

LOS ANGELES COUNTY

METROPOLITAN TRANSPORTATION AUTHORITY

LIGHT RAIL VEHICLE

P2550

**RUNNING
MAINTENANCE
AND
SERVICE MANUAL**

**SECTION 12
TRUCKS & SUSPENSIONS**



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**RUNNING MAINTENANCE
AND
SERVICE MANUAL**

**VOLUME M-01
PART I
THEORY OF OPERATION
SECTION 12 - TRUCKS AND SUSPENSIONS**

SECTION 12

TRUCKS AND SUSPENSIONS

PART I

THEORY OF OPERATION

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SECTION 12

TRUCKS AND SUSPENSIONS

12-I-01 INTRODUCTION

This Section of the Running Maintenance and Service Manual is divided into three Parts:

- Part I: Theory of Operation
- Part II: Troubleshooting
- Part III: Maintenance

Each Paragraph is numbered accordingly, to avoid that paragraphs of the same Section, pertaining to a different Part, have the same number.

Part I - Theory of Operation

Part I gives a thorough overview of the System structure and operation, by means of descriptions, figures, photos, schematics, block diagrams and flow charts, together with references to other documents or Sections when needed.

Part II - Troubleshooting

It gives the Maintenance Technicians a path to troubleshoot the System in every condition by means of the available tools:

- The PTU, equipped with the specific SW program
- The IDU
- The Fault Isolation Table

The Part III - Maintenance consists of:

- Preventive Maintenance
- Corrective Maintenance
- Consumable Materials
- Test Equipment , Tools & Special Tools

12-I-01.a LIST OF ABBREVIATIONS, ACRONYMS AND SYMBOLS

The Abbreviations, Acronyms and Symbols commonly used throughout this manual are given below with their related meaning.

Abbreviation	Meaning
ASME	American Society of Mechanical Engineers
ASU	Air Supply Unit
ATP	Automatic Train Protection
BCF	Breda Costruzioni Ferroviarie
BCU	Brake Control Unit
CL.....	Center Line
DIA	Diameter
DTE	Diagnostic Test Equipment
ECU.....	Brake Electronic Control Unit
Fig./fig.....	Figure
FWD	Forward
HRMM	Heavy Repair and Maintenance Manual
HSCB	High Speed Circuit Breaker
HV	High Voltage
HVAC	Heating Ventilation & Air Conditioning
IPC	Illustrated Parts Catalog
IWD	Integrated Wiring Diagrams
LH.....	Left Hand
LRV	Light Rail (Transit) Vehicle
LV.....	Low Voltage
LVPS	Low Voltage Power Supply
Max.....	Maximum
MBL.....	Metro Blue Line
MFR.....	Manufacturer
Min.....	Minimum
MR.....	Main Reservoir
P/N	Part Number
para(s).....	Paragraph(s)
PGL	Pasadena Gold Line
Qty.....	Quantity
RH	Right Hand
RMSM	Running Maintenance and Servicing Manual
T.o.R.....	Top of Rail
TWC	Train to Wayside Communication

12-I-01.b LIST OF DEFINITIONS

The Definitions commonly used throughout this manual are given below with their related meaning.

Definition	Meaning
'A' body section.....	The section of an articulated vehicle containing the pantograph
'B' body section.....	The section of an articulated vehicle not containing the pantograph
AW0	Empty car operating weight
AW1	Full seated load plus AW0
AW2	Standees at 4 persons per square meter plus AW1
AW3	Standees at 6 persons per square meter plus AW1
AW4	Standees at 8 persons per square meter plus AW1
Front door	The door close to the Operator's Cab
Rear door	The door close to the Articulation Section
MC Handle	Master Controller Handle
"A" Cab (or Cab A).....	Operator Cab in the A body section
"B" Cab (or Cab B).....	Operator Cab in the B body section

12-I-01.c LIST OF MEASUREMENT UNITS AND SYMBOLS

The Measurement Units commonly used throughout this manual are given below with their related meaning.

Definition	Meaning
A	Ampere
ft	Foot
Ft-lb	Foot-Pound
gal.....	Gallon
in.....	Inch
kg.....	Kilogram - approx 2.205 pounds
km	Kilometer - approx 0.621 miles
kN	Kilo-Newton - approx 224.809 pounds force
kW	KiloWatt
l.....	Liter
lb.....	Pound
lb-ft	Pound force
m	Meter - approx 3.28 feet
mm	Millimeter - approx 0.0394 inches
Nm.....	Newton meter
PSI.....	Pounds per Square Inch
PSIG.....	Pounds per Square Inch Gauge
VAC.....	Volt Alternating Current
VDC.....	Volt Direct Current

12-I-02 THEORY OF OPERATION

12-I-02.01 General Description of the System

This document provides a general description of the trucks mounted on the P2550 LRVs and related sub-systems and of their operation.

The trucks mounted on the P2550 LRVs are designed to obtain high performances together with a high degree of safety and an excellent level of ride quality and good maintainability.

The P2550 LRV is equipped with three trucks (two Motor Trucks and one Trailer Truck) (Refer to Figure 12-I-02.1).

The trucks, each one of them equipped with the relevant Suspension System, support the vehicle loads and provide a comfortable ride to passengers. "A" and "B" Motor Trucks, equipped with Traction Motor Units, are located under the relevant vehicle section, while the Trailer Truck is located under the Articulation Section.

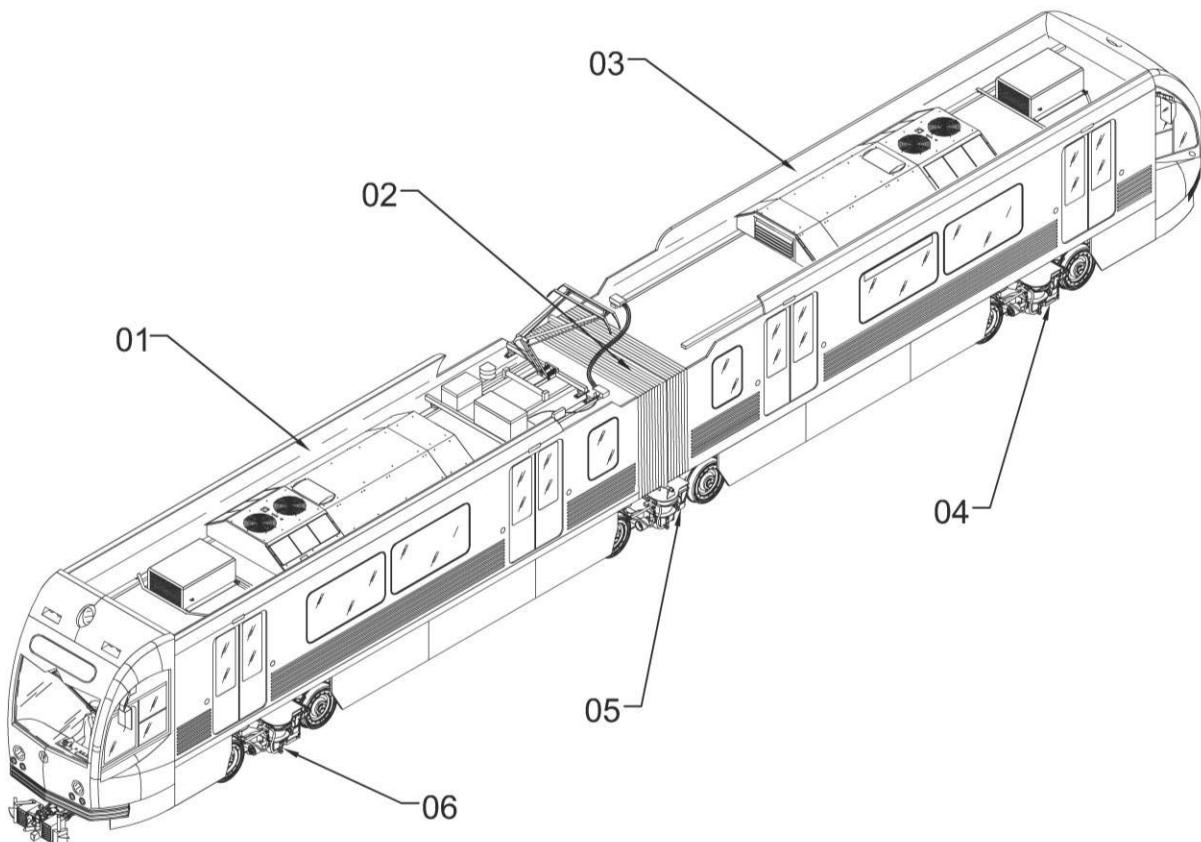
The Truck main components are:

- Slewing Ring, to connect the truck to the Car Body
 - Bolster Beam
 - Frame
 - Primary Suspension
 - Secondary Suspension
 - Wheel Set:

Motor and Trailer trucks are made of interchangeable components at the maximum possible extent, consistently with the different scope of the Motor and the Trailer truck.

Interchangeable components include:

- Journal Boxes
- Journal Bearings
- Wheels
- Primary Suspension
- Secondary Suspension components



01. "A" BODY SECTION
04. "B" MOTOR TRUCK

02. ARTICULATION SECTION
05. TRAILER TRUCK

03. "B" BODY SECTION
06. "A" MOTOR TRUCK

Figure 12-I-02.1 Vehicle Trucks - Location

i. System-Vehicle Relationship

The Trucks are the vehicle's feet while the Suspension System provides a comfortable ride to passengers.

The Truck and Suspension System main purposes are:

transferring the power from the traction motors to the rails through the wheels;
supporting the vehicle weight;

keeping the vehicle leveled at all times and making the ride safe and comfortable.

The two Car Body sections and the articulation section of the Car Body are connected to the three trucks through the relevant Ball Bearing Slewing Ring.

The Motor Truck Slewing Ring is a 2-raceway ball bearing, to be connected to the Car Body section and to the Bolster Beam.

The Trailer Truck Slewing Ring is a 3-raceway ball bearing, to be connected to the two Car Body sections and to the Trailer Truck Bolster Beam.

ii. System-Equipment Relationship

The Truck and Suspension System is made up of:

three Trucks (two Motor Trucks and one Trailer Truck)

the Suspension System relevant to each Truck.

The three Trucks support the weight of the vehicle: the two Motor Trucks support the relevant Car Body sections, while the Trailer Truck supports the Articulation Section.

The Ball Bearing Slewing Ring connects each truck to the relevant Bolster Beam from one side and to the Car Body to the other.

The Bolster Beam is connected to the Truck Frame by means of two Traction Rods and the Secondary Suspension.

The function of the Traction Rod is to restrain the Bolster Beam to the truck frame and to limit the relative movement.

The Primary Suspension is made up of the Journal Bearing Axle-Box (one per wheel) and the relevant two conical springs.

The purpose of the Primary Suspension is to transmit the vertical, lateral and longitudinal loads from the truck frame to the axle while reducing the shock loads to the truck frame, coming from the tracks.

The Secondary Suspension of each truck is made up of two Air Springs, two Shock Absorbers, the Vertical and Lateral Bump Stops, the Traction Rod.

The purpose of the Secondary Suspension is to transmit the load from the Bolster Beam to the Truck Frame and to control the relative movement.

iii. System Characteristics and Performances

Table 12-I-02.1 Motor Truck Technical Data

Characteristics	Description/values	
Type	Closed H Frame, inboard journal bearings	
Track Gauge (nominal)	1435 mm	56.496 in
Wheel Gauge Back to Back	1356 mm	53.386 in
Maximum Axle Load	12500 kg	27500 lbs
Wheel Base	2100 mm	86.677 in
Wheel Diameter (new)	711 mm	28 in
Wheel Diameter (worn)	660 mm	26 in
Clearance Under Truck	63.5 mm	2.5 in
Service Speed	105 kph	65 mph
Maximum Design Speed	113 kph	70 mph
Maximum Design Overspeed	120 kph	75 mph
Mass		
Truck Mass	6380 kg	14065 lbs
Unsprung Masses	2626 kg	5790 lbs
Primary Suspension	Two rubber conical each axle journal bearing box	
Suspension Base	1150 mm	45.28 in
Movements		
Vertical Down	24 mm	0.95 in
Vertical Up	18 mm	0.71 in
Lateral	8 mm	0.31 in
Longitudinal	5 mm	0.20 in
Secondary Suspension Movement		
Suspension Base	1850 mm	72.83 in
Traction Rods Base	1730 mm	68.11 in
Movements		
Vertical Down	35 mm	1.38 in
Vertical Up	35 mm	1.38 in
Lateral	38 mm	1.5 in
Longitudinal	5 mm	0.20 in

Table 12-I-02.1 Motor Truck Technical Data

Characteristics	Description/values	
Traction		
Gear Unit	Parallel Two-stages Gear Unit	
Gear Ratio	4.943:1	
Mass	390 kg	860 lbs
Traction Motor	Electric, self ventilated (axial air cooled)	
Motor Nominal Continuous Power (at 1,760 rpm)	145 kW	
Maximum Motor power (acceleration) (with maximum difference between wheel diameters of different axles of the same Motor Truck of 0.25 in)	219 kW	
Traction Motor Three-phase Short Circuit Torque	6700 Nm	4942 ft-lb
Traction Motor Phase to Phase Short Circuit Torque	7200 Nm	5310 ft-lb
Maximum Motor rpm	4200 rpm	
Limit Motor rpm	4520 rpm	
Mass	595 kg	1312 lbs
Brakes		
Caliper	2 Compact Tread Brake Units with Parking Brake	
Mass	77 kg	170 lbs
Disc	2 Disk Brakes 520x110	
Friction Radius	168 mm	6.614 in
Maximum Friction Force at the Pads	TBS	TBS
Mass	80 kg	176 lbs
Track Brake	2 Magnetic Track Brakes	
Truck Height at Carbody Interface	780 mm	30.71 in

Table 12-I-02.2 Trailer Truck Technical Data

Characteristics	Description/values	
Type	Closed H Frame, inboard journal bearings	
Track Gauge (nominal)	1435 mm	56.496 in
Wheel Gauge Back to Back	1356 mm	53.386 in
Maximum Axle Load	12500 kg	27500 lbs
Wheel Base	2100 mm	86.677 in
Wheel Diameter (new)	711 mm	28 in

Table 12-I-02.2 Trailer Truck Technical Data

Characteristics	Description/values	
Wheel Diameter (worn)	660 mm	26 in
Clearance Under Truck	63.5 mm	2.5 in
Service Speed	105 kph	65 mph
Maximum Design Speed	113 kph	70 mph
Maximum Design Overspeed	120 kph	75 mph
Mass		
Truck Mass	4490 kg	9,900 lbs
Unsprung Masses	2626 kg	5790 lbs
Primary Suspension	Two rubber conical each axle journal bearing box	
Suspension Base	1150 mm	45.28 in
Movements		
Vertical Down	24 mm	0.95 in
Vertical Up	18 mm	0.71 in
Lateral	8 mm	0.31 in
Longitudinal	5 mm	0.20 in
Secondary Suspension Movement		
Suspension Base	1850 mm	72.83 in
Traction Rods Base	1730 mm	68.11 in
Movements		
Vertical Down	35 mm	1.38 in
Vertical Up	35 mm	1.38 in
Lateral	38 mm	1.5 in
Longitudinal	5 mm	0.20 in
Brakes		
Caliper	4 Compact Tread Brake Units	
Mass	59.5 kg	131 lbs
Disc	4 Disk Brakes 520x110	
Friction Radius	168 mm	6.614 in
Mass	80 kg	176 lbs
Track Brake	2 Magnetic Track Brakes	
Truck Height at Carbody Interface	780 mm	30.71 in

Table 12-I-02.3 Tightening Torques

Description	Ft*lb	N*m	AB Database Reference
SLEWING RING			AA02THY
Slewing Ring Special Screw	205.8±5%	279±5%	
PRIMARY SUSPENSION			AA02THK
Hex Bolt M30x20	369	500	
Hex Bolt M10x30	52	70	
Hex Bolt 12x35	64	87	
SECONDARY SUSPENSION			AA02THT
Self Locking Nut M10 (Vertical Bump Stop)	106	144	
Self Locking Nut M12 (Lateral Bump Stop and Shock Absorber)	44	59	
Self Locking Nut M16 (Lateral Bump Stop and Shock Absorber)	25	34	
JOURNAL BEARING			
Threaded Plug	11±0.75	15±0.75	
WHEEL			AA02THH
Self Locking Screw (External Shunts)	7-9	9.5-12.2	
Socket Head Cap Screw	82-88	111-119	
TRACTION ROD			AA02TJ0
Adjustable Locknut	260	350	
Traction Resilient Ring	2.14	2.9	
FLANGE LUBRICATOR AND SAND NOZZLE (Motor Truck only)			AA045V0
Self Locking Nut M10	37.5±5%	51±5%	
Self Locking Nut M12	64±5%	87±5%	
AXLE COVERS			AA02THD
Hex Bolt M10x25	33	45	
BRAKE ATTACHMENTS			AA02TJ5
Screw M12 (Track Brakes)	64	87	
Self locking nut (Calipers)	236	320	

12-I-02.02 MOTOR TRUCK

The vehicle is equipped with two Motor Trucks installed under the "A" and "B" Body Sections.

Each Motor Truck is designed to make maintenance operations easier while all components of any Motor Truck are fully interchangeable with the components of any other Motor Truck of the P2550 LRV Series.

The Motor Truck main components are (Refer to Figure 12-I-02.2):

- Ball Bearing Slewing Ring
- Bolster Beam
- Truck Frame
- Primary Suspension
- Secondary Suspension
- Traction Rods
- Wheel Set

Miscellaneous Items:

- Tread and Flange Lubricators
- Pilot Bar
- Plates

Components pertaining to different Vehicle Systems (Refer to Figure 12-I-02.3) are also mounted on each Motor Truck:

Air Suspension System (refer to Section 13): Mean Pressure Valve, Leveling Valves, Duplex Check Valve, Air Reservoirs, Air Springs and Test Fittings (Refer to paragraph 12-I-02.04 of this Section for Description, Operation and Maintenance Procedures).

Propulsion System. The Propulsion System components installed on the motor truck are: Traction Motor Units, Ground Contacts and Gear Units (Refer to Section 07 of this Manual for Description, Operation and Maintenance Procedures).

Brake System. The Brake System components installed on the Motor Truck are: Brake Disks, Brake Calipers and Track Brakes (Refer to Section 13 of this Manual for Description, Operation and Maintenance Procedures).

Sanding System. The Sanding System components installed on the Motor Truck are only the Sanding Nozzles (Refer to Section 13 of this Manual for Description, Operation and Maintenance Procedures).

Refer to Table 12-I-02.1 for Motor Truck Technical data.

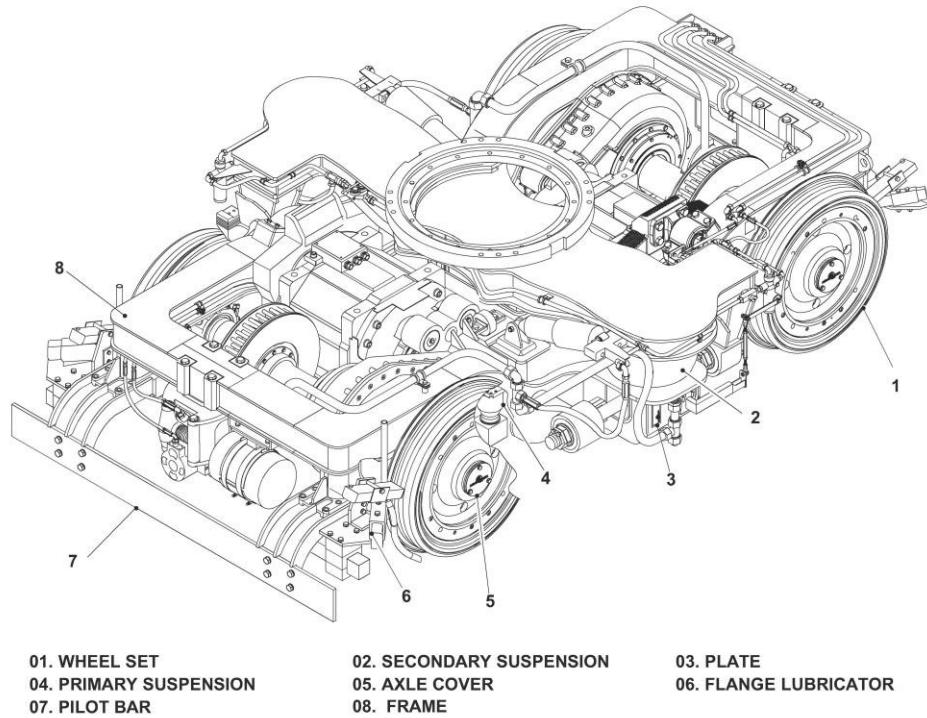


Figure 12-I-02.2 Motor Truck Main Components

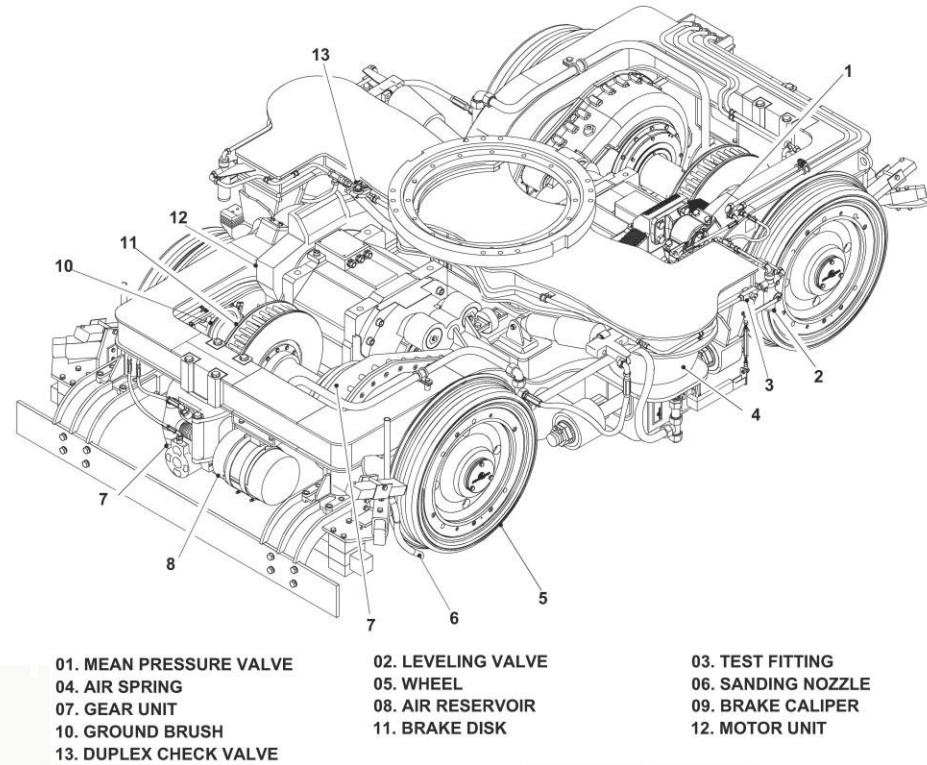


Figure 12-I-02.3 Motor Truck - Installed Equipment

12-I-02.02.01 Motor Truck - Car Body Connection

The Truck Frame (Refer to Figure 12-I-02.5) is designed to have 30 years' service life (under normal service conditions and preventive maintenance operations) without structural repairs or alterations.

This assembly is designed to have the required stress resistance and the load equalization characteristics to operate properly and to prevent unstable oscillations in any operating condition.

Brackets designed to support the main truck components (Secondary Suspension, Wheel Set Assembly, Traction Motor Units, Brake Calipers, Track Brake, Pneumatic and Electrical System Components) are welded to the Truck Frame.

The connection between Motor Truck and Car Body (refer to Figure 12-I-02.4) is realized by means of a slewing ring and a bolster beam. The inner ring of the slewing bearing is bolted to the bolster beam, while the outer ring is bolted to the car body under frame (refer to Figure 12-I-02.8).

The bolster beam is made up of welded steel S355J2G3C (Fe510D1KQ).

It has been subjected to a stress relief heat treatment after welding in order to eliminate residual internal stresses caused by the welding process.

After this treatment, the bolster beam has been machined and checked for dimensional tolerances and then painted.

The bolster beam is longitudinally restrained to the truck frame by means of two rods with resilient elements at each end.

The connection between Motor Truck and Car Body is designed to withstand a horizontal load of 400 kN applied to the truck frame, with reference to the ultimate strength of the material.

To realize that, the support of the lateral bump stops on the bolster beam is engaged on the lateral transom of the truck frame when the traction rods have failed or the relevant brackets are severely deformed.

In this way, big movements between the truck frame and the car body following a catastrophic impact are avoided.

Other than the electrical and pneumatic disconnection, the mechanical disconnection of the truck from the car body requires the unscrewing of the bolts connecting the slewing bearing to the car body.

Access to these bolts is assured by a removable panel on the floor of the Car body (floor trap - refer to Section 02 of this Manual).

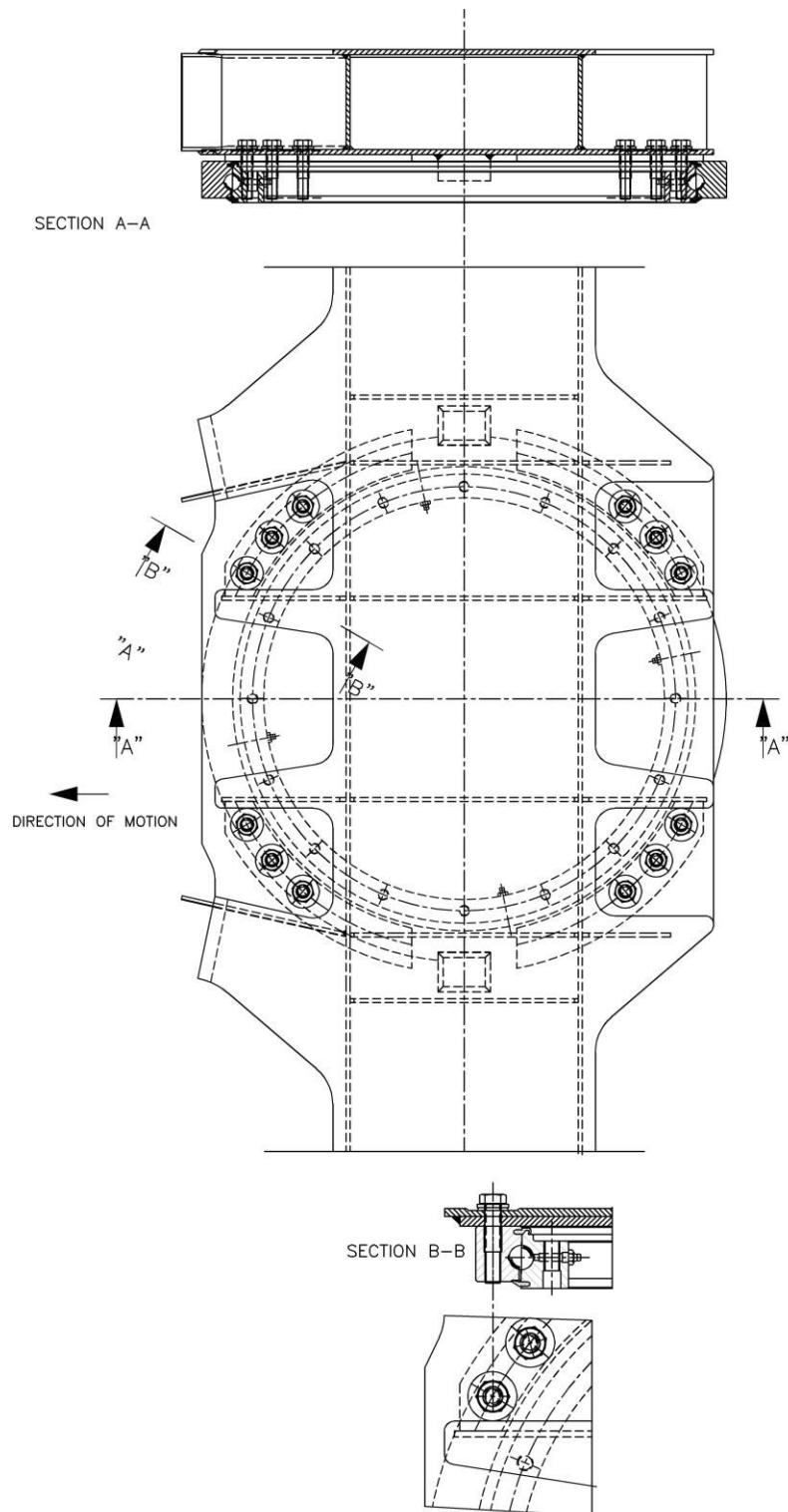
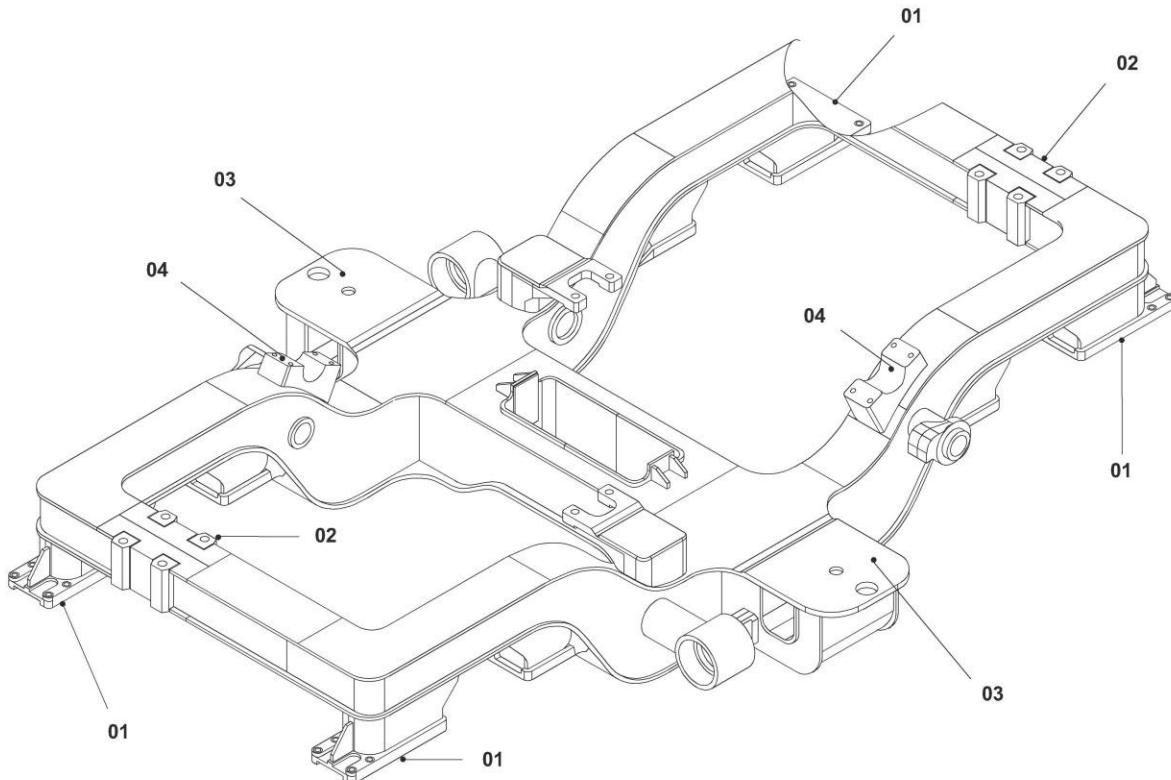


Figure 12-I-02.4 Motor Truck - Car Body Connection



01. PRIMARY SUSPENSION SUPPORT
04. MOTOR SUPPORT

02. BRAKE CALIPER SUPPORT

03. AIR SPRING SUPPORT

RMSM-12-02-02-01

Figure 12-I-02.5 Motor Truck Frame

12-I-02.02.02 Motor Truck Bolster Beam and Slewing Ring

The Bolster Beam (Refer to Figure 12-I-02.6) is designed to have 30 years' service life (under normal service conditions and preventive maintenance operations) without structural repairs or alterations.

The Bolster Beam supports all vehicle loads (through the slewing ring) and transmits them to the truck frame (through the air springs).

The Bolster Beam is designed to support the Slewing Ring on the upper side, Lateral Bump Stops, Shock Absorbers, Air Springs and Traction Rods on the lower side. Brackets to support pneumatic/electrical components are also welded to the Bolster Beam

The Bolster Beam of the Motor Truck is slightly different from the one of the Trailer Truck, even though the main parts are identical.

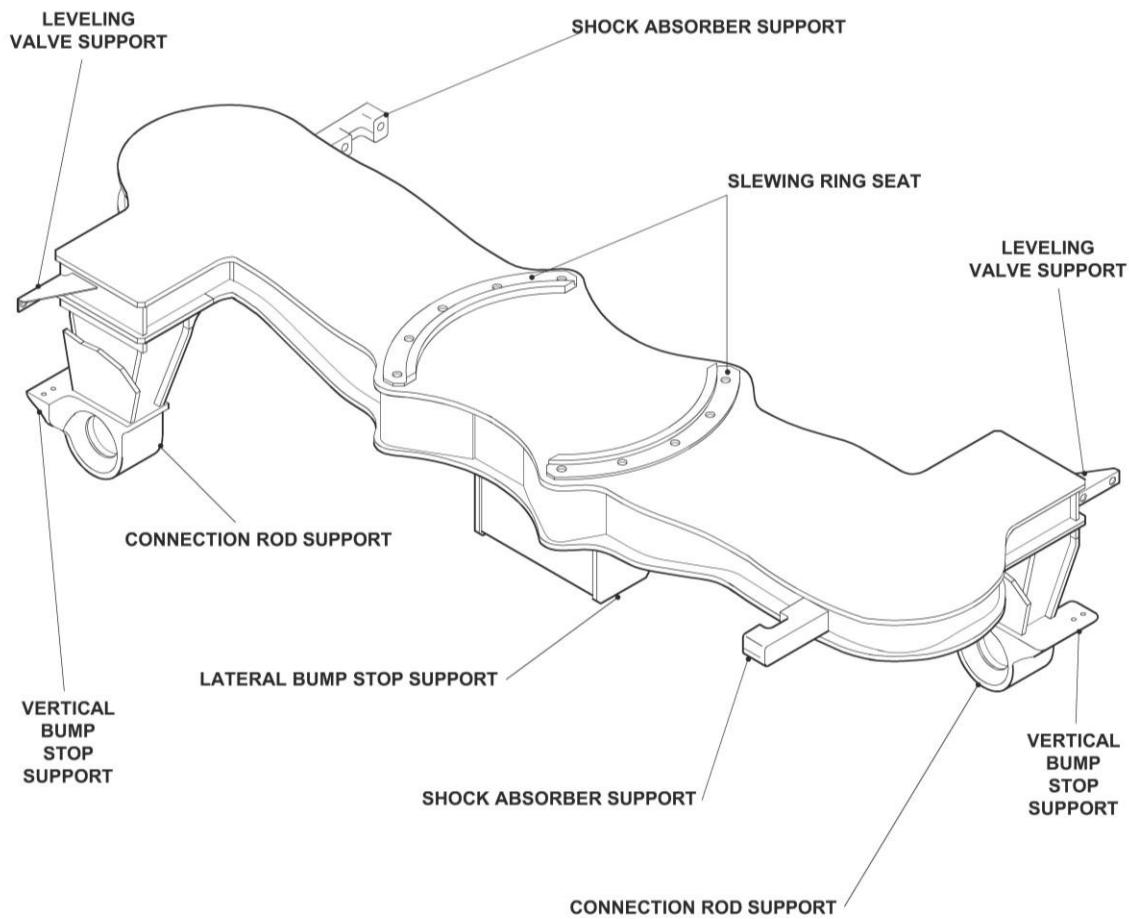


Figure 12-I-02.6 Motor Truck Bolster Beam

The Bolster Beam is made up of a central box sectioned transom and two end arms. The end arms connect the traction rods.

The bolster beam frame is made up of welded steel S355J2G3C (Fe510D1KQ).

The transom ends contain the interfaces with the secondary suspension (air spring). After welding, the Bolster has been subjected to a stress relief heat treatment in order to eliminate residual internal stresses caused by the welding process.

After this treatment, the bolster beam has been machined and checked for dimensional tolerances and then painted

The static and fatigue calculation for the Bolster Beam have been carried out in accordance with MTA specifications, by using the fatigue strength of welding joints derived from document PCA_AA03UA2, based on Eurocode number 3, section 9, and considering the AnsaldoBreda welding quality class and experience.

The fatigue verification has been made for two million cycles and in accordance with Miner's cumulative damage law.

A refined analysis by means of FEM (Failure Effect Mode) has been carried out, both for static and fatigue load conditions



Figure 12-I-02.7 Motor Truck Slewing Ring (1)

Under normal operating conditions, the greasing (Molykote Longterm 2 Plus) of the Ball Bearing Slewing Ring is carried out through the relevant grease nipples every three years at the latest.

Regular preventive visual inspection is recommended in order to evaluate and determine the optimal interval depending on the actual operating conditions.

The greasing is necessary when the grease behind the sealing lips has completely gone. A shorter interval helps increasing the bearing life.

If steam jet cleaning is planned in the slewing ring area, the bearing sealing lips must be protected.

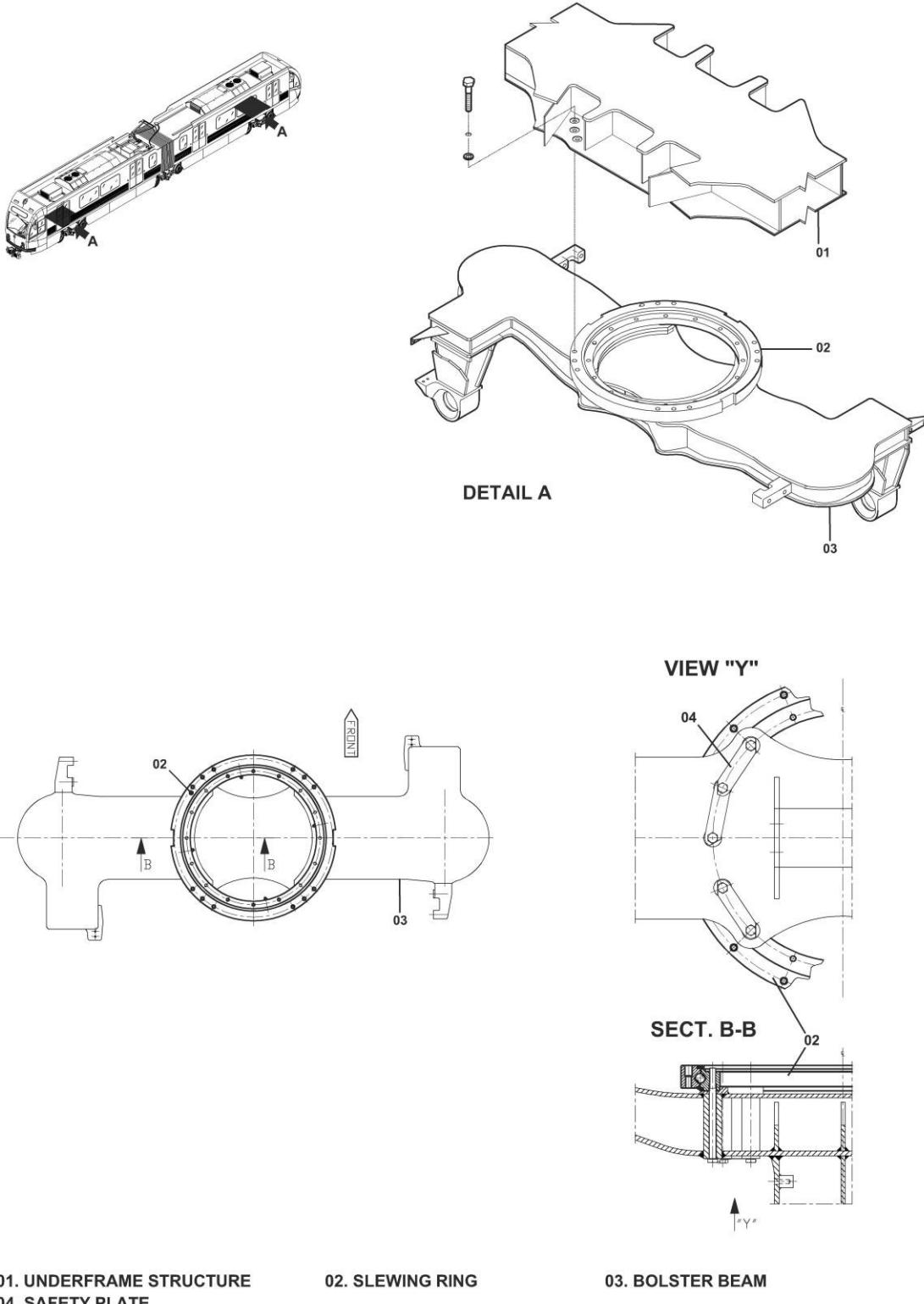


Figure 12-I-02.8 Motor Truck Slewing Ring (2)

12-I-02.02.03 Motor Truck Primary Suspension

The purpose of the primary suspension is to transmit the vertical, lateral and longitudinal loads from the truck frame to the axles, reducing shock loads to the truck frame coming from the tracks.

The Primary Suspension (Refer to Figure 12-I-02.9), consists of eight conical springs made of rubber (GM MC 170 - NC 953/50 Type) installed between the journal boxes and the truck frame.

The Primary Suspension transmits vertical, longitudinal and transverse loads between the truck frame and wheel axles at different rates, thus equalizing wheel loads.

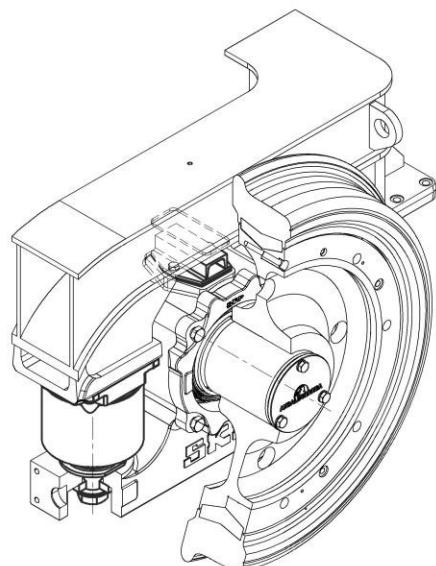
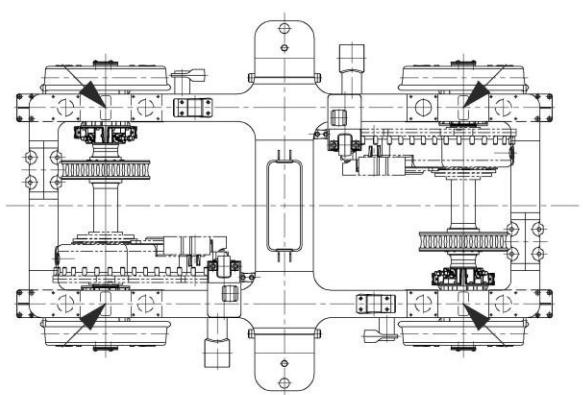
The way conical springs were designed, the vertical resonance frequency of the primary suspension system will not exceed 14 Hz. Conical springs also provide a damping effect.

Conical springs have safety hangers incorporated. Safety hangers limit the vertical movement of the truck frame and are used for lifting the wheel set.

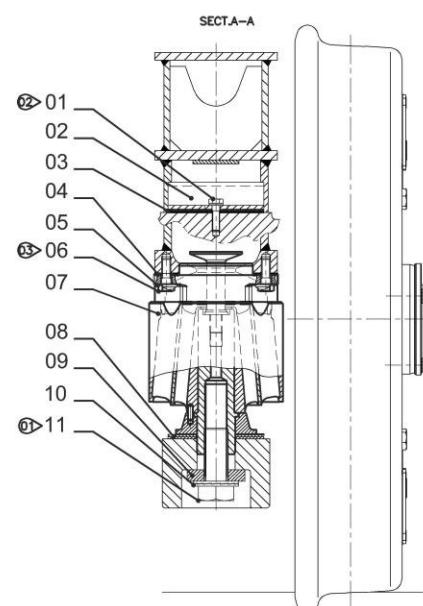
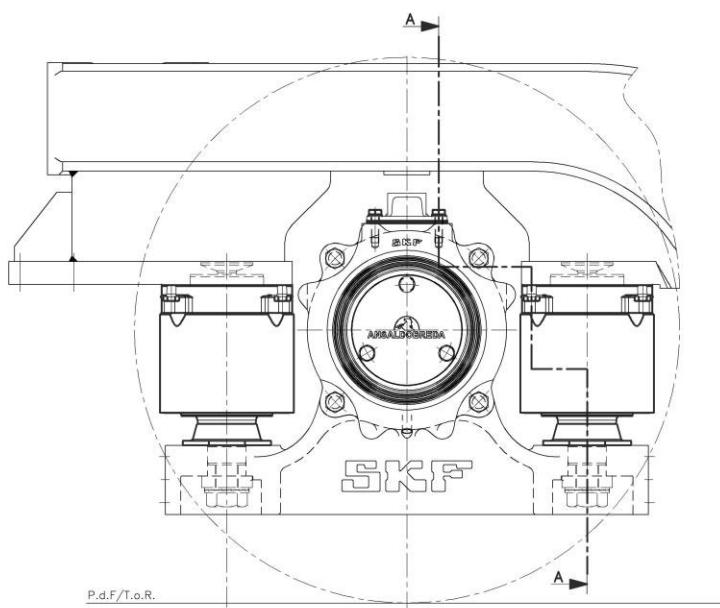
Journal boxes are fitted with cartridge bearings.

Primary suspension stiffness is optimized in order to:

- Assure truck stability in case of over speed
- Maintain a good level of ride quality
- Assure minimum wheel unloading in skew conditions
- Permit good truck behavior during the negotiation of curves


TIGHTENING TORQUE

- ① :TORQUE TO 369 ft*lb
- ② :TORQUE TO 52 ft*lb
- ③ :TORQUE TO 64 ft*lb



01. HEX BOLT M10x30 ISO 4017
 04. CONICAL SPRING UPPER SHIM
 07. CONICAL SPRING
 10. LOCKING TAB

02. VERTICAL STOP
 05. LOCKING TAB
 08. CONICAL SPRING LOWER SHIM
 11. HEX BOLT M30x2 L=70 ISO 4017

03. SHIM
 06. HEX BOLT M12x35 ISO 4017
 09. SPACER

Figure 12-I-02.9 MT Primary Suspension

12-I-02.02.04 Motor Truck Secondary Suspension

With the exception of the leveling valve (only one on the CT) the Mean Pressure valve and the Duplex Check valve, all items of the Secondary Suspension are common to the Motor and the Trailer Truck.

The Secondary Suspension consists of those components that transmit the loads between the bolster beam and the truck frame and control their relative movements.

These components are:

- Air Springs
- Lateral and Vertical Bump Stops
- Shock Absorbers
- Traction Rods
- Leveling Valves

Two Air Springs are installed, symmetrically with reference to the truck center line, between the Bolster Beam and the Truck Frame.

The air springs cut-off high frequency vibrations and assure the required level of comfort inside the car.

To assure the achievement of this comfort, the natural frequency of the air springs has been set below 1.5 Hz, by means of an auxiliary 3.17 gals (12 l) air reservoir for each spring.

The Air springs contain inside rubber bump stops, designed with a progressive vertical spring rate.

For abnormally large vertical oscillations, the inside rubber bump stops serve the purpose of providing a non-linear restoring force.

In the event of an air spring failure, the inside rubber bump stops provide an auxiliary springing system.

The stiffness of the bump stop has been defined in such a way as to allow the required limit of wheel unloading to be maintained, also in case of deflated air spring.

Air springs receive their air supply from the car piping through the relevant leveling valve.

Between the air spring and the auxiliary reservoir, an air lamination damper provides the necessary vertical damping.

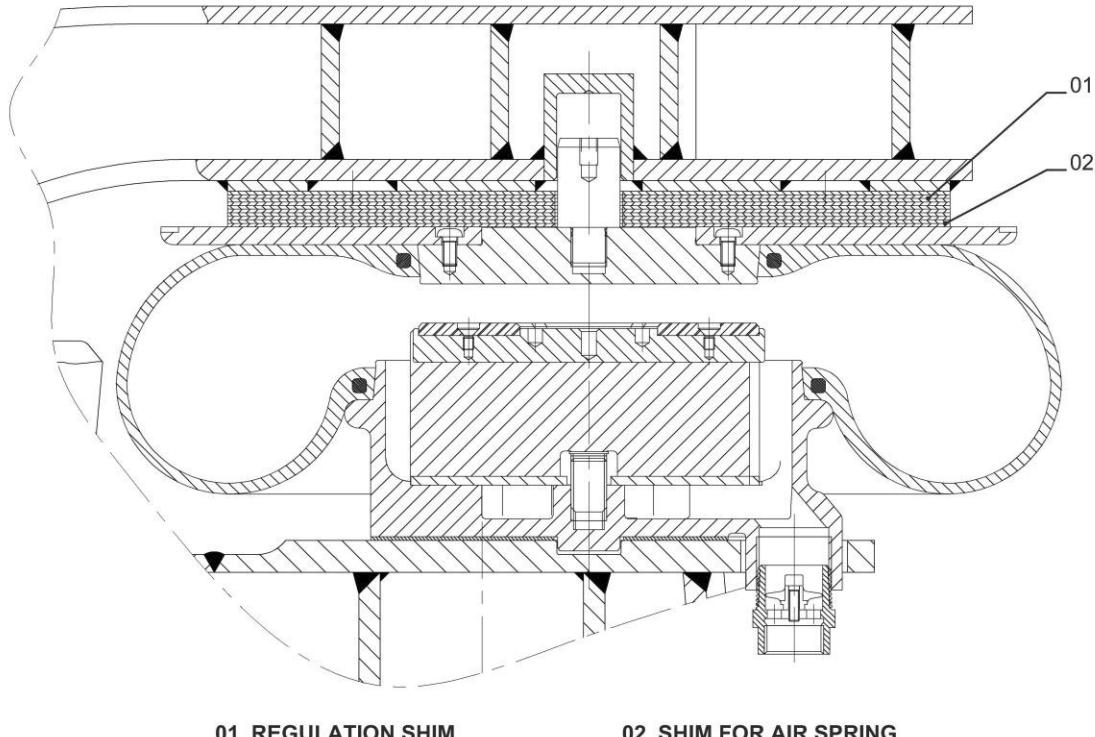


Figure 12-I-02.10 Air Spring

The bolster beam is resiliently restrained to the truck frame:

laterally, by means of two rubber bump-stops, with progressive stiffness (refer to Figure 12-I-02.12).

longitudinally, by means of two traction rods (refer to Figure 12-I-02.13);

lateral damping is provided by hydraulic shock absorbers (refer to Figure 12-I-02.12).

The Lateral Bump Stops are installed on the Bolster Beam, symmetrically with reference to the truck center line, to limit its movements (in cross truck plane) relative to the truck center line.

The Lateral Bump Stops allow the bolster beam to move vertically within the limits set by Vertical Bump Stops.

The Vertical Bump Stops are installed on the truck frame, symmetrically with reference to the truck center line, to limit the vertical movements of the Bolster Beam.

Two Shock Absorbers (hydraulic type) are connected to the bolster beam and to the Truck Frame (by elastic bushings) to equalize the horizontal and vertical movements between them and to reduce the vehicle oscillation.

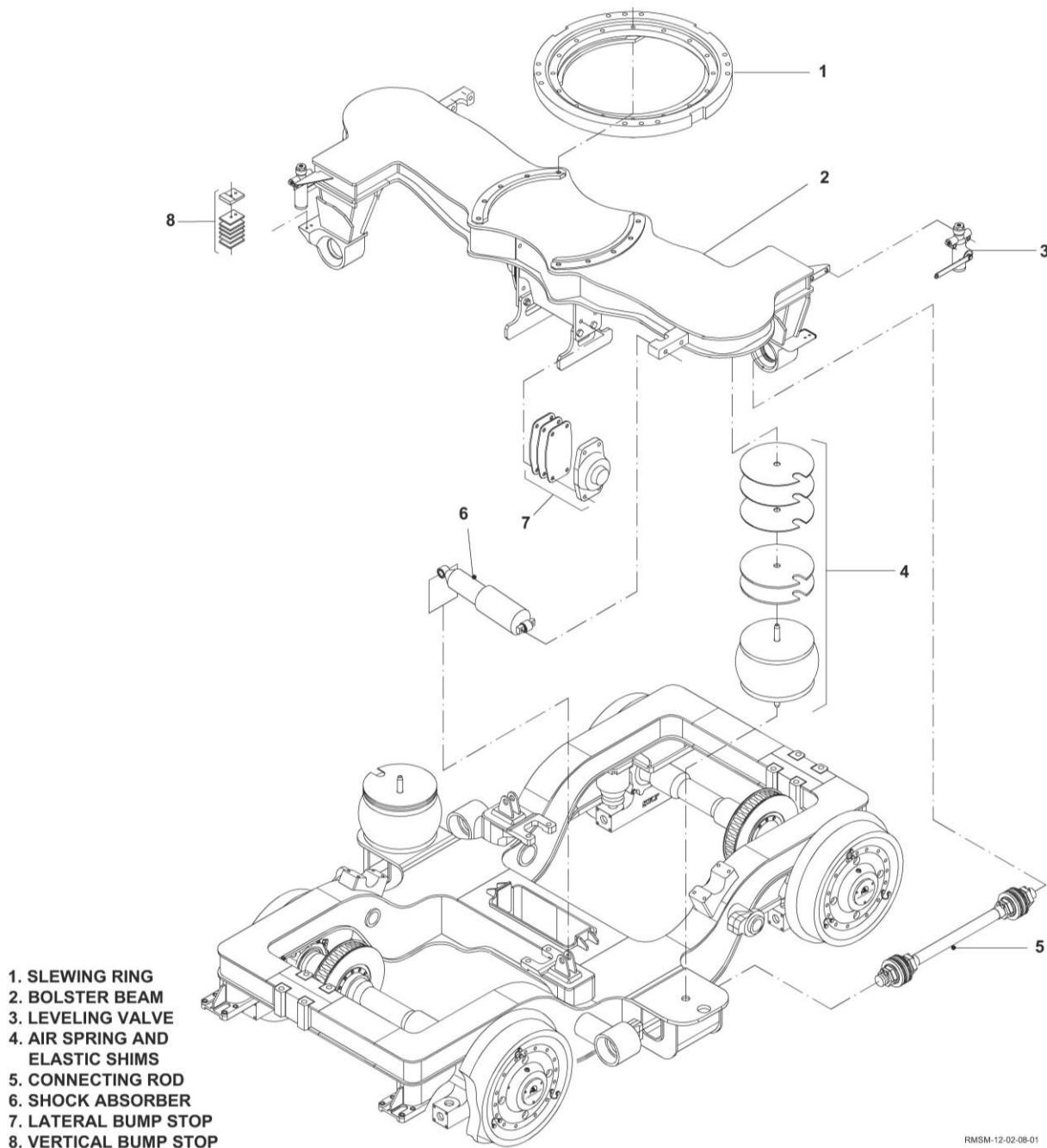
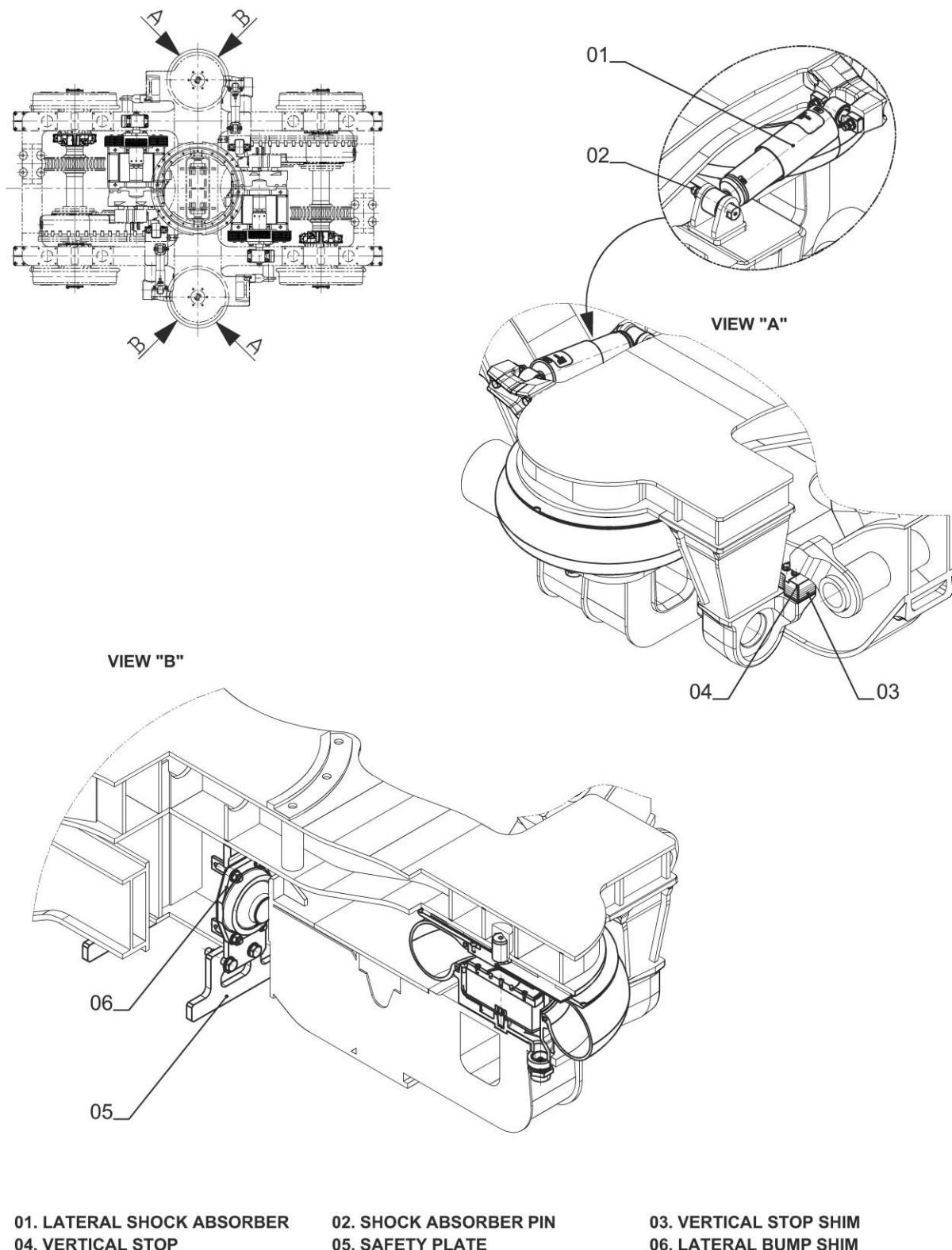


Figure 12-I-02.11 MT Secondary Suspension



01. LATERAL SHOCK ABSORBER
 04. VERTICAL STOP

02. SHOCK ABSORBER PIN
 05. SAFETY PLATE

03. VERTICAL STOP SHIM
 06. LATERAL BUMP SHIM

Figure 12-I-02.12 MT Secondary Suspension - Details

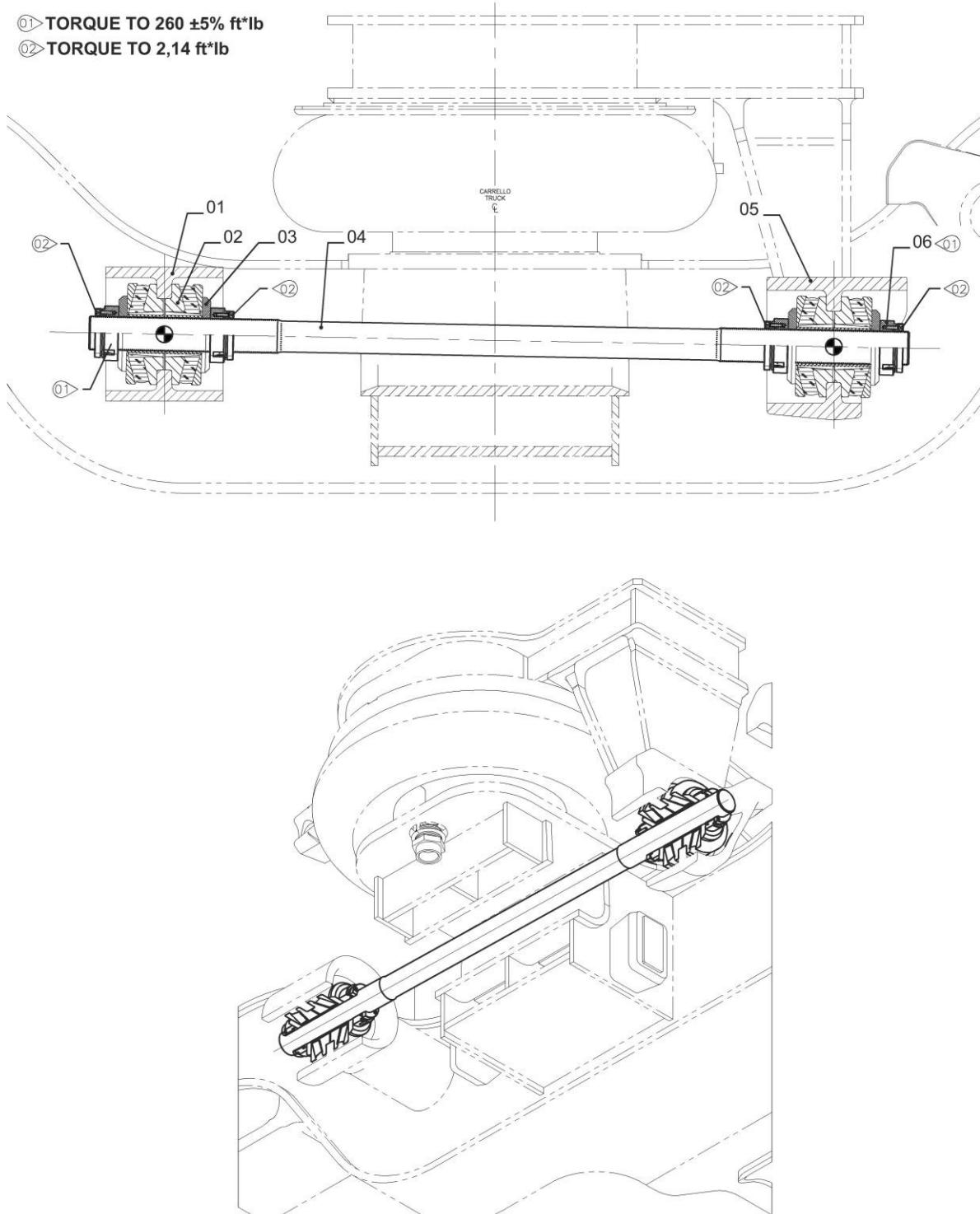


Figure 12-I-02.13 Traction Rod

The two Air Springs are connected to the vehicle's leveling system through two Leveling Valves (Refer to Figure 12-I-02.14 and to Air Suspension System, paragraph 12-I-02.04).

The function of each Leveling Valve is to control the relevant Air Spring working pressure in order to compensate for changes in passenger load distribution, supporting the top of the vehicle's floor.

Two Traction Rods are installed, symmetrically with reference to the truck center line, to provide longitudinal connection between the Truck Frame and the Truck Bolster Beam and to allow vertical movements.

Each connection consists of one steel rod on which four rubber elements have been installed in order to reduce the noise transmission between the Truck Frame and the Bolster Beam.

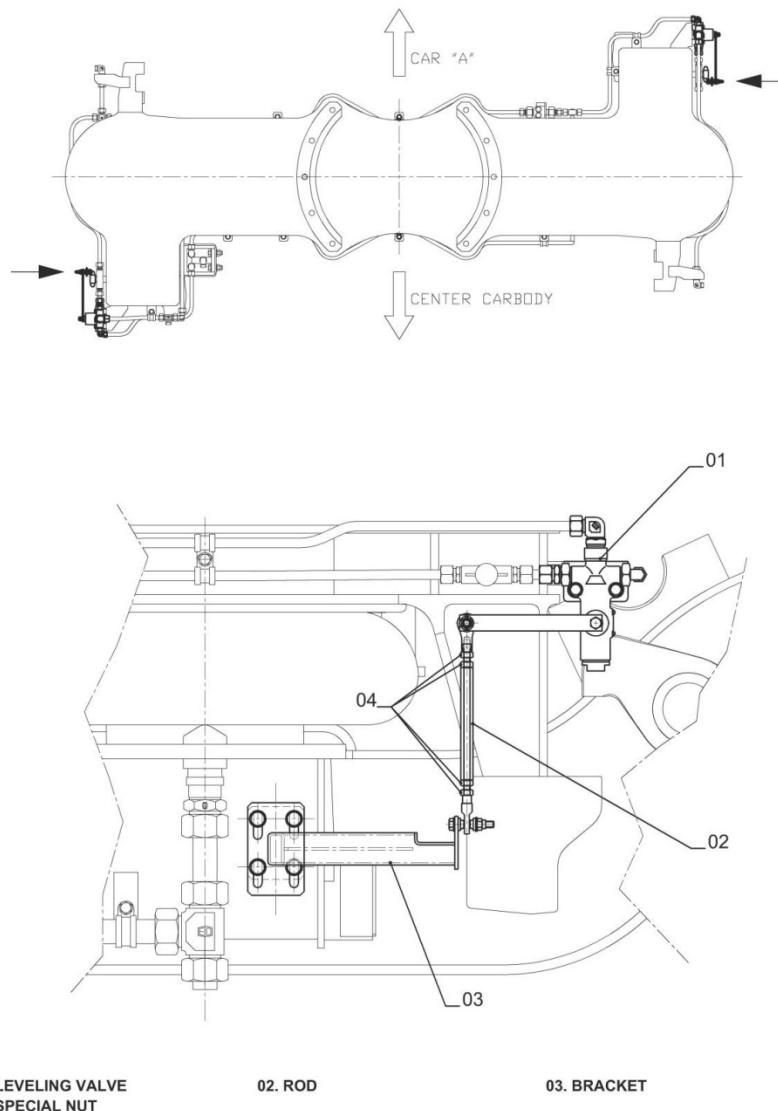


Figure 12-I-02.14 Motor Truck - Leveling Valve

12-I-02.02.05 Motor Truck Wheel Set

Each Motor Truck is provided with two wheel sets. Each wheel set includes the following main components:

- A hollow axle, made of AISI 4130 steel
- Two Bochum 84 resilient wheel type with oil injection removal
- One steel brake disk
- One gear unit
- Two cartridge roller bearings, 203.3x220 mm
- Two cast iron journal boxes
- One grounding contact device

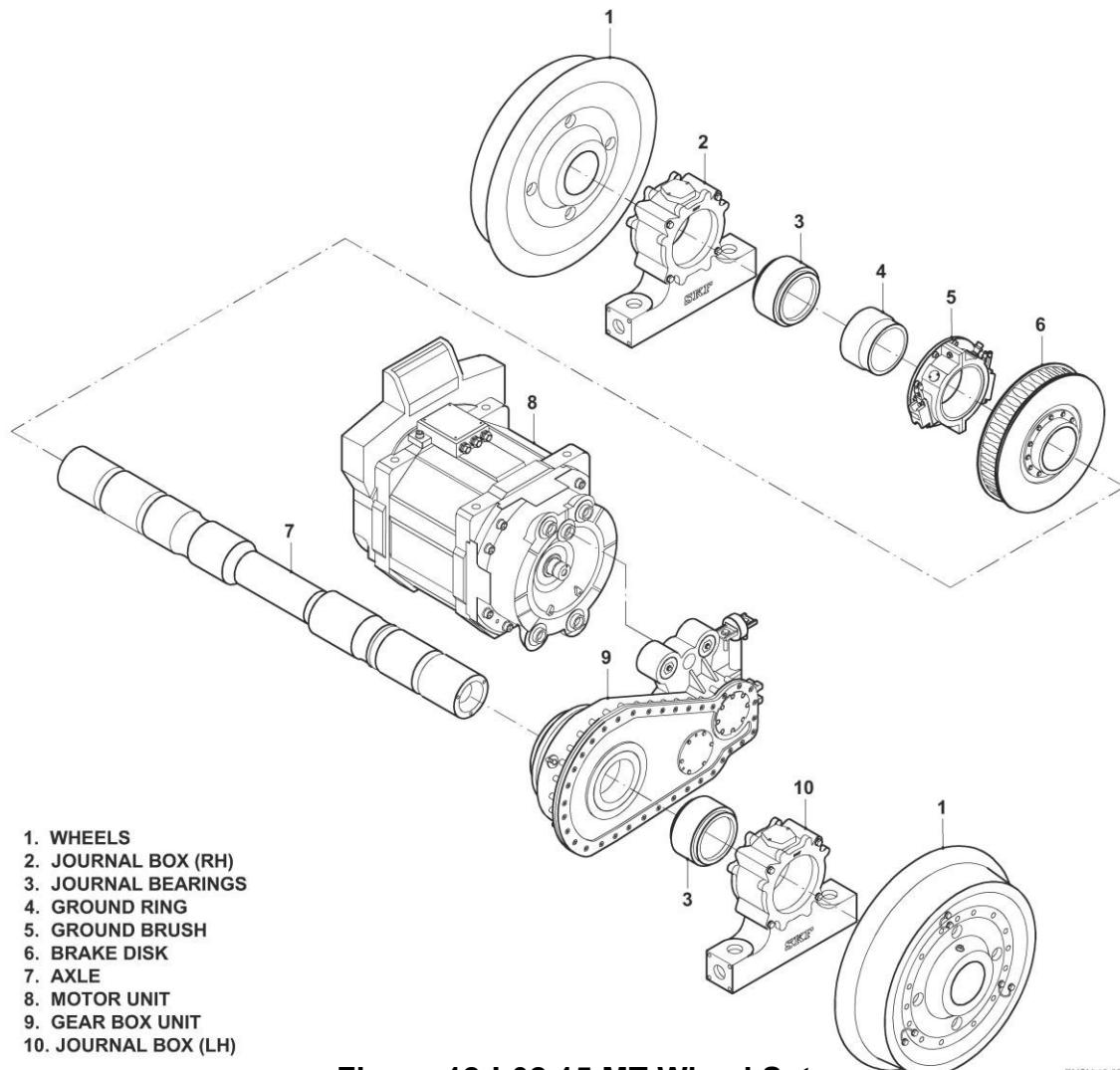


Figure 12-I-02.15 MT Wheel Set

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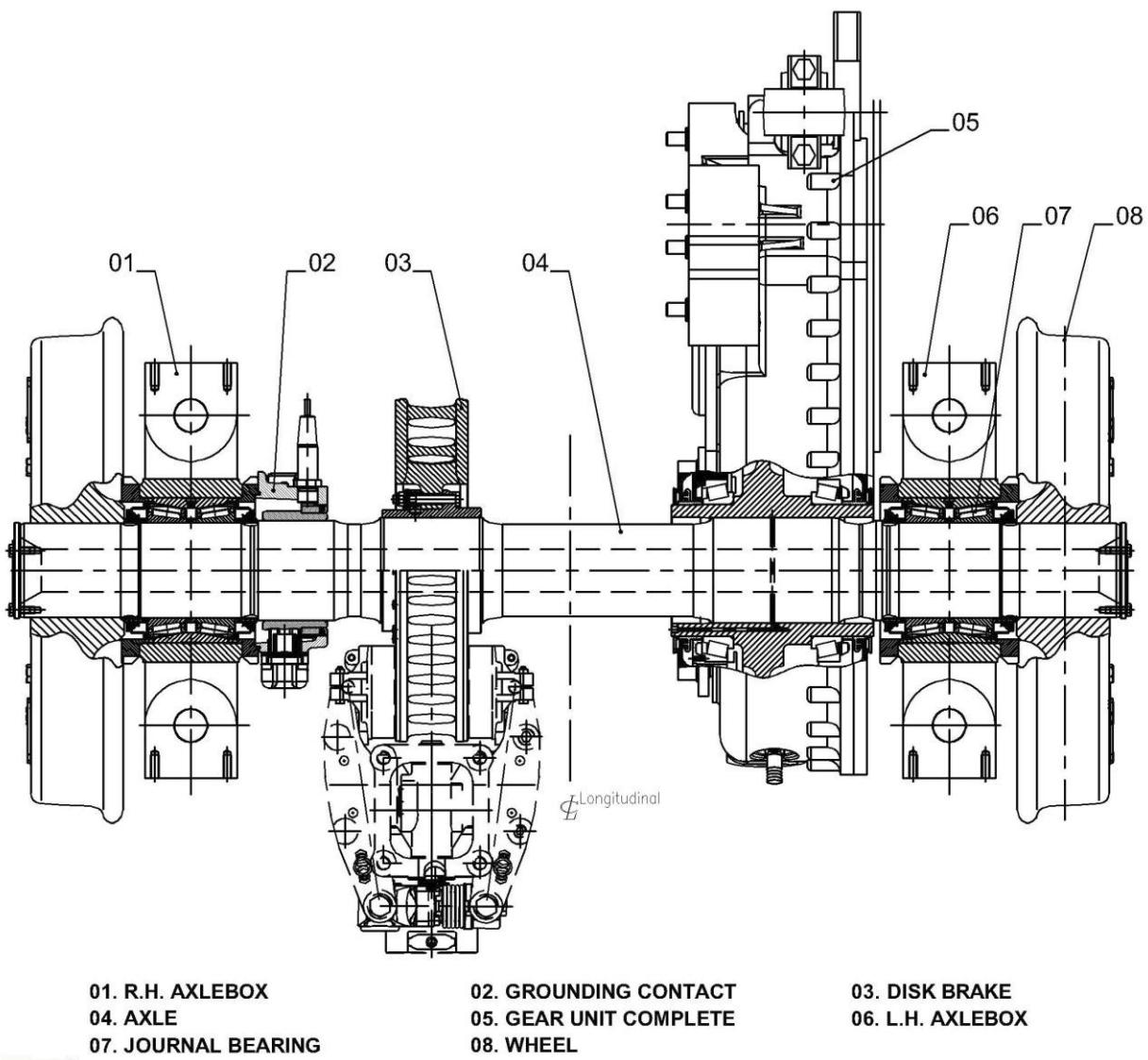


Figure 12-I-02.16 Motor Truck Wheel Set Assembly

The Journal Bearing, (refer to

Figure 12-I-02.17) located inside the Journal Box (refer to Figure 12-I-02.15 and Figure 12-I-02.16), is a TBU (Tapered Bearing Unit) "L" class type of bearing.

Tapered roller bearings have tapered inner and outer ring raceways between which tapered rollers are arranged.

The projection lines of all tapered surfaces meet a common point on the bearing axis. Their design makes tapered roller bearings particularly suitable for the accommodation of combined (radial and axial) loads.

To lubricate the bearing the grease (Esso Arapen RB320) is distributed as follows:

70 g in the center ring (through the threaded plug) ± 0.020 kg;

100 g in each roller row (through the annular Z labyrinth) ± 0.020 kg.

For Gear Unit and Motor Unit description, refer to Section 07 of this Manual.

For Ground Contact description, operation and maintenance procedures, refer to Section 09 of this Manual.

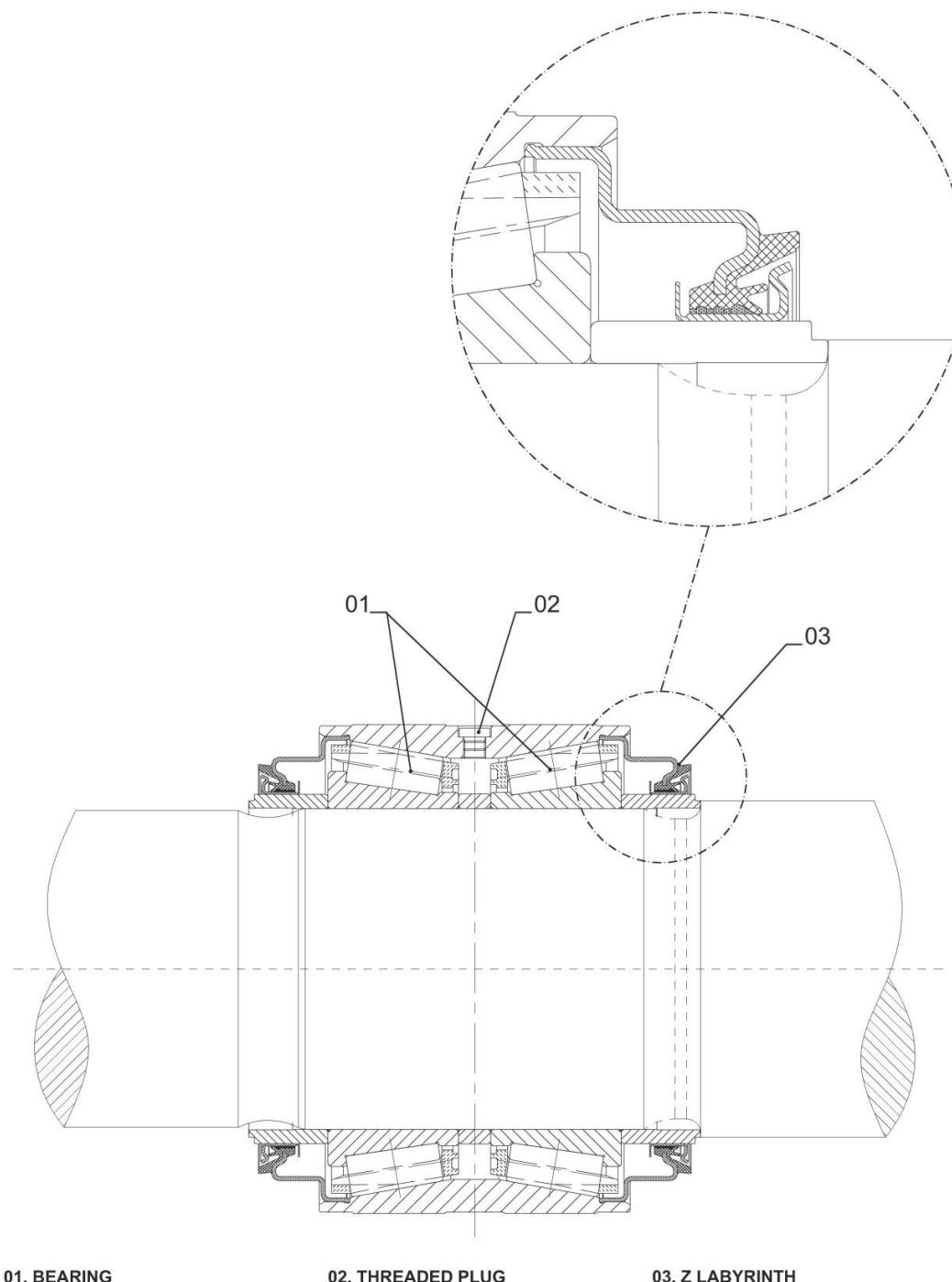


Figure 12-I-02.17 Journal Bearing

12-I-02.05.01 The Wheel

The Wheel is made up of the Wheel Center, the Conical Ring, the Rubber Block and the Tire.

External shunts connect the Tire to the Wheel Center to assure the electrical continuity and the grounding to the rails.

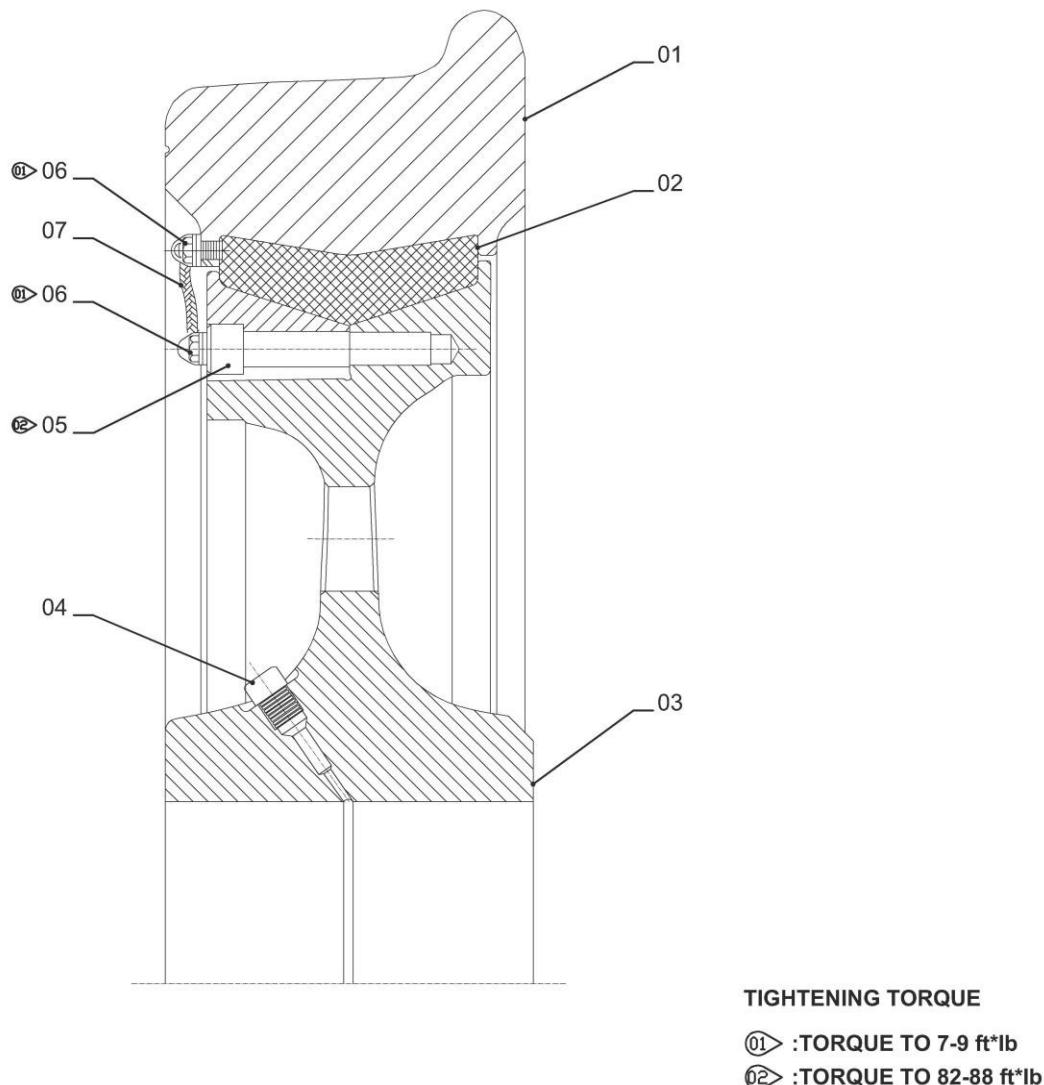


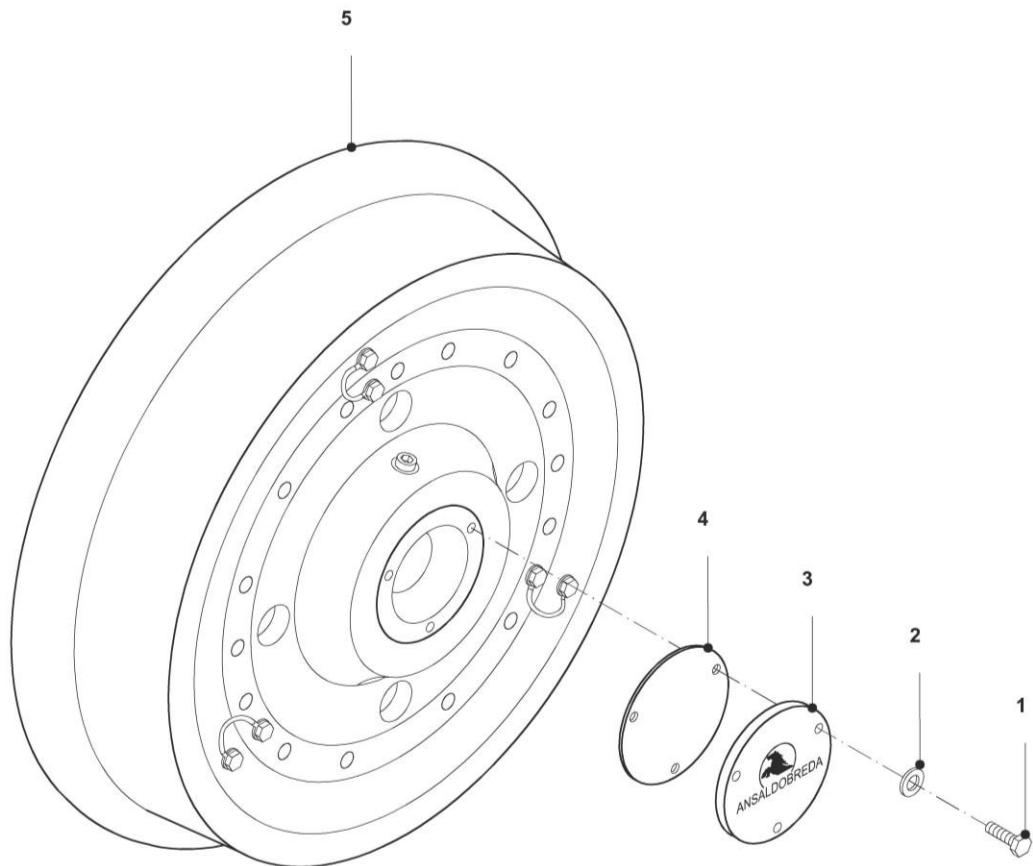
Figure 12-I-02.18 Wheel

12-I-02.02.05.02 Axle Covers

The Axle Covers (3) (Refer to

Figure 12-I-02.19), are installed on the Wheel Axle to protect the axle hole from dirt contamination.

The Gasket (4) is installed between Axle and Cover.



1. SCREW
2. WASHER
3. AXLE COVER
4. GASKET
5. WHEEL

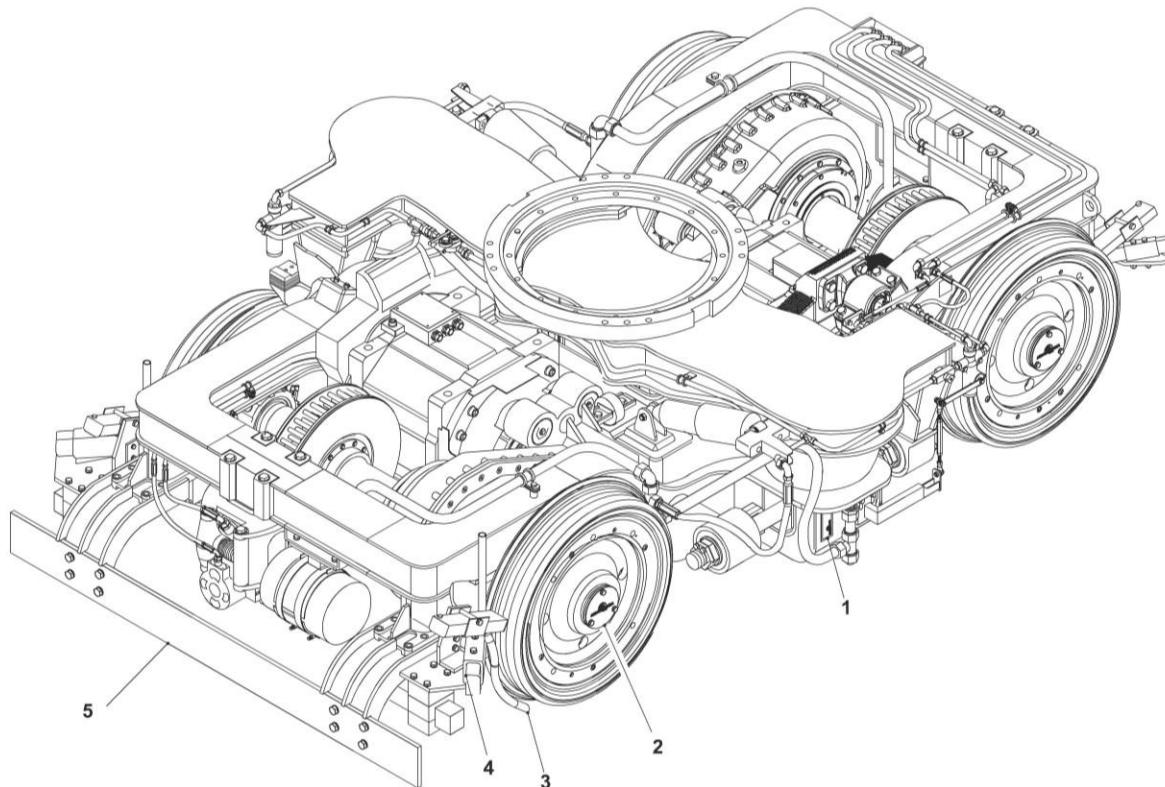
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Figure 12-I-02.19 Axle Covers

12-I-02.02.06 Motor Truck - Miscellaneous Items

The Motor Truck Miscellaneous Items (Refer to Figure 12-I-02.20) consist of the following components mounted on the truck:

- Four Flange/Tread Lubricators (Refer to paragraph 12-I-02.02.06.01 of this Section)
- One Pilot Bar (Refer to paragraph 12-I-02.02.06.02)
- Four Sanding Nozzles (Refer to Section 13 of this Manual) Plates (Refer to para 12-I-02.02.06.03 of this Section)
- ATP Antenna (Refer to Section 15 of this Manual)



01. PLATE
04. FLANGE LUBRICATOR

02. AXLE COVER
05. PILOT BAR

03. SANDING NOZZLE

Figure 12-I-02.20 Motor Truck Miscellaneous Items

12-I-02.02.06.01 Flange Lubricator

Wheel Tread and Flange Lubricators are provided for the wheels of the Motor Truck.

The flange lubricator jacket shall accommodate a 1 x 2 in (25.4 x 51 mm) cassette and the Tread Lubricator bracket shall accept a 1.5 x 2.4 in (38 x 61 mm) cassette.

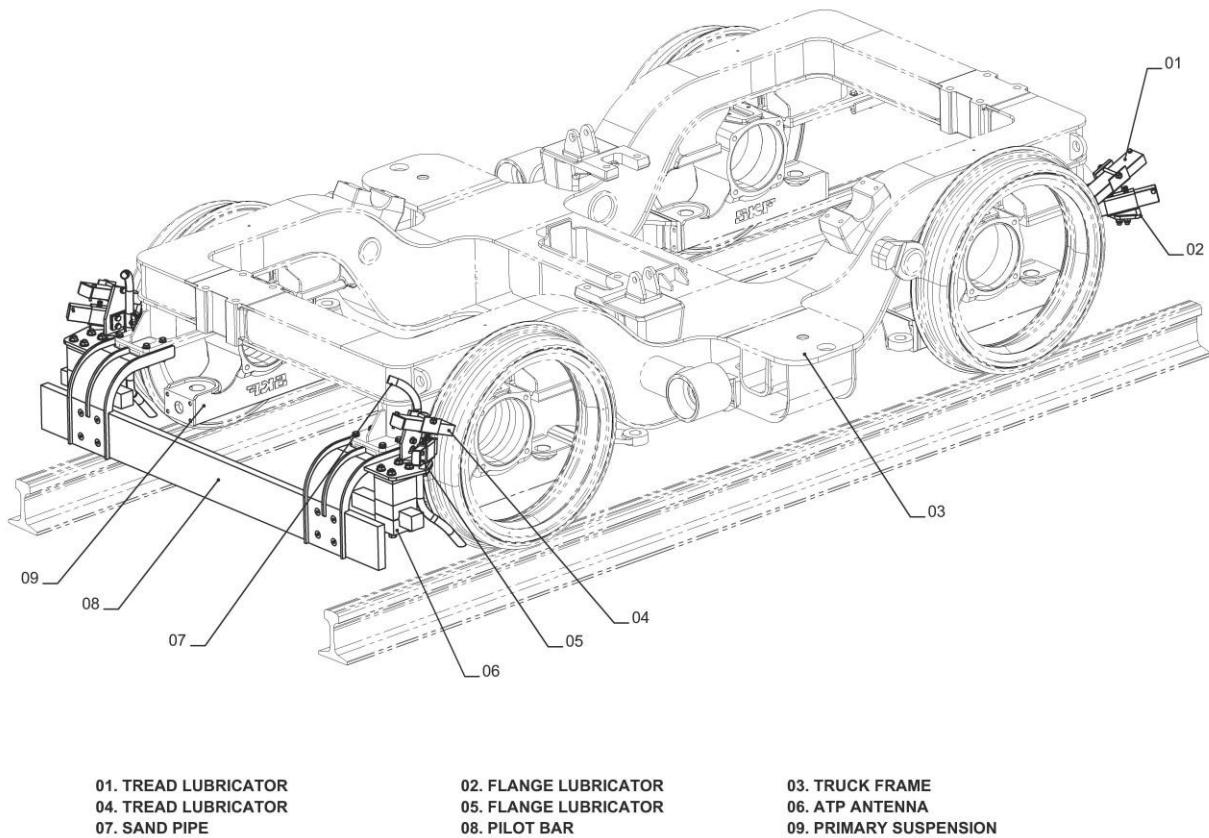


Figure 12-I-02.21 Pilot Bar and Wheel Flange/Tread Lubricator

12-I-02.02.06.02 Pilot Bar

The Pilot Bar (refer to

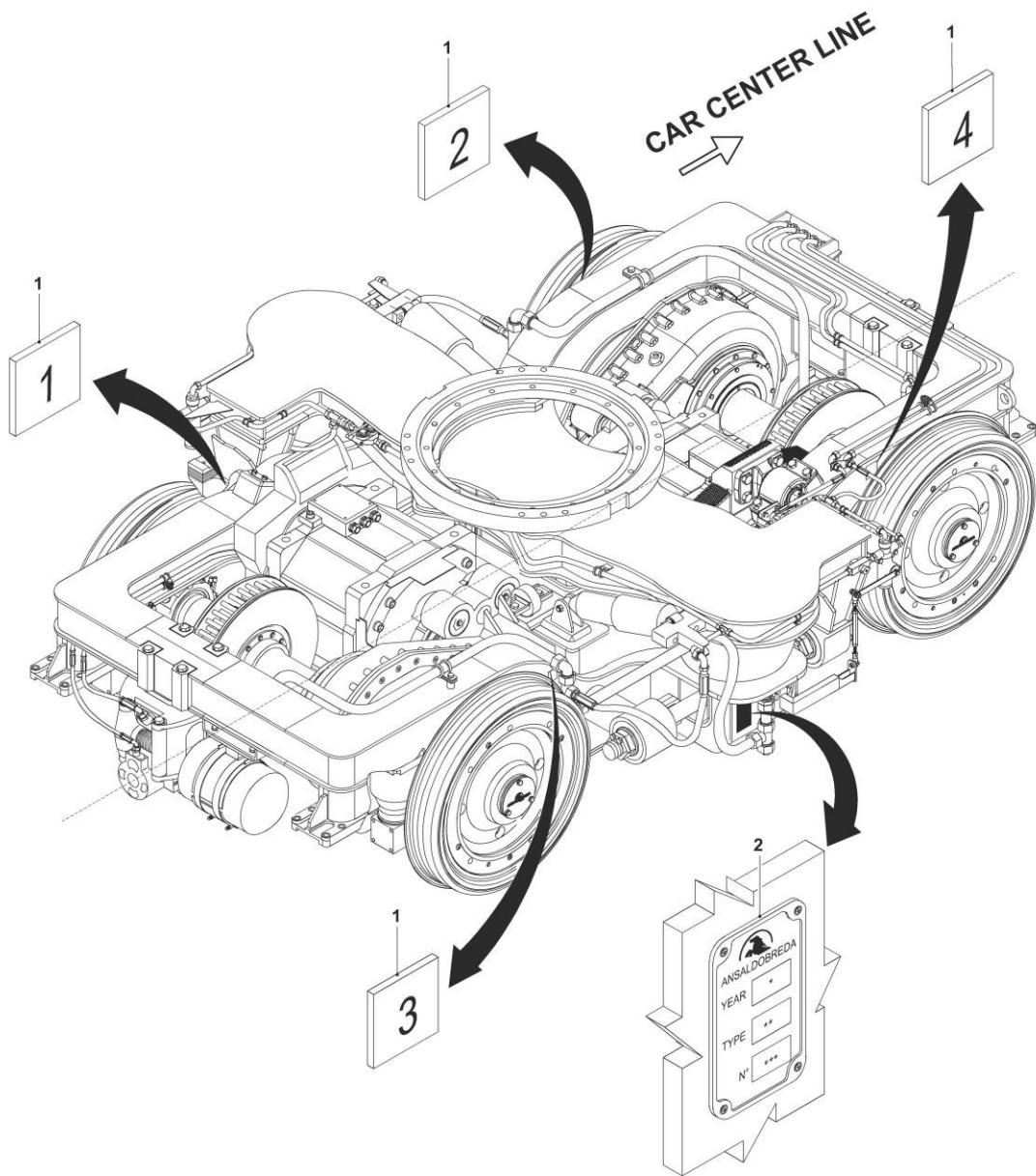
Figure 12-I-02.21) is connected to the Truck frame and protects the ATP antennas (for MGL), the front wheels and other equipment mounted on the lower part of the truck from debris that may be present on the trackway.

12-I-02.06.03 Plates

The plates (Refer to Figure 12-I-02.22), installed on the truck, have the function of identifying the wheel number, the MFR name, the building year and the truck serial number.

The Plates are made with light alloy and are fitted to the frame by screws (MFR name plate) or glued (all other labels).

The glue used is a two-component adhesive type 3M - VHB ACRYLIC FOAM - TAPE 4945.



