

**City and County of San Francisco
Municipal Transportation Agency
One South Van Ness 7th Floor
San Francisco, California 94107**

**Amendment One to
Agreement between the City and County of San Francisco and
AnsaldoBreda Inc.**

LRV Doors and Steps Reconditioning and Systems Rehabilitation

This Amendment is made this 2nd day of June, 2010, in the City and County of San Francisco, State of California, by and between: AnsaldoBreda Inc., a Delaware corporation ("Contractor"), and the City and County of San Francisco, a municipal corporation ("City"), acting by and through its San Francisco Municipal Transportation Agency ("SFMTA") (collectively, the "Parties").

Recitals

A. On or about October 29, 2009, City and Contractor entered into Contract No. APT 591-01 for reconditioning the doors and steps and rehabilitating systems in 143 of SFMTA's light rail vehicles ("Contract" or "Agreement").

B. The Parties wish to amend the Contract to incorporate rehabilitation of the trucks of 34 LRVs and extend the term of the Contract by one year, as well as to correct errata and make several administrative changes to the Contract.

NOW, THEREFORE, Contractor and the City agree as follows:

- 1. The Definitions section of the Agreement is deleted and replaced with the following:**

Definitions

Where any word or phrase defined below, or a pronoun used in place thereof, is used in any part of the contract documents, it shall have the meaning set forth herein.

Acceptance: The formal written acceptance by the City and County of San Francisco that all work, or a specific portion thereof, under the contract has been satisfactorily completed.

Award: Notification from the City to Contractor of acceptance of Contractor's proposal, subject to the execution and approval of a satisfactory Contract therefore and bond to secure the performance thereof, and to such other conditions as may be specified or otherwise required by law.

Certification: Certification by the Controller that funds necessary to make payments as required under the contract are available in accordance with the City's Charter.

City: City and County of San Francisco, a municipal corporation.

Conditional Acceptance; Conditionally Accepted: The condition of a repaired Vehicle that, in the SFMTA's determination, does not meet the requirements for full acceptance,

but is authorized by the SFMTA to enter into revenue service, pending completion of all repairs.

Conformed Contract Documents: The contract documents revised to incorporate information included in the Contractor's Proposal and accepted by the City.

Contract; Agreement: The written Contract executed by the City and Contractor, covering the performance of the work and furnishing of labor, materials, equipment, tools, and services, including work incidental to the procurement, to include the RFP, Technical Specifications, all Conformed Contract Documents, Contractor's Proposal, the Contract bonds or other security, and all supplemental agreements entered into.

Contract Modification: A written order, issued by the City to Contractor, covering changes in the Contract documents within the general scope of the Contract and establishing the basis of payment and time adjustments for the work affected by the changes.

Contractor; Consultant: The Proposer to whom award is made.

Controller: Controller of the City.

Corrective Action Plan: The plan submitted by Contractor to correct Defects that have been determined by the SFMTA to be Fleet Defects, as defined in Section 65.7(a).

Days: Unless otherwise designated, the word "days" refers to working days of the City.

Defect(s): Patent or latent malfunctions or failure in manufacture or design of any component or subsystem.

Director of Capital Programs and Construction: The Division Director in charge of the Capital Programs and Construction Division of the SFMTA.

Engineer: The SFMTA Resident Engineer assigned to the Contract or designated agent.

LRV or Vehicle: A light rail vehicle subject to repair under this Contract.

Muni: The San Francisco Municipal Railway, the public transit system of the City under the supervision and control of the San Francisco Municipal Transportation Agency.

Notice To Proceed: A written notice to the Contractor of the date on which it shall begin prosecution of the work to be done under the contract.

Proposal: The technical and management information and prices submitted in response to the Request for Proposals.

Request for Proposals; RFP: The Request for Proposals issued by the SFMTA on May 6, 2009, for LRV Doors, Steps and Systems Rehabilitation.

Senior Program Manager: The SFMTA staff person assigned to manage the Contract for the SFMTA, or designated agent.

