalization of any employee or property damage estimated in excess of $1,000 to the contractor's superintendent or other person in charge at the job site, and notify the UTA Construction Safety Administrator.

d. The contractor's safety supervisor, or other designated person, must notify all other parties and report the event as outlined in this manual.

e. The local UOSH office (telephone 801 530-6901/fax 801 530-7606) must be notified within twelve hours of an occurrence involving a fatality, disabling, or serious injury to a worker. The UTA Construction Safety Administrator shall be notified within twenty-four hours.

f. If advanced medical assistance is necessary, contractors are instructed to send employees injured on site to medical clinics or hospitals as per the contractor's policy.

g. First aid cases need not to be submitted as a first report of injury. However, such incidents will be categorized as "non-reporting" and "first aid only" unless the injured employee continues to undergo medical treatment. Employees are responsible for reporting all injuries or occupational illnesses immediately to their employer or immediate supervisor. No supervisor shall decline or refuse to accept a report of injury from a subordinate.

h. Except in cases of emergencies, the foreman or immediate supervisor must provide the injured employee with written authorization to seek medical treatment.

i. Questions from the news media and others shall be referred to UTA Public Affairs Office.

j. In the event an employee of a contractor, subcontractor, or sub-subcontractor is exposed to toxic materials or harmful physical agents, the contractor shall notify the UTA Construction Safety Administrator of the incident and the corrective action taken to eliminate further exposures.

k. Only authorized personnel, such as representatives of the UTA Construction Safety Administrator, the insurers, or governmental agencies administering OSHA or UOSH shall be given information pertaining to the accident.

l. All accidents and hazardous incidents including near misses shall be reported. These records are to be maintained and made available to UTA Construction Safety Administrator, upon request, and shall include:

- An in-depth investigation to identify all causes and to recommend hazard control measures;
- The exact location of each incident shall be noted on the reporting form. The grid location of the project site where the accident occurred shall be used whenever possible.

4.11 Accident Investigation

Contractors are expected to conduct their own accident investigations in accordance with their corporate policy. The purpose of these investigations is not to assign blame, but to determine what root cause/contributing factors can be remedied to prevent a repeat of the accident. Contractors are expected to invite UTA Safety Department personnel to the investigation to observe and comment.

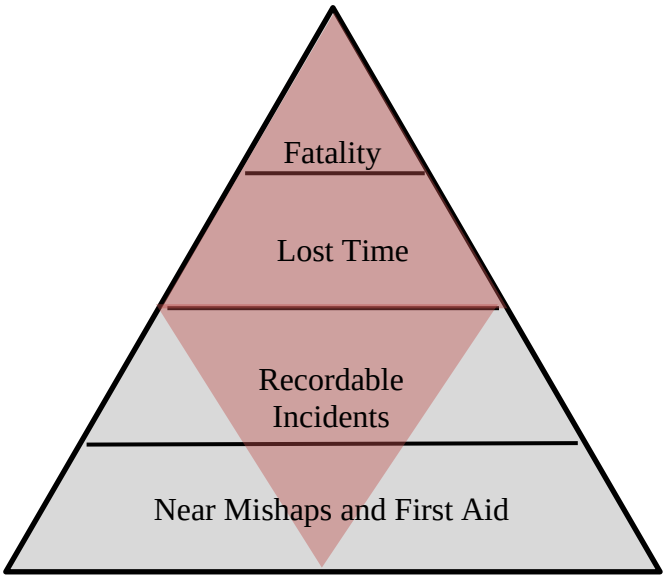
4.11.1 Determining What Accidents to Investigate

UTA has adopted the “Red Diamond” model to determine what construction incidents/accidents deserve investigation. This model recognizes that there is a limit to the time and funding available to investigate the smallest accidents. Additionally, it takes into account the most commonly accepted accident model proposed by Herbert W. Heinrich in 1931. Incidents to be investigated are those within the “Red Diamond”.