01. WHEEL NUMBER PLATE

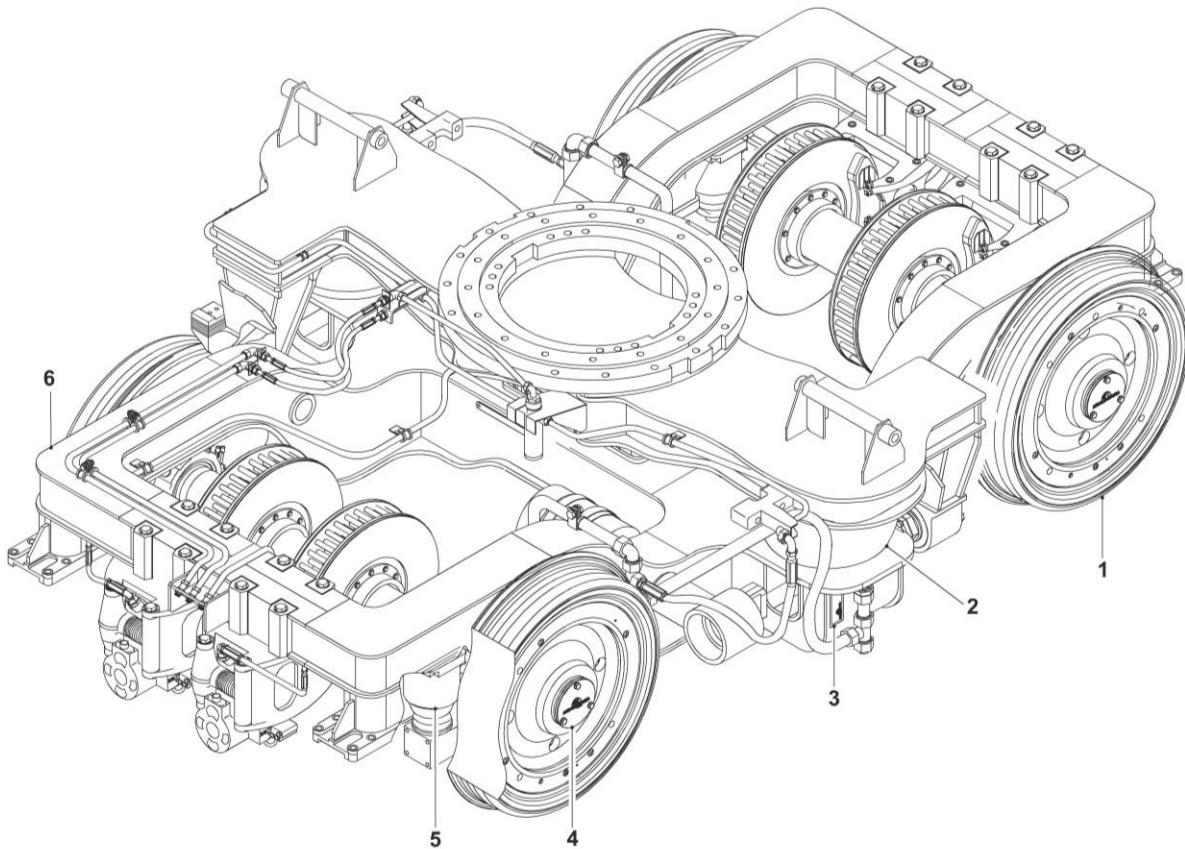
02. MFR / SERIAL NUMBER PLATE

Figure 12-I-02.22 Plates

12-I-02.03 TRAILER TRUCK

The Trailer Truck, located under the Articulation Section, allows the “A” and “B” Vehicle Body Sections rotation.

The Trailer Truck is designed to make Maintenance Operations easier and all components are fully interchangeable with the components of any other Trailer Truck of the P2550 - LRV series.



01. WHEEL SET
04. AXLE COVER

02. SECONDARY SUSPENSION
05. PRIMARY SUSPENSION

03. PLATE
06. FRAME

Figure 12-I-02.23 Trailer Truck

The Trailer Truck main components are (Refer to Figure 12-I-02.23):

- Truck Frame
- Bolster Beam
- Ball Bearing Slewing Ring
- Primary Suspension
- Secondary Suspension
- Connecting Rods
- Wheel Set
- Miscellaneous Items:
- Plates

Components pertaining to different vehicle Systems are also mounted on the Center Truck:

Air Suspension System (refer also to Section 13):

- Leveling Valve
- Air Reservoirs
- Air Springs
- Test Fittings

(Refer to paragraph 12-I-02.04 of this Section for Description, Operation and Maintenance Procedures).

Brake System. The Brake System components installed on the Motor Truck are:

- 4 Brake Disks with relevant Brake Calipers
- 2 Track Brakes

(Refer to Section 13 of this Manual for Description, Operation and Maintenance Procedures).

Refer to Table 12-I-02.2 for Trailer Truck Technical Data.

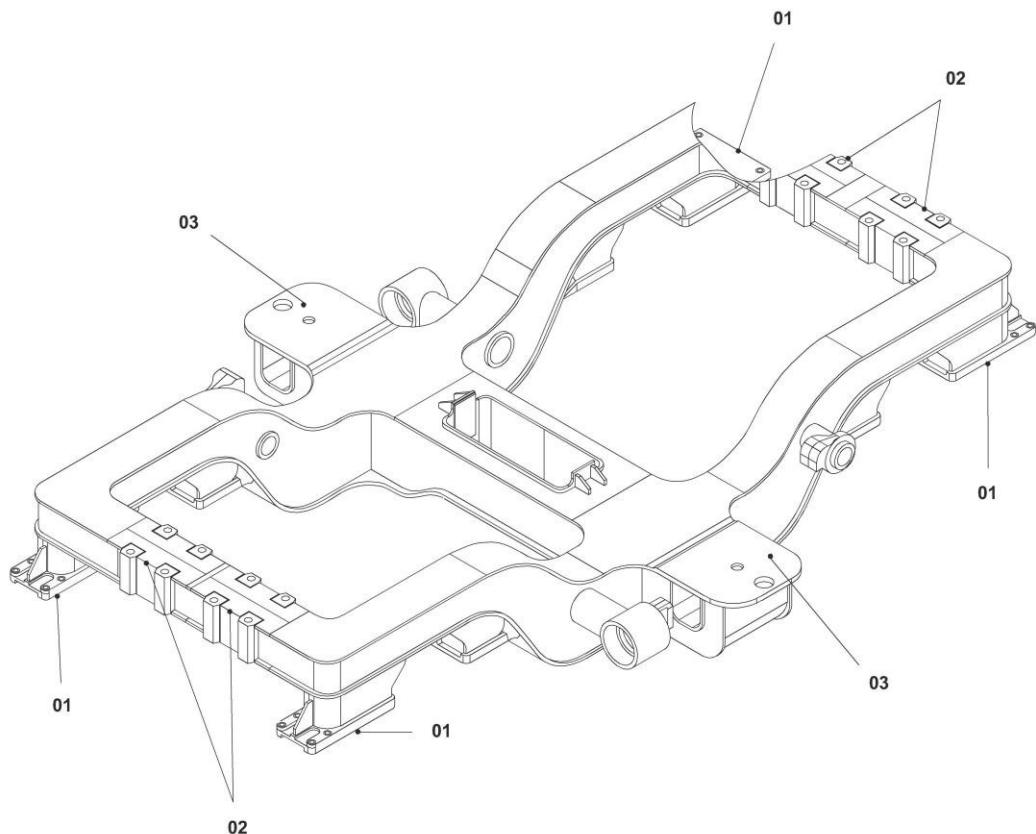
12-I-02.03.01 Trailer Truck-Car Body Connection

With reference to the connection between truck and car body, the only difference between Motor and Trailer Truck is that the slewing ring bearing of the Trailer Truck has three raceways instead of two.

The inner and the outer rings are connected to the car bodies A and B, whereas the intermediate ring is connected to the bolster beam.

Other than the electrical and pneumatic disconnection, the mechanical disconnection of the truck from the carbodies requires the unscrewing of the bolts connecting the slewing bearing to the carbodies.

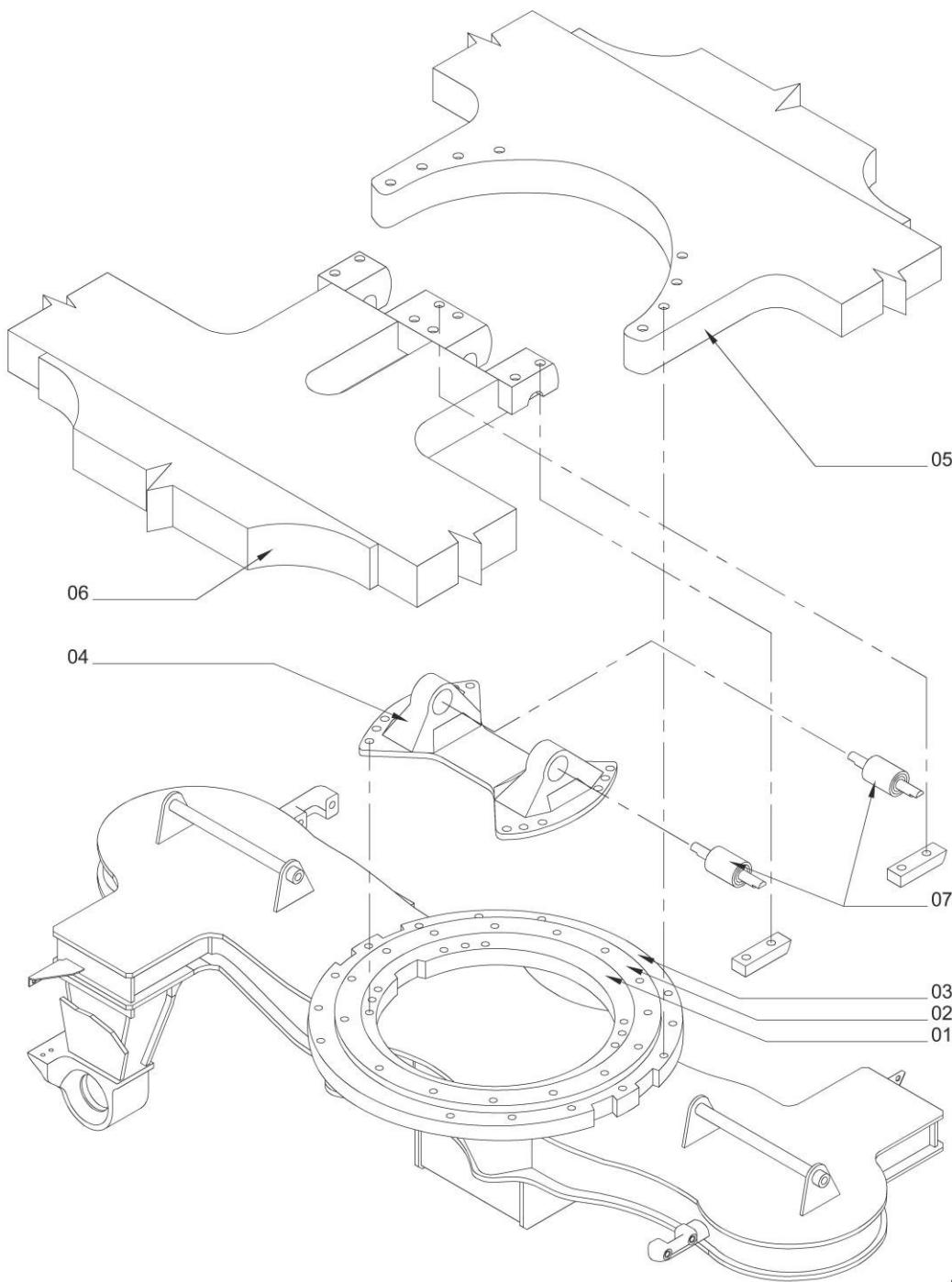
The access to these bolts is assured by removable slices on the floor of the Articulation Section.



01. PRIMARY SUSPENSION SUPPORT 02. BRAKE CALIPER SUPPORT 03. AIR SPRING SUPPORT

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Figure 12-I-02.24 Trailer Truck Frame



01. SLEWING RING - INNER RING
 04. CONNECTION BEAM
 07. CONNECTION PIN

02. SLEWING RING - MIDDLE RING
 05. MAIN UNDERFRAME CAR "B"

03. SLEWING RING - OUTER RING
 06. MAIN UNDERFRAME CAR "A"

Figure 12-I-02.25 Trailer Truck-Car Body Connection

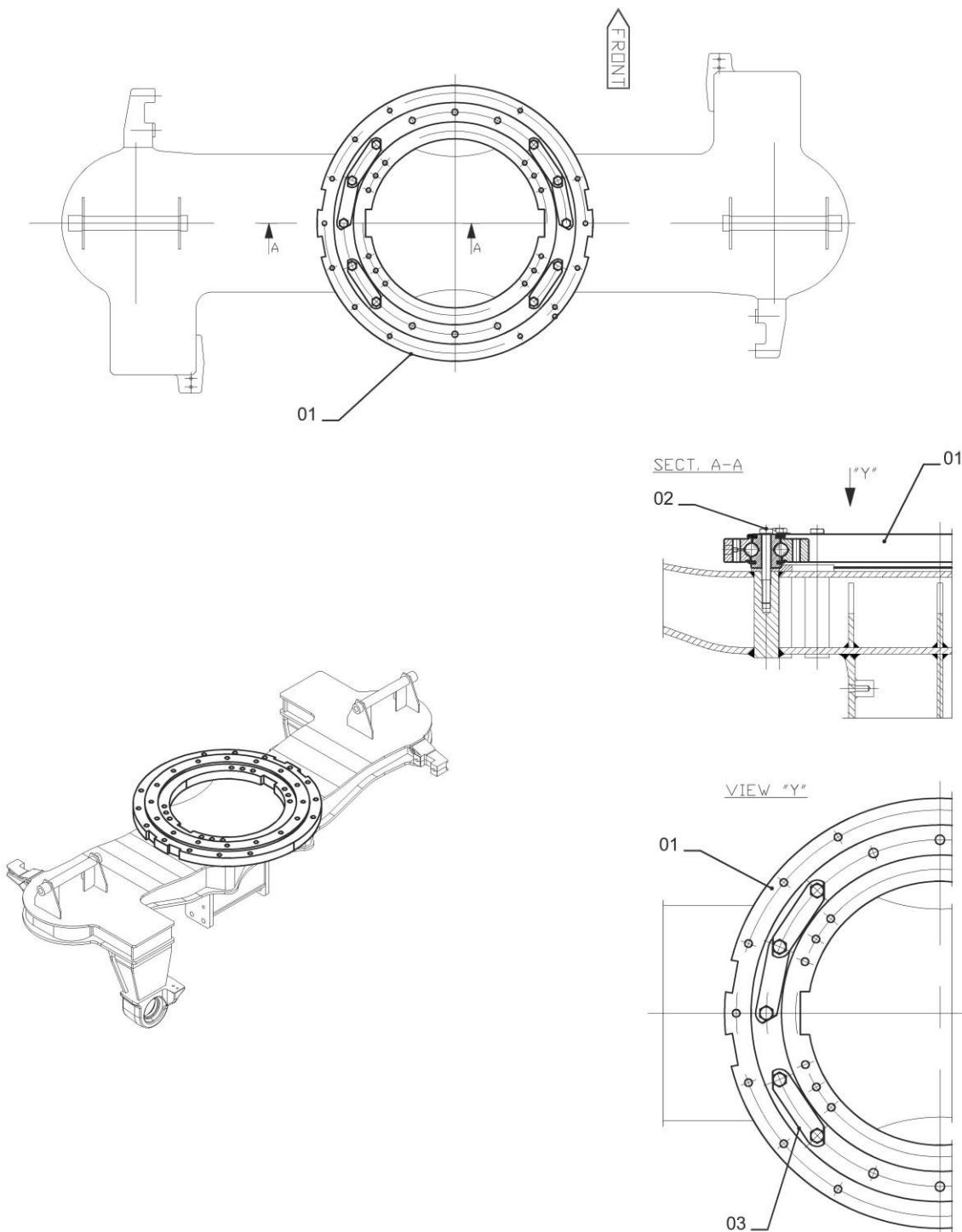


Figure 12-I-02.26 CT Ball Bearing Slewing Ring

12-I-02.03.02 Trailer Truck Bolster Beam and Slewing Ring

The Bolster Beam of the Trailer Truck is slightly different from the one of the Motor Truck, even if the main parts are identical.

In particular, the Trailer Truck Bolster Beam is equipped with the Articulation Support (refer to Figure 12-I-02.27) for supporting the Articulation Section.

The Bolster Beam is made up of a central box sectioned transom and two end arms. End arms connect the traction rods.

The bolster beam frame is made up of welded steel S355J2G3C (Fe510D1KQ), and is equipped with attachments for the components: dampers, bumpers, etc.

Transom ends contain the interfaces with the secondary air spring.

After welding the Bolster has been subjected to a stress relief heat treatment in order to eliminate residual internal stresses caused by the welding process.

After this treatment, the bolster beam has been machined and checked for dimensional tolerances and then painted.

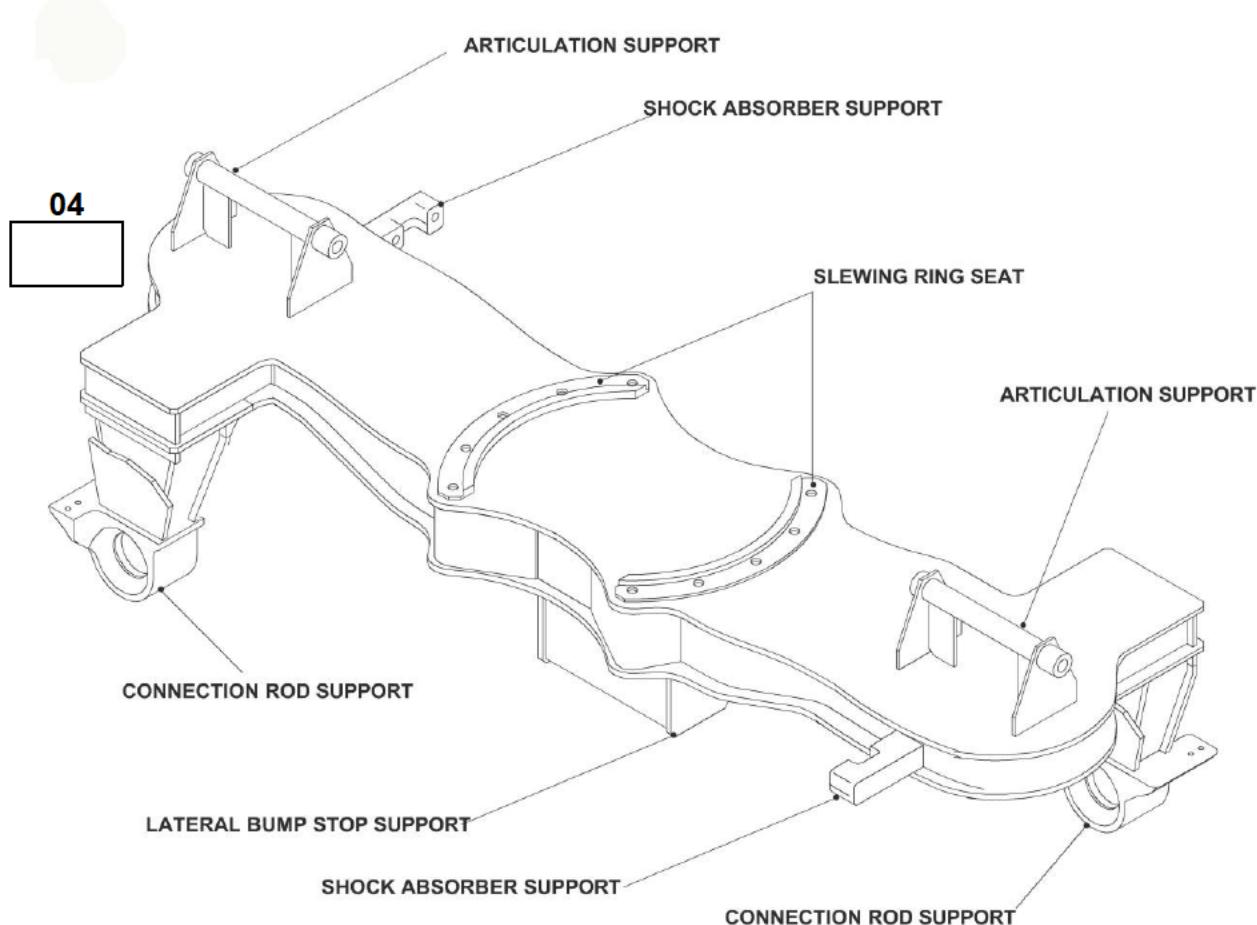


Figure 12-I-02.27 Trailer Truck Bolster Beam

The static and fatigue calculation for the Bolster Beam have been carried out in accordance with MTA specifications, by using the fatigue strength of welding joints derived from document PCA_AA03UA2, based on Eurocode number 3, section 9, and considering the AnsaldoBreda welding quality class and experience.

The fatigue verification has been made for two million cycles and in accordance with Miner's cumulative damage law.

A refined analysis by means of FEM has been carried out, both for static and fatigue load conditions.

12-I-02.03.03 Trailer Truck Primary Suspension

The purpose of the primary suspension is to transmit the vertical, lateral and longitudinal loads from the truck frame to the axles, reducing shock loads to the truck frame coming from the tracks.

Four journal boxes bear the truck frame by means of eight conical springs.

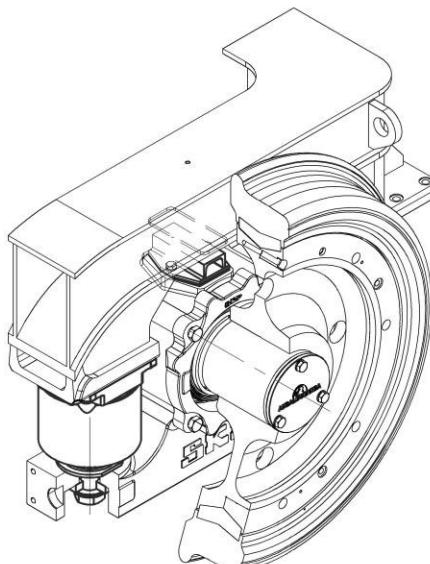
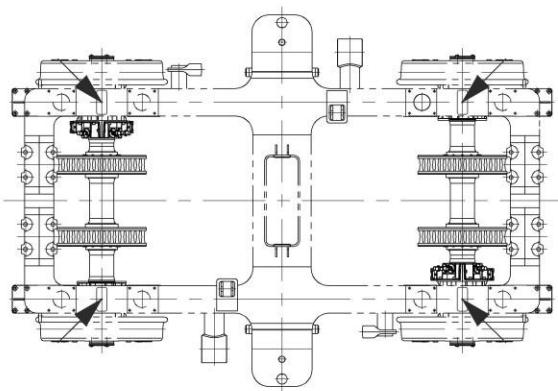
The way conical springs were designed, the vertical resonance frequency of the primary suspension system shall not exceed 14 Hz. Conical springs provide also a damping effect.

Conical springs have the safety hangers incorporated. Safety hangers limit the vertical movement of the truck frame and are used for the lifting of the wheels etc.

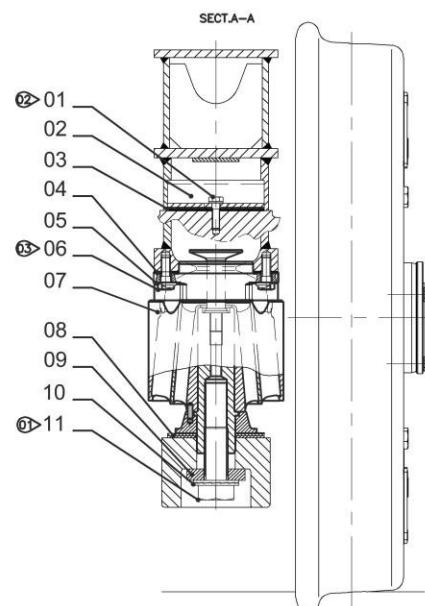
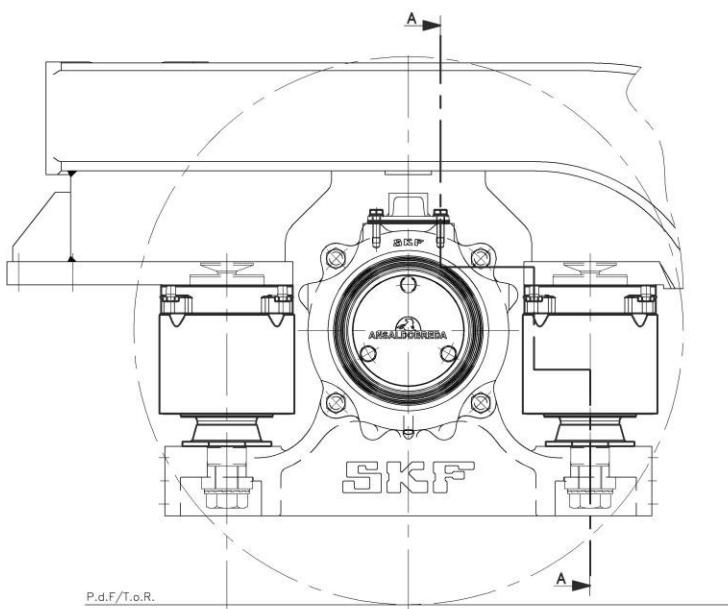
Journal boxes are fitted with cartridge bearings.

Primary suspension stiffness are optimized in order to:

- Assure the truck stability up to the over speed
- Maintain a good level of ride quality
- Assure the minimum wheel unloading in skew conditions
- Permit a good truck behavior during the negotiation of curves

**TIGHTENING TORQUE**

- ① :TORQUE TO 369 ft*lb
- ② :TORQUE TO 52 ft*lb
- ③ :TORQUE TO 64 ft*lb



01. HEX BOLT M10x30 ISO 4017
 04. CONICAL SPRING UPPER SHIM
 07. CONICAL SPRING
 10. LOCKING TAB

02. VERTICAL STOP
 05. LOCKING TAB
 08. CONICAL SPRING LOWER SHIM
 11. HEX BOLT M30x2 L=70 ISO 4017

03. SHIM
 06. HEX BOLT M12x35 ISO 4017
 09. SPACER

Figure 12-I-02.28 CT Primary Suspension

12-I-02.03.04 Trailer Truck Secondary Suspension

With the exception of the Leveling valve (only one on CT) the Mean Pressure valve and the Duplex Check valve, all items of the Secondary Suspension are common to Motor and Trailer Truck.

Secondary suspension consists of the elements that transmit the loads between the bolster beam and the truck frame and control the relative motion.

Two air springs positioned between the bolster beam and the truck frame cut-away high frequency vibrations and assure the required level of comfort inside the car.

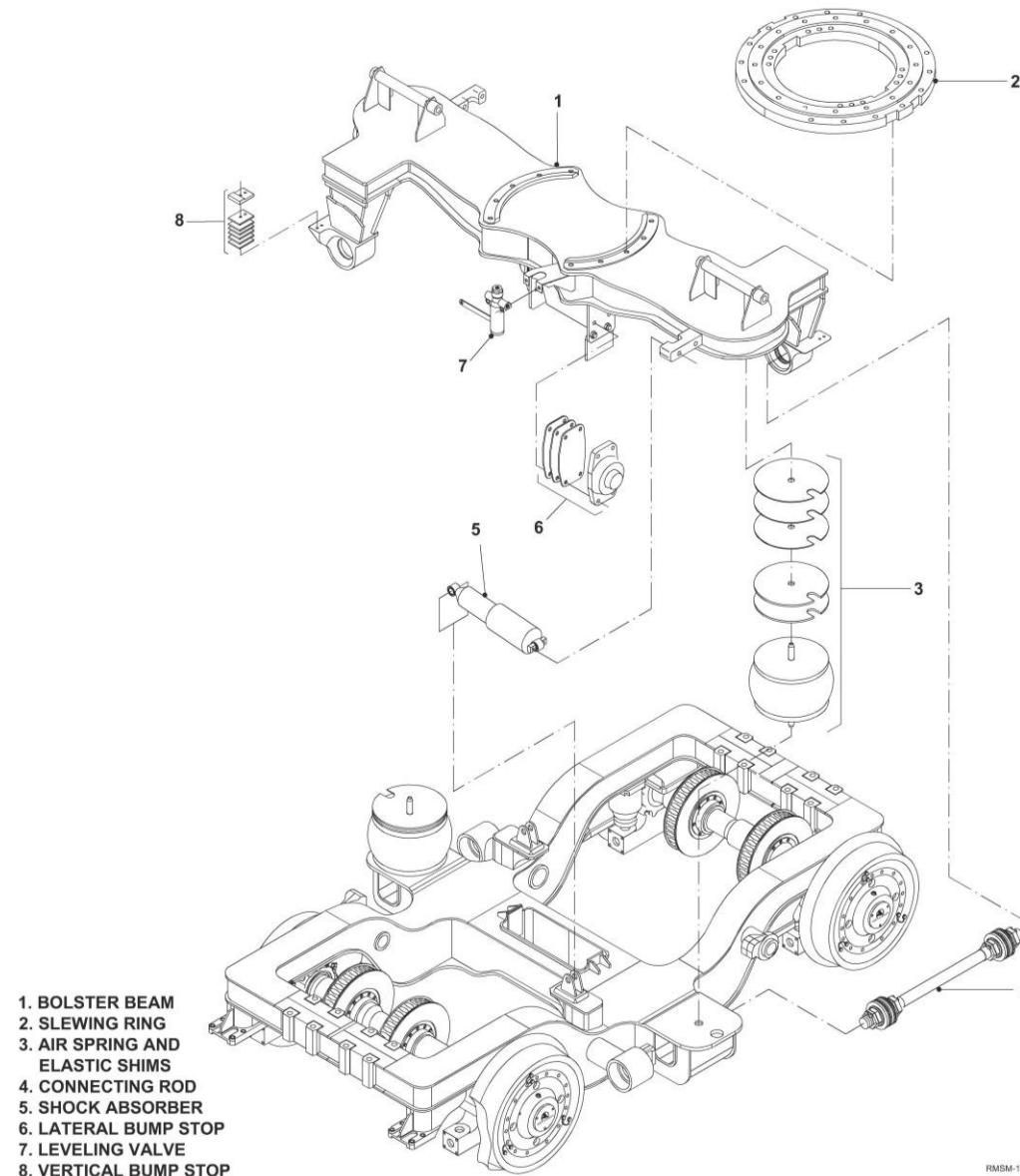


Figure 12-I-02.29 CT Secondary Suspension

To assure the achievement of this comfort, the natural frequency of the air springs has been set below 1.5 Hz, by means of an auxiliary 3.17 gals (12 l) air reservoir for each spring.

Air springs contain inside rubber bump stops, designed with a progressive vertical spring rate.

For abnormally large vertical oscillations, inside rubber bump stops serve the purpose of providing a non-linear restoring force.

In the event of an air spring failure, inside rubber bump stops provide an auxiliary springing system.

The stiffness of the bump stop has been defined in a way that permits to maintain the required limit of wheel unloading also in case of air spring deflated.

Air springs receive their air supply from the car piping through leveling valves. Between the air spring and the auxiliary reservoir an air lamination damper provides the necessary vertical damping.

The bolster beam is resiliently restrained to the truck frame:

- Laterally, by means of two rubber bump-stops, with progressive stiffness
- Longitudinally, by means of two traction rods
- Lateral damping is provided by hydraulic shock absorbers

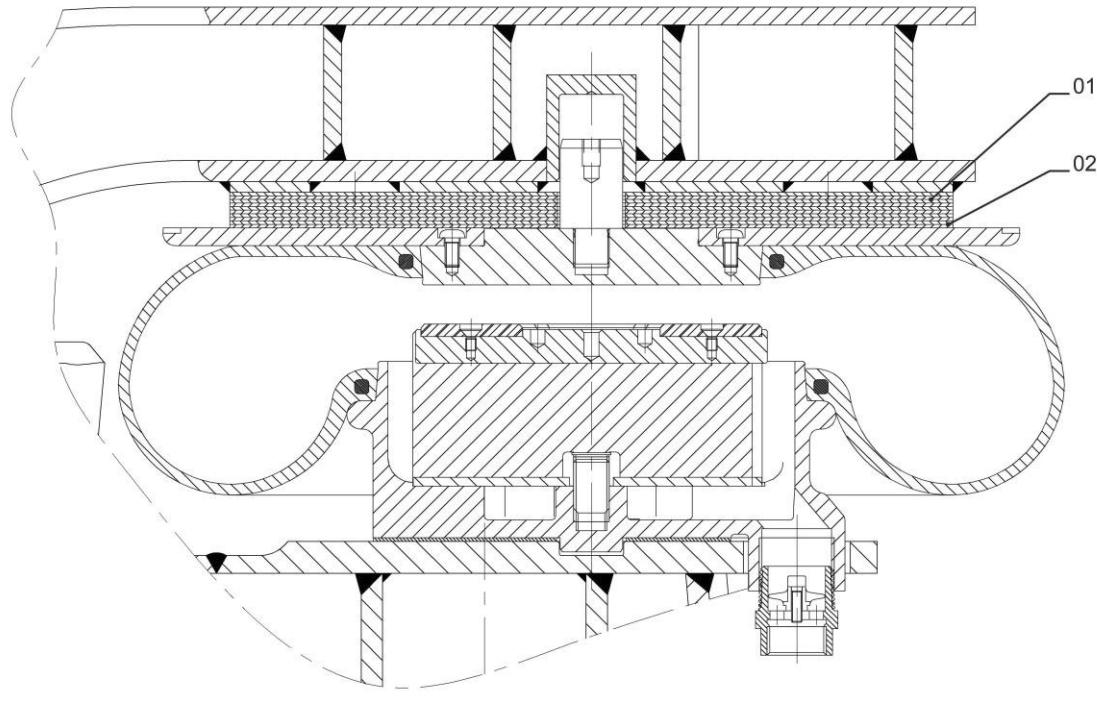


Figure 12-I-02.30 Air Spring

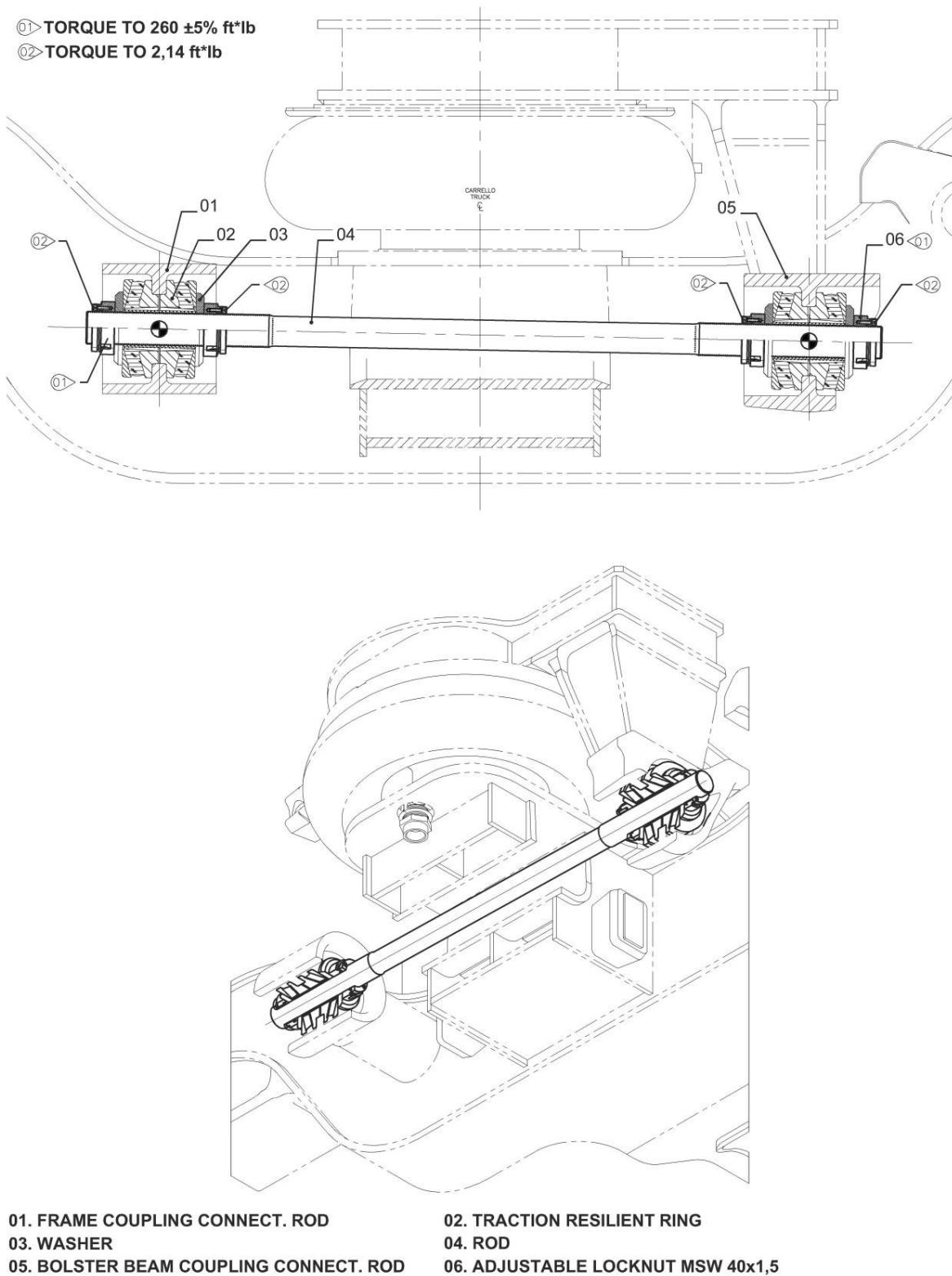


Figure 12-I-02.31 Trailer Truck Traction Rod

12-I-02.03.05 Trailer Truck Wheel Set

Each Trailer Truck is provided with two wheel sets.

Each wheel set includes the following main components:

- A hollow axle, made of AISI 4130 steel
- Two Bochum 84 resilient wheel type with oil injection removal
- Two steel brake disks
- Two cartridge roller bearings, 203.3x220 mm
- Two cast iron journal boxes
- One grounding contact device

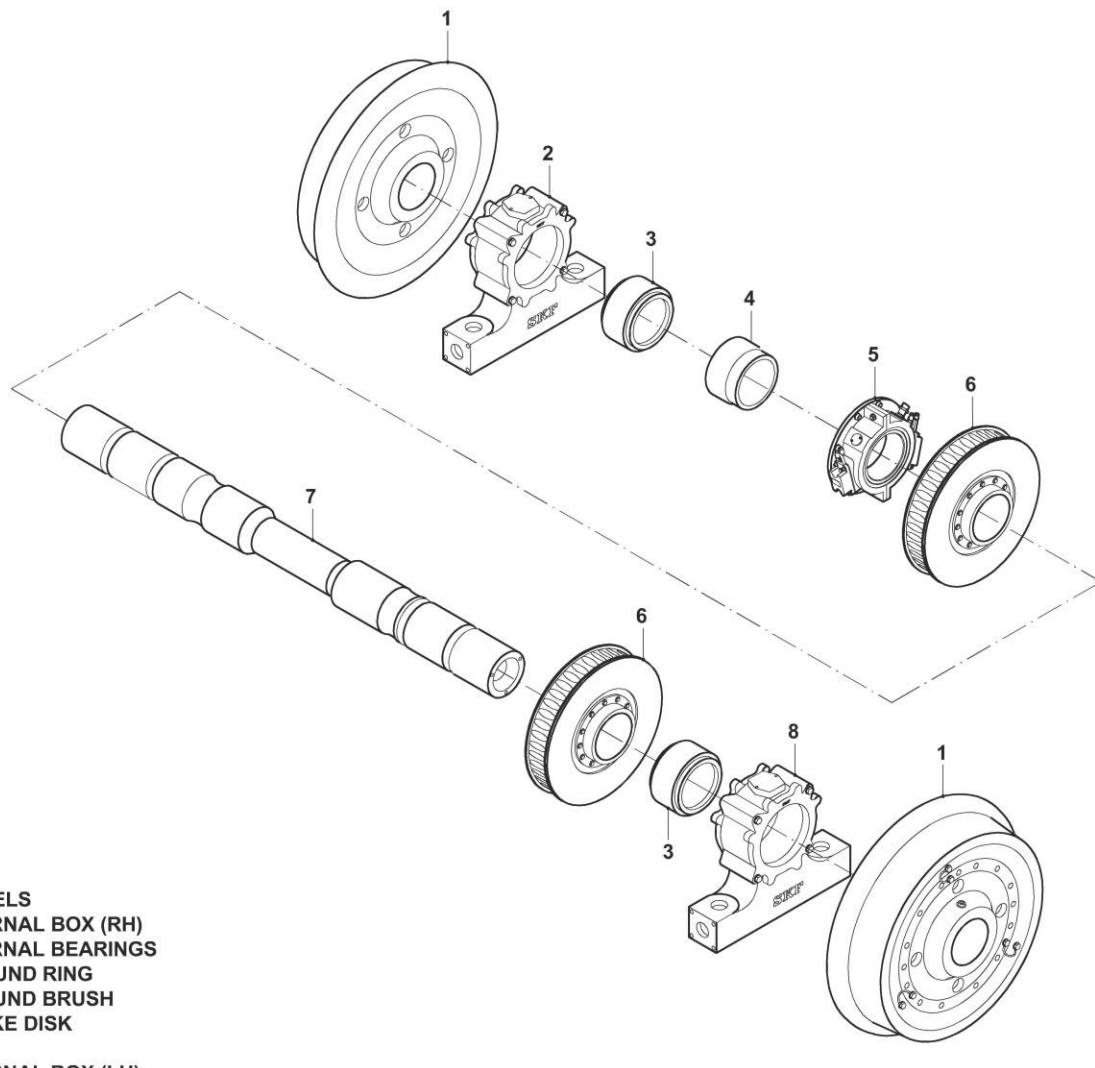


Figure 12-I-02.32 Trailer Truck Wheel Set

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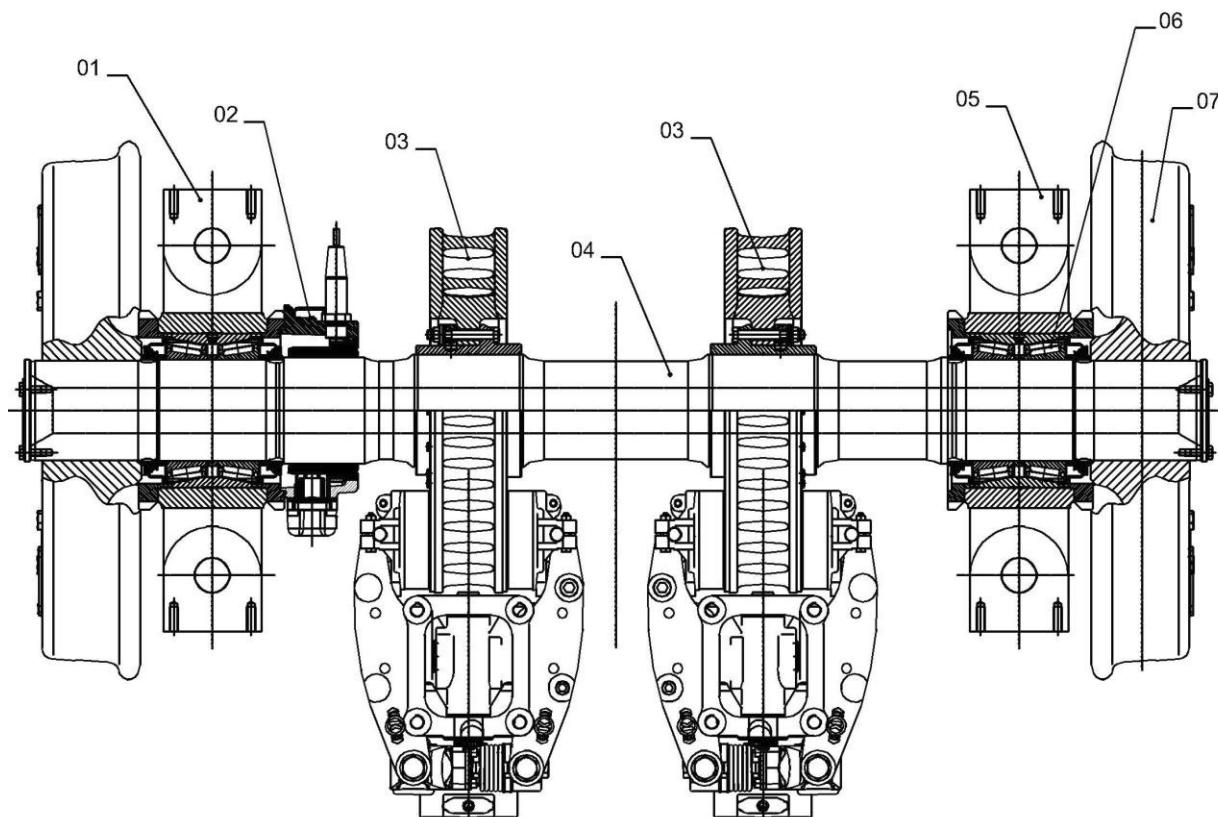


Figure 12-I-02.33 Trailer Truck Wheel Set Assembly

The Journal Bearing, (refer to Figure 12-I-02.34) located inside the Journal Box (refer to Figure 12-I-02.32 and Figure 12-I-02.33), is a TBU (Tapered Bearing Unit) "L" class type of bearing.

Tapered roller bearings have tapered inner and outer ring raceways between which tapered rollers are arranged.

Their design makes tapered roller bearings particularly suitable for the accommodation of combined (radial and axial) loads.

To lubricate the bearing, the grease (Esso Arapen RB320) must be distributed as follows:

- 70 g in the center ring (through the threaded plug) ± 0.020 kg
- 100 g in each roller row (through the annular labyrinth) ± 0.020 kg

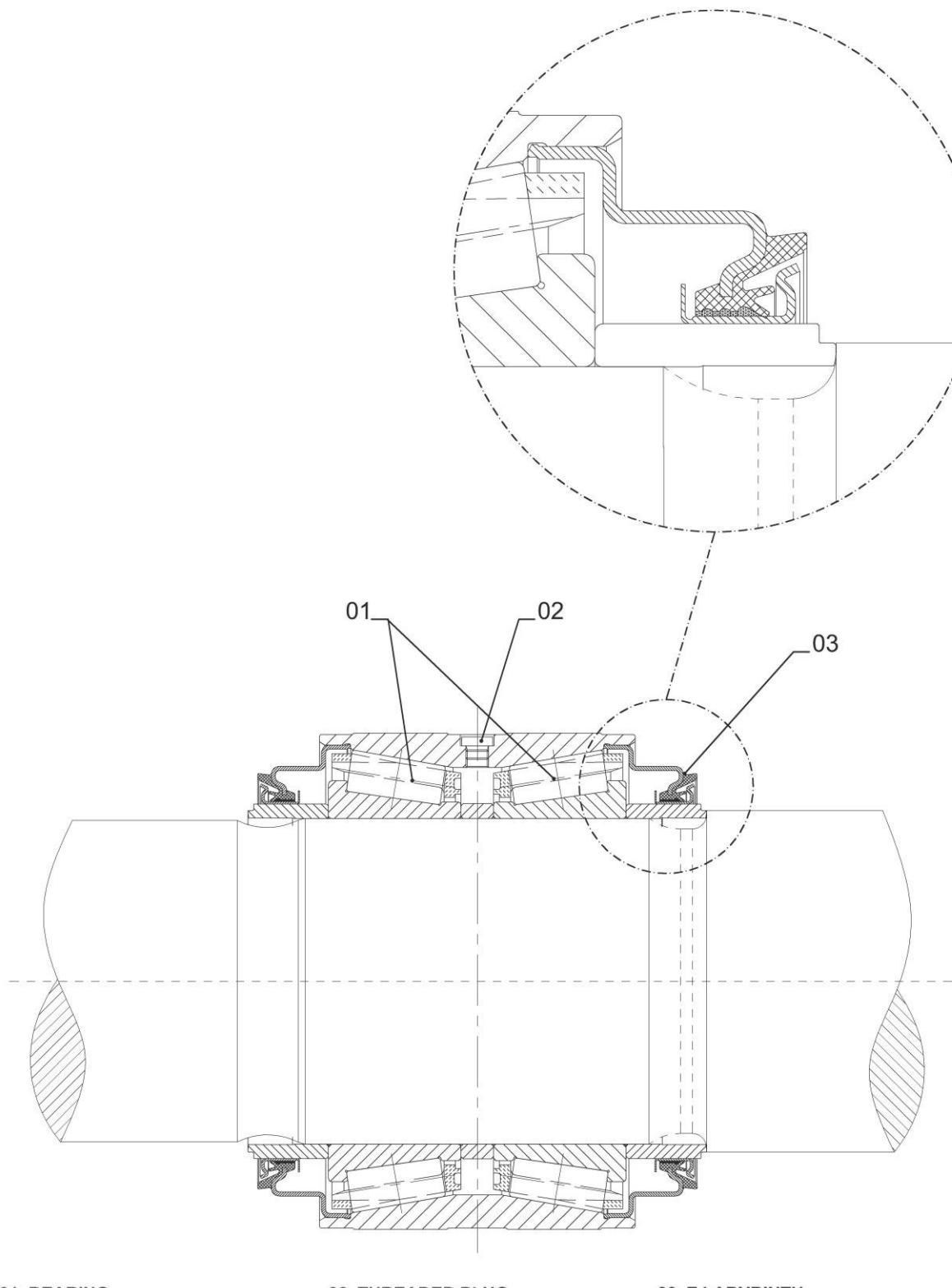
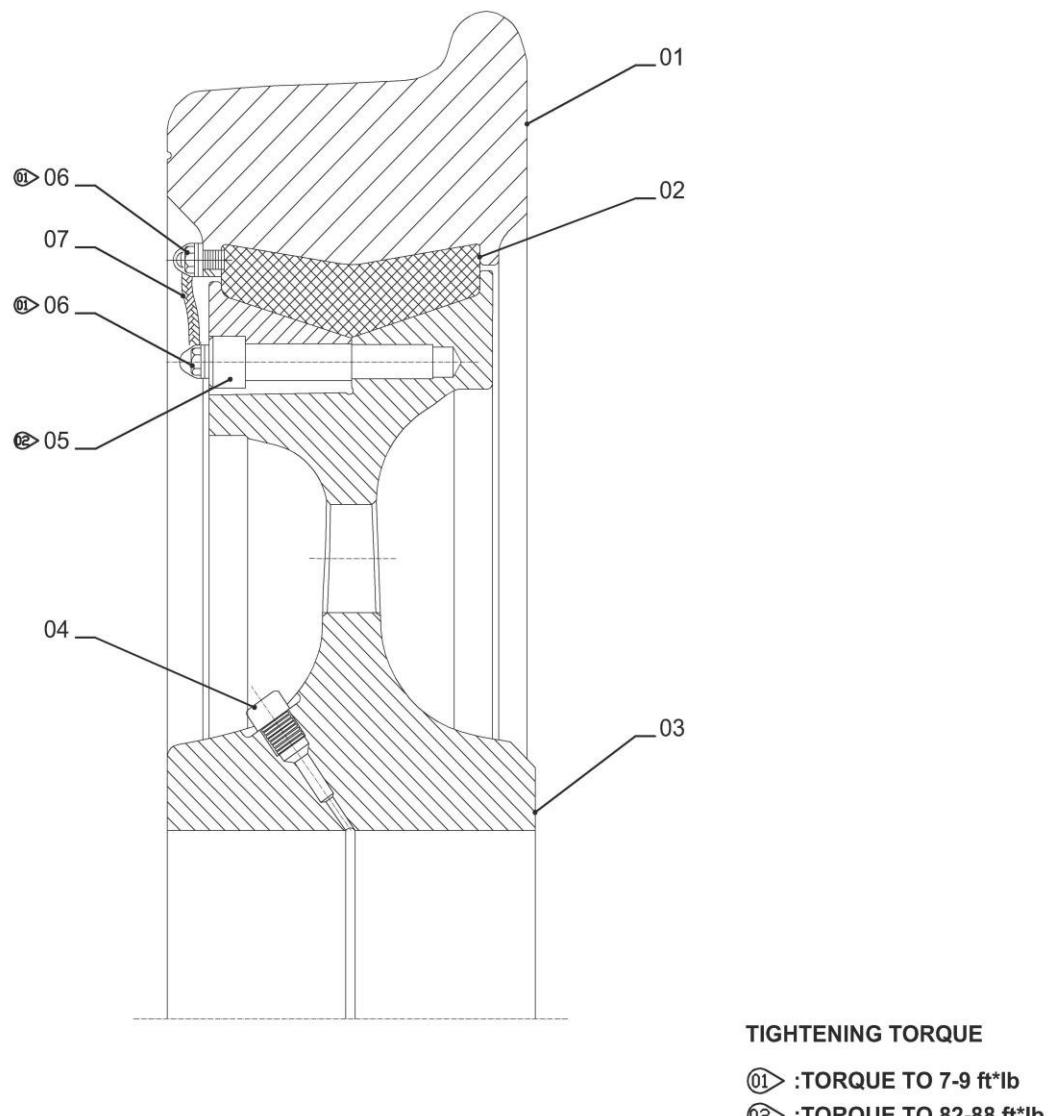


Figure 12-I-02.34 Trailer Truck Journal Bearing

12-I-02.03.05.01 The Wheel

The Wheel is made up of the Wheel Center, the Conical Ring, the Rubber Block and the Tire.

External shunts connect the Tire to the Wheel Center to assure the electrical continuity and the grounding to the rails.



01. TIRE

04. SOCKET HEAD SCREW PLUG
07. EXTERNAL SHUNT

02. F4 RUBBER BLOCK

05. SOCKET HEAD CAP SCREW

03. WHEEL CENTER

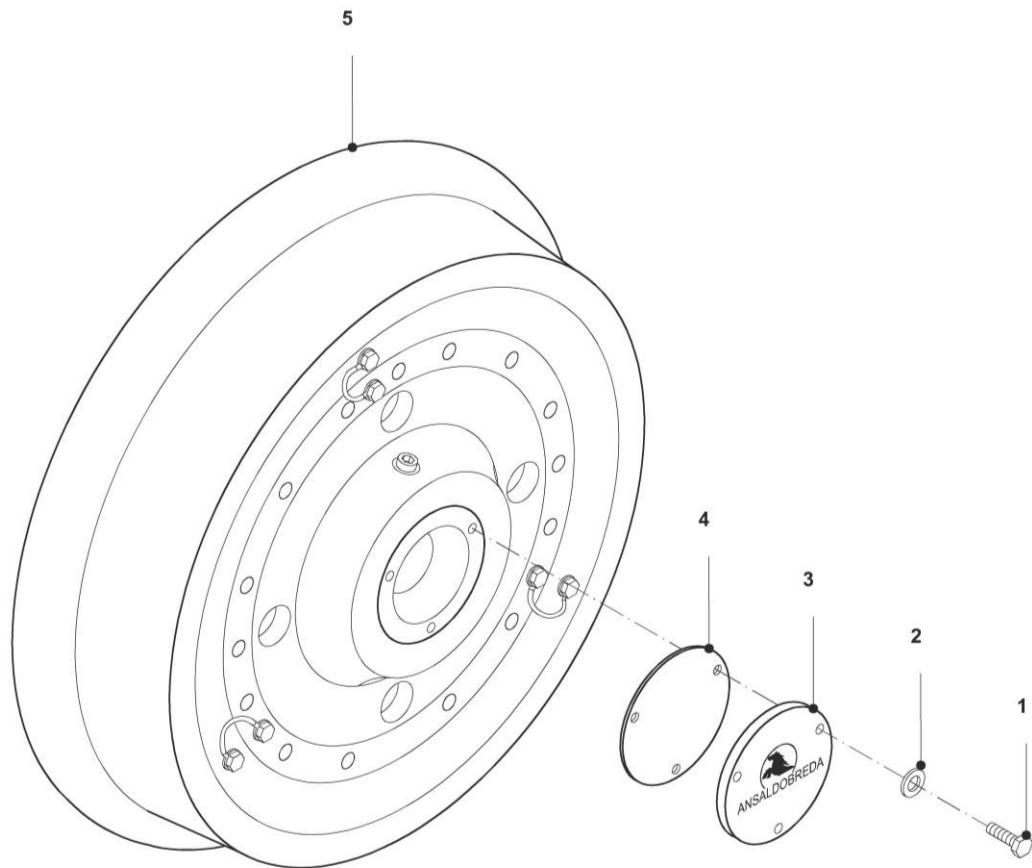
06. SELF LOKING SCREW

Figure 12-I-02.35 Wheel

12-I-02.03.05.02 Axle Covers

The Axle Covers (3) (Refer to Figure 12-I-02.19), are installed on the Wheel Axle to protect the axle hole from contamination.

The Gasket (4) is installed between Axle and Cover.



1. SCREW
2. WASHER
3. AXLE COVER
4. GASKET
5. WHEEL

Figure 12-I-02.36 Axle Covers

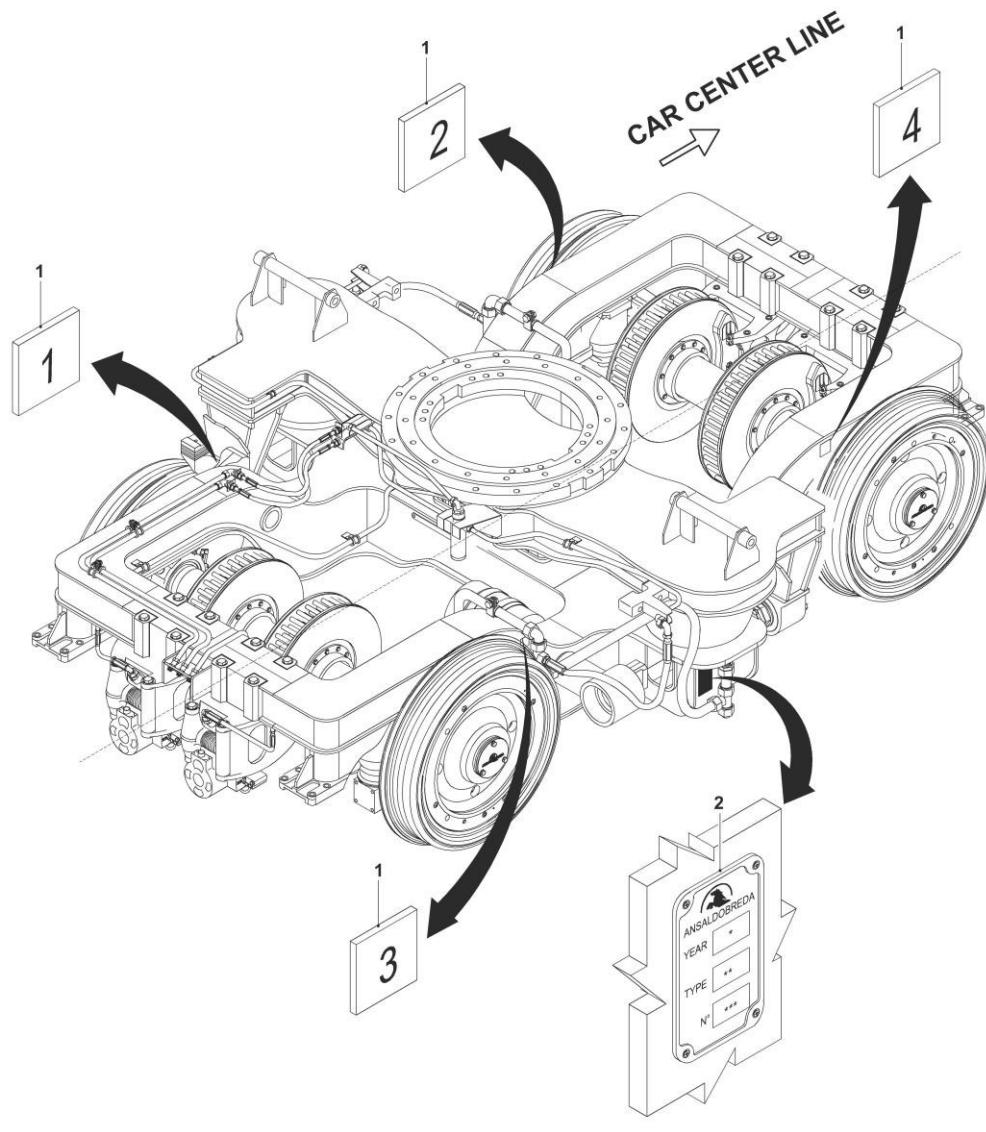
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12-I-02.03.06 Trailer Truck - Miscellaneous Items
12-I-02.03.06.01 Plates

The plates (Refer to Figure 12-02.18), installed on the truck, have the function of identifying the wheel number, the MFR name, the building year and the truck serial number.

The Plates are made with light alloy and are fitted to the frame by screws (MFR name plate) or glued (all other labels).

The glue used is a two-component adhesive type 3M - VHB ACRYLIC FOAM - TAPE 4945.


01. WHEEL NUMBER PLATE
02. MFR / SERIAL NUMBER PLATE
Figure 12-I-02.37 Plates

12-I-02.04 AIR SUSPENSION SYSTEM

The Air Suspension System consists of three independent subsystems: one for "A" Motor Truck, one for "B" Motor Truck and one for Trailer Truck.

The Air Suspension System is designed to keep the vehicle floor at the required height by equalizing the load displacement on a per truck basis.

Air supply pressure for the leveling system comes from the main reservoir supply line through cutout cocks L1.1 and L1.4, air filter L1.2, and check valve L1.3 (refer to Figure 12-I-02.38).

Cutout cock L1.4 is provided to isolate the leveling system in case of failure or during maintenance operations of the truck.

Cutout cock L1.1, used in conjunction with L1.4, permits maintenance of air filter L1.2, and check valve L1.3 without venting main reservoir pressure.

The air supply is shared by two leveling valves on the Motor truck, and one leveling valve on the Trailer Truck.

On the Motor truck, one leveling valve is used to adjust the air volume in one air bag. On the Trailer Truck, one leveling valve adjusts the air volume for two air bags.

The two air bags are on opposite sides of each power truck are joined through a duplex check valve L7.

The duplex check valve allows flow from one air bag to the other only when the pressure differential between air bags exceeds 22 psi.

The mean pressure valve L5 is positioned between, and averages the pneumatic pressure from each air bag.

A single pneumatic pressure is then fed to the load pressure limiting valve of the corresponding brake control unit for each Motor truck.

The trailer truck does not contain a duplex check valve nor a mean pressure valve.

A pneumatic pressure is simply run from one air bag to the load pressure limiting valve.

Two test fittings L8 are mounted on each Motor truck and one on the Trailer Truck for measuring air bag pressures.

The Air Suspension Subsystems are also provided with the following components:

Two Air Reservoirs (L9), with the function of "plenum chamber" to allow the related air spring operation;

Two Test Fittings (L8) on each Motor truck and one on the Trailer Truck, used for monitoring individual air spring pressure.

One Pressure Transducer (B5.10), that converts the air spring pressure value into electrical signals as input for the Brake Control Unit (B5) (Refer to Section 13 of this Manual).

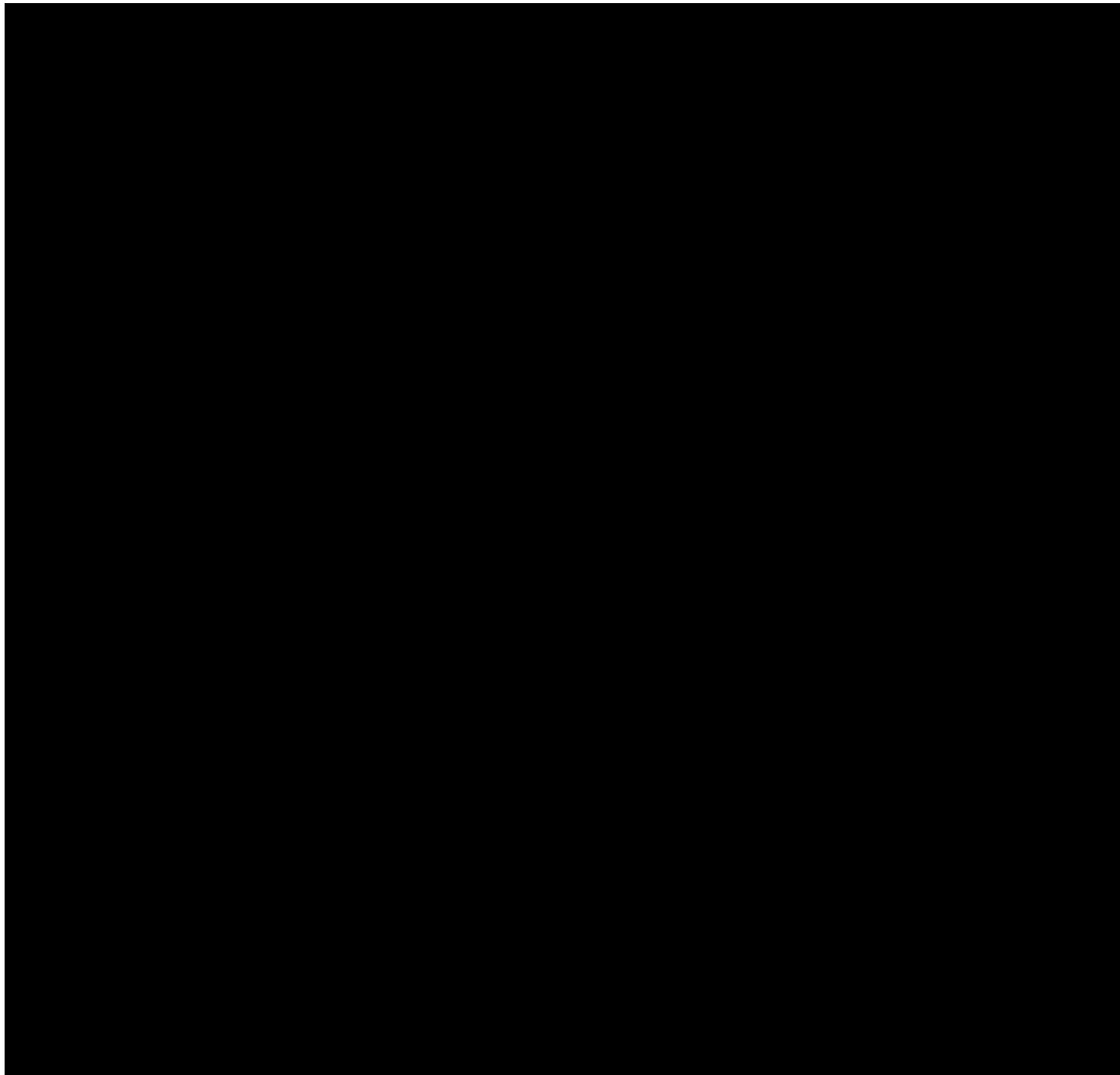
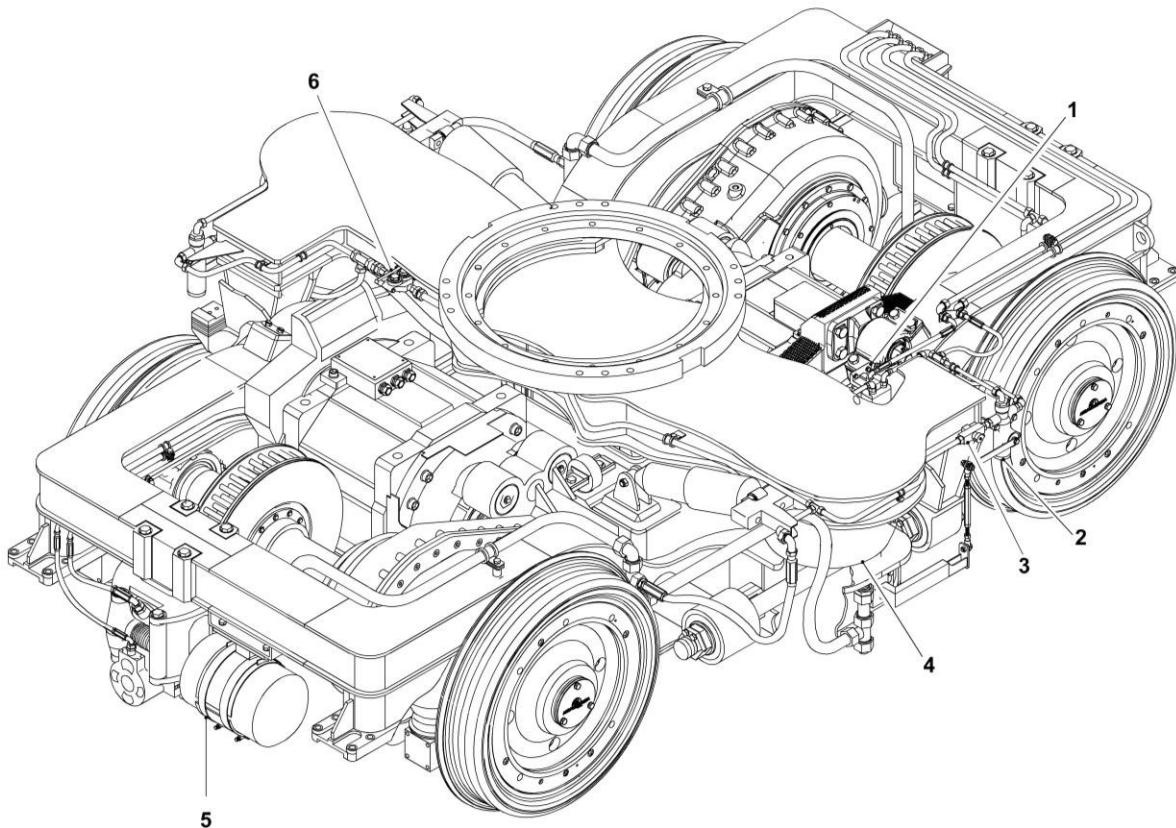


Figure 12-I-02.38 Suspension System Pneumatic Diagram

12-I-02.04.01 Motor Truck and Trailer Truck Air Suspension System Piping



01. MEAN PRESSURE VALVE
04. AIR SPRING

02. LEVELING VALVE
05. AIR RESERVOIR

03. TEST FITTING
06. DUPLEX CHECK VALVE

Figure 12-I-02.39 Motor Truck Air Suspension Components

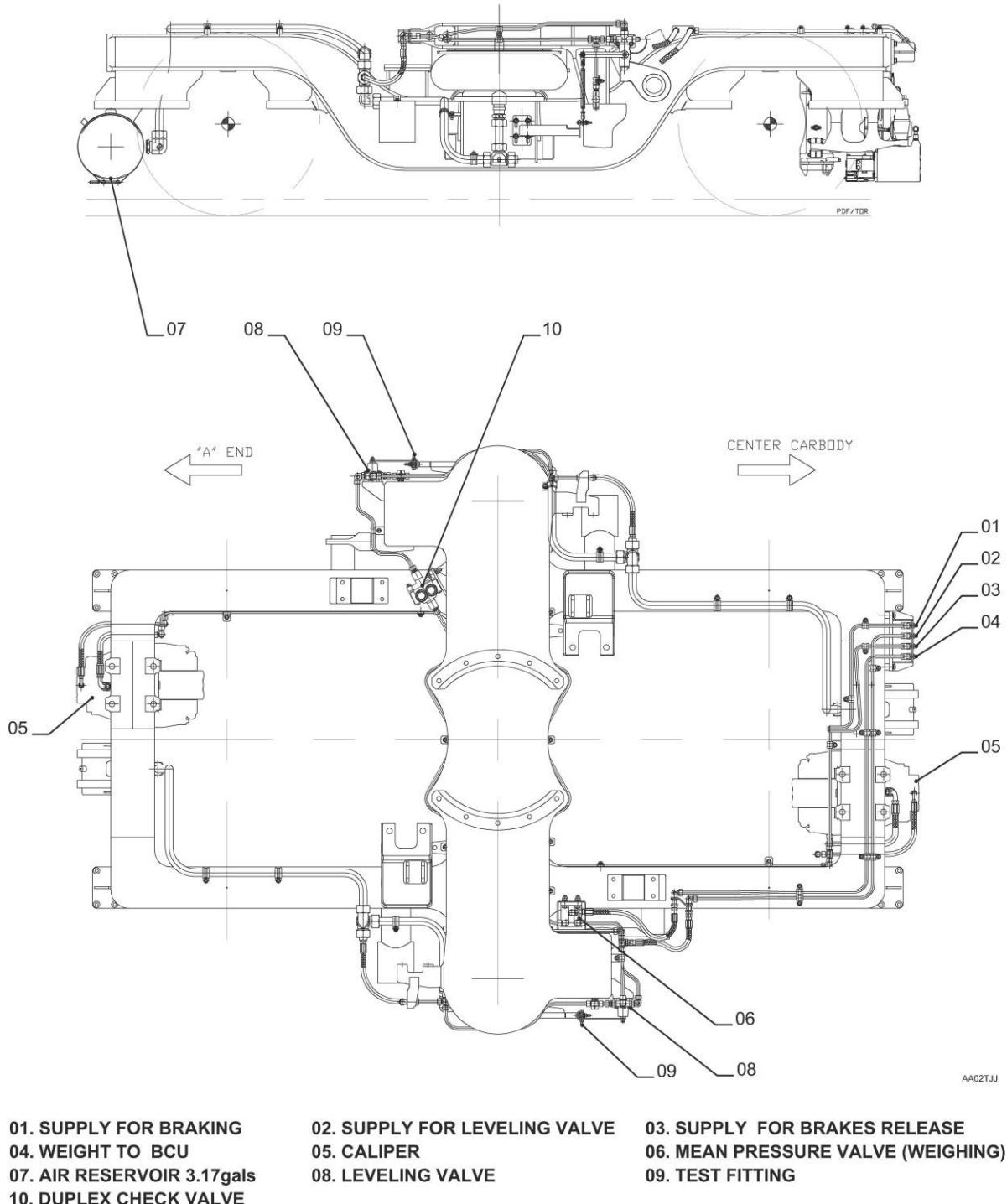


Figure 12-I-02.40 Motor Truck Air Suspension Piping

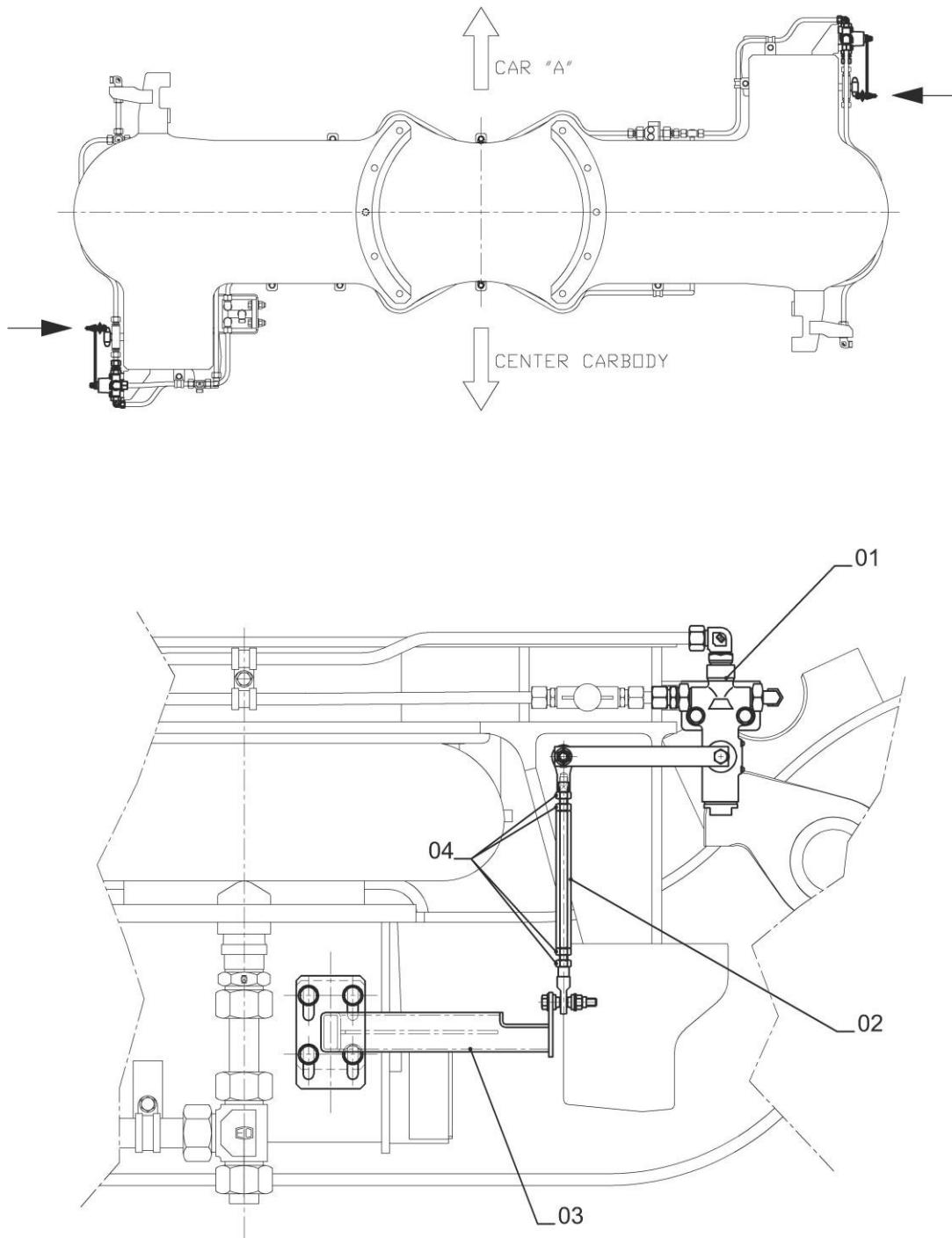
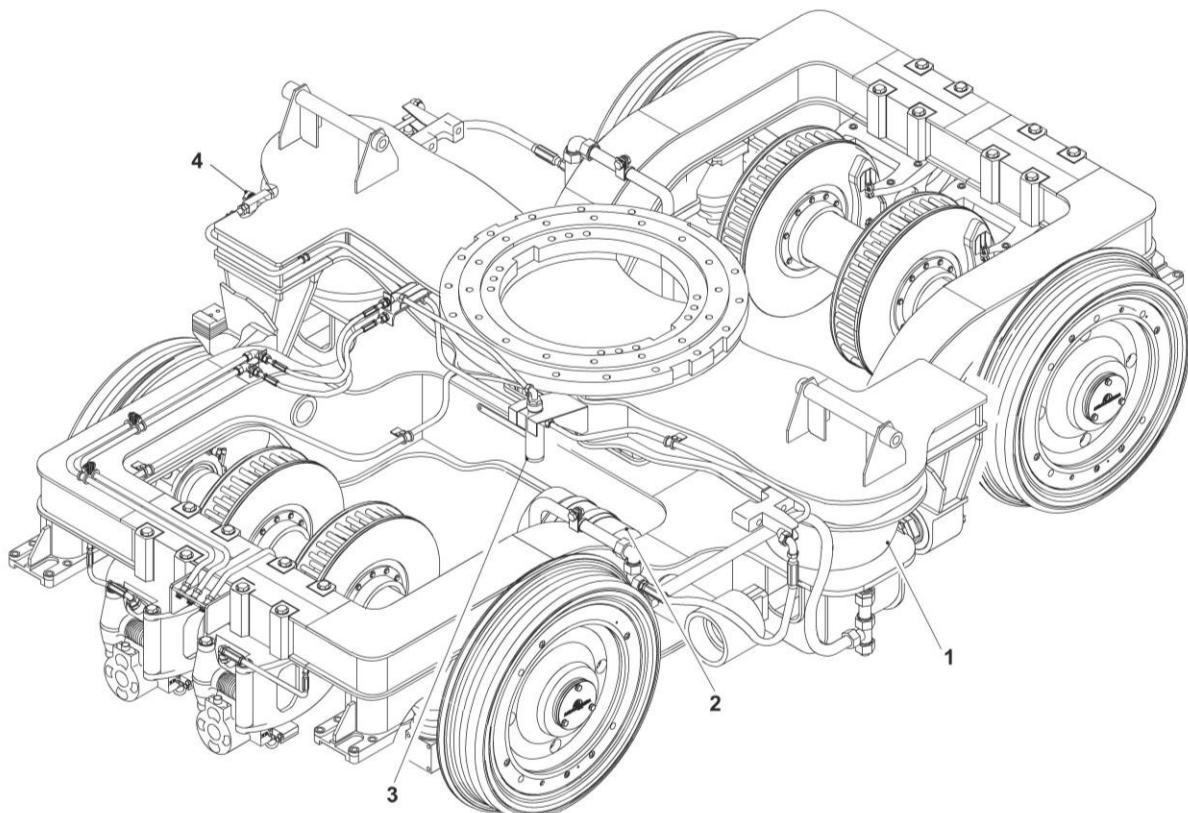


Figure 12-I-02.41 Motor Truck Leveling Valve

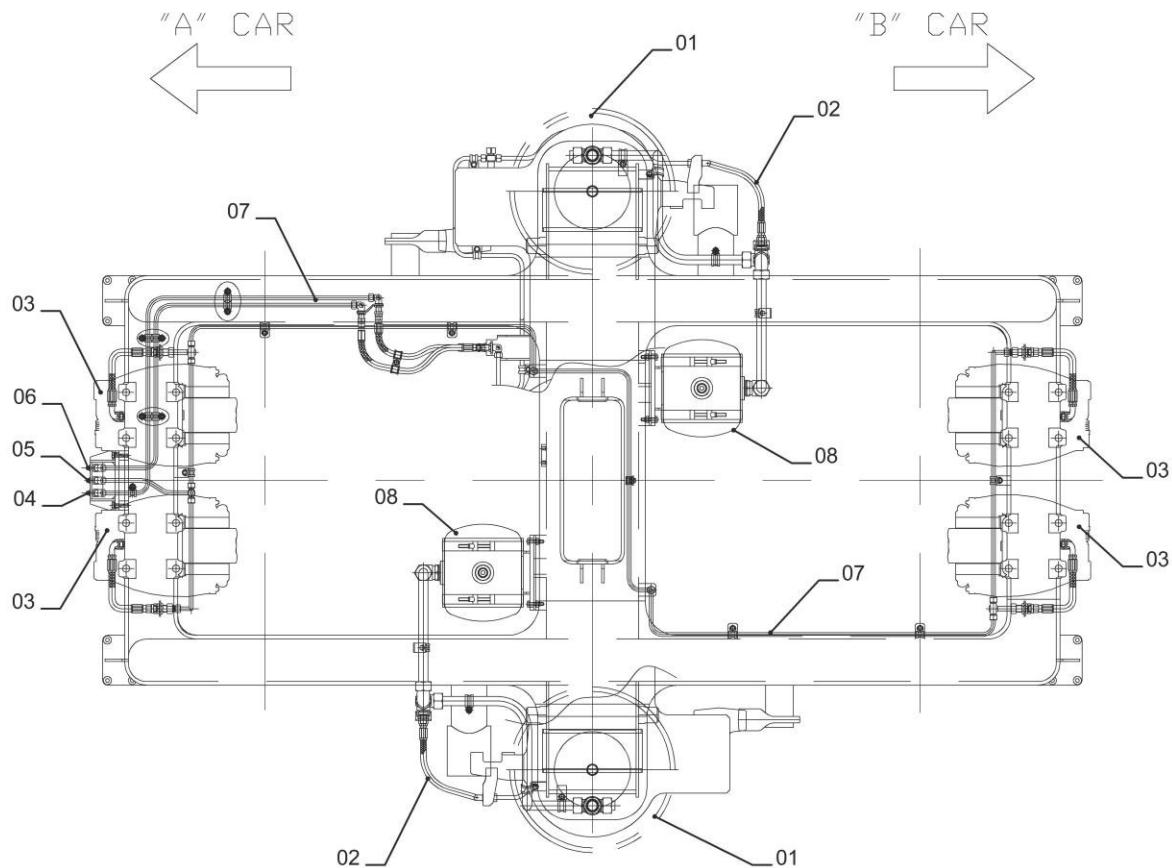
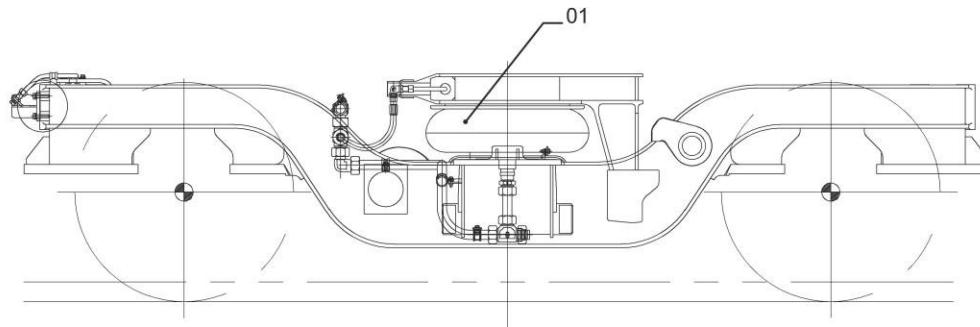


01. AIR SPRING
04. TEST FITTING

02. AIR RESERVOIR

03. LEVELING VALVE

Figure 12-I-02.42 Trailer Truck Air Suspension System Components



01. AIR SPRING
 04. WEIGHT TO BCU
 07. PIPE

02. HOSE
 05. SUPPLY FOR BRAKING
 08. AIR RESERVOIR 3.17gals

03. CALIPER
 06. SUPPLY FOR LEVELING VALVE

Figure 12-I-02.43 Trailer Truck Air Suspension System Piping

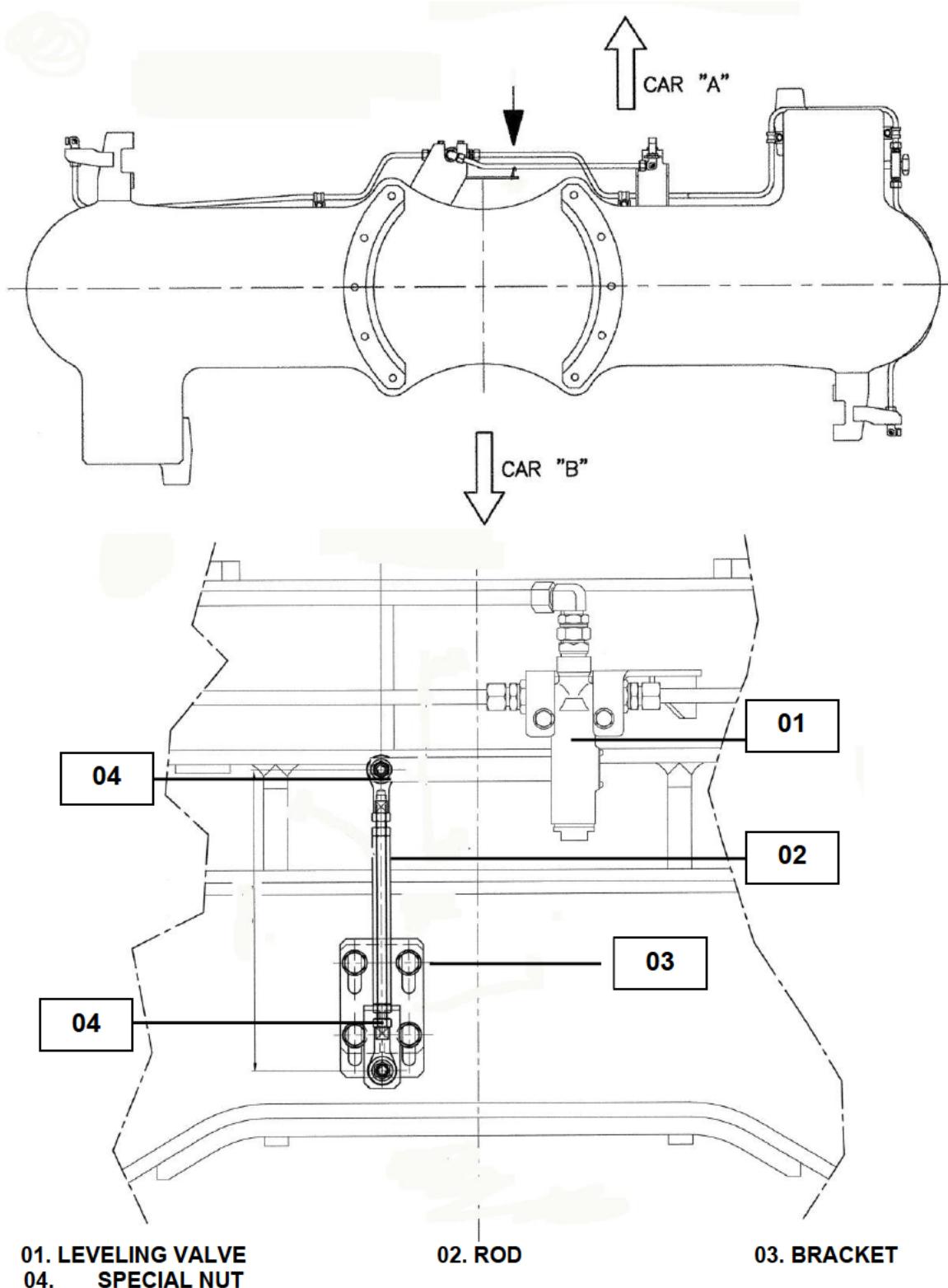


Figure 12-I-02.44 Trailer Truck Leveling Valve

12-I-02.04.02 Suspension System Components

12-I-02.04.02.01 LA2100 AIR FILTER

The LA2100 Air Filter, refer to Figure 12-I-02.45 removes debris from the air input to the secondary suspension system on each truck.

The secondary suspension air filter is identified as L1.2 on Figure 12-I-02.38.

The air filter body (1) contains the strainer element (2), which is held by compression spring (3). The compression spring (3) is restrained by the screw plug (5).

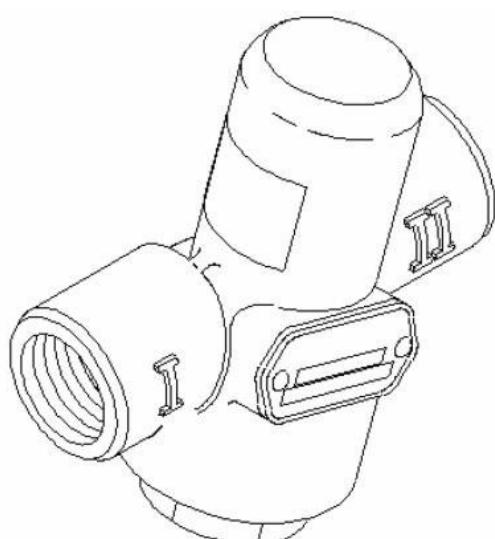
Working Principle

Compressed air flows via the port II through the strainer element (2) to port I, refer to Figure 12-I-02.46.

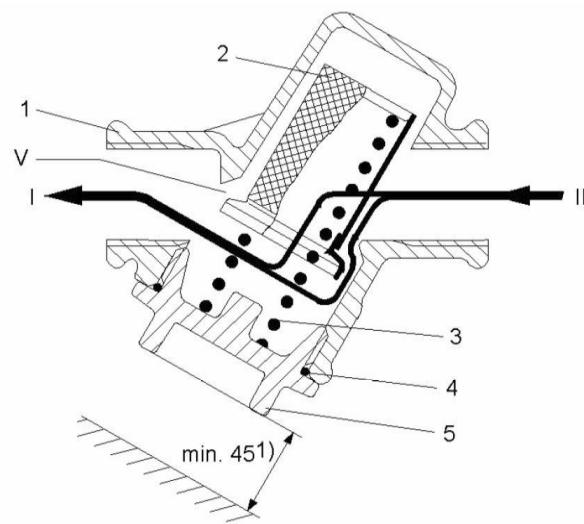
The fine wire meshing of the strainer element (2) holds back impurities carried by the compressed air.

When the strainer element (2) reaches the point of complete saturation, the compression spring (3) is squeezed together by the pressure difference between II and I, allowing compressed air to flow through the valve seat V from II to I.

In this way, the downstream equipment is still supplied with enough compressed air when the strainer element (2) is completely choked.



**Figure 12-I-02.45
LA2100 Air Filter**



1 Body	I Consumer port
2 Strainer element	II Air supply port
3 Compression spring	V Valve seat
4 O-ring	
5 Screw plug	
1) Clearance for removing strainer element	

Figure 12-I-02.46 Air Filter Cross Section

12-I-02.04.02.02 Check Valve

The model RV-10 check valve, Figure 12-I-02.47 is used in compressed air pipes in which the flow of air must be enabled in one direction and reflux disabled in the other direction to avoid a pressure drop.

The unit (Refer to Figure 12-I-02.48) consists essentially of a body (a), the valve cone (b), and the compression spring (c).

The body (a) has a valve seat V. The valve cone (b) is spring-loaded, i.e. it is pressed onto the valve seat V by the thrust of the compression spring (c).

The body (a) has threads for connecting pipes.

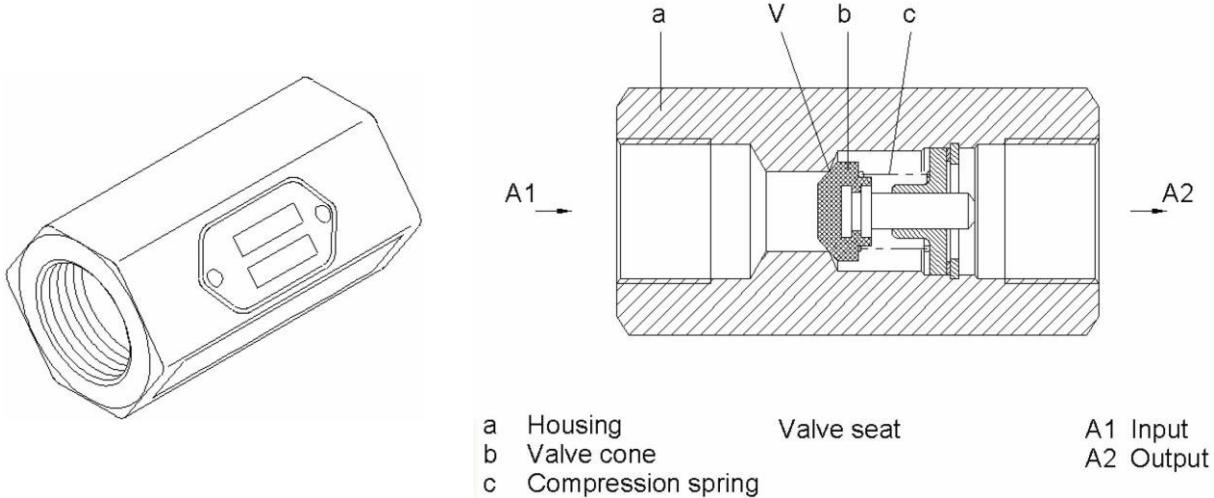
The direction of flow is indicated by an arrow on the outside of the body (a).

Working Principle

Rising pressure in the direction of flow makes the valve cone (b) open the valve seat V against the force of the compression spring (c), thereby admitting compressed air to outlet A₂.

As soon as the pressure at the compressed air inlet A1 drops and falls below the level at the port A2, the compression spring (c) pushes the valve cone (b) onto the valve seat V.

Reflux and falling pressure at the port A2 are stopped in this way.



**Figure 12-I-02.47 RV-10
Check Valve**

**Figure 12-I-02.48 RV-10 Check Valve
Diagrammatic**

12-I-02.04.02.03 Cut-out Cocks

Cutout Cocks, refer to Figure 12-I-02.49, are located in the secondary suspension supply line that feeds from the MR pipe.

Two cutout cocks are provided in each supply line.

Cutout cock L1.1, when in the cutout position, permits maintenance of the air filter L1.2.

Cutout cock L1.4, when cutout, vents all secondary suspension pressure for its truck.

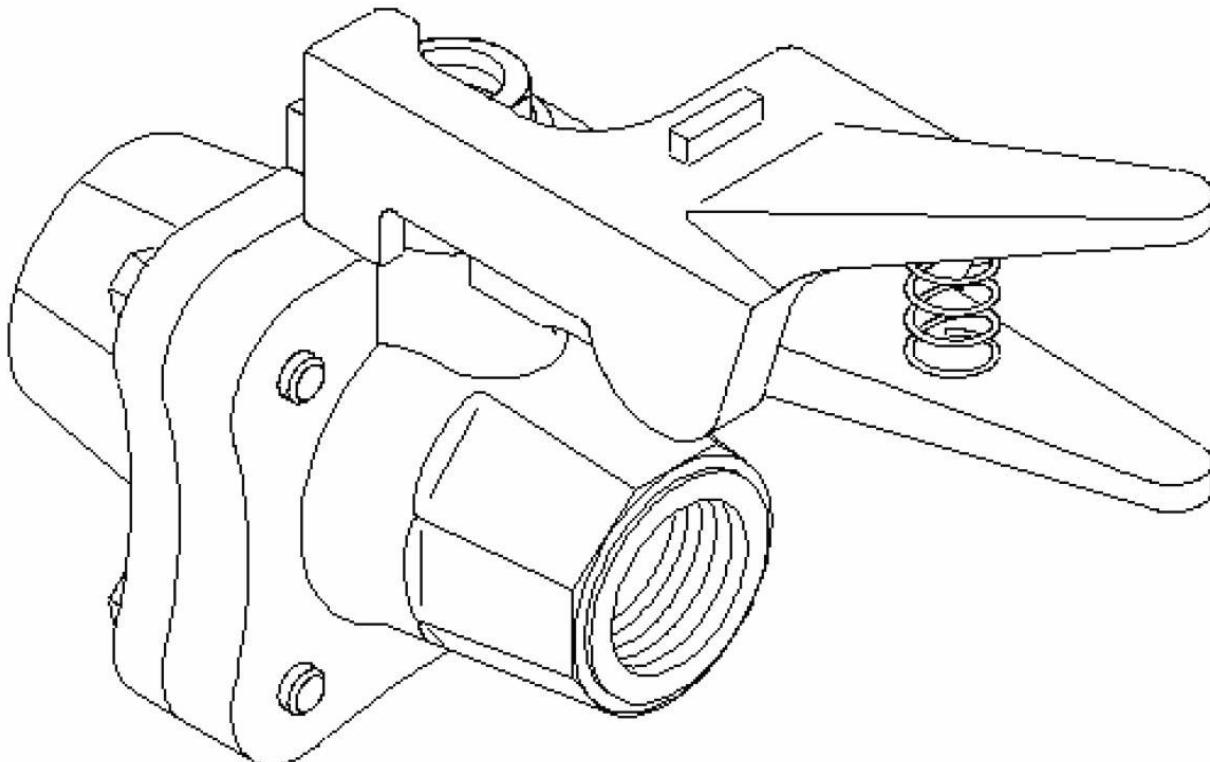


Figure 12-I-02.49 Cut-out Cock

12-I-02.04.02.04 Duplex Check Valve

The duplex check valve, refer to Figure 12-I-02.50, is used in the secondary air suspension system to link the two air bags when the pressure differential between the two air bags exceeds 22 psi.

Working Principle

As long as the pressure differential between ports P1 and P2, refer to Figure 12-I-02.51, does not exceed 22 psi, both valve seats V1 and V2 are kept closed by the thrust of the compression springs (d). Air does not flow from P1 to P2 or vice versa.

If the pressure at port P2 falls below the value representing the thrust of the compression spring (d), i.e. if the specified pressure difference is exceeded, then the gauge pressure at port P1 will open the valve seat V2.

Communication between the two ports is established.

The valve seat V2 stays open until the pressure difference between ports P2 and P1 reaches the specified level again.

If the pressure at port P1 falls, the overflow valve will work in the same way in the other direction.