SFMTA: The San Francisco Municipal Transportation Agency, an agency of the City with responsibility for the Municipal Railway Department and Parking and Traffic.

Subcontractor: Any individual, partnership, firm, or corporation, which undertakes integrally on the Project the partial or total design, manufacture, or performance of one or more items of work under the terms of the contract. As used herein, the terms subcontractor and supplier are synonymous.

Technical Specifications: The specifications, provisions, and requirements that detail the work and the materials, products (including the methods of manufacture, construction, assembly, and testing), and other requirements relative thereto.

Work: The furnishing of all labor, supervision, services, products, materials, machinery, equipment, tools, supplies, and facilities and the performance of all requirements called for by the Contract and necessary to the completion thereof.

Work Program: The plan submitted by Contractor to correct a declared Fleet Defect in all LRVs that have not experienced the Defect.

2. Section 2 of Agreement (Term of the Agreement) is amended to read as follows:

2. Subject to Section 1, this Agreement shall commence on the Effective Date and terminate six years thereafter.

3. Section 5 (Compensation) is deleted and replaced with the following:

5. Compensation

5.1 **Amount of Contract.** In no event shall the amount of this Agreement exceed Sixty-Eight Million, Seven Hundred Forty-Nine Thousand, Four Hundred Twenty-One Dollars (\$68,749,421)

5.2 **Price Breakdown.** The breakdown of costs associated with this Agreement appears in the Price Schedule (Exhibit C) and Payment Schedule (Exhibit D), incorporated by reference as though fully set forth herein. The unit prices in Exhibit C represent the costs for each Vehicle if the Vehicle requires the entire scope of Work listed in Item Nos. 1.1 through 1.6. However, if after inspection of a Vehicle pursuant to Section TP10.03 of the Technical Specifications and design review under Section 61.4, the SFMTA determines that the Vehicle requires only a portion of the scope of Work in a particular Item No., the unit price of the Item No., and the resultant cost of the Work on each Vehicle, shall be reduced after negotiations with Contractor.

5.3 **SFMTA Approval of Work.** No charges shall be incurred under this Agreement nor shall any payments become due to Contractor until reports, services, or both, required under this Agreement are received from Contractor and approved by SFMTA as being in accordance with this Agreement. City may withhold payment to Contractor in any instance in which Contractor has failed or refused to satisfy any material obligation provided for under this Agreement.

5.4 **No Interest; Price Adjustments.** In no event shall City be liable for interest or late charges for any late payments. City will not make price adjustments to this Contract to protect Contractor from economic inflation.

4. Section 15.1(d) is amended to read as follows:

All policies (and bonds, as described in Section 15.2 below) shall provide 30 days' advance written notice to City of cancellation or reduction in coverage for any reason, mailed to the following address:

San Francisco Municipal Transportation Agency
1 South Van Ness Avenue,
3rd Floor San Francisco, CA 94103
Attention: Elson Hao
Contract No. APT 591-01 (CCO 09-1076)

5. Section 49 (Authority of Engineer) is amended to read as follows:

The Engineer shall decide all questions, which may arise as to the quality or acceptability of materials furnished and work performed and as to the manner of performance and rate of progress of the work; all questions, which may arise as to the acceptable fulfillment of the Contract on the part of the Contractor; and all questions as to compensation. In discharging the responsibilities outlined above, the Engineer shall at all times act fairly and reasonably. Any appeal of the Engineer's decisions shall be in accordance with the provisions of Section 55 of this Agreement. As with any claim, change, extra or additional work, Contractor shall be paid in accordance with the payment provisions of this Contract when the dispute is finally resolved.

Should any questions arise as to the meaning and intent of the Contract, the matter shall be referred to the Engineer, who, with input from SFMTA staff and from the Contractor, shall decide the true meaning and intent of the Contract. The Engineer's decision in this regard shall be administratively final and conclusive.