All fatalities and lost-time incidents deserve a full root-cause investigation. Some portion of recordable incidents, first aids, and near mishaps also fall within the red diamond. To determine if a specific accident falls within the parameters, ask the following questions;

- If one factor was different, would this have been a lost time or fatality?

- If it was replayed 100 times, would it result in a fatality?
- "If it hadn't been for luck, I'd be dead."



If the answer to any of these questions is yes, then the incident deserves a closer look. For example:

During a facility construction, the masons use scaffolding. The scaffolding has been set up for weeks, but the masons have been on and off the job due to weather and scheduling issues. An electrician is on his knees, finalizing a connection in a nearby outlet when a brick suddenly lands 3' from him. The brick had obviously fallen from the scaffolding above.

No matter which of the three litmus questions are used, the answer is a resounding yes. As a result, this incident deserves a higher level of scrutiny.

UTA will not prescribe a root cause model or investigation method. This is to be determined by contractor's policy and investigator's preference.

4.12 Contractor's Procedures for Emergency Reporting and Response

The contractor's emergency procedures shall be continually reviewed and adjusted by the contractor to provide maximum effectiveness. All such procedures are to be included in the contractor's safety program and coordinated with the project resident engineer.

4.12.1 Supplies

First aid kits shall meet the requirements outlined in 29 CFR 1926.50.

4.12.2 First Aid Training

At least one person shall be available at the job site to render first aid that has valid certificates in first aid training from the American Red Cross, or an equivalent training program that can be verified. Said persons shall affix suitable emblems to the rear of their hard hats for identification.

4.12.3 Planning

Actions to be taken during emergencies should be discussed regularly with the contractor's supervisory personnel and at "tool box" safety meetings.

4.12.4 Emergency Care

If advanced medical assistance is necessary, contractors are to send employees injured on site to the medical clinics or hospitals according to the contractor's policy.

4.12.5 Emergency Numbers

A telephone or the contractor at the job site shall provide other means of two-way communication before construction begins. The telephone numbers of the UTA public spokesperson, UTA Construction Safety Administrator, and resident engineer shall be posted by the contractor at all project site locations.

4.13 Protection of the Public and Property

"Public" shall be construed as including all persons not employed by the contractor, subcontractor, or any tier sub-subcontractor.

4.13.1 Precautions

In addition to the safety requirements identified within the specific contract documents, the following precautions are required:

a. The contractor shall take all necessary action to prevent injury to the public or property damage.

b. Work shall not be performed in any area occupied or in use by the public unless specifically permitted by the contract or in writing from the project resident engineer.

c. When it is necessary to maintain public use of work areas involving sidewalks, entrances to buildings, lobbies, corridors, aisles, stairways, and vehicular roadways, the contractor shall protect the public with appropriate guardrails, barricades, temporary fences, overhead protection, temporary partitions, shields, and adequate visibility. Such protection shall guard against harmful particles, flying materials, falling or moving materials and equipment, hot or poisonous materials, flammable and explosive atmospheres, flammable or toxic liquids and gases, open flames, energized electric circuits, or other harmful exposures.

d. Sidewalks, entrances to buildings, lobbies, corridors, aisles, doors, or exits that remain in use by the public shall be kept clear by the contractor of obstructions to permit safe access and egress of the public at all times.

e. The contractor shall conspicuously post signs and instructional safety signs where necessary. In addition, the contractor shall utilize a signalman to control the moving of motorized equipment in areas where the public might be endangered

f. Sidewalk sheds, canopies, catch platforms, and appropriate fences shall be provided by the contractor when it is necessary to maintain public pedestrian traffic adjacent to the erection, demolition, or structural alteration of outside walls on any structure.

g. A temporary fence shall be provided by the contractor around the perimeter of aboveground operations adjacent to public areas except where a sidewalk shed or fence is provided by the contract or as required by subparagraph C above.