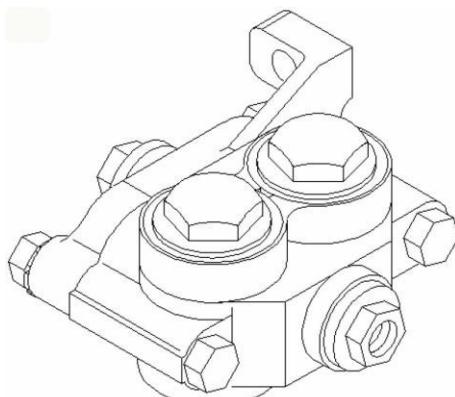
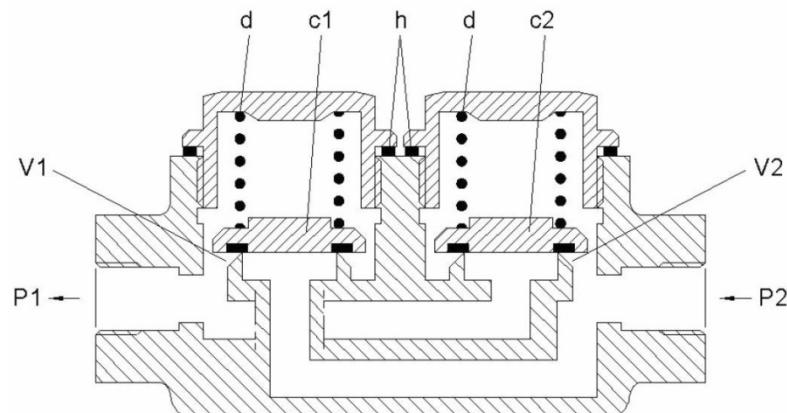


Figure 12-I-02.50 Duplex Check Valve



c1	Valve head	d	Compression spring	P1	Air pipe connection
c2	Valve head	h	Sealing ring	P2	Air pipe connection
			V1	Valve seat	
			V2	Valve seat	

Figure 12-I-02.51 Duplex Check Valve Diagrammatic

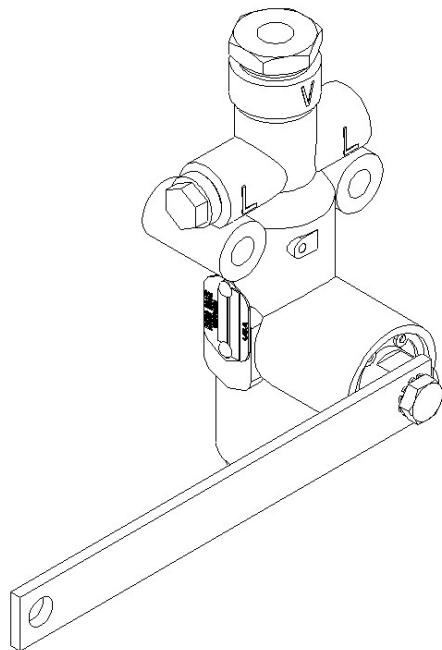
12-I-02.04.02.05 Leveling Valve

The leveling valve, refer to Figure 12-I-02.52, serves as an actuator in the closed loop of an air suspension system.

There are two leveling valves per power truck, and one leveling valve for the center truck.

The valve, refer to Figure 12-I-02.53, has a port V at the top for the auxiliary reservoir, and a port L at both left and right for connection to the air spring bellows.

Opposite the port V is the exhaust port E.



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Figure 12-I-02.52 Leveling Valve

Working Principle

The vertical motions of the trucks relative to the car body - as caused by the vehicle load being increased or decreased - are communicated to the actuating lever (23) via the actuating linkage and are transmitted to the driver and eccentric (18) mounted in the leveling valve's body (1).

The eccentric engages an oblong hole in the piston (16) and makes the piston move upward and downward as the driver rotates.

The valve head (2a) acts like a check valve V1. As a result, it stops air reflux from L (air spring bellows) to V when the pressure V falls.

As long as the vehicle is leveled, the leveling valve is in its so-called lap position where compressed air is neither admitted (for charging) nor discharged (for venting).

This is the position in which both the inlet valve V2 and the outlet valve V3 are closed.

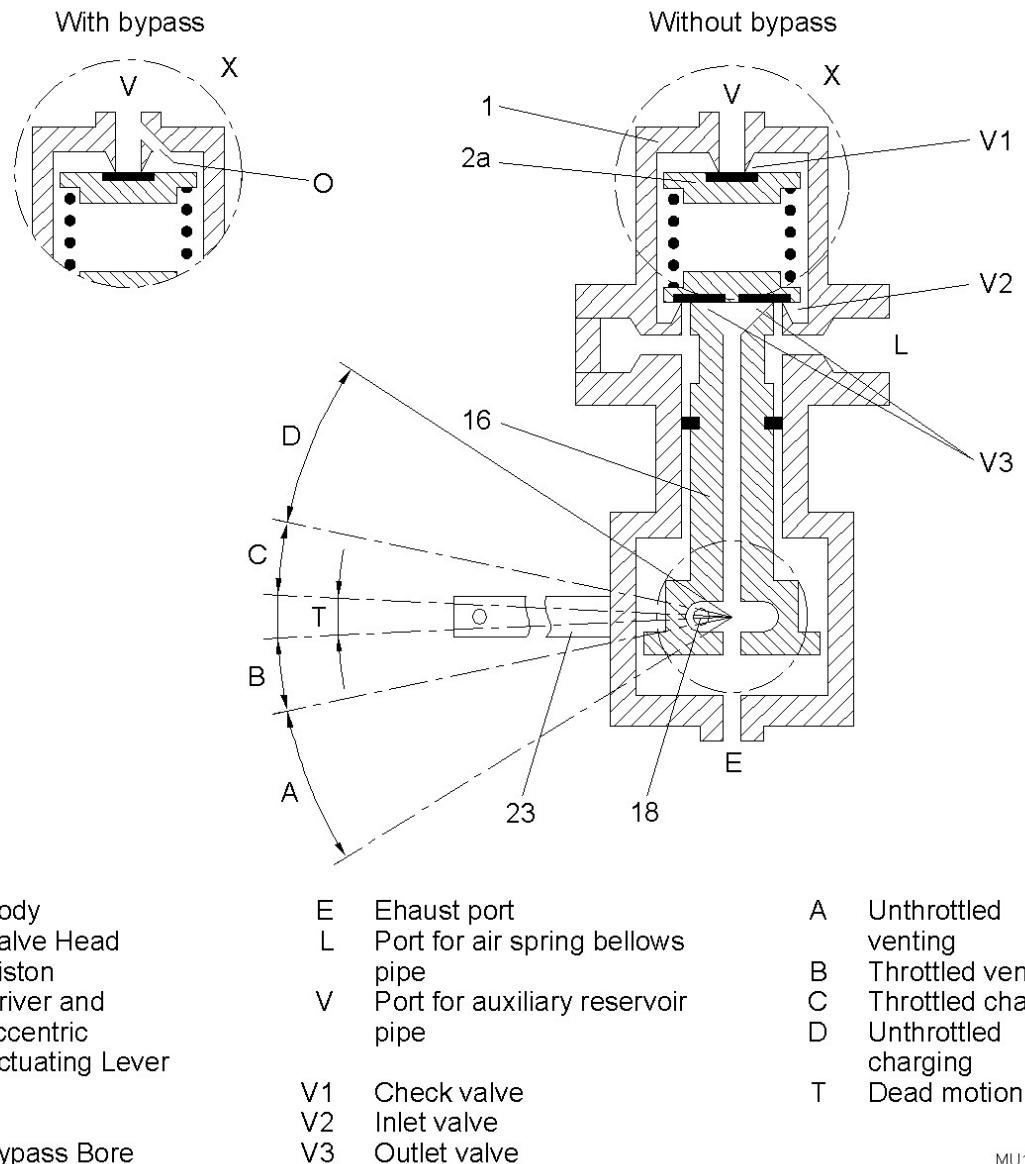


Figure 12-I-02.53 Leveling Valve at Lap Position

Loading

When the vehicle load is increased, refer to Figure 12-I-02.54, the car body first falls as the air spring bellows are compressed by the heavier load.

As the bellows are compressed, the driver (18) is turned via the actuating mechanism, causing the eccentric to move the piston (16) upward and open the inlet valve V2.

The compressed air V coming from the auxiliary reservoir is applied to the upper valve head (2a) and opens the check valve V1.

In the throttled version of the leveling valve, the passage of the compressed air V is throttled by the fine clearance between the piston neck and housing bore before it reaches L and the air spring bellows.

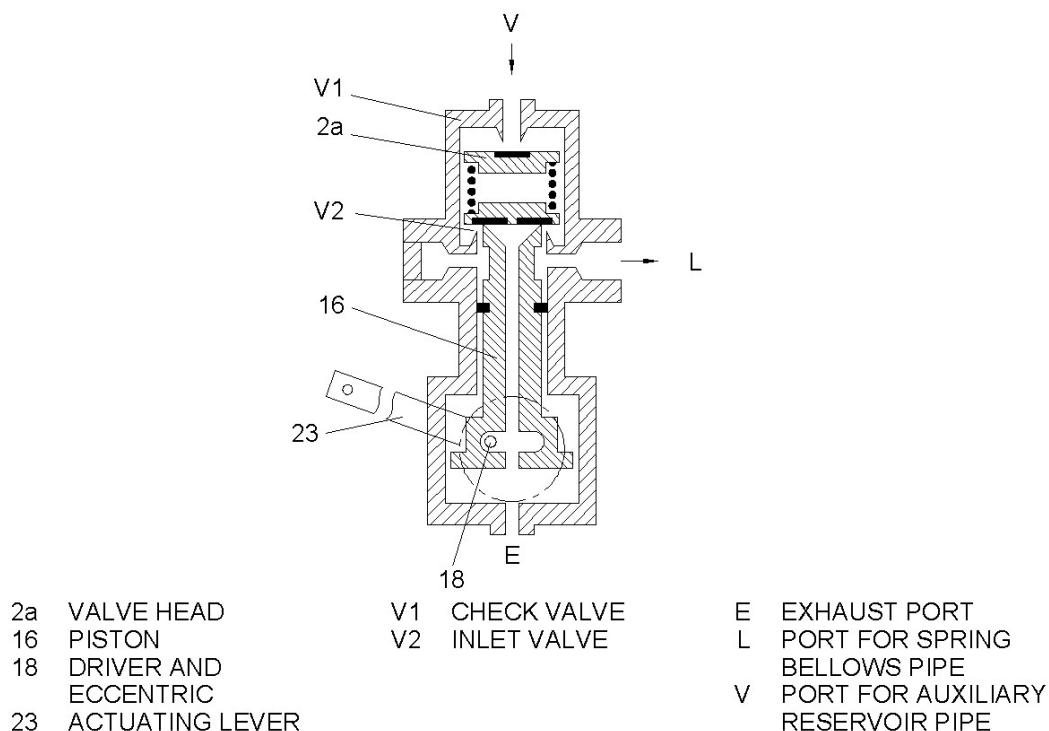
In the version with a bypass, compressed air flows simultaneously through the bypass bore 0 as long as the inlet valve V2 is open.

As the actuating lever (23) is increasingly deflected, the piston (16) is pushed further and further upward and - being appropriately shaped - opens the housing bore by an ever increasing amount.

In the un-throttled version of the leveling valve, the charging bore is opened wide once the end of the dead motion is reached.

The car body is raised. The actuating lever returns to its horizontal position as soon as the original level setting is reached again. T

The leveling valve is at the lap position and the inlet valves V1 and V2 are closed.



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Figure 12-I-02.54 Loading

Unloading

When the vehicle load is decreased, refer to Figure 12-I-02.55, the car body rises first as the air spring bellows are extended by the decreasing load.

As the bellows expand, the driver (18) is turned via the actuating mechanism, causing the eccentric to move the piston (16) downward and open the outlet valve V3.

The inlet valve V2 is kept closed by the force of the compression spring and the pressure V on the valve head (2b).

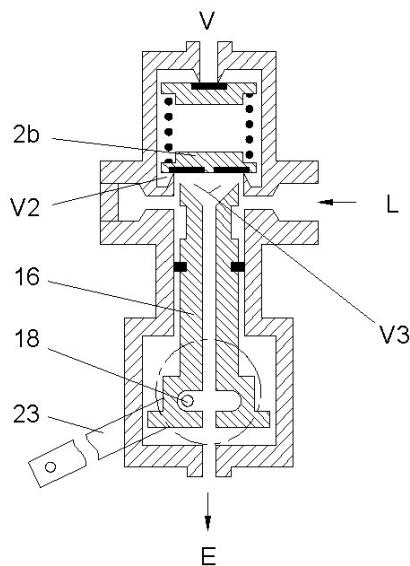
Communication between the auxiliary reservoir and the air spring bellows is cut off by this action.

In the throttled version of the leveling valve, the passage of the compressed air L from the air spring bellows is throttled by the fine clearance between the piston neck and housing bore before it passes through the piston's outlet bore on its way to the exhaust port E.

The piston (16) opens the housing bore wider and wider as it goes further downward. In the un-throttled version of the leveling valve, the venting bore is opened wide once the end of the dead motion is reached.

The car body is lowered so much in this way that it reaches its original level again. The actuating lever reassumes its horizontal position.

The leveling valve is at the lap position and the outlet valve V3 is closed.



2b VALVE HEAD
 16 PISTON
 18 DRIVER AND
 ECCENTRIC
 23 ACTUATING LEVER

V2 CHECK VALVE
 V3 OUTLET VALVE

E EXHAUST PORT
 L PORT FOR SPRING
 BELLOW PIPE
 V PORT FOR AUXILIARY
 RESERVOIR PIPE

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Figure 12-I-02.55 Unloading

12-I-02.04.02.06 Mean Pressure Valve

The mean pressure valve, refer to

Figure 12-I-02.56, is designed exclusively to act as a pressure regulator for installation in pneumatic systems on rail vehicles.

Working Principle

The individual pressures, refer to Figure 12-I-02.57, T1 and T2 act on the back and front of the piston (c) which works as a check valve.

The higher of the two individual pressures pushes the piston (c) onto that valve seat (S1 or S2) that is located at the point of entry of the lower individual pressure; the lower pressure is shut off from the chamber above the twin valve head (d) in this way.

The piston (c) toggles between the valve seats S1 and S2 under the action of changes (e.g. to the payload) and the resulting fluctuations of the individual pressures T1 and T2.

While the individual pressures T1 and T2 are acting on the piston (c), they simultaneously bear on the (equal-sized) annular surfaces F1 and F2 of the differential piston (f).

The differential piston (f) is lifted together with the twin valve head (d) against the force of the compression spring (e) and opens the valve seat S3.

The higher of the two individual pressures (T1 or T2) from the chamber above the twin valve head (d) flows through the open valve seat S3 into the annular chamber above the differential piston (f) whose area is as large as that of the annular surfaces F1 and F2.

Once this pressure has increased far enough to balance out the pressures acting on the annular surfaces F1 and F2, the twin valve head (d) goes to the lap position and closes the valve seat S3.

If one of the two individual pressures T1 or T2 falls, the differential piston (f) will be pushed downwards by the stronger force of the mean pressure M acting on the upper piston half, opening the valve seat S4 to atmosphere (O).

The mean pressure M is lowered continuously until the differential piston (f) reaches the lap position and closes the valve seat S4.

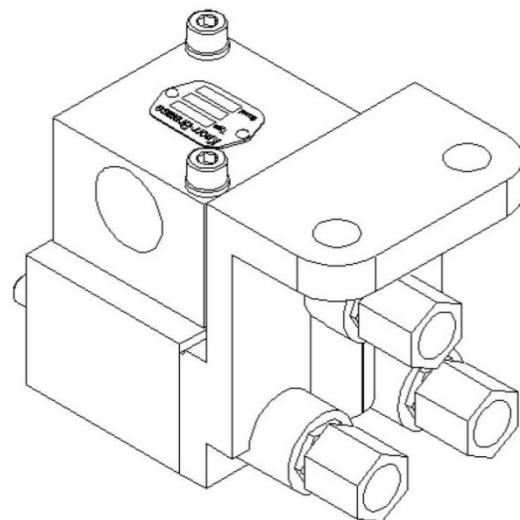
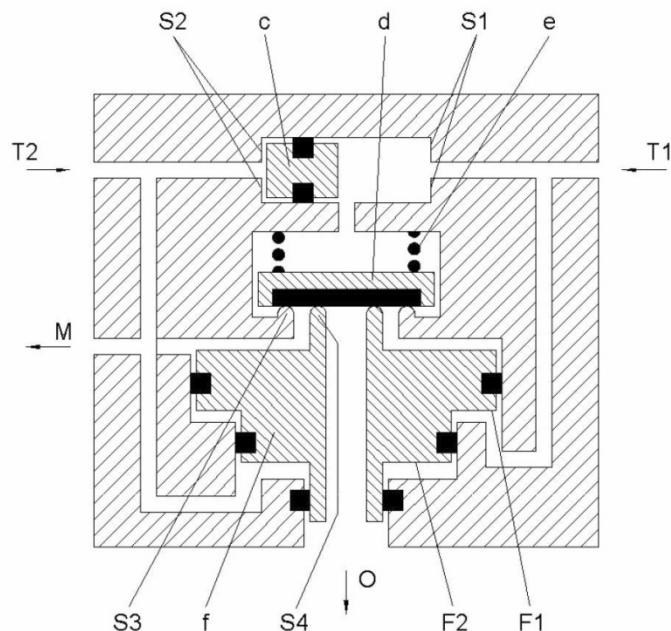


Figure 12-I-02.56 Mean Pressure Valve



c Piston
 d Twin valve head
 e Compression spring
 f Differential piston

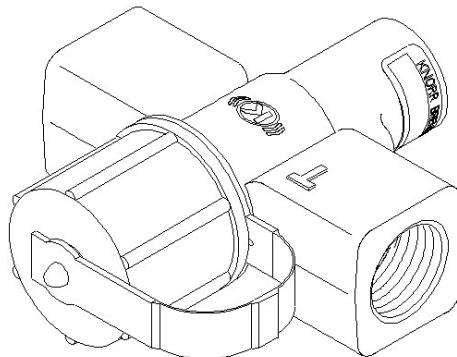
F1 Annular surface
 F2 Annular surface
 S1 Valve seat for piston (c)
 S2 Valve seat for piston (c)
 S3 Valve seat for piston (f)
 S4 Valve seat for piston (f)

T1 Individual pressure
 T2 Individual pressure
 M Mean pressure
 O Exhaust

Figure 12-I-02.57 Mean Pressure Valve Diagrammatic

12-I-02.04.02.07 Test Fitting

The Test Fitting, refer to Figure 12-I-02.58, is used to measure system pressure or inject air into the system to assist in troubleshooting and maintenance.



MU191/3 12-01.22

Figure 12-I-02.58 Test Fitting

Working Principle

The test fitting, refer to

Figure 12-I-02.59, is closed by the cap (b) at its' working position.

The piston (c) is pushed upward by the compression spring (f).

The passage from port I to II is open.

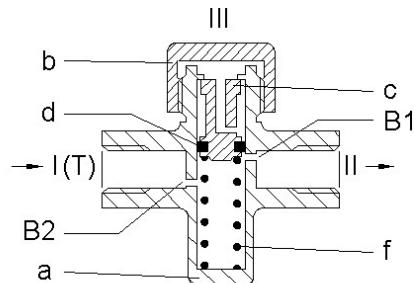
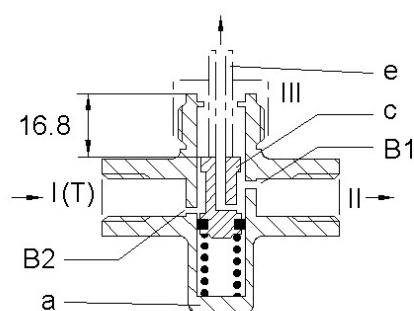
Either a selector switch or a test connection must be screwed onto the test fitting for pressure measurement and external air injection.

Pressure Measurement

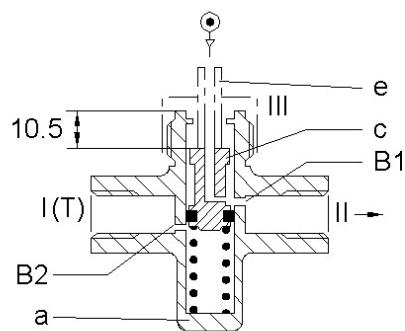
For pressure measurement, the piston (c) is pushed far enough downward to open the path between inlet port I, outlet port II and test port III via the bores B1 and B2.

External Injection

When compressed air from an external source is injected, the path is opened from test port III to port II via bore B1. The passage from I to II is closed.

OPEN POSITION (WORKING POSITION)

PRESSURE MEASUREMENT


a	BODY
b	SCREW CAP
c	PISTON
d	O-RING
e	SELECTOR SWITCH UT2 OR TEST CONNECTION
f	COMPRESSION SPRING
B1	BORE
B2	BORE
I	INLET PORT (T)
II	OUTLET PORT
III	TEST PORT

EXTERNAL INJECTION


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Figure 12-I-02.59 Test Fitting Diagrammatic

LOS ANGELES COUNTY

METROPOLITAN TRANSPORTATION AUTHORITY

LIGHT RAIL VEHICLE

P2550



RUNNING MAINTENANCE
AND
SERVICE MANUAL

VOLUME M-01
PART II
TROUBLESHOOTING
SECTION 12 - TRUCKS AND SUSPENSIONS

SECTION 12

TRUCKS AND SUSPENSIONS

PART II

TROUBLESHOOTING

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SECTION 12

TRUCKS AND SUSPENSIONS

12-II-01 INTRODUCTION

This Section of the Running Maintenance and Service Manual is divided into three Parts:

- Part I: Theory of Operation
- Part II: Troubleshooting
- Part III: Maintenance

Each Paragraph is numbered accordingly, to avoid that paragraphs of the same Section, pertaining to a different Part, have the same number.

Part I - Theory of Operation

Part I gives a thorough overview of the System structure and operation, by means of descriptions, figures, photos, schematics, block diagrams and flow charts, together with references to other documents or Sections when needed.

Part II - Troubleshooting

It gives the Maintenance Technicians a path to troubleshoot the System in every condition by means of the available tools:

- The PTU, equipped with the specific SW program
- The IDU
- The Fault Isolation Table

Part III - Maintenance

The Maintenance Part is divided into two sections:

- Preventive Maintenance
- Corrective Maintenance

Each one of these is supplied with the relevant Maintenance Sheets and Job Cards.

12-II-01.a LIST OF ABBREVIATIONS, ACRONYMS AND SYMBOLS

The Abbreviations, Acronyms and Symbols commonly used throughout this manual are given below with their related meaning.

Abbreviation	Meaning
ASME	American Society of Mechanical Engineers
ASU	Air Supply Unit
ATP	Automatic Train Protection
BCF	Breda Costruzioni Ferroviarie
BCU	Brake Control Unit
CL	Center Line
DIA	Diameter
DTE	Diagnostic Test Equipment
ECU	Brake Electronic Control Unit
Fig./fig.....	Figure
FWD	Forward
HRMM	Heavy Repair and Maintenance Manual
HSCB	High Speed Circuit Breaker
HV	High Voltage
HVAC	Heating Ventilation & Air Conditioning
IPC	Illustrated Parts Catalog
IWD	Integrated Wiring Diagrams
LH	Left Hand
LRV	Light Rail (Transit) Vehicle
LV	Low Voltage
LVPS	Low Voltage Power Supply
Max.....	Maximum
MBL	Metro Blue Line
MFR.....	Manufacturer
Min.....	Minimum
MR.....	Main Reservoir
P/N	Part Number
para(s).....	Paragraph(s)
PGL	Pasadena Gold Line
Qty	Quantity
RH	Right Hand
RMSM	Running Maintenance and Servicing Manual
TBS	To Be Supplied
T.o.R.....	Top of Rail
TWC	Train to Wayside Communication

12-II-01.b LIST OF DEFINITIONS

The Definitions commonly used throughout this manual are given below with their related meaning.

Definition	Meaning
'A' body section.....	The section of an articulated vehicle containing the pantograph
'B' body section.....	The section of an articulated vehicle not containing the pantograph
"A" Cab (or Cab A).....	Operator Cab in the A body section
"B" Cab (or Cab B).....	Operator Cab in the B body section
AW0	Empty car operating weight
AW1	Full seated load plus AW0
AW2	Standees at 4 persons per square meter plus AW1
AW3	Standees at 6 persons per square meter plus AW1
AW4	Standees at 8 persons per square meter plus AW1
Front door	The door close to the Operator's Cab
MC Handle	Master Controller Handle
Rear door	The door close to the Articulation Section

12-II-01.c LIST OF MEASUREMENT UNITS AND SYMBOLS

The Measurement Units commonly used throughout this manual are given below with their related meaning.

Definition	Meaning
A	Ampere
ft	Foot
Ft-lb	Foot-Pound
gal.....	Gallon
in.....	Inch
kg.....	Kilogram - approx 2.205 pounds
km.....	Kilometer - approx 0.621 miles
kN.....	Kilo-Newton - approx 224.809 pounds force
kW.....	KiloWatt
l.....	Liter
lb.....	Pound
lb-ft	Pound force
m	Meter - approx 3.28 feet
mm	Millimeter - approx 0.0394 inches
Nm.....	Newton meter
PSI.....	Pounds per Square Inch
PSIG.....	Pounds per Square Inch Gauge
VAC	Volt Alternating Current
VDC	Volt Direct Current

12-II-02 TROUBLESHOOTING

12-II-02.01 Fault Isolation / Repair Tables

The Fault Isolation / Repair Table lists the System's Malfunction Symptoms with the relevant Probable Causes and Corrective Actions to be accomplished to fix the Fault. The Malfunction Symptoms are listed, sequenced in alphabetical order, by SUBSYSTEM /ASSEMBLY and are provided by Unit / Component.

The Corrective Actions are provided with reference to the relevant Maintenance Sheets the Maintainer should refer to in order to have specific detailed Procedures to be followed.

Table 12-II-02.1 Fault Isolation/Repair

SUBSYSTEM / ASSY		AIR SUSPENSION		
Unit / Component	Malfunction Symptom	Probable Cause	Corrective Action	Refer to -Sheet
AIR SUSPENSION PIPING.	1. Loss of pressure in Air Suspension piping. 2. Loss of pressure in Air Suspension on one or both Cars	1. No air pressure in the Main Reservoir	1. Refer to Fault Isolation / Repair Tables in Section 13	
		1. Supply cutout cock closed	1. Open the cutout cock	N/A
		1. Supply cutout cock defective / damaged	1 .Replace	R-C-12-03-01-01/R-00
		2. Duplex Check Valve defective/damaged	1 .Replace	R-C-12-03-04-00/R-00
		3. Air filter defective/damaged	1 .Replace	R-C-12-03-01-02/R-00
		4. Check Valve defective/damaged	1 .Replace	R-C-12-03-01-03/R-00
		5. Leveling Valve defective/damaged	1 .Replace	R-C-12-03-02-00/R-00
		6. Mean Pressure Valve	1 .Replace	R-C-12-03-03-00/R-00
		7. Test Fitting	1 .Replace	R-C-12-03-05-00/R-00
		8. Leakage occurs at Coupler test point	1. Inspect to ensure that all connections and fittings are secure and tight	R-P-03-01-04-00/I-00
		9. Leakage Air Spring test point	1. Inspect to ensure that all connections and fittings are secure and tight	R-P-12-02-05-00/I-00
AIR SUSPENSION PIPING.	3.Inadequate pressure in Air Suspension	1. Severe leaks or rupture in Air Springs or associated piping and hoses	1. Repair leakage or replace Air Springs	H-C-12-01-05-00/R-00
		2. Low air pressure in Air Spring Reservoir	1. Repair leakage or replace Air Spring Reservoir	R-C-12-03-06-00/R-00
		3.Duplex Check Valve operating at incorrect set point	1 .Replace	R-C-12-03-04-00/R-00

(cont'd)

Table 12-II-02.1 Fault Isolation/Repair

SUBSYSTEM / ASSY		AIR SUSPENSION		
Unit / Component	Malfunction Symptom	Probable Cause	Corrective Action	Refer to -Sheet
AIR FILTER	1. Air discharging constantly from Air Filter	1. Leaking pipe fittings	1. Tighten the pipe fittings	N/A
			2 Perform Air Filter Service	R-P-12-03-01-02/S-00
	2. Downstream air pipes or units are contaminated	1. Strainer element (b) dirty or frozen	2 Perform Air Filter Service	R-P-12-03-01-02/S-00
		2. Unit defective	1. Replace Air Filter	R-C-12-03-01-02/R-00
	3. Little or no air throughput	1. Strainer element (b) dirty or frozen	2 Perform Air Filter Service	R-P-12-03-01-02/S-00
		2. Air Filter defective	1. Replace Air Filter	R-C-12-03-01-02/R-00
CHECK VALVE	1. Air discharging constantly from pipe unions (A1, A2)	1. Ports Leaking	1. Tighten the connections	N/A
	2. Not enough pressure in the user line A2	1. Not enough pressure in the supply line	1. Check whether the pressure upstream of A1 meets the demand	N/A
	3. Air reflux through the Check Valve	1. Valve defective	1. Replace	R-C-12-03-01-03/R-00
DUPLEX CHECK VALVE	1. Air discharging at pipe fittings P1 and/or P2	1. Pipe fittings P1 and/or P2 loose	1. Tighten fittings	N/A
	2. Air discharging at screw plugs (g)	1. Screw Plugs (g) loose	1. Tighten Screw Plugs	N/A
		2. Sealing Ring (h) or Valve defective	2. Remove Valve and replace Sealing Ring or Valve	R-C-12-03-04-00/R-00
	3. Air discharging between body(a) and bracket (b)	1. Hexagon Nut (i) loose	1. Tighten Hexagon Nut (i)	N/A
		2. O-rings (k) or Valve defective	2. Remove Valve and replace O-rings or Valve	R-C-12-03-04-00/R-00
	4. Pressure difference between P1 and P2 exceeds 22 psi (i.e. pressure not balanced)	1. Valve defective	1. Replace Valve	R-C-12-03-04-00/R-00
	5. Pressure difference between P1 and P2 does not reach minimum value permitted (i.e. pressure balanced constantly)	1. Valve defective	1. Replace Valve	R-C-12-03-04-00/R-00

(cont'd)

Table 12-II-02.1 Fault Isolation/Repair

SUBSYSTEM / ASSY		AIR SUSPENSION		
Unit / Component	Malfunction Symptom	Probable Cause	Corrective Action	Refer to -Sheet
LEVELING VALVE	1. Air discharging constantly from the air pipe connections	1. Pipe connections loose 2. Seal or Valve defective	1. Tighten pipe connections 1.Remove Valve and replace Seal or Valve	N/A R-C-12-03-02-00/R-00
	2. Air discharging constantly between body and adapter nipple	1. Adapter Nipple loose 2. Sealing Ring or Valve defective	1. Tighten Adapter Nipple 1.Remove Valve and replace Seal Ring or Valve	N/A R-C-12-03-02-00/R-00
	3. Air discharging constantly from Screw Plug	1. Screw Plug loose 2. Seal or Valve defective	1. Tighten Screw Plug. 1.Remove Valve and replace Seal or Valve	N/A R-C-12-03-02-00/R-00
	4. Charging or venting of Air Spring Bellows does not match the Vehicle load	1. Actuating Linkage damaged	1. Replace Linkage or Valve	R-C-12-03-02-00/R-00
		2. Actuating Lever loose	1. Tighten Adjusting Rod. 2 .Perform Leveling procedure	N/A R-C-01-01-00-00/LL-00
	3. Valve defective	1. Valve defective	1. Replace	R-C-12-03-02-00/R-00
	5. Air reflux from the Air Spring Bellows to the Auxiliary Reservoir when the Air Supply Pressure V is lowered	1. Valve defective	1. Replace	R-C-12-03-02-00/R-00
	6. Air discharging constantly from the Valve through exhaust port E at the lap position	1. Valve defective	1. Replace	R-C-12-03-02-00/R-00
MEAN PRESSURE VALVE	7. Charging time is too long	1. Strainer in port L and/or V is dirty	1. Replace Valve	R-C-12-03-02-00/R-00
	8. Venting time is too long	1. Strainer in port L and/or fabric filter in filter plug(exhaust E) is dirty	1. Replace Valve	R-C-12-03-02-00/R-00
	1. Air discharging constantly from pipe unions (A1, A2)	1. O-ring or Valve damaged	2.Remove Valve and replace O-ring or Valve	R-C-12-03-03-00/R-00
	2. Not enough pressure in the user line A2	1. Valve defective	1. Replace	R-C-12-03-03-00/R-00
	3. Air reflux through the check valve	1. Valve defective	1. Replace	R-C-12-03-03-00/R-00

(cont'd)

Table 12-II-02.1 Fault Isolation/Repair

SUBSYSTEM / ASSY		AIR SUSPENSION		
Unit / Component	Malfunction Symptom	Probable Cause	Corrective Action	Refer to -Sheet
TEST FITTING	1. Charging time is too long	1. Strainer in port L and/or V is dirty	1. Replace Test Fitting	R-C-12-03-05-00/R-00
	2. Venting time is too long	1. Strainer in port L and/or fabric filter in filter plug (exhaust E) is dirty	1. Replace Test Fitting	R-C-12-03-05-00/R-00

SUBSYSTEM / ASSY		TRUCKS		
Unit / Component	Malfunction Symptom	Probable Cause	Corrective Action	Refer to -Sheet
MOTOR TRUCK	1.Vehicle not leveled.	1.Failure in the Secondary Suspension.	1. Inspect the Truck	R-P-12-01-00-00/I-00
			2. Inspect Secondary Suspension.	R-P-12-01-05-00/I-00
			3. Perform Leveling procedure	R-C-01-01-00-00/LL-00
	2.Vibrating noise and/or Vehicle hunting during railroad operations	2 .Failure in the Air Suspension System components.	1.Refer to previous AIR SUSPENSION Fault Isolation/Repair Table	
			1. Inspect Wheel Tire.	R-P-12-01-01-01/I-01
			1. Inspect Secondary Suspension.	R-P-12-01-05-00/I-00
			2. Replace Leveling Valve	R-C-12-03-02-00/R-00
		2 .Secondary Suspension components damaged.	3 .Perform the Truck de-trucking if it is needed. to replace Secondary Suspension components	R-C-12-01-00-00/R-00
			4. Replace faulty/damaged Secondary Suspension components on the de-trucked Truck	H-C-12-01-05-00/R-00
			1. Inspect the Truck	R-P-12-01-00-00/I-00
		3.Primary Suspension components damaged or not working properly.	2. Perform the Truck de-trucking if it is needed. to replace Primary Suspension components	R-C-12-01-00-00/R-00
			3. Replace faulty/damaged Primary Suspension components on the de-trucked Truck	H-C-12-01-04-00/R-00
	4.Journal Bearing (s) damaged.	1. Perform the Truck de-trucking	1. Perform the Truck de-trucking	R-C-12-01-00-00/R-00
			2. Replace the Journal Bearing (s)	H-C-12-01-01-03/R-00

(cont'd)

Table 12-II-02.1 Fault Isolation/Repair

SUBSYSTEM / ASSY		TRUCKS		
Unit / Component	Malfunction Symptom	Probable Cause	Corrective Action	Refer to -Sheet
CENTER TRUCK	1.Vehicle not leveled.	1.Failure in the Secondary Suspension.	1 .Inspect the Truck	R-P-12-02-00-00/I-00
			2 .Inspect Secondary Suspension.	R-P-12-02-05-00/I-00
			3 .Perform Levelling procedure	R-C-01-01-00-00/LL-00
	2.Vibrating noise and/or Vehicle hunting during railroad operations	2 .Failure in the Air Suspension System components.	1.Refer to previous AIR SUSPENSION Fault Isolation/Repair Table	
			1 .Inspect Wheel Tire.	R-P-12-02-01-01/I-01
			1. .Inspect Secondary Suspension.	R-P-12-02-05-00/I-00
			2 .Replace Leveling Valve	R-C-12-03-02-00/R-00
		2 .Secondary Suspension components damaged.	3 .Perform the Truck de-trucking if it is needed. to replace Secondary Suspension components	R-C-12-02-00-00/R-00
			4. Replace faulty/damaged Secondary Suspension components on the de-trucked Truck	H-C-12-02-05-00/R-00
			1 .Inspect the Truck	R-P-12-02-00-00/I-00
		3.Primary Suspension components damaged or not working properly.	2 .Perform the Truck de-trucking if it is needed. to replace Primary Suspension components	R-C-12-02-00-00/R-00
			3. Replace faulty/damaged Primary Suspension components on the de-trucked Truck	H-C-12-02-04-00/R-00
	4.Journal Bearing (s) damaged.	1 .Perform the Truck de-trucking	R-C-12-02-00-00/R-00	
			2 .Replace the Journal Bearing (s)	H-C-12-02-01-03/R-00

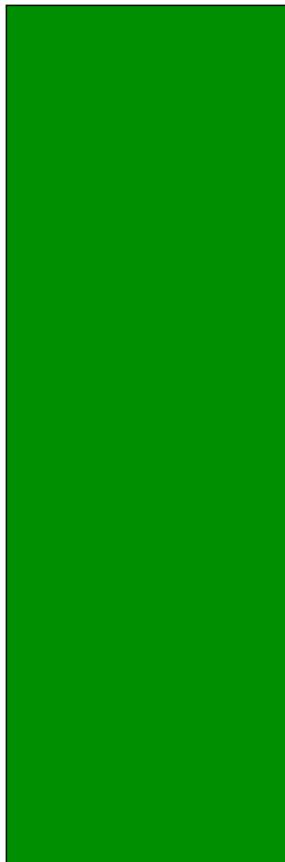
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LOS ANGELES COUNTY

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LIGHT RAIL VEHICLE

P2550



RUNNING MAINTENANCE
AND
SERVICE MANUAL

VOLUME M-01
PART III
MAINTENANCE
SECT 12 TRUCKS & SUSPENSIONS



SECTION 12

TRUCKS & SUSPENSIONS

PART III

MAINTENANCE

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SECTION 12

TRUCKS & SUSPENSIONS

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SECTION 12

TRUCKS & SUSPENSIONS

12-III-01 INTRODUCTION

The “Trucks & Suspensions” Part III - Maintenance consists of:

- Preventive Maintenance
- Corrective Maintenance
- Consumable Materials
- Test Equipment & Special Tools

12-III-01.a List of Abbreviations, Acronyms & Symbols

The Abbreviations, Acronyms and Symbols commonly used throughout this Section are given below with their relevant meaning.

Abbreviation	Meaning
A	Ampere
AB	AnsaldoBreda
AC	Alternate Current
ASME	American Society of Mechanical Engineers
ASSY	Assembly
ASU	Air Supply Unit
ATP	Automatic Train Protection
AW0	Empty transit vehicle weight
AW1	Empty transit vehicle weight plus seated passengers' load
AW2	Empty transit vehicle weight plus seated and Normal rated standing passengers' load
AW3	Empty transit vehicle weight plus seated and Full rated standing passengers' load
BCU	Brake Control Unit
CL	Center Line
Cont'd /cont'd	Continued
DC	Direct Current
DIA	Diameter
DTE	Diagnostic Test Equipment
ECU	Brake Electronic Control Unit
ELE	Electronic
Fig./fig	Figure
Ft	Foot (Linear Measure)
FWD	Forward
H-CML	Heavy Consumable Material List
H-CMS	Heavy Corrective Maintenance Sheet
HRMM	Heavy Repair and Maintenance Manual
HSCB	High Speed Circuit Breaker
HV	High Voltage
HVAC	Heating Ventilation & Air Conditioning
IDU	Integrated Diagnostic Unit
in	Inch (Linear Measure)
IPC	Illustrated Parts Catalog
Kg	Kilogram
lb	Pound (Weight Measure)
LH	Left Hand
LRV	Light Railway Vehicle
LV	Low Voltage
LVDC	Low Voltage Direct Current
LVPS	Low Voltage Power Supply

(cont'd)

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Abbreviation	Meaning
Max	Maximum
MBL	Metro Blue Line
MC	Master Controller
Min.	Minimum
MFR	Manufacturer
MR	Main Reservoir
Para(s) / para	Paragraph(s)
PGL	Pasadena Gold Line
PS	Power Supply
PSI	Pounds per Square Inch
PSIG	Pounds per Square Inch Gauge
P/N	Part Number
PTU	Portable Test Unit
Qty	Quantity
R-CML	Running Consumable Material List
R-CMS	Running Corrective Maintenance Sheet
RH	Right Hand
RMSM	Running Maintenance & Service Manual
R-PMM	Running Preventive Maintenance Matrix
R-PMR	Running Preventive Maintenance Report
R-PMS	Running Preventive Maintenance Sheet
R-TESTL	Running Test Equipment & Special Tools List
SCPM	Safety Critical Preventive Maintenance
SYS	System
TBD	To Be Defined
TBS	To Be Supplied
TOC	Table Of Content
T.o.R.	Top of Rail
TTEM	Tools & Test Equipment Manual
TWC	Train to Wayside Communication
VAC	Voltage Alternate Current
VDC	Voltage Direct Current
W/	With
W/O	Without

12-III-01.b List of Definitions

The Definitions commonly used throughout this Section are given below with their relevant meaning.

Definition	Meaning
'A' body section	The section of an articulated vehicle containing the pantograph
'B' body section	The section of an articulated vehicle not containing the pantograph
AW0	Empty car operating weight
AW1	Full seated load plus AW0
AW2	Standees at 4 persons per square meter plus AW1
AW3	Standees at 6 persons per square meter plus AW1
AW4	Standees at 8 persons per square meter plus AW1
Front door	The door close to the Operator's Cab
Rear door	The door close to the Articulation Section
MC Handle	Master Controller Handle
"A" Cab (or Cab A)	Operator Cab in the A body section
"B" Cab (or Cab B)	Operator Cab in the B body section

12-III-01.c List of Measurement Units

The Measurement Units commonly used throughout this Section are given below with their relevant meaning.

Definition	Meaning
ft	Foot
gal	Gallon
in	Inch
kg	Kilogram - approx 2.205 pounds
km	Kilometer - approx 0.621 miles
lb	Pound
lb-ft	Pound force
m	Meter - approx 3.28 feet
mm	Millimeter - approx 0.0394 inches
mph	Miles per hour
Km/h	Kilometers per hour
s	Seconds
V	Volt
Vdc	Direct Voltage
Vac	Alternate Voltage
kVA	Kilo-Volt-Ampere
kW	Kilo-Watt
W	Watt
F	Farad
H	Henry
Ω	Ohm
$^{\circ}\text{F}$	Fahrenheit
$^{\circ}\text{C}$	Celsius
A	Ampere
Hz	Hertz
rpm	Revolution per Minute
N	Newton
Nm	Newton-Meter
mphs	Mile Per Hour Per Second
	(Acceleration)

12-III-01.d References

Refer to Section 00 of this RMSM for details relevant to the following Topics :

Topic	Paragraph
MANUAL PURPOSE	00-02
MANUAL ARRANGEMENT	00-03
MANUAL APPLICABILITY	00-04
ACQUISITION OF COPIES, REVISIONS AND CHANGES	00-05
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12-III-02 P2550 ANSALDOBREDA MAINTENANCE PLAN

The AB Preventive Maintenance Plan (PMP) has been designed in order to permit a 30-year Structural and Service Vehicle Life with the following basic assumptions :

- Yearly mileage: 120,000 Miles
- Motor and Trailer Truck removal: every 5 years. (600,000 Miles)

The AB Preventive Maintenance Plan (PMP) provides the Preventive Maintenance Tasks to be performed according the following Mileage Intervals:

Running Maintenance		Heavy Maintenance	
Daily			
10,000	Miles		
30,000	Miles	600,000	Miles
60,000	Miles	1,200,000	Miles
120,000	Miles	1,800,000	Miles

In accordance with the Preliminary Version of the AB Preventive Maintenance Plan, the Scheduled Maintenance Tasks for the entire Vehicle Life have been grouped into:

- Running Preventive Maintenance
- Heavy Preventive Maintenance

In accordance with the AB Corrective Maintenance Analysis, the Corrective Maintenance Tasks for the entire Vehicle Life have been grouped into:

- Running Corrective Maintenance
- Heavy Corrective Maintenance

12-III-03 RUNNING -PREVENTIVE MAINTENANCE

12-III-03.01 Running -Preventive Maintenance Matrixes (R-PMM)

The Vehicle Running -Preventive Maintenance Matrix (R-PMM) provides the Vehicle Preventive Maintenance Plan up to 120,000 Miles.

The “Trucks & Suspensions” (R-PMM) is provided in two different arrangements as follows:

- **R-PMM Component Based**

It lists the Running - Preventive Maintenance Tasks ordered by System / Subsystem /Assemblies / Component break down, followed by the PM Task Description and Scheduled Task Interval and linked to the relevant R-PM Sheet Code.

The R-PMM Component Based provides the Maintainer with the following data:

- SUBSYSTEM /ASSEMBLY/UNIT/COMPONENT
- TASK
- SCPM
- INSPECTION INTERVAL
- SHEET CODE

- **R-PMM Mileage Based**

It lists the “Trucks & Suspensions” Running - Preventive Maintenance Tasks ordered by Scheduled Maintenance Interval and broken down into the related Subsystem /Assemblies/Component followed by the PM Task Description and Person Hours and linked to the relevant R-PM Sheet Code.

The R-PMM Mileage Based provides the Maintainer with the following data:

- INSPECTION INTERVAL
- SYSTEM/SUBSYSTEM /ASSEMBLY/UNIT/COMPONENT
- TASK
- SCPM
- PERSON HOURS
- SHEET CODE

The data listed in this Matrix are the same of those listed in the R-PMM Component Based with the exception of the PERSON HOURS.

12-III-03.01.01 Definitions

The following definitions are applicable to both types of R-PMM

Tasks

- Cleaning:** Methods and processes required (Step-By-Step Procedural Instructions) for cleaning specific parts or areas of the Vehicle.
- Inspection:** Preventive Maintenance procedures such as those required to ascertain the serviceability of a Part, Assembly, System or the specific interrelationship of Parts that perform a functional operation.
- Lubrication:** Provides component lubrication Instructions.
- Replacement** Provides the Components / Assemblies and Subassemblies removal & installation in a logical sequential order.
Maintenance procedures identified in this topic include Components that are replaced within a 4 hours window.
- Service:** Operation performed to replenish Sand, Windshield Wiper Washer Fluid, HVAC Coolant, Gear and Compressor Oil, and Vehicle Lubrication.
- Test:** Procedures and Parameters to evaluate the operational efficiency and integrity of a System /Subsystem/Component and the interrelationship of Parts performing functional operations.

12-III-03.01.02 Inspection Intervals

The Running - Preventive Maintenance Intervals for the P2550 LRV Fleet are scheduled as follows:

Daily	10,000 Miles	30,000 Miles	60,000 Miles	120,000 Miles
-------	--------------	--------------	--------------	---------------

The marker “●“ in the INSPECTIONS INTERVAL column, indicates the periodicity of the Corresponding Task.

12-III-03.01.03 Safety Critical Preventive Maintenance (SCPM) Tasks

The marker “✓“ in the SCPM column, indicates that the corresponding Task is a Safety Critical Preventive Maintenance (SCPM) Task, as per the results of the Safety Analyses performed, on Vehicle Subsystems, according to Vehicle Specification.

12-III-03.01.04 Sheet Code

The Sheet Code column, indicates the reference to Running -Preventive Maintenance Sheet where the Procedure to be performed is described and illustrated.

**THE SHEET CODE IS THE EXPLICIT LINK BETWEEN
R-PM MATRIXES, R-PMR /JOB CARDS AND R-PM SHEETS**

Refer to Paragraph 12-III-03.03.01 for Running- Preventive Maintenance Sheet (R-PMS) Form for detailed explanation.

12-III-03.01.05 Person Hours

It indicates the time required to perform the corresponding Task with the basic assumption that the Vehicle is on an Inspection Pit or Stand Up Rail and the Consumables, Tools and Spare Parts needed to accomplish the Task are available at the Location of the Equipment to be maintained.

Refer to:

- Table 12-III-03.1 for Running - Preventive Maintenance Matrix (R-PMM)
(Component Based)
- Table 12-III-03.2 for Running - Preventive Maintenance Matrix (R-PMM)
(Mileage Based)

12-III-03.01.06
Running Preventive Maintenance Matrix (Component Based)
Table 12-III-03.1 Running Preventive Maintenance Matrix (Component Based)

SYSTEM 12 TRUCKS & SUSPENSIONS		S C P M	INSPECTION INTERVAL MILES					SHEET CODE
SUBSYSTEM ASSY/UNIT/COMPONENT	TASK		Daily	10K	30K	60K	120K	
-MOTOR TRUCK	INSPECTION	<input checked="" type="checkbox"/>			●			R-P-12-01-00-00/I-00
--WHEELSET								
---WHEEL	INSPECTION	<input checked="" type="checkbox"/>			●			R-P-12-01-01-01/I-00
---WHEEL	INSPECTION	<input checked="" type="checkbox"/>					●	R-P-12-01-01-01/I-01
---WHEEL / SHUNTS	TEST	<input checked="" type="checkbox"/>					●	R-P-12-01-01-01/T-00
---MOTOR AXLE	INSPECTION	<input checked="" type="checkbox"/>			●			R-P-12-01-01-02/I-00
--SECONDARY SUSPENSION	INSPECTION						●	R-P-12-01-05-00/I-00
--STICK LUBRICATOR	INSPECTION						●	R-P-12-01-08-00/I-00
-TRAILER TRUCK	INSPECTION	<input checked="" type="checkbox"/>			●			R-P-12-02-00-00/I-00
--WHEELSET								
---WHEEL	INSPECTION	<input checked="" type="checkbox"/>			●			R-P-12-02-01-01/I-00
---WHEEL	INSPECTION	<input checked="" type="checkbox"/>					●	R-P-12-02-01-01/I-01
---WHEEL / SHUNTS	TEST	<input checked="" type="checkbox"/>					●	R-P-12-02-01-01/T-00
---TRAILER AXLE	INSPECTION	<input checked="" type="checkbox"/>			●			R-P-12-02-01-02/I-00
--SPEED SENSOR DEVICE	INSPECTION						●	R-P-12-02-01-04/I-00
--SECONDARY SUSPENSION	INSPECTION						●	R-P-12-02-05-00/I-00
-AIR SUSPENSION SYSTEM								
--PNEUMATICS EQUIPMENT								
---AIR FILTER	SERVICE						●	R-P-12-03-01-02/S-00

12-III-03.01.07 Running Preventive Maintenance Matrix (Mileage Based)
Table 12-III-03.2 Running Preventive Maintenance Matrix (Mileage Based)
SYSTEM 12 TRUCKS & SUSPENSIONS

SUBSYSTEM	TASK	S C P M	PERSON HOURS	SHEET CODE
30,000 MILES				
-MOTOR TRUCK	INSPECTION	<input checked="" type="checkbox"/>	2	R-P-12-01-00-00/I-00
--WHEELSET				
---WHEEL	INSPECTION	<input checked="" type="checkbox"/>	1.6	R-P-12-01-01-01/I-00
---MOTOR AXLE	INSPECTION	<input checked="" type="checkbox"/>	1	R-P-12-01-01-02/I-00
-TRAILER TRUCK	INSPECTION	<input checked="" type="checkbox"/>	1	R-P-12-02-00-00/I-00
--WHEELSET				
---WHEEL	INSPECTION	<input checked="" type="checkbox"/>	0.8	R-P-12-02-01-01/I-00
---TRAILER AXLE	INSPECTION	<input checked="" type="checkbox"/>	0.5	R-P-12-02-01-02/I-00
120,000 MILES				
-MOTOR TRUCK				
--WHEELSET				
---WHEEL	INSPECTION	<input checked="" type="checkbox"/>	4	R-P-12-01-01-01/I-01
---WHEEL / SHUNTS	TEST	<input checked="" type="checkbox"/>	2	R-P-12-01-01-01/T-00
--SECONDARY SUSPENSION	INSPECTION		0.5	R-P-12-01-05-00/I-00
--STICK LUBRICATOR	INSPECTION		1.5	R-P-12-01-08-00/I-00
-TRAILER TRUCK				
--WHEELSET				
---WHEEL / SHUNTS	TEST	<input checked="" type="checkbox"/>	1	R-P-12-02-01-01/T-00
---WHEEL	INSPECTION	<input checked="" type="checkbox"/>	2	R-P-12-02-01-01/I-01
---SPEED SENSOR DEVICE	INSPECTION		1	R-P-12-02-01-04/I-00
--SECONDARY SUSPENSION	INSPECTION		0.5	R-P-12-02-05-00/I-00
-AIR SUSPENSION SYSTEM				
--PNEUMATICS EQUIPMENT				
---AIR FILTER	SERVICE		1	R-P-12-03-01-02/S-00
-PNEUMATIC SYSTEM				
--AIR SUPPLY UNIT	SERVICE		1	R-P-13-01-01-00/S-01

12-III-03.02 Running -Preventive Maintenance Reports (R-PMR/Job Cards)

This paragraph describes the contents of the “Trucks & Suspensions” Running -Preventive Maintenance Reports (R-PMR/Job Cards) for the Running - Preventive Maintenance Tasks.

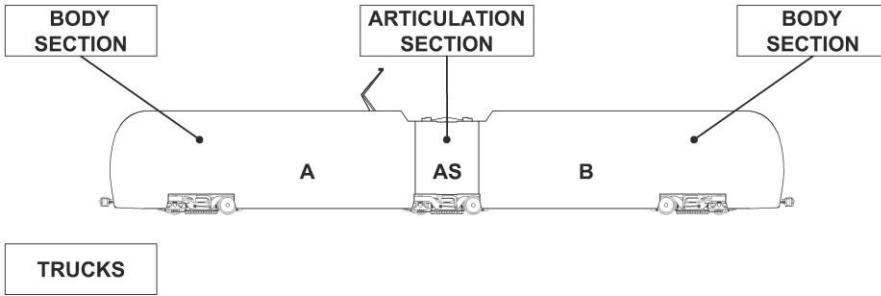
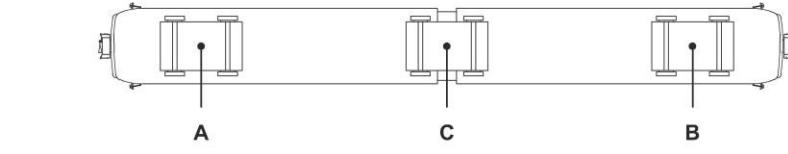
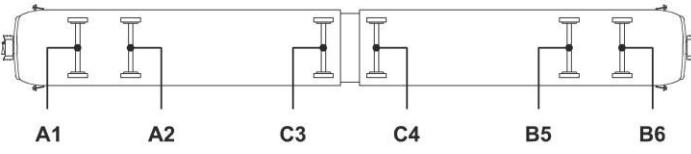
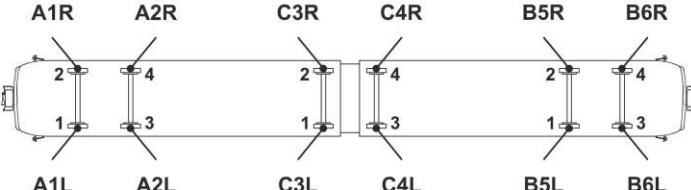
12-III-03.02.01 R-PMR/Job Card Form Content

The R-PMR/JOB CARDS are broken down into two main topics:

Specific Data and R-PM Data

Refer to Figure 12-III-03.1 for R-PMR/JOB CARD Form example

RUNNING PREVENTIVE MAINTENANCE REPORTS (R-PMR/JOB CARDS) FORM		
SPECIFIC DATA TO BE FILLED IN BY THE MAINTAINER		
ITEM #	TITLE	EXPLANATORY NOTE
1	VEHICLE #	This field indicates the Vehicle Identification Number
2	DATE	This field indicates the Date on which the Vehicle entered the Maintenance Shop
3	RUNNING HOURS	This field indicates the Vehicle Running Hours at the above Date
4	MILES	This field indicates the Vehicle Running Miles at the above Date
5	EMPLOYEE # & SIGNATURE	This Field indicates the Employee # & Signature of the Maintainer(s) that perform the referred Task(s)
6	STARTING DATE	This field indicates the Starting Date of the referred Task(s).
7	WORK HOURS	This field indicates the Work duration to perform the referred Task(s).
8	COMPLETION DATE	This field indicates the Completion Date of the referred Task(s).
9	DEFECT FOUND/COMMENTS	This field indicates the result of the Task (s) execution and/ or note related to any items of the maintained Equipment requiring Corrective Maintenance
A	P2550 RUNNING PREVENTIVE MAINTENANCE REPORT SYSTEM (Maintenance Interval) JOB CARD	This field provides R-PMR Title. The R-PM Maintenance Intervals are the following: Daily; 10,000 Miles; 30,000 Miles; 60,000 Miles; 120,000 Miles
B	WORK AREA	This column lists the On Vehicle Areas where the Equipment to be maintained is located The Work Areas are provided to optimize the jobs organization of the Preventive Maintenance tasks in order to: 1- respect the Safety Precautions to be followed 2- complete the preparation and the availability of the Consumables, Tools and Spare Parts, needed to perform the referred Task. 3- respect the time (PERSON HOURS) established to perform the referred Task (with the basic assumption that the Vehicle is on an Inspection Pit or Stand Up Rail and the Consumables, Tools and Spare Parts are available at the location of the Equipment to be maintained.) The On Vehicle Work Areas are the following: Exterior - Interior - Roof - Truck - Undercar - Vehicle (Vehicle as a whole)

RUNNING PREVENTIVE MAINTENANCE REPORTS (R-PMR/JOB CARDS) FORM		
SPECIFIC DATA TO BE FILLED IN BY THE MAINTAINER		
ITEM #	TITLE	EXPLANATORY NOTE
C	ITEM	This column lists the Subsystem/Assembly, Unit, Component to be maintained
D	TASK	<p>This column lists the R-PM tasks to be performed for each Assembly/Unit/Component (i.e., Cleaning, Inspection, Test)</p> <p>The R-PM Tasks are the following:</p> <ul style="list-style-type: none"> - Cleaning - Inspection -Lubrication - - Replacement - Service- Test
E	LOCATION	<p>This column lists the On Board Vehicle Location of all Equipment to be maintained according to the following Location identification Codes</p>    

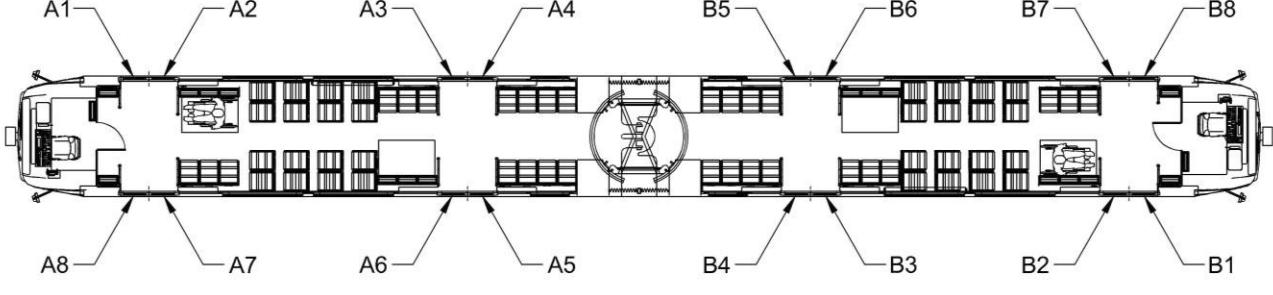
RUNNING PREVENTIVE MAINTENANCE REPORTS (R-PMR/JOB CARDS) FORM		
SPECIFIC DATA TO BE FILLED IN BY THE MAINTAINER		
ITEM #	TITLE	
E (cont'd)	LOCATION (cont'd)	
EXPLANATORY NOTE		
 <p>CAR "A"</p> <p>CAR "B"</p>		
Door Numbering		
ITEM #	TITLE	EXPLANATORY NOTE
F	PM SHEET CODE	<p>This column lists the reference to Running-Preventive Maintenance Sheet where the Procedure to be performed is described and illustrated.</p> <p>Refer to Running-Preventive Maintenance Sheet (R-PMS) Form for detailed explanation.</p>
G	SHEETOF.....	This field indicates the progressive sheet page number of each. R-PMR/JOB CARD

Figure 12-III-03.1 R-PMR/Job Card Form -Example

12-III-03.02.02 R-PMR/Job Card Sequence

The R-PMR/JOB CARDS provided in this Section are grouped according to the following sequence:

Daily 10,000 Miles 30,000 Miles 60,000 Miles 120,000 Miles

12-III-03.02.03 Running -Preventive Maintenance Cycle & R-PMR/Job Card Content

The Running -Preventive Maintenance Cycle and the relevant R-PMR/JOB CARD content are as follows:

MAINTENANCE INTERVAL	PMR /JOB CARD TITLE	PMR /Job Card CONTENT
DAILY	DAILY JOB CARD	<ul style="list-style-type: none"> • List of Assemblies/Components and related Tasks to be performed DAILY
10,000 Miles	10,000 MILES JOB CARD	<ul style="list-style-type: none"> • DAILY Job Card content + List of Assemblies/Components and related Tasks to be performed at 10,000 Miles
30,000 Miles	30,000 MILES JOB CARD	<ul style="list-style-type: none"> • DAILY Job Card content + 10,000 Job Card content + List of Assemblies/Components and related Tasks to be performed at 30,000 Miles
60,000 Miles	60,000 MILES JOB CARD	<ul style="list-style-type: none"> • DAILY Job Card content + 10,000 Job Card content + 30,000 Job Card content + List of Assemblies/Components and related Tasks to be performed at 60,000 Miles
120,000 Miles	120,000 MILES JOB CARD	<ul style="list-style-type: none"> • DAILY Job Card content + 10,000 Job Card content + 30,000 Job Card content + 60,000 Job Card content + List of Assemblies/Components and related Tasks to be performed at 120,000 Miles

12-III-03.02.04 R-PMR/Job Card Data Presentation Sequence

The Subsystems / Assemblies / Units / Components listed in the ITEMS column of each R-PMR/JOB CARD are grouped by Work Area and Vehicle Systems' and sequenced, in alphabetical order, in conjunction with their On Vehicle Locations and Tasks to be performed.

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12-III-03.02.05 Running Preventive Maintenance Reports R-PMR/Job Cards

TRUCKS & SUSPENSIONS

Running - Preventive Maintenance Reports

R-PMR/JOB CARDS

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TRUCKS & SUSPENSIONS
RUNNING PREVENTIVE MAINTENANCE REPORT
30,000 MILES JOB CARD

VEHICLE #		DATE		RUNNING HOURS		MILES		SHEET 1 OF 2
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WORK AREA	SYSTEM	ITEM	TASK	LOCATION				PM SHEET CODE
				BODY SECT	TRUCK	AXLE	SIDE	
TRUCK	TRUCKS AND SUSPENSIONS	MOTOR TRUCK	INSPECTION	A	A			R-P-12-01-00-00/I-00
		MOTOR TRUCK, AXLE A1	INSPECTION	A	A	A1		R-P-12-01-01-02/I-00
		MOTOR TRUCK, AXLE A2	INSPECTION	A	A	A2		R-P-12-01-01-02/I-00
		MOTOR TRUCK, WHEEL A1L	INSPECTION	A	A	A1	LH	R-P-12-01-01-01/I-00
		MOTOR TRUCK, WHEEL A1R	INSPECTION	A	A	A1	RH	R-P-12-01-01-01/I-00
		MOTOR TRUCK, WHEEL A2L	INSPECTION	A	A	A2	LH	R-P-12-01-01-01/I-00
		MOTOR TRUCK, WHEEL A2R	INSPECTION	A	A	A2	RH	R-P-12-01-01-01/I-00
		TRAILER TRUCK	INSPECTION	AS	C			R-P-12-02-00-00/I-00
		TRAILER TRUCK, AXLE C3	INSPECTION	AS	C	C3		R-P-12-02-01-02/I-00
		TRAILER TRUCK, AXLE C4	INSPECTION	AS	C	C4		R-P-12-02-01-02/I-00
		TRAILER TRUCK, WHEEL C3L	INSPECTION	AS	C	C3	LH	R-P-12-02-01-01/I-00
		TRAILER TRUCK, WHEEL C3R	INSPECTION	AS	C	C3	RH	R-P-12-02-01-01/I-00
		TRAILER TRUCK, WHEEL C4L	INSPECTION	AS	C	C4	LH	R-P-12-02-01-01/I-00
		TRAILER TRUCK, WHEEL C4R	INSPECTION	AS	C	C4	RH	R-P-12-02-01-01/I-00
		MOTOR TRUCK	INSPECTION	B	B			R-P-12-01-00-00/I-00
		MOTOR TRUCK, AXLE B5	INSPECTION	B	B	B5		R-P-12-01-01-02/I-00
		MOTOR TRUCK, AXLE B6	INSPECTION	B	B	B6		R-P-12-01-01-02/I-00
		MOTOR TRUCK, WHEEL B5L	INSPECTION	B	B	B5	LH	R-P-12-01-01-01/I-00
		MOTOR TRUCK, WHEEL B5R	INSPECTION	B	B	B5	RH	R-P-12-01-01-01/I-00
		MOTOR TRUCK, WHEEL B6L	INSPECTION	B	B	B6	LH	R-P-12-01-01-01/I-00
		MOTOR TRUCK, WHEEL B6R	INSPECTION	B	B	B6	RH	R-P-12-01-01-01/I-00

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TRUCKS & SUSPENSIONS RUNNING PREVENTIVE MAINTENANCE REPORT 30,000 MILES JOB CARD

VEHICLE # **DATE** **RUNNING HOURS** **MILES** **SHEET 2 OF 2**

EMPLOYEE # & SIGNATURE	STARTING DATE	WORK HOURS	COMPLETION DATE

(cont'd)

TRUCKS & SUSPENSIONS
RUNNING PREVENTIVE MAINTENANCE REPORT
60,000 MILES JOB CARD

VEHICLE #		DATE		RUNNING HOURS		MILES		SHEET 1 OF 2
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WORK AREA	SYSTEM	ITEM	TASK	LOCATION				PM SHEET CODE
				BODY SECT	TRUCK	AXLE	SIDE	
TRUCK	TRUCKS AND SUSPENSIONS	MOTOR TRUCK	INSPECTION	A	A			R-P-12-01-00-00/I-00
		MOTOR TRUCK, AXLE A1	INSPECTION	A	A	A1		R-P-12-01-01-02/I-00
		MOTOR TRUCK, AXLE A2	INSPECTION	A	A	A2		R-P-12-01-01-02/I-00
		MOTOR TRUCK, WHEEL A1L	INSPECTION	A	A	A1	LH	R-P-12-01-01-01/I-00
		MOTOR TRUCK, WHEEL A1R	INSPECTION	A	A	A1	RH	R-P-12-01-01-01/I-00
		MOTOR TRUCK, WHEEL A2L	INSPECTION	A	A	A2	LH	R-P-12-01-01-01/I-00
		MOTOR TRUCK, WHEEL A2R	INSPECTION	A	A	A2	RH	R-P-12-01-01-01/I-00
		TRAILER TRUCK	INSPECTION	AS	C			R-P-12-02-00-00/I-00
		TRAILER TRUCK, AXLE C3	INSPECTION	AS	C	C3		R-P-12-02-01-02/I-00
		TRAILER TRUCK, AXLE C4	INSPECTION	AS	C	C4		R-P-12-02-01-02/I-00
		TRAILER TRUCK, WHEEL C3L	INSPECTION	AS	C	C3	LH	R-P-12-02-01-01/I-00
		TRAILER TRUCK, WHEEL C3R	INSPECTION	AS	C	C3	RH	R-P-12-02-01-01/I-00
		TRAILER TRUCK, WHEEL C4L	INSPECTION	AS	C	C4	LH	R-P-12-02-01-01/I-00
		TRAILER TRUCK, WHEEL C4R	INSPECTION	AS	C	C4	RH	R-P-12-02-01-01/I-00
		MOTOR TRUCK	INSPECTION	B	B			R-P-12-01-00-00/I-00
		MOTOR TRUCK, AXLE B5	INSPECTION	B	B	B5		R-P-12-01-01-02/I-00
		MOTOR TRUCK, AXLE B6	INSPECTION	B	B	B6		R-P-12-01-01-02/I-00
		MOTOR TRUCK, WHEEL B5L	INSPECTION	B	B	B5	LH	R-P-12-01-01-01/I-00
		MOTOR TRUCK, WHEEL B5R	INSPECTION	B	B	B5	RH	R-P-12-01-01-01/I-00
		MOTOR TRUCK, WHEEL B6L	INSPECTION	B	B	B6	LH	R-P-12-01-01-01/I-00
		MOTOR TRUCK, WHEEL B6R	INSPECTION	B	B	B6	RH	R-P-12-01-01-01/I-00

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TRUCKS & SUSPENSIONS RUNNING PREVENTIVE MAINTENANCE REPORT 60,000 MILES JOB CARD

VEHICLE # **DATE** **RUNNING HOURS** **MILES** **SHEET 2 OF 2**

EMPLOYEE # & SIGNATURE	STARTING DATE	WORK HOURS	COMPLETION DATE

(cont'd)

TRUCKS & SUSPENSIONS
RUNNING PREVENTIVE MAINTENANCE REPORT
120,000 MILES JOB CARD

VEHICLE #		DATE		RUNNING HOURS		MILES		SHEET 1 OF 5
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WORK AREA	SYSTEM	ITEM	TASK	LOCATION				PM SHEET CODE
				BODY SECT	TRUCK	AXLE	SIDE	
TRUCK (cont'd)	TRUCKS AND SUSPENSIONS	MOTOR TRUCK	INSPECTION	A	A			R-P-12-01-00-00/I-00
		MOTOR TRUCK, AXLE A1	INSPECTION	A	A	A1		R-P-12-01-01-02/I-00
		MOTOR TRUCK, AXLE A2	INSPECTION	A	A	A2		R-P-12-01-01-02/I-00
		MOTOR TRUCK, SECONDARY SUSPENSION	INSPECTION	A	A			R-P-12-01-05-00/I-00
		MOTOR TRUCK, STICK LUBRICATOR	INSPECTION	A	A	A1	RH	R-P-12-01-08-00/I-00
		MOTOR TRUCK, STICK LUBRICATOR	INSPECTION	A	A	A1	LH	R-P-12-01-08-00/I-00
		MOTOR TRUCK, STICK LUBRICATOR	INSPECTION	A	A	A2	RH	R-P-12-01-08-00/I-00
		MOTOR TRUCK, STICK LUBRICATOR	INSPECTION	A	A	A2	LH	R-P-12-01-08-00/I-00
		MOTOR TRUCK, WHEEL A1L	INSPECTION	A	A	A1	LH	R-P-12-01-01-01/I-00
		MOTOR TRUCK, WHEEL A1L	INSPECTION	A	A	A1	LH	R-P-12-01-01-01/I-01
		MOTOR TRUCK, WHEEL A1R	INSPECTION	A	A	A1	RH	R-P-12-01-01-01/I-00
		MOTOR TRUCK, WHEEL A1R	INSPECTION	A	A	A1	RH	R-P-12-01-01-01/I-01
		MOTOR TRUCK, WHEEL A2L	INSPECTION	A	A	A2	LH	R-P-12-01-01-01/I-00
		MOTOR TRUCK, WHEEL A2L	INSPECTION	A	A	A2	LH	R-P-12-01-01-01/I-01
		MOTOR TRUCK, WHEEL A2R	INSPECTION	A	A	A2	RH	R-P-12-01-01-01/I-00
		MOTOR TRUCK, WHEEL A2R	INSPECTION	A	A	A2	RH	R-P-12-01-01-01/I-01
		MOTOR TRUCK, WHEEL SHUNTS A1L	TEST	A	A	A1	LH	R-P-12-01-01-01/T-00
		MOTOR TRUCK, WHEEL SHUNTS A1R	TEST	A	A	A1	RH	R-P-12-01-01-01/T-00
		MOTOR TRUCK, WHEEL SHUNTS A2L	TEST	A	A	A2	LH	R-P-12-01-01-01/T-00

(cont' d)

(cont' d)

TRUCKS & SUSPENSIONS RUNNING PREVENTIVE MAINTENANCE REPORT 120,000 MILES JOB CARD

VEHICLE#		DATE		RUNNING HOURS		MILES		SHEET 2 OF 5
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WORK AREA	SYSTEM	ITEM	TASK	LOCATION				PM SHEET CODE
				BODY SECT	TRUCK	AXLE	SIDE	
TRUCK (cont'd)	TRUCKS AND SUSPENSIONS (cont'd)	MOTOR TRUCK, WHEEL SHUNTS A2R	TEST	A	A	A2	RH	R-P-12-01-01-01/T-00
		TRAILER TRUCK	INSPECTION	AS	C			R-P-12-02-00-00/I-00
		TRAILER TRUCK, AXLE C3	INSPECTION	AS	C	C3		R-P-12-02-01-02/I-00
		TRAILER TRUCK, AXLE C4	INSPECTION	AS	C	C4		R-P-12-02-01-02/I-00
		TRAILER TRUCK, SECONDARY SUSPENSION	INSPECTION	AS	C			R-P-12-02-05-00/I-00
		TRAILER TRUCK, SPEED SENSOR DEVICE	INSPECTION	AS	C	C3	RH	R-P-12-02-01-04/I-00
		TRAILER TRUCK, SPEED SENSOR DEVICE	INSPECTION	AS	C	C4	LH	R-P-12-02-01-04/I-00
		TRAILER TRUCK, WHEEL C3L	INSPECTION	AS	C	C3	LH	R-P-12-02-01-01/I-00
		TRAILER TRUCK, WHEEL C3L	INSPECTION	AS	C	C3	LH	R-P-12-02-01-01/I-01
		TRAILER TRUCK, WHEEL C3R	INSPECTION	AS	C	C3	RH	R-P-12-02-01-01/I-00
		TRAILER TRUCK, WHEEL C3R	INSPECTION	AS	C	C3	RH	R-P-12-02-01-01/I-01
		TRAILER TRUCK, WHEEL C4L	INSPECTION	AS	C	C4	LH	R-P-12-02-01-01/I-00
		TRAILER TRUCK, WHEEL C4L	INSPECTION	AS	C	C4	LH	R-P-12-02-01-01/I-01
		TRAILER TRUCK, WHEEL C4R	INSPECTION	AS	C	C4	RH	R-P-12-02-01-01/I-00
		TRAILER TRUCK, WHEEL C4R	INSPECTION	AS	C	C4	RH	R-P-12-02-01-01/I-01
		TRAILER TRUCK, WHEEL SHUNTS C3L	TEST	AS	C	C3	LH	R-P-12-02-01-01/T-00
		TRAILER TRUCK, WHEEL SHUNTS C3R	TEST	AS	C	C3	RH	R-P-12-02-01-01/T-00
		TRAILER TRUCK, WHEEL SHUNTS C4L	TEST	AS	C	C4	LH	R-P-12-02-01-01/T-00
		TRAILER TRUCK, WHEEL SHUNTS C4R	TEST	AS	C	C4	RH	R-P-12-02-01-01/T-00
		MOTOR TRUCK	INSPECTION	B	B			R-P-12-01-00-00/I-00

(cont' d)

TRUCKS & SUSPENSIONS RUNNING PREVENTIVE MAINTENANCE REPORT 120,000 MILES JOB CARD

VEHICLE#		DATE		RUNNING HOURS		MILES		SHEET 3 OF 5
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WORK AREA	SYSTEM	ITEM	TASK	LOCATION				PM SHEET CODE
				BODY SECT	TRUC K	AXLE	SIDE	
TRUCK (cont'd)	TRUCKS AND SUSPENSIONS (cont'd)	MOTOR TRUCK, AXLE B5	INSPECTION	B	B	B5		R-P-12-01-01-02/I-00
		MOTOR TRUCK, AXLE B6	INSPECTION	B	B	B6		R-P-12-01-01-02/I-00
		MOTOR TRUCK, SECONDARY SUSPENSION	INSPECTION	B	B			R-P-12-01-05-00/I-00
		MOTOR TRUCK, STICK LUBRICATOR	INSPECTION	B	B	B5	RH	R-P-12-01-08-00/I-00
		MOTOR TRUCK, STICK LUBRICATOR	INSPECTION	B	B	B5	LH	R-P-12-01-08-00/I-00
		MOTOR TRUCK, STICK LUBRICATOR	INSPECTION	B	B	B6	RH	R-P-12-01-08-00/I-00
		MOTOR TRUCK, STICK LUBRICATOR	INSPECTION	B	B	B6	LH	R-P-12-01-08-00/I-00
		MOTOR TRUCK, WHEEL B5L	INSPECTION	B	B	B5	LH	R-P-12-01-01-01/I-00
		MOTOR TRUCK, WHEEL B5L	INSPECTION	B	B	B5	LH	R-P-12-01-01-01/I-01
		MOTOR TRUCK, WHEEL B5R	INSPECTION	B	B	B5	RH	R-P-12-01-01-01/I-00
		MOTOR TRUCK, WHEEL B5R	INSPECTION	B	B	B5	RH	R-P-12-01-01-01/I-01
		MOTOR TRUCK, WHEEL B6L	INSPECTION	B	B	B6	LH	R-P-12-01-01-01/I-00
		MOTOR TRUCK, WHEEL B6L	INSPECTION	B	B	B6	LH	R-P-12-01-01-01/I-01
		MOTOR TRUCK, WHEEL B6R	INSPECTION	B	B	B6	RH	R-P-12-01-01-01/I-00
		MOTOR TRUCK, WHEEL B6R	INSPECTION	B	B	B6	RH	R-P-12-01-01-01/I-01
		MOTOR TRUCK, WHEEL SHUNTS B5L	TEST	B	B	B5	LH	R-P-12-01-01-01/T-00
		MOTOR TRUCK, WHEEL SHUNTS B5R	TEST	B	B	B5	RH	R-P-12-01-01-01/T-00
		MOTOR TRUCK, WHEEL SHUNTS B6L	TEST	B	B	B6	LH	R-P-12-01-01-01/T-00
		MOTOR TRUCK, WHEEL SHUNTS B6R	TEST	B	B	B6	RH	R-P-12-01-01-01/T-00

(cont' d)

(cont'd)

TRUCKS & SUSPENSIONS RUNNING PREVENTIVE MAINTENANCE REPORT 120,000 MILES JOB CARD

VEHICLE# DATE RUNNING HOURS MILES SHEET 4 OF 5

(cont'd)



(cont' d)

TRUCKS & SUSPENSIONS RUNNING PREVENTIVE MAINTENANCE REPORT 120,000 MILES JOB CARD

VEHICLE#		DATE		RUNNING HOURS		MILES		SHEET 5 OF 5
----------	--	------	--	---------------	--	-------	--	--------------

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12-III-03.03 Running -Preventive Maintenance Sheets (R-PMS)

Each R-PMS provides the following data consistent with Preventive Maintenance Plan (PMP), AB Design Documentation and Vehicle Systems Functional Tree:

- **R-PM Sheet Code**
- **SYSTEM, SUBSYSTEM /ASSEMBLY, UNIT, Component (Names)**
- **SYSTEM, SUBSYSTEM /ASSEMBLY, UNIT, Component (Location)**
- **Maintenance Interval (Miles)**
- **Maintenance Task,**
- **Man Hours**, needed to perform the Task
- **SPARE PARTS**, needed to perform the Task

Each R-PMS also provides:

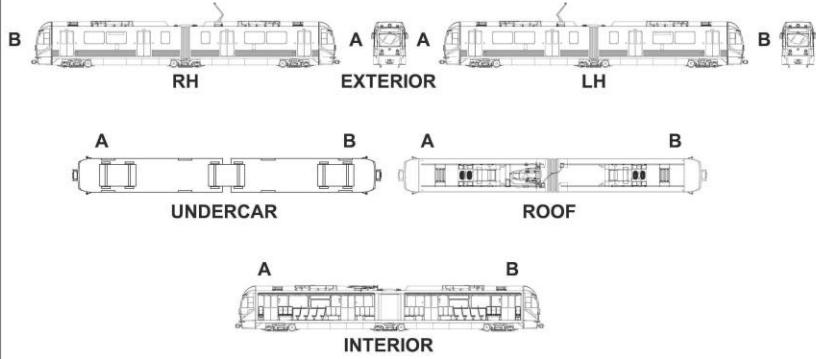
- **SAFETY PRECAUTIONS**, to be followed to safely accomplish the Task
- **TOOLS**, including Special Tools and Test Equipment, needed to accomplish the Task
- **CONSUMABLES**, required to accomplish the Task and consistent with those used by MTA
- **PROCEDURE**, consisting of **Preliminary Operations** and **Procedural Steps**, to be followed while performing Maintenance Tasks
- **Illustrations** and **Pictures** are inserted in the text to facilitate the understanding of the topics and/or to explain step-by-step procedure

12-III-03.01 Running- Preventive Maintenance Sheet (R-PMS) Form

The R-PMS Form (refer to Figure 12-III-03.2) consists of several fields containing the following data/ information:

RUNNING -PREVENTIVE MAINTENANCE SHEET (RPMS) Form			
ITEM #	TITLE	CONTENT	EXPLANATORY NOTES
1	Card code	Sheet code	<p>The Sheet Code is an alphanumerical code that identifies each R-PM Sheet.</p> <p>THE SHEET CODE IS THE EXPLICIT LINK BETWEEN R-PM MATRIXES, R-PMR /JOB CARDS AND R-PM SHEETS</p> <p>The Sheet Code consists of letters R-P followed by an 11 digit code number as follows:</p> <p>R-P-nn-mm-zz-ww/Y-kk</p> <p>R = Running P= Preventive</p> <p>nn may vary from 02 to 19, identifying the System/ Manual Section number.</p> <p>mm-zz-ww each one may vary from 00 to 99, according to AB System Functional Tree, allowing the identification of the Assembly/Unit/Component</p> <p>Y Maintenance Task Code. It may be one of the following:</p> <p>C=Cleaning I=Inspection L=Lubrication</p> <p>R=Replacement S=Service T=Test</p> <p>kk It may vary from 00 to 99.</p> <p>It is a progressive number allowing the explicit identification of RPMS when one of the following cases occur:</p> <ul style="list-style-type: none"> 1- same Maintenance Task pertaining to vehicle as a whole or to the same System/Subsystem/Assembly to be performed at same Maintenance Interval in different Vehicle Area (i.e Vehicle as a Whole DAILY Exterior /Interior INSPECTION) 2- same Maintenance Task pertaining to the same Assembly/Unit/Component to be performed at different Maintenance Intervals and for this reason consisting of different Maintenance Procedure
2	System	System name	This field indicates the System to which the Assembly/Unit/Component belongs.
3	Subsystem/ Assembly	Subsystem/ Assembly name	This field indicates the Subsystem/Assembly to which the Unit/Component belongs.
4	Unit	Unit name	This field indicates the Unit to which the Component belongs.
5	Component	Component name	This field indicates the Component the Maintenance Task is referring to
6	Maintenance Task	Maintenance Task name	This field indicates the Maintenance Task to be performed.
7	Interval Miles	Number	<p>This field indicates the maintenance Interval Miles.</p> <p>It may be DAILY, 10,000 Miles, 30,000 Miles, 60,000 Miles, 120,000 Miles</p>

RUNNING -PREVENTIVE MAINTENANCE SHEET (RPMS) Form (cont'd)			
ITEM #	TITLE	CONTENT	EXPLANATORY NOTES
8	Man Hours	Number	The Man Hour field indicates the time needed to perform the corresponding Maintenance Task, with the basic assumption that the Vehicle is staged on an Inspection Pit/Jacking tracks with the required Consumables, Tools and Materials Available.
9	Sheet	Pages numbering	This field indicates the progressive R-PMS sheet page number.
10	LOCATION	Illustration	This field indicates the On Board Location of the Equipment to be maintained The following Graphic Symbols are used for: Assembly/Unit/Component <input type="checkbox"/> for System/Subsystem/Vehicle as a Whole <input type="checkbox"/>
11	R	Letter	This field indicates that the Sheet pertains to Running Maintenance
12	P	Letter	This field indicates that the Sheet pertains to Preventive Maintenance
13	nn	Number	This field indicates the System/Manual Section number to which the Sheet pertains. It may vary from 01 to 19
14	rr	Number	This field indicates the Sheet Revision number
15	Page ##	Page ##	This field indicates the RMSM Section Page number
16	-#	Number	This field indicates the RMSM Section Revision number
17	SAFETY PRECAUTIONS	Text	This field presents the General and/or specific Safety Precautions to be followed to safely accomplish the relevant Maintenance Tasks.
18	TOOLS	Text	This field lists the description and the P/N of the Standard tools, Special Tools and Test Equipment needed to accomplish the Maintenance Task. Refer to the TTE Manual for the TE and Special Tools detailed descriptions and tools maintenance.
19	CONSUMABLES	Text	This field lists the Consumables Materials (consistent with those used by MTA with the related P/N.) needed to accomplish the Maintenance Task. Cleaning agents are included
20	SPARE PARTS	Text	This field lists the Description and PN of Spare Parts (consistent with Illustrated Parts Catalog) needed to accomplish the Maintenance Task.
21	PROCEDURE	Text	The Procedure field provides Preliminary Operations and Procedural step by step Instructions to be followed while performing the Maintenance Task. Illustrations and Pictures are inserted in the text to facilitate the understanding of the topics and/or to explain step-by-step procedure.

	LACMTA P2550 LRV Running Maintenance and Servicing Manual - Section 01
P2550 PREVENTIVE MAINTENANCE SHEET	
System: Card Code: R-P-nn-mm-zz-ww/Y-kk	
Subsystem/Assy: Sheet: x/z	
Component: Man Hours:	
Maintenance Task: Interval/Miles:	
LOCATION:	
	
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
R P nn mm zz ww Y kk M Metro	
Page 011 Draft	

**Figure 12-III-03.2 R-PMS Form
(Sheet 1 of 2)**

LACMTA P2550 LRV Running Maintenance and Servicing Manual - Section 01		 AnsaldoBreda				
P2550 PREVENTIVE MAINTENANCE SHEET						
Card Code: R-P-nn-mm-zz-ww/Y-kk						
System: _____		Sheet: x/z				
Subsystem/Assy: _____		Unit: _____				
Component: _____		Man Hours: _____				
Maintenance Task: _____		Interval/Miles: _____				
SAFETY PRECAUTIONS:						
17. _____						
18. _____						
19. _____						
20. _____						
21. _____						
TOOLS: _____						
CONSUMABLES: _____						
SPARE PARTS: _____						
PROCEDURE: PRELIMINARY OPERATIONS						
Page 01-2 Draft						
						
<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding: 2px;">R</td> <td style="padding: 2px;">P</td> <td style="padding: 2px;">nn</td> <td style="padding: 2px;">rr</td> </tr> </table>			R	P	nn	rr
R	P	nn	rr			

**Figure 12-III-03.2 R-PMS Form
(Sheet 2 of 2)**

12-III-03.02 How to Use the R-PM Sheets and R-PMR /Job Cards

To optimize the job organization, proceed as follows:

1. At Scheduled Preventive Maintenance Interval Expiration Date

- a) Use the relevant (Maintenance Interval) R-PMR/JOB CARD where the Subsystems/Assemblies/Units/ Components, listed in the ITEMS column, are grouped by Work Area and Vehicle System and sequenced, in alphabetical order, in conjunction with their On Vehicle Location and Task to be performed.
- b) Select the Work Area and the System
- c) Select the first Equipment listed in the ITEMS column and the Sheet Code listed in conjunction with the Task to be performed and gather the relevant Sheet
- d) Read carefully the Sheet to fully understand the provided Data/Instructions.
- e) Carefully read:
 - The Safety Precautions to perform the Task safely
 - The Preliminary Operations to set the Vehicle in safety conditions according to MTA Maintenance Shop Regulations
 - The Tools, Consumables and Spare Parts listed in each Sheet which are needed to accomplish the Task, in order to have all of them available next to the location of the Equipment to be maintained before starting the activities
- f) Fill the R-PMR/JOB CARD with the data required by the Maintainer at the start of the Maintenance Activities

2. Task Execution

- a) Follow carefully the prescribed Safety Precautions and Maintenance Procedural Steps provided in the R-PM Sheet.
- b) Perform the Maintenance Task Procedure on the first Equipment(listed in the ITEMS column of the relevant R-PMR /JOB CARD) at its On Vehicle LOCATION as indicated in the LOCATION column of the R-PMR /JOB CARD.
- c) Upon completing the Maintenance Task on the first Equipment, highlight (with a flag) its LOCATION field on the R-PMR / JOB CARD.
- d) Note Equipment Defect Found and / or your Comments on the End Page of the R-PMR / JOB CARD
- e) Proceed to perform the same Task on the second (same) Equipment listed in the R-PMR / JOB CARD at its On Vehicle LOCATION, (different from the previous one) as indicated in the LOCATION column of the R-PMR /JOB CARD.
- f) Proceed as above to perform the same Task on every Equipment (to which the same Sheet Code refers) listed in the ITEMS column of the relevant (Maintenance Interval) R-PMR /JOB CARD.
- g) During Task execution, note any Areas / Items of the Assembly / Unit/ Component under Preventive Maintenance Process requiring Corrective Maintenance.
- h) Gather as much information about the Equipment as is practical to increase your Equipment knowledge (i.e.; knowledge about the malfunction in terms of correctly operating and incorrectly operating equipment processes).

3. At every Task Completion

- a) Follow carefully the prescribed Safety Precautions before restoring Electrical Power to Vehicle.
- b) Check the correct operation and/or functions of the Subsystem to which the maintained Equipment pertains.
- c) Perform this check on the IDU "A" as follows:

NOTE: Through the IDU you can check if all Systems are exchanging data through the MVB or LonWorks Bus and the Trainlines Status.

The IDU Display also shows in real time the Status of all Vehicle Systems.

Reading the IDU Fault List it is possible to immediately detect a fault
Using the IDU in the Operating Mode the Fault Indications are generic,

Using the IDU in Maintenance Mode the same Fault has a detailed description.

For more in depth troubleshooting use the PTU connected to the relevant system that requires further troubleshooting.

1. On IDU "A" access to the Maintenance Menu first and then to the "Faults" Screen by selecting, in sequence, the relevant icons.
2. Check, On IDU "A" through the list of the Current Active Faults shown in the "Faults" Screen, for "Fault" Codes related to the Subsystem to which the maintained Equipment pertains.
Refer to Section 18 of RMSM for Fault Signals Details.
3. As per "Fault" Codes check results proceed as follows:

➤ **No Faults are listed in the "Faults" Screen**

- a) Key OFF the Vehicle.
- b) Record Service and Test results on the Defect Report Card for administrative and maintenance planning.
- c) Fill the R-PMR /JOB CARD with the data required from the Maintainer at the completion of the Maintenance Activities and include your comments

➤ **Fault Codes are listed in the “Faults” Screen**

- a) Investigate/troubleshoot the Equipment previously maintained first and then the System/Subsystem/Assembly/Unit for Fault Probable Causes
- b) Gather as much information about the failure symptoms as is practical.
- c) Refer to Section 18 of RMSM for Fault Signals Details
- d) Try to identify the malfunction in terms of correctly operating and incorrectly operating equipment processes.
- e) Identify which equipment signals or parameters will best help you to localize the failure.
- f) Identify the source of the problem.
- g) Repair or replace the defective component.
- h) Verify that the repair is effective in eliminating all of the failure symptoms.
- i) Evaluate whether or not the defective component was the root cause of the failure.
- j) Once the Fault Codes are not found in the “Faults” Screen perform steps from 3-a through 3-c (previous subparagraph **“No Faults are listed in the “Faults” Screen”**)

12-III-03.03.03 Running- Preventive Maintenance Sheet (R-PMS) List

The “Trucks & Suspensions” Running- Preventive Maintenance Sheets (R-PMS) List is provided in the following pages.

The R-PM Sheets are listed by Subsystem / Assembly / Unit / Component and sequenced by Maintenance Interval in conjunction with their Sheet Codes and Tasks (including SCPM flag) to be performed.

Table 12-III-03.3 Running Preventive Maintenance Sheets List

SYSTEM 12		TRUCKS & SUSPENSIONS			
SUBSYSTEM/ ASSY	ASSY /UNIT/ COMPONENT	SCPM	TASK	MAINTEN. INTERVAL (MILES)	 SHEET CODE
MOTOR TRUCK	MOTOR TRUCK	<input checked="" type="checkbox"/>	INSPECTION	30,000	R-P-12-01-00-00/I-00
MOTOR TRUCK	WHEEL	<input checked="" type="checkbox"/>	INSPECTION	30,000	R-P-12-01-01-01/I-00
MOTOR TRUCK	MOTOR AXLE	<input checked="" type="checkbox"/>	INSPECTION	30,000	R-P-12-01-01-02/I-00
MOTOR TRUCK	WHEEL	<input checked="" type="checkbox"/>	INSPECTION	120,000	R-P-12-01-01-01/I-01
MOTOR TRUCK	WHEEL - SHUNTS	<input checked="" type="checkbox"/>	TEST	120,000	R-P-12-01-01-01/T-00
MOTOR TRUCK	SECONDARY SUSPENSION		INSPECTION	120,000	R-P-12-01-05-00/I-00
MOTOR TRUCK	STICK LUBRICATOR		INSPECTION	120,000	R-P-12-01-08-00/I-00
TRAILER TRUCK	TRAILER TRUCK	<input checked="" type="checkbox"/>	INSPECTION	30,000	R-P-12-02-00-00/I-00
TRAILER TRUCK	WHEEL	<input checked="" type="checkbox"/>	INSPECTION	30,000	R-P-12-02-01-01/I-00
TRAILER TRUCK	TRAILER AXLE	<input checked="" type="checkbox"/>	INSPECTION	30,000	R-P-12-02-01-02/I-00
TRAILER TRUCK	WHEEL	<input checked="" type="checkbox"/>	INSPECTION	120,000	R-P-12-02-01-01/I-01
TRAILER TRUCK	WHEEL - SHUNTS	<input checked="" type="checkbox"/>	TEST	120,000	R-P-12-02-01-01/T-00
TRAILER TRUCK	SPEED SENSOR DEVICE		INSPECTION	120,000	R-P-12-02-01-04/I-00
TRAILER TRUCK	SECONDARY SUSPENSION		INSPECTION	120,000	R-P-12-02-05-00/I-00
AIR SUSPENSION SYSTEM	AIR FILTER		SERVICE	120,000	R-P-12-03-01-02/S-00

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12-III-03.03.04 **Running- Preventive Maintenance Sheets (R-PMS)**

TRUCKS & SUSPENSIONS

Running - Preventive Maintenance Sheets

R-PMS

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P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-00-00/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

1/4

Subsystem/Assy:

MOTOR TRUCK

Unit:

Component:

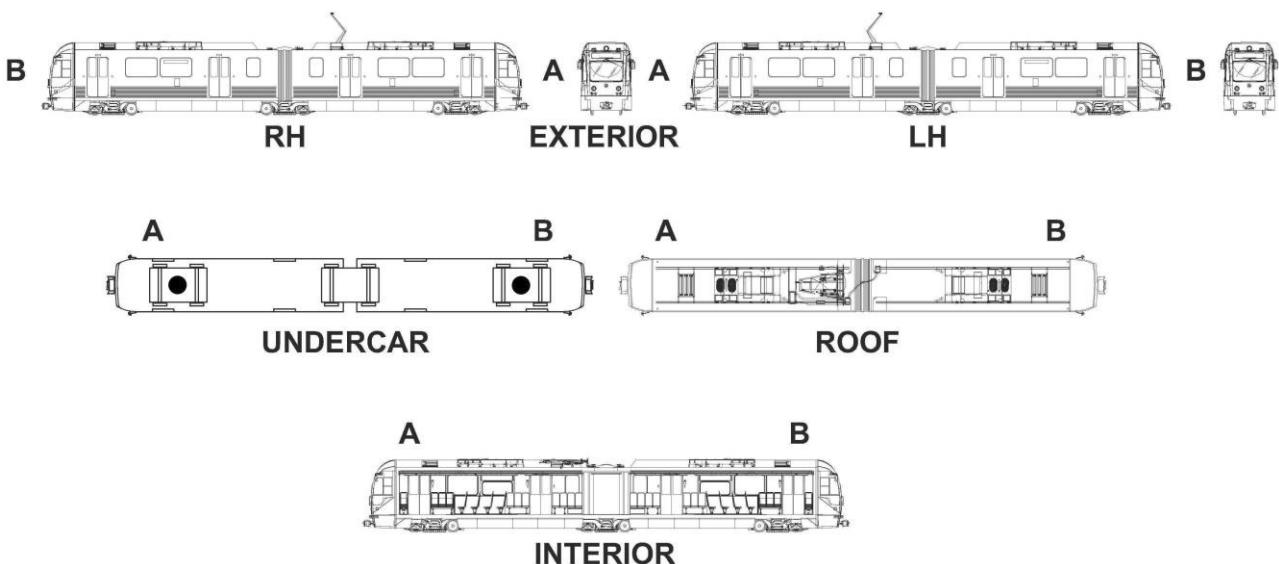
Man Hours:

2

Maintenance Task:

INSPECTION

Interval/Miles:

30,000**LOCATION:**

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-00-00/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

2/4

Subsystem/Assy:

MOTOR TRUCK

Unit:

Component:

Man Hours:

2

Maintenance Task:

INSPECTION

Interval/Miles:

30,000**SAFETY PRECAUTIONS:**

WARNING: BLUE FLAG THE VEHICLE IN ACCORDANCE WITH ALL LACMTA BLUE FLAG POLICIES, RULES, & PROCEDURES IN ORDER TO WARN THAT MAINTENANCE PERSONNEL ARE WORKING ON, UNDER, OR NEAR ROLLING EQUIPMENT.

WARNING: WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.

TOOLS:

LACMTA Maintenance Shop Standard Tools Kit.

CONSUMABLES:

N/A

SPARE PARTS:

N/A

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-00-00/I-00

System:

Sheet:

TRUCKS AND SUSPENSIONS
3/4

Subsystem/Assy:

MOTOR TRUCK

Unit:

Component:

Man Hours:

2

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE:

PRELIMINARY OPERATIONS

Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop Regulations:

- 1) Place the Vehicle over the Pit (or Stand Up Rail).
- 2) Set the Master Controller Handle to FSB position.
- 3) Make sure that all Parking Brakes are applied (by checking on the IDU "Parking Brake A and B Not Released" and on Indicator Panel "A" "Park / Friction Brake" ON).
- 4) Remove Electrical Power from Vehicle by lowering the Pantograph.
- 5) Turn the Transfer Switch to OFF.
- 6) Set the Pantograph Control Motor Switch(5F02 CB LV Locker "A" Section) to OFF
- 7) Lock out and tag out the Switch in accordance with all LACMTA Safety Rules, Regulations, Policies, and Procedures.

NOTE The tag must indicate the name of the person who removed Power.

That person knows why the Power was removed and when it safe to restore it.

Only the individual whose name appears on the tag or a person with his approval should remove the tag and restore Power.