6. Sections 55.2 (Resolution of Disputes) and 55.3 (No Cessation of Work) are amended to read as follows:

55.2 Resolution of Disputes. Disputes arising in the performance of this Agreement that are not resolved by negotiation between the SFMTA Liaison and Contractor shall be decided in writing by the SFMTA Senior Program Manager. The decision shall be administratively final and conclusive unless within ten (10) days from the date of such decision, the Contractor mails or otherwise furnishes a written appeal to the Director of Capital Programs and Construction, or his/her designee. In connection with such an appeal, the Contractor shall be afforded an opportunity to be heard and to offer evidence in support of its position. The decision of the Director of Capital Programs and Construction shall be administratively final and conclusive. This section applies to all disputes unless a specific provision of this Agreement provides that the Engineer's decision as to a particular dispute is final.

55.3 No Cessation of Work. Pending final resolution of a dispute hereunder, the Contractor shall proceed diligently with the performance of its obligations under this Agreement in accordance with the written directions of the Engineer.

7. Subsection (b) (Remedy) of Section 64.7(Fleet Defects) is amended to read as follows:

(b) Remedy. The Contractor shall correct a fleet defect under the warranty provisions defined in "Repair Procedures" (Section 65). Within 30 days of receipt of notification of a Fleet Defect, the Contractor shall provide the SFMTA with a Corrective Action Plan, subject to approval by SFMTA, specifying how and when all LRVs with Defects shall be corrected. No later than 10 days after correcting the Defects, the Contractor shall submit a proposed Work Program reasonably designed to prevent the occurrence of the same Defect in all LRVs remaining to be repaired, and, if applicable, spare parts purchased under this Contract. The Work Program shall specify how and when the corrective work in all remaining LRVs will be performed. If SFMTA requires changes to a Corrective Action Plan or Work Program in order to approve it, Contractor shall submit the revised Plan or Program within five days after SFMTA requests such changes. Where the specific Defect can be solely attributed to particular identifiable part(s), the Work Program shall include redesign and/or replacement of only the defectively designed and/or manufactured part(s). In all other cases, the work program shall include inspection and/or correction of all of the LRVs in the fleet via a mutually agreed to arrangement. Any Contractor-proposed changes to a Fleet Defect Corrective

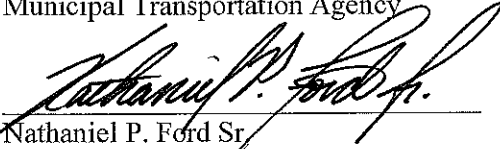
Action Plan or Work Program must be submitted to the SFMTA for approval. If (a) Contractor does not provide a Corrective Action Plan or Work Program within the time specified above (or as extended by SFMTA), or (b) Contractor does not submit revisions to a Corrective Action Plan or Work Program as requested by the SFMTA, or (c) Contractor does not fully correct a specific declared Fleet Defect within the time specified in the Corrective Action Plan or in the Work Program, SFMTA will assess liquidated damages in accordance with Section 19 of this Agreement.

- 8. Exhibit B of the Agreement is deleted and replaced by a new Exhibit B, attached to this Amendment and incorporated by reference as though fully set forth.**
- 9. Exhibit C of the Agreement is deleted and replaced by a new Exhibit C, attached to this Amendment and incorporated by reference as though fully set forth.**
- 10. Exhibit D of the Agreement is deleted and replaced by a new Exhibit D, attached to this Amendment and incorporated by reference as though fully set forth.**
- 11. The Technical Specifications are amended to add Section TP05M1 Truck and Suspension Systems, which is attached to this Amendment and incorporated by reference as though fully set forth.**

IN WITNESS WHEREOF, the parties hereto have executed this Agreement on the day first mentioned above.

CITY

Municipal Transportation Agency


Nathaniel P. Ford Sr.
Executive Director/CEO

Municipal Transportation Agency
Board of Directors

Resolution No. 10-042

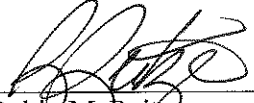
Dated: 4/6/10

Attest: 
R. Boomer

Secretary

Approved as to Form:


Dennis J. Herrera
City Attorney

By 
Robin M. Reitzes
Deputy City Attorney

Board of Supervisors

Resolution No. 250-10

Dated: 6/02/2010

Attest: 
A. S. Galindo

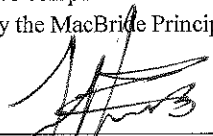
Clerk of the Board

CONTRACTOR

AnsaldoBreda Inc.