h. Perimeter fences shall be at least six feet high. They may be constructed of wood or metal frame and sheathing, heavy wire mesh, or a combination of both as provided in contract documents. When the fence is adjacent to a sidewalk near a street intersection, at least the upper section of the fence shall be open wire mesh from a point not over four feet above the

sidewalk and extending at least twenty-five feet in both directions from the corner of the fence to provide drivers and pedestrians visibility at the intersection.

i. Hazards to which the public may be exposed shall be barricaded, signed, and illuminated between dusk and sunrise and the servicing contractor shall maintain such protection.

j. Guardrails shall be made of rigid materials capable of withstanding a force of at least two hundred pounds applied in any direction at any point in their structure. Their height shall be approximately forty-two inches. Top rails and posts may be two inches by four inches dressed wood or equal material. Vertical posts shall not be over eight feet apart.

k. Barricades meeting UTA requirements shall be provided by the contractor where sidewalk sheds, fences, or guardrails as referenced above are not required between work areas and pedestrian walkways, roadways, or occupied buildings. Barricades shall be secured against accidental displacement and shall be maintained in place except where temporary removal is necessary to perform the work. When a barricade is temporarily removed, a watchman shall be placed at all openings.

4.14 Noncompliance

If the UTA Construction Safety Administrator notes any noncompliance with this manual, or the contractor's safety program, or is advised of such noncompliance by others or by a governmental agency with the authority to enforce safety regulations, the UTA Construction Safety Administrator shall perform the following:

a. Notify the contractor of the noncompliance and of the corrective action required. This notice, when delivered to the contractor or the contractor's representative at the job site shall be deemed sufficient notice of the noncompliance. Immediate corrective action is required of the contractor.

b. Exercise the right to issue a suspend-work order stopping all or part of the work if the contractor fails or refuses to take corrective action within the time specified in the notice. At resident engineer's option, the order will remain in effect until satisfactory corrective action has been taken.

c. Deny any claim or request from the contractor for equitable adjustment for additional time or money on any suspend-work order issued under these circumstances.

d. Require the removal from the job site of any employee, subcontractor, sub-subcontractor, or piece of equipment that is deemed to be unsafe.

4.15 Notice of Noncompliance with Safety and Health Regulations

All serious injuries and accidents, including a potential for a fatality or serious injury, shall be reported immediately to the UTA Construction Safety Administrator or the resident engineer.

a. When violations of the job site safety requirement are observed, the UTA Construction Safety Administrator will inform the contractor orally and when determined as necessary. The UTA Construction Safety Administrator shall issue a notice of noncompliance to the contractor.

b. The failure of contractor's safety supervisor to secure and maintain safety performance shall subject such personnel to removal from the job site. Personnel who are denied job site access for noncompliance with safety requirements, at the UTA Construction Safety Administrator's request, will not be granted job site access to the UTA site for other services of work.

4.16 Non-Performance

The contractor's safety supervisor or other authorized personnel shall be replaced by the contractor at the direction of the project resident engineer for nonperformance of his or her safety/security duties at no additional cost to the project.

4.17 Failure to Correct Unsafe Conditions

If the contractor fails to correct the conditions described in the noncompliance notice within the time specified, a second noncompliance notice shall be issued.

Should the contractor fail to correct the safety violation which creates a hazard for persons or property, the resident engineer can perform, or cause to be performed, the necessary work and back charge the contractor or take any other action provided in the contract.

Failure to reach agreement, or failure to correct the violation, shall be documented, and the matter referred to the resident engineer for resolution with the contractor's senior management.

If an "imminent" danger or loss of property condition exists, the resident engineer shall have authority to shut down contractor's work until correction of said condition is made.

Contractor superintendents, who fail to control the actions of their employees regarding safety, are subject to suspension from the job site.