INSPECTION

The aim of this Visual Inspection is to verify the structural integrity of the Truck

To perform the task proceed as follows:

1. Inspect Frame and Bolster Beam for obvious visible damage such as dents, deformation, scoring, Corrosion, and signs of rust / paint degradation.
2. Inspect welded brackets for damage, deformation and corrosion.
3. In addition visually inspect :
 - a) Electrical components, wiring and connections for damage, missing/loose parts and signs of frying / overheating.
 - b) Friction Brakes & Pneumatic Systems components, piping and connections for damage, missing / loose attaching parts. and air leakage.
 - c) Axle and Wheel mounted equipment for damage, missing/loose attaching parts / lubricant leakage.
 - d) Tires for the following Defects:Shell Outs, Thin Flange,Breaks, Build Up, Hollow Tread, Grooves,Flat Spots, Thermal Cracks. For Defect Details and Pictures refer to Sheet R-P 12-01-01-01 / I-00.
 - e) Labels for damage and missing/loose parts.
 - f) Primary Suspension and Secondary Suspension components for damage and missing/loose attaching parts and oil leakage.
 - g) Pilot Bar (Cow Catcher) and ATP Antenna for damage, deformation and missing/loose attaching parts.
4. Restore Electrical Power

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-00-00/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

4/4

Subsystem/Assy:

MOTOR TRUCK

Unit:

Component:

Man Hours:

2

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE:

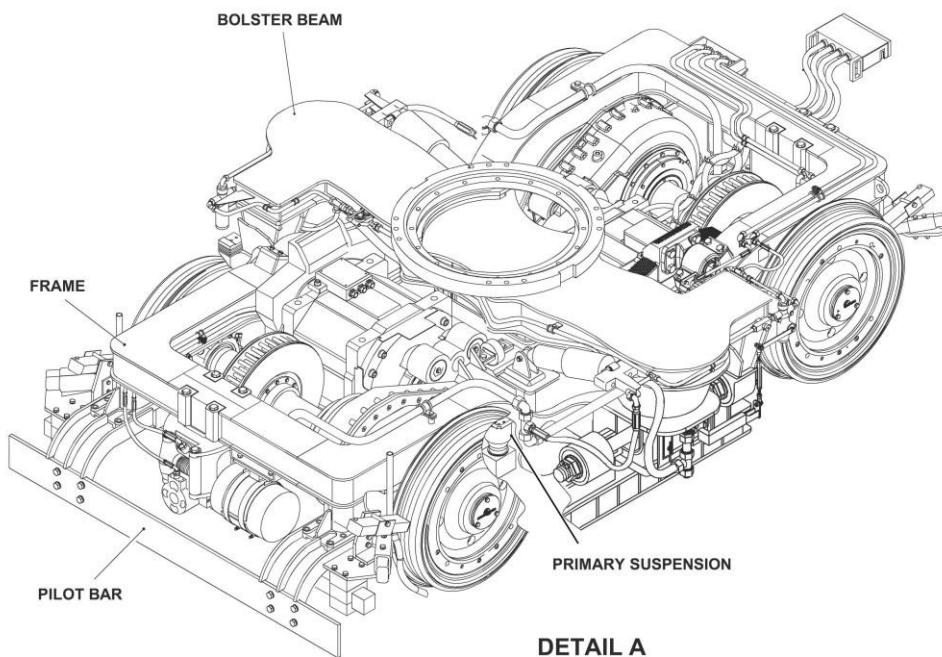
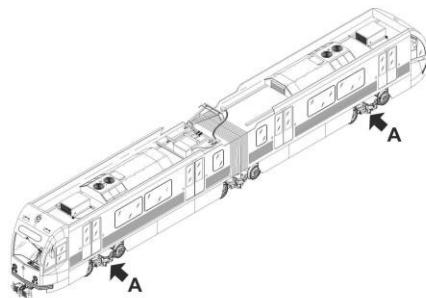


Figure 1 - MOTOR TRUCK INSPECTION

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-00

System:

Sheet:

TRUCKS AND SUSPENSIONS

1/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

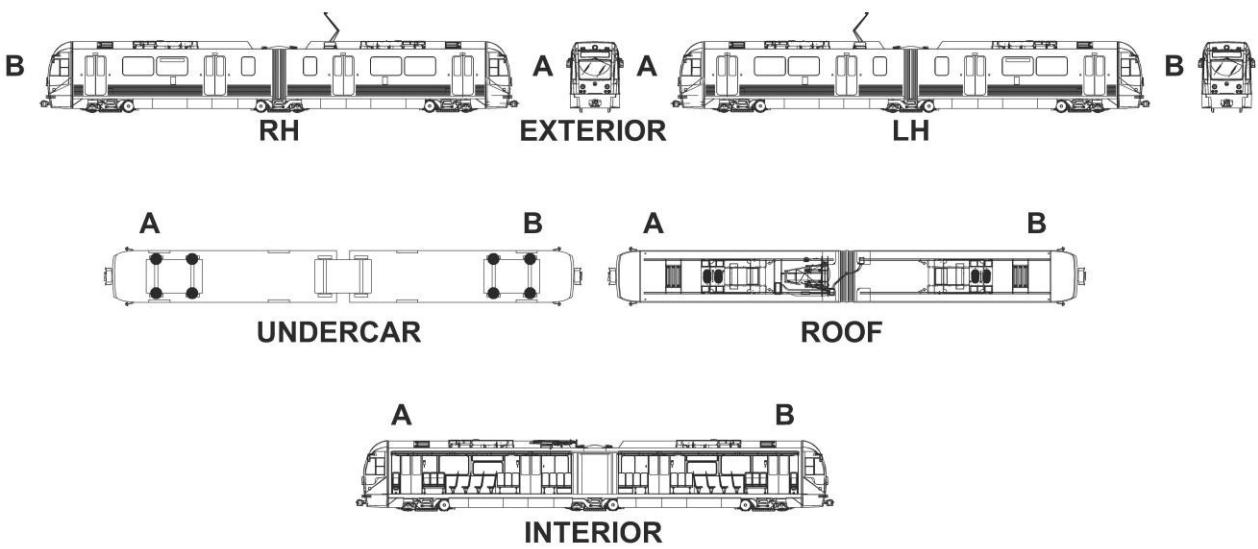
Man Hours:

1.6

Maintenance Task:

INSPECTION

Interval/Miles:

30,000
LOCATION:


P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

2/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

1.6

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

SAFETY PRECAUTIONS:

WARNING: BLUE FLAG THE VEHICLE IN ACCORDANCE WITH ALL LACMTA BLUE FLAG POLICIES, RULES, & PROCEDURES IN ORDER TO WARN THAT MAINTENANCE PERSONNEL ARE WORKING ON, UNDER, OR NEAR ROLLING EQUIPMENT.

WARNING: APPLY WHEEL CHOCKS TO PREVENT THE VEHICLE FROM MOVING.

WARNING: WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.

CAUTION: Pi TAPE ACCURACY IS +/- .001 ON STANDARD TAPES UP TO 144" MAKE SURE THE TAPE HAS NOT BEEN STEPPED ON OR KINKED, WHICH MAY REDUCE / DESTROY THE ACCURACY.

CAUTION: IT IS MANDATORY TO PERFORM THE VEHICLE LEVELING PROCEDURE, ACCORDING TO SHEET R-C-01-01-00-00/LL-00, AFTER EVERY WHEEL TRUING.

TOOLS:

LACMTA Maintenance Shop Standard Tools Kit.

Pi Tape 24 to 36 inch range (AAR Tool for Wheel Diameter check).

AAR Steel Wheel Gauge (AAR Tool for Wheel Profile check).

AAR Wheel Defect Gauge (AAR Tool for Wheel Profile check).

CONSUMABLES:

N/A

SPARE PARTS:

N/A

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-00

System:

Sheet:

TRUCKS AND SUSPENSIONS

3/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

1.6

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE

PRELIMINARY OPERATIONS

Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop Regulations:

1. Apply wheel chocks to prevent the Vehicle from moving.

EXPLANATORY NOTES:

1- WHEEL IDENTIFICATION DATA

Each Wheel is identified by the following Data:

Month & Year of Manufacture	Manufacturer	Type of material	Heat #	Individual serial #	Drawing #
Refer to Fig 1		Refer to Fig 2		Refer to Fig 3	



Figure 1 - WHEEL IDENTIFICATION DATA

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

4/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

1.6

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D):

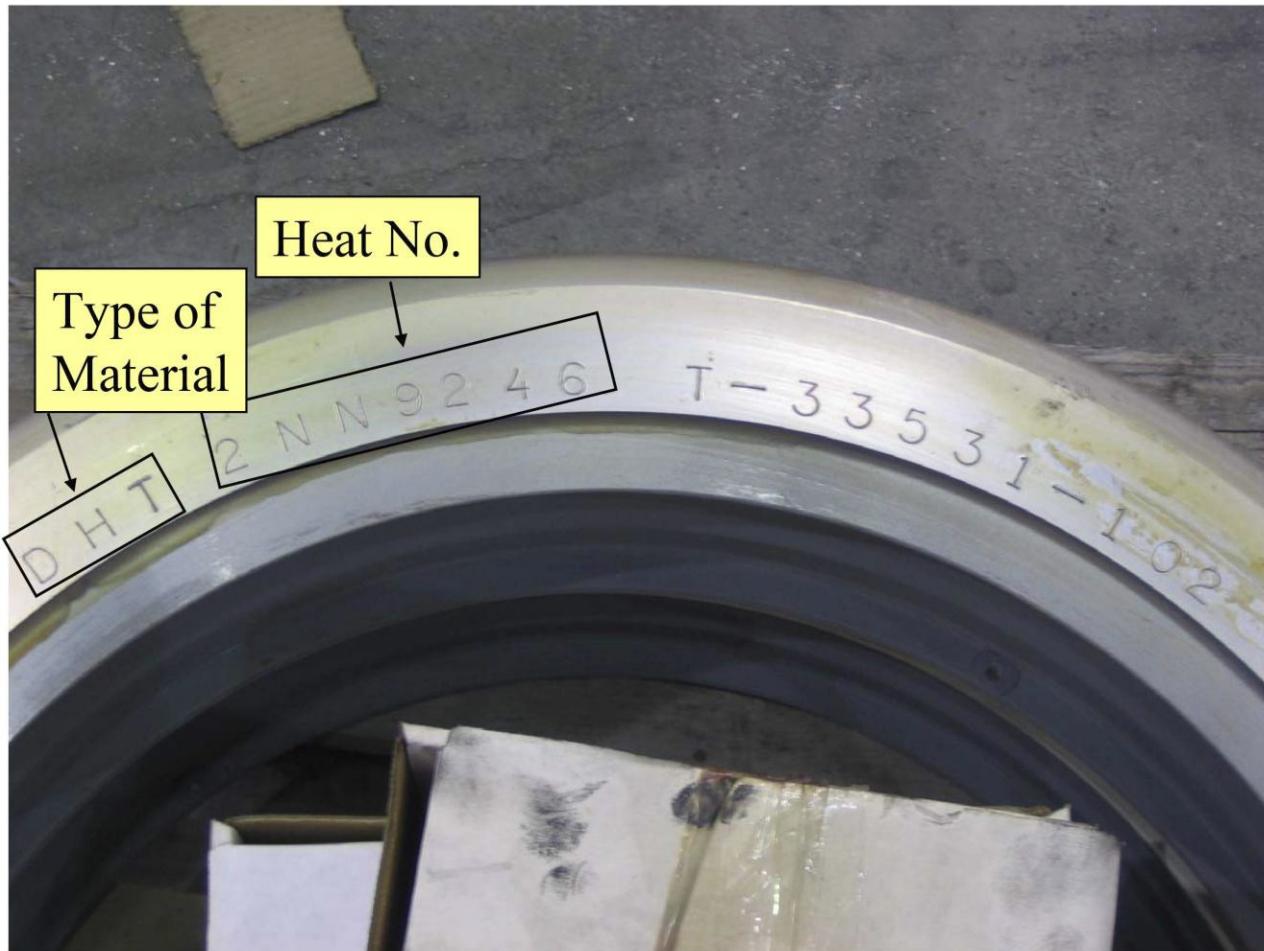


Figure 2 - WHEEL IDENTIFICATION DATA

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-00

System:

Sheet:

TRUCKS AND SUSPENSIONS
5/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

1.6

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D):

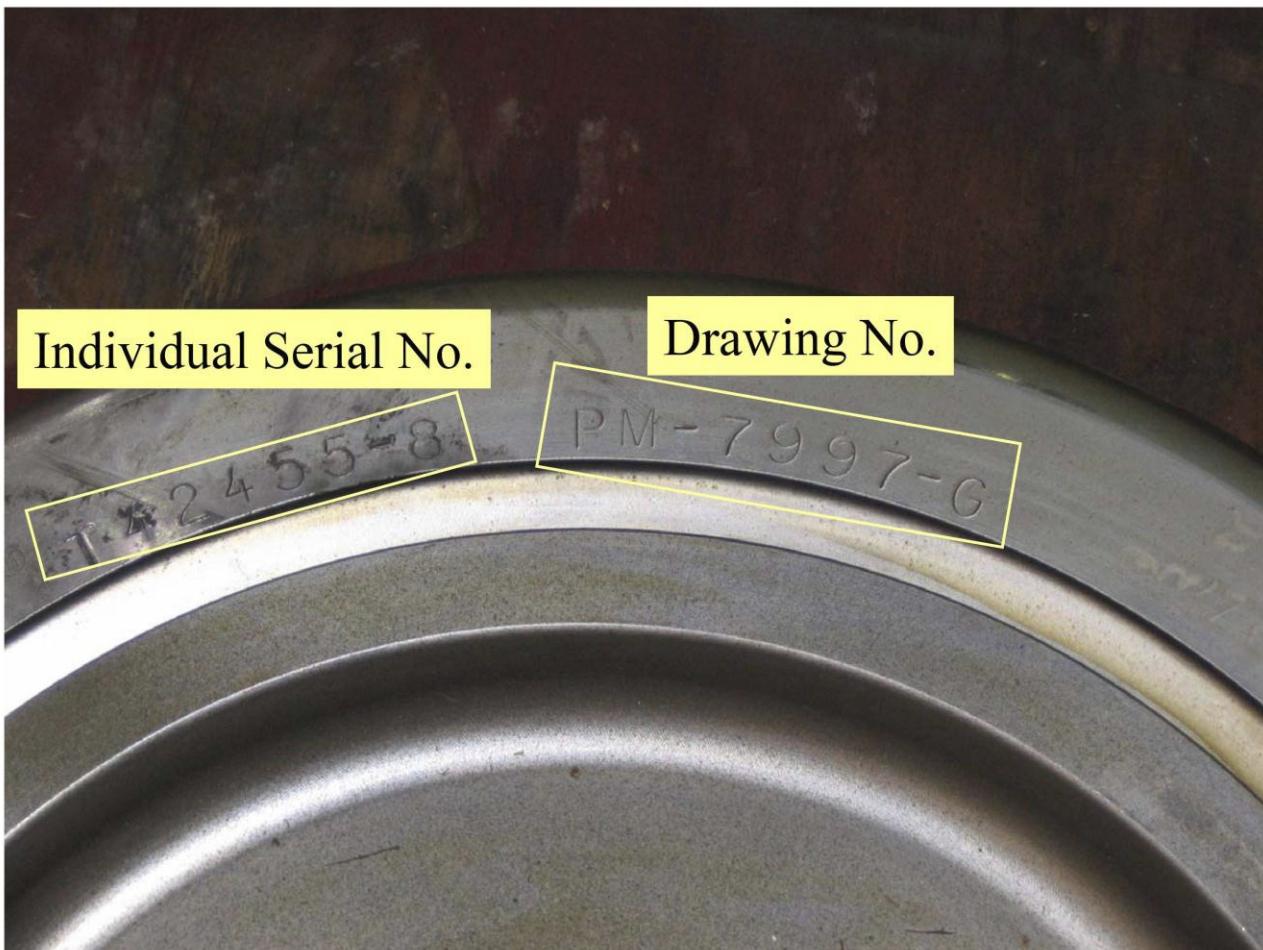


Figure 3 - WHEEL IDENTIFICATION DATA

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

6/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

1.6

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D):

2- WHEEL DEFECTS

The Types of Wheel Defects are shown in Figure 4:

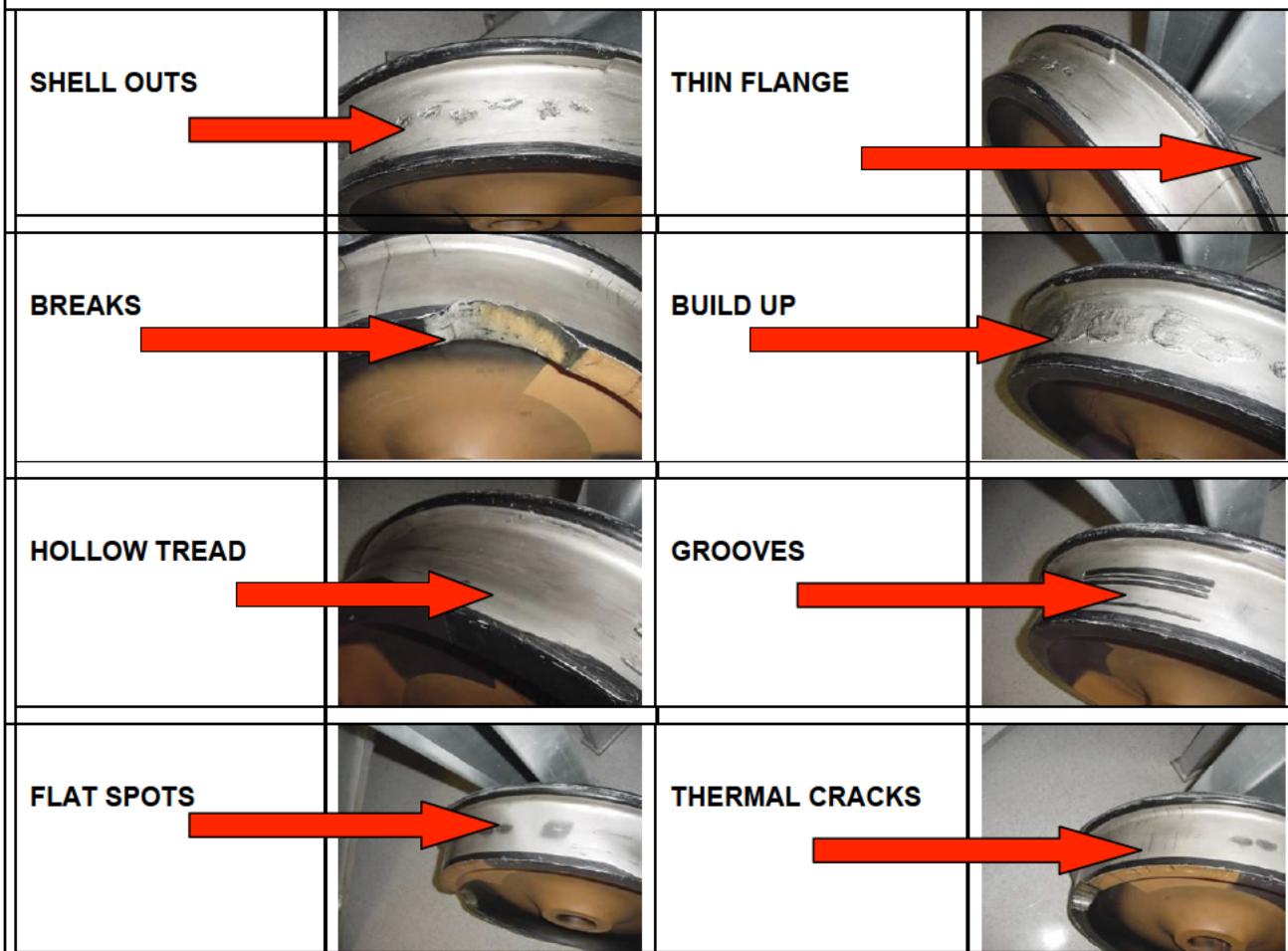


Figure 4 - TYPES OF WHEEL DEFECTS

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-00

System:

Sheet:

TRUCKS AND SUSPENSIONS

7/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

1.6

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D):

3- HOW TO USE THE Pi TAPE (24 TO 36 INCH RANGE) TO MEASURE WHEEL OUTSIDE DIAMETER

1. Make sure that Pi Tape and Wheel Outside Circumference are properly clean.
2. Apply the Pi Tape around the Wheel Outside Circumference.

NOTE: It is recommended to use pieces of masking tape to hold the Pi Tape in proper parallel position.

3. Apply a snug pull of 5 pounds tension when reading.

CAUTION: Pi TAPE ACCURACY IS +/- .001 ON STANDARD TAPES UP TO 144"
 MAKE SURE THE TAPE HAS NOT BEEN STEPPED ON OR KINKED,
 WHICH MAY REDUCE / DESTROY THE ACCURACY.

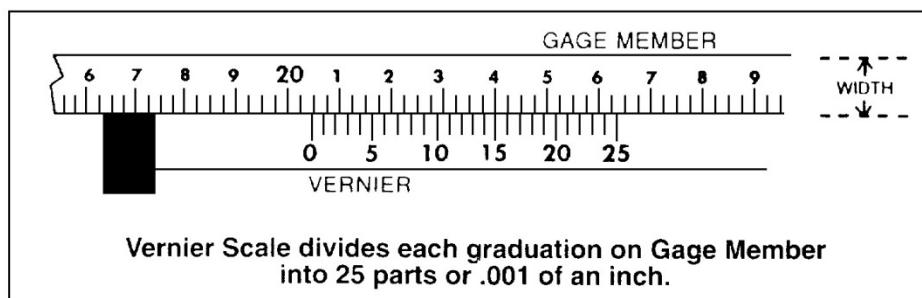


Figure 5 - EXAMPLE OF OUTSIDE DIAMETER MEASUREMENT TAPE READING

4. In the above Figure, the division to the left of the Vernier ZERO are 20 inches plus 1 division, or 20.025.

The 15th LINE on the Vernier coincides with a LINE on the Gage Member.

This is added to the 20.025, making a Total Diameter Reading of 20.040, which is

THE TRUE WHEEL DIAMETER READING AS MEASURED ON THE OUTSIDE CIRCUMFERENCE.

5. Once measurement is completed, proceed as follows:

- a) Wipe clean.
- b) Apply a light coat of rust preventative oil.
- c) Store in the Tape Container.

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

8/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

1.6

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D):

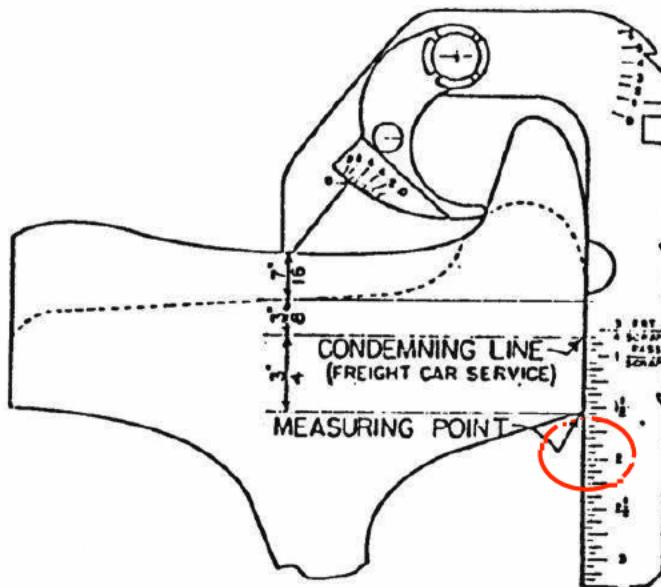
4- HOW TO USE THE AAR STEEL WHEEL GAUGE TO MEASURE WHEEL DIMENSIONS

1. Wheel Tire Diameter Measuring (2 measurements per wheel):

- Observe and Record the Radius reading in 16ths of an inch at the Measuring Point.
- Divide the Measuring Point Radius Reading by 16 to get the decimal equivalent.
- Multiply the decimal equivalent Radius Reading by 2 to get the Diameter Reading.
- Add the Diameter Reading to the known diameter of the wheel at the Measuring Point (24.121").
- The Result is the Wheel Diameter for the Measured Wheel.

NOTE: For Passing Criteria refer to:

AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."



$$\text{WHEEL DIAMETER} = 24.121" + [2 \times (\text{MEASURING POINT READING} / 16)]$$

Figure 6 - WHEEL DIAMETER MEASURING

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-00

System:

Sheet:

TRUCKS AND SUSPENSIONS
9/22

Subsystem/Assy:

Unit:

MOTOR TRUCK
WHEEL SET MOTOR TRUCK

Component:

Man Hours:

WHEEL
1.6

Maintenance Task:

Interval/Miles:

INSPECTION
30,000

PROCEDURE (CONT'D):

2. **Wheel Flange Thickness Measuring (2 measurements per wheel):**

NOTE: For Passing Criteria refer to:
 AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

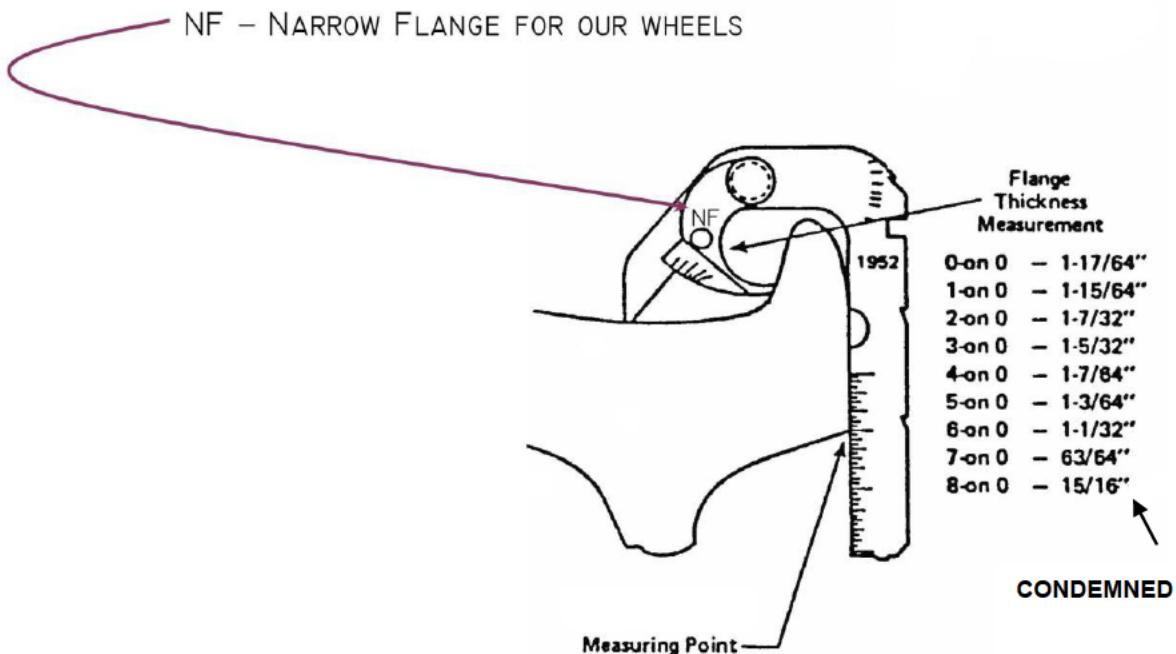


Figure 7 - WHEEL FLANGE THICKNESS MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

10/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

1.6

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D):

3. Wheel Flange Height Measuring (2 measurements per wheel)

NOTE: For Passing Criteria refer to:
AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

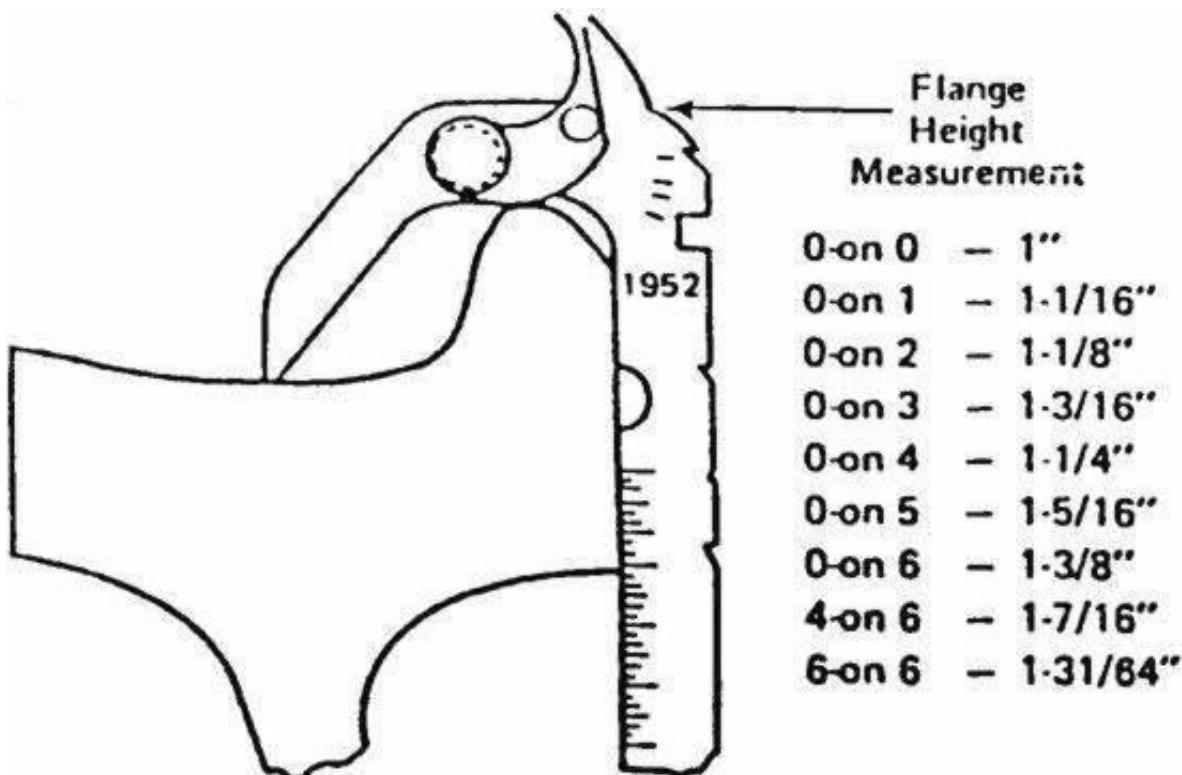


Figure 8 - WHEEL FLANGE HEIGHT MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

11/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

1.6

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D):

4. **Wheel High Flange Measuring (2 measurements per wheel).**

NOTE: For Passing Criteria refer to:

AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

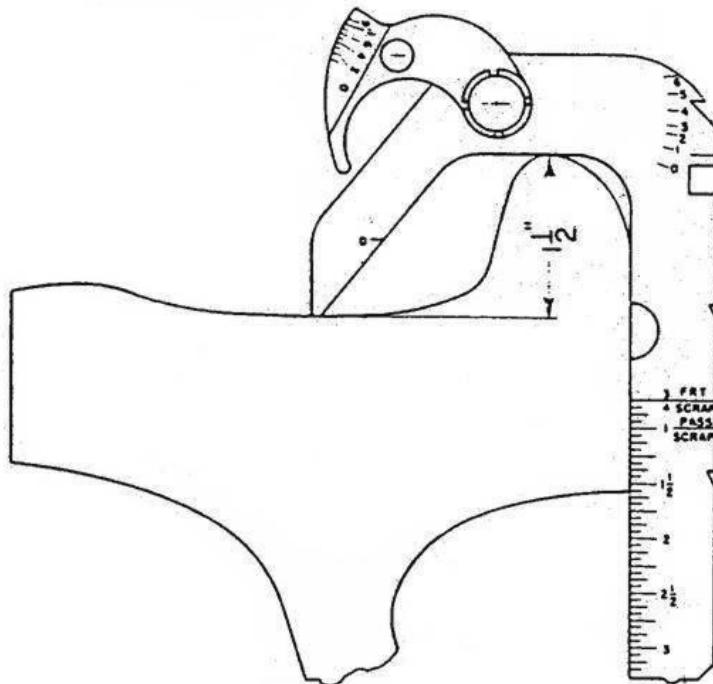


Figure 9 - WHEEL HIGH FLANGE MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

12/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

1.6

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D):

5. **Wheel Witness Groove Position Measuring (2 measurements per wheel).**

NOTE: For Passing Criteria refer to:
AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

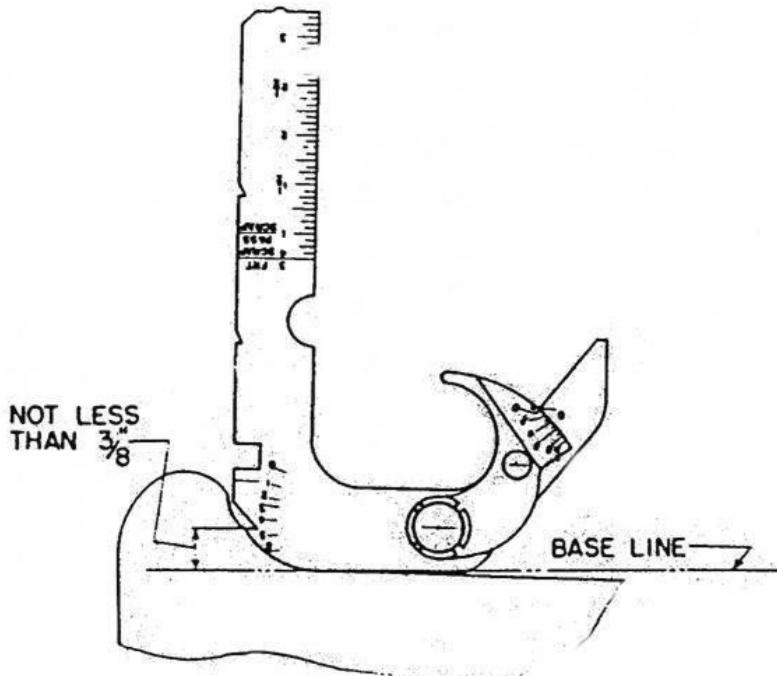


Figure 10 - WHEEL WITNESS GROOVE POSITION MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

13/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

1.6

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D):

6. **Wheel Witness Groove Depth Measuring (2 measurements per wheel).**

NOTE: For Passing Criteria refer to:

AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

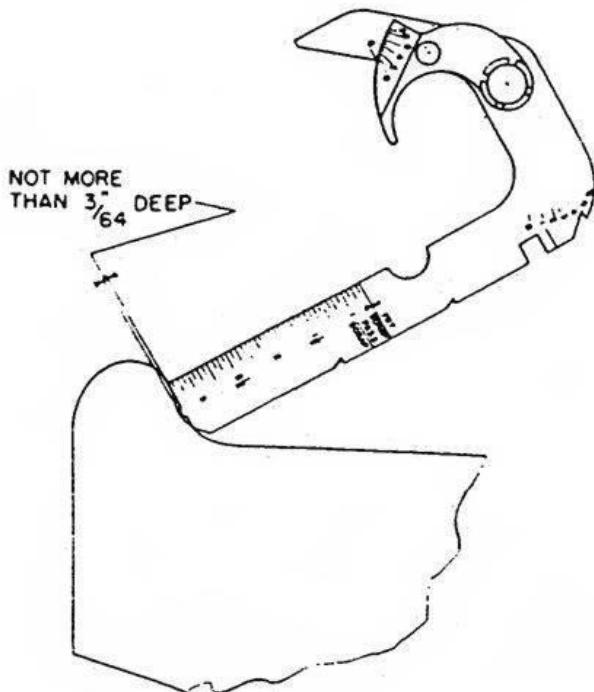


Figure 11 - WHEEL WITNESS GROOVE DEPTH MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

14/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

1.6

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D):

7. **Wheel Vertical Flange Measuring (2 measurements per wheel).**

NOTE: For Passing Criteria refer to:
AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

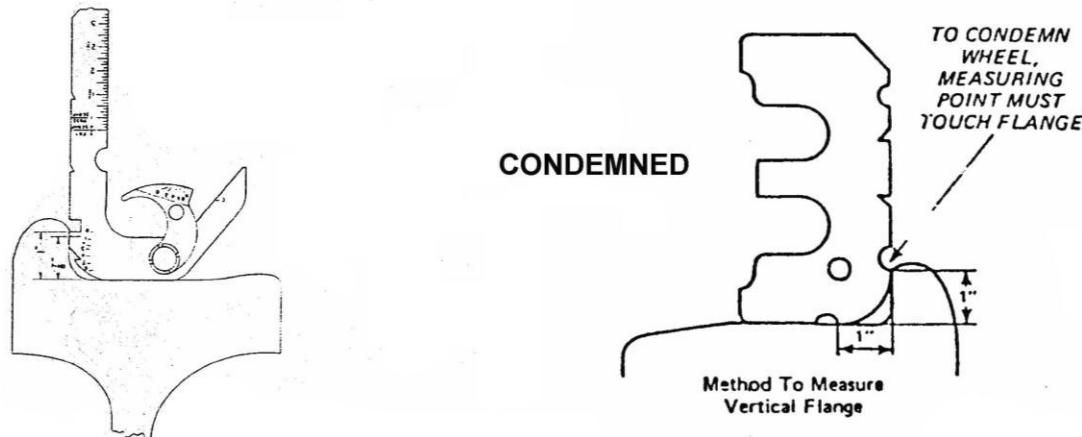


Figure 12 - WHEEL VERTICAL FLANGE MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

15/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

1.6

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D):

8. **Wheel Flange Thickness Measuring (2 measurements per wheel).**

NOTE: For Passing Criteria refer to:

AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

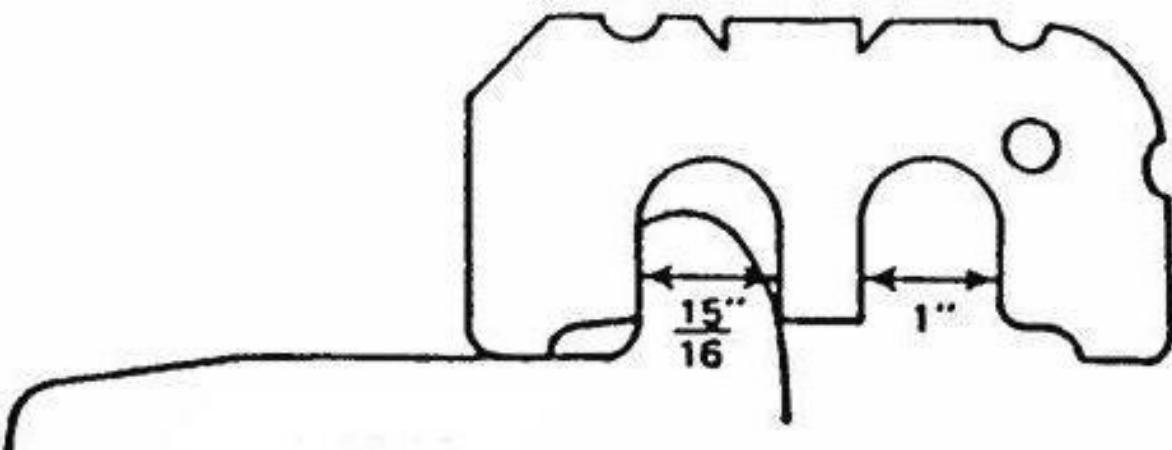


Figure 13 - WHEEL FLANGE THICKNESS MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

16/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

1.6

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D):

9. **Wheel Broken Rim & Heavy Flange Measuring (2 measurements per wheel).**

NOTE: For Passing Criteria refer to:
AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

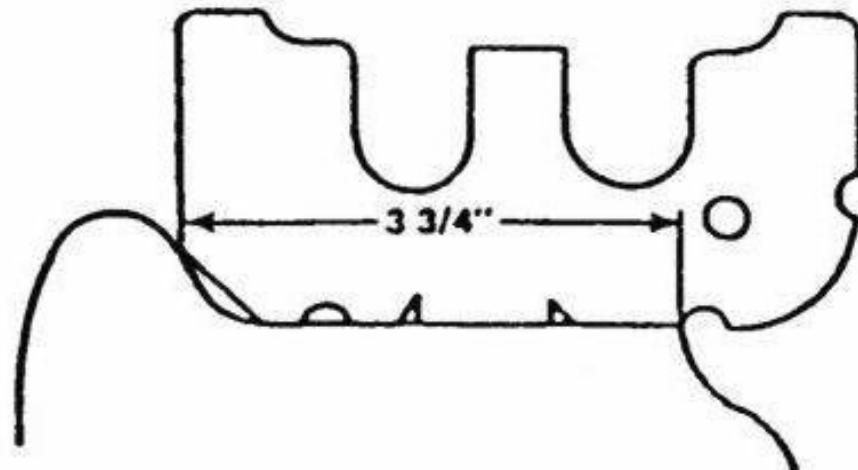


Figure 14 - WHEEL BROKEN RIM & HEAVY FLANGE MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

17/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

1.6

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D):

10. Wheel Flat And Shell Spots Measuring

NOTE: For Passing Criteria refer to:

AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."
If found 1/2" or more then inform Supervisor/Leader and have wheels reprofiling.

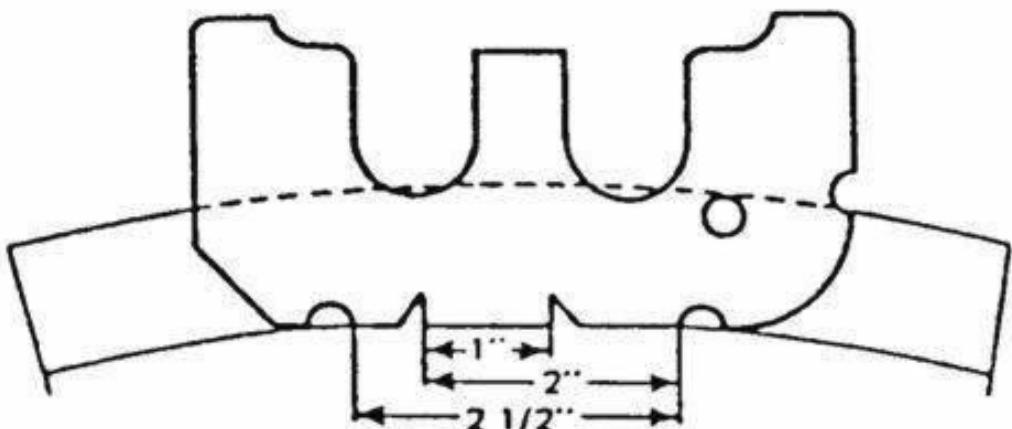


Figure 15 - WHEEL FLAT AND SHELL SPOTS MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

18/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

1.6

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D):

INSPECTION

To perform the task proceed as follows (Refer to Figures 1 through 17):

1. Inspect each Wheel for damage and missing /loose parts.

Particularly check that the following items are not missing /loose:

- a. Plastic plugs (covering the pusher bolt holes on the conical ring).
- b. Pipe plug.
- c. Locking bolts (which fasten the conical ring tight against the wheel center).

2. Inspect each Tire for the Defects shown in the previously Figure 4.

3. Measure each Tire diameter, using recommended AAR tool (refer to Figure 5).

4. Check each Tire profile, using recommended AAR tool (refer to Figures 6 through 15).

NOTE: For Passing Criteria refer to:

AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

5. Check each Tire for Flats & Shell Spots and measure any defects with the recommended AAR tool (refer to Figure 15).

WARNING: WHEELS WITH TIRES LESS THAN 26.0" IN DIAMETER MUST BE REMOVED FROM SERVICE IMMEDIATELY.

6. As per measurement and check results and according to the Wheel Dimensional Data and to the Wheel.

Dimensions shown in the Fig 17, perform, if necessary, the Wheel Truing procedure according to Sheet.

R-C-12-01-01-01/RP-00.

NOTE: In case of re-profiling refer to next specific Steps provided at the end of this Sheet

7. Inspect the External Shunts for damage, signs of fraying and missing / loose parts.

8. Perform the External Shunt Resistance Test according to Sheet R-P-12-01-01-01/T-00.

9. Inspect Rubber Blocks for:

- a. even distribution around the wheel.
- b. cracks (in radial direction).

NOTE: Cracks in the rubber blocks are largely cosmetic (due to Ozone exposure), but cracks that extend the length of the block (in radial direction) need to be replaced.

WARNING: REMOVE FROM SERVICE ANY WHEEL WITH 3 OR MORE RUBBER BLOCKS THAT ARE CRACKED ALONG THE ENTIRE LENGTH OF THE BLOCK UNTIL THE RUBBER BLOCKS ARE REPLACED.

10. Restore Electrical Power.

11. Remove Wheel Chocks.

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

19/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

1.6

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D):

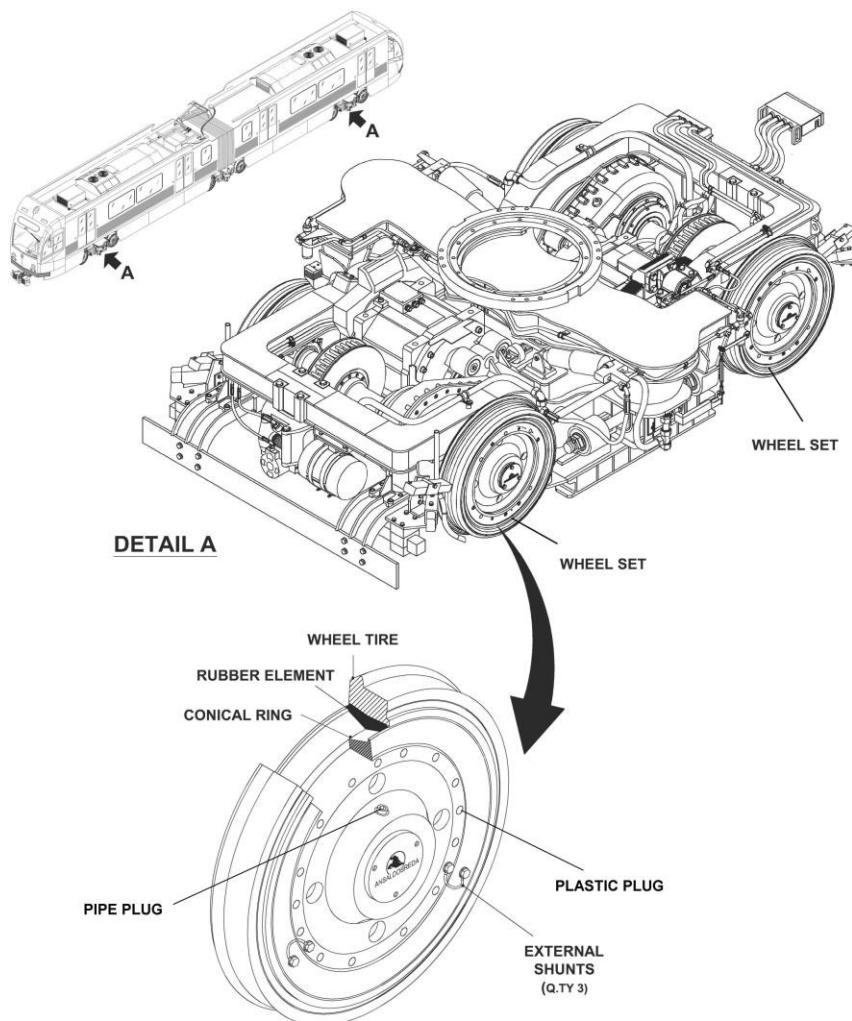


Figure 16 - MOTOR TRUCK - WHEEL INSPECTION

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

20/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

1.6

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D):

WHEEL - DIMENSIONAL DATA

Wheel diameter (new) 28.00 in
 Wheel wear before replacement on diameter 2.00 in
 Difference between the diameter of the wheels (same axle <.080 in)
 Difference between the diameter of the wheels (same truck .38 in)
 Difference between the diameter of the wheels (same vehicle ± 2 in)

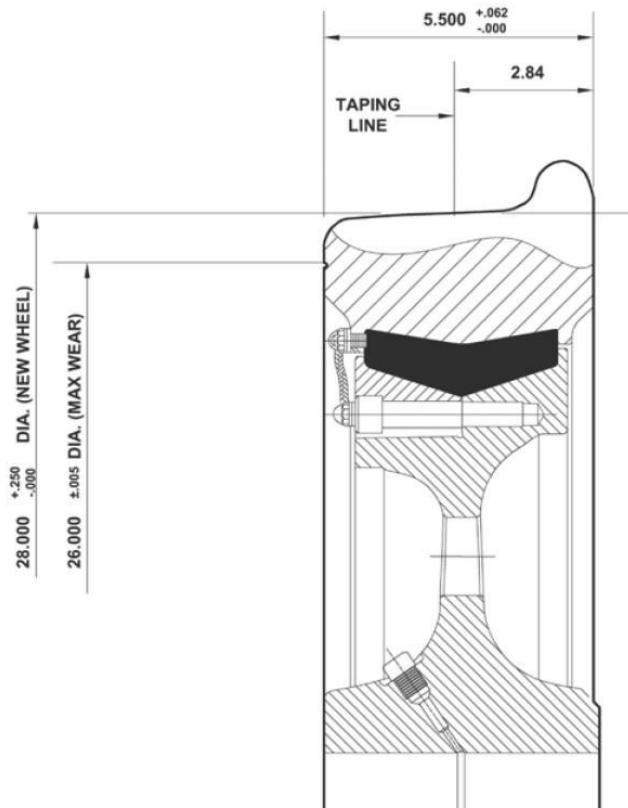


Figure 17 - TRUCKS WHEEL PROFILE

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-00

System:

Sheet:

TRUCKS AND SUSPENSIONS

21/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

1.6

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D):

IN CASE OF REPROFILING:

1. If the A1R /A1L Wheels have been re-profiled, input the "new" Wheel Diameter value into IDU ("A" Cab).

NOTE: To input the new diameter (in millimeters) it is necessary to access to the Maintenance Mode first and then to the Utility Screen of the Maintenance Menu Screen (refer to Fig 18).

CAUTION: FOR A1R /A1L WHEELS RE-PROFILING, THE "NEW" WHEEL DIAMETER INPUT INTO IDU (A CAB) IS MANDATORY BECAUSE THE PROPULSION LOGIC MAKES AN ON-LINE MEASUREMENT OF THE WHEEL DIAMETERS BASED ON THE STORED VALUE OF THE REFERENCE A1R /A1L WHEEL DIAMETERS.

NOTE: For the re-profiling of any other Wheels, it is not necessary to input the new diameter because it is calculated comparing the A1R /A1L reference diameter with the speed sensors' frequencies and then considers the ratio between them.

The wheel diameter calculation is executed only when both the following conditions are met:

- a. The car speed is in the range between 5mph and 25mph.
- b. The car mode is coasting for at least 3 seconds.

2. Upon completing the re-profiling it is recommended to perform the External Shunt Resistance Test on all wheels which were re-profiled, according to Sheet R-P-12-01-01-01/T-00.
3. Perform the Vehicle Leveling procedure according to Sheet R-C-01-01-00-00/LL-00:
4. Remove wheel chocks.
5. Record Inspection and Test results on the Defect Report Card for administrative and maintenance planning.

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

22/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

1.6

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D):



Figure 18 - UTILITY SCREEN - WHEEL DIAMETER

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-02/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

1/4

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

MOTOR AXLE

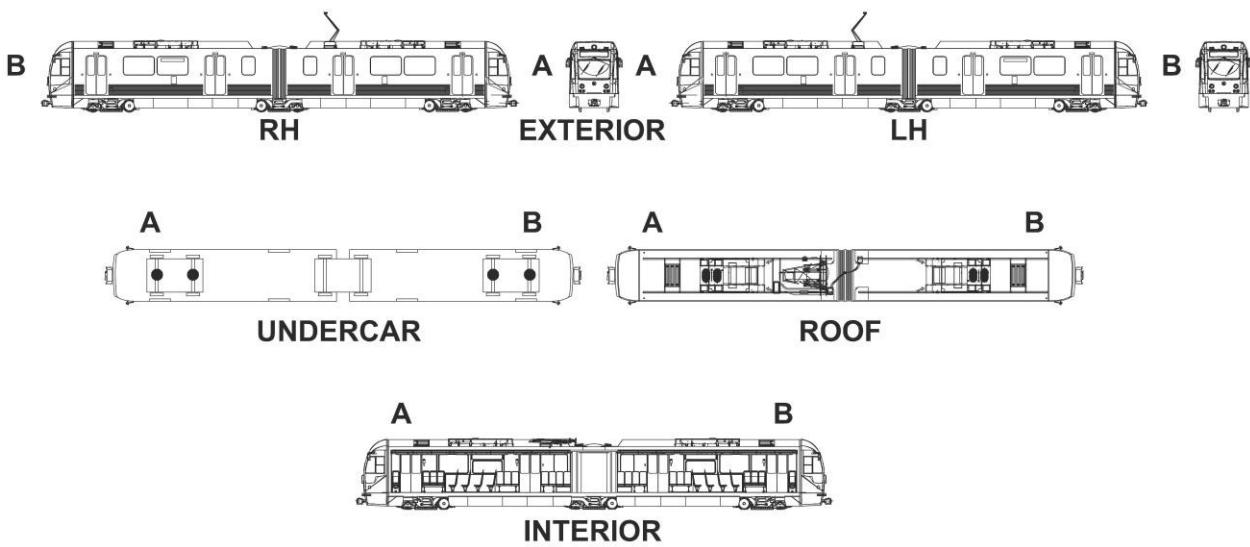
Man Hours:

1

Maintenance Task:

INSPECTION

Interval/Miles:

30,000**LOCATION:**

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-02/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

2/4

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

MOTOR AXLE

Man Hours:

1

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

SAFETY PRECAUTIONS:

WARNING: BLUE FLAG THE VEHICLE IN ACCORDANCE WITH ALL LACMTA BLUE FLAG POLICIES, RULES, & PROCEDURES IN ORDER TO WARN THAT MAINTENANCE PERSONNEL ARE WORKING ON, UNDER, OR NEAR ROLLING EQUIPMENT.

WARNING: APPLY WHEEL CHOCKS TO PREVENT THE VEHICLE FROM MOVING.

WARNING: WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.

TOOLS:

LACMTA Maintenance Shop Standard Tools Kit.

CONSUMABLES:

Cleaner/Degreaser

SPARE PARTS:

N/A

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-02/I-00

System: TRUCKS AND SUSPENSIONS	Sheet: 3/4
Subsystem/Assy: MOTOR TRUCK	Unit: WHEEL SET MOTOR TRUCK
Component: MOTOR AXLE	Man Hours: 1
Maintenance Task: INSPECTION	Interval/Miles: 30,000

PROCEDURE:

PRELIMINARY OPERATIONS

Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop Regulations:

INSPECTION

1. Clean /decrease, using cleaner / degreaser, the portions of the Axles that are free of equipment.
2. Inspect the Axle surface for signs of damage, (incipient) cracks or signs of (fatigue) stress.
3. As per Inspection results proceed as follows:
 - a. Axle found to have no signs of damage, cracks or stress
 - b. Axle found to have no signs of damage, cracks or stress

NOTE Remove from service only after notifying supervisor and per management instructions.

1. For safety reasons remove from service the Truck with the bad Axle, according to Sheet R C 12-01-00-00-R / 00 and replace all affected components.

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-02/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

4/4

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

MOTOR AXLE

Man Hours:

1

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE:

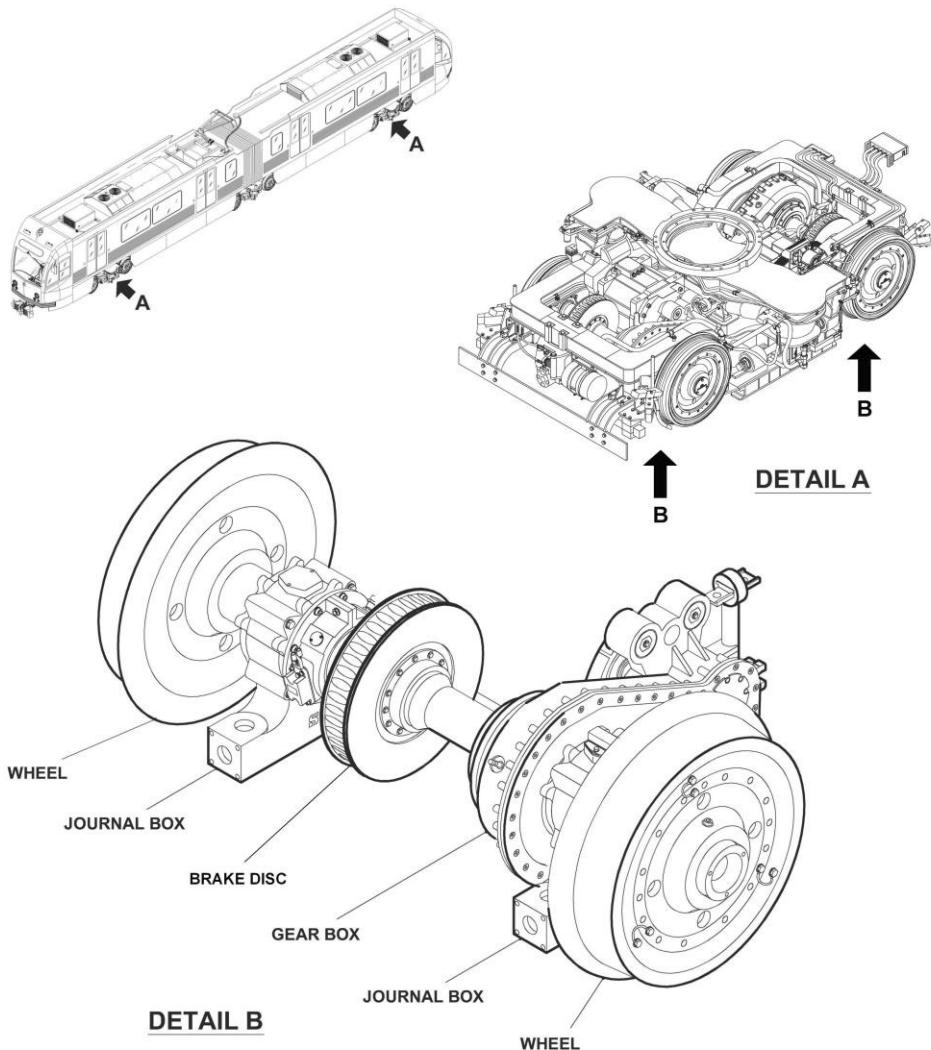


Figure 1 - MOTOR TRUCK AXLE

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-01

System:

Sheet:

TRUCKS AND SUSPENSIONS

1/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

4

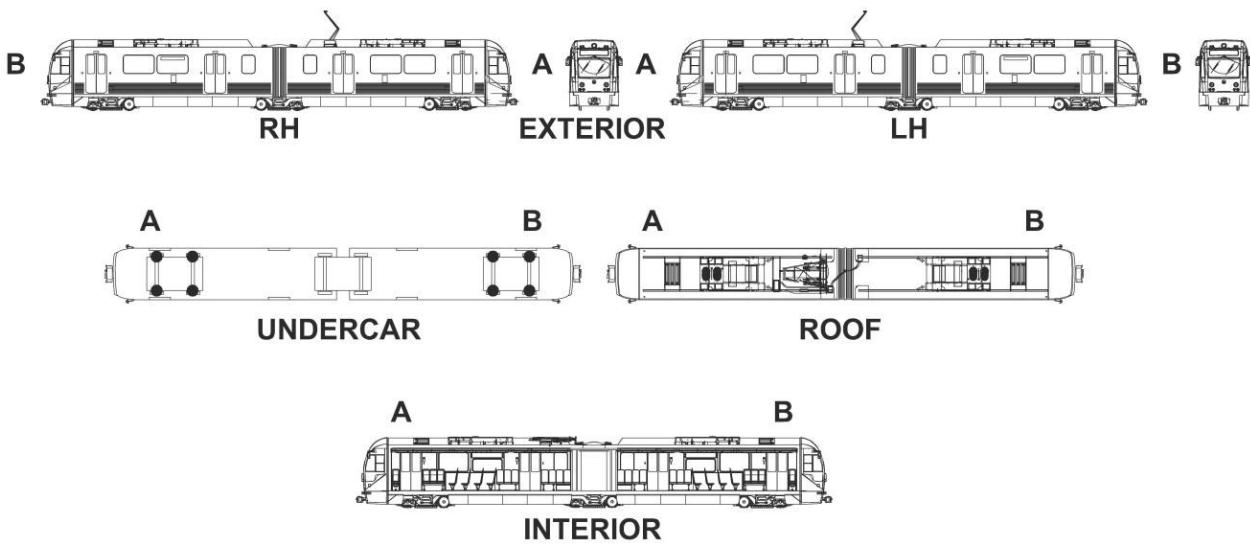
Maintenance Task:

INSPECTION

Interval/Miles:

120,000

LOCATION:



P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-01

System:

TRUCKS AND SUSPENSIONS

Sheet:

2/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

4

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

SAFETY PRECAUTIONS:

WARNING: BLUE FLAG THE VEHICLE IN ACCORDANCE WITH ALL LACMTA BLUE FLAG POLICIES, RULES, & PROCEDURES IN ORDER TO WARN THAT MAINTENANCE PERSONNEL ARE WORKING ON, UNDER, OR NEAR ROLLING EQUIPMENT.

WARNING: APPLY WHEEL CHOCKS TO PREVENT THE VEHICLE FROM MOVING.

WARNING: WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.

CAUTION: Pi TAPE ACCURACY IS +/- .001 ON STANDARD TAPES UP TO 144" MAKE SURE THE TAPE HAS NOT BEEN STEPPED ON OR KINKED, WHICH MAY REDUCE / DESTROY THE ACCURACY.

CAUTION: IT IS MANDATORY TO PERFORM THE VEHICLE LEVELING PROCEDURE, ACCORDING TO SHEET R-C-01-01-00-00/LL-00, AFTER EVERY WHEEL TRUING.

TOOLS:

Pi Tape 24 to 36 inch range (AAR Tool for Wheel Diameter check).

AAR Steel Wheel Gauge (AAR Tool for Wheel Profile check).

AAR Wheel Defect Gauge (AAR Tool for Wheel Profile check).

CONSUMABLES:

N/A

SPARE PARTS:

N/A

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-01

System:

Sheet:

TRUCKS AND SUSPENSIONS**3/22**

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

4

Maintenance Task:

INSPECTION

Interval/Miles:

120,000**PROCEDURE****PRELIMINARY OPERATIONS**

Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop Regulations:

1. Apply wheel chocks to prevent the Vehicle from moving.

EXPLANATORY NOTES:**1- WHEEL IDENTIFICATION DATA**

Each Wheel is identified by the following Data:

Month & Year of Manufacture	Manufacturer	Type of material	Heat #	Individual serial #	Drawing #
Refer to Fig 1		Refer to Fig 2		Refer to Fig 3	



Figure 1 - WHEEL IDENTIFICATION DATA

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-01

System:

TRUCKS AND SUSPENSIONS

Sheet:

4/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

4

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

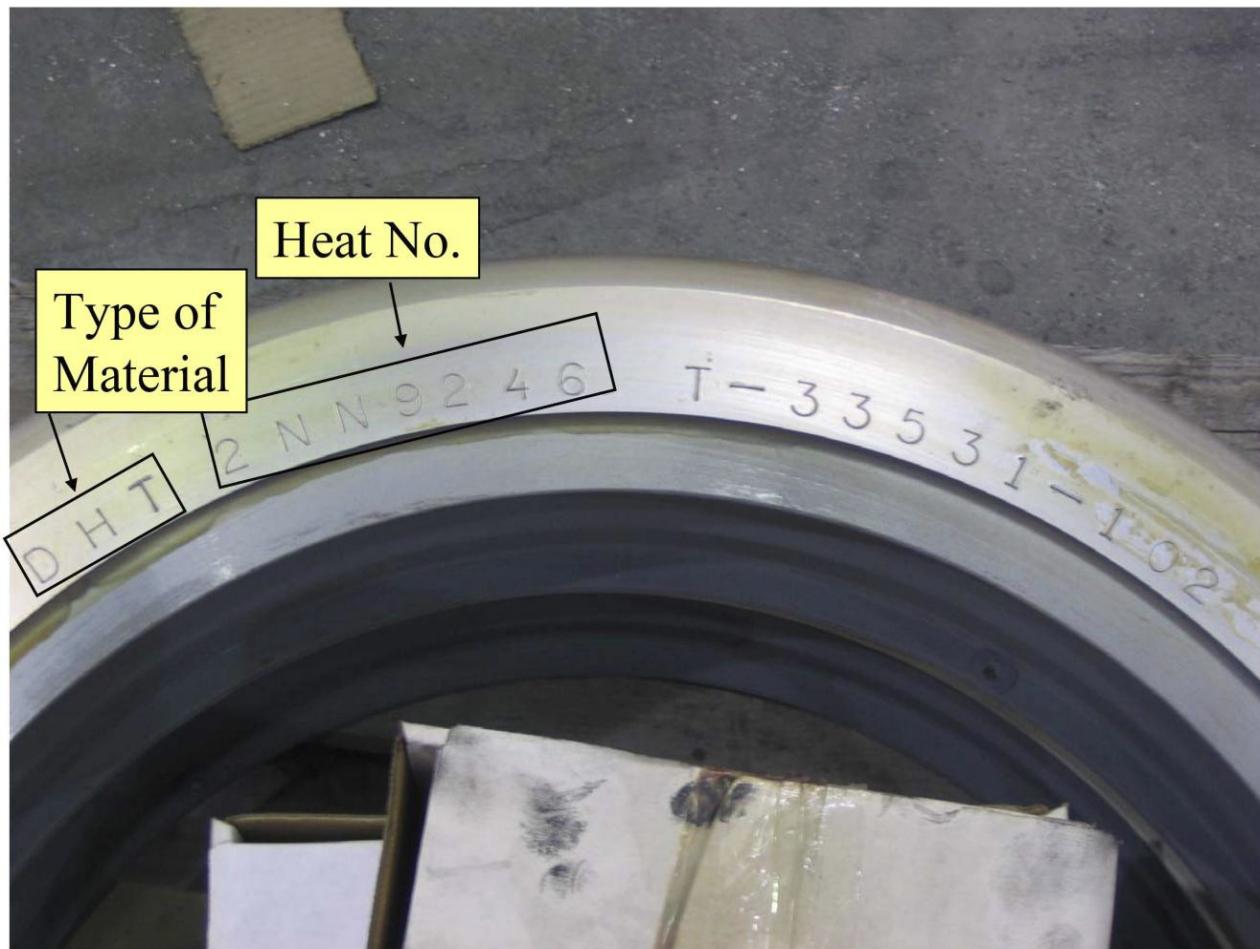


Figure 2 - WHEEL IDENTIFICATION DATA

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-01

System:

TRUCKS AND SUSPENSIONS

Sheet:

5/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

4

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

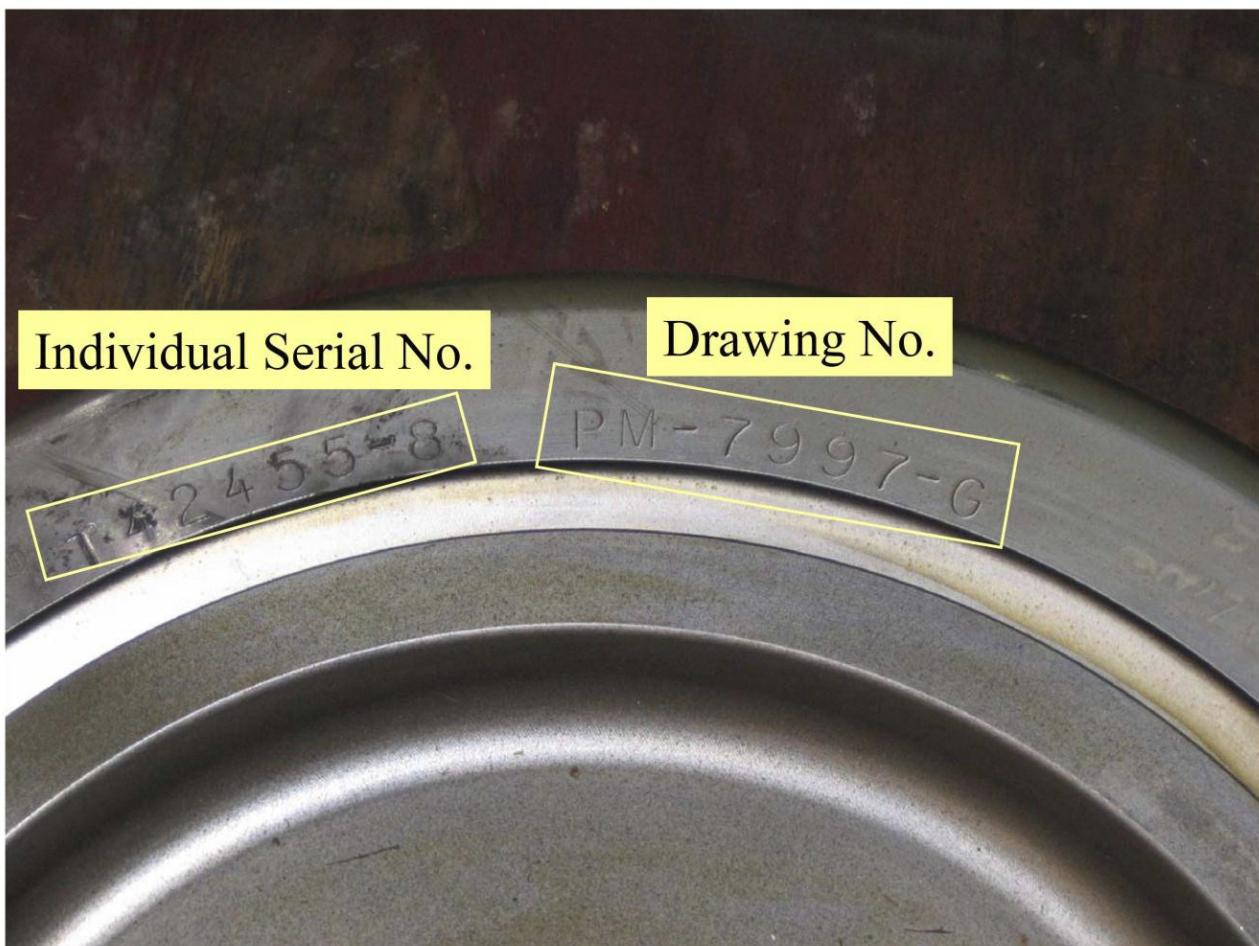


Figure 3 - WHEEL IDENTIFICATION DATA

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-01

System:

TRUCKS AND SUSPENSIONS

Sheet:

6/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

4

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

2- WHEEL DEFECTS

The Types of Wheel Defects are shown in Figure 4:

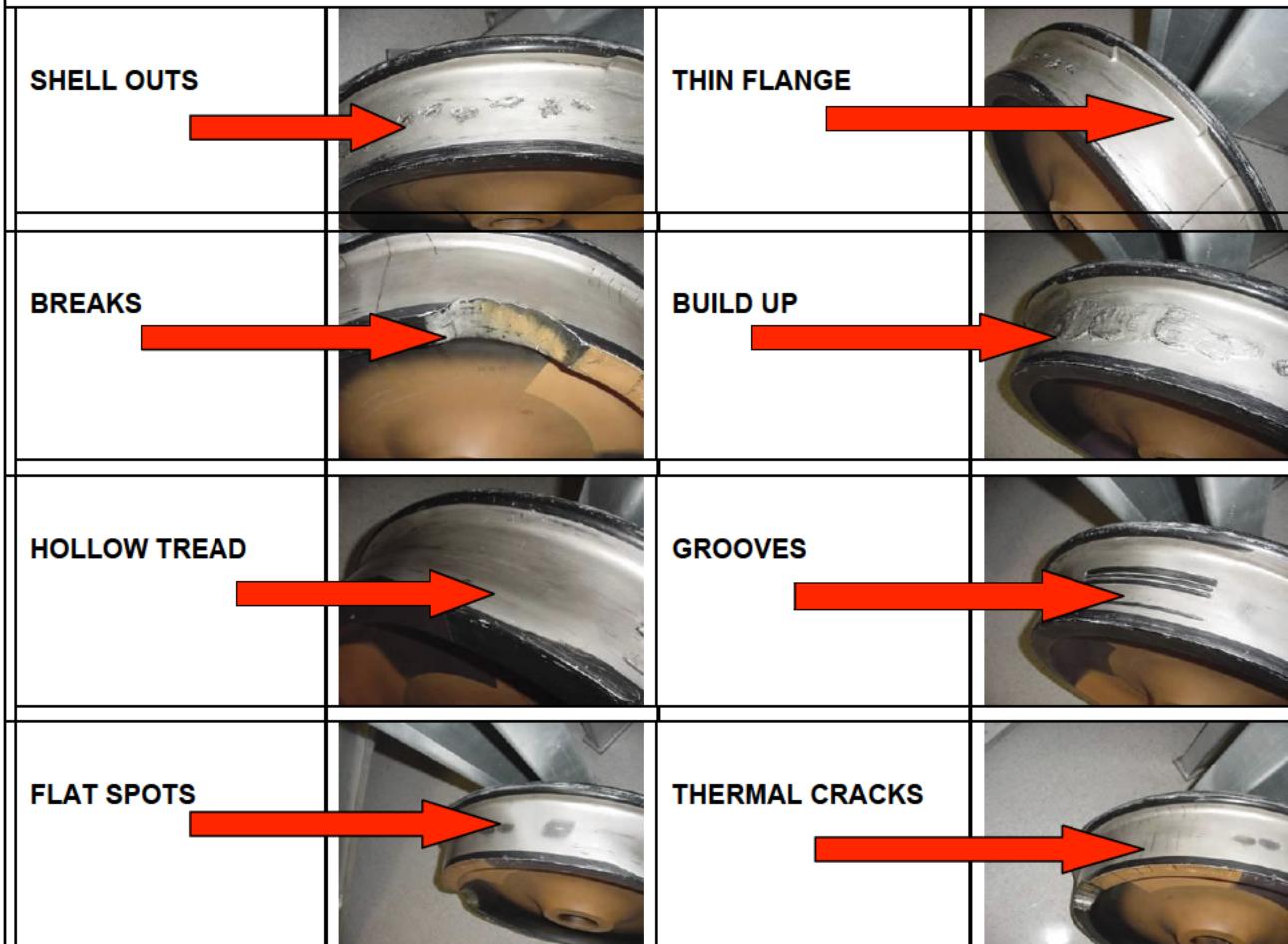


Figure 4 - TYPES OF WHEEL DEFECTS

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-01

System:

Sheet:

TRUCKS AND SUSPENSIONS

7/22

Subsystem/Assy:

Unit:

MOTOR TRUCK**WHEEL SET MOTOR TRUCK**

Component:

Man Hours:

WHEEL**4**

Maintenance Task:

Interval/Miles:

INSPECTION**120,000**

PROCEDURE (CONT'D):

3- HOW TO USE THE Pi TAPE (24 TO 36 INCH RANGE) TO MEASURE WHEEL OUTSIDE DIAMETER

1. Make sure that Pi Tape and Wheel Outside Circumference are properly clean.
2. Apply the Pi Tape around the Wheel Outside Circumference.

NOTE: It is recommended to use pieces of masking tape to hold the Pi Tape in proper parallel position.

3. Apply a snug pull of 5 pounds tension when reading.

CAUTION: Pi TAPE ACCURACY IS +/- .001 ON STANDARD TAPES UP TO 144"
MAKE SURE THE TAPE HAS NOT BEEN STEPPED ON OR KINKED,
WHICH MAY REDUCE / DESTROY THE ACCURACY.

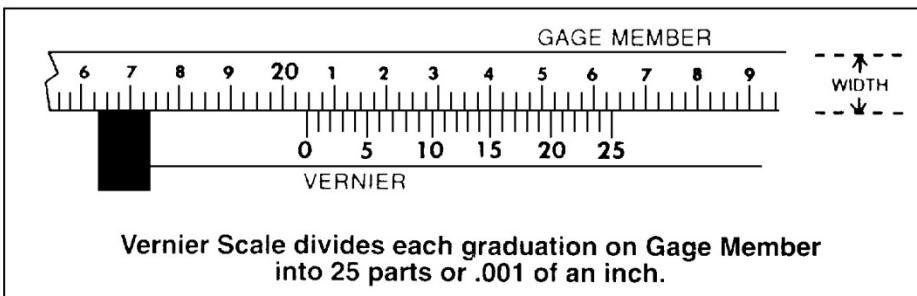


Figure 5 - EXAMPLE OF OUTSIDE DIAMETER MEASUREMENT TAPE READING

4. In the above Figure, the division to the left of the Vernier ZERO are 20 inches plus 1 division, or 20.025.

The 15th LINE on the Vernier coincides with a LINE on the Gage Member.

This is added to the 20.025, making a Total Diameter Reading of 20.040, which is

THE TRUE WHEEL DIAMETER READING AS MEASURED ON THE OUTSIDE CIRCUMFERENCE.

5. Once measurement is completed, proceed as follows:

- a) Wipe clean
- b) Apply a light coat of rust preventative oil.
- c) Store in the Tape Container.

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-01

System:

TRUCKS AND SUSPENSIONS

Sheet:

8/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

4

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

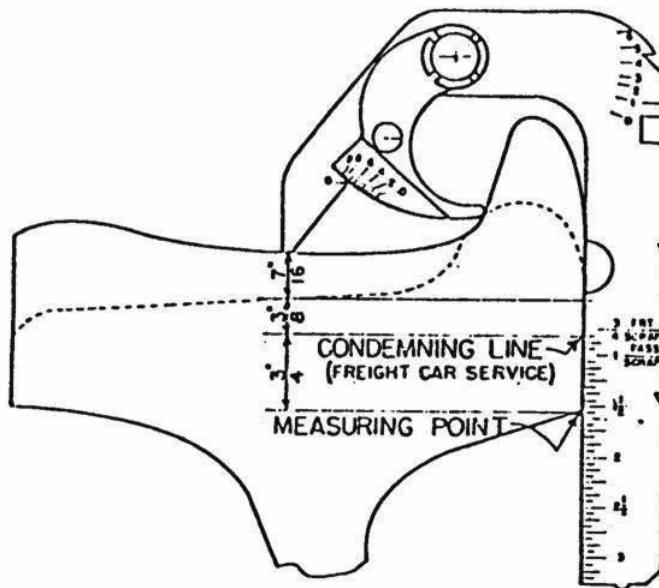
4- HOW TO USE THE AAR STEEL WHEEL GAUGE TO MEASURE WHEEL DIMENSIONS

1. Tire Diameter Measuring (2 measurements per wheel):

- a) Observe and Record the Radius reading in 16ths of an inch at the Measuring Point.
- b) Divide the Measuring Point Radius Reading by 16 to get the decimal equivalent.
- c) Multiply the decimal equivalent Radius Reading by 2 to get the Diameter Reading.
- d) Add the Diameter Reading to the known diameter of the wheel at the Measuring Point (24.121").
- e) The Result is the Wheel Diameter for the Measured Wheel.

NOTE: For Passing Criteria refer to:

AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."



$$\text{WHEEL DIAMETER} = 24.121" + [2 \times (\text{MEASURING POINT READING} / 16)]$$

Figure 6 - WHEEL DIAMETER MEASURING

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-01

System:

Sheet:

TRUCKS AND SUSPENSIONS
9/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

4

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

2. **Wheel Flange Thickness Measuring (2 measurements per wheel):**

NOTE: For Passing Criteria refer to:
 AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

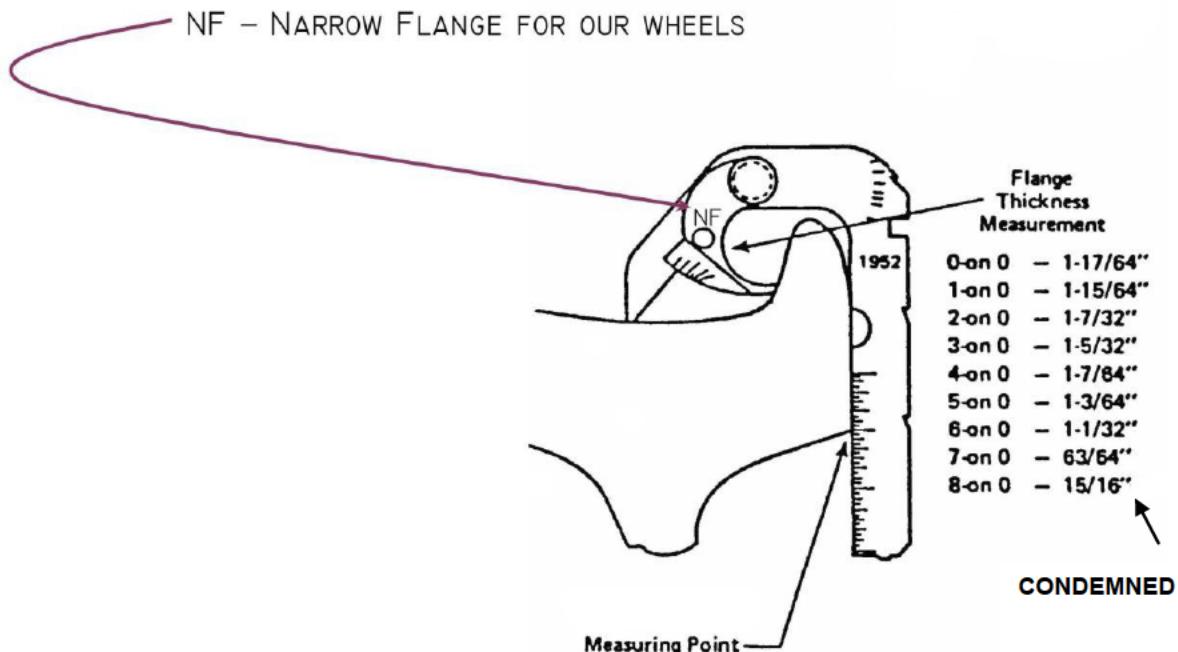


Figure 7 - WHEEL FLANGE THICKNESS MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-01

System:

TRUCKS AND SUSPENSIONS

Sheet:

10/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

4

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

3. **Wheel Flange Height Measuring (2 measurements per wheel)**

NOTE: For Passing Criteria refer to:
AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

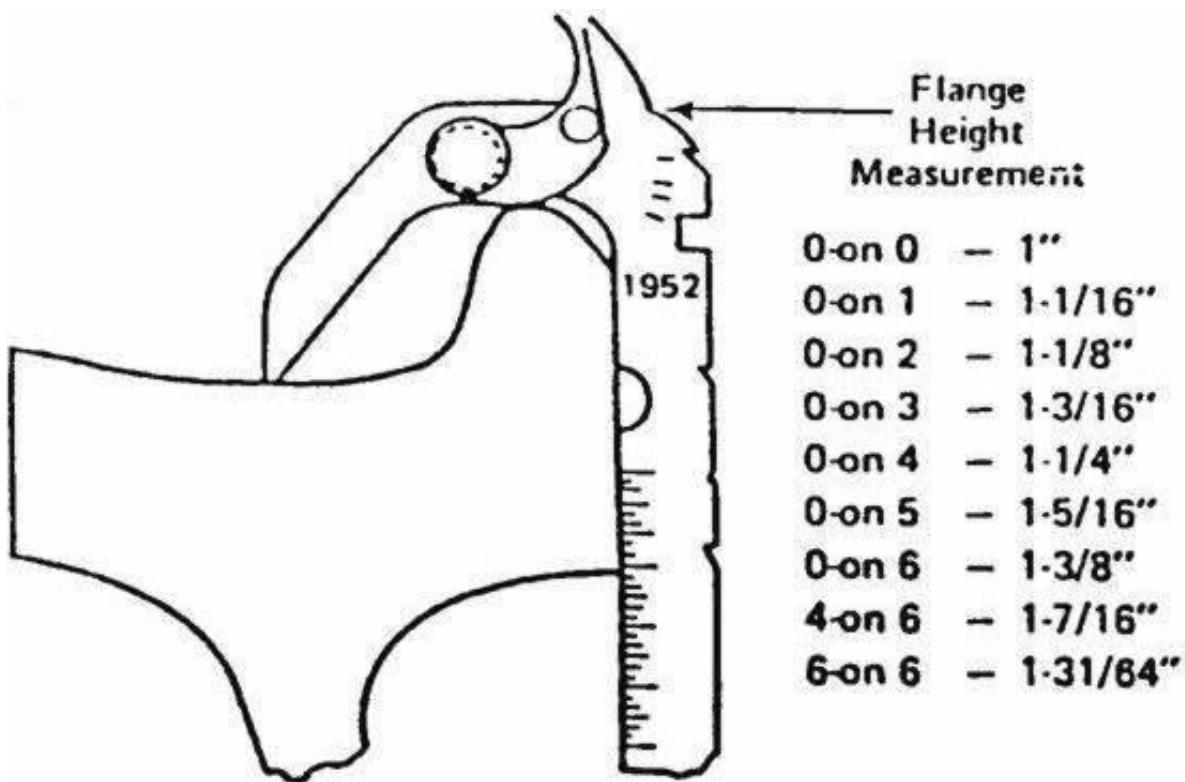


Figure 8 - WHEEL FLANGE HEIGHT MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-01

System:

Sheet:

TRUCKS AND SUSPENSIONS
11/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

4

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

4. Wheel High Flange Measuring (2 measurements per wheel).

NOTE: For Passing Criteria refer to:

AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

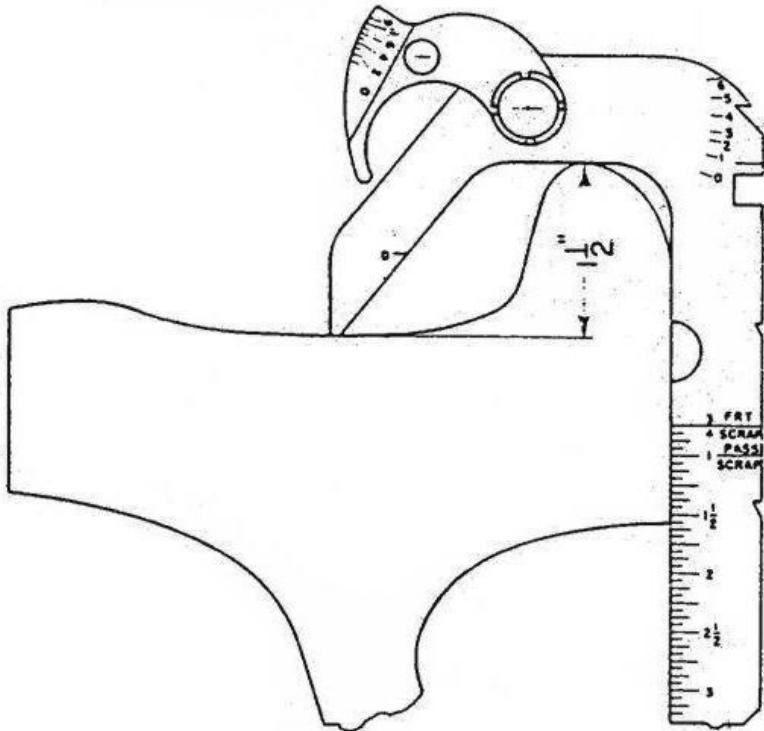


Figure 9 - WHEEL HIGH FLANGE MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-01

System:

TRUCKS AND SUSPENSIONS

Sheet:

12/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

4

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

5. Wheel Witness Groove Position Measuring (2 measurements per wheel).

NOTE: For Passing Criteria refer to:

AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

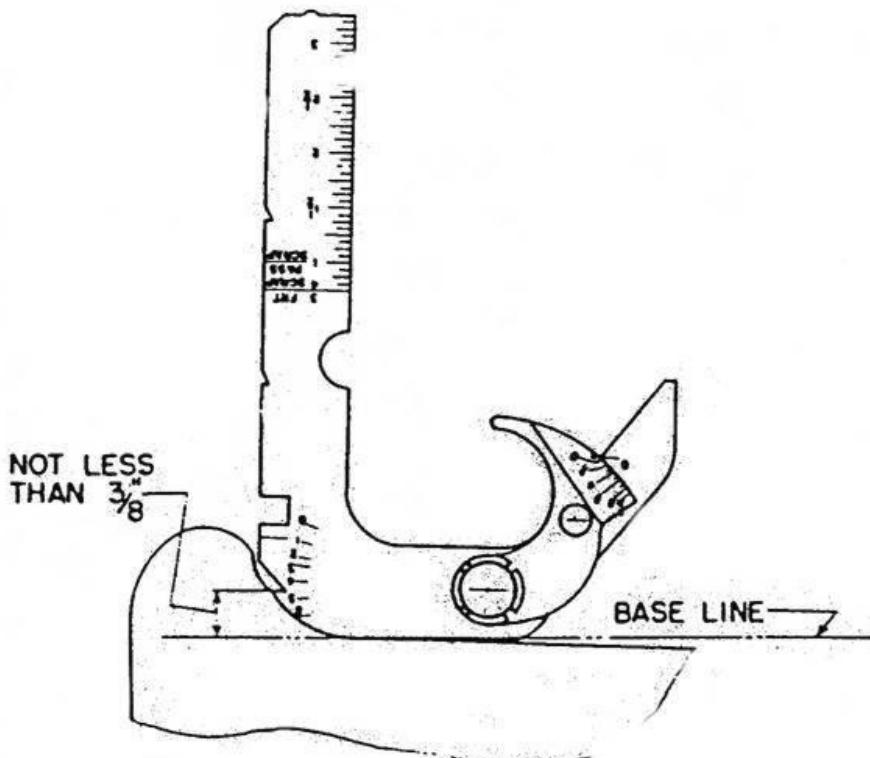


Figure 10 - WHEEL WITNESS GROOVE POSITION MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-01

System:

TRUCKS AND SUSPENSIONS

Sheet:

13/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

4

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

6. Wheel Witness Groove Depth Measuring (2 measurements per wheel).

NOTE: For Passing Criteria refer to:

AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

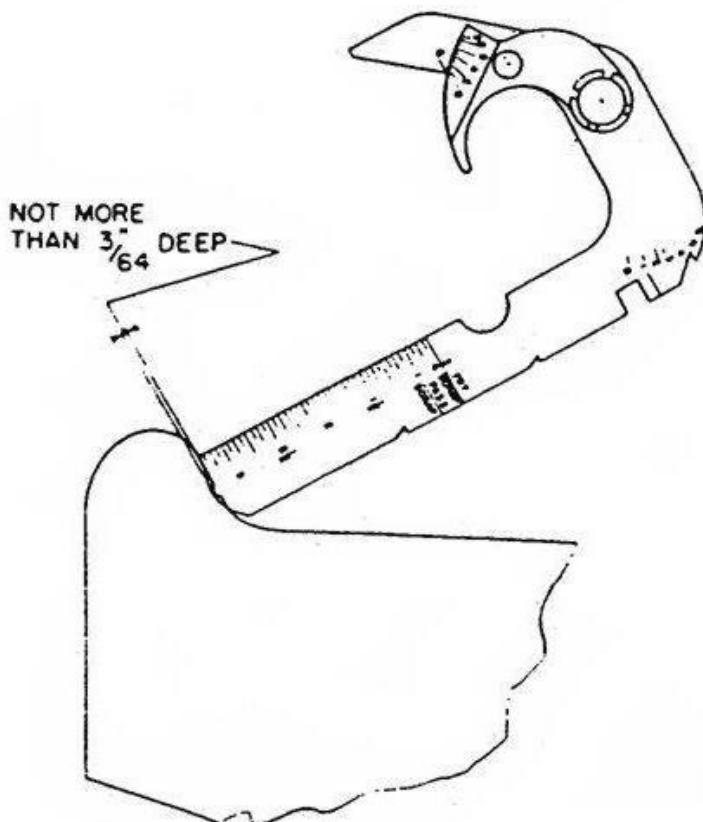


Figure 11 - WHEEL WITNESS GROOVE DEPTH MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-01

System:

TRUCKS AND SUSPENSIONS

Sheet:

14/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

4

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

7. Wheel Vertical Flange Measuring (2 measurements per wheel).

NOTE: For Passing Criteria refer to:

AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

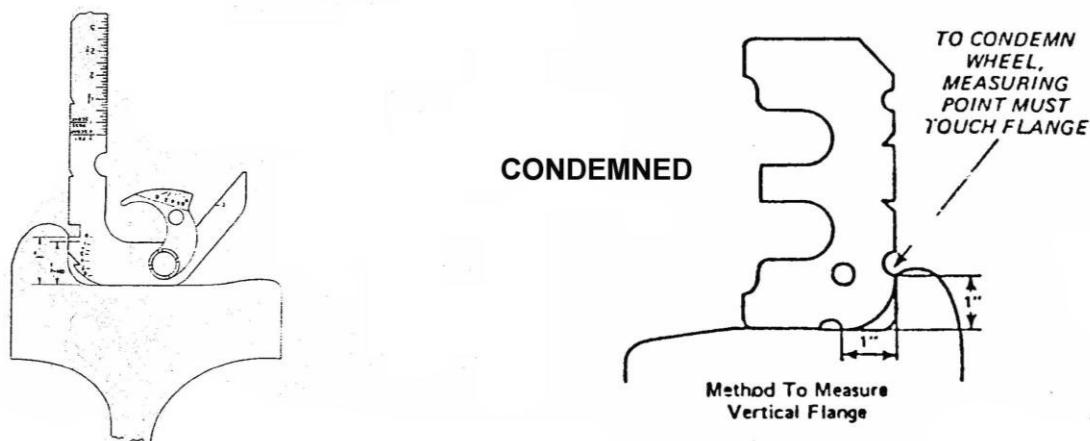


Figure 12 - WHEEL VERTICAL FLANGE MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-01

System:

Sheet:

TRUCKS AND SUSPENSIONS
15/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

4

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

8. Wheel Flange Thickness Measuring (2 measurements per wheel).

NOTE: For Passing Criteria refer to:
 AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

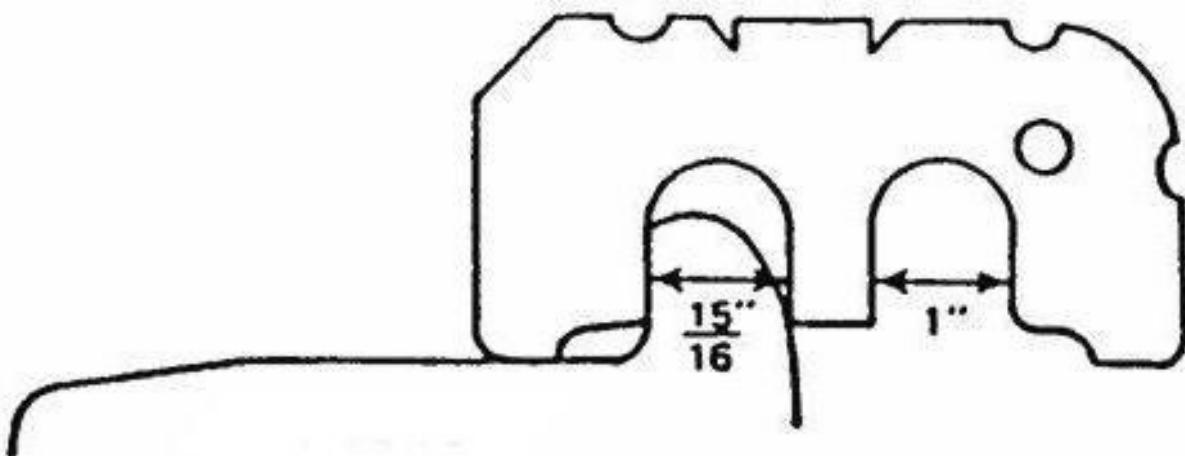


Figure 13 - WHEEL FLANGE THICKNESS MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-01

System:

TRUCKS AND SUSPENSIONS

Sheet:

16/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

4

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

- 9. Wheel Broken Rim & Heavy Flange Measuring (2 measurements per wheel).**

NOTE: For Passing Criteria refer to:

AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

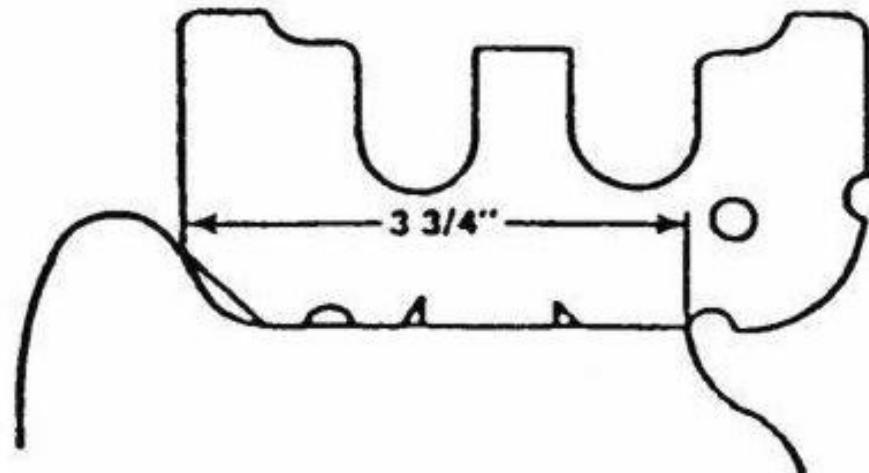


Figure 14 - WHEEL BROKEN RIM & HEAVY FLANGE MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-01

System:

Sheet:

TRUCKS AND SUSPENSIONS**17/22**

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

4

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

10. Wheel Flat And Shell Spots Measuring

NOTE: For Passing Criteria refer to:

AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."
If found 1/2" or more then inform Supervisor/Leader and have wheels reprofiling.

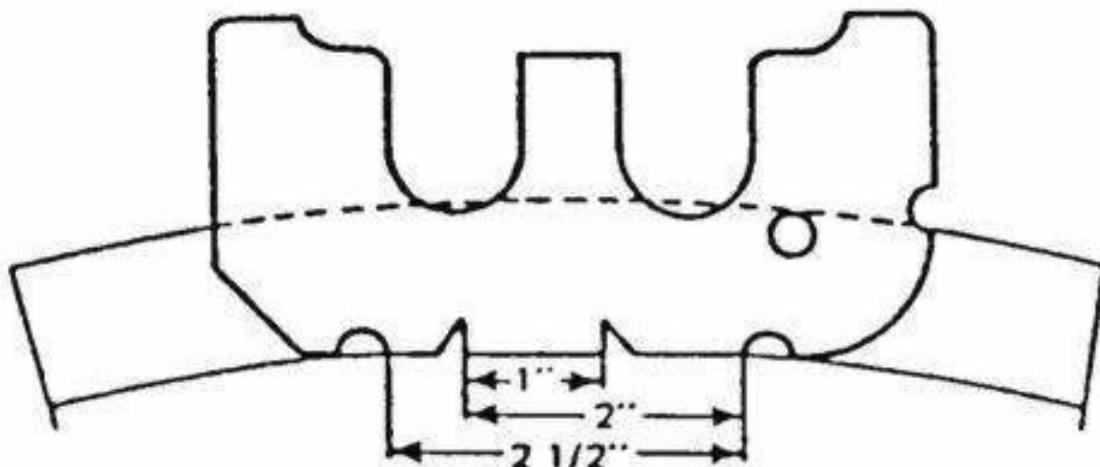


Figure 15 - WHEEL FLAT AND SHELL SPOTS MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-01

System:

TRUCKS AND SUSPENSIONS

Sheet:

18/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

4

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

INSPECTION

The aim of this task is to check wheels and re-profile, as necessary. (Refer to Figures 1 through 17).