By signing this Agreement, I certify that I comply with the requirements of the Minimum Compensation Ordinance, which entitle Covered Employees to certain minimum hourly wages and compensated and uncompensated time off.

I have read and understood paragraph 35, the City's statement urging companies doing business in Northern Ireland to move towards resolving employment inequities, encouraging compliance with the MacBride Principles, and urging San Francisco companies to do business with corporations that abide by the MacBride Principles.


Lorenzo Reffeger
Vice President, Marketing, Sales and Service
1461 Lovelidge Road
Pittsburg, CA 94565

City vendor number: 41208

EXHIBIT B
PROJECT DELIVERY SCHEDULE

Delivery of 143 Rehabilitated Light Rail Vehicles and Associated Deliverables

DELIVERY MILESTONE		AFTER NTP
a. Acceptance of Management Work Plan, Master Baseline Schedule	+30	30 days
b. Delivery of Pilot LRV ready for acceptance testing no later than	+150	180 days
c. Delivery of successful testing and Conditional Acceptance of the Pilot Car no later than	+30	210 days
d. Completion of successful testing and Conditional Acceptance of Second car	+60	270 days
e. Completion of successful testing and Conditional Acceptance of 143 rd car	+1110	1380 days

Milestone requirements detailed in Section 67 of the Contract and in Section TP01.08 of the Technical Provisions.

**EXHIBIT C
PRICE SCHEDULE**

FOR SFMTA REHABILITATION OF IDENTIFIED SUBSYSTEMS FOR 143 LRVs

Item No.	Description	Qty.	Unit Price	Total Price
1.	Rehabilitation of Couplers, Truck, Air Supply Units, Doors and Steps, Articulation Wiring and harnesses for 143 LRVs including manuals, CDRLs, Transport of Vehicle to Contractor facility and return to SFMTA facility, Site Support & Warranty*			
1.1	Rehabilitated couplers (electrical and mechanical) complete assembly (A)	143	\$53,500	\$7,650,443
1.2	Rehabilitated doors and steps complete assembly (B)	143	\$203,963	\$29,166,640
1.3	Replacement PSC-2 Wiring Harnesses (C)	143	\$6,860	\$980,980
1.4	Re-designed new articulation wiring and harnesses complete assembly (D)	143	\$37,306	\$5,334,726
1.5	Rehabilitated air supply units complete assembly (E)	143	\$24,003	\$3,432,425
1.6.	Replacement of Center Pins and Traction Motor Bearings (F)	143	\$11,210	\$1,602,991
1.7	Program Management, Engineering, QA Support (G)			\$2,813,410
Subtotal of Item 1 (A+B+C+D+E+F+G)				\$50,981,615
2.	Rehabilitate Motored and Non-Motored Trucks (H) of the LRVs	34	\$334,223.18	\$11,363,588.10
3.	Training 35 SFMTA employees and trainers on the operations and maintenance of supplied equipment including training on the use of special tools and software as applicable and manuals (I)	Lump Sum		\$20,000

4.0	Spare Parts For 143 LRVs			
4.1	Rehabilitated couplers (electrical and mechanical) complete assembly (SFMTA will provide cores) (J)	10	26,750	267,498
4.2	Rehabilitated doors and steps complete assembly (K)	2	181,165	362,329
4.3	Replacement PSC-2 Wiring Harnesses (L)	1	6,859	6,859
4.4	Re-designed new articulation wiring and harnesses ; a. Jumper Cables b. Bulkhead Connectors			
	Articulation Wiring Spares a+b (M)	10	21,871	218,708
Subtotal of Spares (J+K+L+M)				\$855,394
5.	Allowance for latent or unforeseen mechanical conditions			\$2,000,000
6.	Sales tax on materials (reimbursable)			\$3,528,823.90
	CONTRACT TOTAL (1+2+3+4+5)			\$68,749,421