5.0 Security Requirements

5.1 Security on the Job Site

Contractors shall be responsible for the security of their own property and equipment in their care, custody, and control while working on a UTA job site. Site security shall be coordinated with UTA to ensure any concerns are addressed prior to the start of any construction. UTA does not assume any responsibility for any stolen or damaged equipment, property, or building material. Ultimately, the contractor is responsible for providing security commensurate with local risks. UTA's Manager of Security as well as UTA's Chief of Police should be consulted with during the project planning and design phases to ensure all security needs are addressed before any equipment or material arrives on a job site. The contractor will be required to maintain secure work sites, material storage sites, and office facilities. Provision of security requirements will be for the protection of both the UTA property and the property of the contractor from theft, vandalism, pilfering, or other destructive activities, as well as for protection of personnel. Although some Business Units employee Facility Security Guards, these guards are tasked with providing security for operational maintenance and operations facilities supporting UTA revenue service and will not be tasked to secure any construction activity, equipment, or material.

The following UTA policies may provide more information to resolve unique situations:

- Corporate Policy 6.1.15: Contractor Badging and Background Checks: Details who is eligible for a contractor badge and the mechanisms to issue this type of badge
- Corporate Policy 4.3.6: Visitor Access: Provides guidance to employees and managers on the requirement of visitor access into UTA business units and facilities
- Corporate Policy 4.1.4: Security Initiatives: Provides additional requirements to employees on visitor access control procedures as well as the correct method of displaying employee, contractor, and visitor badges.

The minimum requirements for the contractor's security program will identified in the contract documents. The approved contractor's security program may include both active and passive security measures such as the following:

5.1.1 Contract Security Services

Contract Security is recommended in vulnerable areas where the threat of vandalism, theft, and pilferage is high. There are several contact security companies in the Salt Lake Valley who offer low cost facility security during times of increased risk (non-operations hours such as weekends and at night). One security guard is recommended for small and medium construction jobs. Larger jobs with more equipment and material may require more than one guard.

5.1.2 Cameras

Cameras serve as both a deterrent as well as an investigative tool following a security incident. Due to several legal factors, "dummy" cameras are not authorized on UTA property or construction sites. If used, cameras should be recorded through a local DVR or by other means. If used, cameras should be placed around perimeters as well as around equipment storage sites where the risk of theft is high. If existing UTA cameras are installed on the construction site, footage may be retrieved for the purposes of an investigation. Requests for the footage must go through the proper procedures. The UTA Transit Police are the best point of contact.

5.1.3 Provisions for entry control

Proper entry control is designed to ensure no unauthorized personnel are allowed to enter a construction site. This can be achieved through administrative procedures such as visitor logs or through infrastructure such as proper fencing, gates, and choke points. Other access control methods include standardized safety vests with company logo, a badging system, or a process for reporting unknown workers on a construction site to the job superintendent.

5.1.4 Fencing

Adequate site fencing is strongly recommended when feasible. It will not be realistic in all circumstances to erect temporary security fencing. Where it is feasible, fencing serves to deter theft, trespassing, and pilferage. When used, it is recommended that fencing be 8 foot, chain link, and semi-permanently fixed to the ground.

5.1.5 Site Lighting

Studies suggest that proper perimeter and area lighting will deter criminal activity. If used, it is recommended that perimeter lighting be a minimum of 3 Foot Candles and area lighting a minimum of 2 Foot Candles. Check local municipalities to ensure these light levels do not violate and codes or statutes.

6.0 Hazard Analysis

6.1 Preliminary Hazard Analysis

Each construction project that requires input from a professional service (architect or engineer) undergoes a design review process. Part of this process is the development of Preliminary Hazard Analysis or PHA. A Safety and Security Working Group (SSWG) reviews the PHA and determines if the risk is acceptable or should be mitigated.

Once the project has been turned over to UTA for pre-revenue operations, the operators and operational safety administrator take over the hazard assessment. This is referred to as the Operational Hazard Assessment or OHA. Further description of the PHA, OHA, TVA, and SSWG are in the UTA TASP.