To perform the task proceed as follows:

1. Inspect each Tire for the Defects shown in the previous Figure 4.
2. Measure each Wheel Tire Diameter, using recommended AAR tool, (refer to Figure 5).
3. Check the Wheel Back to Back and Runout tolerance values according to the next Table 1 and Figure 16
4. Check each Tire profile, using recommended AAR tool, (refer to Figures 6 through 15).
5. Check each Tire for Flats & Shell Spots and measure any defects with the recommended AAR tool (refer to Figure 15).

NOTE: For Passing Criteria refer to:

AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

WARNING: WHEELS WITH TIRES LESS THAN 26.0" IN DIAMETER MUST BE REMOVED FROM SERVICE IMMEDIATELY.

6. As per measurements and checks results, determine the New Wheel Diameter Value to meet.
7. Perform the Wheel Truing procedure according to:
 - a. MTA Wheel Truing Regulation.
 - b. Wheel Dimensional Data and Wheel Dimensions shown in the Fig 17.
 - c. New Diameter Value previously determined.
 - d. Sheet R C 12-01-01-01-/RP-00.
8. Restore Electrical Power.
9. If the A1R /A1L Wheels have been re-profiled, input the "new" Wheel Diameter value into IDU ("A" Cab).

NOTE: To input the new diameter (in millimeters) it is necessary to access to the Maintenance Mode first and then to the Utility Screen of the Maintenance Menu Screen (refer to Fig 18).

CAUTION: FOR A1R /A1L WHEELS RE-PROFILING, THE "NEW" WHEEL DIAMETER INPUT INTO IDU (A CAB) IS MANDATORY BECAUSE THE PROPULSION LOGIC MAKES AN ON-LINE MEASUREMENT OF THE WHEEL DIAMETERS BASED ON THE STORED VALUE OF THE REFERENCE A1R /A1L WHEEL DIAMETERS.

NOTE: For the re-profiling of any other Wheels, it is not necessary to input the new diameter because it is calculated comparing the A1R /A1L reference diameter with the speed sensors' frequencies and then considers the ratio between them.

The wheel diameter calculation is executed only when both the following conditions are met:

- a. The car speed is in the range between 5mph and 25mph.
- b. The car mode is coasting for at least 3 seconds.

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-01

System:

Sheet:

TRUCKS AND SUSPENSIONS**19/22**

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

4

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

10. Upon completing the re-profiling it is recommended to perform the External Shunt Resistance Test on all wheels which were re-profiled, according to Sheet R-P-12-01-01-01/T-00.
11. Perform the Vehicle Leveling procedure according to Sheet R-C-01-01-00-00/LL-00:
12. Remove wheel chocks.
13. Record Inspection and Test results on the Defect Report Card for administrative and maintenance planning.

TABLE 1 MOTOR TRUCK - WHEEL BACK TO BACK AND RUNOUT TOLERANCES

DESCRIPTION	NOMINAL DIMENSION	TOLERANCES
Back to Back	1356 mm (3.375 in)	+2 mm /-5mm (+0.079 in /- 0.197)
Wheel TIR Radial Direction	0711 mm (028.00in)	not exceed 0.7 mm (0.028 in)
Wheel TIR direction parallel to the axle centreline		not exceed 1 mm (0.040 in)

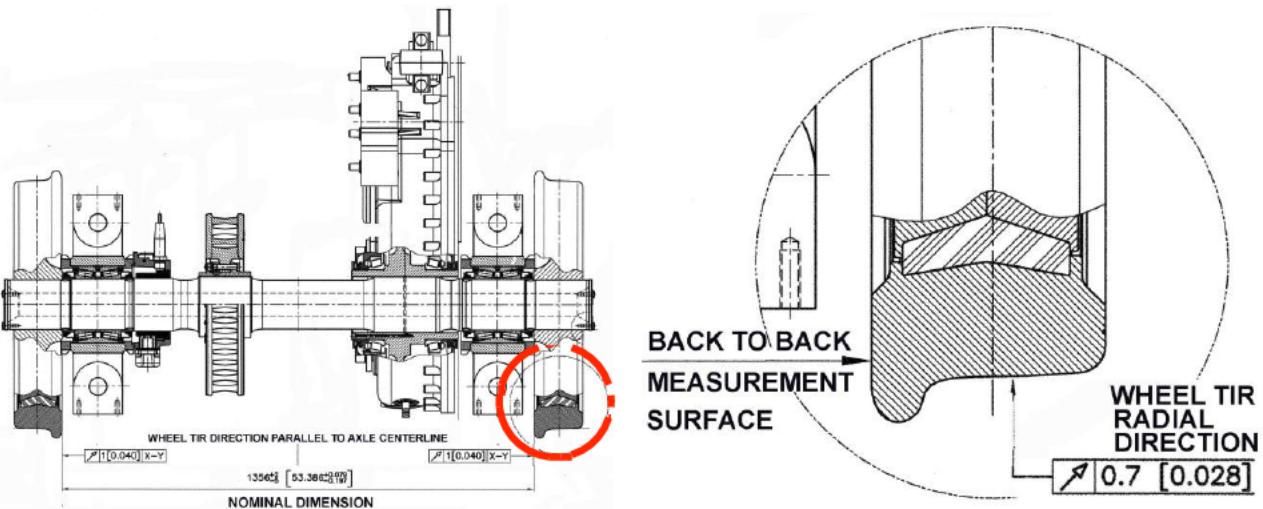


Figure 16 MOTOR TRUCK - WHEEL BACK TO BACK AND RUNOUT TOLERANCES

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-01

System:

TRUCKS AND SUSPENSIONS

Sheet:

20/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

4

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

WHEEL - DIMENSIONAL DATA

Wheel diameter (new) 28.00 in
 Wheel wear before replacement on diameter 2.00 in
 Difference between the diameter of the wheels (same axle <.080 in)
 Difference between the diameter of the wheels (same truck .38 in)
 Difference between the diameter of the wheels (same vehicle ± 2 in)

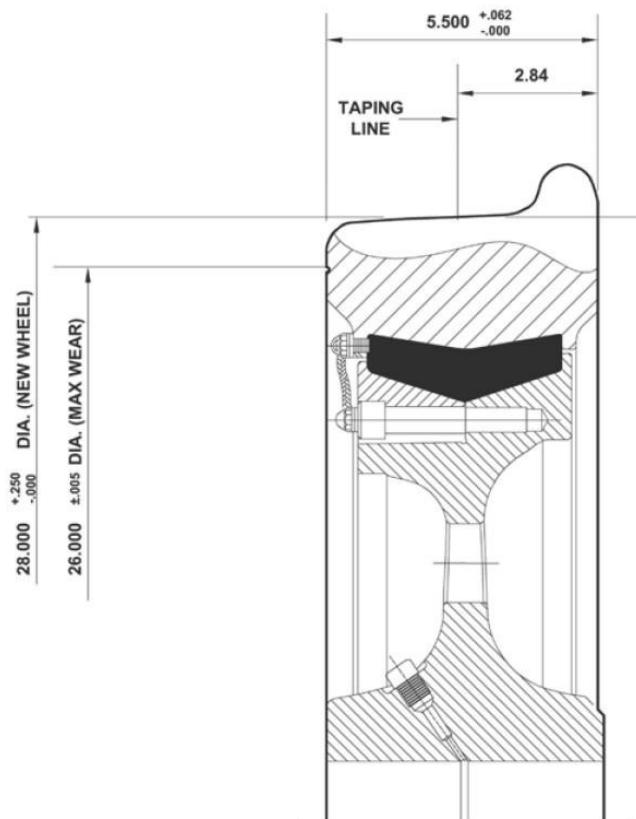


Figure 17 - TRUCKS WHEEL PROFILE

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-01

System:

Sheet:

TRUCKS AND SUSPENSIONS

21/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

4

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):



Figure 18 - UTILITY SCREEN - WHEEL DIAMETER

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/I-01

System:

TRUCKS AND SUSPENSIONS

Sheet:

22/22

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

4

Maintenance Task:

INSPECTION

Interval/Miles:

120,000**INTENTIONALLY LEFT BLANK**

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/T-00

System:

Sheet:

TRUCKS AND SUSPENSIONS

1/8

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL SHUNTS

Man Hours:

2

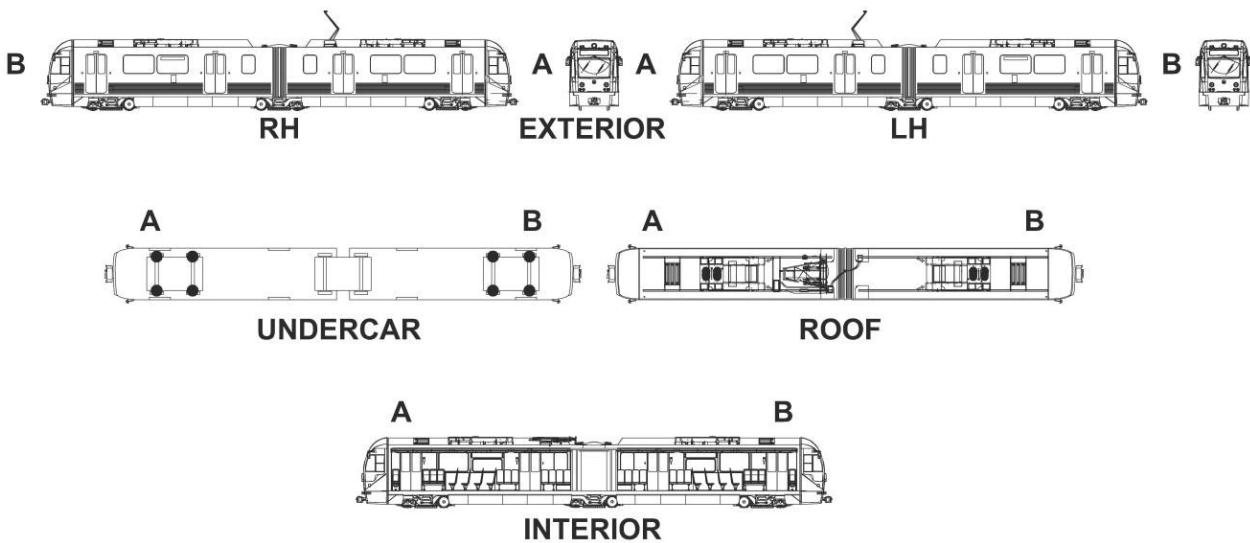
Maintenance Task:

TEST

Interval/Miles:

120,000

LOCATION:



P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/T-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

2/8

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL SHUNTS

Man Hours:

2

Maintenance Task:

TEST

Interval/Miles:

120,000

SAFETY PRECAUTIONS:

WARNING: APPLY WHEEL CHOCKS TO PREVENT THE VEHICLE FROM MOVING.

WARNING: WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.

WARNING: LOSS OF CONTINUITY CAN AFFECT TRAIN CONTROL, SYSTEM SIGNALING OR VEHICLE GROUNDING AND COULD CAUSE SERIOUS INJURY.

WARNING: LOSS OF CONTINUITY CAN AFFECT TIRE INTEGRITY. A COMPLETE TIRE FAILURE COULD CAUSE A VEHICLE DERAILMENT.

CAUTION: METER PROBES AND WHEEL CONTACT SURFACES, MUST BE AS CLEAN AS POSSIBLE WHERE READINGS ARE TO BE TAKEN.

CAUTION: IN ORDER TO PERFORM THE EXTERNAL SHUNT RESISTANCE TEST, THE WHEEL AND/OR WHEEL SET SHOULD BE EITHER RAISED OR ELECTRICALLY ISOLATED FROM THE TRACK.

CAUTION: CARE SHOULD BE EXERCISED TO NOT OVER TORQUE THE SHUNT FASTENERS.

TOOLS:

Thompson Bridge, AEMC Corporation Model # 141.100
Or Isotek Corporation M210 Resistance Meter or equivalent.

CONSUMABLES:

Rubber Sheets(or similar non conductor)	QTY = 8
Emery cloth 80 grit, or equivalent	as necessary
Cleaning rags,	as necessary
Cleaner / Degreaser / Mild Solvent, or equivalent	as necessary
Loctite 242	as necessary
Anti-Oxidant Joint Compound,	as necessary

SPARE PARTS:

External Shunt (PN 00658413) QTY 24

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/T-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

3/8

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL SHUNTS

Man Hours:

2

Maintenance Task:

TEST

Interval/Miles:

120,000

PROCEDURE:

PRELIMINARY OPERATIONS

Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop Regulations:

NOTE The wheels need to be insulated from the rails for this test.

1. Move the vehicle so that one power truck and the trailer truck wheels are on top of rubber insulators.
NOTE Be sure to leave at least one power truck un-insulated so that the vehicle can be moved insulated to the other power truck.
2. Remove Electrical Power from Vehicle by lowering the Pantograph and deenergizing the catenary.
3. Lock out and tag out the catenary in accordance with all LACMTA Safety Rules, Regulations, Policies, and Procedures.

NOTE The tag must indicate the name of the person who removed Power.

That person knows why the Power was removed and when it safe to restore it.

Only the individual whose name appears on the tag or a person with his approval should remove the tag and restore Power.

4. Apply wheel chocks to prevent the Vehicle from moving.

SHUNT RESISTANCE TEST

To perform the task proceed as follows:

1. Inspect each External Tire Shunt for damage, signs of fraying and missing / loose parts.

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/T-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

4/8

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL SHUNTS

Man Hours:

2

Maintenance Task:

TEST

Interval/Miles:

120,000**PROCEDURE:**

2. Replace all faulty / damaged External Shunts as follows:
- Remove and discard damaged Shunt and relevant Shunt Mounting Bolts.
 - Clean, on the Tire and on the Wheel Center, the Shunt contact surface using recommended agents as required.
 - Apply a small amount of Loctite 242 to the threads of the new Shunt Mounting Bolts.
 - Apply a bead of Anti-Oxidant Joint Compound (in a circular path around the bolt hole) to the underside of the Shunt Terminals.



- Align Shunt over proper locations and position as they were removed, in "U" shape, on the Tire and Wheel Center.



- Insert the Loctite 242 Shunt Mounting Bolts and torque to **min 7 max 9 ft-lb.**

CAUTION: CARE SHOULD BE EXERCISED TO NOT OVER TORQUE THE SHUNT FASTENERS.

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/T-00

System:

Sheet:

TRUCKS AND SUSPENSIONS**5/8**

Subsystem/Assy:

Unit:

MOTOR TRUCK**WHEEL SET MOTOR TRUCK**

Component:

Man Hours:

WHEEL SHUNTS**2**

Maintenance Task:

Interval/Miles:

TEST**120,000**

PROCEDURE:

3. Perform the External Shunt Resistance Test as follows:
 - a. **Wheel Center - Wheel Tire(same Wheel) Resistance Test**
 1. Locate the area on the Wheel Tire and on the Wheel Center where the 1st reading is to be taken.
 2. Clean the Tire and Wheel Center areas using Emery Cloth 80 grit and mild solvent (or equivalent)



3. Position one meter probe to the Wheel Tire and the other meter probe to the Wheel Center (hub) (of the same Wheel).



P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/T-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

6/8

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL SHUNTS

Man Hours:

2

Maintenance Task:

TEST

Interval/Miles:

120,000**PROCEDURE:**

4. Read the 1st resistance value on the Resistance Meter and record it on the Form provided at the end of this Sheet.

CAUTION METER PROBES AND WHEEL CONTACT SURFACES, MUST BE AS CLEAN AS POSSIBLE WHERE READINGS ARE TO BE TAKEN

5. Locate the area (which should be 180° from the spot of the first reading) on the Tire and Wheel Center (hub) where the 2nd reading is to be taken.
6. Clean the Wheel Tire and Wheel Center areas using Emery Cloth 80 grit and mild solvent or equivalent.
7. Position one meter probe to the Wheel Tire and the other meter probe to the Wheel Center(hub) (of the same Wheel) for the 2nd reading.
8. Read the 2nd resistance value on the Resistance Meter and record it on the Form provided at the end of this Sheet.
9. Calculate the Average Value between the two readings and record it on the Form provided at the end of this Sheet.
10. Perform the External Shunt Resistance Test for the other Wheel of same Axle according to previous steps 3 a 1 through 3 a 9 and relevant instructions.

b. Wheel Tire to Wheel Tire (same Axle) Resistance Test

1. Read the 1st resistance value on the Resistance Meter and record it.

CAUTION METER PROBES AND WHEEL CONTACT SURFACES, MUST BE AS CLEAN AS POSSIBLE WHERE READINGS ARE TO BE TAKEN.

2. Locate the area, on both Tires (of the same axle), where the 1st Tire-Hub was taken.
3. Clean both Tire areas using Emery Cloth 80 grit and mild solvent.
4. Position one meter probe to the Tire of one Wheel and the other probe to the Tire of the other Wheel (of the same Axle).
5. Repeat for the Second Tire Hub reading.
6. Read the 2nd resistance value on the Resistance Meter and record it on the Form provided at the end of this Sheet.
7. Calculate the Average Value between the two readings and record it on the Form provided at the end of this Sheet.
8. Upon completing the Center to Tire readings of both Wheels and the Tire to Tire readings of the same axle, proceed as follows:
 - a. Compare, for each Wheel and for the relevant Wheel Set, the resulting Average Values with the consistent Condemning Limits listed below and follows the Instructions listed beside.

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/T-00

System:

Sheet:

TRUCKS AND SUSPENSIONS

7/8

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL SHUNTS

Man Hours:

2

Maintenance Task:

TEST

Interval/Miles:

120,000

PROCEDURE:

METER READING AVERAGE VALUES CONDEMNING LIMITS			Instructions
CENTER TO TIRE LH WHEEL	CENTER TO TIRE RH WHEEL	TIRE TO TIRE WHEEL SET	
< 0.005 Ohm (GOOD)	< 0.005 Ohm (GOOD)	< 0.010 Ohm (GOOD)	No action needed. Leave all shunts in place.
> 0.005 Ohm (BAD)	> 0.005 Ohm (BAD)	> 0.010 Ohm (BAD)	1-Replace ALL External Shunts of both Wheels according to previous step 2 2-After replacement repeat : a) Center to Tire Resistance Test of both Wheels b) Tire to Tire Resistance Test of the relevant Wheel Set
< 0.005 Ohm (GOOD)	> 0.005 Ohm (BAD)	> 0.010 Ohm (BAD)	1-Replace the External Shunts (on the Tire which is BAD) according to previous step 2 2-After replacement repeat : a) Center to Tire Resistance Test on the Wheel where the External Shunts have been replaced. b) Tire to Tire Resistance Test of the relevant Wheel Set
> 0.005 Ohm (BAD)	< 0.005 Ohm (GOOD)	> 0.010 Ohm (BAD)	1-Replace the External Shunts (on the Tire which is BAD) according to previous step 2 2-After replacement repeat : a) Center to Tire Resistance Test on the Wheel where the External Shunts have been replaced b) Tire to Tire Resistance Test of the relevant Wheel Set

9. Perform the External Shunt Resistance Test(Center to Tire) on the other Wheels and(Tire to Tire) on the relevant Wheel Set of same Truck according to previous steps **3 a** and **3 b**

10. Restore Electrical Power

11. Remove wheel chocks

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-01-01/T-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

8/8

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL SHUNTS

Man Hours:

2

Maintenance Task:

TEST

Interval/Miles:

120,000**INTENTIONALLY LEFT BLANK**

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-05-00/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

1/6

Subsystem/Assy:

MOTOR TRUCK

Unit:

SECONDARY SUSPENSION

Component:

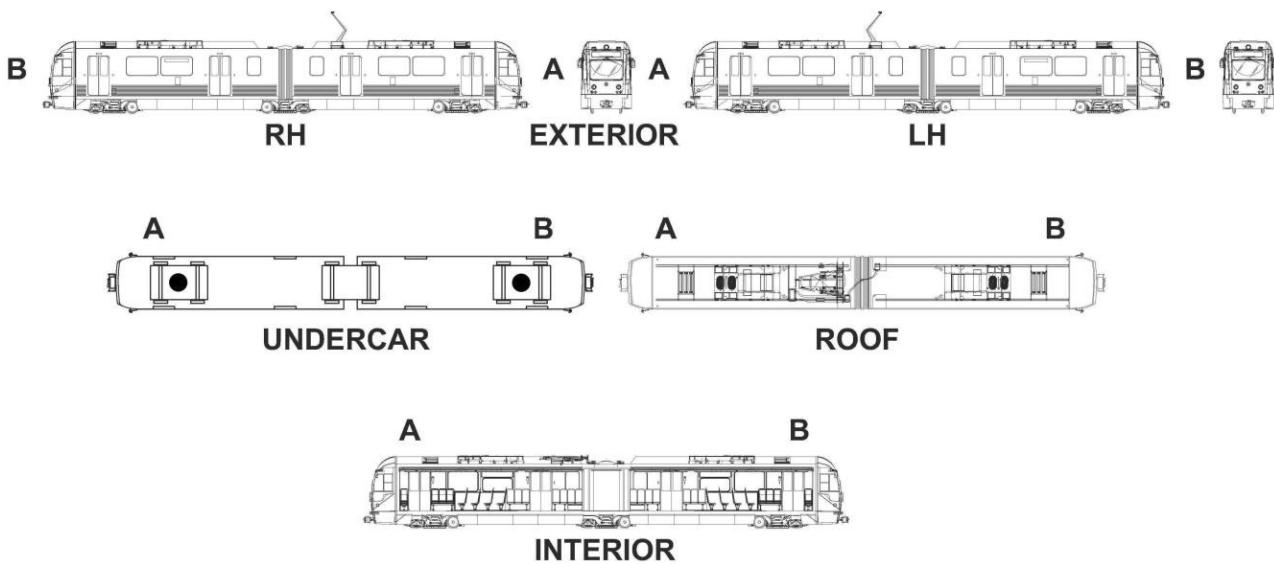
Man Hours:

0.5

Maintenance Task:

INSPECTION

Interval/Miles:

120,000
LOCATION:


P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-05-00/I-00

System:	TRUCKS AND SUSPENSIONS	Sheet:
Subsystem/Assy:	MOTOR TRUCK	Unit: SECONDARY SUSPENSION
Component:		Man Hours: 0.5
Maintenance Task:	INSPECTION	Interval/Miles: 120,000

SAFETY PRECAUTIONS:

WARNING: BLUE FLAG THE VEHICLE IN ACCORDANCE WITH ALL LACMTA BLUE FLAG POLICIES, RULES, & PROCEDURES IN ORDER TO WARN THAT MAINTENANCE PERSONNEL ARE WORKING ON, UNDER, OR NEAR ROLLING EQUIPMENT.

WARNING: WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.

TOOLS:

LACMTA Maintenance Shop Standard Tools Kit.

CONSUMABLES:

Cleaner / Degreaser

Dow Corning BR2 EP grease, as needed

SPARE PARTS:

N/A

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-05-00/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

3/6

Subsystem/Assy:

MOTOR TRUCK

Unit:

SECONDARY SUSPENSION

Component:

Man Hours:

0.5

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE:

PRELIMINARY OPERATIONS

Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop.

1. Place the Vehicle over the Pit (or Stand Up Rail).
2. Set the Master Controller Handle to FSB position.
3. Make sure that all Parking Brakes are applied (by checking on the IDU "Parking Brake A and B Not Released" and on Indicator Panel "A" "Park / Friction Brake" ON).
4. Remove Electrical Power from Vehicle by lowering the Pantograph.
5. Turn the Transfer Switch to OFF.
6. Set the Pantograph Control Motor Switch (5F02 CB LV Locker "A" Section) to OFF.
7. Lock out and tag out the Switch in accordance with all LACMTA Safety Rules, Regulations, Policies, and Procedures.

NOTE The tag must indicate the name of the person who removed Power.

That person knows why the Power was removed and when it safe to restore it.

Only the individual whose name appears on the tag or a person with his approval should remove the tag and restore Power.

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-05-00/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

4/6

Subsystem/Assy:

MOTOR TRUCK

Unit:

SECONDARY SUSPENSION

Component:

Man Hours:

0.5

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

INSPECTION

To perform the task proceed as follows (Refer to Fig 1 and 2):

1. Inspect each Air Spring for deformation / visible deflection and /or damage.
2. Inspect each Air Spring Piston for damage / deformation and signs of rust / paint degradation.
3. Inspect each Air Spring Lamination Damper and piping connection for damage /loose parts and air leakage.
4. Inspect each Air Spring Seat (on Bolster beam) and Plate for damage / deformation and signs of rust / paint degradation.
5. Inspect the Air Springs Elastic Shims (if installed) and Vertical Bump Stop Shims for proper installation /damage / deformation.
6. Inspect each Lateral Shock Absorber for damage, missing / loose parts, oil leakage and signs of rust / paint degradation.
7. Inspect each Connecting Rod for deformation / damage and missing / loose parts.
8. Inspect each Connecting Rod Rubber Elements for damage / wear.
9. Inspect the Lateral and Vertical Bump Stops for signs of damage / deformation and the Rubber Elements for signs of wear and missing/loose parts.
10. Inspect both Leveling Valves, Adjusting Rods, Brackets (with relevant attaching parts) for signs of damage, deformation, missing / loose parts and air leakage.
11. Lubricate the Spherical Terminals of the Adjusting Rod of the Leveling Valve, using recommended product
12. Inspect Secondary Suspension Piping and piping connections for damage, loose parts and air leakage.
13. Inspect Secondary Suspension piping clamps for damage and missing / loose parts.
14. Restore Electrical Power.
15. Record Inspection results on the Defect Report Card for administrative and maintenance planning.

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-05-00/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

5/6

Subsystem/Assy:

MOTOR TRUCK

Unit:

SECONDARY SUSPENSION

Component:

Man Hours:

0.5

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

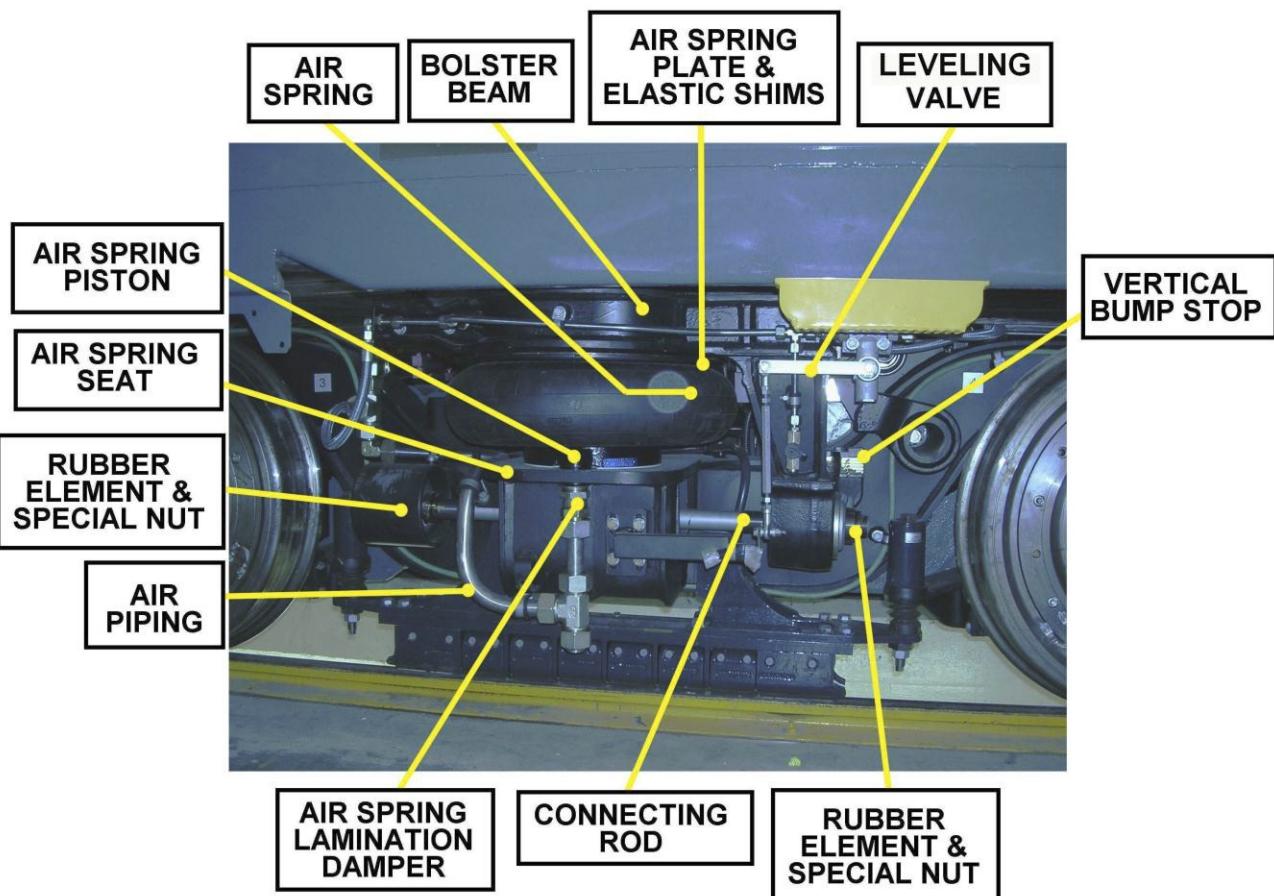


Figure 1 - SECONDARY SUSPENSION INSPECTION

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-05-00/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

6/6

Subsystem/Assy:

MOTOR TRUCK

Unit:

SECONDARY SUSPENSION

Component:

Man Hours:

0.5

Maintenance Task:

INSPECTION

Interval/Miles:

120,000**PROCEDURE (CONT'D):****INTENTIONALLY LEFT
BLANK**

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-08-00/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

1/4

Subsystem/Assy:

MOTOR TRUCK

Unit:

STICK LUBRICATOR

Component:

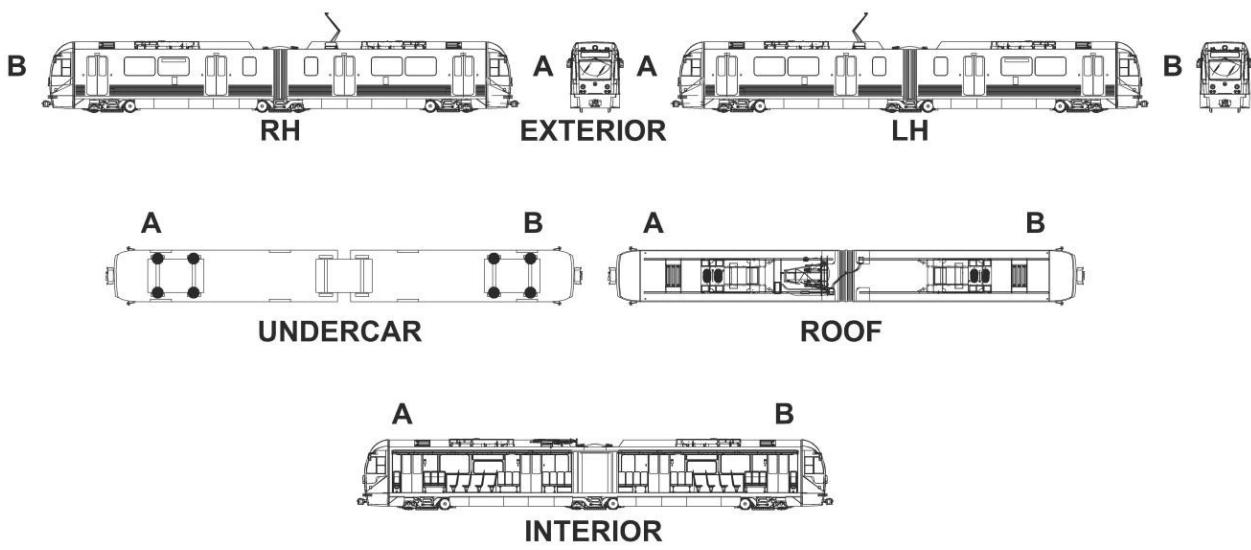
Man Hours:

1.5

Maintenance Task:

INSPECTION

Interval/Miles:

120,000
LOCATION:


P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-08-00/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

2/4

Subsystem/Assy:

MOTOR TRUCK

Unit:

STICK LUBRICATOR

Component:

Man Hours:

1.5

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

SAFETY PRECAUTIONS:

WARNING: BLUE FLAG THE VEHICLE IN ACCORDANCE WITH ALL LACMTA BLUE FLAG POLICIES, RULES, & PROCEDURES IN ORDER TO WARN THAT MAINTENANCE PERSONNEL ARE WORKING ON, UNDER, OR NEAR ROLLING EQUIPMENT.

WARNING: APPLY WHEEL CHOCKS TO PREVENT THE VEHICLE FROM MOVING.

WARNING: WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.

TOOLS:

LACMTA Maintenance Shop Standard Tools Kit.

CONSUMABLES:

N/A

SPARE PARTS:

STICK AA07150 -101RW010
HPF (High Positive Friction) Wheel Tread and Top-of-Rail Friction Modifier QTY =8

STICK AA07151 -201RW017
LCF (Low Coefficient of Friction) Wheel Flange and Rail Gauge Face Lubricator QTY =8

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-08-00/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

3/4

Subsystem/Assy:

MOTOR TRUCK

Unit:

STICK LUBRICATOR

Component:

Man Hours:

1.5

Maintenance Task:

INSPECTION

Interval/Miles:

120,000**PROCEDURE:****PRELIMINARY OPERATIONS**

Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop Regulations:

1. Make sure that all Parking Brakes are applied (by checking on the IDU "Parking Brake A and B Not Released" and on Indicator Panel "A" "Park / Friction Brake" ON)

SERVICE

(Refer to Fig 1 and 2)

1. Inspect each Lubricator (HPF -High Positive Friction- Wheel Tread and Top-of-Rail Friction Modifier and LCF -Low Coefficient of Friction- Wheel Flange and Rail Gauge Face Lubricator), Support and Stick Box for damage, deformations and missing/loose hardware.
3. Check each Lubricator Stick for wear. Replace as needed.
4. Check each Lubricator (HPF and LCF)correct orientation.
5. Adjust, if needed, then torque to **40.5 ft-lb (55 Nm)**.

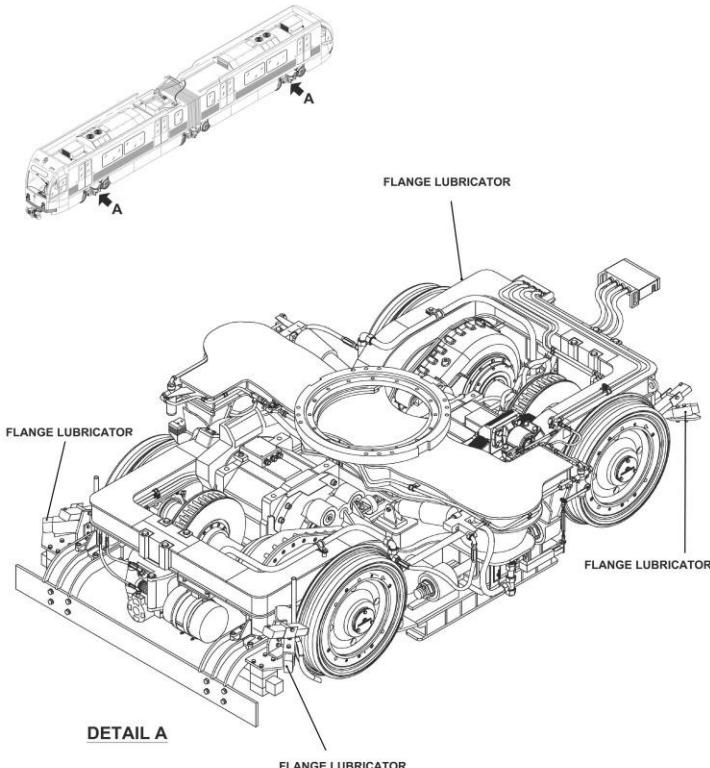


Figure 1 - MOTOR TRUCK - STICK LUBRICATOR LOCATION

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-01-08-00/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

4/4

Subsystem/Assy:

MOTOR TRUCK

Unit:

STICK LUBRICATOR

Component:

Man Hours:

1.5

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE:

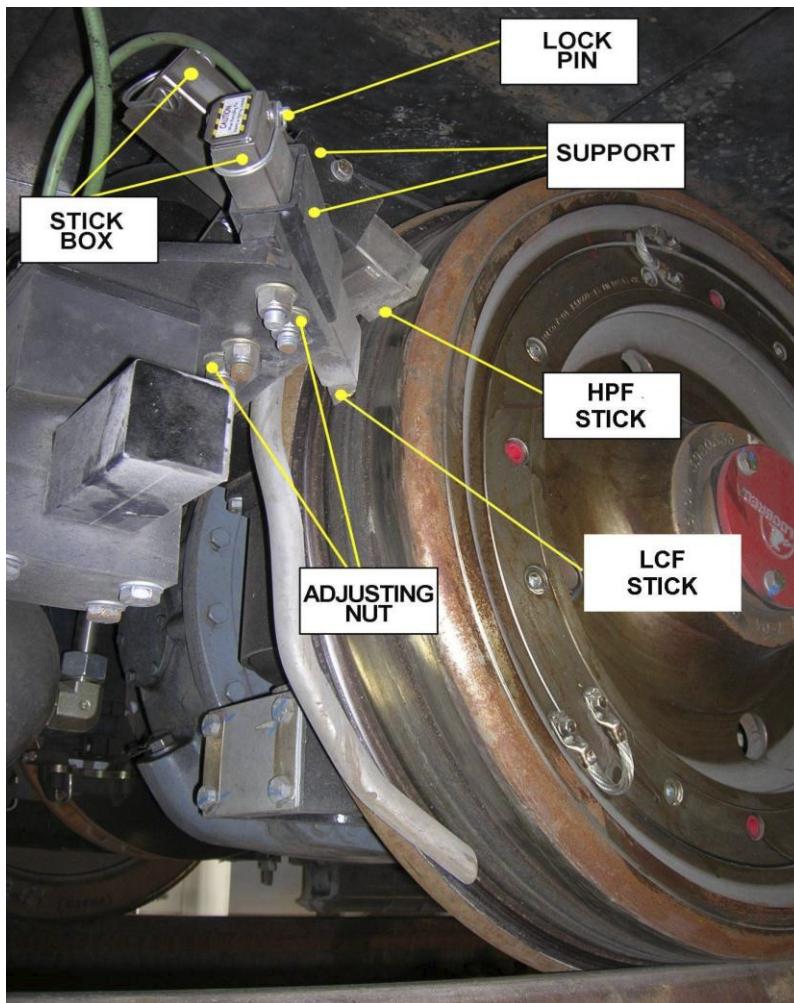


Figure 2 - STICK LUBRICATORS

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-00-00/I-00

System:

Sheet:

TRUCKS AND SUSPENSIONS
1/4

Subsystem/Assy:

TRAILER TRUCK

Unit:

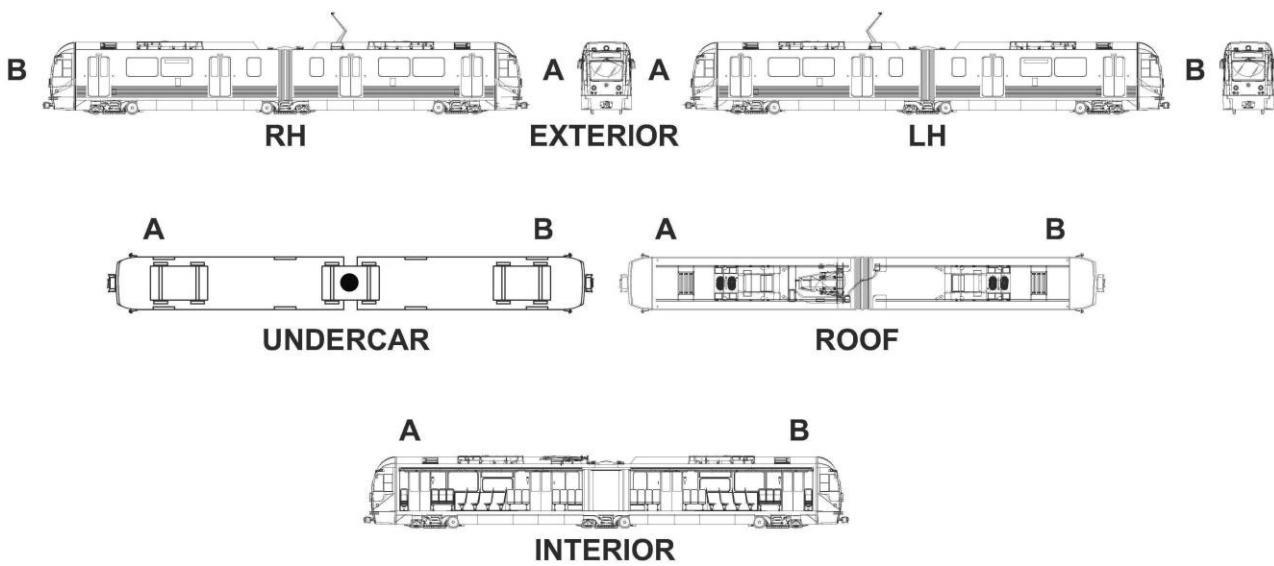
Component:

Man Hours:

1

Maintenance Task:

Interval/Miles:

INSPECTION
30,000
LOCATION:


P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-00-00/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

2/4

Subsystem/Assy:

TRAILER TRUCK

Unit:

Component:

Man Hours:

1

Maintenance Task:

INSPECTION

Interval/Miles:

30,000**SAFETY PRECAUTIONS:**

WARNING: BLUE FLAG THE VEHICLE IN ACCORDANCE WITH ALL LACMTA BLUE FLAG POLICIES, RULES, & PROCEDURES IN ORDER TO WARN THAT MAINTENANCE PERSONNEL ARE WORKING ON, UNDER, OR NEAR ROLLING EQUIPMENT.

WARNING: WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.

TOOLS:

LACMTA Maintenance Shop Standard Tools Kit.

CONSUMABLES:

N/A

SPARE PARTS:

N/A

P2550 PREVENTIVE MAINTENANCE SHEET	
Card Code:	
R-P-12-02-00-00/I-00	
System: TRUCKS AND SUSPENSIONS	Sheet: 3/4
Subsystem/Assy: TRAILER TRUCK	Unit:
Component:	Man Hours: 1
Maintenance Task: INSPECTION	Interval/Miles: 30,000
PROCEDURE: PRELIMINARY OPERATIONS <p>Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop Regulations:</p> <ol style="list-style-type: none"> 1) Place the Vehicle over the Pit (or Stand Up Rail). 2) Set the Master Controller Handle to FSB position. 3) Make sure that all Parking Brakes are applied (by checking on the IDU "Parking Brake A and B Not Released" and on Indicator Panel "A" "Park / Friction Brake" ON). 4) Remove Electrical Power from Vehicle by lowering the Pantograph. 5) Turn the Transfer Switch to OFF. 6) Set the Pantograph Control Motor Switch(5F02 CB LV Locker "A" Section) to OFF. 7) Lock out and tag out the Switch in accordance with all LACMTA Safety Rules, Regulations, Policies, and Procedures. <p>NOTE The tag must indicate the name of the person who removed Power. That person knows why the Power was removed and when it safe to restore it. Only the individual whose name appears on the tag or a person with his approval should remove the tag and restore Power.</p>	
INSPECTION <p>The aim of this Visual Inspection is to verify the structural integrity of the Truck. To perform the task proceed as follows:</p> <ol style="list-style-type: none"> 1. Inspect Frame and Bolster Beam for obvious visible damage such as dents, deformation, scoring, corrosion. and signs of rust / paint degradation. 2. Inspect welded brackets for damage, deformation and corrosion. 3. In addition visually inspect : <ol style="list-style-type: none"> a) Electrical components, wiring and connectors for damage, missing/loose attaching parts and signs of overheating. b) Friction Brake & Pneumatic System components, piping and connections for damage, missing/loose attaching parts and air leakage. c) Axle and Wheel mounted equipment for damage, missing/loose attaching parts / lubricant leakage d) Wheel Tires for the following Defects: Shell Outs, Thin Flange, Breaks, Build Up, Hollow Tread, Grooves, Flat Spots, Thermal Cracks. For Defect Details and Pictures refer to Sheet R-P 12-02-01-01 / I-00. e) Labels for damage and missing/loose attaching parts. f) Primary Suspension and Secondary Suspension components for damage and missing/loose attaching parts and oil leakage. 4. Restore Electrical Power. 5. Record inspection results on the Defect Report Card for administrative and maintenance planning. 	

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-00-00/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

4/4

Subsystem/Assy:

TRAILER TRUCK

Unit:

Component:

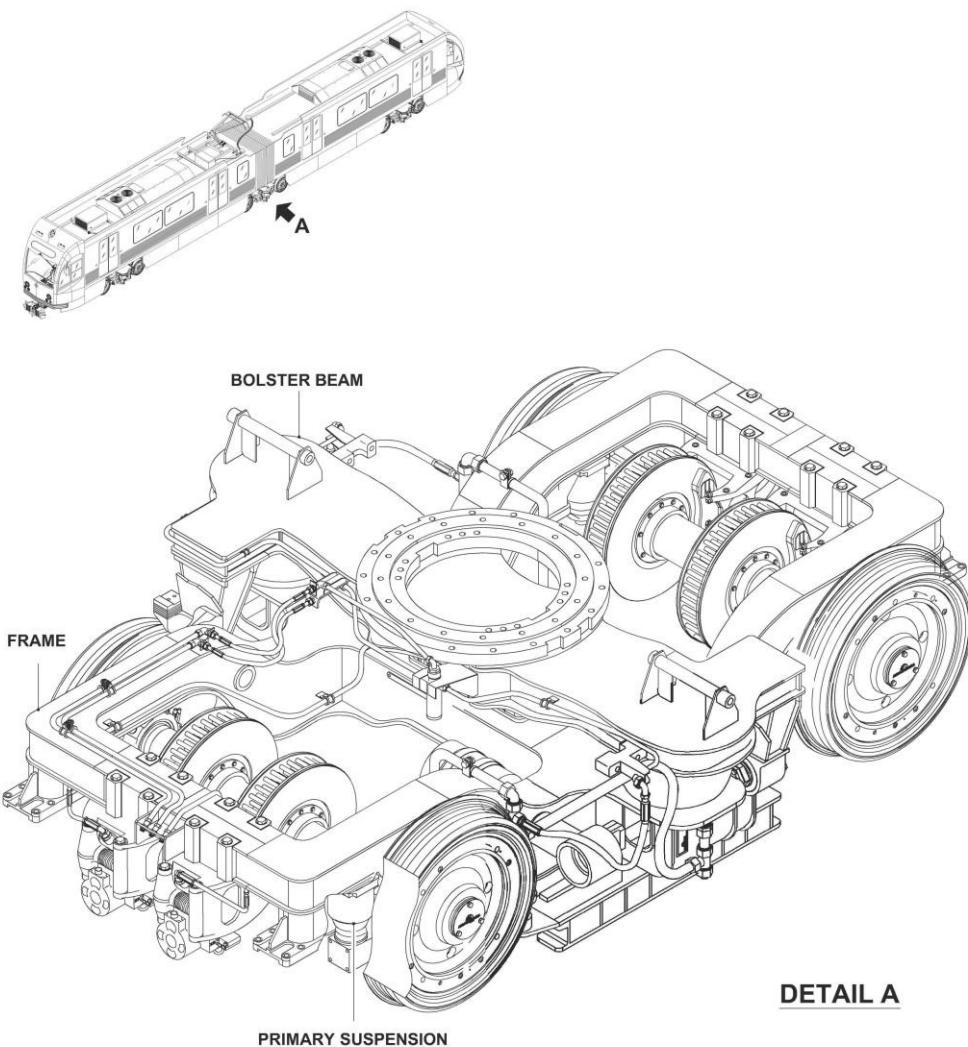
Man Hours:

1

Maintenance Task:

INSPECTION

Interval/Miles:

30,000**PROCEDURE:****Figure 1 - TRAILER TRUCK INSPECTION**

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

1/22

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

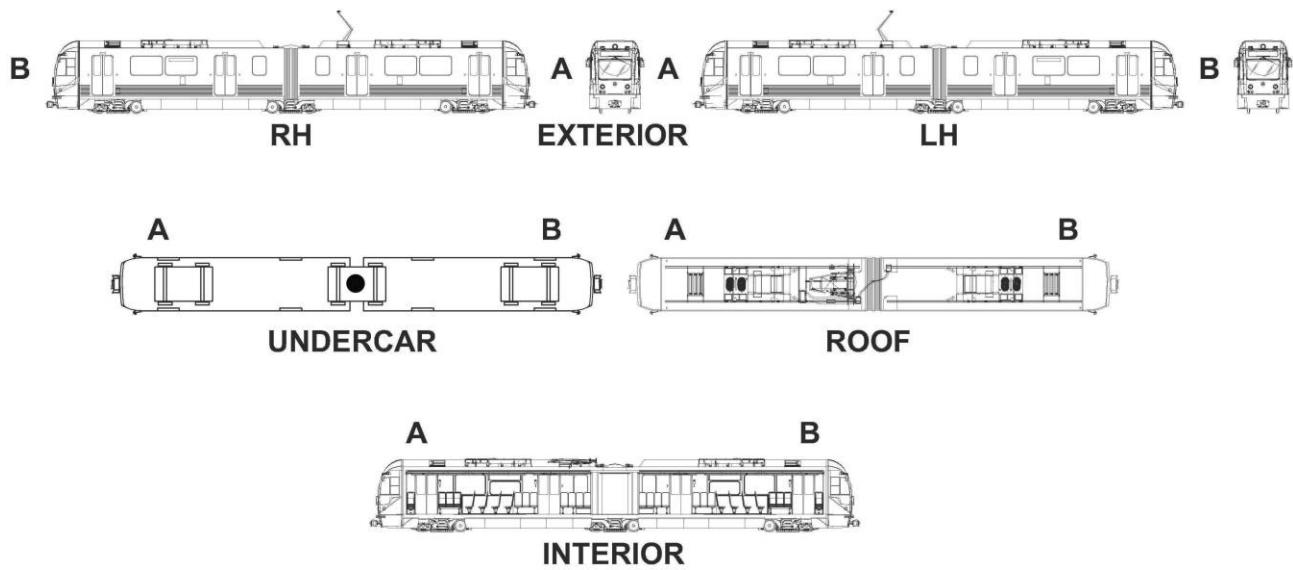
Man Hours:

0.8

Maintenance Task:

INSPECTION

Interval/Miles:

30,000
LOCATION:


P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

2/22

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

0.8

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

SAFETY PRECAUTIONS:

WARNING: BLUE FLAG THE VEHICLE IN ACCORDANCE WITH ALL LACMTA BLUE FLAG POLICIES, RULES, & PROCEDURES IN ORDER TO WARN THAT MAINTENANCE PERSONNEL ARE WORKING ON, UNDER, OR NEAR ROLLING EQUIPMENT.

WARNING: APPLY WHEEL CHOCKS TO PREVENT THE VEHICLE FROM MOVING.

WARNING: WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.

CAUTION: Pi TAPE ACCURACY IS +/- .001 ON STANDARD TAPES UP TO 144" MAKE SURE THE TAPE HAS NOT BEEN STEPPED ON OR KINKED, WHICH MAY REDUCE / DESTROY THE ACCURACY.

CAUTION: IT IS MANDATORY TO PERFORM THE VEHICLE LEVELING PROCEDURE, ACCORDING TO SHEET R-C-01-01-00-00/LL-00, AFTER EVERY WHEEL TRUING.

TOOLS:

LACMTA Maintenance Shop Standard Tools Kit.

Pi Tape 24 to 36 inch range (AAR Tool for Wheel Diameter check).

AAR Steel Wheel Gauge (AAR Tool for Wheel Profile check).

AAR Wheel Defect Gauge (AAR Tool for Wheel Profile check).

CONSUMABLES:

N/A

SPARE PARTS:

N/A

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-00

System:

Sheet:

TRUCKS AND SUSPENSIONS

3/22

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

0.8

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D): PRELIMINARY OPERATIONS

Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop Regulations:

1. Apply wheel chocks to prevent the Vehicle from moving.

EXPLANATORY NOTES:

1- WHEEL IDENTIFICATION DATA

Each Wheel is identified by the following Data:

Month & Year of Manufacture	Manufacturer	Type of material	Heat #	Individual serial #	Drawing #
Refer to Fig 1	Refer to Fig 2	Refer to Fig 3			



Figure 1 - WHEEL IDENTIFICATION DATA

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

4/22

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

0.8

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D):

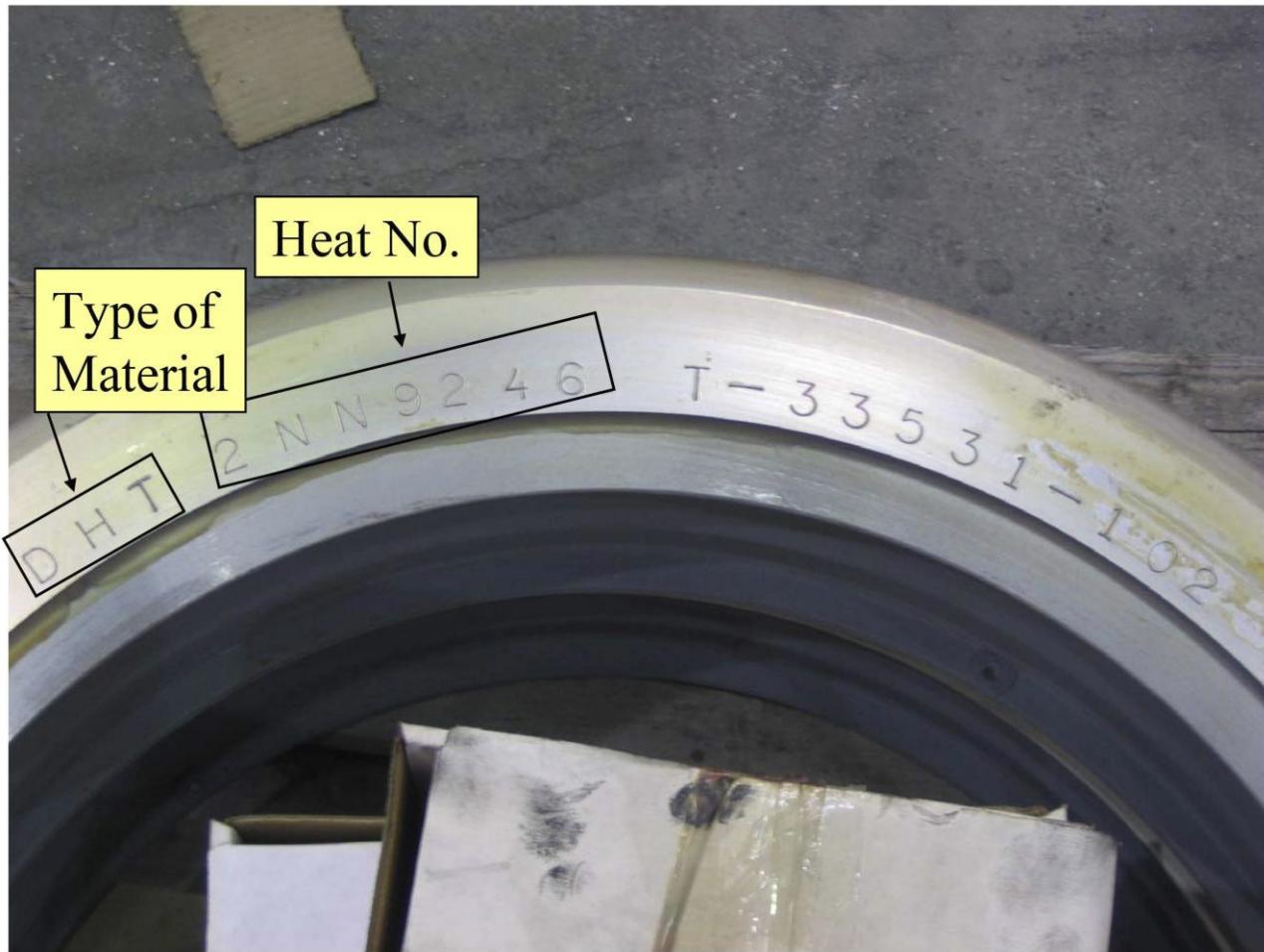


Figure 2 - WHEEL IDENTIFICATION DATA

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-00

System:

Sheet:

TRUCKS AND SUSPENSIONS**5/22**

Subsystem/Assy:

Unit:

TRAILER TRUCK**WHEEL SET TRAILER TRUCK**

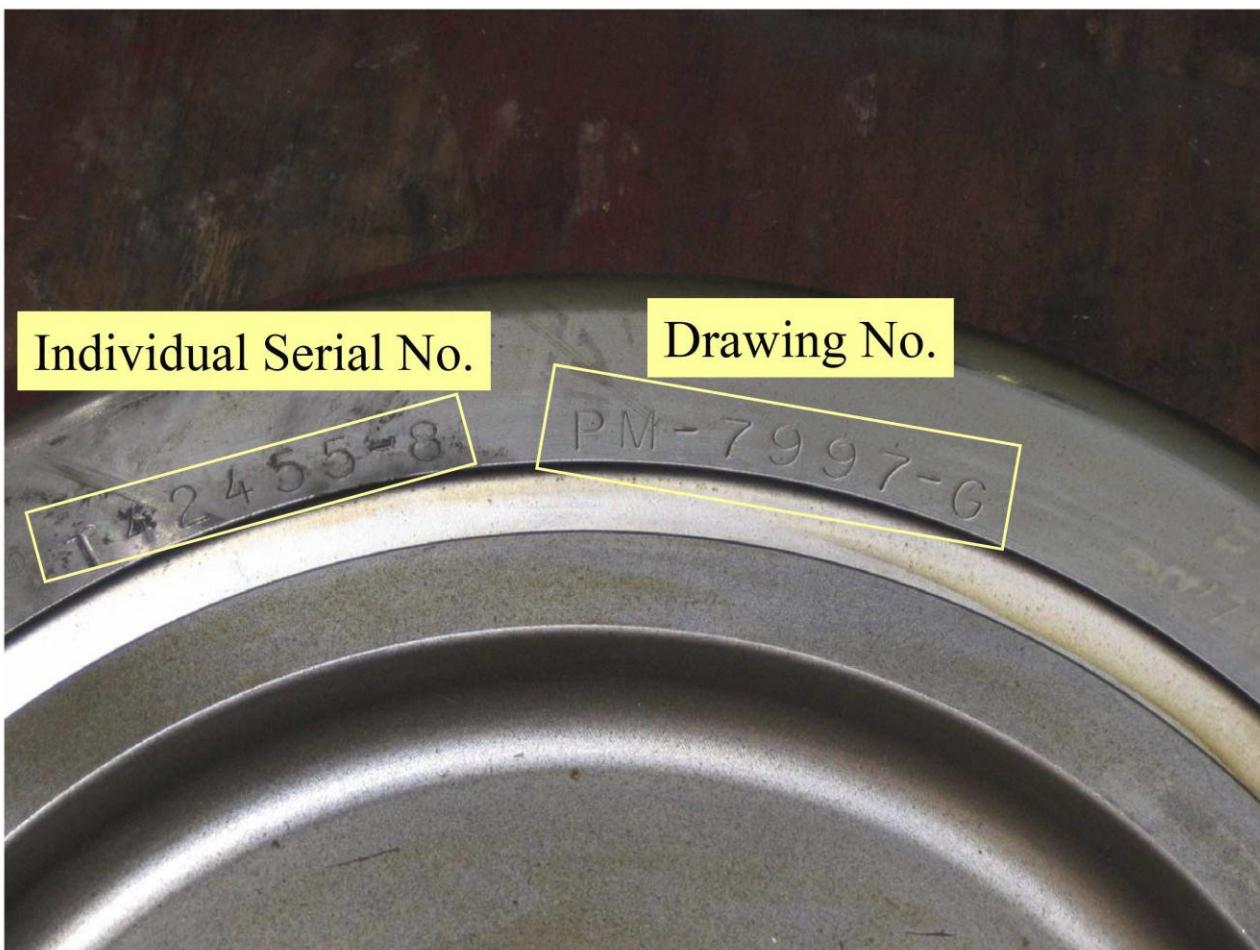
Component:

Man Hours:

WHEEL**0.8**

Maintenance Task:

Interval/Miles:

INSPECTION**30,000****PROCEDURE (CONT'D):****Figure 3 - WHEEL IDENTIFICATION DATA**

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

6/22

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

0.8

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D):

2- WHEEL DEFECTS

The Types of Wheel Defects are shown in Figure 4:

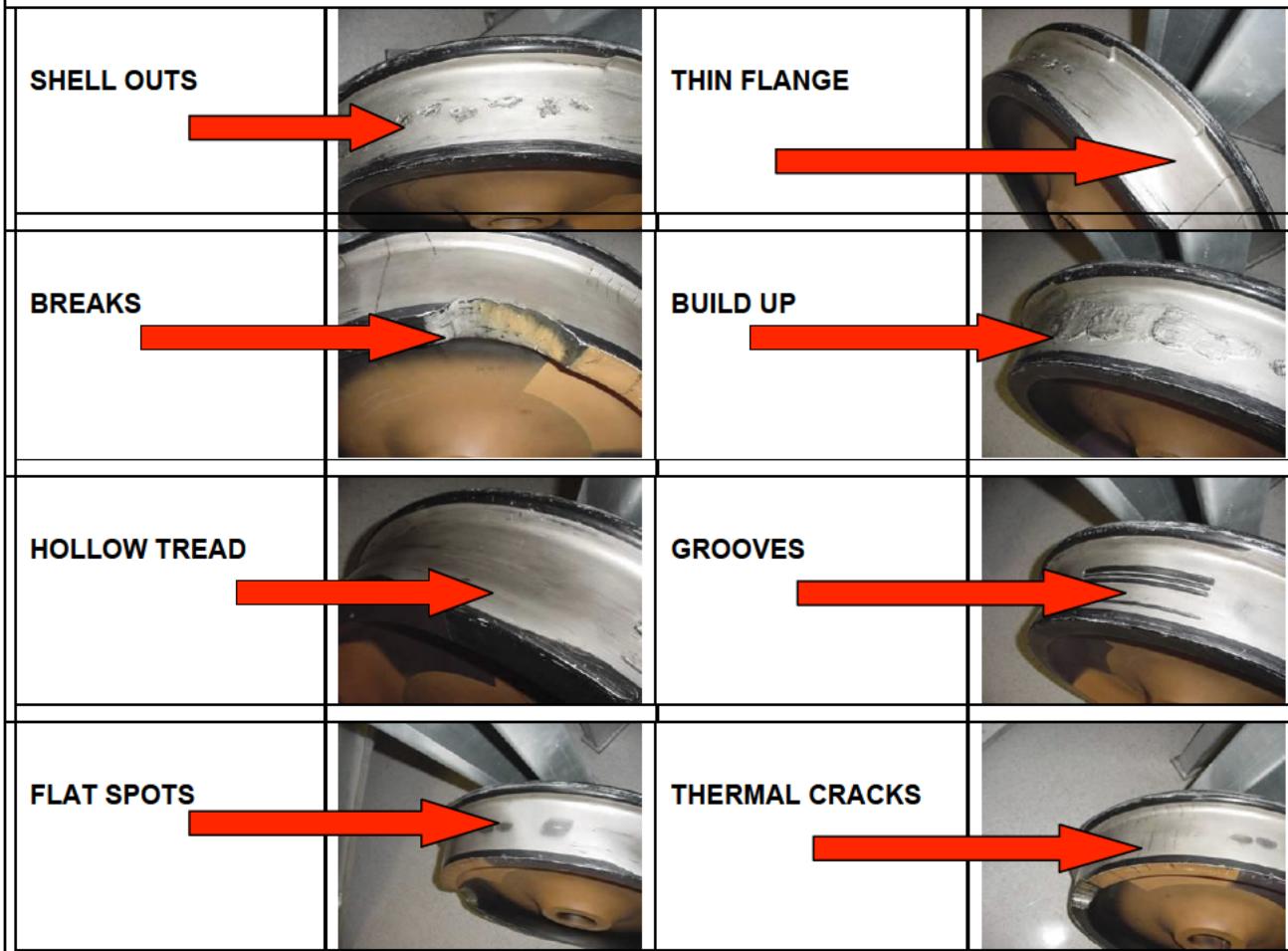


Figure 4 - TYPES OF WHEEL DEFECTS

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-00

System:

Sheet:

TRUCKS AND SUSPENSIONS

7/22

Subsystem/Assy:

Unit:

TRAILER TRUCK

WHEEL SET TRAILER TRUCK

Component:

Man Hours:

WHEEL

0.8

Maintenance Task:

Interval/Miles:

INSPECTION

30,000

PROCEDURE (CONT'D):

3- HOW TO USE THE Pi TAPE (24 TO 36 INCH RANGE) TO MEASURE WHEEL OUTSIDE DIAMETER

1. Make sure that Pi Tape and Wheel Outside Circumference are properly clean.
2. Apply the Pi Tape around the Wheel Outside Circumference.

NOTE: It is recommended to use pieces of masking tape to hold the Pi Tape in proper parallel position.

3. Apply a snug pull of 5 pounds tension when reading.

CAUTION: Pi TAPE ACCURACY IS +/- .001 ON STANDARD TAPES UP TO 144"
MAKE SURE THE TAPE HAS NOT BEEN STEPPED ON OR KINKED,
WHICH MAY REDUCE / DESTROY THE ACCURACY.

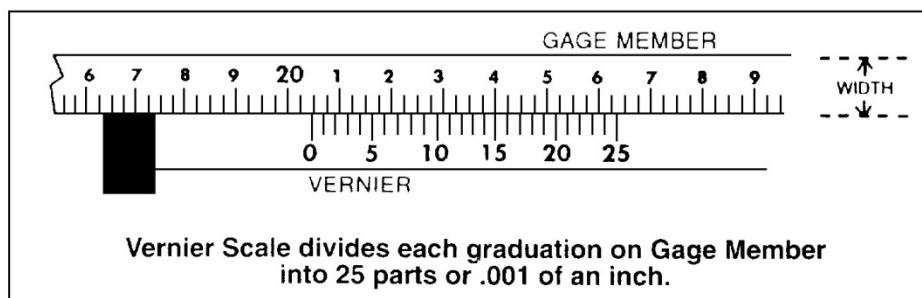


Figure 5 - EXAMPLE OF OUTSIDE DIAMETER MEASUREMENT TAPE READING

4. In the above Figure, the division to the left of the Vernier ZERO are 20 inches plus 1 division, or 20.025.

The 15th LINE on the Vernier coincides with a LINE on the Gage Member.

This is added to the 20.025, making a Total Diameter Reading of 20.040, which is

THE TRUE WHEEL DIAMETER READING AS MEASURED ON THE OUTSIDE CIRCUMFERENCE.

5. Once measurement is completed, proceed as follows:
 - a) Wipe clean.
 - b) Apply a light coat of rust preventative oil.
 - c) Store in the Tape Container.

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

8/22

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

0.8

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D):

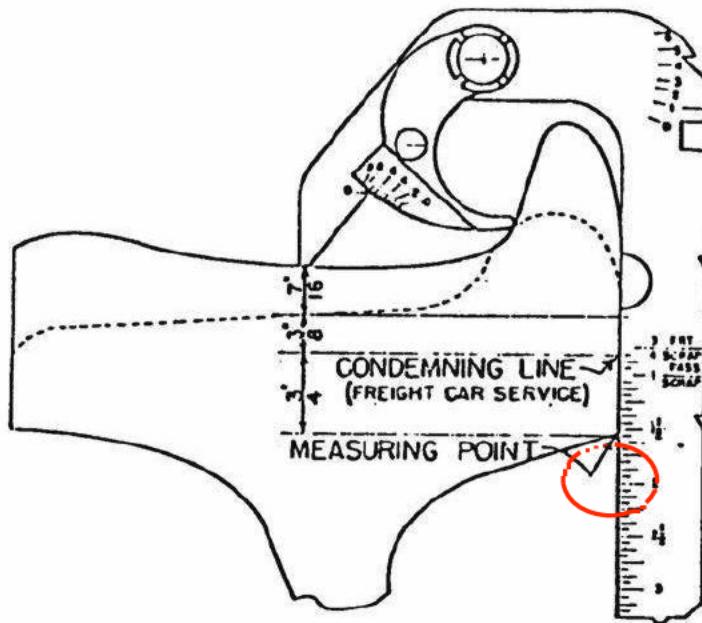
4- HOW TO USE THE AAR STEEL WHEEL GAUGE TO MEASURE WHEEL DIMENSIONS

1. Wheel Tire Diameter Measuring (2 measurements per wheel):

- a) Observe and Record the Radius reading in 16ths of an inch at the Measuring Point.
- b) Divide the Measuring Point Radius Reading by 16 to get the decimal equivalent.
- c) Multiply the decimal equivalent Radius Reading by 2 to get the Diameter Reading.
- d) Add the Diameter Reading to the known diameter of the wheel at the Measuring Point (24.121").
- e) The Result is the Wheel Diameter for the Measured Wheel.

NOTE: For Passing Criteria refer to:

AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."



P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-00

System:

Sheet:

TRUCKS AND SUSPENSIONS**9/22**

Subsystem/Assy:

Unit:

TRAILER TRUCK**WHEEL SET TRAILER TRUCK**

Component:

Man Hours:

WHEEL**0.8**

Maintenance Task:

Interval/Miles:

INSPECTION**30,000**

PROCEDURE (CONT'D):

2. Wheel Flange Thickness Measuring (2 measurements per wheel):

NOTE: For Passing Criteria refer to:

AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

NOTE: For Passing Criteria refer to:

AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

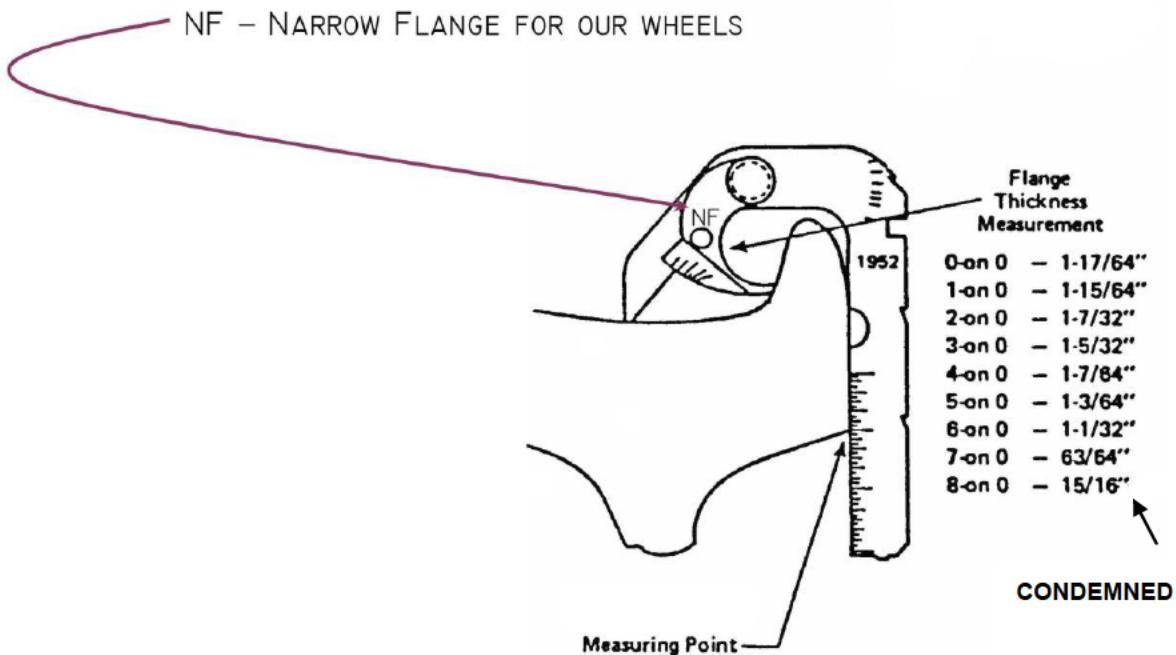


Figure 7 - WHEEL FLANGE THICKNESS MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

10/22

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

0.8

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D):

3. Wheel Flange Height Measuring (2 measurements per wheel)

NOTE: For Passing Criteria refer to:

AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

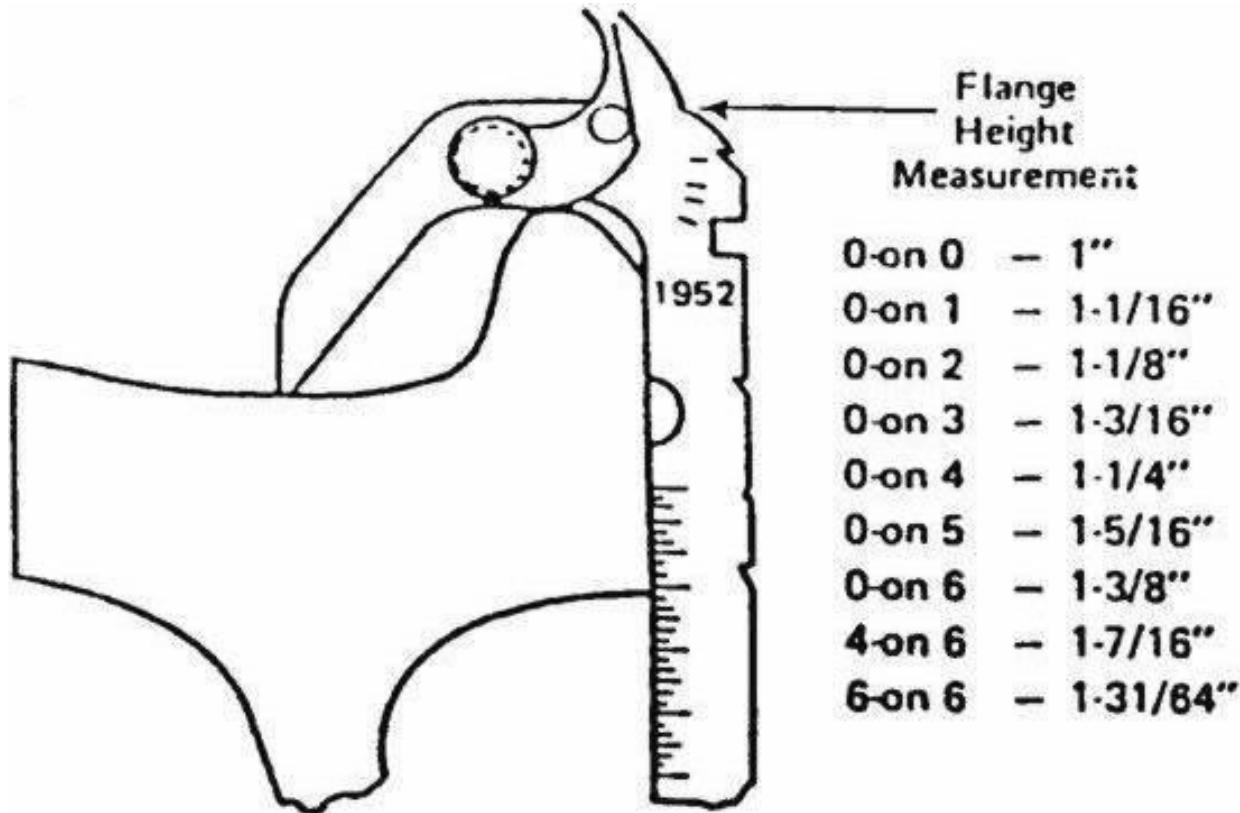


Figure 8 - WHEEL FLANGE HEIGHT MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-00

System:

Sheet:

TRUCKS AND SUSPENSIONS**11/22**

Subsystem/Assy:

Unit:

TRAILER TRUCK**WHEEL SET TRAILER TRUCK**

Component:

Man Hours:

WHEEL**0.8**

Maintenance Task:

Interval/Miles:

INSPECTION**30,000**

PROCEDURE (CONT'D):

4. **Wheel High Flange Measuring (2 measurements per wheel).**

NOTE: For Passing Criteria refer to:

AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

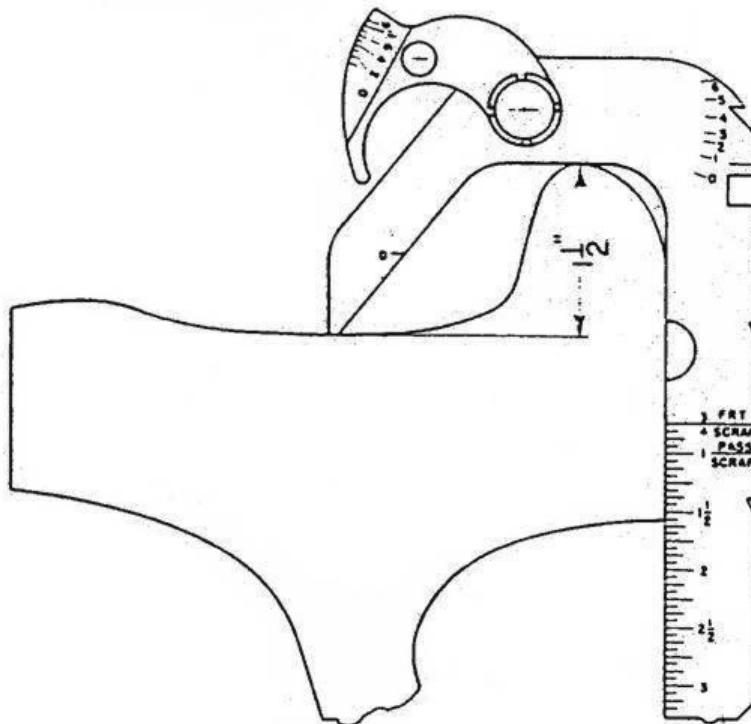


Figure 9 - WHEEL HIGH FLANGE MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

12/22

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

0.8

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D):

5. Wheel Witness Groove Position Measuring (2 measurements per wheel).

NOTE: For Passing Criteria refer to:
AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

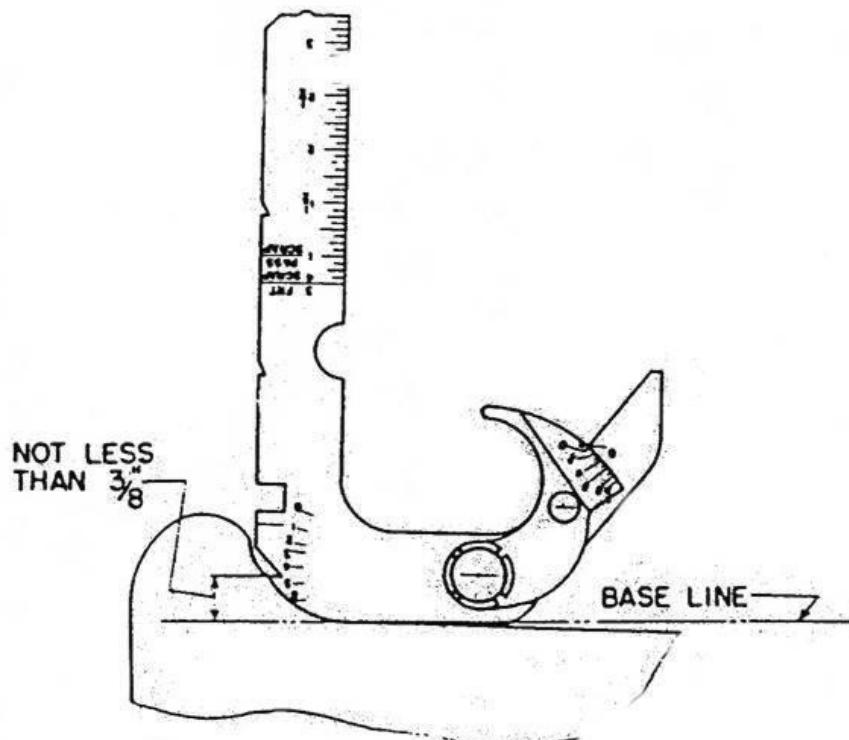


Figure 10 - WHEEL WITNESS GROOVE POSITION MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

13/22

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

0.8

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D):

6. Wheel Witness Groove Depth Measuring (2 measurements per wheel)

NOTE: For Passing Criteria refer to:

AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

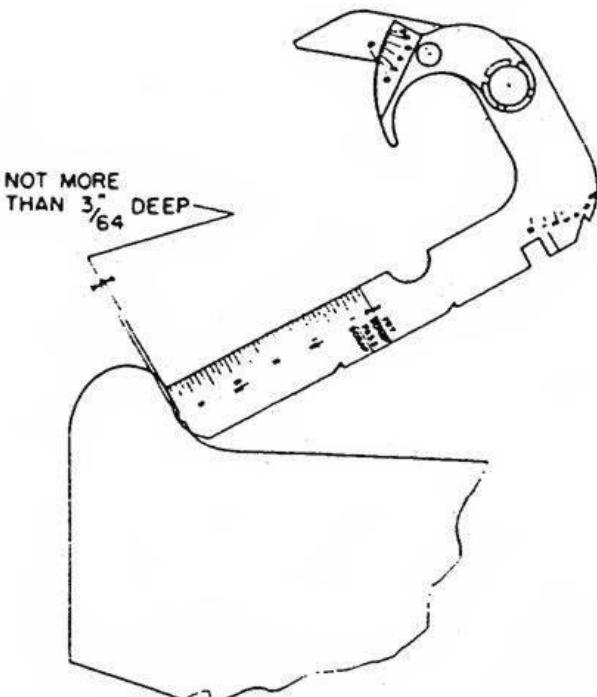


Figure 11 - WHEEL WITNESS GROOVE DEPTH MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

14/22

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

0.8

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D):

7. **Wheel Vertical Flange Measuring (2 measurements per wheel).**

NOTE: For Passing Criteria refer to:
AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

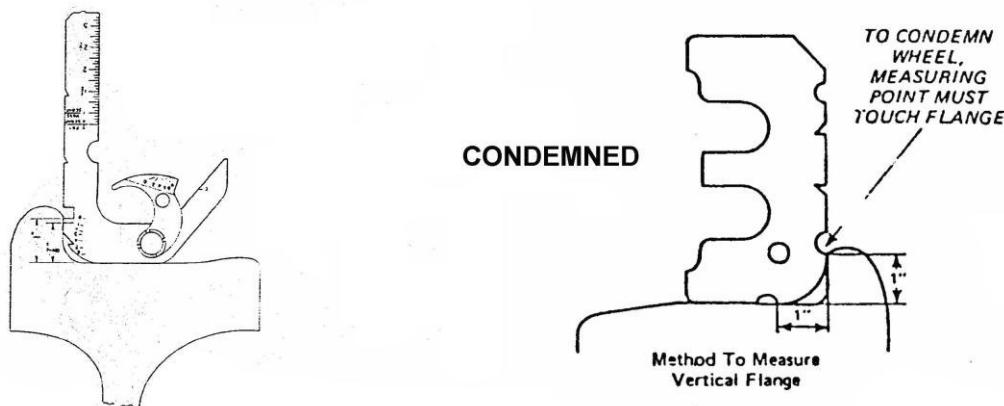


Figure 12 - WHEEL VERTICAL FLANGE MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

15/22

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

0.8

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D):

8. **Wheel Flange Thickness Measuring (2 measurements per wheel).**

NOTE: For Passing Criteria refer to:

AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

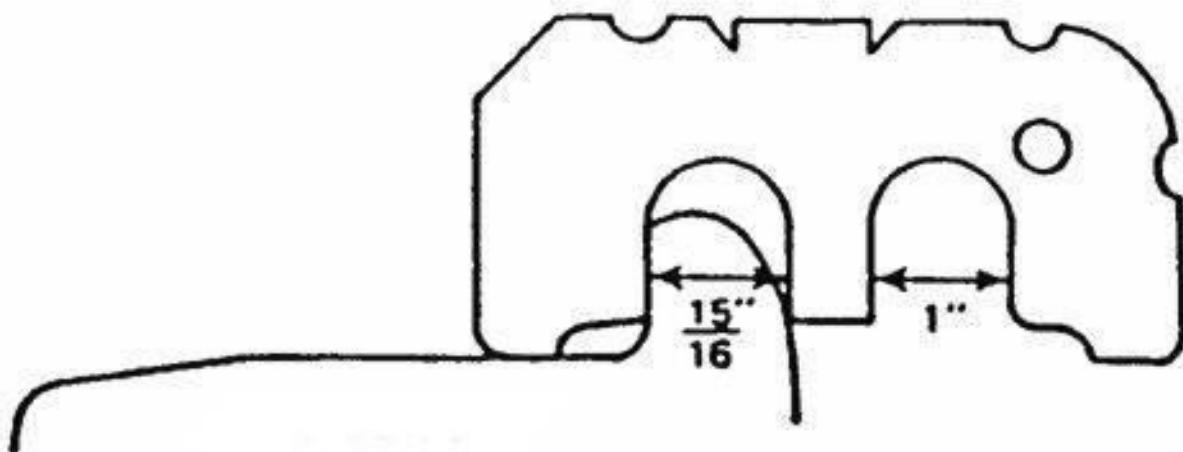


Figure 13 - WHEEL FLANGE THICKNESS MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

16/22

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

0.8

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D):

9. **Wheel Broken Rim & Heavy Flange Measuring (2 measurements per wheel).**

NOTE: For Passing Criteria refer to:
AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

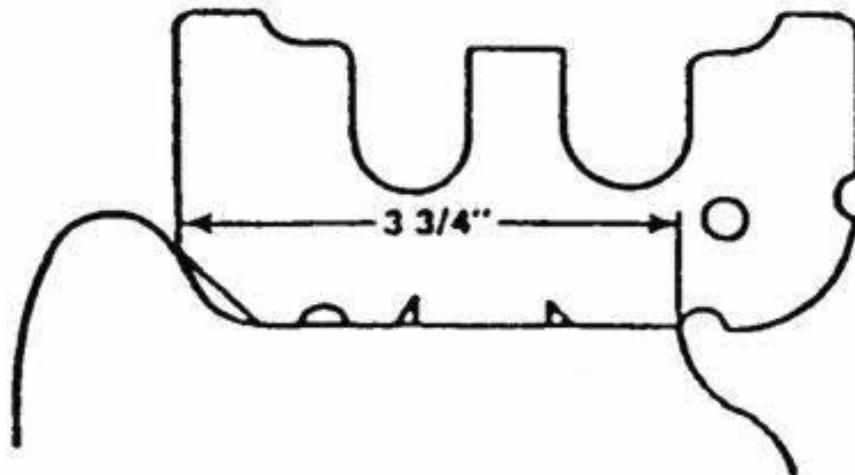


Figure 14 - WHEEL BROKEN RIM & HEAVY FLANGE MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

17/22

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

0.8

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D):

10. Wheel Flat And Shell Spots Measuring

NOTE: For Passing Criteria refer to:

AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."
If found 1/2" or more then inform Supervisor/Leader and have wheels reprofiling.

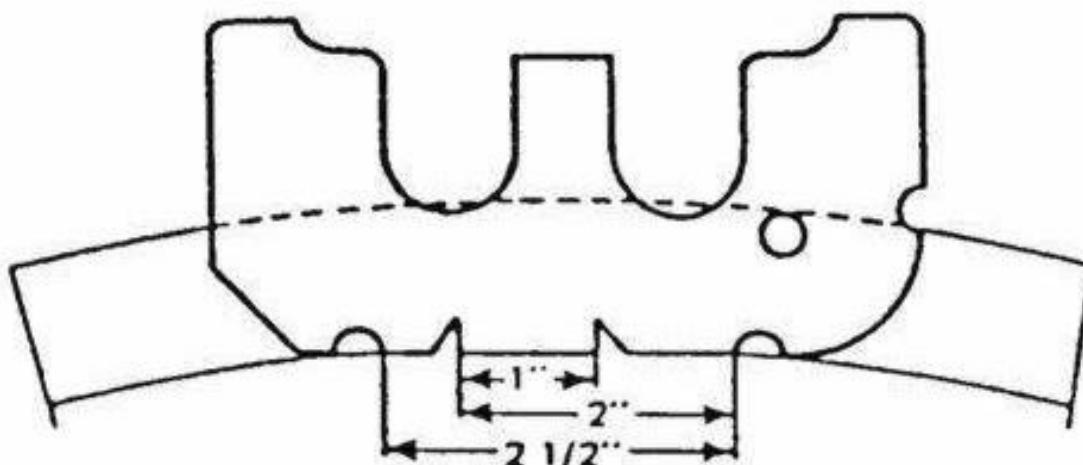


Figure 15 - WHEEL FLAT AND SHELL SPOTS MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

18/22

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

0.8

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D):

INSPECTION

To perform the task proceed as follows (Refer to Figures 1 through 17):

1. Inspect each Wheel for damage and missing /loose parts.
Particularly check that the following items are not missing /loose:
 - a. Plastic plugs (covering the pusher bolt holes on the conical ring).
 - b. Pipe plug.
 - c. Locking bolts (which fasten the conical ring tight against the wheel center).
2. Inspect each Tire for the Defects shown in the previous Figure 4.
3. Measure each Tire diameter, using recommended AAR tool (refer to Figure 5).
4. Check each Tire profile, using recommended AAR tool (refer to Figures 6 through 14).
5. Check each Tire for Flats & Shell Spots and measure any defects with the recommended AAR tool (refer to Figure 15).

NOTE: For Passing Criteria refer to:

AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

WARNING: WHEELS WITH TIRES LESS THAN 26.0" IN DIAMETER MUST BE REMOVED FROM SERVICE IMMEDIATELY.

6. As per measurements and checks results and according to the Wheel Dimensional Data and to the Wheel Dimensions shown in the Fig 17, perform, if necessary, the Wheel Truing procedure according to Sheet R-C-12-02-01-01/RP-00.

CAUTION: IT IS MANDATORY TO PERFORM THE VEHICLE LEVELING PROCEDURE, ACCORDING TO SHEET R-C-01-01-00-00/LL-00, AFTER EVERY WHEEL TRUING.

7. Inspect the External Shunts for damage, signs of fraying and missing / loose parts.
8. Perform the External Shunt Resistance Test according to Sheet R-P-12-02-01-01/T-00.

P2550 PREVENTIVE MAINTENANCE SHEET	
Card Code:	
R-P-12-02-01-01/I-00	
System: TRUCKS AND SUSPENSIONS	Sheet: 19/22
Subsystem/Assy: TRAILER TRUCK	Unit: WHEEL SET TRAILER TRUCK
Component: WHEEL	Man Hours: 0.8
Maintenance Task: INSPECTION	Interval/Miles: 30,000
PROCEDURE (CONT'D):	
<p>9. Inspect Rubber Blocks for:</p> <ul style="list-style-type: none"> a. even distribution around the wheel. b. cracks (in radial direction). <p>NOTE: Cracks in the rubber blocks are largely cosmetic (due to Ozone exposure), but cracks that extend the length of the block (in radial direction) need to be replaced.</p> <p>WARNING: REMOVE FROM SERVICE ANY WHEEL WITH 3 OR MORE RUBBER BLOCKS THAT ARE CRACKED ALONG THE ENTIRE LENGTH OF THE BLOCK UNTIL THE RUBBER BLOCKS ARE REPLACED.</p> <p>10. Restore Electrical Power. 11. Remove Wheel Chocks.</p>	

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

20/22

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

0.8

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

PROCEDURE (CONT'D):

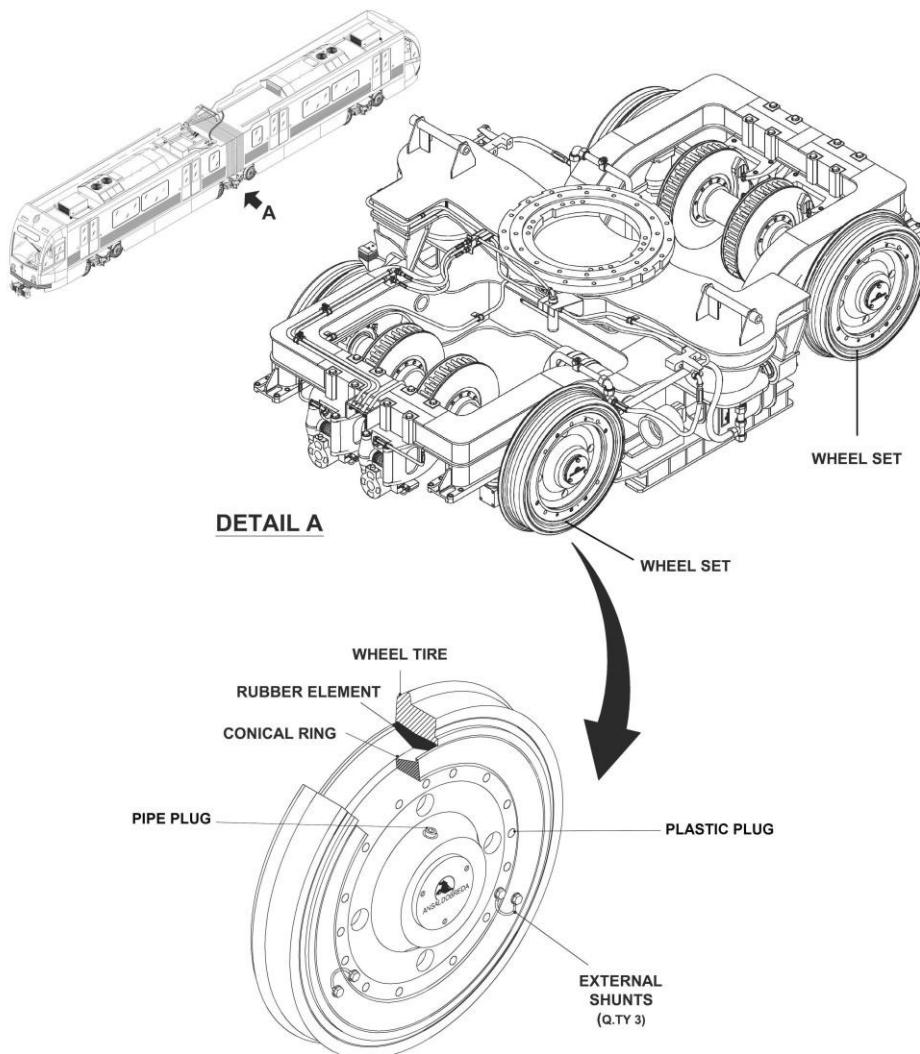


Figure 16 - TRAILER TRUCK - WHEEL INSPECTION

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

21/22

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

0.8

Maintenance Task:

INSPECTION

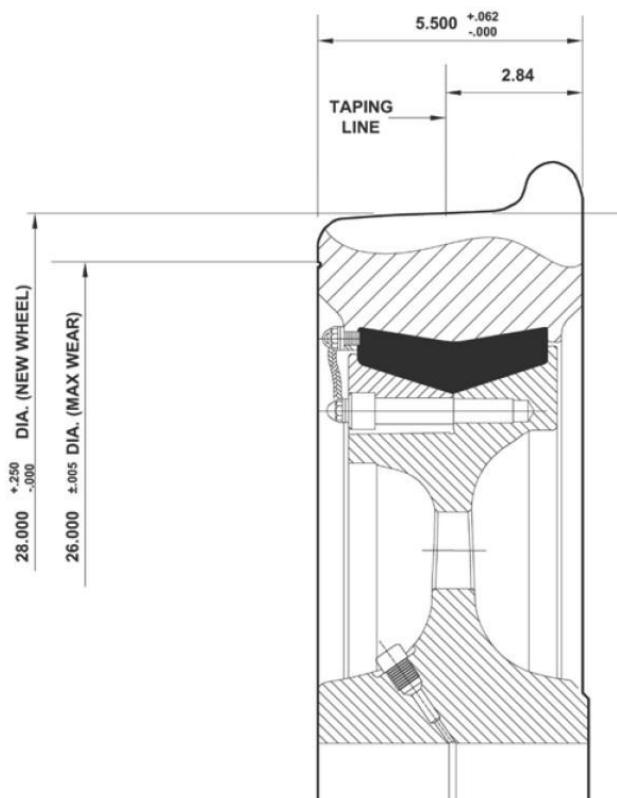
Interval/Miles:

30,000

PROCEDURE (CONT'D):

WHEEL - DIMENSIONAL DATA

Wheel diameter (new).....	28.00 in
Wheel wear before replacement on diameter.....	2.00 in
Difference between the diameter of the wheels	(same axle <.080 in)
Difference between the diameter of the wheels.....	(same truck .38 in)
Difference between the diameter of the wheels.....	(same vehicle ± 2 in)


Figure 17 - TRUCKS WHEEL PROFILE

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

22/22

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

0.8

Maintenance Task:

INSPECTION

Interval/Miles:

30,000**INTENTIONALLY LEFT BLANK**

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:
R-P-12-02-01-02/I-00

System:

Sheet:

TRUCKS AND SUSPENSIONS

1/4

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

TRAILER AXLE

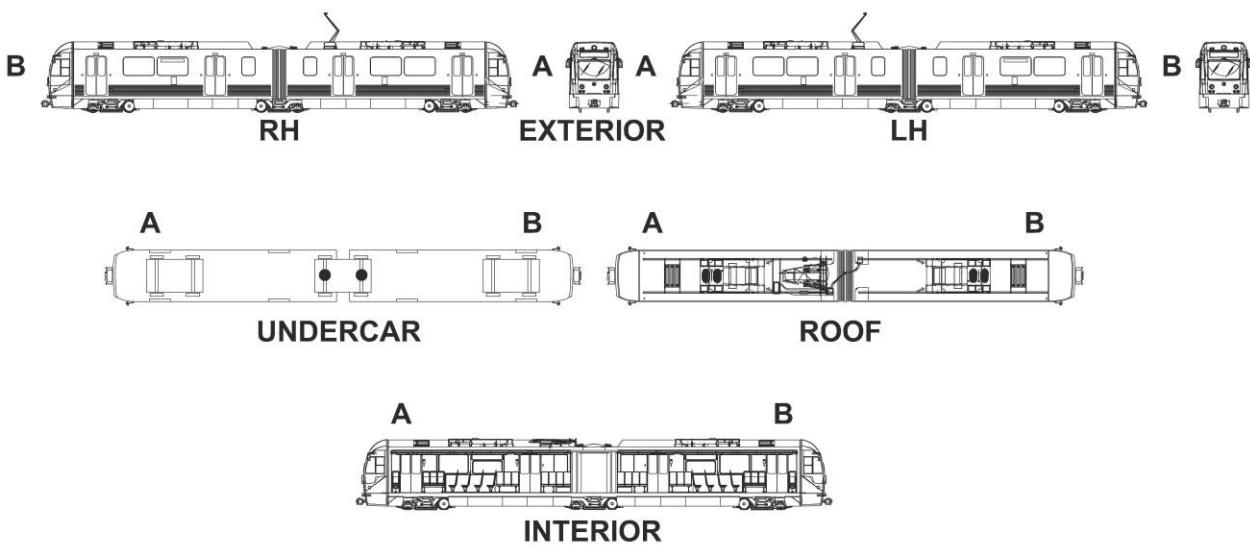
Man Hours:

0.5

Maintenance Task:

INSPECTION

Interval/Miles:

30,000**LOCATION:**

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-02/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

2/4

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

TRAILER AXLE

Man Hours:

0.5

Maintenance Task:

INSPECTION

Interval/Miles:

30,000

SAFETY PRECAUTIONS:

WARNING: BLUE FLAG THE VEHICLE IN ACCORDANCE WITH ALL LACMTA BLUE FLAG POLICIES, RULES, & PROCEDURES IN ORDER TO WARN THAT MAINTENANCE PERSONNEL ARE WORKING ON, UNDER, OR NEAR ROLLING EQUIPMENT.