EXHIBIT D
PAYMENT SCHEDULE

1. Rehabilitation of 143 Light Rail Vehicles

1a.	Approval of Contractor's Management Work Plan and Program CDRL's (Program CDRL's as defined in section TP15 Deliverables Summary)	5% of the amount of Line Item 1 of Price Schedule (30% of the amount to be paid upon delivery of the Work Plan and all CDRLs to SFMTA and 70% to be paid upon approval of the Work Plan and all CDRLs by SFMTA)
1b.	Proof of ordering Major Parts and Assemblies including Couplers, Trucks, Air Supply Units, Doors and Steps, Articulation Wiring and harnesses, (Based on presentation of executed purchase orders)	Not to exceed 25% of the amount of Line Item 1 of Price Schedule
1c.	Delivery of car to Pittsburgh	20% of the amount of Line Item 1 of Price Schedule, on a per car basis
1d.	Completion of Pre-Shipment testing, and Release of car for shipment (Based on TP01.08 - Release for shipment Certificate)	20% of the amount of Line Item 1 of Price Schedule, on a per car basis.
1e.	Conditional Acceptance of each Vehicle (per Section 67.2 of Agreement) (Based on TP01.08 - Approval for Revenue Service Certificate)	20% of the amount of Line Item 1 of Price Schedule, on a per car basis.
1f.	Final Acceptance, delivery of all car-based deliverables, closure of all Corrective Actions (Based on Final Acceptance Certificate, per TP01.08)	5% of the amount of Line Item 1 of Price Schedule, on a per car basis.
1g.	Closure of all contract deliverables by SFMTA (Based on Contract Closeout Certificate TP01.08)	5% of the amount of Line Item 1 of Price Schedule

2. Rehabilitation of Trucks for 34 Light Rail Vehicles

2a.	Proof of ordering Major Parts and Assemblies (Based on presentation of executed purchase orders)	Not to exceed 30% of the amount of Line Item 2 of Price Schedule
2b.	Delivery of car to Pittsburgh	20% of the amount of Line Item 2 of Price Schedule, on a per car basis
2c.	Completion of Pre-Shipment testing, and Release of car for shipment (Based on TP01.08 - Release for shipment Certificate)	20% of the amount of Line Item 2 of Price Schedule, on a per car basis
2d.	Conditional Acceptance of each Vehicle (per Section 67.2 of Agreement) (Based on TP01.08 - Approval for Revenue Service Certificate)	20% of the amount of Line Item 2 of Price Schedule, on a per car basis.
2e.	Final Acceptance, delivery of all car-based deliverables, closure of all Corrective Actions (Based on Final Acceptance Certificate, per TP01.08)	10% of the amount of Line Item 2 of Price Schedule, on a per car basis.

3. Training

3a.	Delivery and Approval of Training Plan	15% of the amount of Line Item 3 of Price Schedule
3b.	Completion of all training	80% of the amount of Line Item 3 of Price Schedule

3c.	Final acceptance of all contract deliverables	5% of the amount of Line Item 3 of Price Schedule
-----	---	---

4. Spare parts

Spare parts delivered and accepted by SFMTA in San Francisco shall be paid according to the detailed list in Line Item 4 of Price Schedule

NOTE: Payment for the rehabilitation work will occur upon completion of listed items on this Payment Schedule, upon proper receipt of an invoice requesting payment and acceptable completion of all contract terms. Sales taxes shall be reimbursed quarterly based on evidence of payment to the California State Board of Equalization.