Contractors should have an awareness of the PHA-OHA process. Throughout the project, the SSWG may tour the site without notice as long as the individuals are properly attired and briefed. Additionally, the SSWG can make recommendations via the PHA to the UTA Project Manager that may result in a change order or directive.

6.2 Job Safety Briefings

Prior to starting a new or unfamiliar task, the contractor is responsible for performing a Job Safety Briefing with employees. This briefing should familiarize everybody with the task, tools, techniques, procedures, and risks or hazards. The Superintendent or Foreman usually leads these briefings and may include these briefings in the Toolbox/tailgate talks.

Appendix A: Applicable Governmental Agency and Industry Safety Standards

The contractor shall comply with the safety requirements and provisions of the following agencies, codes, laws, and regulations:

- Federal Railroad Administration (FRA) Safety Rules and Regulations as applicable
- 29 CFR 1910 and 29 CFR 1926 Occupational Safety and Health Act
- 49 CFR 214 Roadway Worker Protection Act
- MUTCD - Manual on Uniform Traffic Control Devices
- NEC - National Electrical Code
- NFPA - National Fire Protection Association
- NIOSH - National Institute of Occupational Safety and Health
- ANSI - American National Standards Institute
- UBC - Uniform Building Code
- IBC – International Building Code, when applicable
- EPA - US. Environmental Protection Agency (EPA)
- UOSH - UTAH OSHA R574
- 49 CFR 655 – Drug and Alcohol Use in Transit Operations
- 49 CFR 40 – Drug and Alcohol Testing Programs
- Chapter 38 of the Utah Code

Appendix B: Monthly Safety Report/Contract Document

Contractor's Name:_____ Contract No. _____

Period Covered (Month and Year):_____

Name of Contractor's Safety Manager:_____

Item	Contract Total This Month	Contract Cumulative Total for Year
No. Hours Worked (Construction & Office)		
No. Lost Workday Cases (Entire Shift Lost)		
No. Restricted Workdays (Partial Shift Lost or reassigned to "light" duty)		
No. Cases Requiring Medical Attention		
No. Cases Recordable		
No. Fatalities		
No. On-Site Safety Meetings		
No. On-Site Equipment Accidents		
No. Vehicle Accidents, including off-site accidents by Contractor vehicles working on Contract		
No. New Workers on Site During Period		
No. Workers Safety Orientation		
No. Supervisor/Foreman Safety Sessions		
No. Site Safety Inspections		

1. Describe circumstances surrounding each lost workday and each fatality case.

2. Describe actions taken and/or planned to prevent reoccurrence.

Signed for the Contractor:

_____ _____

(Signature) (Signature)

_____ _____

(Printed or typed name) Safety Manager (Printed or typed name) Project Manager

_____ _____

(Date) (Date)

Appendix C: PPE Visual Guide

	**Mandatory PPE unless otherwise noted below is Hardhat, Safety Glasses, Safety Vest & Steel/Composite Toe Work Boots** (Rail crews are also required to wear metatarsal foot protection at all times)								
Drills							PEL=Permissible Exposure Limit		
	 (If above PEL)	 (if flying debris)		 (If above PEL)					
		 (If above PEL)	 (if flying debris)		 (If above PEL)				
									
Saws									
	 Concrete						 If above PEL)		
	 Metal								
			 (If above PEL)						
									
						 (If above PEL)			
									
									
Pneumatic	(jack hammers, chipping guns, rivet busters, impact wrenches, scalers, tie tampers, nail guns)								
						 (if visible dust)	 If above PEL)		
				 Anti-vibration			 (if visible dus	 If above PEL)	
									
									

Grinder									
								 If above PEL)	
Percussion	(hammers, hammer drills, rotary hammers)								
						 If above PEL)			
Router									
									
Welding Machine									
							 (if above PEL)		
Cutting Torch									
							 (if above PEL)		
Compactors									
									
									
Vacuum Truck									
									
Concrete Vibrator									
									
Pressure Washer