WARNING: APPLY WHEEL CHOCKS TO PREVENT THE VEHICLE FROM MOVING.

WARNING: WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.

TOOLS:

LACMTA Maintenance Shop Standard Tools Kit.

CONSUMABLES:

CLEANER/DEGREASER

SPARE PARTS:

N/A

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-02/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

3/4

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

TRAILER AXLE

Man Hours:

0.5

Maintenance Task:

INSPECTION

Interval/Miles:

30,000**PROCEDURE:****PRELIMINARY OPERATIONS****PRELIMINARY OPERATIONS**

Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop Regulations:

INSPECTION

1. Clean /degrease, using cleaner / degreaser, the portions of the Axles that are free of equipment.
2. Inspect the Axle surface for signs of damage, (incipient) cracks or signs of (fatigue) stress
3. As per Inspection results proceed as follows:
 - a. Axle found to have no signs of damage, cracks or stress.
 - b. Axle found to have no signs of damage, cracks or stress.

NOTE Remove from service only after notifying supervisor and per management instructions.

1. For safety reasons remove from service the Truck with the bad Axle, according to Sheet R C 12-02-00-00-R / 00 and replace all affected components.

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-02/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

4/4

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

TRAILER AXLE

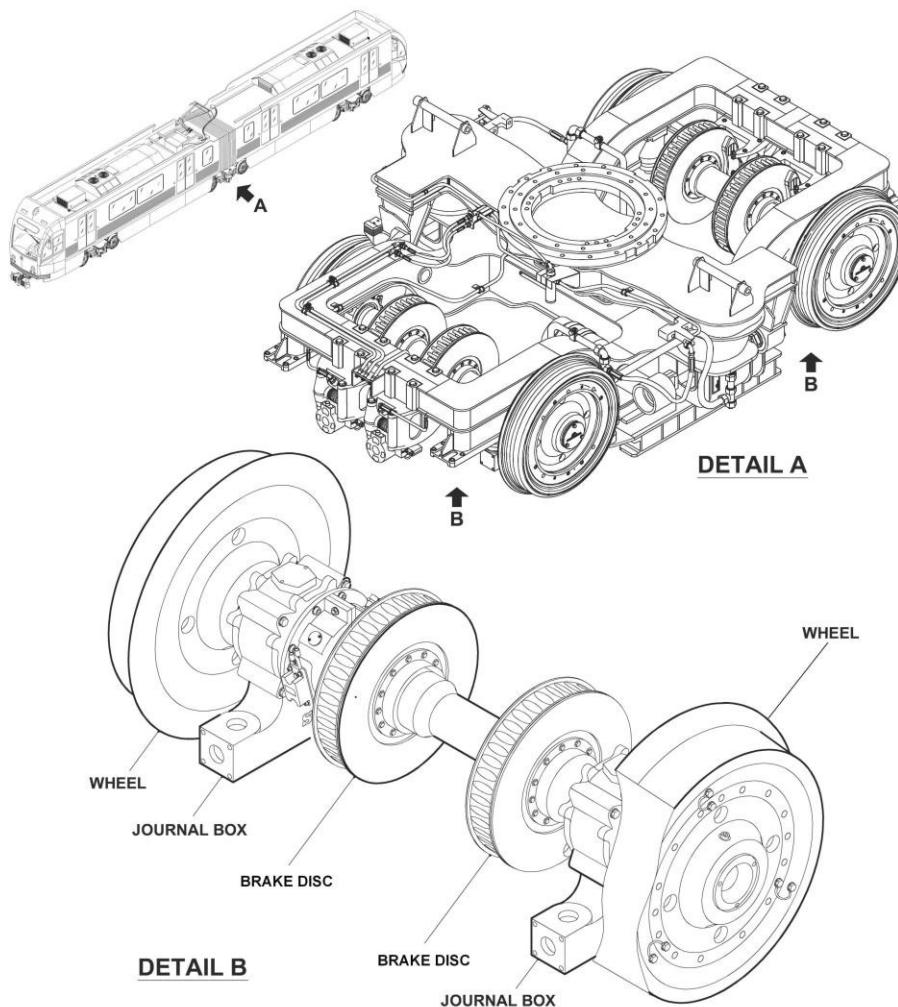
Man Hours:

0.5

Maintenance Task:

INSPECTION

Interval/Miles:

30,000**PROCEDURE:****INSPECTION****Figure 1 - TRAILER TRUCK AXLE**

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-01

System:

TRUCKS AND SUSPENSIONS

Sheet:

1/20

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

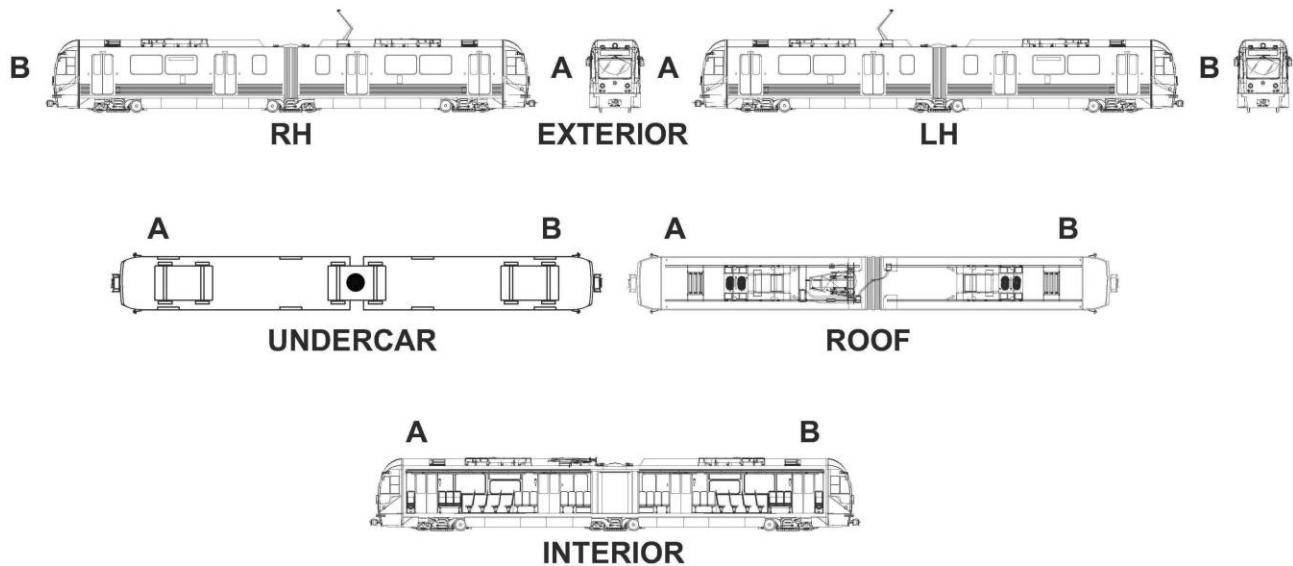
Man Hours:

2

Maintenance Task:

INSPECTION

Interval/Miles:

120,000
LOCATION:


P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-01

System:

TRUCKS AND SUSPENSIONS

Sheet:

2/20

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

2

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

SAFETY PRECAUTIONS:

WARNING: BLUE FLAG THE VEHICLE IN ACCORDANCE WITH ALL LACMTA BLUE FLAG POLICIES, RULES, & PROCEDURES IN ORDER TO WARN THAT MAINTENANCE PERSONNEL ARE WORKING ON, UNDER, OR NEAR ROLLING EQUIPMENT.

WARNING: APPLY WHEEL CHOCKS TO PREVENT THE VEHICLE FROM MOVING.

WARNING: WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.

CAUTION: Pi TAPE ACCURACY IS +/- .001 ON STANDARD TAPES UP TO 144" MAKE SURE THE TAPE HAS NOT BEEN STEPPED ON OR KINKED, WHICH MAY REDUCE / DESTROY THE ACCURACY.

CAUTION: IT IS MANDATORY TO PERFORM THE VEHICLE LEVELING PROCEDURE, ACCORDING TO

TOOLS:

Pi Tape 24 to 36 inch range (AAR Tool for Wheel Diameter check).

AAR Steel Wheel Gauge (AAR Tool for Wheel Profile check).

AAR Wheel Defect Gauge (AAR Tool for Wheel Profile check).

CONSUMABLES:

N/A

SPARE PARTS:

N/A

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-01

System:

TRUCKS AND SUSPENSIONS

Sheet:

3/20

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

2

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE

PRELIMINARY OPERATIONS

Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop Regulations:

1. Apply wheel chocks to prevent the Vehicle from moving.

EXPLANATORY NOTES:

1- WHEEL IDENTIFICATION DATA

Each Wheel is identified by the following Data:

Month & Year of Manufacture	Manufacturer	Type of material	Heat #	Individual serial #	Drawing #
Refer to Fig 1		Refer to Fig 2		Refer to Fig 3	



Figure 1 - WHEEL IDENTIFICATION DATA

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-01

System:

TRUCKS AND SUSPENSIONS

Sheet:

4/20

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

2

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

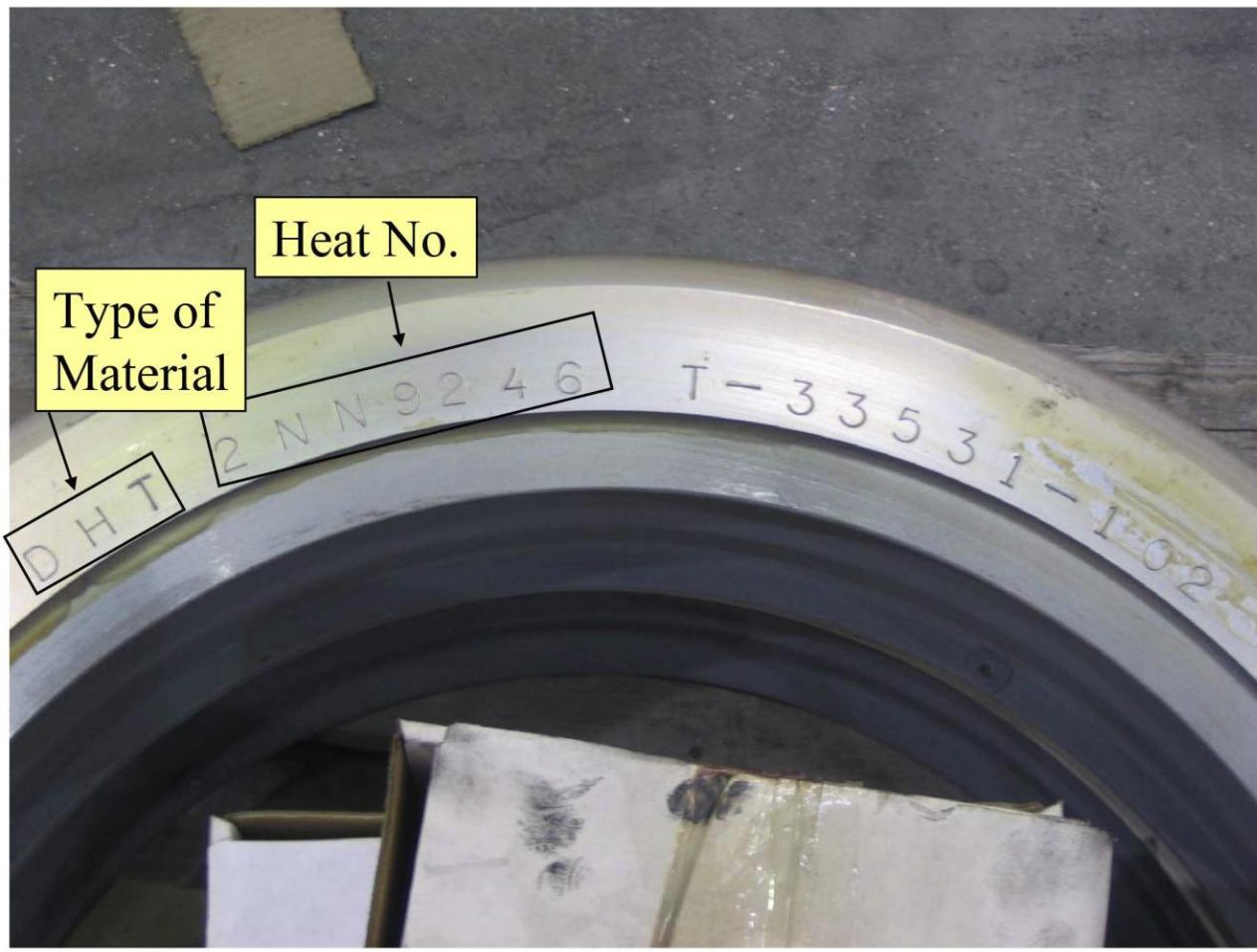


Figure 2 - WHEEL IDENTIFICATION DATA

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-01

System:

TRUCKS AND SUSPENSIONS

Sheet:

5/20

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

2

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

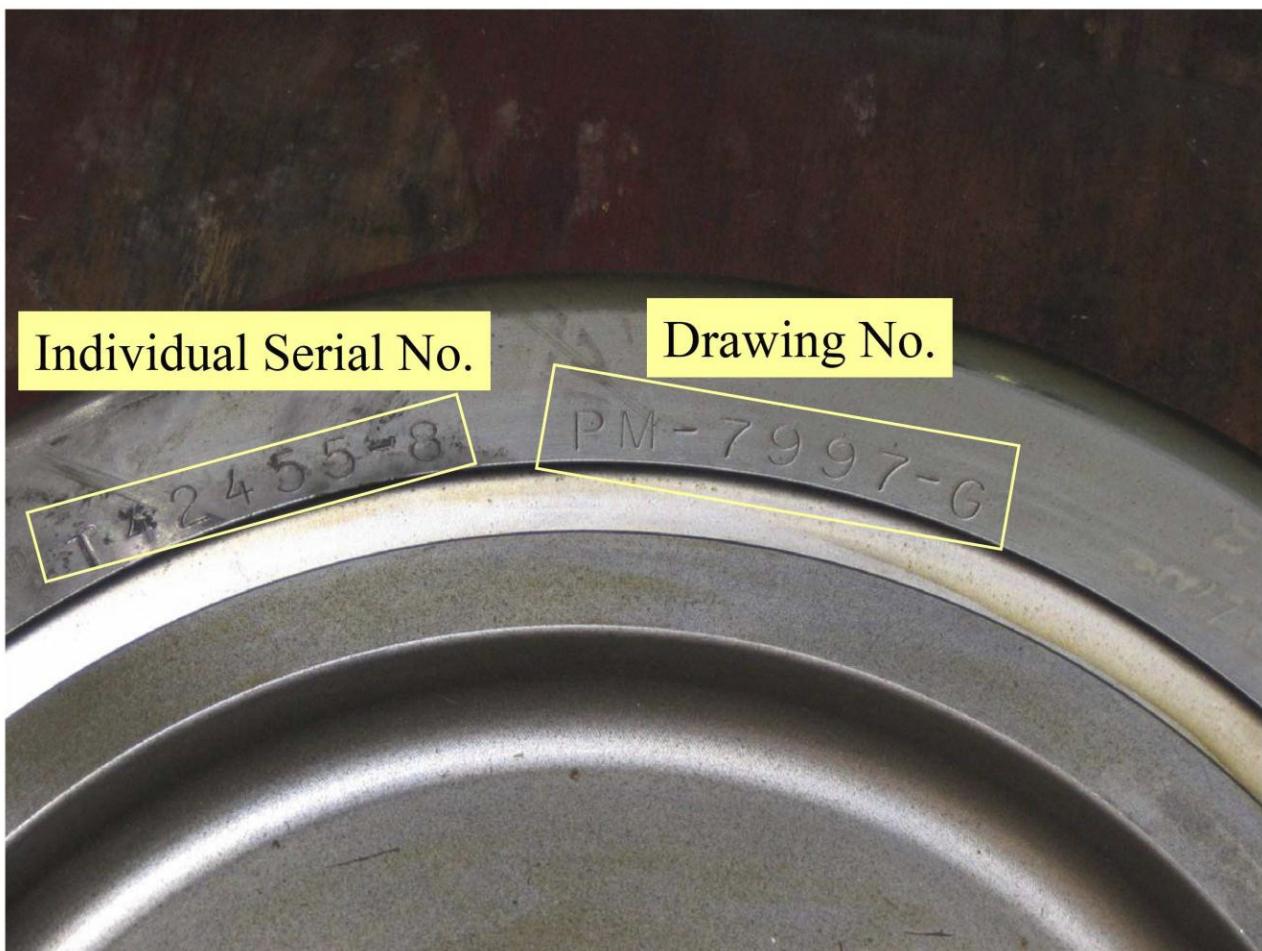


Figure 3 - WHEEL IDENTIFICATION DATA

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-01

System:

TRUCKS AND SUSPENSIONS

Sheet:

6/20

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

2

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

2- WHEEL DEFECTS

The Types of Wheel Defects are shown in Figure 4:

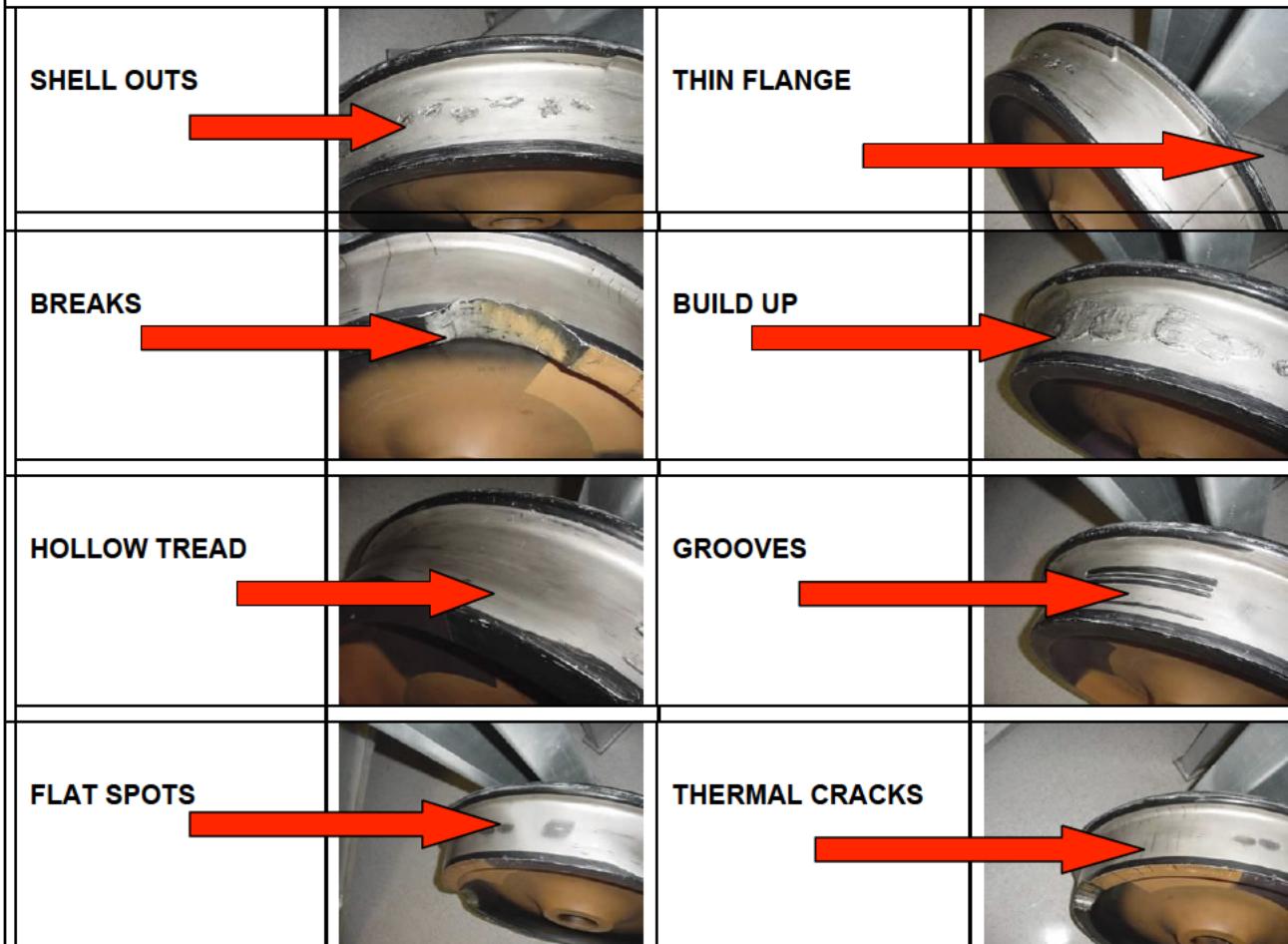


Figure 4 - TYPES OF WHEEL DEFECTS

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-01

System:

Sheet:

TRUCKS AND SUSPENSIONS

7/20

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

2

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

3- HOW TO USE THE Pi TAPE (24 TO 36 INCH RANGE) TO MEASURE WHEEL OUTSIDE DIAMETER

1. Make sure that Pi Tape and Wheel Outside Circumference are properly clean.
2. Apply the Pi Tape around the Wheel Outside Circumference.

NOTE: It is recommended to use pieces of masking tape to hold the Pi Tape in proper parallel position.

3. Apply a snug pull of 5 pounds tension when reading.

CAUTION: Pi TAPE ACCURACY IS +/- .001 ON STANDARD TAPES UP TO 144"
MAKE SURE THE TAPE HAS NOT BEEN STEPPED ON OR KINKED,
WHICH MAY REDUCE / DESTROY THE ACCURACY.

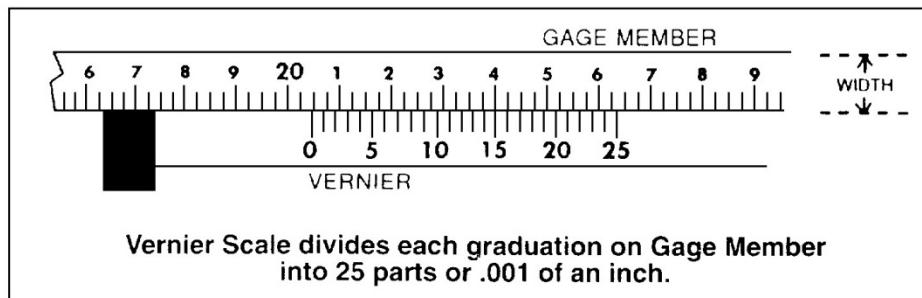


Figure 5 - EXAMPLE OF OUTSIDE DIAMETER MEASUREMENT TAPE READING

4. In the above Figure, the division to the left of the Vernier ZERO are 20 inches plus 1 division, or 20.025.

The 15th LINE on the Vernier coincides with a LINE on the Gage Member.

This is added to the 20.025, making a Total Diameter Reading of 20.040, which is

THE TRUE WHEEL DIAMETER READING AS MEASURED ON THE OUTSIDE CIRCUMFERENCE.

5. Once measurement is completed, proceed as follows:

- a) Wipe clean.
- b) Apply a light coat of rust preventative oil.
- c) Store in the Tape Container.

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-01

System:

TRUCKS AND SUSPENSIONS

Sheet:

8/20

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

2

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

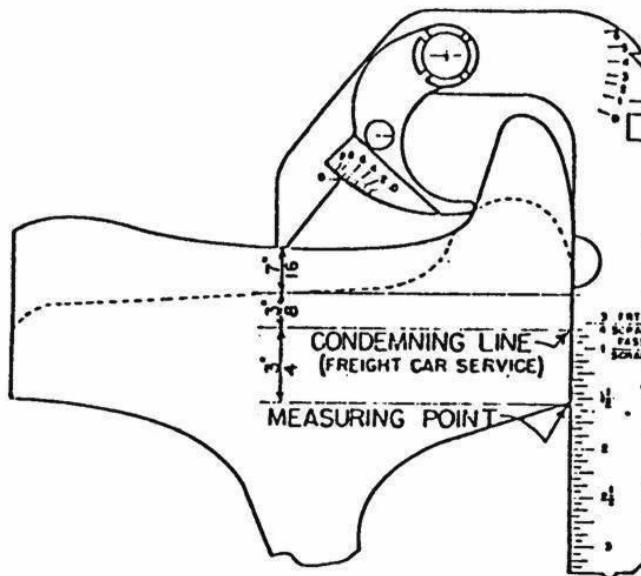
4- HOW TO USE THE AAR STEEL WHEEL GAUGE TO MEASURE WHEEL DIMENSIONS

1. Wheel Tire Diameter Measuring (2 measurements per wheel):

- a) Observe and Record the Radius reading in 16ths of an inch at the Measuring Point.
- b) Divide the Measuring Point Radius Reading by 16 to get the decimal equivalent.
- c) Multiply the decimal equivalent Radius Reading by 2 to get the Diameter Reading.
- d) Add the Diameter Reading to the known diameter of the wheel at the Measuring Point (24.121").
- e) The Result is the Wheel Diameter for the Measured Wheel.

NOTE: For Passing Criteria refer to:

AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."



$$\text{WHEEL DIAMETER} = 24.121" + [2 \times (\text{MEASURING POINT READING} / 16)]$$

Figure 6 - WHEEL DIAMETER MEASURING

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-01

System:

Sheet:

TRUCKS AND SUSPENSIONS
9/20

Subsystem/Assy:

Unit:

TRAILER TRUCK
WHEEL SET TRAILER TRUCK

Component:

Man Hours:

WHEEL
2

Maintenance Task:

Interval/Miles:

INSPECTION
120,000

PROCEDURE (CONT'D):

2. Wheel Flange Thickness Measuring (2 measurements per wheel):

NOTE: For Passing Criteria refer to:
 AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

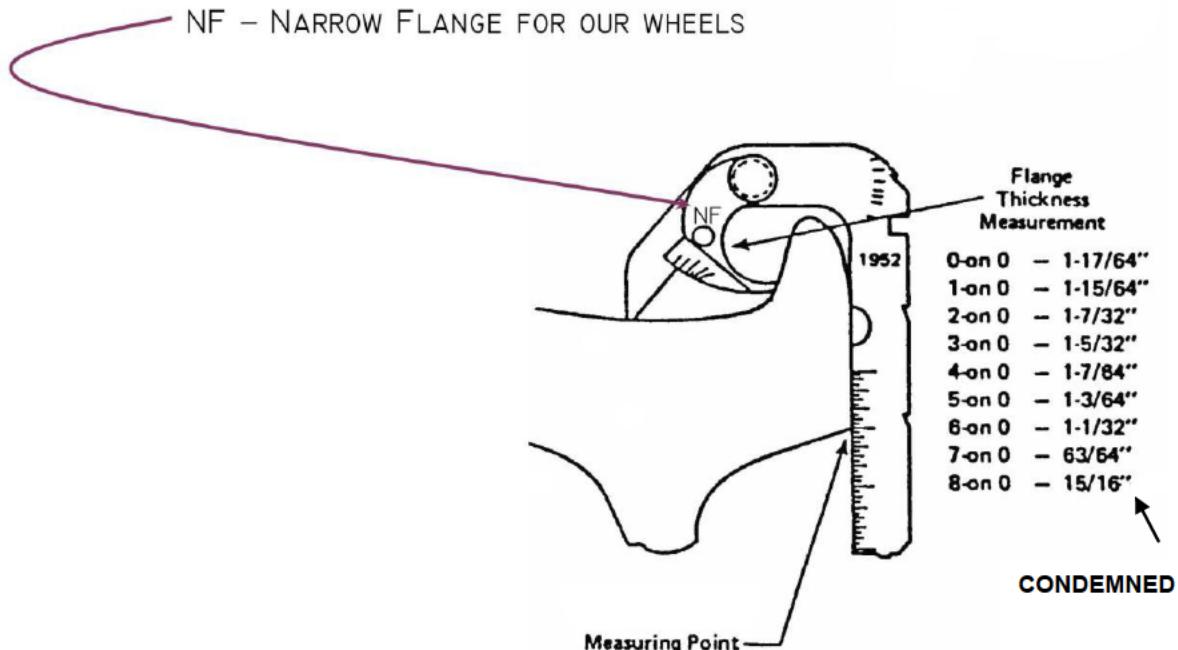


Figure 7 - WHEEL FLANGE THICKNESS MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-01

System:

TRUCKS AND SUSPENSIONS

Sheet:

10/20

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

2

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

3. **Wheel Flange Height Measuring (2 measurements per wheel)**

NOTE: For Passing Criteria refer to:
AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

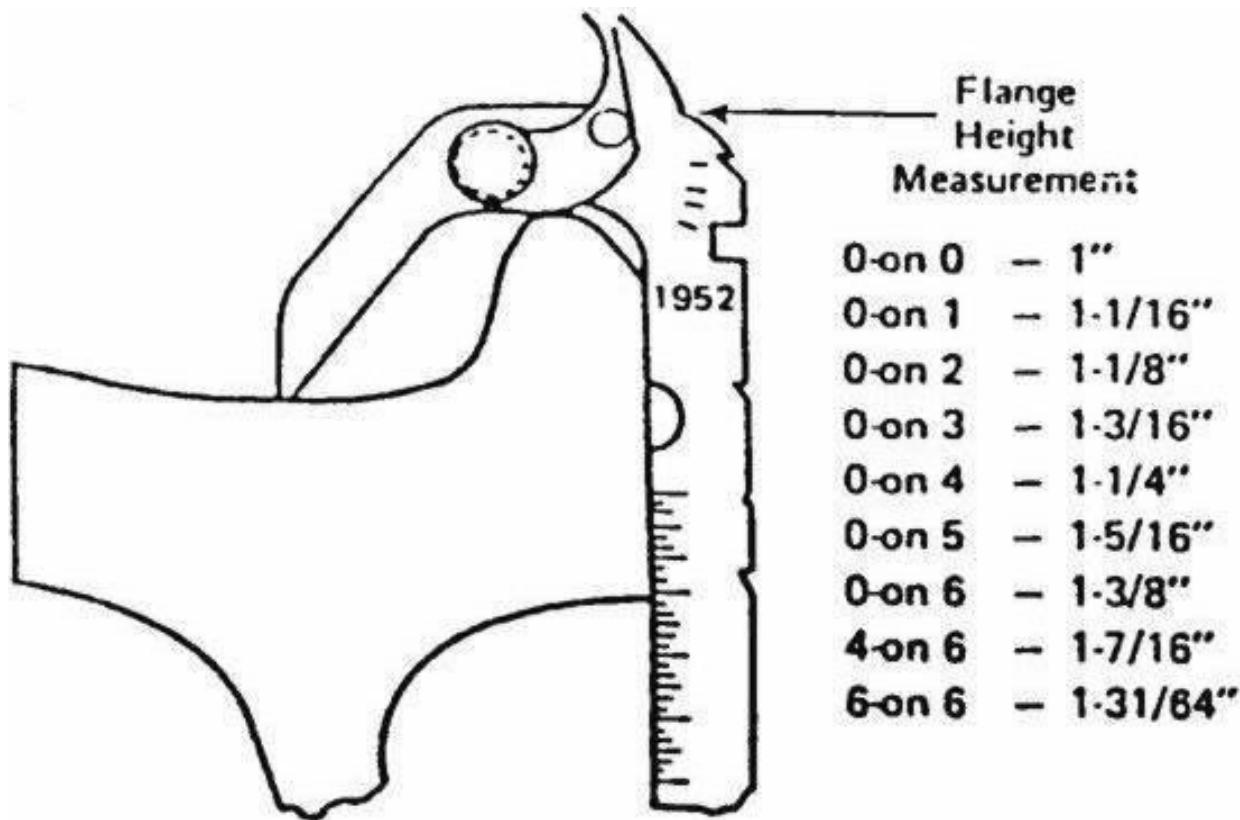


Figure 8 - WHEEL FLANGE HEIGHT MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-01

System:

TRUCKS AND SUSPENSIONS

Sheet:

11/20

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

2

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

4. Wheel High Flange Measuring (2 measurements per wheel)

NOTE: For Passing Criteria refer to:

AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

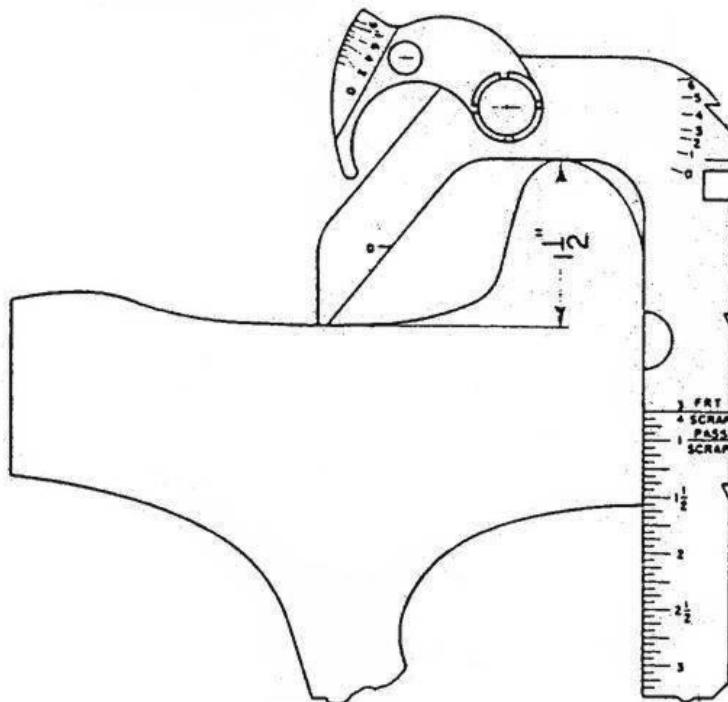


Figure 9 - WHEEL HIGH FLANGE MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-01

System:

TRUCKS AND SUSPENSIONS

Sheet:

12/20

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

2

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

5. Wheel Witness Groove Position Measuring (2 measurements per wheel)

NOTE: For Passing Criteria refer to:

AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

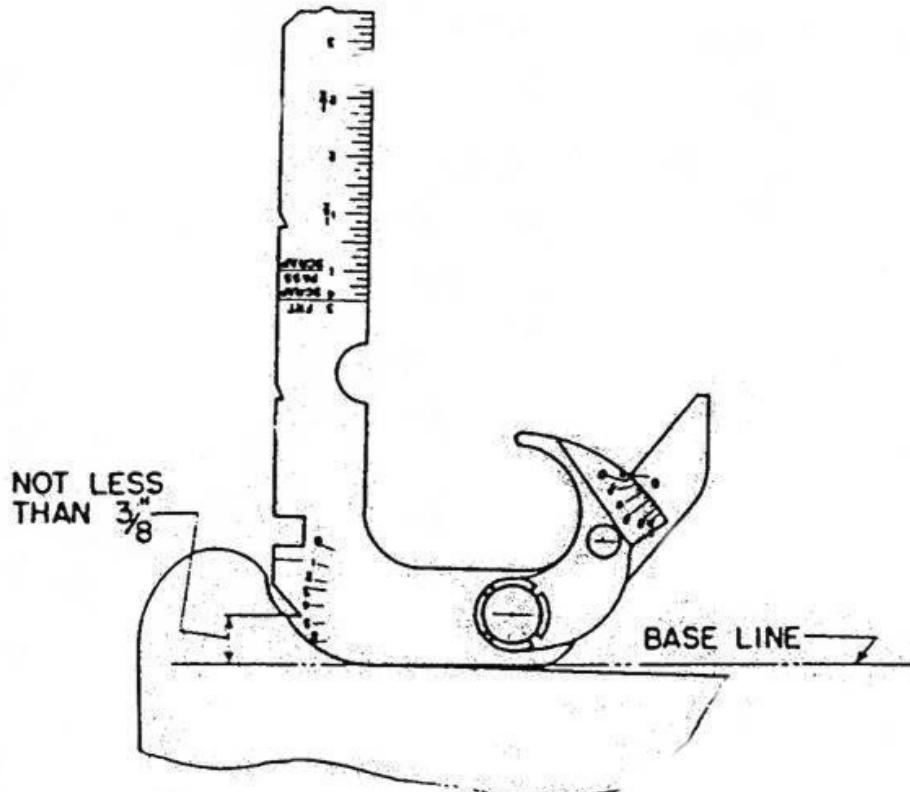


Figure 10 - WHEEL WITNESS GROOVE POSITION MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-01

System:

Sheet:

TRUCKS AND SUSPENSIONS
13/20

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

2

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

6. Wheel Witness Groove Depth Measuring (2 measurements per wheel)

NOTE: For Passing Criteria refer to:
AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

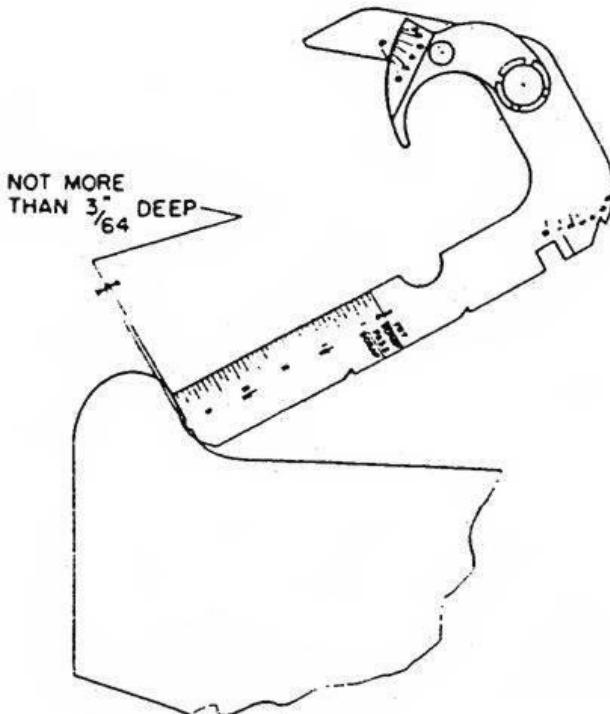


Figure 11 - WHEEL WITNESS GROOVE DEPTH MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-01

System:

TRUCKS AND SUSPENSIONS

Sheet:

14/20

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

2

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

7. Wheel Vertical Flange Measuring (2 measurements per wheel)

NOTE: For Passing Criteria refer to:

AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

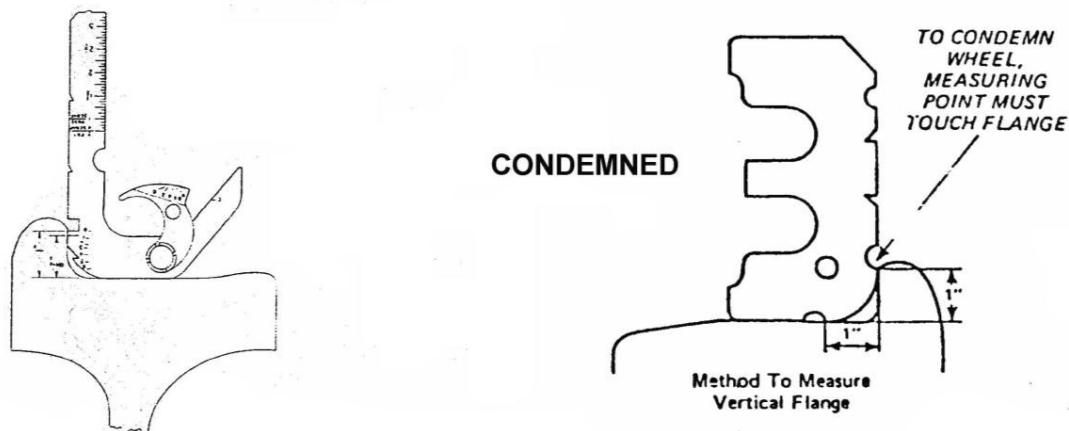


Figure 12 - WHEEL VERTICAL FLANGE MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-01

System:

Sheet:

TRUCKS AND SUSPENSIONS**15/20**

Subsystem/Assy:

Unit:

TRAILER TRUCK**WHEEL SET TRAILER TRUCK**

Component:

Man Hours:

WHEEL**2**

Maintenance Task:

Interval/Miles:

INSPECTION**120,000**

PROCEDURE (CONT'D):

8. Wheel Flange Thickness Measuring (2 measurements per wheel)

NOTE: For Passing Criteria refer to:
 AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

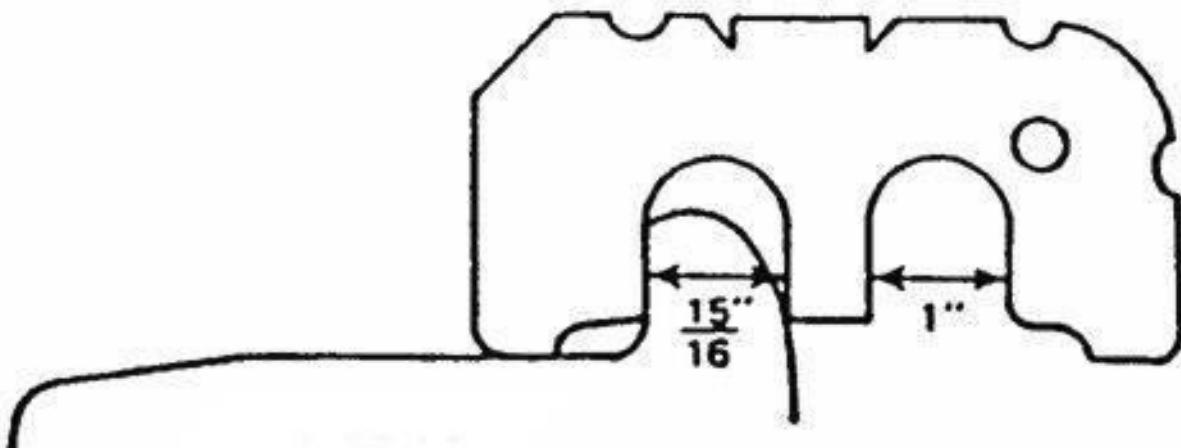


Figure 13 - WHEEL FLANGE THICKNESS MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-01

System:

TRUCKS AND SUSPENSIONS

Sheet:

16/20

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

2

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

9. Wheel Broken Rim & Heavy Flange Measuring (2 measurements per wheel)

NOTE: For Passing Criteria refer to:

AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

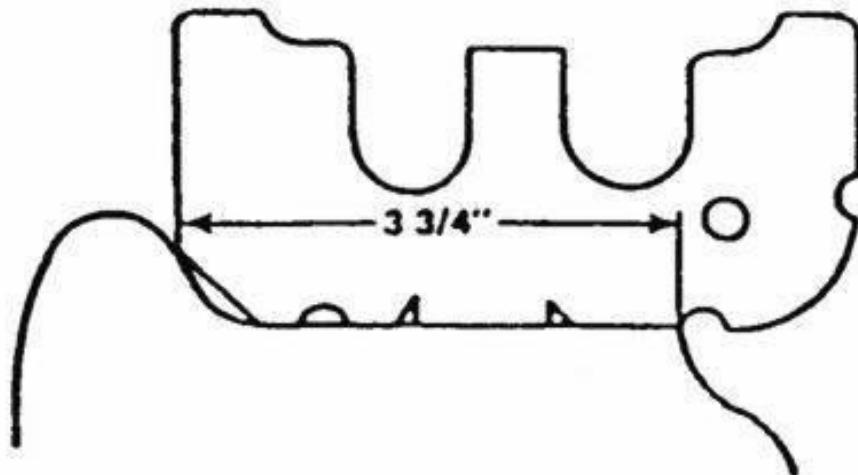


Figure 14 - WHEEL BROKEN RIM & HEAVY FLANGE MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-01

System:

Sheet:

TRUCKS AND SUSPENSIONS
17/20

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

2

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

10. Wheel Flat And Shell Spots Measuring

NOTE: For Passing Criteria refer to:

AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

If found 1/2" or more then inform Supervisor/Leader and have wheels reprofiling.

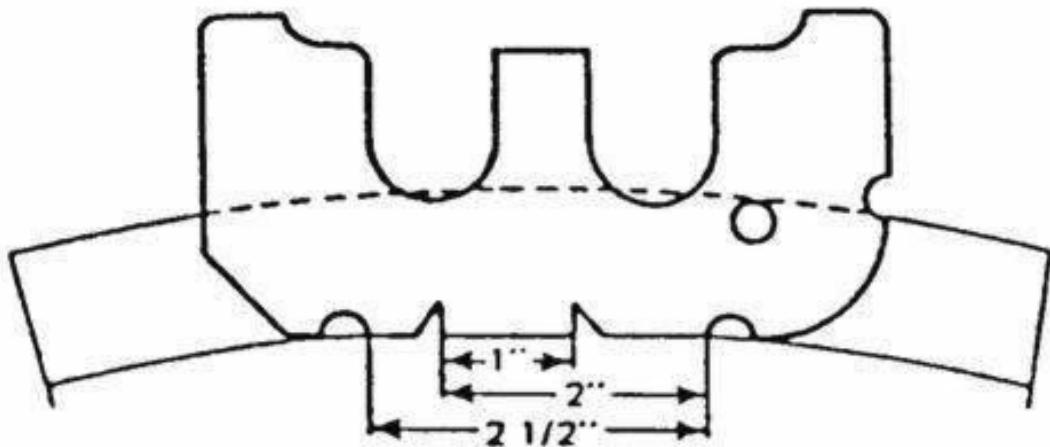


Figure 15 - WHEEL FLAT AND SHELL SPOTS MEASUREMENT

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-01

System:

TRUCKS AND SUSPENSIONS

Sheet:

18/20

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

2

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

INSPECTION

The aim of this task is to check wheels and re-profile, as necessary. (Refer to Figures 1 through 17).

To perform the task proceed as follows:

1. Inspect each Tire for the Defects shown in the previous Figure 4.
2. Measure each Wheel Tire Diameter, using recommended AAR tool, (refer to Figure 5).
3. Check the Wheel Back to Back and Runout tolerance values according to the next Table 1 and Figure 16
4. Check each Tire profile, using recommended AAR tool, (refer to Figures 6 through 15).
5. Check each Tire for Flats & Shell Spots and measure any defects with the recommended AAR tool (refer to Figure 15).

NOTE: For Passing Criteria refer to:

AAR Manual of Standard and Recommended Practices Section G "Wheel & Axles."

WARNING: WHEELS WITH TIRES LESS THAN 26.0" IN DIAMETER MUST BE REMOVED FROM SERVICE IMMEDIATELY.

6. As per measurements and checks results, determine the New Wheel Diameter Value to meet.
7. Perform the Wheel Truing procedure according to:
 - a. MTA Wheel Truing Regulation.
 - b. Wheel Dimensional Data and Wheel Dimensions shown in the Fig 17.
 - c. New Diameter Value previously determined.
 - d. Sheet R C 12-02-01-01-/RP-00.
8. Restore Electrical Power.

NOTE: For Trailer Truck Wheels re-profiling, the input of the "new" Wheel Diameter into IDU(A Cab) is not necessary because the Propulsion Logic makes an on-line measurement of the Wheel Diameters comparing the stored value of the reference A1R /A1L Wheels with the speed sensors frequencies and considering the ratio between them.

The wheel diameter calculation is executed only when both the following conditions are met:

 - a. The car speed is in the range between 5mph and 25mph.
 - b. The car mode is coasting for at least 3 seconds.
9. Upon completing the re-profiling it is recommended to perform the External Shunt Resistance Test on all wheels which were re-profiled, according to Sheet R-P-12-02-01-01/T-00.
10. Perform the Vehicle Leveling procedure according to Sheet R-C-01-01-00-00/LL-00
11. Remove wheel chocks.
12. Record Inspection and Test results on the Defect Report Card for administrative and maintenance planning.

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-01

System:

Sheet:

TRUCKS AND SUSPENSIONS

19/20

Subsystem/Assy:

Unit:

TRAILER TRUCK

WHEEL SET TRAILER TRUCK

Component:

Man Hours:

WHEEL

2

Maintenance Task:

Interval/Miles:

INSPECTION

120,000

PROCEDURE (CONT'D):

TABLE 1 TRAILER TRUCK - WHEEL BACK TO BACK AND RUNOUT TOLERANCES

DESCRIPTION	NOMINAL DIMENSION	TOLERANCES
Back to Back	1356 mm (3.375 in)	+2 mm /-5mm (+0.079 in /- 0.197)
Wheel TIR Radial Direction	0711 mm (028.00in)	not exceed 0.7 mm (0.028 in)
Wheel TIR direction parallel to the axle centreline		not exceed 1 mm (0.040 in)

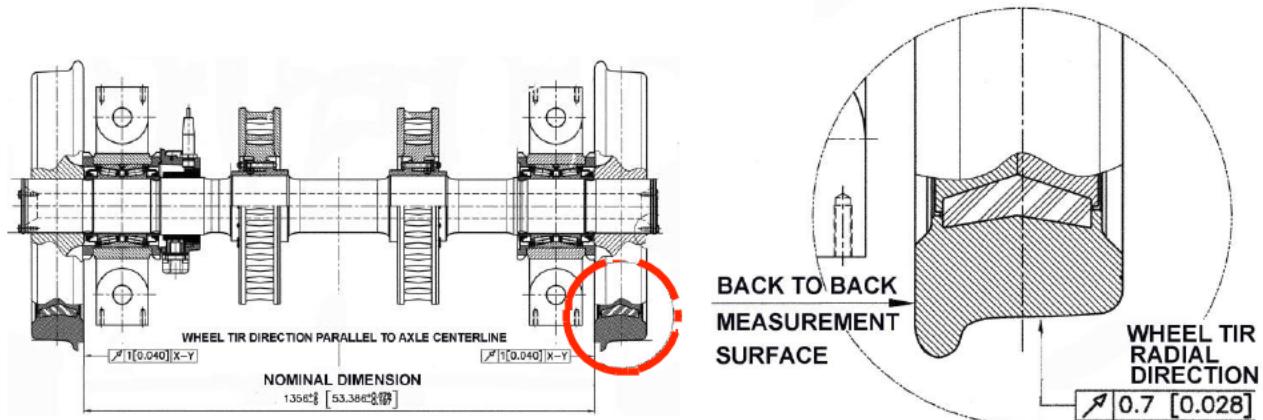


Figure 16 TRAILER TRUCK - WHEEL BACK TO BACK AND RUNOUT TOLERANCES

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/I-01

System:

TRUCKS AND SUSPENSIONS

Sheet:

20/20

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

2

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

WHEEL - DIMENSIONAL DATA

Wheel diameter (new) 28.00 in
 Wheel wear before replacement on diameter. 2.00 in
 Difference between the diameter of the wheels (same axle <.080 in)
 Difference between the diameter of the wheels. (same truck .38 in)
 Difference between the diameter of the wheels. (same vehicle ± 2 in)

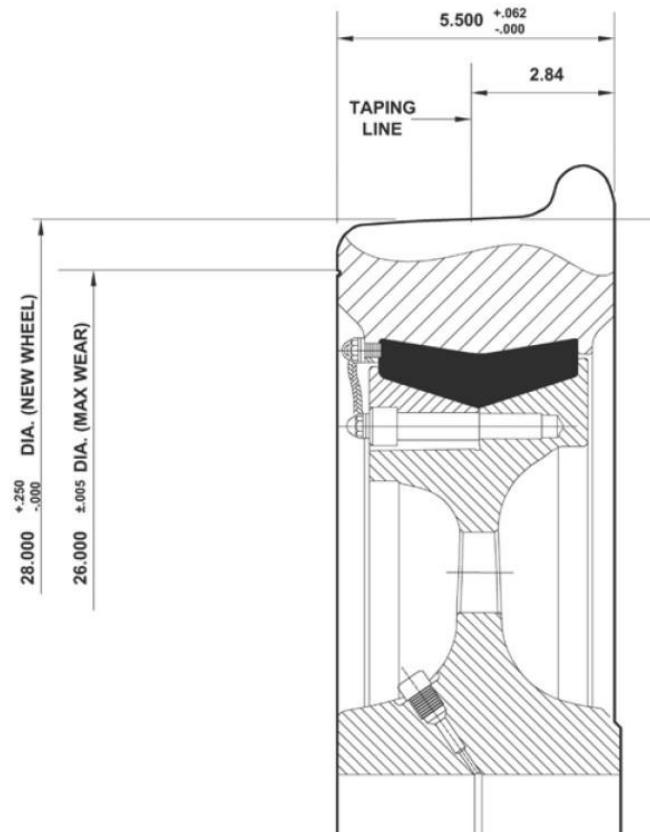


Figure 17 - TRUCKS WHEEL PROFILE

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:
R-P-12-02-01-01/T-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

1/8

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL SHUNTS

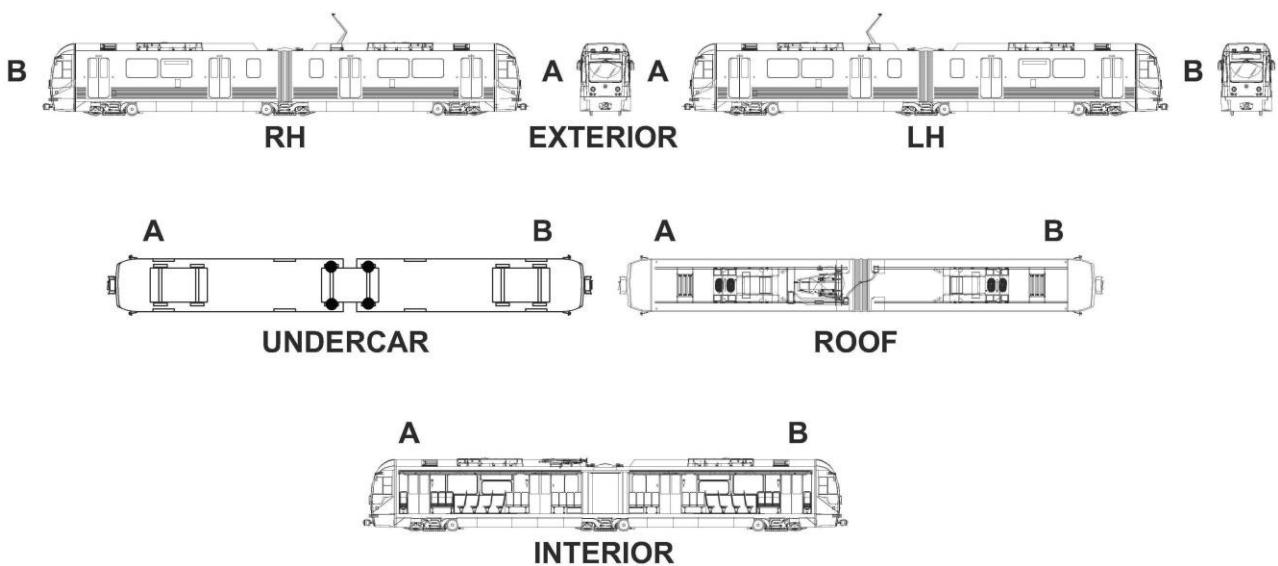
Man Hours:

2

Maintenance Task:

TEST

Interval/Miles:

120,000**LOCATION:**

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/T-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

2/8

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL SHUNTS

Man Hours:

2

Maintenance Task:

TEST

Interval/Miles:

120,000

SAFETY PRECAUTIONS:

WARNING: APPLY WHEEL CHOCKS TO PREVENT THE VEHICLE FROM MOVING.

WARNING: WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.

WARNING: LOSS OF CONTINUITY CAN AFFECT TRAIN CONTROL, SYSTEM SIGNALING OR VEHICLE GROUNDING AND COULD CAUSE SERIOUS INJURY.

WARNING: LOSS OF CONTINUITY CAN AFFECT TIRE INTEGRITY. A COMPLETE TIRE FAILURE COULD CAUSE A VEHICLE DERAILMENT.

CAUTION: METER PROBES AND WHEEL CONTACT SURFACES, MUST BE AS CLEAN AS POSSIBLE WHERE READINGS ARE TO BE TAKEN.

CAUTION: IN ORDER TO PERFORM THE EXTERNAL SHUNT RESISTANCE TEST, THE WHEEL AND/OR WHEEL SET SHOULD BE EITHER RAISED OR ELECTRICALLY ISOLATED FROM THE TRACK.

CAUTION: CARE SHOULD BE EXERCISED TO NOT OVER TORQUE THE SHUNT FASTENERS.

TOOLS:

Thompson Bridge, AEMC Corporation Model # 141.100

or

Isotek Corporation M210 Resistance Meter or equivalent

CONSUMABLES:

Rubber Sheets(or similar non conductor)

QTY = 8

Emery cloth 80 grit, or equivalent

as necessary

Cleaning rags,

as necessary

Cleaner / Degreaser / Mild Solvent, or equivalent

as necessary

Loctite 242

as necessary y

Anti-Oxidant Joint Compound,

as necessary

SPARE PARTS:

External Shunt

(PN 00658413)

QTY 12

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/T-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

3/8

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL SHUNTS

Man Hours:

2

Maintenance Task:

TEST

Interval/Miles:

120,000

PROCEDURE:

PRELIMINARY OPERATIONS

Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop Regulations:

NOTE The wheels need to be insulated from the rails for this test.

1. Move the vehicle so that one power truck and the trailer truck wheels are on top of rubber insulators.
NOTE Be sure to leave at least one power truck un-insulated so that the vehicle can be moved insulated to the other power truck.
2. Remove Electrical Power from Vehicle by lowering the Pantograph and deenergizing the catenary.
3. Lock out and tag out the catenary in accordance with all LACMTA Safety Rules, Regulations, Policies, and Procedures.

NOTE The tag must indicate the name of the person who removed Power.

That person knows why the Power was removed and when it safe to restore it.

Only the individual whose name appears on the tag or a person with his approval should remove the tag and restore Power.

4. Apply wheel chocks to prevent the Vehicle from moving.

SHUNT RESISTANCE TEST

To perform the task proceed as follows:

1. Inspect each External Tire Shunt for damage, signs of fraying and missing / loose parts.

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/T-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

4/8

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL SHUNTS

Man Hours:

2

Maintenance Task:

TEST

Interval/Miles:

120,000**PROCEDURE:**

2. Replace all faulty / damaged External Shunts as follows:
- Remove and discard damaged Shunt and relevant Shunt Mounting Bolts.
 - Clean, on the Tire and on the Wheel Center, the Shunt contact surface using recommended agents as required.
 - Apply a small amount of Loctite 242 to the threads of the new Shunt Mounting Bolts.
 - Apply a bead of Anti-Oxidant Joint Compound (in a circular path around the bolt hole)to the underside of the Shunt Terminals.



- Align Shunt over proper locations and position as they were removed, in "U" shape, on the Tire and Wheel Center.



- Insert the Loctite 242 Shunt Mounting Bolts and torque to **min 7 max 9 ft-lb.**

CAUTION: CARE SHOULD BE EXERCISED TO NOT OVER TORQUE THE SHUNT FASTENERS.

**P2550 PREVENTIVE
MAINTENANCE SHEET**

System:

TRUCKS AND SUSPENSIONS

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET

Component:

WHEEL SHUNTS

Maintenance Task:

TEST

PROCEDURE:

3. Perform the External Shunt Resistance Test as follows:

a. Wheel Center - Wheel Tire(same Wheel) Resistance Test

1. Locate the area on the Wheel Tire and on the Wheel Center where the 1st reading is to be taken.
2. Clean the Tire and Wheel Center areas using Emery Cloth 80 grit and mild solvent



3. Position one meter probe to the Wheel Tire and the other meter probe to the Wheel Center (hub)(of the same Wheel).



P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/T-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

6/8

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL SHUNTS

Man Hours:

2

Maintenance Task:

TEST

Interval/Miles:

120,000**PROCEDURE:**

4. Read the 1st resistance value on the Resistance Meter and record it on the Form provided at the end of this Sheet.

CAUTION METER PROBES AND WHEEL CONTACT SURFACES, MUST BE AS CLEAN AS POSSIBLE WHERE READINGS ARE TO BE TAKEN

5. Locate the area (which should be 180° from the spot of the first reading) on the Tire and Wheel Center (hub) where the 2nd reading is to be taken.
6. Clean the Wheel Tire and Wheel Center areas using Emery Cloth 80 grit and mild solvent or equivalent.
7. Position one meter probe to the Wheel Tire and the other meter probe to the Wheel Center (hub) (of the same Wheel) for the 2nd reading.
8. Read the 2nd resistance value on the Resistance Meter and record it on the Form provided at the end of this Sheet.
9. Calculate the Average Value between the two readings and record it on the Form provided at the end of this Sheet.
10. Perform the External Shunt Resistance Test for the other Wheel of same Axle according to previous steps 3 a 1 through 3 a 9 and relevant instructions.

b. Wheel Tire to Wheel Tire (same Axle) Resistance Test

1. Read the 1st resistance value on the Resistance Meter and record it.

CAUTION METER PROBES AND WHEEL CONTACT SURFACES, MUST BE AS CLEAN AS POSSIBLE WHERE READINGS ARE TO BE TAKEN

2. Locate the area, on both Tires (of the same axle), where the 1st Tire-Hub was taken.
3. Clean both Tire areas using Emery Cloth 80 grit and mild solvent.
4. Position one meter probe to the Tire of one Wheel and the other probe to the Tire of the other Wheel (of the same Axle).
5. Repeat for the Second Tire Hub reading.
6. Read the 2nd resistance value on the Resistance Meter and record it on the Form provided at the end of this Sheet.
7. Calculate the Average Value between the two readings and record it on the Form provided at the end of this Sheet.
8. Upon completing the Center to Tire readings of both Wheels and the Tire to Tire readings of the same axle, proceed as follows:
 - a. Compare, for each Wheel and for the relevant Wheel Set, the resulting Average Values with the consistent Condemning Limits listed below and follows the Instructions listed beside.

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/T-00

System:

Sheet:

TRUCKS AND SUSPENSIONS

7/8

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL SHUNTS

Man Hours:

2

Maintenance Task:

TEST

Interval/Miles:

120,000

PROCEDURE:

METER READING AVERAGE VALUES CONDEMNING LIMITS			Instructions
CENTER TO TIRE LH WHEEL	CENTER TO TIRE RH WHEEL	TIRE TO TIRE WHEEL SET	
< 0.005 Ohm (GOOD)	< 0.005 Ohm (GOOD)	< 0.010 Ohm (GOOD)	No action needed. Leave all shunts in place.
> 0.005 Ohm (BAD)	> 0.005 Ohm (BAD)	> 0.010 Ohm (BAD)	1-Replace ALL External Shunts of both Wheels according to previous step 2 2-After replacement repeat : a) Center to Tire Resistance Test of both Wheels b) Tire to Tire Resistance Test of the relevant Wheel Set
< 0.005 Ohm (GOOD)	> 0.005 Ohm (BAD)	> 0.010 Ohm (BAD)	1-Replace the External Shunts (on the Tire which is BAD) according to previous step 2 2-After replacement repeat : a) Center to Tire Resistance Test on the Wheel where the External Shunts have been replaced. b) Tire to Tire Resistance Test of the relevant Wheel Set
> 0.005 Ohm (BAD)	< 0.005 Ohm (GOOD)	> 0.010 Ohm (BAD)	1-Replace the External Shunts (on the Tire which is BAD) according to previous step 2 2-After replacement repeat : a) Center to Tire Resistance Test on the Wheel where the External Shunts have been replaced b) Tire to Tire Resistance Test of the relevant Wheel Set

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-01/T-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

8/8

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL SHUNTS

Man Hours:

2

Maintenance Task:

TEST

Interval/Miles:

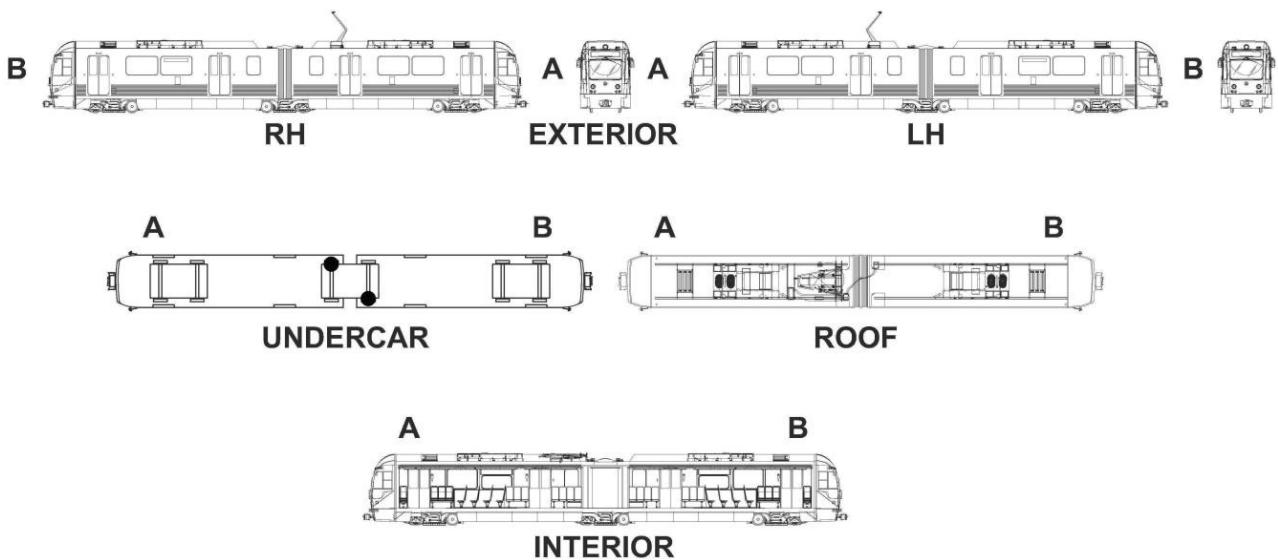
120,000**INTENTIONALLY LEFT BLANK**

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:
R-P-12-02-01-04/I-00

System:	Sheet:
TRUCKS AND SUSPENSIONS	1/4
Subsystem/Assy:	Unit:
TRAILER TRUCK	WHEEL SET TRAILER TRUCK
Component:	Man Hours:
SPEED SENSOR DEVICE	1
Maintenance Task:	Interval/Miles:
INSPECTION	120,000

LOCATION:



P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-04/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

2/4

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

SPEED SENSOR DEVICE

Man Hours:

1

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

SAFETY PRECAUTIONS:

WARNING: BLUE FLAG THE VEHICLE IN ACCORDANCE WITH ALL LACMTA BLUE FLAG POLICIES, RULES, & PROCEDURES IN ORDER TO WARN THAT MAINTENANCE PERSONNEL ARE WORKING ON, UNDER, OR NEAR ROLLING EQUIPMENT.

WARNING: VERIFY THAT THE PARKING BRAKE ARE APPLIED

WARNING: WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.

TOOLS:

LACMTA Maintenance Shop Standard Tools Kit.

CONSUMABLES:

CRC Industrial - Precision Cleaner M3 PN 147535

Dry Compressed Air for Electronic Equipment (commercial)

SPARE PARTS:

Propulsion Speed Sensor (Passive) (PN 371VE03010B) QTY=2

Mating Connector (PN AA04A96) (IT 3106A-10SL-4S) QTY=2

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-04/I-00

System:

Sheet:

TRUCKS AND SUSPENSIONS
3/4

Subsystem/Assy:

Unit:

TRAILER TRUCK
WHEEL SET TRAILER TRUCK

Component:

Man Hours:

SPEED SENSOR DEVICE
1

Maintenance Task:

Interval/Miles:

INSPECTION
120,000

PROCEDURE:

PRELIMINARY OPERATIONS

Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop Regulations:

1. Place the Vehicle over the Pit (or Stand Up Rail).
2. Set the Master Controller Handle to FSB position.
3. Make sure that all Parking Brakes are applied (by checking on the IDU "Parking Brake A and B Not Released" and on Indicator Panel "A" "Park / Friction Brake" ON).
4. Remove Electrical Power from Vehicle by lowering the Pantograph.
5. Turn the Transfer Switch to OFF.
6. Set the Pantograph Control Motor Switch (5F02 CB LV Locker "A" Section) to OFF.
7. Lock out and tag out the Switch in accordance with all LACMTA Safety Rules, Regulations, Policies, and Procedures.

NOTE: The tag must indicate the name of the person who removed Power.

That person knows why the Power was removed and when it safe to restore it.

Only the individual whose name appears on the tag or a person with his approval should remove the tag and restore Power.

8. Apply wheel chocks to prevent the Vehicle from moving.

INSPECTION

1. Locate the Propulsion Speed Sensor Device to be inspected (see Fig 1).
2. Thoroughly clean the visible part of the Propulsion Speed Sensor Device using recommended cleaning agent and lint-free rags.
3. Inspect the Electrical Connector for visible damage and loose / missing parts.
4. Verify cable is tight at the speed sensor.
5. Thoroughly clean and dry the Electrical Connector.
6. If there is a Speed Sensor fault on the IDU or the Speed Sensor is loosen proceed with the following steps:
 - a. Loose the Locking Nut, then gently screw the Speed Sensor into the Ground Contact Device housing until it makes contact with the Gear.
 - b. Back the Speed Sensor out $\frac{3}{4}$ of turn.
 - c. Lock the Speed Sensor in place using the Jam Nuts. Torque the Nuts to **20 ft-lb**.

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-01-04/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

6/4

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

SPEED SENSOR DEVICE

Man Hours:

1

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE:

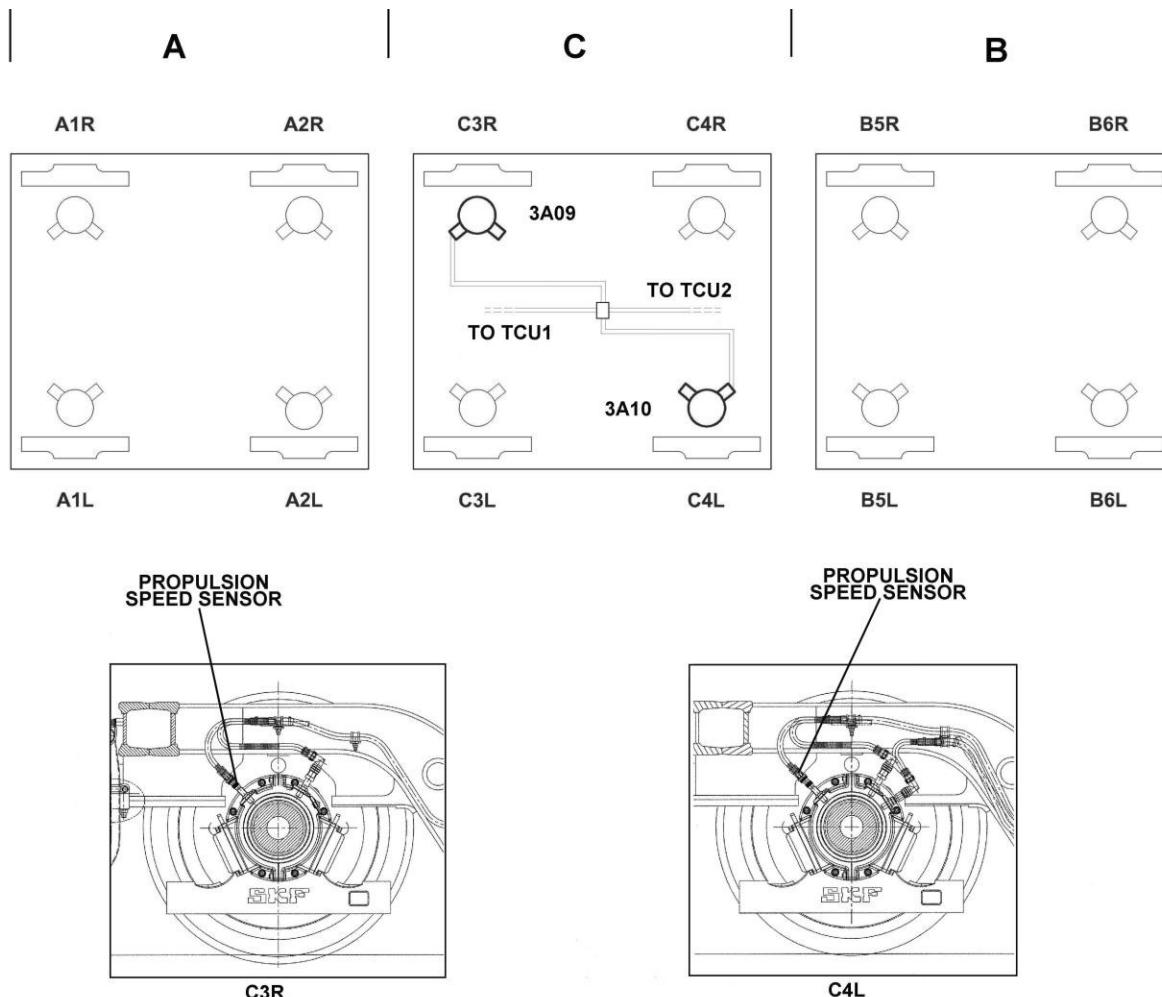


Figure 1 - PROPULSION SPEED SENSORS LOCATION

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-05-00/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

1/8

Subsystem/Assy:

TRAILER TRUCK

Unit:

SECONDARY SUSPENSION

Component:

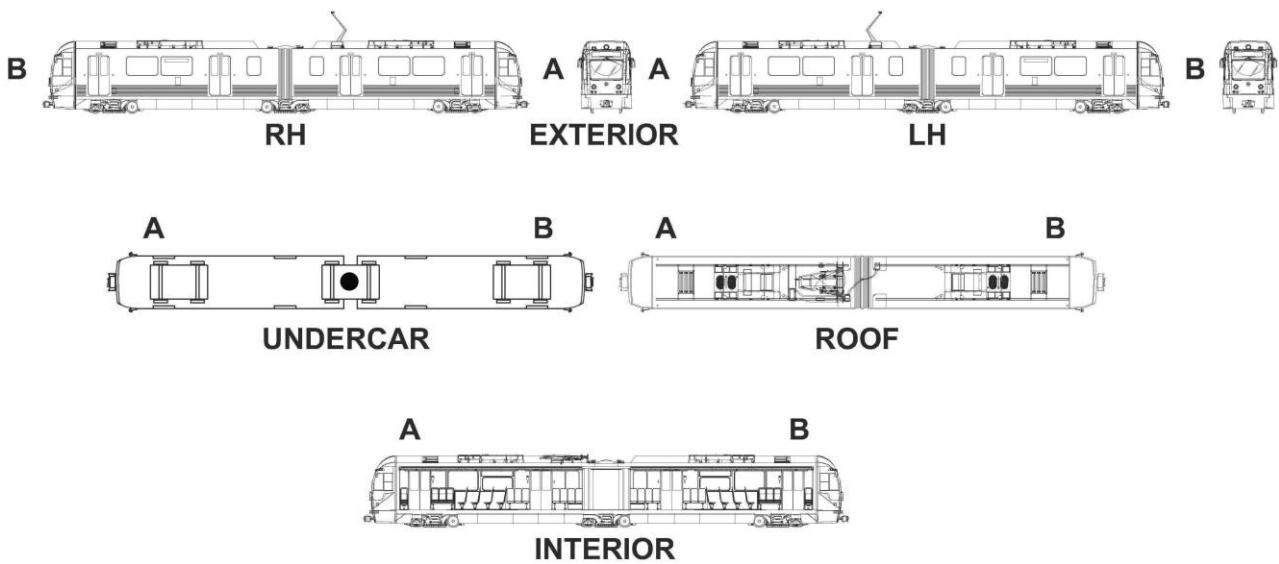
Man Hours:

0.5

Maintenance Task:

INSPECTION

Interval/Miles:

120,000**LOCATION:**

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-05-00/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

2/8

Subsystem/Assy:

TRAILER TRUCK

Unit:

SECONDARY SUSPENSION

Component:

Man Hours:

0.5

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

SAFETY PRECAUTIONS:

WARNING: BLUE FLAG THE VEHICLE IN ACCORDANCE WITH ALL LACMTA BLUE FLAG POLICIES, RULES, & PROCEDURES IN ORDER TO WARN THAT MAINTENANCE PERSONNEL ARE WORKING ON, UNDER, OR NEAR ROLLING EQUIPMENT.

WARNING: WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.

TOOLS:

LACMTA Maintenance Shop Standard Tools Kit.

CONSUMABLES:

Cleaner / Degreaser

Dow Corning BR2 EP grease, as needed

SPARE PARTS:

N/A

P2550 PREVENTIVE MAINTENANCE SHEET	
Card Code:	
R-P-12-02-05-00/I-00	
System: TRUCKS AND SUSPENSIONS	Sheet: 3/8
Subsystem/Assy: TRAILER TRUCK	Unit: SECONDARY SUSPENSION
Component:	Man Hours: 0.5
Maintenance Task: INSPECTION PROCEDURE:	Interval/Miles: 120,000
PRELIMINARY OPERATIONS	
Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop Regulations:	
<ol style="list-style-type: none"> 1. Place the Vehicle over the Pit (or Stand Up Rail). 2. Set the Master Controller Handle to FSB position. 3. Make sure that all Parking Brakes are applied (by checking on the IDU "Parking Brake A and B Not Released" and on Indicator Panel "A" "Park / Friction Brake" ON). 4. Remove Electrical Power from Vehicle by lowering the Pantograph. 5. Turn the Transfer Switch to OFF. 6. Set the Pantograph Control Motor Switch (5F02 CB LV Locker "A" Section) to OFF. 7. Attach a tag with the person's name who removed power. 	
<p>NOTE: That person knows why the Power was removed and when it safe to restore it.</p> <p>Only the individual whose name appears on the tag or a person with his approval should remove the tag and restore power.</p>	

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-05-00/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

4/8

Subsystem/Assy:

TRAILER TRUCK

Unit:

SECONDARY SUSPENSION

Component:

Man Hours:

0.5

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

INSPECTION

To perform the task proceed as follows (Refer to Figures 1 through 3):

1. Inspect each Air Spring for deformation / visible deflection and /or damage.
2. Inspect each Air Spring Piston for damage / deformation and signs of rust / paint degradation.
3. Inspect each Air Spring Lamination Damper and piping connection for damage /loose parts and air leakage.
4. Inspect each Air Spring Seat (on Bolster beam) and Plate for damage / deformation and signs of rust /paint degradation.
5. Inspect the Air Springs Elastic Shims (if installed) and Vertical Bump Stop Shims for proper installation /damage / deformation.
6. Inspect each Lateral Shock Absorber for damage, missing / loose parts, oil leakage and signs of rust / paint degradation.
7. Inspect each Connecting Rod for deformation / damage and missing / loose parts.
8. Inspect each Connecting Rod Rubber Elements for damage / wear.
9. Inspect the Lateral and Vertical Bump Stops for signs of damage / deformation and the Rubber Elements for signs of wear and missing/loose parts.
10. Inspect Leveling Valve, Adjusting Rod, Bracket (with relevant attaching parts) for signs of damage, deformation, missing / loose parts and air leakage.
11. Lubricate the Spherical Terminals of the Adjusting Rod of the Leveling Valve, using recommended Product.
12. Inspect Secondary Suspension Piping and piping connections for damage, loose parts and air leakage.
13. Inspect Secondary Suspension piping clamps for damage and missing /loose parts.
14. Restore Electrical Power.
15. Record Inspection results on the Defect Report Card for administrative and maintenance planning.

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-05-00/I-00

System:

Sheet:

TRUCKS AND SUSPENSIONS**5/8**

Subsystem/Assy:

Unit:

TRAILER TRUCK**SECONDARY SUSPENSION**

Component:

Man Hours:

0.5

Maintenance Task:

Interval/Miles:

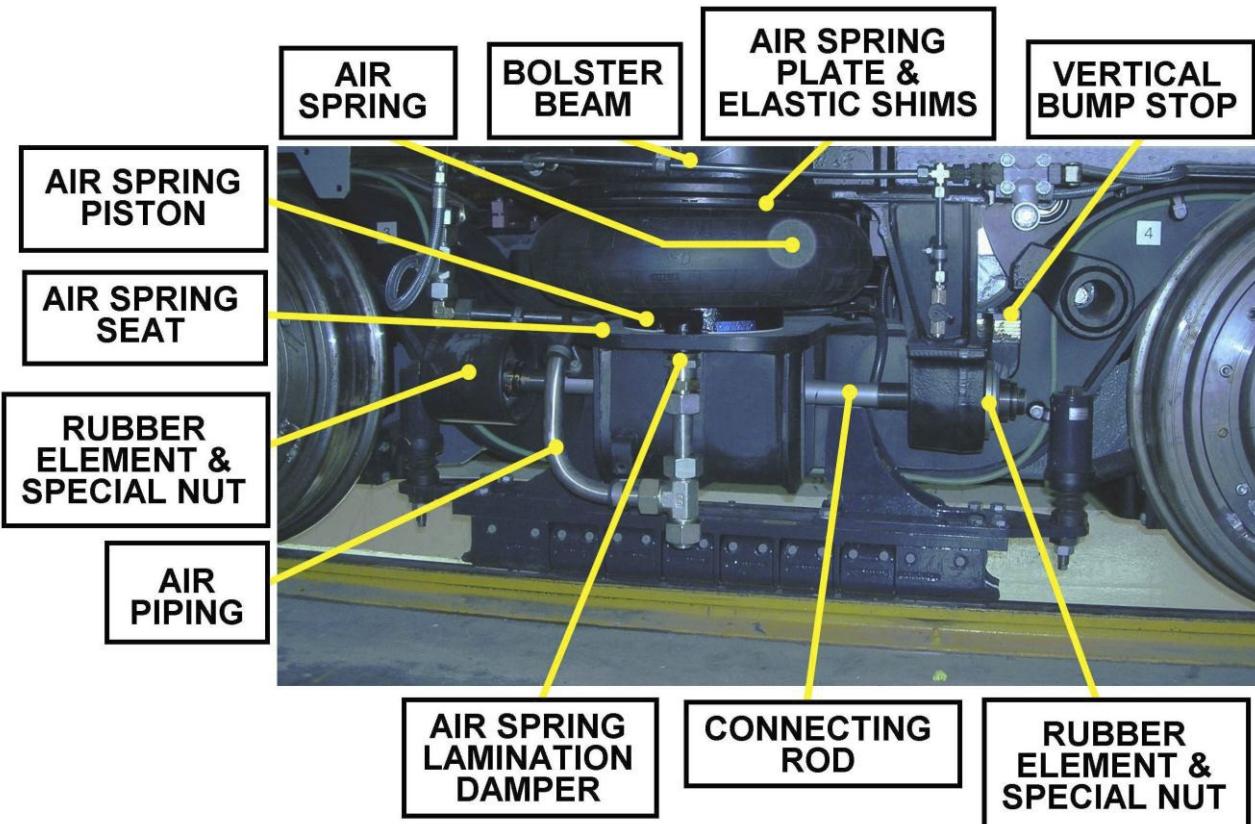
INSPECTION**120,000****PROCEDURE (CONT'D):**

Figure 1 - SECONDARY SUSPENSION INSPECTION

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-05-00/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

6/8

Subsystem/Assy:

TRAILER TRUCK

Unit:

SECONDARY SUSPENSION

Component:

Man Hours:

0.5

Maintenance Task:

INSPECTION

Interval/Miles:

120,000

PROCEDURE (CONT'D):

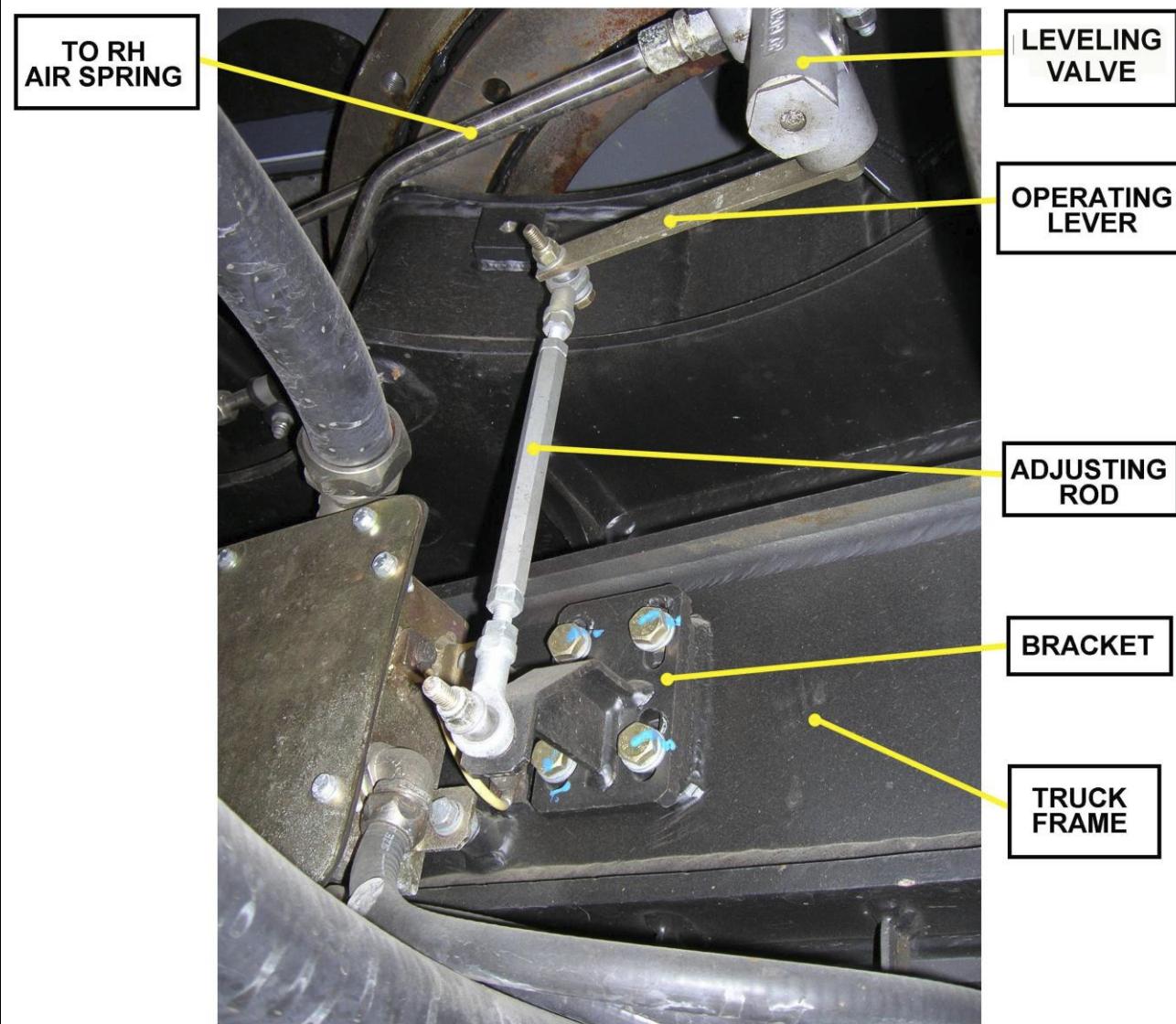


Figure 2 - LEVELING VALVE INSPECTION

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-05-00/I-00

System:

Sheet:

TRUCKS AND SUSPENSIONS**7/8**

Subsystem/Assy:

TRAILER TRUCK

Unit:

SECONDARY SUSPENSION

Component:

Man Hours:

0.5

Maintenance Task:

INSPECTION

Interval/Miles:

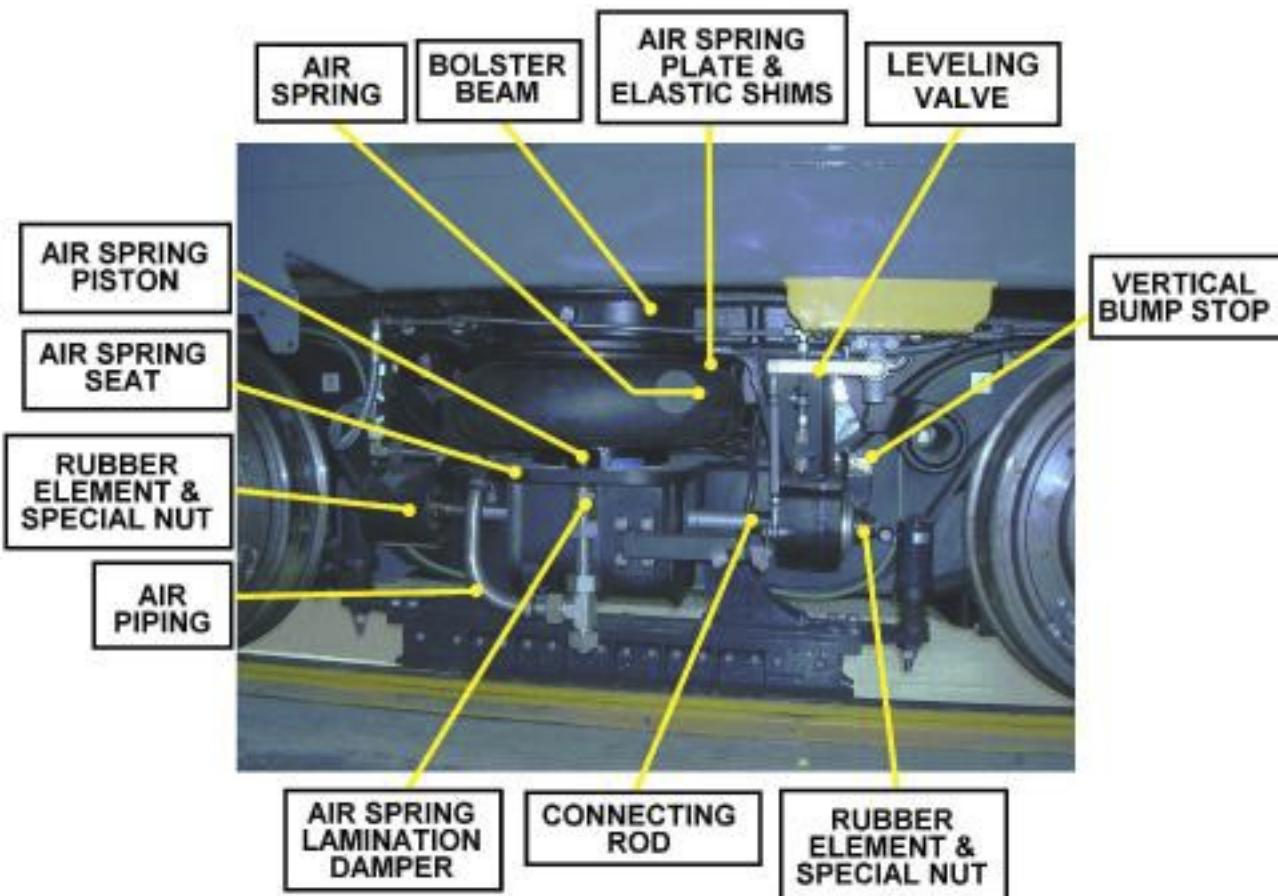
120,000**PROCEDURE (CONT'D):**

Figure 3 - SECONDARY SUSPENSION INSPECTION

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-02-05-00/I-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

8/8

Subsystem/Assy:

TRAILER TRUCK

Unit:

SECONDARY SUSPENSION

Component:

Man Hours:

0.5

Maintenance Task:

INSPECTION

Interval/Miles:

120,000**INTENTIONALLY LEFT
BLANK**

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-03-01-02/S-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

1/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

PNEUMATICS EQUIPMENT

Component:

AIR FILTER

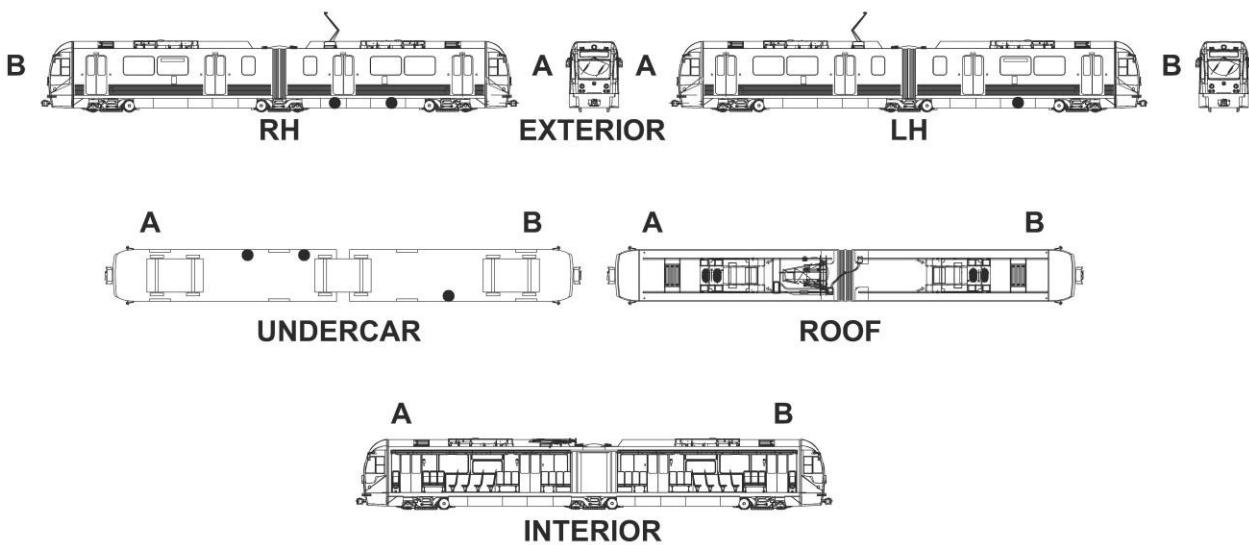
Man Hours:

1

Maintenance Task:

SERVICE

Interval/Miles:

120,000
LOCATION:


P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-03-01-02/S-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

2/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

PNEUMATICS EQUIPMENT

Component:

AIR FILTER

Man Hours:

1

Maintenance Task:

SERVICE

Interval/Miles:

120,000**SAFETY PRECAUTIONS:**

- WARNING:** BLUE FLAG THE VEHICLE IN ACCORDANCE WITH ALL LACMTA BLUE FLAG POLICIES, RULES, & PROCEDURES IN ORDER TO WARN THAT MAINTENANCE PERSONNEL ARE WORKING ON, UNDER, OR NEAR ROLLING EQUIPMENT.
- WARNING:** APPLY WHEEL CHOCKS TO PREVENT THE VEHICLE FROM MOVING.
- WARNING:** WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.
- WARNING:** HIGH PRESSURE IS VENTED WHEN CUTOUT COCK IS CLOSED. WEAR SAFETY GOGGLES AND EAR PROTECTION AND EXERCISE CAUTION. FAILURE TO COMPLY MAY RESULT IN INJURY.
- WARNING:** FILTER CONTAINS A SPRING LOADED FILTER ELEMENT. EXERCISE CAUTION WHEN DISASSEMBLING PLUG CAP. FAILURE TO COMPLY CAN LEAD TO INJURY.
- WARNING:** SOLVENTS AND SOLVENT FUMES CAN BE HARMFUL TO HEALTH. WHEN USING SOLVENTS, WEAR EYE, SKIN, AND RESPIRATORY PROTECTION AS REQUIRED. WORK IN WELL VENTILATED AREA. AVOID REPEATED OR PROLONGED CONTACT. KEEP SOLVENT CONTAINER CLOSED. KEEP SOLVENT AWAY FROM SPARKS, FLAMES, AND HEAT. FAILURE TO OBSERVE THESE SAFETY PRECAUTIONS CAN LEAD TO INJURY OR INTOXICATION.
- WARNING:** CLEANING USING COMPRESSED AIR CAN CAUSE DIRT PARTICLES TO BECOME AIRBORNE. WEAR EYE PROTECTION WHEN CLEANING WITH COMPRESSED AIR TO AVOID INJURY. DO NOT EXCEED 30 PSI. FAILURE TO COMPLY CAN LEAD TO INJURY.

TOOLS:

LACMTA Maintenance Shop Standard Tools Kit.
1"+1/4 Wrench

CONSUMABLES:

Mineral Spirit
 Aeroshell # 6 grease (PN 2275094)
 Cleaning Rags
 Leak Detector (commercial)

SPARE PARTS:

O-ring (34 mm ID x 2.3 mm THK, Buna-N 70) (PN A37523) QTY = 3
 Filter Element (PN I/47890) QTY = 3

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-03-01-02/S-00

System:

Sheet:

TRUCKS AND SUSPENSIONS
3/6

Subsystem/Assy:

Unit:

AIR SUSPENSION SYSTEM
PNEUMATICS EQUIPMENT

Component:

Man Hours:

AIR FILTER
1

Maintenance Task:

Interval/Miles:

SERVICE
120,000

PROCEDURE:

PRELIMINARY OPERATIONS

Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop Regulations.

SERVICE

(Refer to Fig 1 and 2)

1. Insulate the Air Filter to be serviced and vent pneumatic pressure from Air Piping by closing the Air Filter Cut Out Cock

**WARNING: HIGH PRESSURE IS VENTED WHEN CUTOUT COCK IS CLOSED.
WEAR SAFETY GOGGLES AND EAR PROTECTION AND EXERCISE
CAUTION.FAILURE TO COMPLY MAY RESULT IN INJURY.**

2. Remove Plug Cap with O-ring, Spring, and Filter Element from Air Filter Housing.

**WARNING: AIR FILTER CONTAINS SPRING LOADED FILTER ELEMENT.
EXERCISE CAUTION WHEN REMOVING SCREW PLUG.
FAILURE TO COMPLY CAN LEAD TO INJURY**

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-03-01-02/S-00

System:	TRUCKS AND SUSPENSIONS	Sheet:	4/6
Subsystem/Assy:	AIR SUSPENSION SYSTEM	Unit:	PNEUMATICS EQUIPMENT
Component:	AIR FILTER	Man Hours:	1
Maintenance Task:	SERVICE	Interval/Miles:	120,000

PROCEDURE:

3. Clean Filter Element in mineral spirits and blow dry with compressed air.

**WARNING: SOLVENTS AND SOLVENT FUMES CAN BE HARMFUL TO HEALTH.
WHEN USING SOLVENTS, WEAR EYE, SKIN, AND RESPIRATORY PROTECTION AS REQUIRED. WORK IN WELL VENTILATED AREA. AVOID REPEATED OR PROLONGED CONTACT. KEEP SOLVENT CONTAINER CLOSED. KEEP SOLVENT AWAY FROM SPARKS, FLAMES, AND HEAT. FAILURE TO OBSERVE THESE SAFETY PRECAUTIONS CAN LEAD TO INJURY OR INTOXICATION.**

WARNING: CLEANING USING COMPRESSED AIR CAN CAUSE DIRT PARTICLES TO BECOME AIRBORNE. WEAR EYE PROTECTION WHEN CLEANING WITH COMPRESSED AIR TO AVOID INJURY. DO NOT EXCEED 30 PSI. FAILURE TO COMPLY CAN LEAD TO INJURY.