**TECHNICAL SPECIFICATIONS
(TECHNICAL PROVISIONS)**

SECTION TP05M1

**CONTRACT MODIFICATION #1 FOR
TRUCKS AND SUSPENSION SYSTEMS**

March 10, 2010
Rev. 0

Section TP05M1: Table of Contents

SECTION TP05M1
TRUCK AND SUSPENSION SYSTEMS

TABLE OF CONTENTS

Section	Page
TP05M1: TRUCKS AND SUSPENSION SYSTEMS	1
<u>TP05M1.01</u> <u>GENERAL</u>	1
<u>TP05M1.02</u> <u>SCOPE OF WORK</u>	1
<u>TP05M1.03</u> <u>OVERHAUL REQUIREMENTS</u>	1
<u>A.</u> <u>Terminology</u>	1
<u>B.</u> <u>Hardware/Fasteners</u>	1
<u>C.</u> <u>Labels</u>	2
<u>D.</u> <u>Overhaul Criteria</u>	2
<u>E.</u> <u>Disassembly, Cleaning & Storage</u>	2
<u>F.</u> <u>Structural Inspection and repair</u>	2
<u>TP05M1.04</u> <u>NEW COMPONENTS AND/OR ASSEMBLIES</u>	2
<u>A.</u> <u>100% Replacement</u>	2
<u>B.</u> <u>As- Needed Replacement</u>	3
<u>TP05M1.05</u> <u>OVERHAULED COMPONENTS AND ASSEMBLIES</u>	3
<u>A.</u> <u>Motors (power truck)</u>	3
<u>B.</u> <u>Gear units and coupling (power truck)</u>	3
<u>C.</u> <u>SAV valves</u>	3
<u>D.</u> <u>Brake calipers</u>	4
<u>E.</u> <u>Track brakes springs and guides</u>	4
<u>TP05M1.06</u> <u>PIPING</u>	4
<u>TP05M1.07</u> <u>ODOMETER</u>	4
<u>TP05M1.08</u> <u>PAINT</u>	4
<u>TP05M1.09</u> <u>REPLACEMENT OF SUSPENSION COMPONENTS</u>	4
<u>TP05M1.10</u> <u>MISSING PARTS</u>	4
<u>TP05M1.11</u> <u>ASSEMBLY, INSTALLATION & ADJUSTMENT, AND TESTING OF EQUIPMENT</u>	4
<u>A.</u> <u>Assembly</u>	4
<u>B.</u> <u>Installation & Adjustment</u>	5
<u>C.</u> <u>Testing</u>	5
<u>1.</u> <u>Pre-Possession Test</u>	5
<u>2.</u> <u>Acceptance Testing</u>	5
<u>D.</u> <u>First Article Inspection</u>	5
<u>TP05M1.12</u> <u>CONTRACT DELIVERABLE REQUIREMENTS LIST</u>	5



TP05M1: TRUCKS AND SUSPENSION SYSTEMS

TP05M1.01 GENERAL

The work described in this section shall apply only to 34 LRVs and shall be in addition to the work required in Section TP05 – Truck Assemblies of the original Contract.

TP05M1.02 SCOPE OF WORK

The Contractor shall remove, disassemble, inspect, repair, replace, overhaul, reassemble, test and reinstall the components of the trucks and suspension systems of the LRVs as specified herein. These specifications apply to both motored and non-motored trucks of the LRV.

TP05M1.03 OVERHAUL REQUIREMENTS

A. Terminology

Whenever the term “overhaul” is used herein, it shall mean the level of effort designated for a component or assembly, including, but not limited to, cleaning, refinishing, repair, or replacement.

Whenever the term “replace in kind” is used herein, it shall mean replacement with identical OEM parts, or SFMTA-approved equal. The SFMTA is not obligated to accept other than OEM parts, unless the OEM part is obsolete, and may require the Contractor to perform whatever reasonable verification activities as needed in order to demonstrate that the alternative is acceptable based on its being equivalent or superior to the OEM part per Section 1.04.C.1 of these Technical Provisions.

The costs associated with proving that an alternative is equivalent or superior to an OEM part shall be borne by the Contractor.

Whenever the term “replace” is used herein, it shall mean replacement with components compliant with applicable material and workmanship standards. This term is utilized primarily for hardware, where compliance with applicable standards is sufficient to demonstrate equivalence to the OEM part.