4. Inspect Filter Element for damage. Replace as per inspection result
5. Inspect O-ring for damage. Replace O-ring as per inspection result.
6. Lightly lubricate O-ring with recommended grease.
7. Insert Filter Element, Spring, O-ring, and Plug Cap in the Air Filter Housing. Tighten Plug Cap securely.
8. Re-pressurize Air Piping by opening Air Filter Cut Out Cock.
9. Apply Leak Detector and test Air Filter for leakage around the Plug Cap and around the Air Piping connections.
10. Tighten joints where bubbles form.
11. Remove, using water, all traces of leak detector immediately after test.
12. Restore Electrical Power.
13. Remove wheel chocks.

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-03-01-02/S-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

5/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

PNEUMATICS EQUIPMENT

Component:

AIR FILTER

Man Hours:

1

Maintenance Task:

SERVICE

Interval/Miles:

120,000

PROCEDURE:

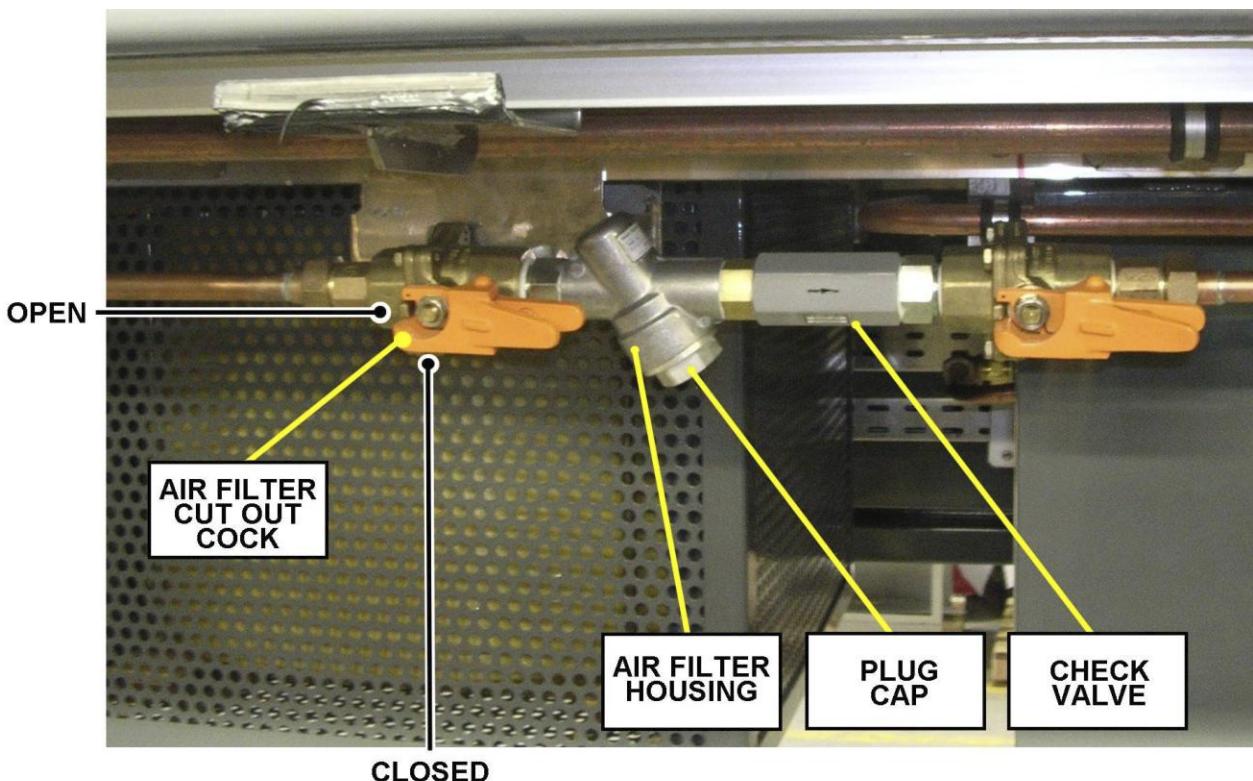


Figure 1 - SUSPENSION AIR FILTER AND CUTOFF COCKS

P2550 PREVENTIVE MAINTENANCE SHEET

Card Code:

R-P-12-03-01-02/S-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

6/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

PNEUMATICS EQUIPMENT

Component:

AIR FILTER

Man Hours:

1

Maintenance Task:

SERVICE

Interval/Miles:

120,000

PROCEDURE:

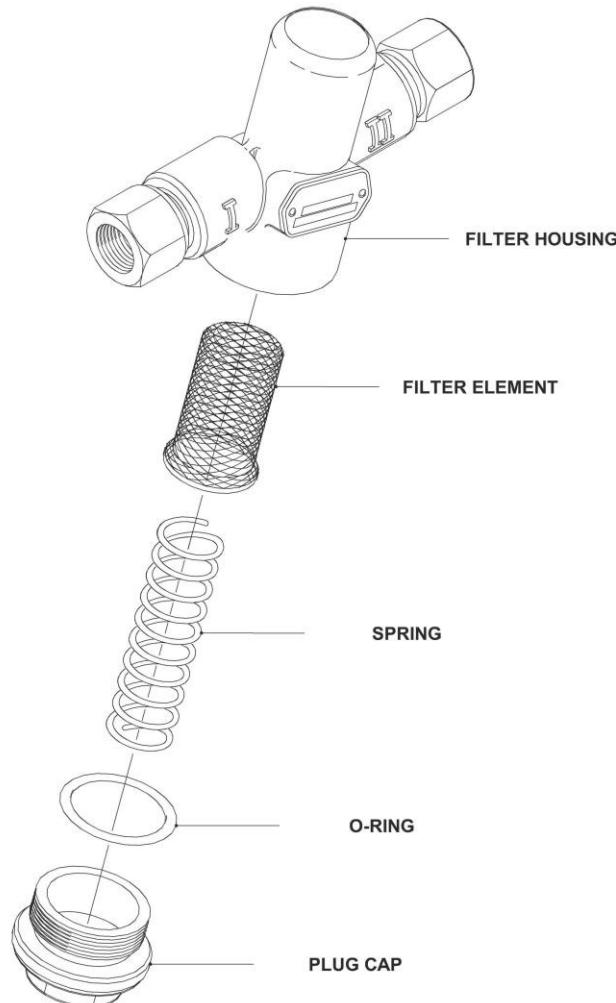


Figure 2 - SUSPENSION AIR FILTER

12-III-04 RUNNING -CORRECTIVE MAINTENANCE

12-III-04.01 Running -Corrective Maintenance Sheets (R-CMS)

Each R-CMS provides the following data consistent with Corrective Maintenance Analysis (CMA), AB Design Documentation and Vehicle Systems Functional Tree:

- **R-CM Sheet Code**
- **SYSTEM, SUBSYSTEM /ASSEMBLY, UNIT, Component** (Names)
- **SYSTEM, SUBSYSTEM /ASSEMBLY, UNIT, Component** (Location)
- **Maintenance Task,**

The following definitions are applicable to the R-CM Tasks

Inspection:	Maintenance procedures such as those required to ascertain the serviceability of a Part, Assembly, System or the specific interrelationship of Parts that perform a functional operation.
Leveling:	Procedure to adjust the distance between the Vehicle Floor to the Top Of Rail and the designated Vehicle Height
Replacement:	Provides the Components / Assemblies and Subassemblies removal & installation in a logical sequential order.
Re-Profiling:	Provides the procedure to maintain the safe and proper "wheel profile".
Repair:	Provides detailed procedures for the repair of a specific Equipment / Component
Service:	Operation performed to replenish Sand, Windshield Wiper Washer Fluid, HVAC Coolant, Gear and Compressor Oil, and Vehicle Lubrication.

- **Man Hours**, needed to perform the Task
- **SPARE PARTS**, needed to perform the Task

Each R-CMS also provides:

- **SAFETY PRECAUTIONS**, to be followed to safely accomplish the Task
- **TOOLS**, including Special Tools and Test Equipment, needed to accomplish the Task
- **CONSUMABLES**, required to accomplish the Task and consistent with those used by MTA
- **PROCEDURE**, consisting of Preliminary Operations and Procedural Steps, to be followed while performing Maintenance Tasks.
- **Illustrations and Pictures** are inserted in the text to facilitate the understanding of the topics and/or to explain step-by-step procedure.

Each R-CM Sheet refers to one Task and consists of several pages where Safety Precautions and Maintenance Instructions to perform safely the Task are provided by Procedural Steps in conjunction with Illustrations and Pictures.

12-III-04.01.01 Running- Corrective Maintenance Sheet (R-CMS) Form

The R-CMS Form (refer to Figure 12-III-04.1) consists of several fields containing the following data/ information:

RUNNING -CORRECTIVE MAINTENANCE SHEET (R-CMS) Form			
ITEM #	TITLE	CONTENT	EXPLANATORY NOTES
1	Card code	Sheet code	<p>The Sheet Code is an alphanumerical code that identifies each R-CM Sheet.</p> <p>THE SHEET CODE IS EXPLICIT</p> <p>The Sheet Code consists of letters R-C followed by an 11 digit code number as follows:</p> <p>R-C-nn-mm-zz-ww/Y-kk</p> <p>R = Running C = Corrective</p> <p>nn may vary from 02 to 19, identifying the System/ Manual Section number.</p> <p>mm-zz-ww each one may vary from 00 to 99, according to AB System Functional Tree, allowing the identification of the Assembly/Unit/Component</p> <p>Y Maintenance Task Code. It may be one of the following:</p> <p>I = Inspection LL =Leveling</p> <p>R = Replacement RP= Re-Proiling</p> <p>RR = Repair S = Service</p> <p>SP = Safety Precautions</p> <p>kk It may vary from 00 to 99. It is a progressive number allowing the explicit identification of R-CMS</p> <p>NOTE : The code R-C-nn-00-00-00-R-kk identifies a Typical Replacement Procedure The Typical Replacement Procedure is provided for the following items : Board, Circuit Breaker, Diode, Indicator Lamp, Main Contactor, Switch & Relays..</p>
2	System	System name	This field indicates the System to which the Assembly/Unit/Component belongs.
3	Subsystem/ Assembly	Subsystem/ Assembly name	This field indicates the Subsystem/Assembly to which the Unit/Component belongs.
4	Unit	Unit name	This field indicates the Unit to which the Component belongs.
5	Component	Component name	This field indicates the Component the Maintenance Task is referring to
6	Maintenance Task	Maintenance Task name	This field indicates the Maintenance Task to be performed.
7	Man Hours	Number	The Man Hour field indicates the time needed to perform the corresponding Maintenance Task. with the basic assumption that the Vehicle is staged on an Inspection Pit/Jacking tracks with the required Consumables, Tools and Materials available.

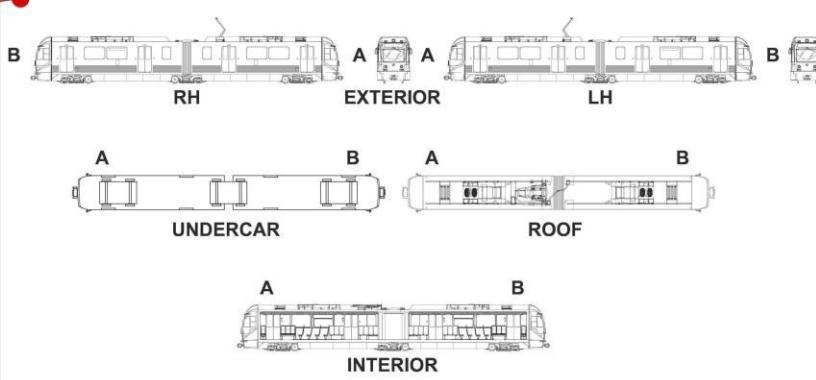
RUNNING -CORRECTIVE MAINTENANCE SHEET (R-CMS) Form (cont'd)			
ITEM #	TITLE	CONTENT	EXPLANATORY NOTES
8	Sheet	Pages numbering	This field indicates the progressive R-CMS sheet page number.
9	LOCATION	Illustration	This field indicates the On Board Location of the Equipment to be maintained The following Graphic Symbols are used for: Assembly/Unit/Component  for System/Subsystem/Vehicle as a Whole 
10	R	Letter	This field indicates that the Sheet pertains to Running Maintenance
11	C	Letter	This field indicates that the Sheet pertains to Corrective Maintenance
12	nn	Number	This field indicates the System/Manual Section number to which the Sheet pertains. It may vary from 01 to 19
13	rr	Number	This field indicates the Sheet Revision number
14	Page ##	Page ##	This field indicates the RMSM Section Page number
15	-#	Number	This field indicates the RMSM Section Revision number
16	SAFETY PRECAUTIONS	Text	This field presents the General and/or specific Safety Precautions to be followed to accomplish safely the relevant Maintenance Tasks.
17	TOOLS	Text	This field lists the description and the P/N of the Standard tools, Special Tools and Test Equipment needed to accomplish the Maintenance Task. Refer to the TTE Manual for the TE and Special Tools detailed descriptions and tools maintenance.
18	CONSUMABLES	Text	This field lists the Consumables Materials (consistent with those used by MTA with the related P/N.) needed to accomplish the Maintenance Task. Cleaning agents are included
19	SPARE PARTS	Text	This field lists the Description and PN of Spare Parts (consistent with Illustrated Parts Catalog) needed to accomplish the Maintenance Task.
20	PROCEDURE	Text	The Procedure field provides Preliminary Operations and Procedural step by step Instructions to be followed while performing the Maintenance Task. Illustrations and Pictures are inserted in the text to facilitate the understanding of the topics and/or to explain step-by-step procedure.

LACMTA P2550 LRV
Running Maintenance and Servicing Manual - Section 01

P2550 CORRECTIVE MAINTENANCE SHEET

System:	Sheet:	Card Code:
Subsystem/Assy:	Unit:	x/z
Component:	Man Hours:	
Maintenance Task:		
LOCATION:		

R-C-nn-mm-zz-ww/Y-kk



1 **2** **3** **4** **5** **6** **7** **8** **9** **10** **11** **12** **13** **14** **15**

M_{Metro}

Page 011 Draft

**Figure 12-III-04.1 R-CMS Form
(Sheet 1 of 2)**

LACMTA P2550 LRV Running Maintenance and Servicing Manual - Section 01		 AnsaldoBreda				
P2550 CORRECTIVE MAINTENANCE SHEET						
Card Code: R-C-nn-mm-zz-ww/Y-kk		Sheet: x/z				
System:		Unit:				
Subsystem/Assy:		Man Hours:				
Component:						
Maintenance Task:						
16	SAFETY PRECAUTIONS:					
17	TOOLS:					
18	CONSUMABLES:					
19	SPARE PARTS:					
20	PROCEDURE: PRELIMINARY OPERATIONS					
Page 01-2 Draft						
						
<table border="1" style="margin-left: auto; margin-right: 0; border-collapse: collapse;"> <tr> <td style="padding: 2px;">R</td> <td style="padding: 2px;">C</td> <td style="padding: 2px;">nn</td> <td style="padding: 2px;">rr</td> </tr> </table>			R	C	nn	rr
R	C	nn	rr			

**Figure 12-III-04.1 R-CMS Form
(Sheet 2 of 2)**

12-III-04.01.02 How to Use the R-CM Sheets

To optimize the job organization it is suggested to proceed as follows:

1. Before Task Execution

- a) Carefully read the sheets to ensure that you fully understand all safety precautions, preliminary conditions required, warnings, notes & procedures that will be followed
- b) Particularly read
 - The Safety Precautions to perform safely the Task
 - The Preliminary Operations to set the Vehicle in safety conditions according to MTA Maintenance Shop Regulations
 - The Tools, Consumables and Spare Parts listed in each Sheet and needed to accomplish the Task, to have all of them available next the location of the Equipment to be maintained before to start the activities

2. During Task Execution

- a) Follow accurately the prescribed Safety Precautions and Maintenance Procedural Steps.
- b) Note any Areas/Items of the Assembly/Unit/Component under Corrective Maintenance Process requiring further Corrective Maintenance.
- c) Gather as much information about the Equipment as is practical
 - (i e knowledge about the malfunction in terms of correctly operating and incorrectly operating equipment processes) to increase your equipment knowledge.

3. At every Task Completion

- a) Carefully follow the prescribed Safety Precautions before restoring the Electrical Power to Vehicle.
- b) Check the correct operation and/or functions of the Subsystem to which the maintained Equipment pertains.
- c) It is suggested to perform this check on the IDU "A" as follows:

NOTE: Through the IDU you can check if all Systems are exchanging data by MVB or LonWorks Bus and the Trainlines Status.

The IDU Display also shows in real time the Status of all Vehicle Systems.
 Reading the IDU Fault List it is possible to immediately detect a fault
 Using the IDU in the Operating Mode the Fault Indications are generic
 Using the IDU in Maintenance Mode the same Fault has a detailed description.

For more in depth troubleshooting use the PTU connected to the relevant system that requires further troubleshooting.

1. On IDU "A" access to the Maintenance Menu first and then to the "Faults" Screen by selecting, in sequence, the relevant icons
2. Check, On IDU "A" through the list of the Current Active Faults shown in the "Faults" Screen, for Fault Codes related to the Subsystem to which the maintained Equipment pertains.

Refer to Section 18 of RMSM for Fault Signals Details

3. As per "Fault" Codes check results proceed as follows:

➤ **No Faults are listed in the "Faults" Screen**

- a) Key OFF the Vehicle
- b) Record Service and Test results on the Defect Report Card for administrative and maintenance planning.

➤ **Fault Codes are listed in the "Faults" Screen**

- a) Investigate/troubleshoot the Equipment previously maintained first and then the System/Subsystem/Assembly/Unit for Fault Probable Causes.
- b) Gather as much information about the failure symptoms as is practical. Refer to Section 18 of RMSM for Fault Signals Details.
- c) Try to identify the malfunction in terms of correctly operating and incorrectly operating equipment processes.
- d) Identify which equipment signals or parameters will best help you to localize the failure.
- e) Identify the source of the problem.
- f) Repair or replace the defective component.
- g) Verify that the repair is effective in eliminating all of the failure symptoms.
- h) Evaluate whether or not the defective component was the root cause of the failure.
- i) Once the Fault Codes are not found in the "Faults" Screen perform steps from 3-a through 3-b (previous subparagraph **"No Faults are listed in the "Faults" Screen"**).

12-III-04.01.03 Running- Corrective Maintenance Sheet (R-CMS) List

The “Trucks & Suspensions” Running- Corrective Maintenance Sheets (R-CMS) List is provided in the following.

Table 12-III-04.1

The R-CM Sheets are listed by Subsystem / Assembly / Unit / Component and sequenced by Sheet Codes and Tasks to be performed.

Table 12-III-04.1 Running Corrective Maintenance Sheets List

SYSTEM 12 TRUCKS & SUSPENSIONS				
SUBSYSTEM / ASSY	UNIT	COMPONENT	TASK	SHEET CODE
MOTOR TRUCK			REPLACEMENT	R-C-12-01-00-00/R-00
MOTOR TRUCK	WHEEL SET MOTOR TRUCK	WHEEL	RE-PROFILING	R-C-12-01-01-01/RP-00
MOTOR TRUCK	WHEELSET	GROUND CONTACT DEVICE	REPLACEMENT	R-C-12-01-01-05/R-00
MOTOR TRUCK	STICK LUBRICATOR		REPLACEMENT	R-C-12-01-08-00/R-00
TRAILER TRUCK			REPLACEMENT	R-C-12-02-00-00/R-00
TRAILER TRUCK	WHEEL SET TRAILER TRUCK	WHEEL	RE-PROFILING	R-C-12-02-01-01/RP-00
TRAILER TRUCK	WHEELSET	SPEED SENSOR DEVICE	REPLACEMENT	R-C-12-02-01-04/R-00
TRAILER TRUCK	WHEELSET	GROUND CONTACT DEVICE	REPLACEMENT	R-C-12-02-01-06/R-00
AIR SUSPENSION SYSTEM	PNEUMATICS EQUIPMENT	CUT-OUT COCK	REPLACEMENT	R-C-12-03-01-01/R-00
AIR SUSPENSION SYSTEM	PNEUMATICS EQUIPMENT	AIR FILTER	REPLACEMENT	R-C-12-03-01-02/R-00
AIR SUSPENSION SYSTEM	PNEUMATICS EQUIPMENT	CHECK VALVE	REPLACEMENT	R-C-12-03-01-03/R-00
AIR SUSPENSION SYSTEM	LEVELING VALVE		REPLACEMENT	R-C-12-03-02-00/R-00
AIR SUSPENSION SYSTEM	MEAN PRESSURE VALVE		REPLACEMENT	R-C-12-03-03-00/R-00
AIR SUSPENSION SYSTEM	DUPLEX CHECK VALVE		REPLACEMENT	R-C-12-03-04-00/R-00
AIR SUSPENSION SYSTEM	TEST FITTING		REPLACEMENT	R-C-12-03-05-00/R-00
AIR SUSPENSION SYSTEM	AIR RESERVOIR(1.5 LT)		REPLACEMENT	R-C-12-03-06-00/R-00

12-III-04.01.04 Running- Corrective Maintenance Sheets (R-CMS)

TRUCKS & SUSPENSIONS

Running - Corrective Maintenance Sheets

R-CMS

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P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-00-00/R-00

System:

Sheet:

TRUCKS AND SUSPENSIONS
1/26

Subsystem/Assy:

Unit:

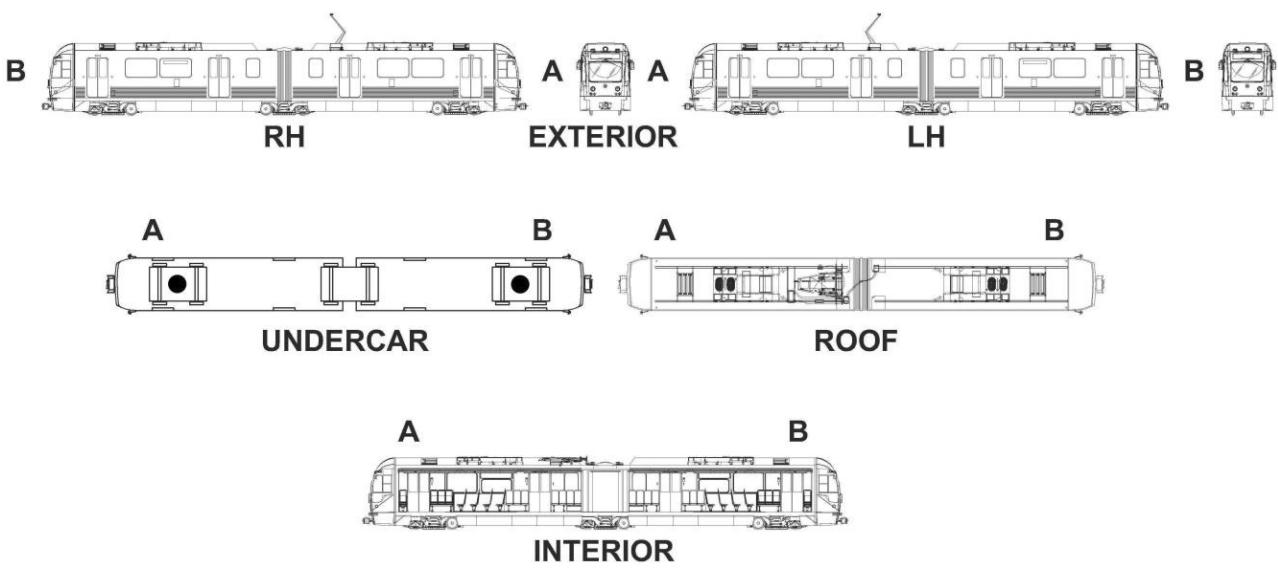
MOTOR TRUCK

Component:

Man Hours:

6

Maintenance Task:

REPLACEMENT
LOCATION:


P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-00-00/R-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

2/26

Subsystem/Assy:

MOTOR TRUCK

Unit:

Component:

Man Hours:

6

Maintenance Task:

REPLACEMENT

SAFETY PRECAUTIONS:

WARNING: BEFORE PERFORMING TRUCK REPLACEMENT:

1. REMOVE ELECTRICAL POWER FROM VEHICLE.
2. RELEASE PNEUMATIC PRESSURE FROM AIR SUSPENSION SYSTEM AND BRAKES SYSTEM.

WARNING: BLUE FLAG THE VEHICLE IN ACCORDANCE WITH ALL LACMTA BLUE FLAG POLICIES, RULES, & PROCEDURES IN ORDER TO WARN THAT MAINTENANCE PERSONNEL ARE WORKING ON, UNDER, OR NEAR ROLLING EQUIPMENT.

WARNING: APPLY WHEEL CHOCKS TO PREVENT THE VEHICLE FROM MOVING.

WARNING: WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.

WARNING: HEAVY OBJECT - MOTOR TRUCK WEIGHTS 15,500 LB. APPROX SUPPORT EVERY PART WITH SUITABLE LIFTING DEVICE, IN ACCORDANCE WITH LACMTA MAINTENANCE SHOP SAFETY REGULATIONS. FAILURE TO THIS CAUTION CAN CAUSE SERIOUS PERSONAL INJURY OR DEATH.

CAUTION: DURING THE TRUCK LOWERING AND RAISING PAY ATTENTION TO NOT DAMAGE CABLES, HOSES, ETC. ON THE VEHICLE AND ON THE TRUCK.

CAUTION: IT IS MANDATORY TO AVOID THE USE OF ANY LUBRICANT AND OF SCREW TAPS FOR SLEWING RING HOLES AND BOLTS CLEANING.

CAUTION: TO AVOID DAMAGE/MALFUNCTIONS TO THE VEHICLE POWER SYSTEM, DAMAGED O-RING(S) MUST BE REPLACED.

CAUTION: TO AVOID DAMAGE/MALFUNCTIONS TO THE PROPULSION AND TRACK BRAKES SYSTEM, DAMAGED O-RING(S) MUST BE REPLACED.

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-00-00/R-00

System:

Sheet:

TRUCKS AND SUSPENSIONS**3/26**

Subsystem/Assy:

Unit:

MOTOR TRUCK

Component:

Man Hours:

6

Maintenance Task:

REPLACEMENT**TOOLS:**

LACMTA Maintenance Shop Standard Tools Kit

Car Hoist and Support System

Torque Wrench (150-250 ft-lb)

Clamps, Caps, Masks (to secure and protect Cables, Connectors and Equipment)

CONSUMABLES:

Cleaner/Degreaser, as needed

Loctite 242, as needed

3M Teflon Tape (Threads Sealant), as needed

Double Sided Adhesive Tape (3M 950 Transfer Type), as needed

SPARE PARTS:

O-ring (Polychloroprene Rubber and Silicone/green) (commercial) (PN 3143) QTY = 4

Gasket (PN AA03G08) QTY = 1

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-00-00/R-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

4/26

Subsystem/Assy:

MOTOR TRUCK

Unit:

Component:

Man Hours:

6

Maintenance Task:

REPLACEMENT

PROCEDURE:

PRELIMINARY OPERATIONS

Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop Regulations:

1. Place the Vehicle over the Car Hoist and Support System.
2. Check that the Trucks are correctly positioned on the Stand up Rail.
3. Set the Master Controller Handle to FSB position.
4. Make sure that all Parking Brakes are applied (by checking on the IDU "Parking Brake A and B Not Released" and on Indicator Panel "A" "Park / Friction Brake" ON).
5. Remove Electrical Power from Vehicle by lowering the Pantograph.
6. Turn the Transfer Switch to OFF.
7. Set the Pantograph Control Motor Switch (5F02 CB LV Locker "A" Section) to OFF.
8. Lock out and tag out the Switch in accordance with all LACMTA Safety Rules, Regulations, Policies, and Procedures.

NOTE The tag must indicate the name of the person who removed Power.

That person knows why the Power was removed and when it safe to restore it.

Only the individual whose name appears on the tag or a person with his approval should remove the tag and restore Power.

9. Apply wheel chocks to prevent the Vehicle from moving.

TRUCK REPLACEMENT

To perform the task proceed as follows:

REMOVAL

1. Set the Vehicle in safety condition in accordance with LACMTA Overhaul Regulations.
2. On each Truck, apply wheel chocks to prevent the Vehicle from moving (both running directions).
3. Switch OFF the Battery Disconnect Circuit Breaker (3F01 Battery Circuit Breaker Box) located in the Battery Box (B Section RH Side) to remove Battery Power (refer to Fig 1).
4. Perform the following instructions to assure safety for personnel and the equipment on the truck to be removed.

PNEUMATIC SYSTEM

- a. Close Air Suspension System (Vented) Cut-Out Cock to release Pneumatic Pressure from Air Suspension System (refer to Fig 2).

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

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System:

Sheet:

TRUCKS AND SUSPENSIONS

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Subsystem/Assy:

MOTOR TRUCK

Unit:

Component:

Man Hours:

6

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

MOTOR TRUCK SANDING SYSTEM

- a. Close Sanding System (Vented) Cut-Out Cock to release Pneumatic Pressure from Sanding System (refer to Fig 3).

BRAKES SYSTEM

- a. Close both Disc Brakes and Parking Brakes (Vented) Cut-Out Cocks (located in the BCU Box) to release Pneumatic Pressure from Brakes System (refer to Fig 4).

5. Operate the Car Hoist and Support System in "ALL TRUCKS HOIST" mode to raise the Vehicle until the rails under the Trucks are at a minimum distance of 40 in (1,016 mm) measured from the Maintenance Shop Floor.
6. Raise the (Car Hoist System) Body Stands until they make contact with the Car Body Jacking Pads (YELLOW) (refer to Fig 5). (Green indicator "ALL BODY STANDS CONTACT MADE" should illuminate).

CAUTION: INDIVIDUAL TRUCK HOIST WILL NOT LOWER IF ALL BODY STANDS ARE NOT CORRECTLY POSITIONED.

7. On the Truck to be removed, proceed as follows to disconnect Electrical, Pneumatic and Mechanical Connections:

ELECTRICAL CONNECTIONS

- a. **HV Traction Motors Power Supply** (refer to Fig 6)

1. Disengage the Locking Device of the Traction Motors Power Supply Quick Disconnect Box.
2. Unplug the (Male) Plug of Quick Disconnect Box.
3. Hold up and secure to the Truck, with suitable Clamp, the Cables and protect, to avoid damage during maintenance operations in the Maintenance Shop, the Plug using suitable Cap.

- b. **HV Traction Current Return** (refer to Fig 7)

1. Disconnect the HV Traction Current Return Terminal by loosening the relevant Hardware connecting the HV Traction Current Return to the Traction Current Return Insulated Plate.
2. Retain the Hardware for later use (Truck installation).
3. Hold up and secure to the Truck structure, with suitable clamp, the HV Traction Current Return cable and protect the Terminal using suitable Cap.

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-00-00/R-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

6/26

Subsystem/Assy:

MOTOR TRUCK

Unit:

Component:

Man Hours:

6

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

c. LV System (refer to Fig 6)

1. Disconnect the Speed Sensors Mating Connector.
2. Disconnect the Track Brake Power Supply Mating Connector.
3. Hold up and secure to the Truck, with suitable Clamps, both the Cables and protect, to avoid damage during maintenance operations in the Maintenance Shop, both the Plugs using suitable Caps.

d. Ground Braid (refer to Fig 8)

1. Disconnect the Ground Braid Terminals by loosening the relevant Hardware connecting the Ground Braid to the Truck.
2. Retain the Hardware for later use (Truck installation).
3. Hold up and secure to the Underframe structure, with suitable Clamps, the Ground Braid and protect the Terminals using suitable Caps.

PNEUMATIC CONNECTIONS

a. Air Suspension System and Brakes System (refer to Fig 9)

1. Disconnect (Flexible Hose) Connections by loosening the relevant Nipples.
2. Hold up and secure to the Truck, with suitable Clamps, the (Flexible Hose) Connections and protect, to avoid damage during maintenance operations in the Maintenance Shop, the relevant (Flexible Hose) free Ends using suitable Caps.

b. Motor Truck Sanding System (refer to Fig 10)

1. Disconnect both RH and LH (Flexible) Hose Connections from Sanding Nozzles by removing relevant Clamps.
2. Retain both the Clamps for later use (Truck installation).
3. Hold up and secure to the Underframe structure, with suitable Clamps, both the (Flexible) Hose Connections and protect the relevant (Flexible Hose) free ends using suitable Caps.

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-00-00/R-00

System:

Sheet:

TRUCKS AND SUSPENSIONS

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Subsystem/Assy:

MOTOR TRUCK

Unit:

Component:

Man Hours:

6

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

MECHANICAL CONNECTIONS

a. Truck-Carbody Connection (refer to Fig 11)

1. Gain access to Truck-Carbody Connection from Vehicle interior, by unlocking the relevant Floor Trap Screws first and then and by removing the Floor Trap Panel.
2. Retain the Floor Trap Panel Hardware for later use.
3. Remove the (Truck-Carbody Connection) Bolts, Spring Washers and Flat Washers.
4. Retain the Bolts, Spring Washers and Flat Washers for later use (Truck installation).

b. Parking Brakes Manual Release (refer to Fig 12)

1. Locate the Parking Brakes Manual Release Cable coming from the Cab.
2. Disengage the Parking Brakes Manual Release Cable from relevant Junction Box installed on the Truck Frame.
3. Hold up and secure to the Underframe structure, with suitable Clamp, the (Parking Brakes Manual Release Cable and protect the relevant Cable free end using suitable Cap).

8. Check that all Electrical, Pneumatic and Mechanical Connections between the Truck and Car Body are disconnected, secured and protected.
9. Operate the Car Hoist and Support System in LOWER TRUCK HOIST mode to lower accordingly the relevant Truck to be de-trucked.

CAUTION: DURING THE TRUCK LOWERING PAY ATTENTION TO NOT DAMAGE CABLES, HOSES, ETC. ON THE VEHICLE AND ON THE TRUCK.

10. Once the Truck is completely lowered proceed as follows:

- a. Remove wheel chocks previously installed to the Truck.
- b. Move the Truck in order to have it available for Maintenance operations.
- c. Mask the Traction Motors Air Grille to avoid dirt entering during maintenance operations in the Maintenance Shop.
- d. Reposition the Floor Trap on Vehicle for Safety reasons.

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-00-00/R-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

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Subsystem/Assy:

MOTOR TRUCK

Unit:

Component:

Man Hours:

6

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):



Figure 1 - BATTERY CIRCUIT BREAKER (3F01)

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-00-00/R-00

System:

Sheet:

TRUCKS AND SUSPENSIONS**9/26**

Subsystem/Assy:

Unit:

MOTOR TRUCK

Component:

Man Hours:

6

Maintenance Task:

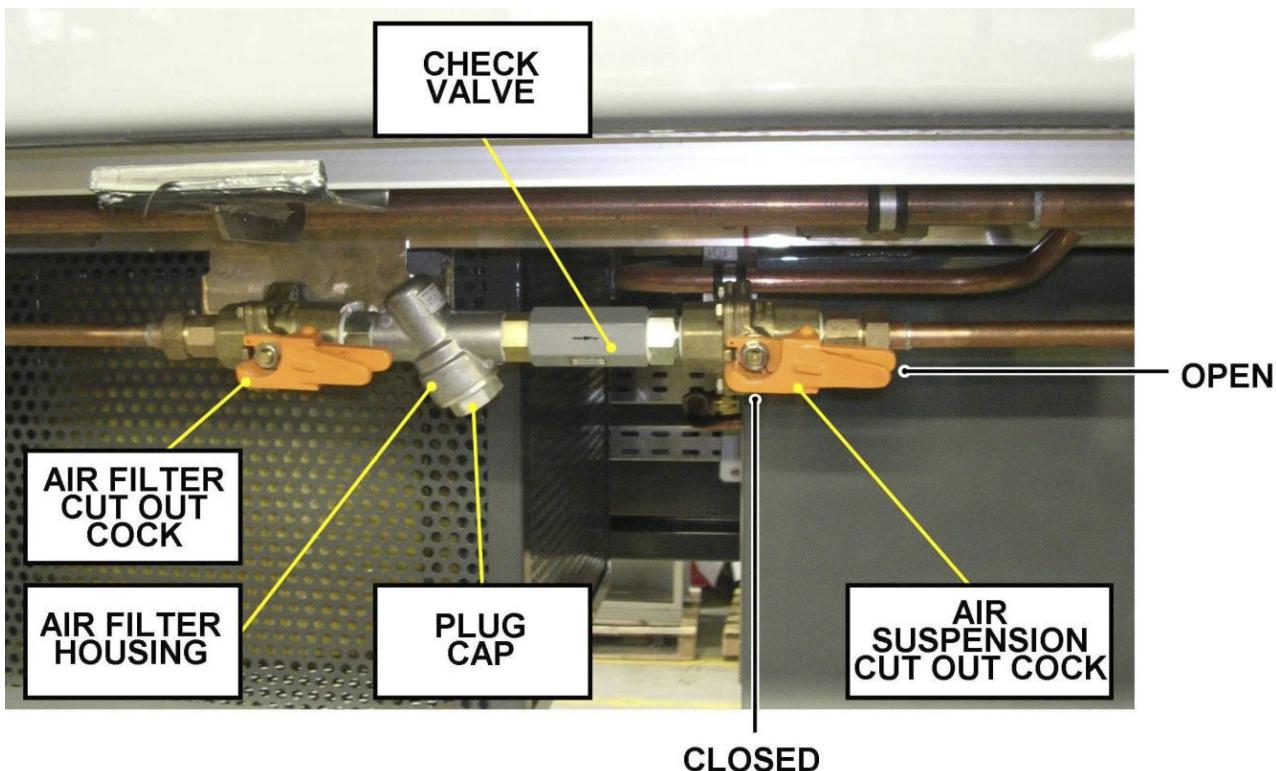
REPLACEMENT**PROCEDURE (CONT'D):**

Figure 2 - AIR SUSPENSION (VENTED) CUTOUT COCK

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-00-00/R-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

10/26

Subsystem/Assy:

MOTOR TRUCK

Unit:

Component:

Man Hours:

6

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

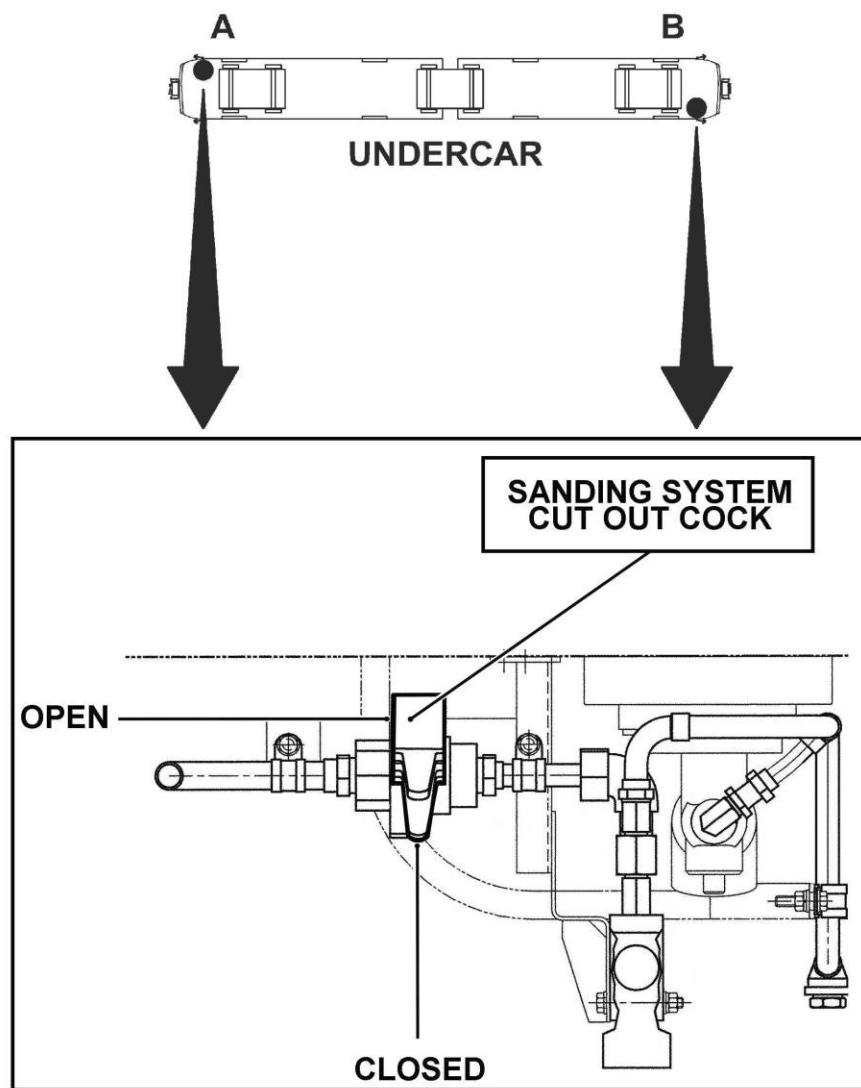


Figure 3 – MOTOR TRUCK SANDING SYSTEM CUT OUT COCK

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-00-00/R-00

System:

Sheet:

TRUCKS AND SUSPENSIONS**11/26**

Subsystem/Assy:

Unit:

MOTOR TRUCK

Component:

Man Hours:

6

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

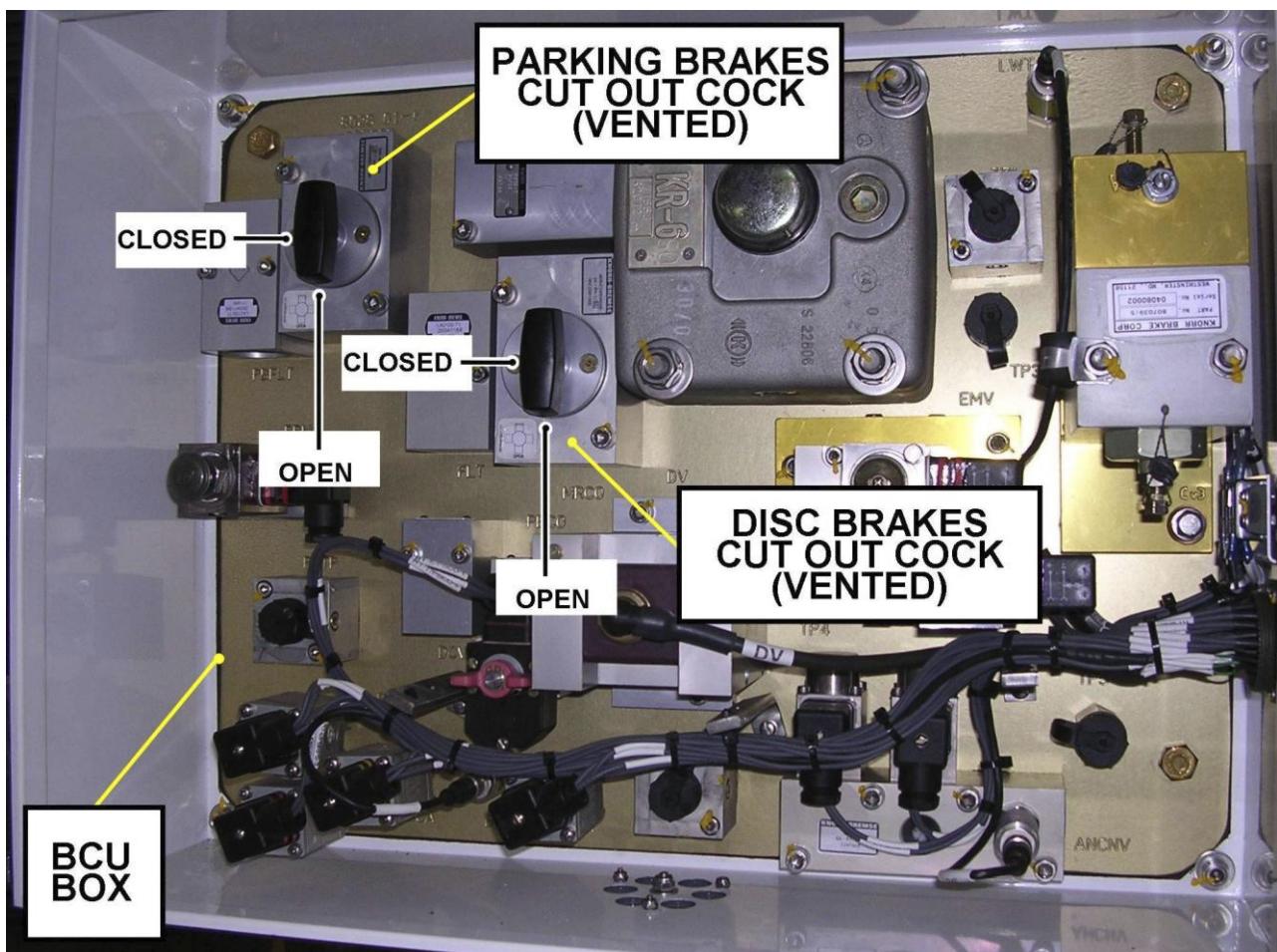


Figure 4 - BRAKES CUT OUT COCKS - LOCATION

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-00-00/R-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

12/26

Subsystem/Assy:

MOTOR TRUCK

Unit:

Component:

Man Hours:

6

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

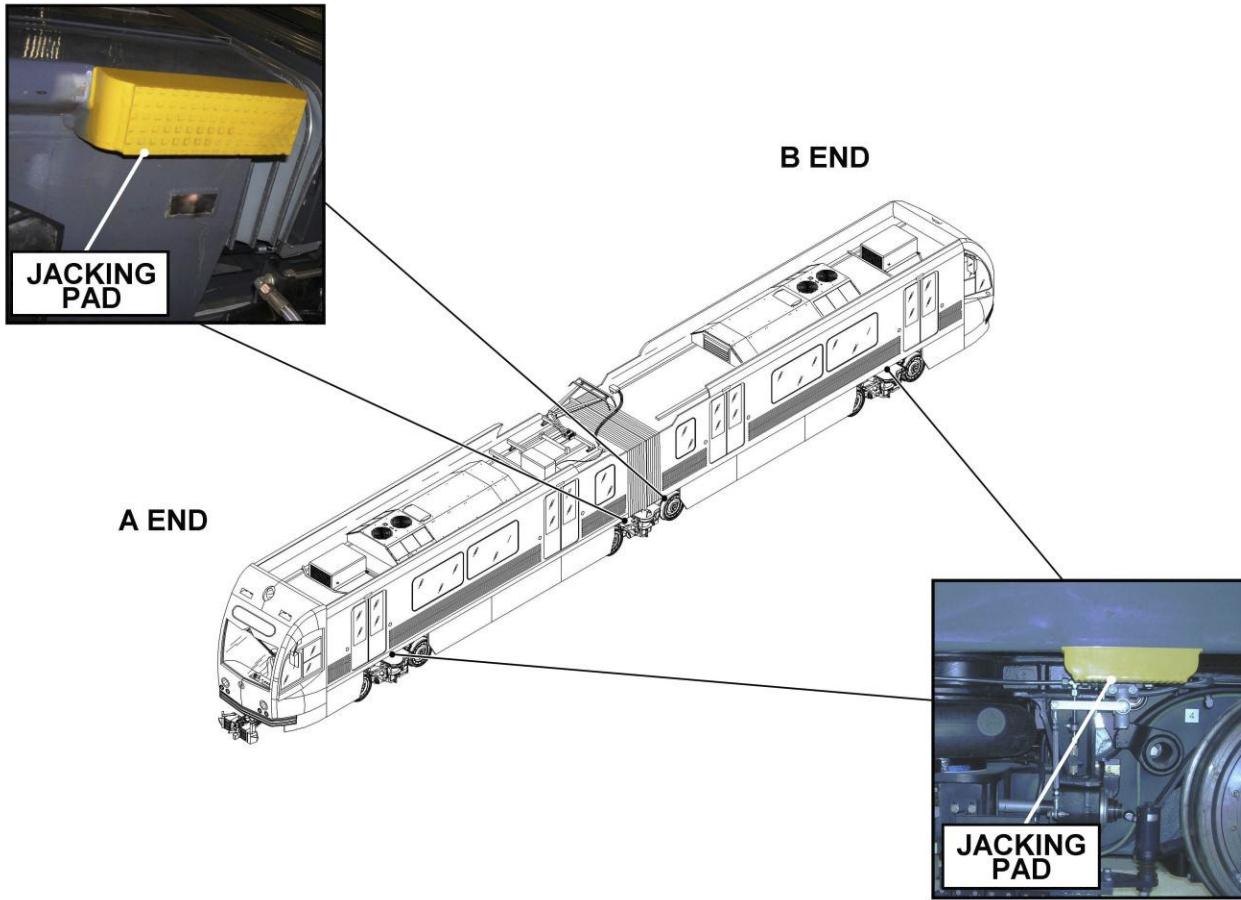


Figure 5 - CARBODY JACKING PADS LOCATION

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-00-00/R-00

System:

Sheet:

TRUCKS AND SUSPENSIONS**13/26**

Subsystem/Assy:

Unit:

MOTOR TRUCK

Component:

Man Hours:

6

Maintenance Task:

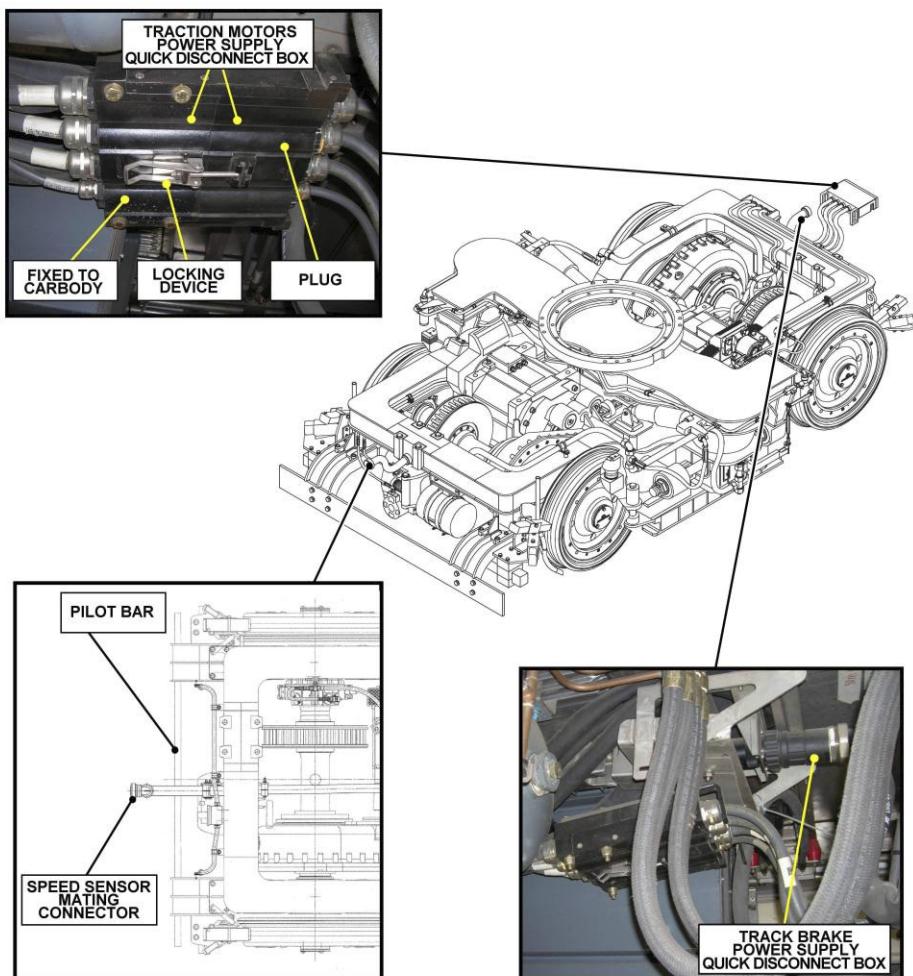
REPLACEMENT**PROCEDURE (CONT'D):**

Figure 6 - MOTOR TRUCK - ELECTRICAL CONNECTORS

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-00-00/R-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

14/26

Subsystem/Assy:

MOTOR TRUCK

Unit:

Component:

Man Hours:

6

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

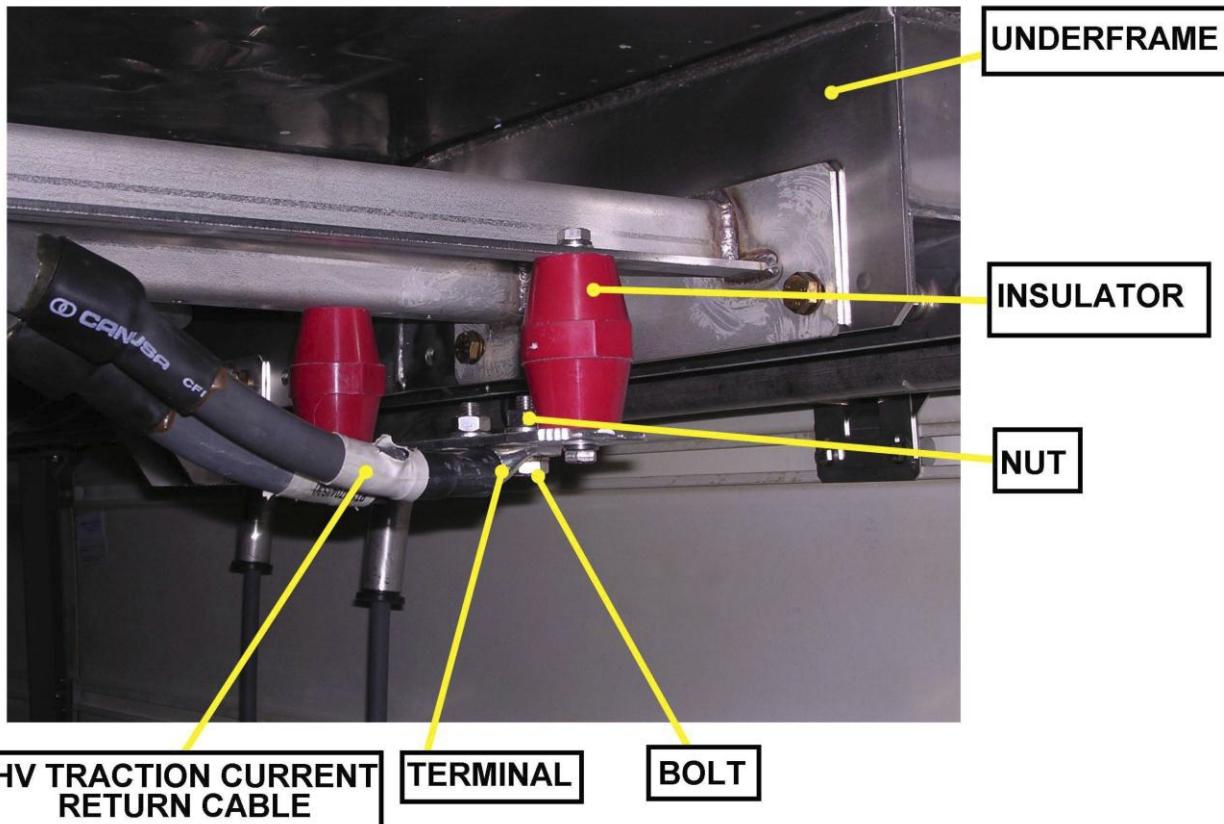


Figure 7 - HV TRACTION CURRENT RETURN - MOTOR TRUCK

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-00-00/R-00

System:

Sheet:

TRUCKS AND SUSPENSIONS**15/26**

Subsystem/Assy:

Unit:

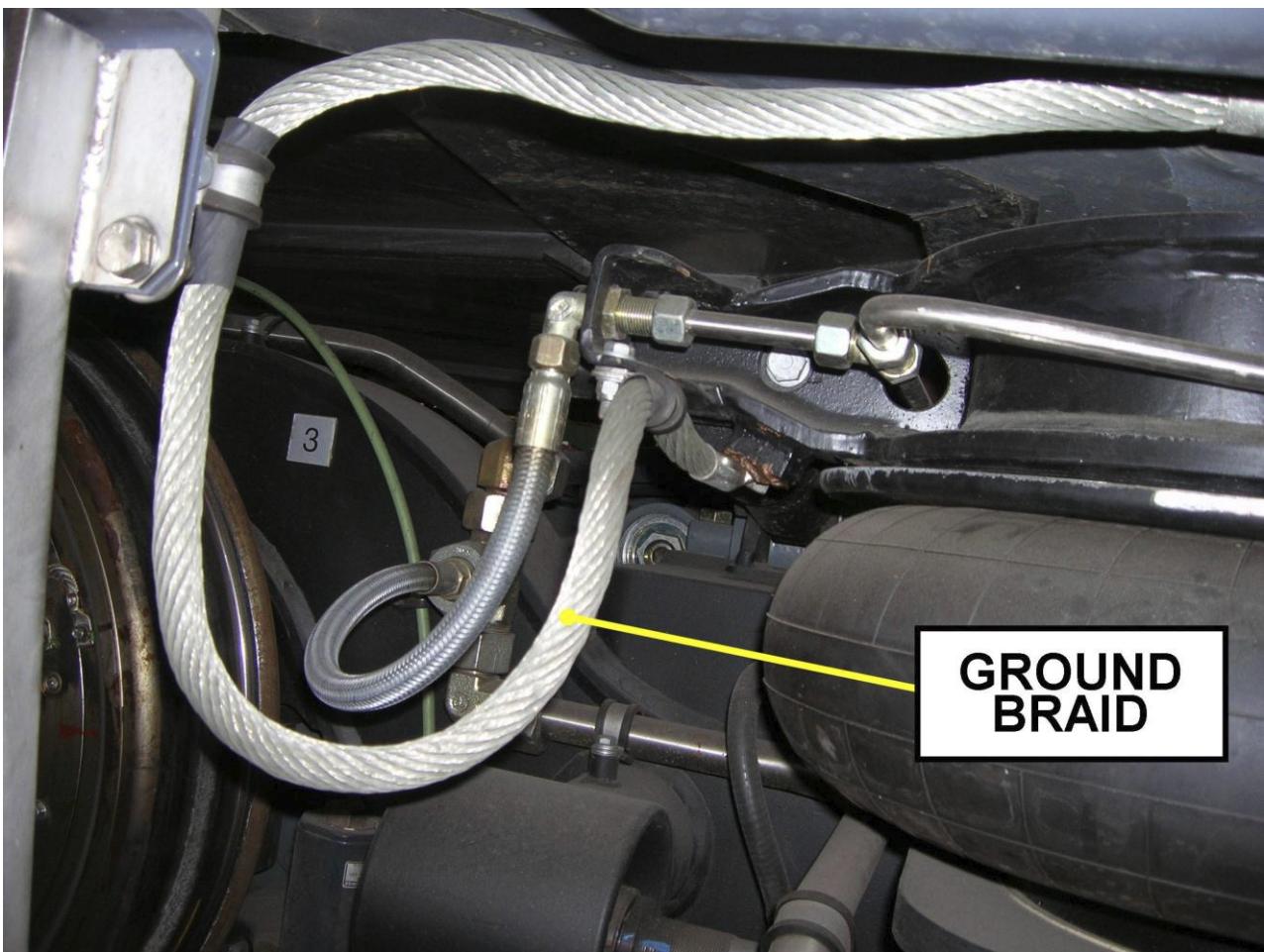
MOTOR TRUCK

Component:

Man Hours:

6

Maintenance Task:

REPLACEMENT**PROCEDURE (CONT'D):****Figure 8 - GROUND BRAID - MOTOR TRUCK**

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-00-00/R-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

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Subsystem/Assy:

MOTOR TRUCK

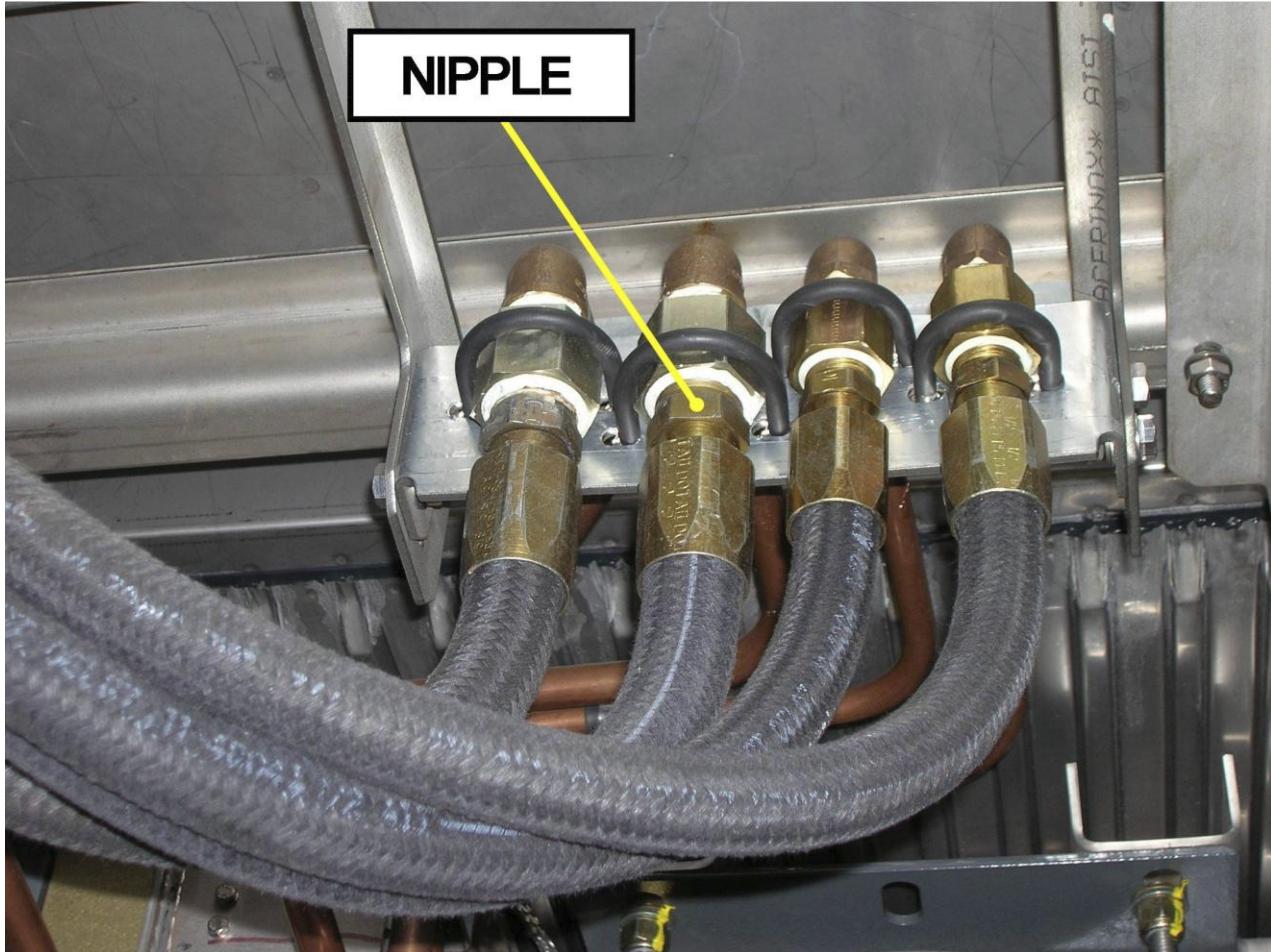
Unit:

Component:

Man Hours:

6

Maintenance Task:

REPLACEMENT**PROCEDURE (CONT'D):****Figure 9 - PNEUMATIC CONNECTIONS**

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-00-00/R-00

System:

Sheet:

TRUCKS AND SUSPENSIONS
17/26

Subsystem/Assy:

MOTOR TRUCK

Unit:

Component:

Man Hours:

6

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

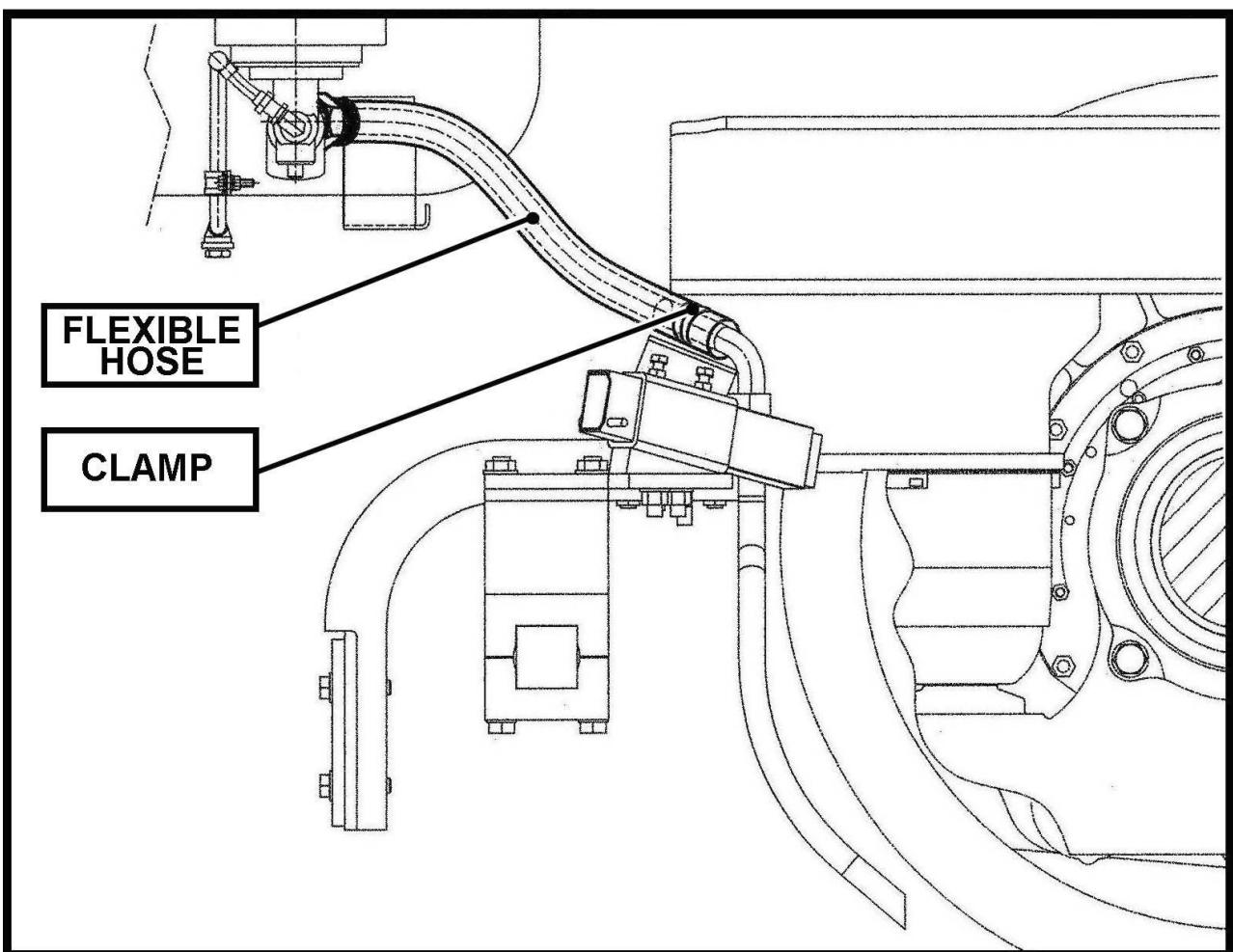


Figure 10 - SANDING NOZZLE - HOSE CONNECTION

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-00-00/R-00

System:

TRUCKS AND SUSPENSIONS

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Subsystem/Assy:

MOTOR TRUCK

Unit:

Component:

Man Hours:

6

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

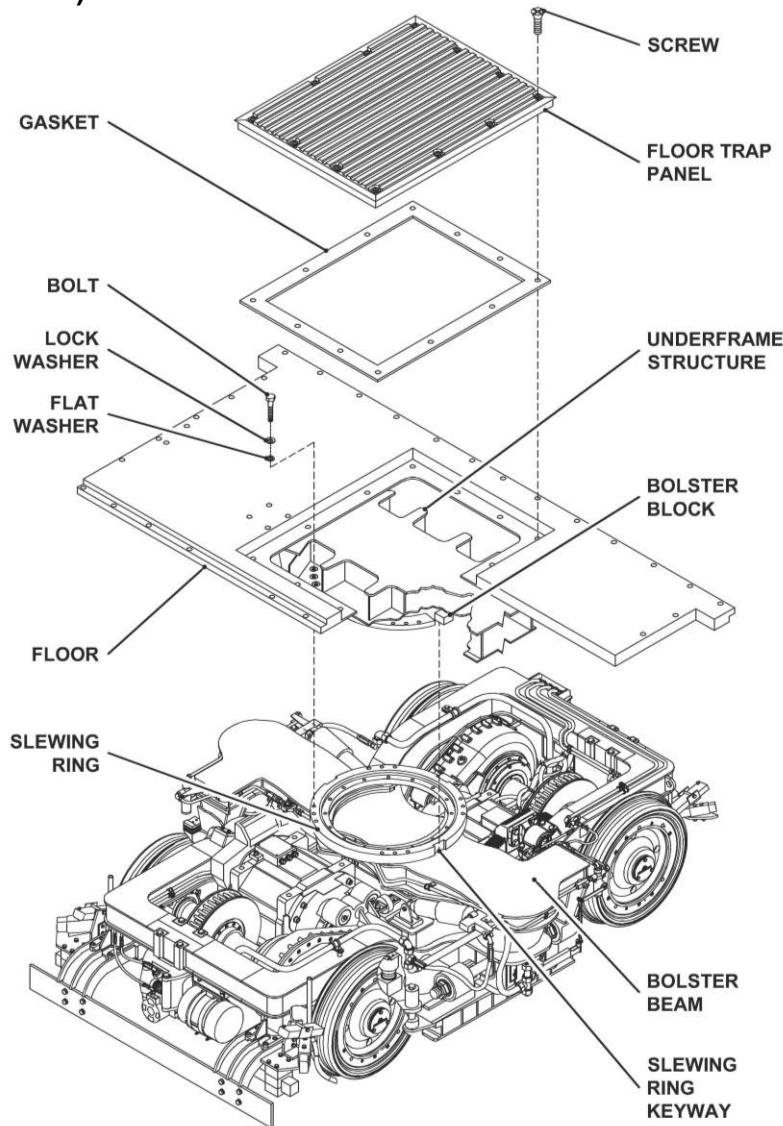


Figure 11 - TRUCK-CARBODY STRUCTURE ACCESS AND CONNECTION

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

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TRUCKS AND SUSPENSIONS

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Subsystem/Assy:

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Unit:

Component:

Man Hours:

6

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

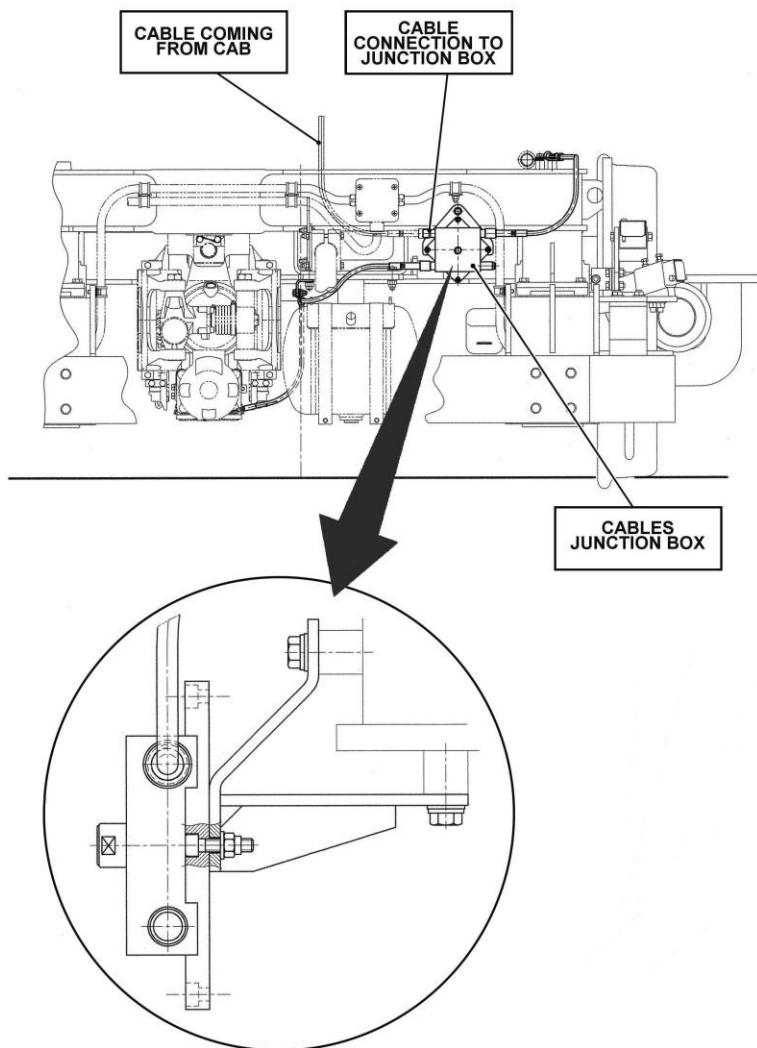


Figure 12 - PARKING BRAKE RELEASING WITH TRUCK REMOVED

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-00-00/R-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

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Subsystem/Assy:

MOTOR TRUCK

Unit:

Component:

Man Hours:

6

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

INSTALLATION

1. It is assumed that:
 - a. The vehicle is in Safety Conditions in accordance with LACMTA Overhaul Regulations.
 - b. The Car body is:
 1. Raised by Transit Car Hoist and Support System with a minimum clearance of 40 in. measured from (Car Body) Body Bolster and the Top of Rail.
 2. Leveled in cross truck plane.
 - c. Floor Trap (related to the truck to be installed) removed.
 - d. Clamps, Caps and Masks are applied, on Truck to be installed and on the Vehicle, to the Pneumatic Hoses, Electrical Connectors and Traction Motors, to avoid damage during Truck transferring from maintenance area to the Vehicle and during re-trucking operations.
2. Move the Truck under the Car Body using shop rails and turntable.
3. Remove the Masks (previously installed) from the Traction Motors Air Grille.
4. Clean the mating surfaces of the Slewing Ring (Motor Truck) and Body Bolster (Car Body) using recommended agent and cleaning rags.
5. Clean the Holes of the Slewing Ring and the Bolts using recommended agent and cleaning rags.

CAUTION: IT IS MANDATORY TO AVOID THE USE OF ANY LUBRICANT AND OF SCREW TAPS.

6. Position the Truck under the Car Body.
7. Verify that the Truck is correctly positioned on the yellow rails of the Transit Car Hoist and System first and the apply wheel chocks on both running directions.
8. Check on the Truck and on the Vehicle that all Electrical, Pneumatic and Mechanical Connections are secured and protected to avoid damage during re-trucking operations.
9. Slowly operate the Car Hoist and Support System in TRUCK RAISE TRUCK HOIST mode to raise the Truck to be re-trucked in order to match the Body Bolster Blocks in the Slewing Ring Keyway.

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Card Code:

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TRUCKS AND SUSPENSIONS

Sheet:

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Subsystem/Assy:

MOTOR TRUCK

Unit:

Component:

Man Hours:

6

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

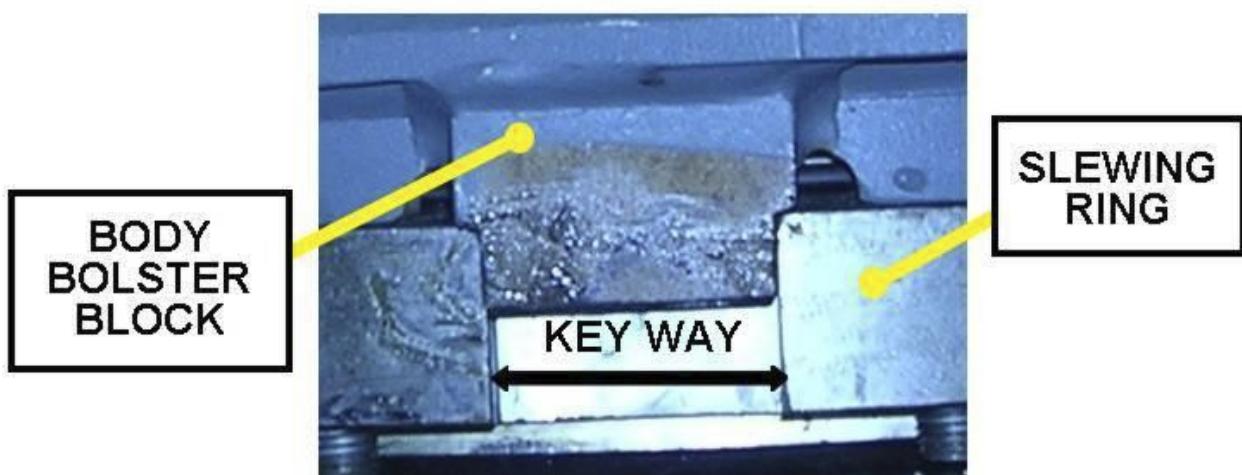


Figure 13 - BODY BOLSTER BLOCK IN THE SLEWING RING KEYWAY MATCHING

CAUTION: PERFORM THE TRUCK RAISING WITH EXTREME CARE.PAY ATTENTION TO NOT DAMAGE TRUCK /VEHICLE COMPONENTS.

- 10** Once the matching is correctly completed, to restore Mechanical, Pneumatic and Electrical Connections proceed as follows:

MECHANICAL CONNECTIONS

- a. **Truck-Carbody Connection** (refer to previous Fig 11)

1. Apply a small amount of Loctite 243 to the threads of the Bolts.
2. Install Bolts, Lock Washers and Flat Washers.
3. Torque the Bolts to **200 Ft-Lb (270 Nm)**, in a star pattern, using suitable Torque Wrench.

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Card Code:

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System:

TRUCKS AND SUSPENSIONS

Sheet:

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Subsystem/Assy:

MOTOR TRUCK

Unit:

Component:

Man Hours:

6

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

- b. Parking Brakes Manual Release** (refer to previous Fig 12)
 - 1. Locate the Parking Brakes Manual Release Cable coming from the Cab.
 - 2. Remove the Cap (previously installed) from Parking Brakes Manual Release Cable.
 - 3. Engage the Cable to the relevant Junction Box installed on the Truck Frame.

PNEUMATIC CONNECTIONS

- a. Air Suspension System and Brakes System** (refer to previous Fig 9)
 - 1. Remove the Caps (previously installed) from the (Flexible Hose) Connections Nipples.
 - 2. Apply recommended sealant to relevant (Flexible Hose) Connections thread Nipples.
 - 3. Restore (Flexible Hose) Connections by tightening the relevant Nipples.
- b. Motor Truck Sanding System** (refer to previous Fig 10)
 - 1. Remove the Caps (previously installed) from RH and LH (Flexible) Hose Connections free ends.
 - 2. Restore both RH and LH (Flexible) Hose Connections to Sanding Nozzles by installing and tightening the relevant Clamps.

ELECTRICAL CONNECTIONS

- a. HV Traction Motors Power Supply** (refer to previous Fig 6)
 - 1. Remove the Caps (previously installed) from Plug and (Fixed) Traction Motors Power Supply Connector.
 - 2. Clean mating surface and poles of Plug and (Fixed) Traction Motors Power Supply Connector using recommended cleaner and cleaning rags.
 - 3. Check for damage/deformation all the O-rings (green) installed on the (Male) Plugs. Replace as per check result.

CAUTION: TO AVOID DAMAGE / MALFUNCTIONS TO THE VEHICLE POWER SYSTEM, DAMAGED O-RING(S) MUST BE REPLACED.
- 4. Plug the (Male) Plug into the (Female) Quick Disconnect Box.
- 5. Engage the Locking Device to lock the two parts of the Quick Disconnect Box.

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Card Code:

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System:

Sheet:

TRUCKS AND SUSPENSIONS

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Subsystem/Assy:

MOTOR TRUCK

Unit:

Component:

Man Hours:

6

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

b. HV Traction Current Return (refer to Fig 7)

1. Remove the Cap (previously installed) from the HV Traction Current Return Terminal.
2. Clean the contact surface of HV Traction Current Return Terminal (on Terminal and on the Traction Current Return Insulated Plate) using recommended cleaner and cleaning rags.
3. Check the HV Traction Current Return Terminal for damage/deformation (on Terminal and on the Traction Current Return Insulated Plate). Replace/adjust as per check result.
4. Reconnect HV Traction Current Return Terminal by installing and tightening to **52 ft-lb** the relevant Hardware connecting the HV Traction Current Return Cable to the Traction Current Return Insulated Plate.

c. LV System (refer to previous Fig 6)

1. Remove the Caps (previously installed) from Plug and (Fixed) Speed Sensors and Track Brake Power Supply Connectors.
2. Clean mating surface of Plugs and (Fixed) Speed Sensors and Track Brake Power Supply Connectors of using recommended cleaner and cleaning rags.
3. Check for damage/deformation the O-rings installed on the (Male) Plug. Replace as per check result.

CAUTION: TO AVOID DAMAGE / MALFUNCTIONS TO THE PROPULSION AND TRACK BRAKES SYSTEM, DAMAGED O-RING(S) MUST BE REPLACED.

4. Reconnect Speed Sensors Mating Connector.
5. Reconnect Track Brake Power Supply Mating Connector.

d. Ground Braid (refer to previous Fig 8)

1. Remove the Caps (previously installed) from the Ground Braid Terminal.
2. Clean the contact surface of Ground Braid Terminal (on Terminal and on the Truck) using recommended cleaner and cleaning rags.
3. Check the Ground Braid Terminals for damage/deformation (on Terminal and on the Truck Connection). Replace/adjust as per check result.
4. Reconnect Ground Braid Terminal by installing and tightening the relevant Hardware connecting the Ground Braid to the Truck.

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-00-00/R-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

24/26

Subsystem/Assy:

MOTOR TRUCK

Unit:

Component:

Man Hours:

6

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

- 11.** Once Mechanical, Pneumatic and Electrical reconnections were completed and successfully verified proceed as follows:

- a. Install the Floor Trap Panel as follows:

NOTE: In order to prevent/reduce noise level in the Vehicle, perform the following procedure with extreme care.

1. Check the Floor Trap Gasket for damage/deformation. Replace as per check result.
2. Check installation of the Gasket on the Floor Trap Well. As per check result use recommended product to restore design installation.
3. Clean the Floor Well in contact with the Gasket using recommended product.
4. Position Floor Trap Panel.
5. Install and tighten the Screws.
6. Check that there are no level differences between the Vehicle Floor and the Floor Trap Panel. Adjust as per check result.

13. FINAL OPERATIONS

- a. Raise the truck hoist first and then lower the Body Stands just to have the Vehicle Load completely supported by means of all the three Truck Hoists by operating the "LOWER BODY STANDS" Pushbutton on the Transit Car Hoist and Support System-Master Panel.
- b. Once the vehicle load is in charge of the three Truck Hoists, fully lower the Body Stands.
- c. Operate the Car Hoist and Support System in "ALL TRUCKS HOIST" mode to lower the Vehicle by operating the "LOWER TRUCK HOIST" Pushbutton on the Transit Car Hoist and Support System-Master Panel.
- d. Inspect Truck and Vehicle to verify that the operation was successful.
- e. Switch ON the Battery Disconnect Circuit Breaker (3F01 Battery Circuit Breaker Box) located in the Battery Box (B Section Rh Side) to restore Battery Power (refer to previous Fig 1)
- f. Operate as follows to restore operating condition of the following Systems of the Truck installed.

1. PNEUMATIC SYSTEM

Open Air Suspension System (Vented) Cut-Out Cock to restore Pneumatic Pressure to Air Suspension System (refer to previous Fig 2).

2. MOTOR TRUCK SANDING SYSTEM

Open Sanding System (Vented) Cut-Out Cock to restore Pneumatic Pressure to Sanding System (refer to previous Fig 3).

3. BRAKES SYSTEM

Open both Disc Brakes and Parking Brakes (Vented) Cut-Out Cocks located in the BCU Box to restore Pneumatic Pressure to Brakes System (refer to previous Fig 4).

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-00-00/R-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

25/26

Subsystem/Assy:

MOTOR TRUCK

Unit:

Component:

Man Hours:

6

Maintenance Task:

REPLACEMENT

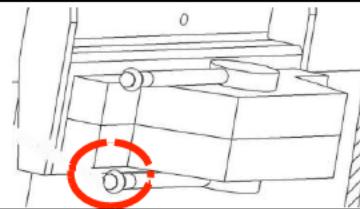
PROCEDURE (CONT'D):

13. FINAL OPERATIONS (CONT'D)

- g. Restore Electrical Power.
- h. Enable the "A" Cab by keying ON the Transfer Switch.
- i. Check, on the Duplex Air Pressure Gauge (A Cab) that Pneumatic Pressure build up.
- j. Check Carbody-Truck Pneumatic Connections, previously restored, (refer to previous Fig 9) for air leakage. Adjust as per check result.
- k. Reset the Parking Brakes Release by opening and, after some seconds, closing the Parking Brakes Cut out Cock (Refer to Figure 4) inside the BCU. (This action applies the Parking Brakes).
- l. Check that all Parking Brakes are applied (by checking "Parking Brake A and B Not Released."

- m. Release the Parking Brakes by pushing forward the Black Knob Handle in the Cab

NOTE: The Parking Brakes will be released simultaneously and two "clicks" can be heard; one click per Brake Caliper.



CAUTION: IF THE PARKING BRAKES RELEASING FAILS COMPLETELY (NO "CLICKS") OR PARTIALLY (ONE "CLICK") PERFORM THE PARKING BRAKE CABLE TENSION ADJUSTMENT PROVIDED IN THE SPECIFIC STEP OF THE SHEET R-C-13-03-05-00/R-00

- n. Check, on IDU "A", - System Status Screen -, that all the Vehicle Systems are clear of troubles (OK-green).
Particularly check for the following Systems involved in the re-trucking operations:
 - 1. Propulsion System.
 - 2. Brake System.
 - 3. APS/LVPS.
- o. If faults are found, first access the Maintenance Menu and then to the Faults Screen by selecting, in sequence, the relevant icons.
- p. Check, through the list of the current active faults shown in the Faults Screen, for any Fault relevant to the re-trucked Truck and/or to the Systems previously listed.
- q. As per Fault Check Results remove the Fault Causes to restore Systems Operational Conditions.
- r. Perform Vehicle Leveling Procedure (Refer to Sheet R-C-01-01-00-00 / LL-00).
- s. Remove wheel chocks.
- t. Record the Truck Re-Trucking and the Vehicle Leveling results on the Defect Report Cards to allow the planning of Maintenance Operations.

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-00-00/R-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

26/26

Subsystem/Assy:

MOTOR TRUCK

Unit:

Component:

Man Hours:

6

Maintenance Task:

REPLACEMENT**INTENTIONALLY LEFT BLANK**

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-01-01/RP-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

1/10

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

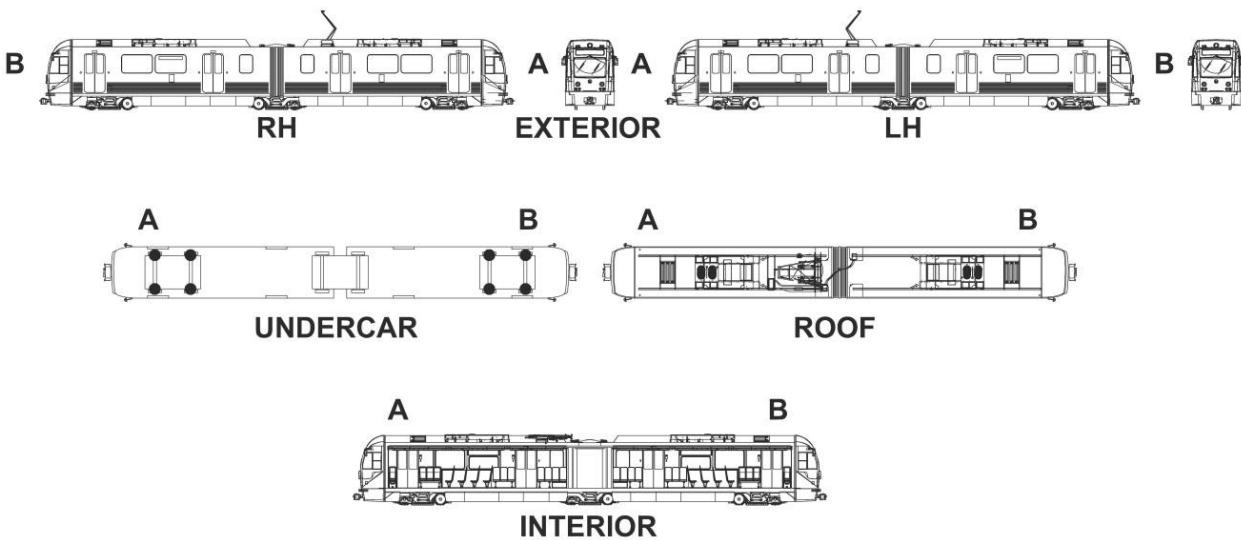
Component:

WHEEL

Man Hours:

4

Maintenance Task:

RE-PROFILING
LOCATION:

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-01-01/RP-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

2/10

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

4

Maintenance Task:

RE-PROFILING**SAFETY PRECAUTIONS:**

WARNING: BLUE FLAG THE VEHICLE IN ACCORDANCE WITH ALL LACMTA BLUE FLAG POLICIES, RULES, & PROCEDURES IN ORDER TO WARN THAT MAINTENANCE PERSONNEL ARE WORKING ON, UNDER, OR NEAR ROLLING EQUIPMENT.

WARNING: APPLY WHEEL CHOCKS TO PREVENT THE VEHICLE FROM MOVING.

WARNING: WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.

CAUTION: DURING THE RE-PROFILING, THE TEMPERATURES GENERATED BY THE PROCESS SHOULD NOT EXCEED 212°F (100°C). HIGHER TEMPERATURES MAY CAUSE DAMAGE TO THE RUBBER BLOCKS, THUS REDUCING THE LIFE OF THE BLOCKS.

TOOLS:

Pi Tape 24 to 36 inch range (AAR Tool for Wheel Diameter check)

AAR Steel Wheel Gauge (AAR Tool for Wheel Profile check)

MTA Wheel Truing Machine

CONSUMABLES:

N/A

SPARE PARTS:

N/A

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-01-01/RP-00

System:

Sheet:

TRUCKS AND SUSPENSIONS

3/10

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

4

Maintenance Task:

RE-PROFILING

PROCEDURE:

PRELIMINARY OPERATIONS

Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop Regulations:

1. Place the Vehicle over the Pit(or Stand Up Rail) provided with Wheel Truing Machine.
2. Set the Master Controller Handle to FSB position.
3. Make sure that all Parking Brakes are applied (by checking on the IDU "Parking Brake A and B Not Released" and on Indicator Panel "A" "Park / Friction Brake" ON).
4. Remove Electrical Power from Vehicle by lowering the Pantograph.
5. Turn the Transfer Switch to OFF.
6. Set the Pantograph Control Motor Switch (5F02 CB LV Locker "A" Section) to OFF
7. Lock out and tag out the Switch in accordance with all LACMTA Safety Rules, Regulations, Policies, and Procedures.

NOTE The tag must indicate the name of the person who removed Power.
 That person knows why the Power was removed and when it safe to restore it.
 Only the individual whose name appears on the tag or a person with his approval should remove the tag and restore Power.

8. Apply wheel chocks to prevent the Vehicle from moving

WHEEL RE-PROFILING PROCEDURE

NOTE It is assumed that:

- a. The Truck involved in the Wheel Truing is positioned on the Wheel Truing Machine according to MTA Regulations.
- b. The Wheel to be re-profiled is adjusted and set on the Wheel Truing Machine
- c. All Parking Brakes are applied.
- d. Wheel Chocks to prevent the Vehicle from moving are applied to the (wheels) trucks not involved in the Wheel Truing.

To perform the task proceed as follows:

WARNING: THE FOLLOWING STEPS MUST BE PERFORMED ONLY FOR THE TRUCK INVOLVED IN THE WHEEL TRUING.

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-01-01/RP-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

4/10

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

4

Maintenance Task:

RE-PROFILING

PROCEDURE (CONT'D):

1. Release the Friction Brakes as follows :

- a. Cut out the Friction Brakes Cylinders by rotating the Friction Brakes Cut -Out Cock(ORANGE) to CUT OUT position.

NOTE: To do so, the Maintainer must open the Underframe Skirt in correspondence with the Cut-Out Cock and turn the valve (ORANGE) as indicated in the Figure 1

2. Release the Parking Brakes as follows :

- a. Cut out the Parking Brakes Cylinders by rotating the Parking Brakes Cut Out Cock(RED) to CUT OUT (vertical) position.

NOTE To do so, the Maintainer must open the Underframe Skirt in correspondence with the BCU Box first and then open the BCU Cover and turn the valve (RED) indicated in the figures 3 and 4.

CAUTION: WITHOUT CUT-OUT COCK CUT OUT THE PARKING BRAKE CYLINDERS COULD BE REACTIVATED.

- b. Operate the Parking Brakes Release Handle to mechanically release the Parking Brakes.

NOTE: To do so, open the door of the locker located in the Cab A for Truck A and in the Cab B for Truck B, (at the left of the Operator seat) and operate the Brake Release Handle (BLACK -LOWER) indicated in the Figure 5.

3. Make sure that the Wheel Set is free to rotate

4. Operate the Wheel Truing Machine according to:

- a. MTA Wheel Truing Regulations.
- b. Wheel Dimensional Data and Wheel Dimensions shown in the Fig 6.
- c. New wheel diameter value to meet (determined as per Wheel Diameter and Profile measurements previously done, according to Sheets R-P-12-01-01-01/I-00 and R P-12-01-01-01/I-01).

CAUTION: DURING THE RE-PROFILING, THE TEMPERATURES GENERATED BY THE PROCESS SHOULD NOT EXCEED 212°F (100°C).
HIGHER TEMPERATURES MAY CAUSE DAMAGE TO THE RUBBER BLOCKS, THUS REDUCING THE LIFE OF THE BLOCKS.

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-01-01/RP-00

System:

Sheet:

TRUCKS AND SUSPENSIONS**5/10**

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

4

Maintenance Task:

RE-PROFILING**PROCEDURE (CONT'D):**

5. Measure /check the re-profiled Wheels for New Diameter and Profile, according to the condemning limits shown in Wheel Dimensional Data in Fig 6.
6. Upon completing the re-profiling proceed as follows:
 - a. Operate the Parking Brake Release Handle (Cab) to NORMAL position.
 - b. Remove the Parking Brakes Cut Out status by rotating the Parking Brakes Cut Out Cock (RED) to WORK (horizontal) position.
 - c. Remove the Friction Brakes Cut out status by rotating the Friction Brakes Cut -Out Cock (ORANGE) to WORK position
7. Restore Electrical Power.
8. If the A1R /A1L Wheels have been re-profiled, input the "new" Wheel Diameter value into IDU ("A" Cab).

NOTE: To input the new diameter (in millimeters) it is necessary to access to the Maintenance Mode first and then to the Utility Screen of the Maintenance Menu Screen (refer to Fig 7).

CAUTION: FOR A1R /A1L WHEELS RE-PROFILING, THE "NEW" WHEEL DIAMETER INPUT INTO IDU (A CAB) IS MANDATORY BECAUSE THE PROPULSION LOGIC MAKES AN ON-LINE MEASUREMENT OF THE WHEEL DIAMETERS BASED ON THE STORED VALUE OF THE REFERENCE A1R /A1L WHEEL DIAMETERS.

NOTE: For the re-profiling of any other Wheels, it is not necessary to input the new diameter because it is calculated comparing the A1R /A1L reference diameter with the speed sensors' frequencies and then considers the ratio between them.

The wheel diameter calculation is executed only when both the following conditions are met:

- a. The car speed is in the range between 5mph and 25mph.
- b. The car mode is coasting for at least 3 seconds.

9. Upon completing the re-profiling it is recommended to perform the External Shunt Resistance Test on all wheels which were re-profiled, according to Sheet R-P-12-01-01-01/T-00.
10. Perform the Vehicle Leveling procedure according to Sheet R-C-01-01-00-00/LL-00:
11. Remove wheel chocks.
12. Record Inspection and Test results on the Defect Report Card for administrative and maintenance planning.