Whenever the term “reuse” is used herein, it shall mean disassemble, clean, inspect, verify, refinish and lubricate as needed, reassemble, and reinstall onto the overhauled assemblies; this term reflects estimation that none will require replacement, unless otherwise specified.

B. Hardware/Fasteners

All hardware and fasteners, including, but not limited to, screws, bolts, nuts, clips, washers, lock-washers, shrink wrap, c-clips, tie straps, shaft-keys, springs, shrinkable tubing, cotter pins, retaining rings, bushings, roll pins, clips, gaskets, and etc., on, or in, overhauled assemblies, components, or parts, shall be replaced unless identified for reuse herein.



C. Labels

The Contractor shall apply labels to the truck, gearbox and traction motor to indicate when it was overhauled. The labels shall be of the same type as the OEM labels currently installed on the equipment. The quantity and locations of labels shall be similar to the original labeling arrangement, per the labeling requirement in TP1.07.O of these Technical Specifications.

D. Overhaul Criteria

The Contractor shall follow the truck repair and overhaul criteria of the San Francisco Muni LRV2 Heavy Repair and Workshop Manual, Section 3 "Trucks and Suspension."

The Contractor shall follow the traction motor overhaul criteria of section 4, "Propulsion and Electronic Controls."

The Contractor shall follow the track brake overhaul criteria of section 16 "Brakes."

E. Disassembly, Cleaning & Storage

The Contractor shall disassemble the truck and clean all reusable components. Non reusable components shall be properly disposed of.

Parts waiting reassembly shall be tagged and properly stored.

F. Structural Inspection and Repair

The Contractor shall strip/clean down to clean paint and visually inspect the truck frame, bolster beam, connecting rods, axles and hubs for dimensional accuracy and inspect for cracks. All cracks found shall be documented in the truck history book and repaired as provided below.

The Contractor shall inspect all mating surfaces of the truck frame, threaded attachment points, and permanently affixed brackets for damage. All damage found shall be documented in the truck history book and repaired as provided below.

The Contractor shall notify and obtain SFMTA approval prior to performing any repairs under this Section. Such repairs shall be deemed as extra work under Section 48.2 of the Agreement.

TP05M1.04 New Components and/or Assemblies

The Contractor shall remove, replace in-kind, and install the following components or assemblies on all LRVs under Amendment No. One to the Agreement.

A. 100% Replacement

1. Journal axle bearings
2. Shock absorbers
3. Grounding cables
4. Primary suspension (latest configuration)
5. Secondary suspension (air bags)
6. Brake caliper suspension bushings
7. Pilot bar/antenna bar mounts (latest configuration)
8. Leveling valve and hardware



9. Air hoses (Knorr)
10. Knorr test fittings (cut-out cock)
11. Wiring harnesses
12. Traction rod rubber element
13. Flexible pads (GE)
14. Connecting rod rubber elements GE
15. Miscellaneous rubber components
16. Lateral bump stop
17. Slewing Ring
18. Lubrication
19. Truck cleaning and waste disposal

B. As- Needed Replacement

The Contractor shall remove, replace in-kind, and install the following components and assemblies. The number in parenthesis (##) indicates the quantity of vehicles the components or assemblies of which are estimated to be replaced under this Amendment. If the quantity of components replaced is less than the estimated quantity, Contractor shall deliver the unused quantity to SFMTA, and title to those components shall pass to the SFMTA. If the quantity of components replaced is more than the estimated quantity, the SFMTA will provide those components to the Contractor or compensate Contractor for the additional cost of the components.

1. Steel tires, rubber isolators and shunts (50% - the steel tires shall be replaced when the diameter is below 26.75 inches)
2. Ground brush assemblies (10%)
3. Gear unit coupling (both halves and sleeves) (35%)
4. Antenna receiver/transmitter (Alcatel) (10%)
5. Tachometers (10%)
6. Brake disc (15%)
7. Drive axles (10%)
8. Idler axles (10%)
9. Aluminum wheel centers (10%)
10. Miscellaneous hardware replacement (35%)
11. Air tanks (2%)
12. Air fittings and piping (25%)

TP05M1.05 Overhauled Components and Assemblies

The Contractor shall remove, overhaul, and reinstall the following truck components and assemblies.

Rebuilt components shall meet the requirements for adjustment and testing of section 3, "Trucks and Suspension," of the LRV2 Heavy Repair and Workshop Manual, except for the traction motors, which shall meet the requirements of section 4, "Propulsion and Electronic Controls," and the track brake, which shall be rebuilt according to section 16 "Brakes."

A. Motors (power truck)

B. Gear units and coupling (power truck)



C. SAV valves

D. Brake calipers

E. Track brakes springs and guides

TP05M1.06 Piping

The Contractor shall clean, inside and out, and reuse piping that is not damaged. The Contractor shall replace damaged piping with new piping.

TP05M1.07 Paint

The Contractor shall touch-up paint, low gloss black, the truck frame, bolster beam, air tanks, vertical bump stop brackets, pilot/antenna bar brackets, derail alarm sensor bracket, and journal box caps where bare metal is exposed.

TP05M1.08 Replacement of Suspension Components

The Contractor shall replace suspension-related components with the identical original replacement component if available or an upgraded version that has been used in existing SFMTA trucks. If the original-type component is not available, the Contractor shall source a substitute part which still meets the suspension requirements of the LRV conformed specification # 309 for leveling, natural frequency, motion damping-ride quality, displacement criteria-body roll, and load weigh adjustment.

TP05M1.09 Assembly, Installation & Adjustment, and Testing of Equipment

Refer to TP10 Inspection and Testing for the detailed requirements for the test and inspection program, as well as the CDRLs associated with the inspection and testing of the trucks and suspension system.

A. Assembly

The overhauled equipment shall be assembled using procedures developed in accordance with the HRWM manuals. Assembly procedures shall include any intermediate testing and/or functional verifications required to ensure that the assembled components will function properly. Each assembly shall have sign-off sheets for workers to document that their efforts were conducted in accordance with applicable procedures, and aid in failure and/or quality assurance investigations; pass/fail entries shall be required in the sign-off sheet for all required intermediate tests and/or functional verifications performed by the assembler, including the proper application of torque marks. Multiple components may be included on tabulated sign-off sheets with approval of the Authority. Sign off sheets [CDRL 5-001] shall be submitted for inclusion in the Car History Book.

B. Installation & Adjustment

The overhauled equipment shall be installed and adjusted using procedures developed in accordance with the HRWM manuals. Each installation shall have sign-off sheets for workers to document that their efforts were conducted in accordance with applicable procedures, and aid in failure and/or quality assurance investigations; pass/fail entries shall be required in the sign-off sheet for all required intermediate tests and/or functional verifications performed by the installer.



C. Testing

1. Pre-Possession Test

The Contractor shall confirm before taking possession of the vehicle that the two Automatic Train Control (ATCS) Receive Antennae, the two ATCS Transmit Antennae, the truck tachometers and the truck caliper brake release switches are functioning by conducting an ATCS Yard Departure Test on the SFMTA's Track 1 at the Green facility. This test shall be Incorporated into the pre-overhaul test procedure and report referenced in TP10 of these Technical Provisions.

SFMTA personnel will operate the LRV during the test, and the Contractor shall conduct the test. All testing activities and documentation shall be compliant with TP10 Inspection and Testing section of these Technical Specifications.

2. Acceptance Testing

Upon redelivery of the LRV to the SFMTA, the LRV shall be subject to acceptance tests as required by Section TP10 of these Technical Specifications, including identification of CDRLs. After passing the test, the Contractor shall provide and sign an acceptance test report.

TP05M1.10 CONTRACT DELIVERABLE REQUIREMENTS LIST

CDRL #	Title	Reference Paragraph
5-001	Sign-off Sheets	TP05M1.11A

End of Section