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-01-01/RP-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

6/10

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

4

Maintenance Task:

RE-PROFILING

PROCEDURE (CONT'D):

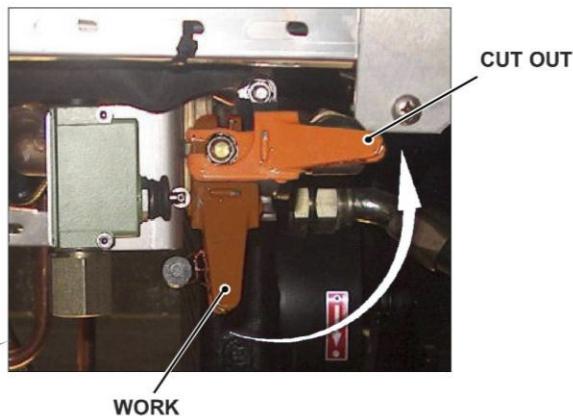
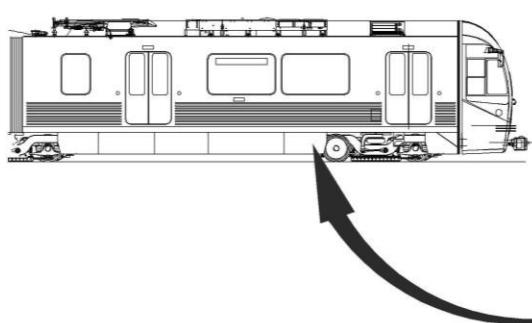


Figure 1 - MOTOR TRUCK FRICTION BRAKE CUT OUT (TYPICAL)

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-01-01/RP-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

7/10

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

4

Maintenance Task:

RE-PROFILING

PROCEDURE (CONT'D):

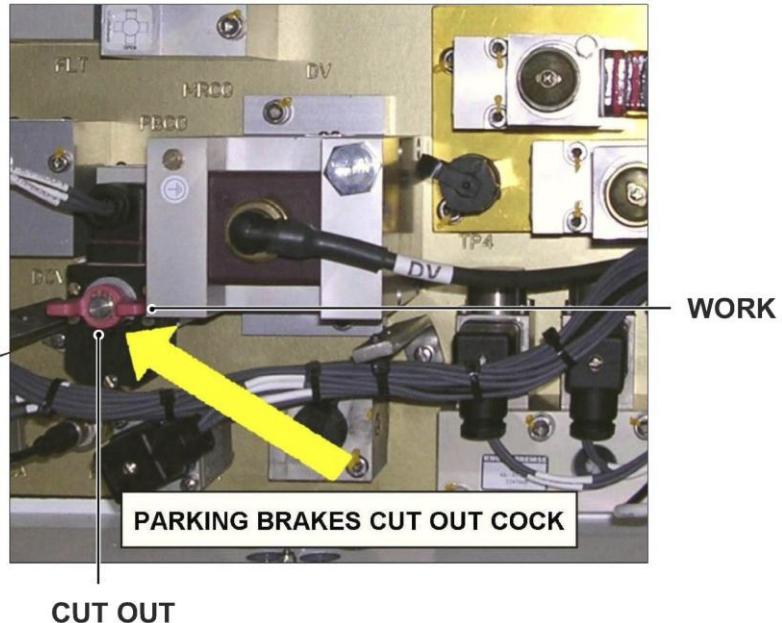
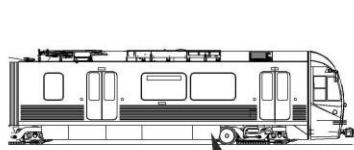


Figure 3 - TRUCK PARKING BRAKES CUT OUT COCK (RED)-(TYPICAL)

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-01-01/RP-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

8/10

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

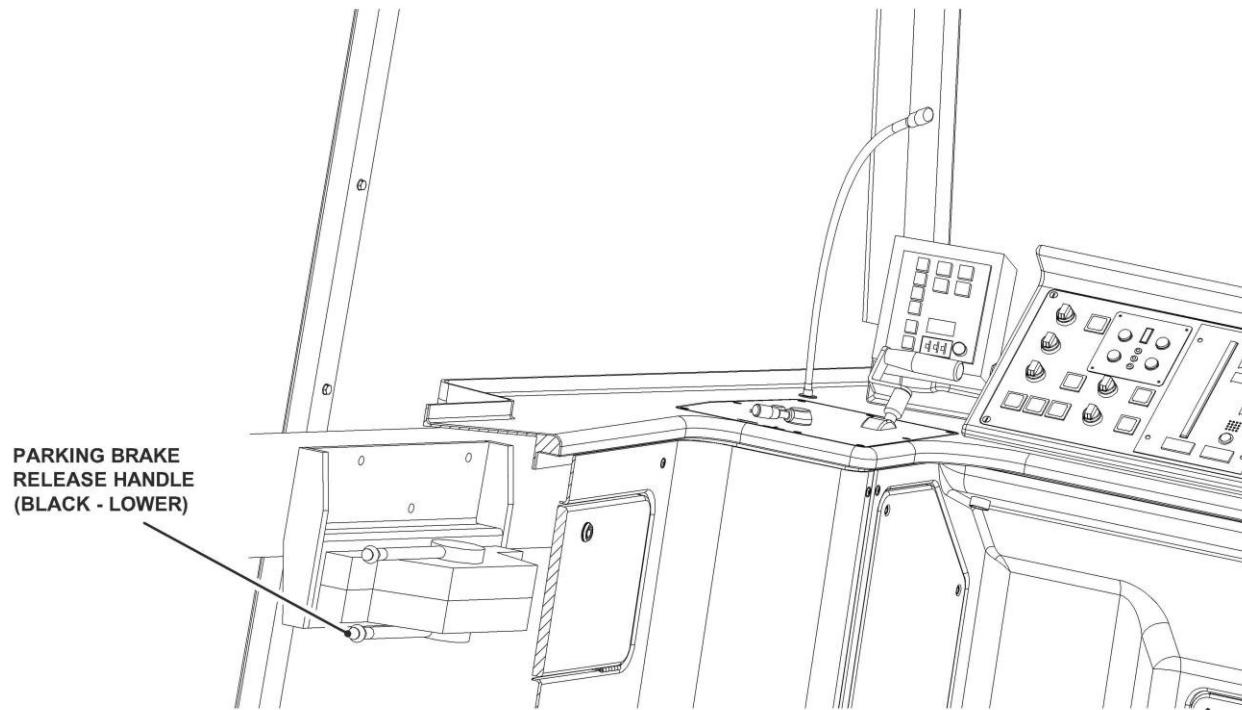
Component:

WHEEL

Man Hours:

4

Maintenance Task:

RE-PROFILING**PROCEDURE (CONT'D):****Figure 5 - PARKING BRAKE RELEASE HANDLE**

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-01-01/RP-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

9/10

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

4

Maintenance Task:

RE-PROFILING

PROCEDURE (CONT'D):

WHEEL - DIMENSIONAL DATA

Wheel diameter (new).....	28.00 in
Wheel wear before replacement on diameter.....	2.00 in
Difference between the diameter of the wheels	(same axle <.080 in)
Difference between the diameter of the wheels.....	(same truck .38 in)
Difference between the diameter of the wheels.....	(same vehicle ± 2 in)

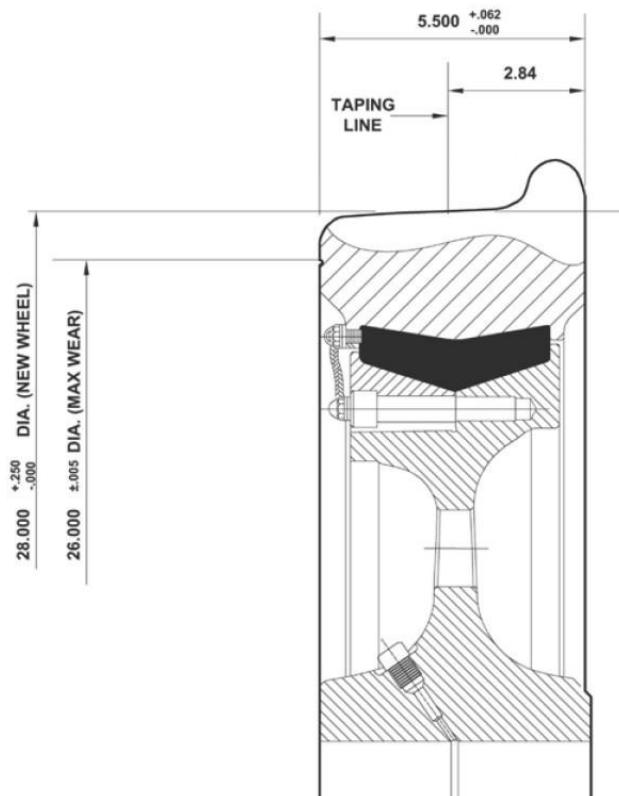


Figure 6 - TRUCKS WHEEL PROFILE

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-01-01/RP-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

10/10

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEEL SET MOTOR TRUCK

Component:

WHEEL

Man Hours:

4

Maintenance Task:

RE-PROFILING

PROCEDURE (CONT'D):



Figure 7 - UTILITY SCREEN - WHEEL DIAMETER

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-01-05/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

1/8

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEELSET

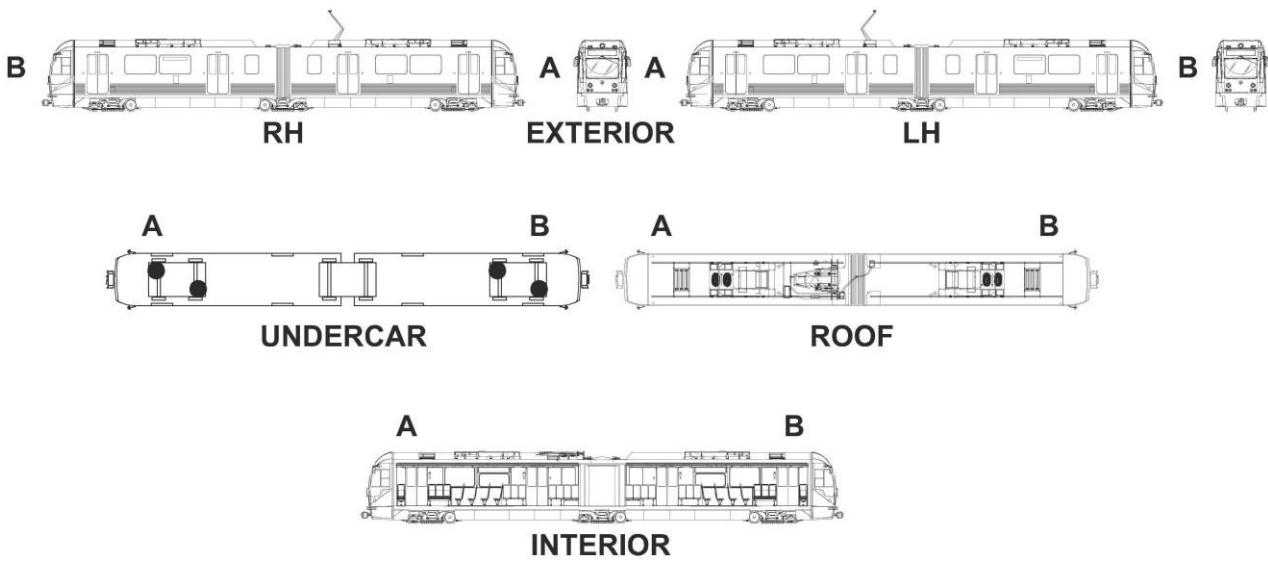
Component:

GROUND CONTACT DEVICE

Man Hours:

1

Maintenance Task:

REPLACEMENT
LOCATION:


P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-01-05/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

2/8

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEELSET

Component:

GROUND CONTACT DEVICE

Man Hours:

1

Maintenance Task:

REPLACEMENT

SAFETY PRECAUTIONS:

WARNING: BLUE FLAG THE VEHICLE IN ACCORDANCE WITH ALL LACMTA BLUE FLAG POLICIES, RULES, & PROCEDURES IN ORDER TO WARN THAT MAINTENANCE PERSONNEL ARE WORKING ON, UNDER, OR NEAR ROLLING EQUIPMENT.

WARNING: ALWAYS WEAR EYE PROTECTION AND GLOVES WHILE PERFORMING THIS MAINTENANCE TASK.

WARNING: ELECTRICAL HAZARD IS PRESENT THROUGHOUT THE PROPULSION SYSTEM AND CAUTION MUST BE TAKEN WHILE WORKING ON OR NEAR THE EQUIPMENT.
REMOVE ALL ELECTRICAL POWER BEFORE PERFORMING MAINTENANCE TO THE SYSTEM.

WARNING: BEFORE PERFORMING MAINTENANCE PROCEDURES AND TOUCHING ANY COMPONENT, USE A RELIABLE HIGH VOLTAGE TEST PROBE TO VERIFY THAT NO VOLTAGE IS PRESENT.

WARNING: HIGH VOLTAGE IS PRESENT ON THE INVERTER GROUP. AFTER REMOVING ALL POWER FROM THE VEHICLE, WAIT A MINIMUM OF 1 MINUTE PRIOR TO REMOVING OR OPENING MAIN INVERTER GROUP, SINCE THE CAPACITORS DISCHARGE TIME IS 10 SECONDS
FAILURE TO COMPLY WITH SAFETY REGULATIONS COULD RESULT IN SERIOUS INJURY OR EVEN DEATH IF NOT FOLLOWED.

WARNING: WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.

CAUTION IT IS IMPERATIVE THAT NO OIL, GREASE OR DIRT IS LEFT ON THE GROUND RING / CURRENT RETURN BRUSHES.
RESIDUE OF ANY KIND WILL CAUSE FAILURE TO THE GROUNDING CONTACT.
CLEAN GROUND RING / CURRENT RETURN BRUSHES WITH A CLEAN CLOTH USING WHITE ALCOHOL SPIRITS ONLY.

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-01-05/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

3/8

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEELSET

Component:

GROUND CONTACT DEVICE

Man Hours:

1

Maintenance Task:

REPLACEMENT

TOOLS:

LACMTA Maintenance Shop Standard Tools Kit.

CONSUMABLES:

Cleaner / Degreaser, as needed.

White Alcohol Spirits as needed.

Anti-Oxidant Joint Compound Korp - Shield, as needed

SPARE PARTS:

Ground / Return Brushes (PN 06.21.0076.13)

Housing LH (PN 06.50.0151.00)

Housing RH (PN 06.50.0151.01)

Housing LH Gasket (PN tbd)

Housing RH Gasket (PN tbd)

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-01-05/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

4/8

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEELSET

Component:

GROUND CONTACT DEVICE

Man Hours:

1

Maintenance Task:

REPLACEMENT**PROCEDURE:****PRELIMINARY OPERATIONS**

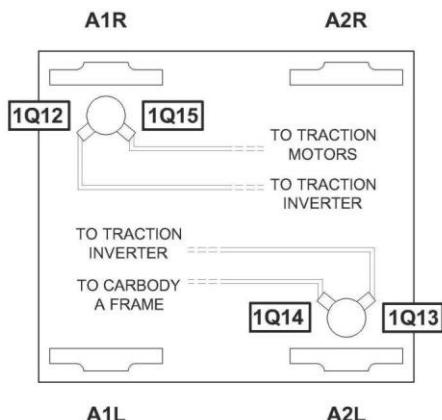
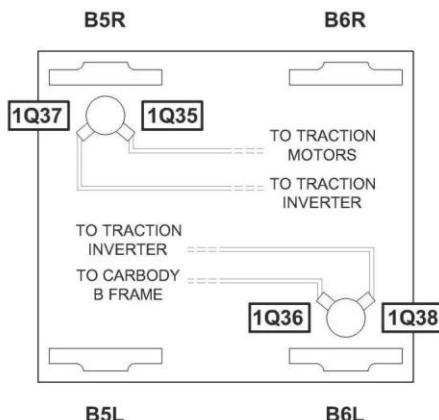
Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop Regulations:

1. Place the Vehicle over the Pit (or Stand Up Rail).
2. Set the Master Controller Handle to FSB position.
3. Make sure that all Parking Brakes are applied (by checking on the IDU "Parking Brake A and B Not Released" and on Indicator Panel "A" "Park / Friction Brake" ON).
4. Remove Electrical Power from Vehicle by lowering the Pantograph.
5. Turn the Transfer Switch to OFF.
6. Set the Pantograph Control Motor Switch (5F02 CB LV Locker "A" Section) to OFF.
7. Lock out and tag out the Switch in accordance with all LACMTA Safety Rules, Regulations, Policies, and Procedures.

NOTE The tag must indicate the name of the person who removed Power.

That person knows why the Power was removed and when it safe to restore it.

Only the individual whose name appears on the tag or a person with his approval should remove the tag and restore Power.

"A" MOTOR TRUCK**"B" MOTOR TRUCK****Figure 1 - GROUND CONTACT DEVICES - LOCATION**

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-01-05/R-00

System:

Sheet:

TRUCKS & SUSPENSIONS
5/8

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEELSET

Component:

GROUND CONTACT DEVICE

Man Hours:

1

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

REMOVAL

To perform the task proceed as follows (Refer to figures 2 and 3):

1. Remove Terminals and Cables of Ground / Current Return Brushes.
2. Disconnect the Electrical Connectors and remove Sensors and Cables.
3. Remove Screws (E), Washers (F) and Lock-washers (G), then remove Brush Housings Cover (A) and Gasket (B).
4. Slide Out the Pressure Device (C) from the slot in the Brush Guide (D) to disengage the Brush Terminals.
5. Separate Ground Brush Housing (1 and 2) by removing Screws (8), Washers (9), Lock-washers (10) and Hex Nuts (11).
6. Remove the Ground Brush Housings (1 and 2) with Gaskets (13) from the Junction Box by removing Screws (14), Lock-washer (10) and Washers (9).

INSTALLATION

To perform the task proceed as follows (Refer to figures 2 and 3):

CAUTION: IT IS IMPERATIVE THAT NO OIL, GREASE OR DIRT IS LEFT ON THE GROUND RING / CURRENT RETURN BRUSHES.

RESIDUE OF ANY KIND WILL CAUSE FAILURE TO THE GROUNDING CONTACT.

CLEAN GROUND RING / CURRENT RETURN BRUSHES WITH A CLEAN CLOTH USING WHITE ALCOHOL SPIRITS ONLY.

1. Speed Sensor Ring (5) and Ground Ring (4) are in position.
2. If necessary:
 - a. Separate Ground Brush Housing (1 and 2) by removing Screws (8), Washers (9), Lock-washers (10) and Hex Nuts (11).
 - b. Remove Cover (A), Gasket (B) and Pressure Devices (C) from Contact Assembly.
3. Place Ground Brush Housings (1 and 2) over Ground Ring (4). Install Gaskets (13) between the Housings.

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-01-05/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

6/8

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEELSET

Component:

GROUND CONTACT DEVICE

Man Hours:

1

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

4. Mount the Ground Brush Housings (1 and 2) to the Junction Box using Screws (14), Lock-washer (10) and Washers (9) and hand tighten.
5. Install Screws (8), Washer (9), Lock-washers (10) and Hex Nuts (11) into Ground Brush Housings (1 and 2) and hand tighten. Use LOCTITE 232 on threads.
6. Gradually tighten Screws (8 and 14) with an alternating crisscross pattern in 1/4 turn increments to minimize distortion of the housings.
Final torque Screws (8) to **22 ft-lb** and Screws (14) to **36 ft-lb**.
7. Slide Pressure Devices (C) into slot in the Brush guide (D) until it "clicks" into place.
8. Check Pressure Devices for correct working.
9. Install Cover (A) and Gasket (B). Install Screws (E), Washers (F) and Lock-washers (G). Torque to **11 ft-lb**.
10. Install Cables and Terminals of Ground / Current Return Brushes. Torque Terminal connections to **30 ft-lb**.
11. Install Sensors and Electrical Connectors, then tighten as required.
12. Restore Electrical Power.

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-01-05/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

7/8

Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEELSET

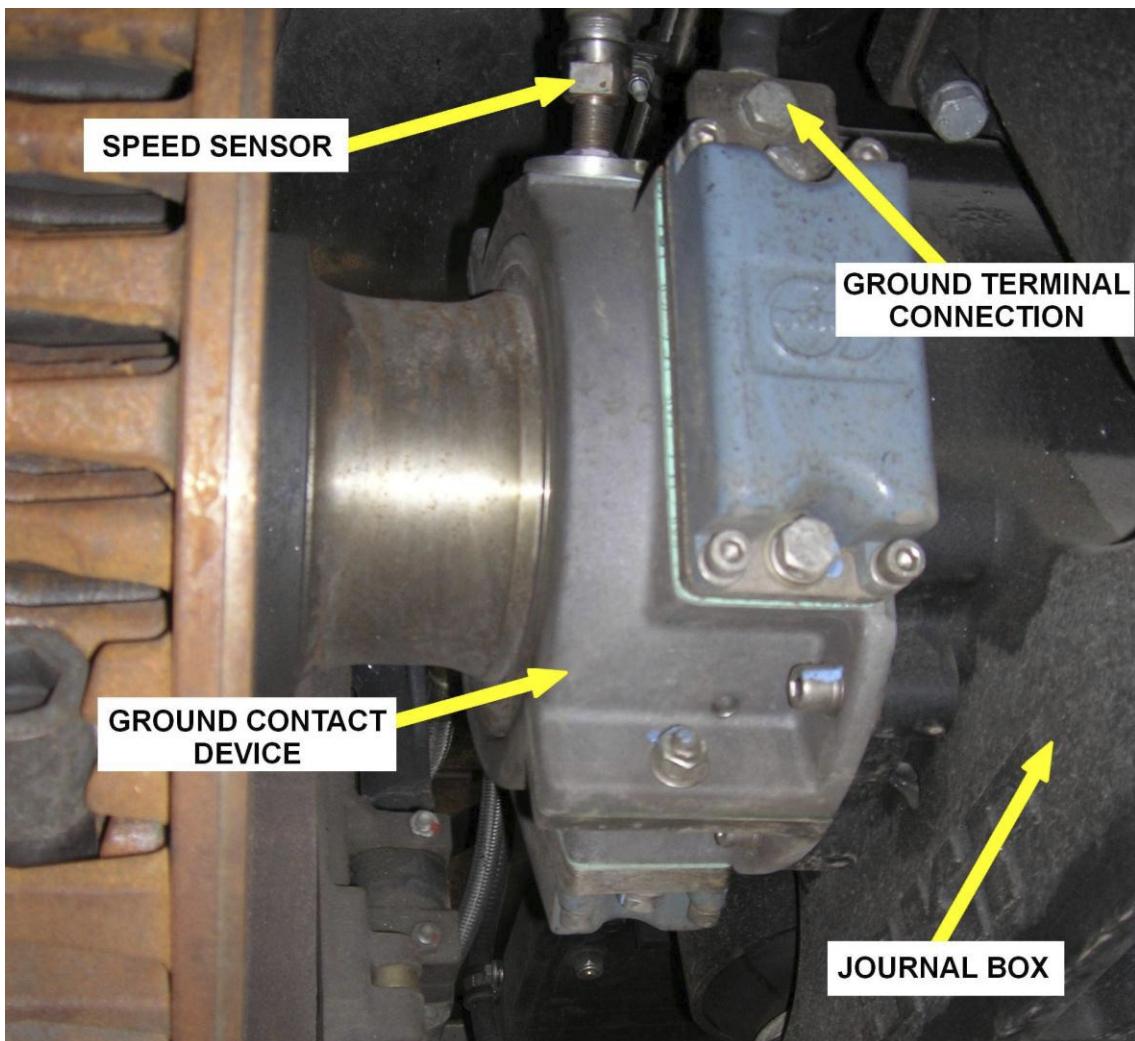
Component:

GROUND CONTACT DEVICE

Man Hours:

1

Maintenance Task:

REPLACEMENT**PROCEDURE:**
Figure 2 - GROUND CONTACT DEVICE

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-01-05/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

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Subsystem/Assy:

MOTOR TRUCK

Unit:

WHEELSET

Component:

GROUND CONTACT DEVICE

Man Hours:

1

Maintenance Task:

REPLACEMENT

PROCEDURE:

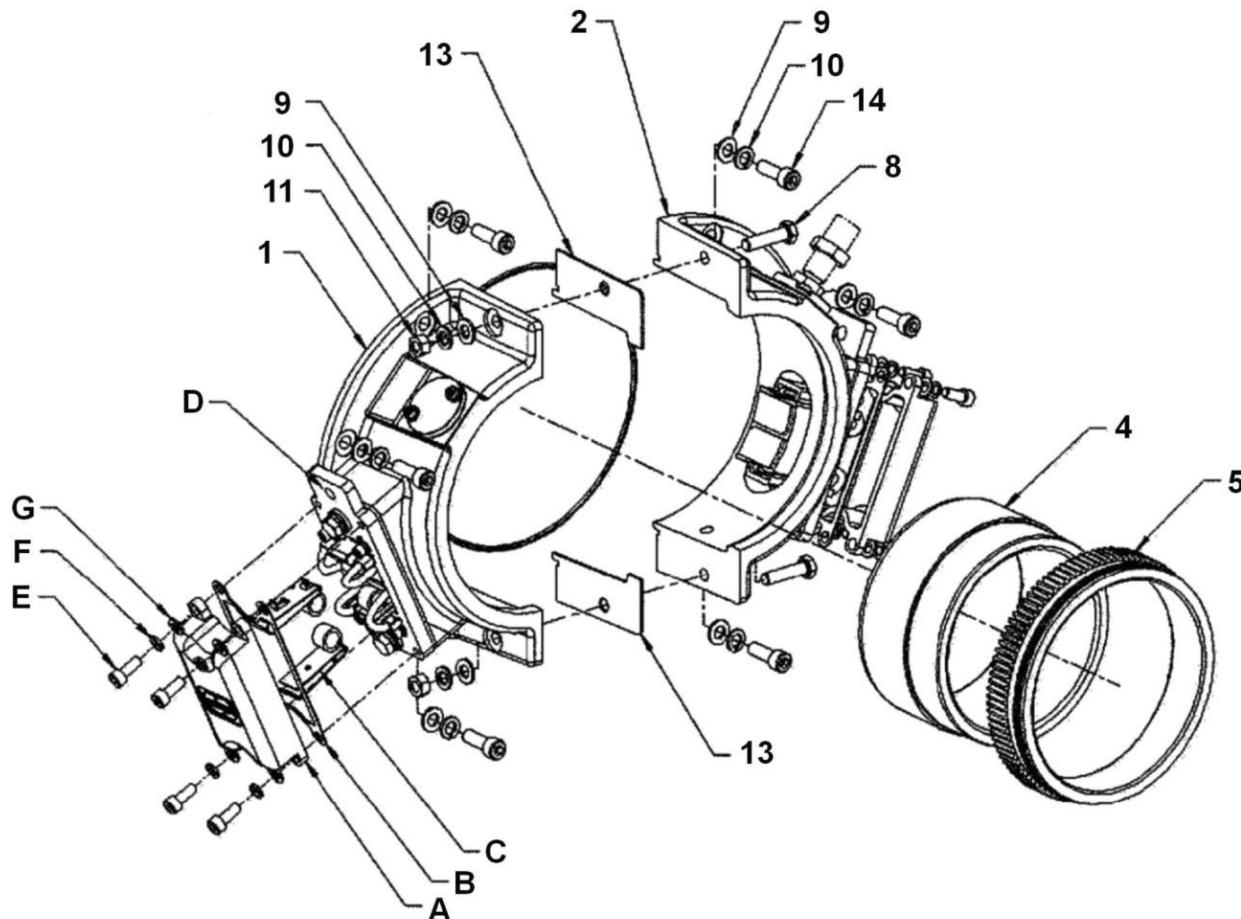


Figure 3 - GROUND CONTACT DEVICE REPLACEMENT

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-08-00/R-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

1/6

Subsystem/Assy:

MOTOR TRUCK

Unit:

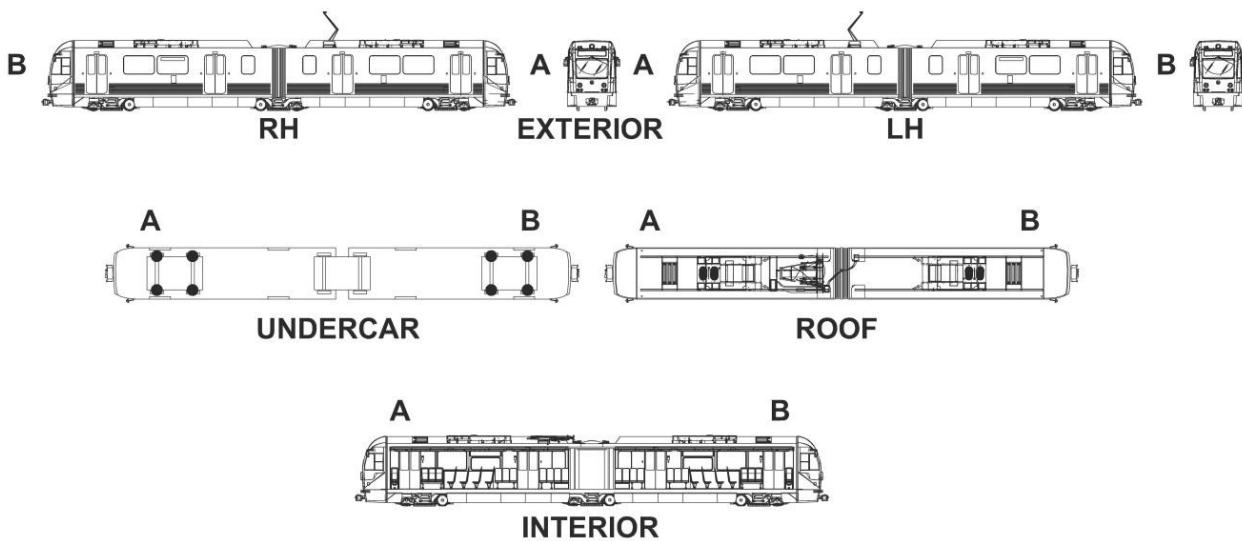
STICK LUBRICATOR

Component:

Man Hours:

2

Maintenance Task:

REPLACEMENT
LOCATION:


P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-08-00/R-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

2/6

Subsystem/Assy:

MOTOR TRUCK

Unit:

STICK LUBRICATOR

Component:

Man Hours:

2

Maintenance Task:

REPLACEMENT

SAFETY PRECAUTIONS:

WARNING: BLUE FLAG THE VEHICLE IN ACCORDANCE WITH ALL LACMTA BLUE FLAG POLICIES, RULES, & PROCEDURES IN ORDER TO WARN THAT MAINTENANCE PERSONNEL ARE WORKING ON, UNDER, OR NEAR ROLLING EQUIPMENT.

WARNING: APPLY WHEEL CHOCKS TO PREVENT THE VEHICLE FROM MOVING.

WARNING: WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.

TOOLS:

LACMTA Maintenance Shop Standard Tools Kit.

CONSUMABLES:

N/A

SPARE PARTS:

STICK AA07150 -101RW010
 HPF (High Positive Friction) Wheel Tread and Top-of-Rail Friction Modifier QTY =8

STICK AA07151 -201RW017
 LCF (Low Coefficient of Friction) Wheel Flange and Rail Gauge Face Lubricator QTY =8

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Card Code:

R-C-12-01-08-00/R-00

System:

Sheet:

TRUCKS AND SUSPENSIONS
3/6

Subsystem/Assy:

Unit:

MOTOR TRUCK
STICK LUBRICATOR

Component:

Man Hours:

2

Maintenance Task:

REPLACEMENT

PROCEDURE:

PRELIMINARY OPERATIONS

Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop Regulations:

1. Place the Vehicle over the Pit (or Stand Up Rail) provided with Wheel Truing Machine
2. Set the Master Controller Handle to FSB position
3. Make sure that all Parking Brakes are applied (by checking on the IDU "Parking Brake A and B Not Released" and on Indicator Panel "A" "Park / Friction Brake" ON)
4. Remove Electrical Power from Vehicle by lowering the Pantograph
5. Turn the Transfer Switch to OFF
6. Set the Pantograph Control Motor Switch(5F02 CB LV Locker "A" Section) to OFF
7. Lock out and tag out the Switch in accordance with all LACMTA Safety Rules, Regulations, Policies, and Procedures

NOTE The tag must indicate the name of the person who removed Power.

That person knows why the Power was removed and when it safe to restore it.

Only the individual whose name appears on the tag or a person with his approval should remove the tag and restore Power.

8. Apply wheel chocks to prevent the Vehicle from moving

REPLACEMENT

a. Removal

To remove HPF (High Positive Friction) Lubricator (Wheel Tread and Top-of-Rail Friction Modifier) and LCF (Low Coefficient of Friction) Lubricator (Wheel Flange and Rail Gauge Face Lubricator), proceeds as follows (Refer to Figures 1 and 2):

HPF Lubricator

1. Remove Screw (12), Washers (13) and Nut (14), then remove the HPF Lubricator (11).
2. If necessary remove Screws (7), Washers (9), Nuts (10) and Support (8).

LCF Lubricator

1. Remove Screws (19) and Nuts (20), then remove the LCF Lubricator (18).
2. If necessary remove Nuts (17), Washers (16) and Support (15).

Lubricator Bracket

1. If necessary remove Screws (1), Washers (2 & 5), Nuts (6), Shim (3) and Bracket (4).

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Card Code:

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System:

TRUCKS AND SUSPENSIONS

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4/6

Subsystem/Assy:

MOTOR TRUCK

Unit:

STICK LUBRICATOR

Component:

Man Hours:

2

Maintenance Task:

REPLACEMENT

PROCEDURE:

b. Installation

To install HPF (High Positive Friction) Lubricator (Wheel Tread and Top-of-Rail Friction Modifier) and LCF (Low Coefficient of Friction) Lubricator (Wheel Flange and Rail Gauge Face Lubricator), proceeds as follows (Refer to Figures 1 and 2):

Lubricator Bracket

1. If removed, install Screws (1), Washers (2 & 5), Nuts (6), Shim (3) and Bracket (4).

HPF Lubricator

1. If removed, install Screws (7), Washers (9), Nuts (10) and Support (8).
2. Install the HPF Lubricator (11) and fasten it with Screw (12), Washers (13) and Nut (14).

LCF Lubricator

1. If removed, install Nuts (17), Washers (16) and Support (15).
2. Install the LCF Lubricator (18) and fasten it with Screws (19) and Nuts (20).

FINAL OPERATIONS

1. Restore Electrical Power.

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Card Code:

R-C-12-01-08-00/R-00

System:

Sheet:

TRUCKS AND SUSPENSIONS
5/6

Subsystem/Assy:

MOTOR TRUCK

Unit:

STICK LUBRICATOR

Component:

Man Hours:

2

Maintenance Task:

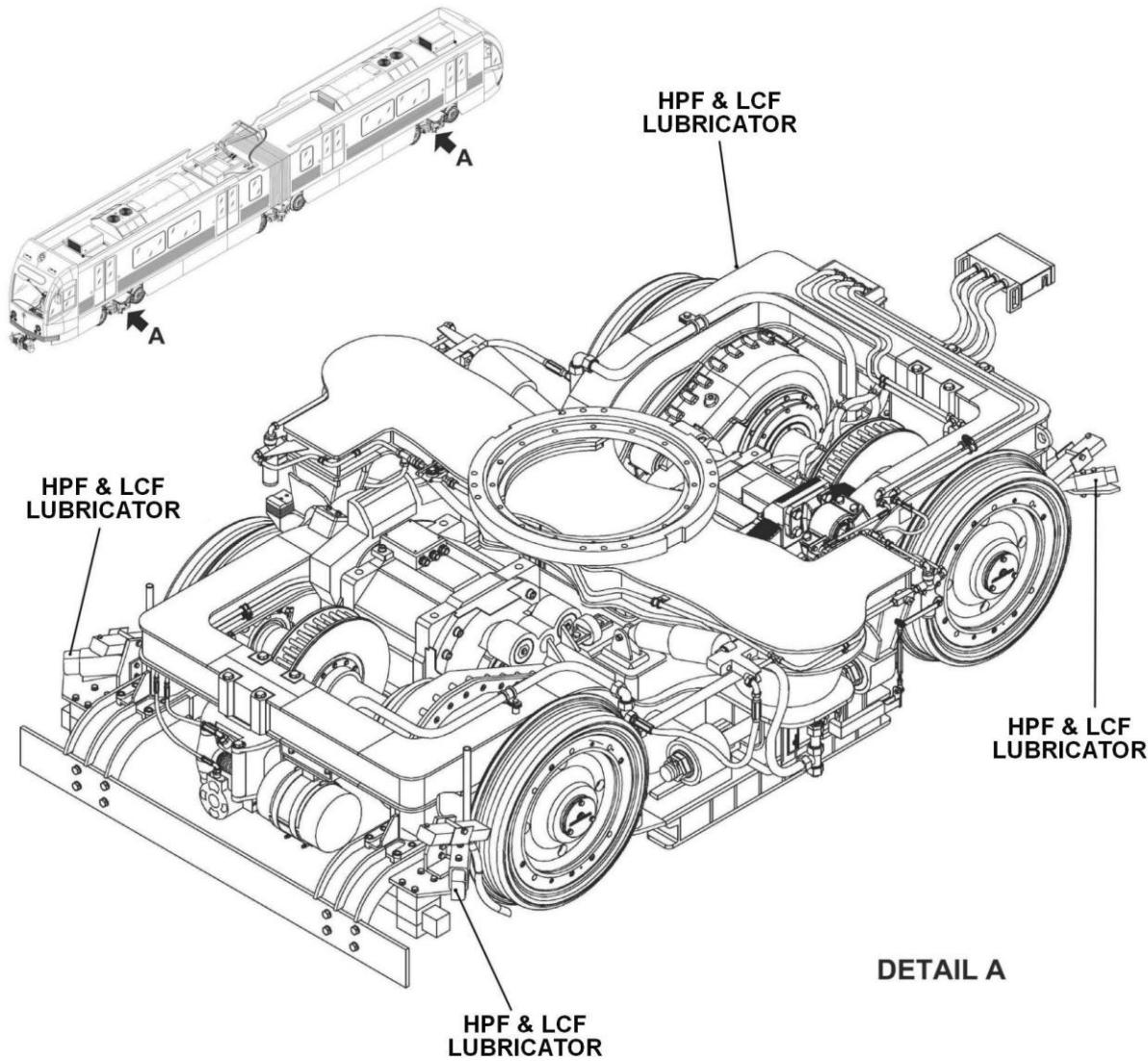
REPLACEMENT
PROCEDURE:


Figure 1 - MOTOR TRUCK - STICK LUBRICATOR LOCATION

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-01-08-00/R-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

6/6

Subsystem/Assy:

MOTOR TRUCK

Unit:

STICK LUBRICATOR

Component:

Man Hours:

2

Maintenance Task:

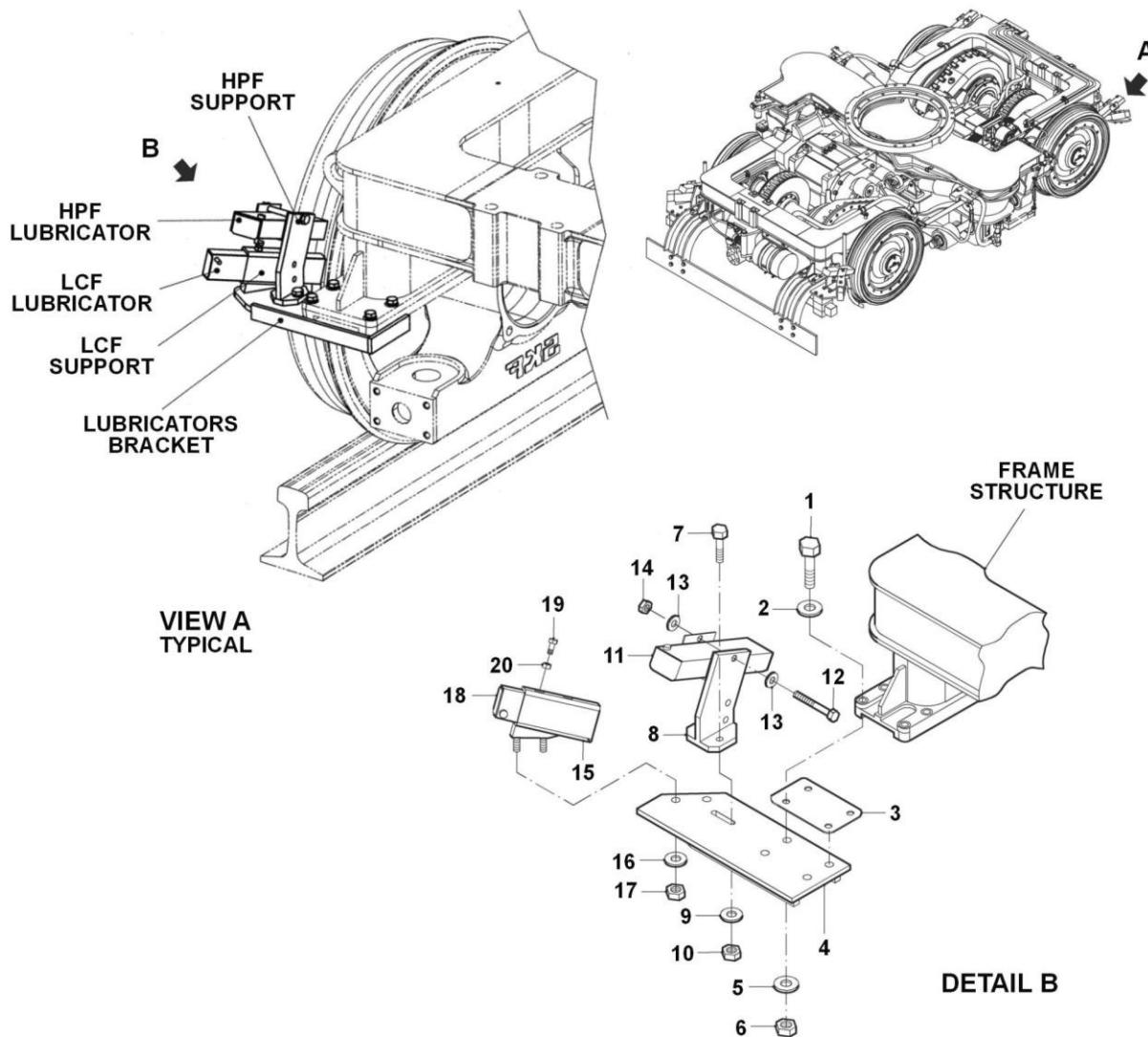
REPLACEMENT**PROCEDURE:**

Figure 2 - STICK LUBRICATORS REMOVAL/INSTALLATION

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-00-00/R-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

1/26

Subsystem/Assy:

TRAILER TRUCK

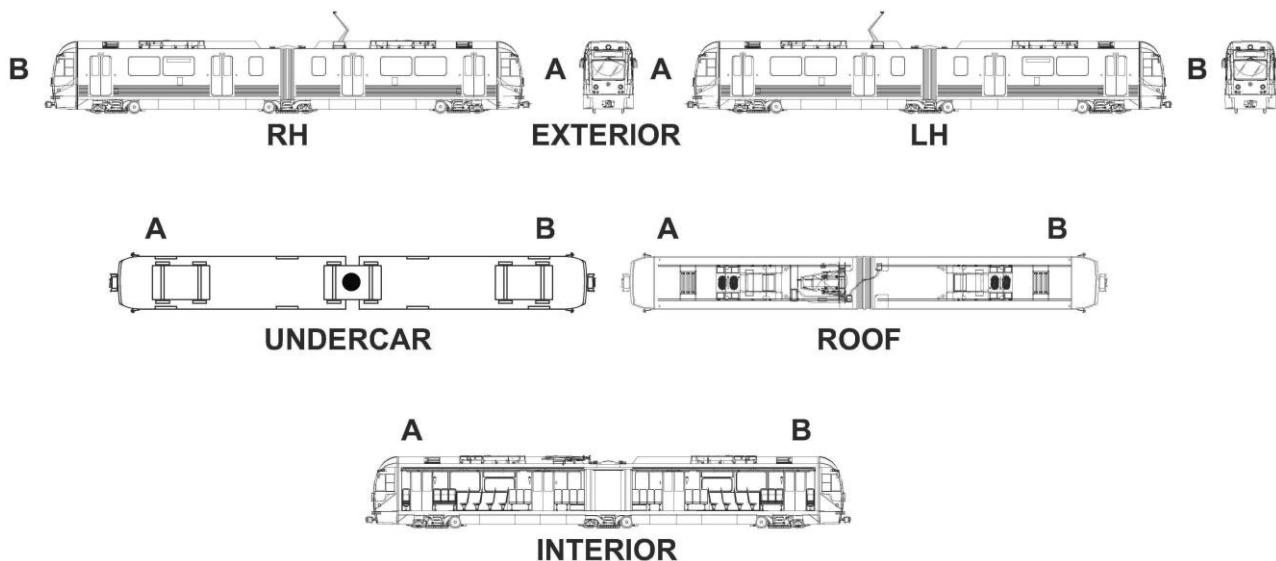
Unit:

Component:

Man Hours:

3

Maintenance Task:

REPLACEMENT
LOCATION:


P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-00-00/R-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

2/26

Subsystem/Assy:

TRAILER TRUCK

Unit:

Component:

Man Hours:

3

Maintenance Task:

REPLACEMENT

SAFETY PRECAUTIONS:

WARNING: BLUE FLAG THE VEHICLE IN ACCORDANCE WITH ALL LACMTA BLUE FLAG POLICIES, RULES, & PROCEDURES IN ORDER TO WARN THAT MAINTENANCE PERSONNEL ARE WORKING ON, UNDER, OR NEAR ROLLING EQUIPMENT.

WARNING: BEFORE PERFORMING TRUCK REPLACEMENT:

1. REMOVE ELECTRICAL POWER FROM VEHICLE.
2. RELEASE PNEUMATIC PRESSURE FROM AIR SUSPENSION SYSTEM AND BRAKES SYSTEM.

WARNING: APPLY WHEEL CHOCKS TO PREVENT THE VEHICLE FROM MOVING.

WARNING: WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.

WARNING: HEAVY OBJECT - TRAILER TRUCK WEIGHTS 14,500 LB. APPROX SUPPORT EVERY PART WITH SUITABLE LIFTING DEVICE, IN ACCORDANCE WITH LACMTA MAINTENANCE SHOP SAFETY REGULATIONS. FAILURE TO THIS CAUTION CAN CAUSE SERIOUS PERSONAL INJURY OR DEATH.

CAUTION: DURING THE TRUCK LOWERING AND RAISING PAY ATTENTION TO NOT DAMAGE CABLES, HOSES, ETC. ON THE VEHICLE AND ON THE TRUCK.

CAUTION: IT IS MANDATORY TO AVOID THE USE OF ANY LUBRICANT AND OF SCREW TAPS FOR SLEWING RING HOLES AND BOLTS CLEANING.

CAUTION: TO AVOID DAMAGE/MALFUNCTIONS TO THE VEHICLE POWER SYSTEM, DAMAGED O-RING(S) MUST BE REPLACED.

CAUTION: TO AVOID DAMAGE/MALFUNCTIONS TO THE PROPULSION AND TRACK BRAKES SYSTEM, DAMAGED O-RING(S) MUST BE REPLACED.

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System:

Sheet:

TRUCKS AND SUSPENSIONS**3/26**

Subsystem/Assy:

Unit:

TRAILER TRUCK

Component:

Man Hours:

3

Maintenance Task:

REPLACEMENT**TOOLS:**

LACMTA Maintenance Shop Standard Tools Kit

Car Hoist and Support System

Torque Wrench (150-250 ft-lb)

Clamps, Caps, Masks (to secure and protect Cables, Connectors and Equipment)

CONSUMABLES:

Cleaner/Degreaser, as needed

Loctite 242, as needed

3M Teflon Tape (Threads Sealant), as needed

Double Sided Adhesive Tape (3M 950 Transfer Type), as needed

SPARE PARTS:

Gasket (ART SECT Floor Central Part) P/N AA03CXP

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Card Code:

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System:

TRUCKS AND SUSPENSIONS

Sheet:

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Subsystem/Assy:

TRAILER TRUCK

Unit:

Component:

Man Hours:

3

Maintenance Task:

REPLACEMENT

PROCEDURE:

PRELIMINARY OPERATIONS

Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop Regulations:

1. Place the Vehicle over the Car Hoist and Support System.
2. Check that the Trucks are correctly positioned on the Stand up Rail.
3. Set the Master Controller Handle to FSB position.
4. Make sure that all Parking Brakes are applied (by checking on the IDU "Parking Brake A and B Not Released" and on Indicator Panel "A" "Park / Friction Brake" ON).
5. Remove Electrical Power from Vehicle by lowering the Pantograph.
6. Turn the Transfer Switch to OFF.
7. Set the Pantograph Control Motor Switch (5F02 CB LV Locker "A" Section) to OFF.
8. Lock out and tag out the Switch in accordance with all LACMTA Safety Rules, Regulations, Policies, and Procedures.

NOTE The tag must indicate the name of the person who removed Power.

That person knows why the Power was removed and when it safe to restore it.

Only the individual whose name appears on the tag or a person with his approval should remove the tag and restore Power.

9. Apply wheel chocks to prevent the Vehicle from moving.

TRUCK REPLACEMENT

To perform the task proceed as follows:

REMOVAL

1. Set the Vehicle in safety condition in accordance with LACMTA Overhaul Regulations.
2. On the Truck, apply wheel chocks to prevent the Vehicle from moving (both running directions).
3. Switch OFF the Battery Disconnect Circuit Breaker (3F01 Battery Circuit Breaker Box) located in the Battery Box (B Section Rh Side) to remove Battery Power (Refer to Fig 1).
4. Perform the following instructions to assure safety for personnel and the equipment on the truck to be removed.

PNEUMATIC SYSTEM

- a. Close Air Suspension System (Vented) Cut-Out Cock to release Pneumatic Pressure from Air Suspension System (Refer to Fig 2).

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TRUCKS AND SUSPENSIONS

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Subsystem/Assy:

TRAILER TRUCK

Unit:

Component:

Man Hours:

3

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

BRAKES SYSTEM

- a. Close the Disc Brakes (Vented) Cut-Out Cock (located in the BCU Box) to release Pneumatic Pressure from Brakes System (refer to Fig 3).
- 5. Operate the Car Hoist and Support System in "ALL TRUCKS HOIST" mode to raise the Vehicle until the rails under the Truck are at a minimum distance of 70 in (1,800 mm) measured from the Maintenance Shop Floor.
- 6. Raise the (Car Hoist System) Body Stands until they make contact with the Car Body Jacking Pads (YELLOW) (refer to Fig 4). (Green indicator "ALL BODY STANDS CONTACT MADE" should illuminate).

CAUTION: INDIVIDUAL TRUCK HOIST WILL NOT LOWER IF ALL BODY STANDS ARE NOT CORRECTLY POSTIONED

- 7. On the Truck to be removed, proceed as follows to disconnect Electrical, Pneumatic and Mechanical Connections:

ELECTRICAL CONNECTIONS

- a. **LV System** (Refer to Fig 5)

1. Disconnect the Speed Sensors Mating Connector.
2. Disconnect the Track Brake Power Supply Mating Connector.
3. Hold up and secure to the Truck, with suitable Clamps, both the Cables and protect, to avoid damage during maintenance operations in the Maintenance Shop, both the Plugs using suitable Caps.

- b. **Ground Braids** (Refer to Fig 6 & 7)

1. Disconnect the Ground Braid Terminals by loosening the relevant Hardware connecting the Ground Braids to the Truck.
2. Retain the Hardware for later use (Truck installation).
3. Hold up and secure to the Underframe structure, with suitable Clamps, the Ground Braids and protect the Terminals using suitable Caps.

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Card Code:

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TRUCKS AND SUSPENSIONS

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Subsystem/Assy:

TRAILER TRUCK

Unit:

Component:

Man Hours:

3

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

PNEUMATIC CONNECTIONS

a. **Air Suspension System and Brakes System** (Refer to Fig 8)

1. Disconnect (Flexible Hose) Connections by loosening the relevant Nipples.
2. Hold up and secure to the Truck, with suitable Clamps, the (Flexible Hose) Connections and protect, to avoid damage during maintenance operations in the Maintenance Shop, the relevant (Flexible Hose) free Ends using suitable Caps.

MECHANICAL CONNECTIONS

a. **Truck-Carbody Connections** (refer to Fig 9)

PRELIMINARY OPERATIONS

1. It is assumed that the Trailer Truck, once lowered / removed from Vehicle, will be pulled/pushed out, passing underneath the A or B Motor Truck to make it available for Maintenance.
 2. To permit the Trailer Truck passing underneath the A or B Motor Truck it is necessary to lower the Yellow Rails under the A or B Motor Truck which will remain hung to the Carbody.
- To do so it is necessary to operate on the A or B Motor Truck as follows:

- Position (as indicated in fig 9) a Wooden Straight Edge (2"x 1") or a suitable Wooden Wedge between the Vertical Bump Stop and its relevant Frame Stopper on each side of the A or B Motor Truck in order to avoid the disengagement of the Air Spring Pins from the Bolster Beam when the A or B Motor truck will remain hung to the Carbody.
 - Position, on each Articulation Section Side (as indicated in fig 10), a Movable Column Type Hydraulic Jack (400 lb minimum capacity).
3. Carefully put under stress both the Movable Column Type Hydraulic Jacks in order to support the Articulation Section once its connections with the Trailer Truck Bolster Beam will be removed.

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Sheet:

TRUCKS AND SUSPENSIONS

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Subsystem/Assy:

TRAILER TRUCK

Unit:

Component:

Man Hours:

3

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

- 4.** Gain access to Truck - Carbody connection from Vehicle Interior by removing the Articulation Floor Central Part.

To remove Articulation Floor Central Part proceed as follows (Refer to fig 11):

- Remove molding screws and molding.
- Remove Central Part.

TRUCK-CARBODY DISCONNECTION

- 1.** Operate through the Articulation Floor Central Part opening as follows:

- a) Un-bend the 4 Safety Plates of the (8) Bolts connecting the Slewing Outer Ring with the B Section Frame.
- b) Unscrew the (8) Bolts connecting the Slewing Outer Ring with the B Section and remove the (4) Safety Plates and Washers.
- c) Discard Safety Plates and Washers and retain Bolts for later use.
- d) Un-bend the 4 Safety Plates of the (12) Bolts connecting the Slewing Inner Ring with the A Section Frame.
- e) Unscrew the (12) Bolts connecting the Slewing Inner Ring with the A Section Frame and remove the (4) Safety Plates.
- f) Discard Safety Plates and retain Bolts for later use.

NOTE: All parts (safety plates & washers) discarded must be accounted for in the spare parts section above (include part numbers).

NOTE: When finished with the above steps:

- The A and B Section Structures are mechanically disconnected. They remain in position because fully supported by the Body Stands.
- The Connection Beam is still connected to the A Section Rear Structure by means of the relevant Resilient Pins.
- To remove the Connection Beam remove the four Support Plates of the two Resilient Pins first and then remove the Connection Beam together with the Resilient Pins installed on it.

- g) Unscrew both the Nuts connecting the Articulation Section Dome Structure with the Truck Bolster Beam and remove the relevant Washers, Lock Washers and Spacers.
- h) Discard Washers and Lock Washers and retain Nuts and Spacers for later use.
- i) From outside the Vehicle remove both Pins using a suitable Puller Device.

NOTE: When finished with the above steps the Trailer Truck is fully mechanically disconnected from the Carbody and in condition to be lowered.

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Card Code:

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System:

TRUCKS AND SUSPENSIONS

Sheet:

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Subsystem/Assy:

TRAILER TRUCK

Unit:

Component:

Man Hours:

3

Maintenance Task:

REPLACEMENT**PROCEDURE (CONT'D):****TRUCK-CARBODY DISCONNECTION(CONT'D)**

- 2.** Check that all Electrical, Pneumatic Connections between the Truck and Car Body are disconnected, secured and protected.
- 3.** Operate the Car Hoist and Support System in LOWER TRUCK HOIST mode to lower accordingly the Trailer Truck.

CAUTION: DURING THE TRUCK LOWERING PAY ATTENTION TO NOT DAMAGE CABLES, HOSES, ETC. ON THE VEHICLE AND ON THE TRUCK.

- 4.** Once the Trailer Truck is completely lowered proceed as follows:
 - a) Operate the Car Hoist and Support System in NORTH TRUCK HOIST mode to lower the (yellow) rails under the A or B Motor Truck.

NOTE: Upon completing the above step the A or B Motor Truck is hung to the Carbody.

- 5.** Remove wheel chocks previously installed to the Trailer Truck.
- 6.** Pull/push out the Trailer Truck, passing underneath the suspended A or B Motor Truck, in order to have it available for Maintenance operations.
- 7.** Operate the Car Hoist and Support System in NORTH TRUCK HOIST mode to raise the (Yellow) Rails under the A or B Motor Truck, in order to avoid that it remains hung to the Carbody no longer than the time strictly necessary for the Trailer Truck passing underneath the suspended A or B Motor Truck.

CAUTION: KEEP THE MOVABLE COLUMN TYPE HYDRAULIC JACKS IN POSITION TO SUPPORT THE ARTICULATION SECTION.

- 8.** Reposition the Articulation Section Floor Central Part on Vehicle for Safety reasons.

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-00-00/R-00

System:

Sheet:

TRUCKS AND SUSPENSIONS**9/26**

Subsystem/Assy:

Unit:

TRAILER TRUCK

Component:

Man Hours:

3

Maintenance Task:

REPLACEMENT**PROCEDURE (CONT'D):****Figure 1 - BATTERY CIRCUIT BREAKER (3F01)**

P2550 CORRECTIVE MAINTENANCE SHEET

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TRUCKS AND SUSPENSIONS

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Subsystem/Assy:

TRAILER TRUCK

Unit:

Component:

Man Hours:

3

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

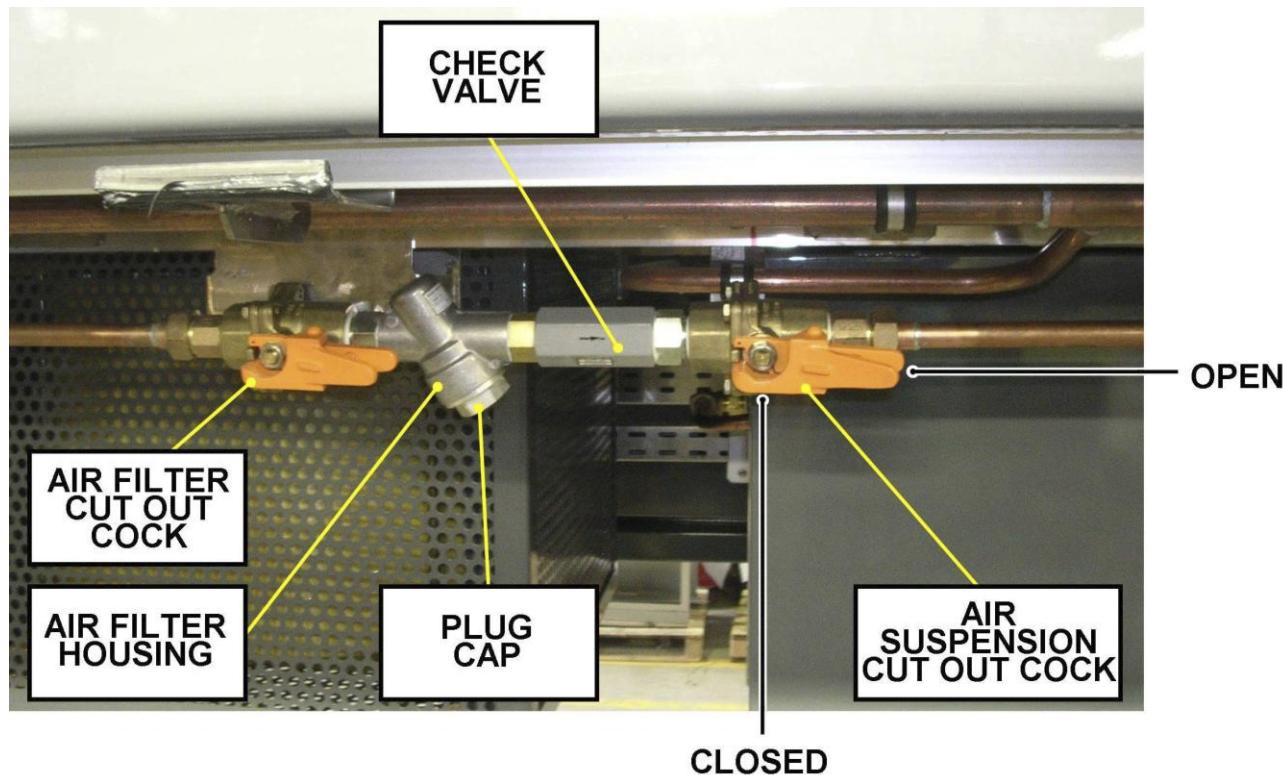


Figure 2 - AIR SUSPENSION (VENTED) CUTOUT COCK

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-00-00/R-00

System:

Sheet:

TRUCKS AND SUSPENSIONS**11/26**

Subsystem/Assy:

Unit:

TRAILER TRUCK

Component:

Man Hours:

3

Maintenance Task:

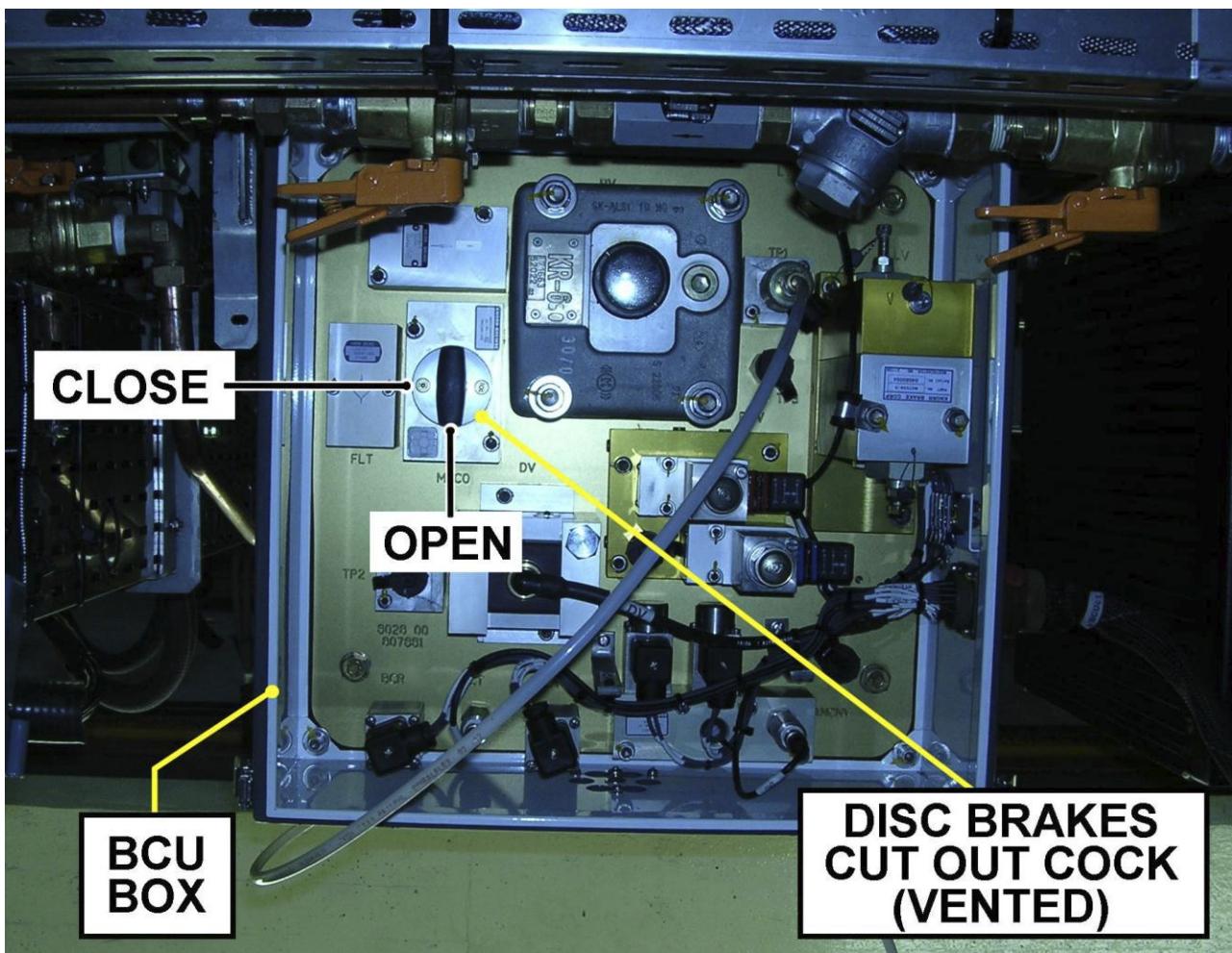
REPLACEMENT**PROCEDURE (CONT'D):**

Figure 3 - BRAKES CUT OUT COCKS - LOCATION

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Card Code:

R-C-12-02-00-00/R-00

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Subsystem/Assy:

TRAILER TRUCK

Unit:

Component:

Man Hours:

3

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

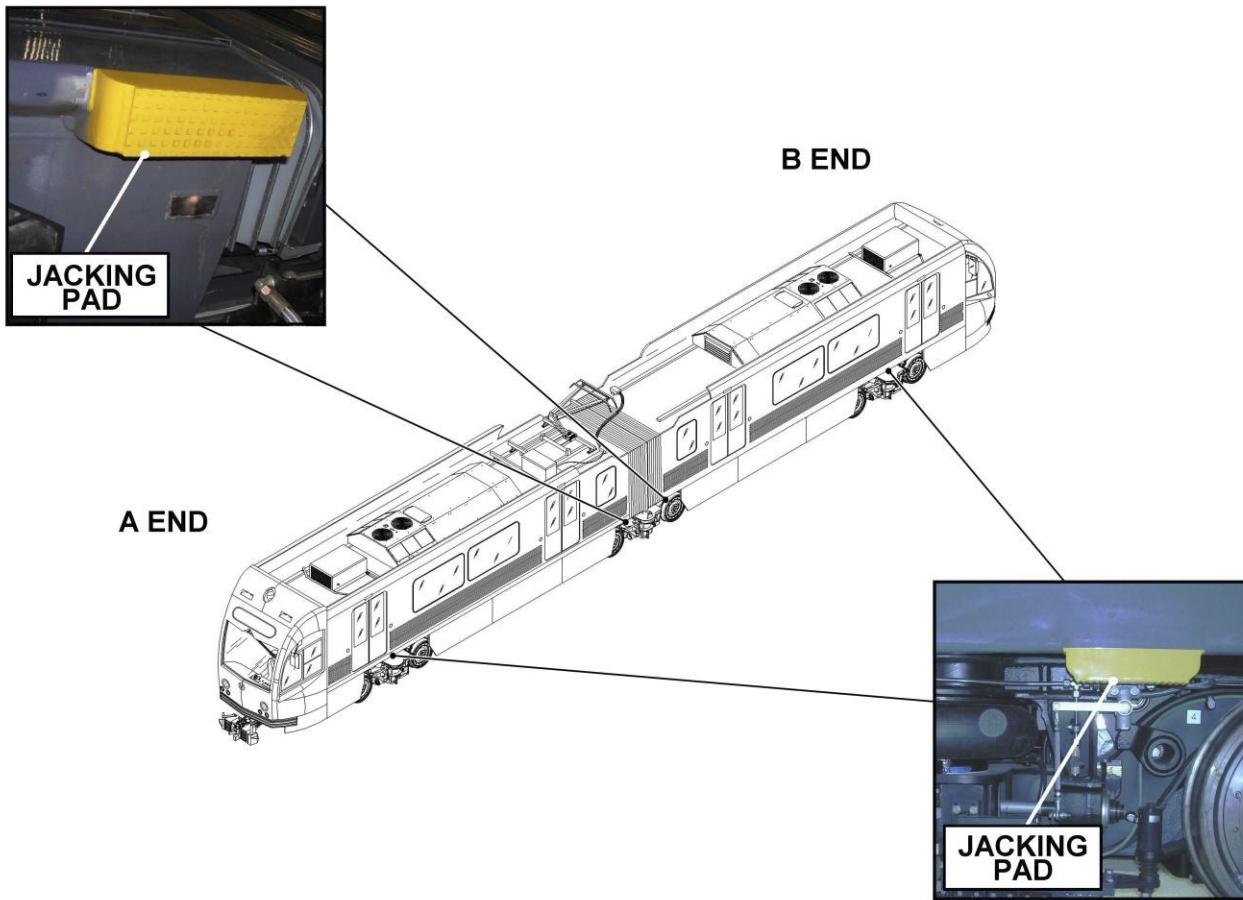


Figure 4 - CARBODY JACKING PADS LOCATION

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Card Code:

R-C-12-02-00-00/R-00

System:

Sheet:

TRUCKS AND SUSPENSIONS

13/26

Subsystem/Assy:

Unit:

TRAILER TRUCK

Component:

Man Hours:

3

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

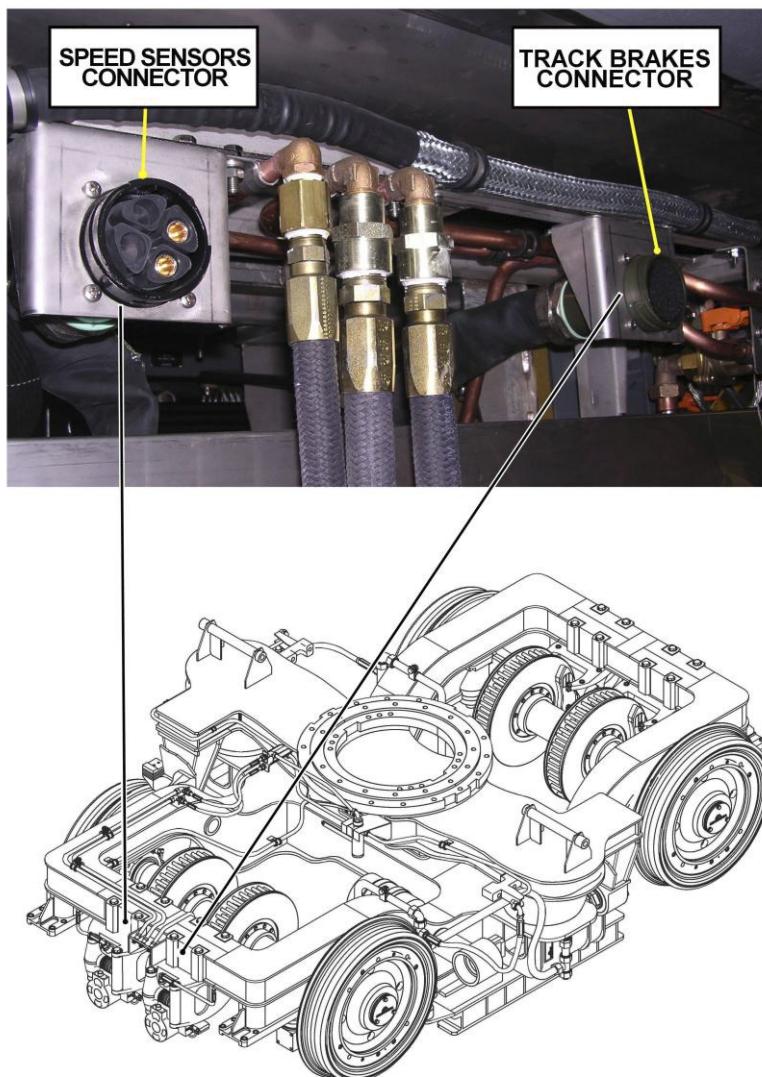


Figure 5 - TRAILER TRUCK - ELECTRICAL CONNECTORS

P2550 CORRECTIVE MAINTENANCE SHEET

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TRUCKS AND SUSPENSIONS

Sheet:

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Subsystem/Assy:

TRAILER TRUCK

Unit:

Component:

Man Hours:

3

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

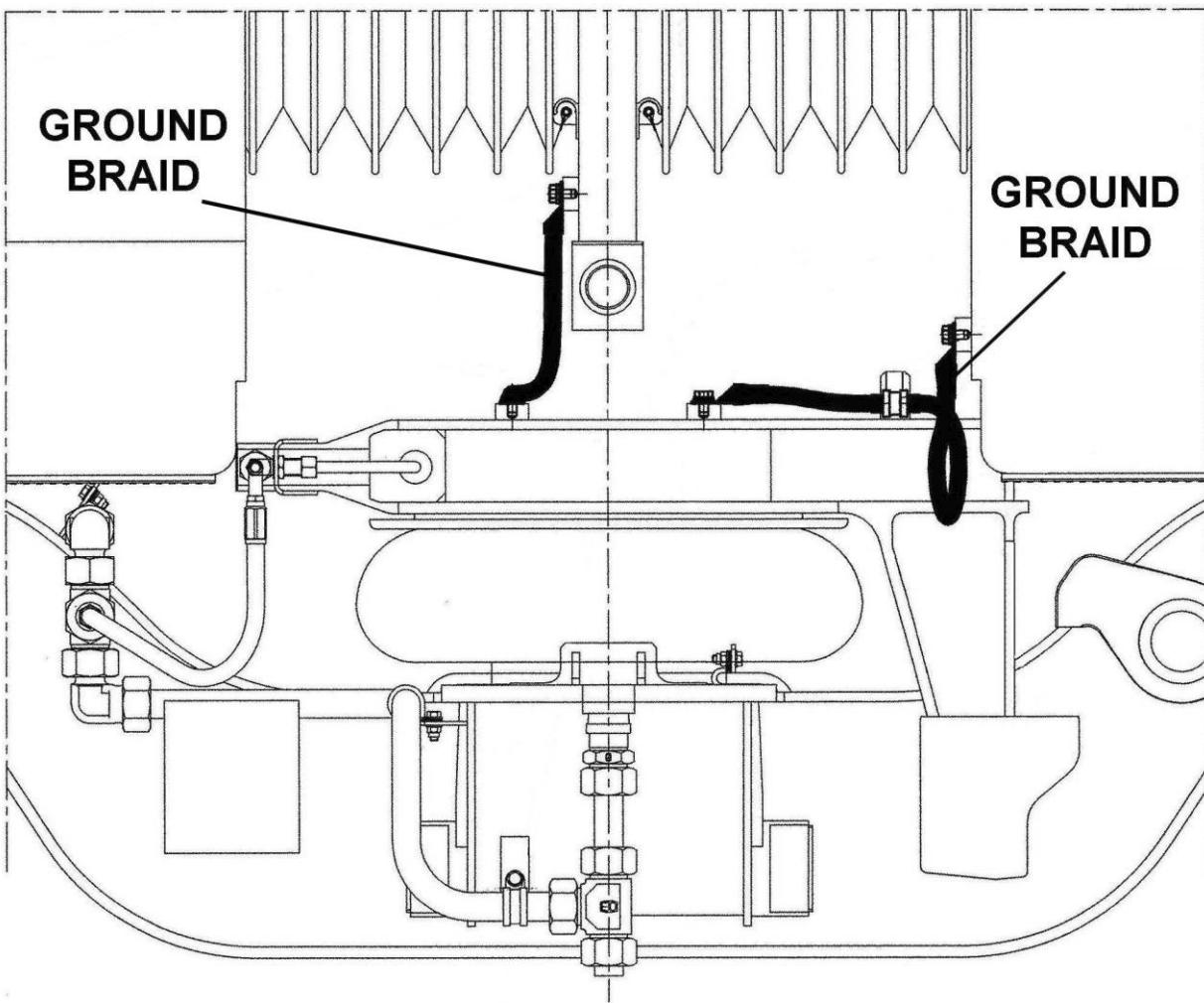


Figure 6 - GROUND BRAID - TRAILER TRUCK -LH

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

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Unit:

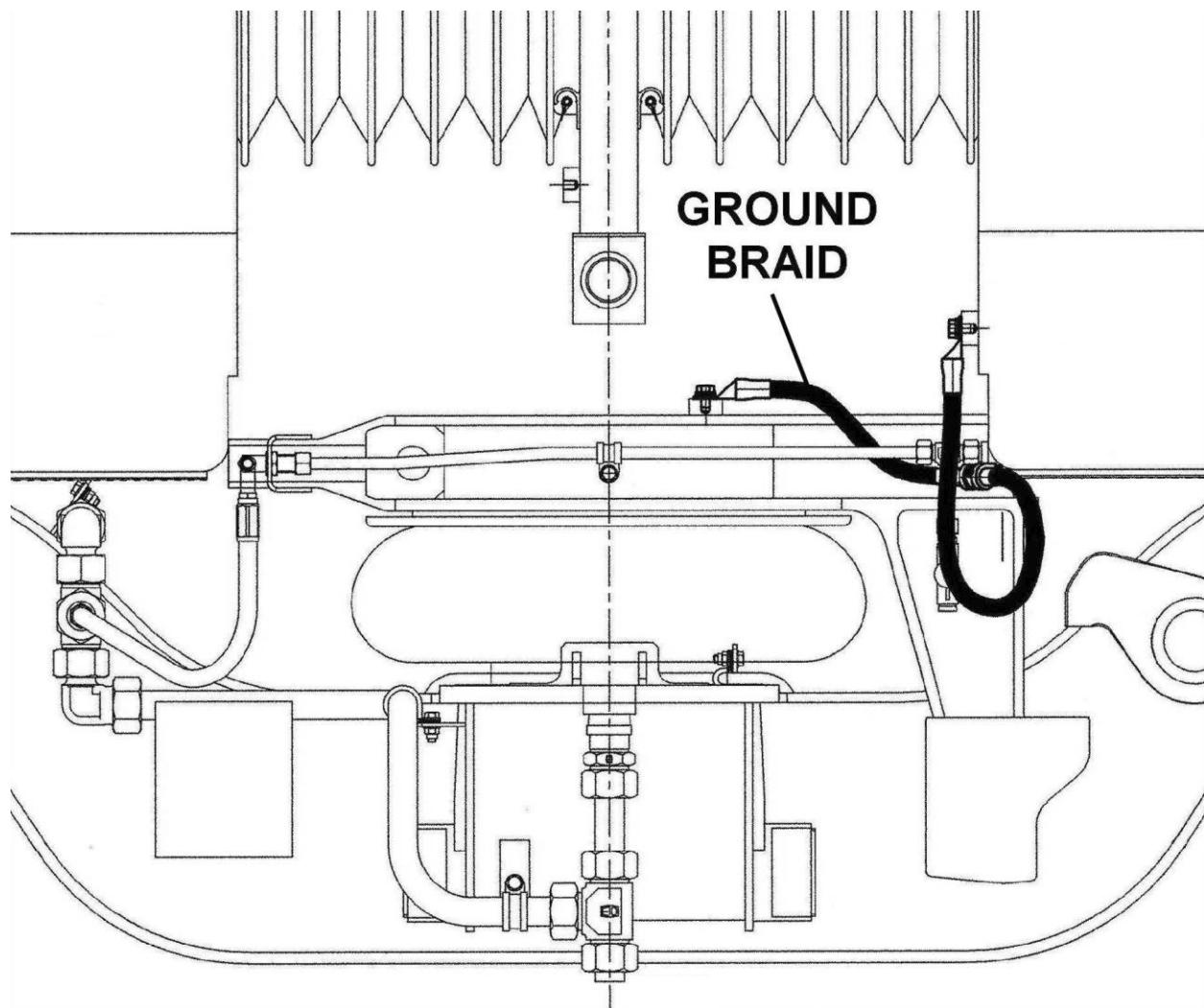
TRAILER TRUCK

Component:

Man Hours:

3

Maintenance Task:

REPLACEMENT
PROCEDURE (CONT'D):

Figure 7 - GROUND BRAID - TRAILER TRUCK -RH

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-00-00/R-00

System:

TRUCKS AND SUSPENSIONS

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16/26

Subsystem/Assy:

TRAILER TRUCK

Unit:

Component:

Man Hours:

3

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

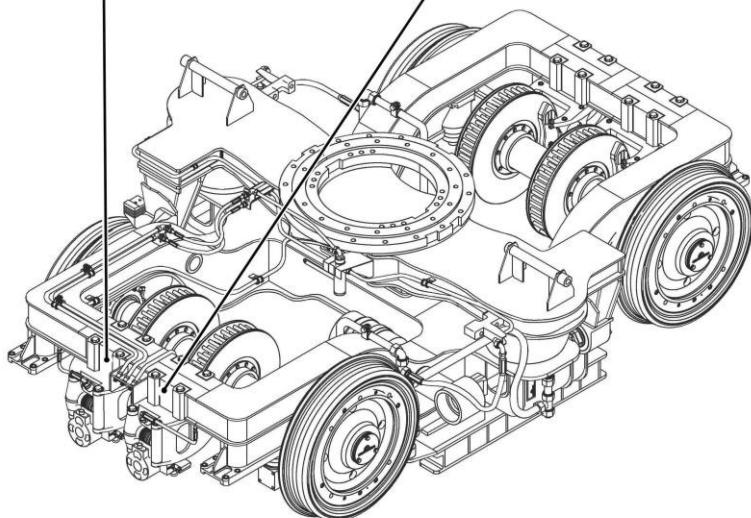
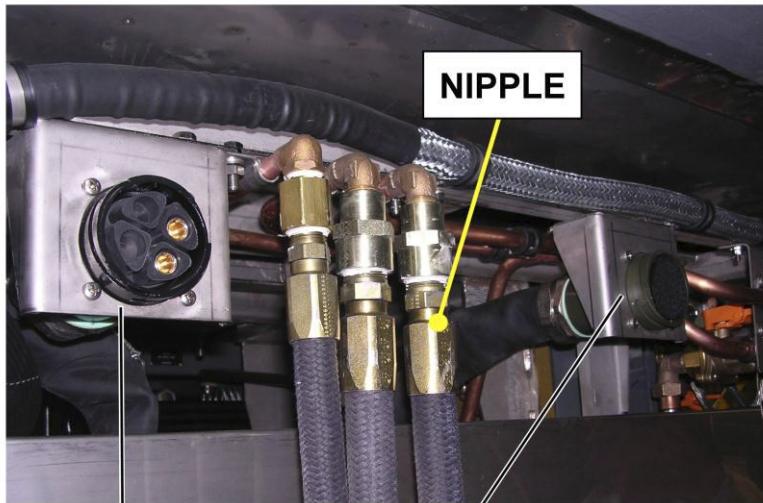


Figure 8 - PNEUMATIC CONNECTIONS

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-00-00/R-00

System:

Sheet:

TRUCKS AND SUSPENSIONS

17/26

Subsystem/Assy:

TRAILER TRUCK

Unit:

Component:

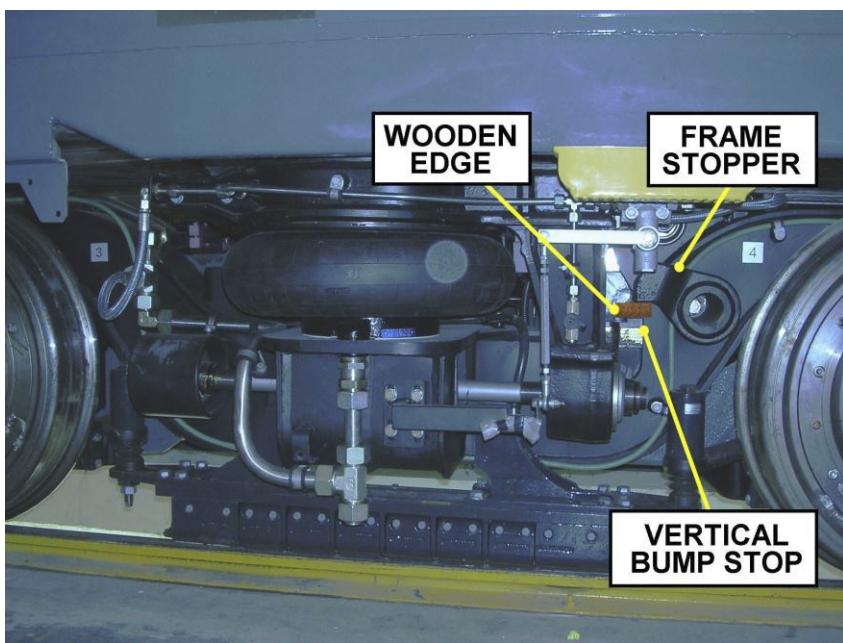
Man Hours:

3

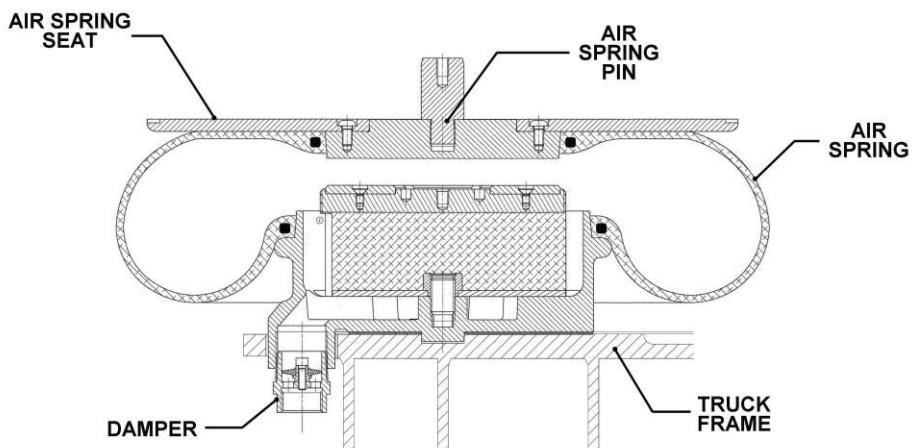
Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):



Motor Truck-Wooden Edge Positioning



Motor Truck Air Spring Pin

Figure 9 --PRELIMINARY OPERATIONS on MOTOR TRUCK

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-00-00/R-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

18/26

Subsystem/Assy:

TRAILER TRUCK

Unit:

Component:

Man Hours:

3

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):



Figure 10 - ART SECTION SUPPORTING -HYDRAULIC JACK POSITIONING

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-00-00/R-00

System:

Sheet:

TRUCKS AND SUSPENSIONS

19/26

Subsystem/Assy:

Unit:

TRAILER TRUCK

Component:

Man Hours:

3

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

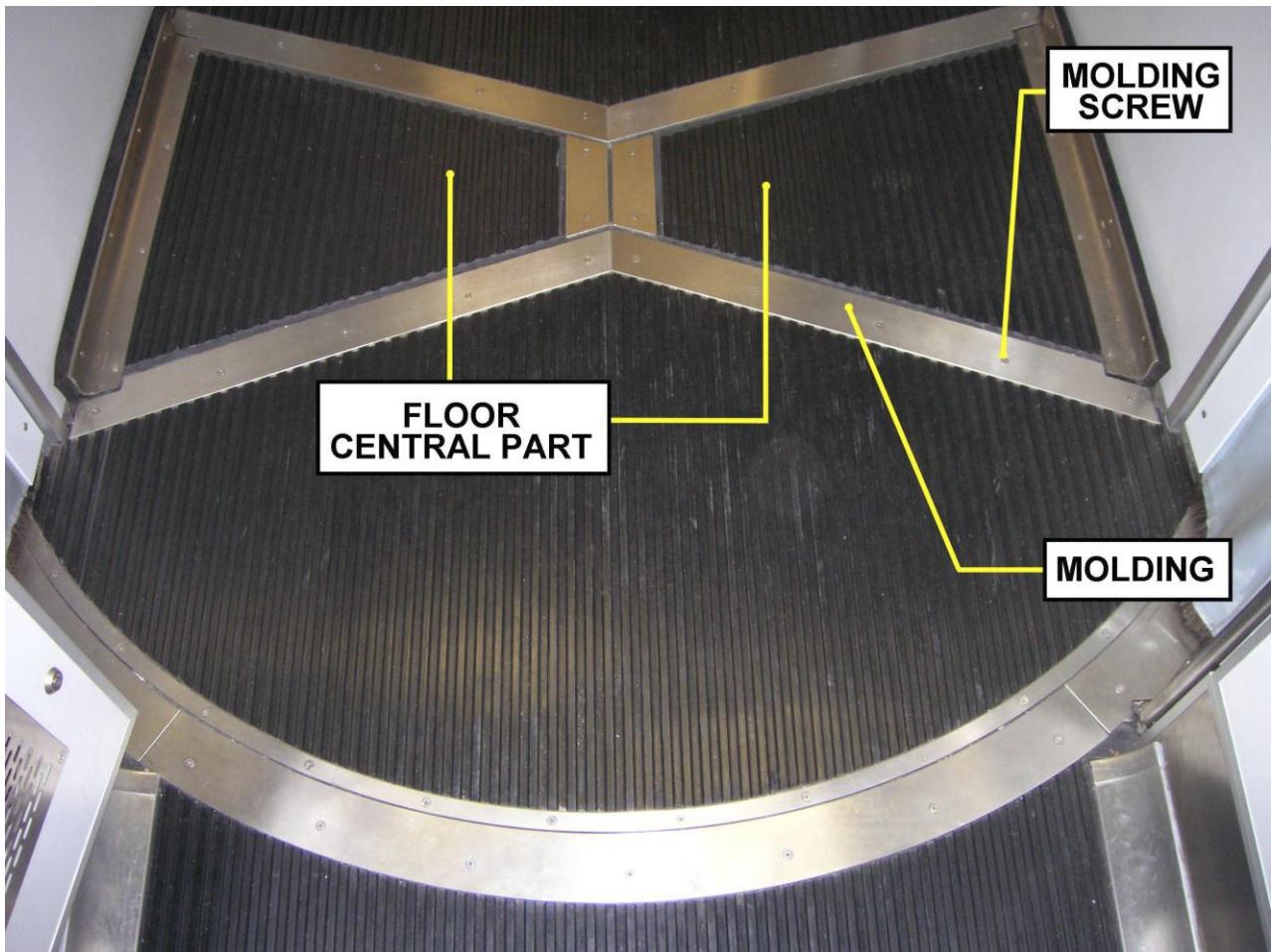


Figure 11 - ART SECTION FLOOR -CENTRAL PART

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-00-00/R-00

System:

Sheet:

TRUCKS AND SUSPENSIONS**20/26**

Subsystem/Assy:

TRAILER TRUCK

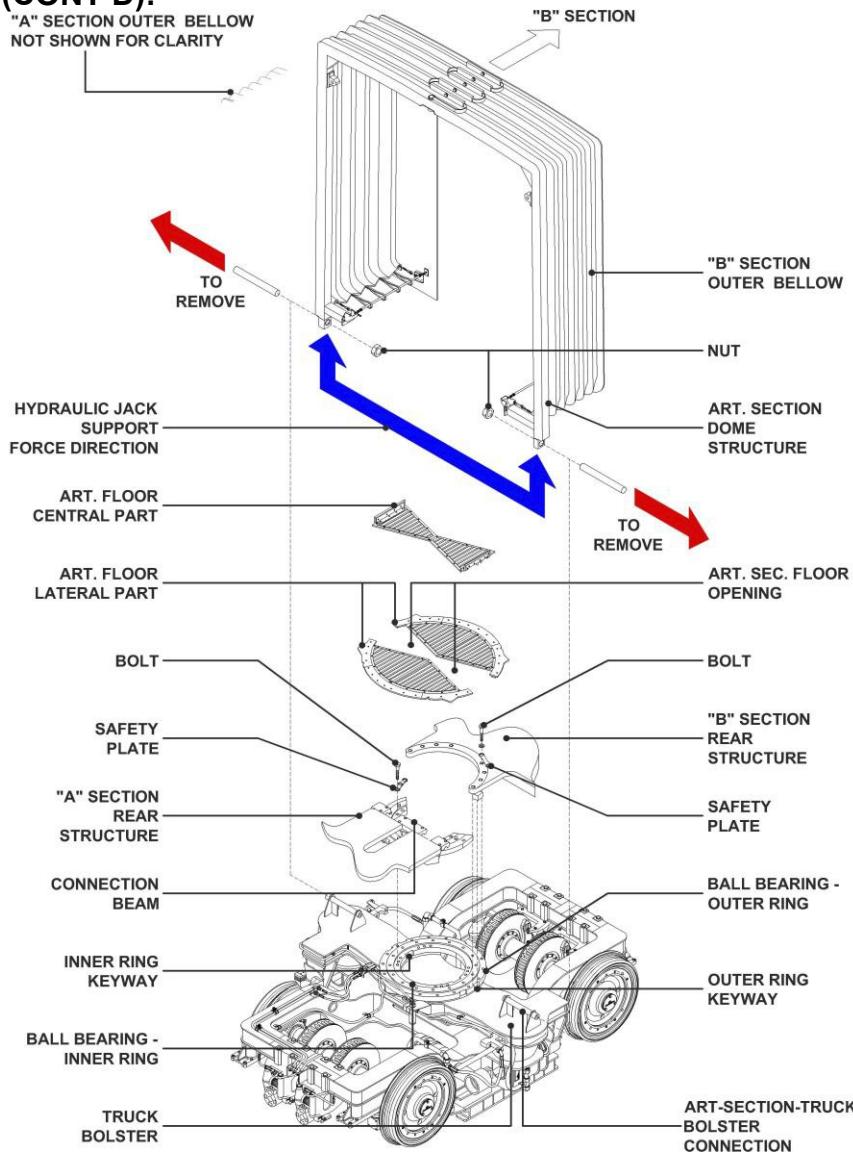
Unit:

Component:

Man Hours:

3

Maintenance Task:

REPLACEMENT**PROCEDURE (CONT'D):****Figure 12 - TRUCK / CARBODIES / ART.SECTION STRUCTURE ACCESS & CONNECTIONS**

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-00-00/R-00

System:

Sheet:

TRUCKS AND SUSPENSIONS

21/26

Subsystem/Assy:

TRAILER TRUCK

Unit:

Component:

Man Hours:

3

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

INSTALLATION

1. It is assumed that:
 - a. The vehicle is in Safety Conditions in accordance with LACMTA Overhaul Regulations.
 - b. The Car body is:
 - Raised by Transit Car Hoist and Support System Body Stands with a minimum clearance of 70 in. measured from the Maintenance Shop Floor.
 - Leveled in cross truck plane.
 - c. The Trailer Truck to be installed, will be pulled/pushed toward the Articulation Section, passing underneath the A or B Motor Truck for the installation on Vehicle.

NOTE: To permit the Trailer Truck passing underneath the A or B Motor Truck it is necessary to lower the Yellow Rails under the A or B Motor Truck which will remain hung to the Carbony.

 - d. A Wooden Straight Edge (2"x 1") or a suitable Wooden Wedge is positioned between the Vertical Bump Stop and its relevant Frame Stopper on each side of the A or B Motor Truck in order to avoid the disengagement of the Air Spring Pins from the Bolster Beam when the A or B Motor truck will remain hung to the Carbony.
 - e. On each Articulation Section Side (as indicated in fig 10), a Movable Column Type Hydraulic Jack (400 lb minimum capacity) is properly supporting the Articulation Section until the Art Sect Dome Structure will be reconnected to the Bolster Beam of the Trailer Truck to be installed.
 - f. The Articulation Section Floor Central Part is removed.
 - g. Clamps, Caps are applied, on Truck to be installed and on the Vehicle, to the Pneumatic Hoses and Electrical Connectors, to avoid damage during Truck transferring from maintenance area to the Vehicle and during re-trucking operations.
 2. Clean the mating surfaces of the Slewing Ring (Trailer Truck) and A and B Rear Underframes using recommended agent and cleaning rags.
 3. Clean the Holes of the Connection Beam using recommended agent and cleaning rags.
 4. Clean the Holes of the Outer and Inner Slewing Rings and the Bolts using recommended agent and cleaning rags.
- CAUTION:** IT IS MANDATORY TO AVOID THE USE OF ANY LUBRICANT AND OF SCREW TAPS.
5. Pull/push the Trailer Truck toward the Articulation Section, passing underneath the A or B Motor Truck.
 6. Position the Trailer Truck under the Articulation Section.

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-00-00/R-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

22/26

Subsystem/Assy:

TRAILER TRUCK

Unit:

Component:

Man Hours:

3

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

7. Verify that the Truck is correctly positioned on the yellow rails of the Transit Car Hoist and Support System first and then apply wheel chocks on both running directions.
8. Check on the Truck and on the Vehicle that all Electrical, Pneumatic Connections are secured and protected to avoid damage during re-trucking operations.
9. Slowly operate the Car Hoist and Support System in CENTER RAISE TRUCK HOIST mode to raise the Truck in order to match the Connection Beam Block and the B Section Rear Structure Block in the corresponding (Slewing) Inner Ring And Outer Ring Keyways (refer to Fig 12 & 13).

CAUTION: PERFORM THE TRUCK RAISING WITH EXTREME CARE. PAY ATTENTION TO NOT DAMAGE TRUCK /VEHICLE COMPONENTS.

CAUTION: PAY ATTENTION TO NOT DAMAGE CONNECTION BEAM AND RELEVANT RESILIENT PINS DURING THE MATCHING OPERATION.

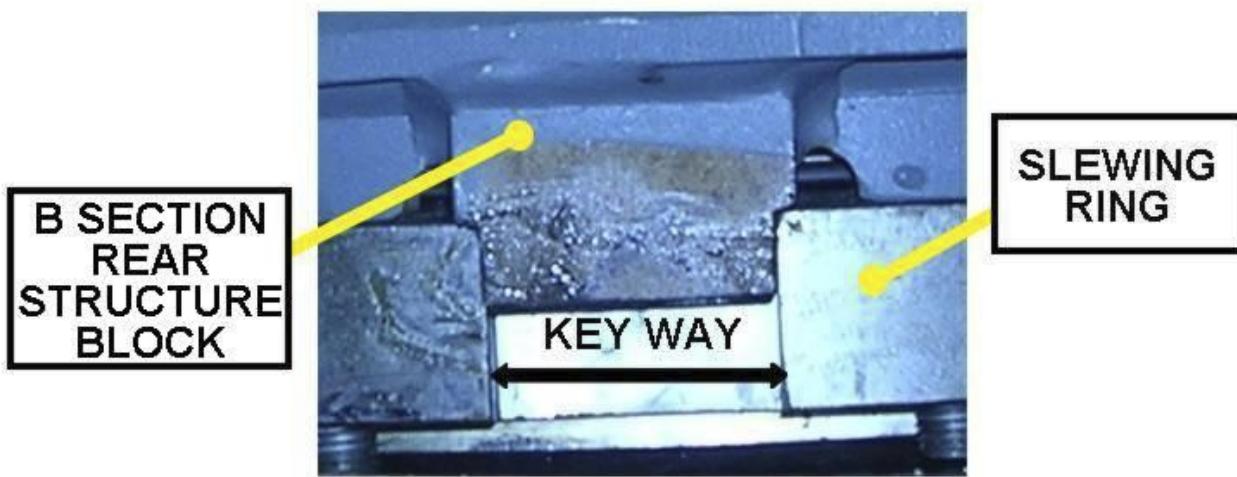


Figure 13 - STRUCTURE BLOCK & SLEWING RING KEYWAY MATCHING

10. Once the matching is correctly completed, to restore Mechanical, Pneumatic and Electrical Connections proceed as follows:

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-00-00/R-00

System:

Sheet:

TRUCKS AND SUSPENSIONS

23/26

Subsystem/Assy:

Unit:

TRAILER TRUCK

Component:

Man Hours:

3

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

MECHANICAL CONNECTIONS

a. Truck-Carbody Connection (refer to previous Fig 12)

1 INNER RING

NOTE If previously removed, install the Connection Beam provided with the relevant two Resilient Pins on it seat first and fix the Pins by the relevant four Support Plates and attaching hardware.

- Install the twelve (12) Bolts with relevant new four (4) Safety Plates.
- Torque the Bolts to **200 ft-lb** (270 Nm), in a star pattern, using suitable Torque Wrench.
- Bend the safety plates by means of flat head screw driver and hammer.

CAUTION: PAY ATTENTION TO AVOID ANY DAMAGE TO THE WASHER AND BOLTS HEAD.

2 OUTER RING

- Install the eight(8) Bolts with relevant new Washers and new four(4) Safety Plates
- Torque the Bolts to **200 ft-lb** (270 Nm), in an opposing fashion, using suitable Torque Wrench.
- Bend the safety plates by means of flat head screw driver and hammer

CAUTION: PAY ATTENTION TO AVOID ANY DAMAGE TO THE WASHER AND BOLTS HEAD.

NOTE: When finished with the above steps, the A and B Section Structures are mechanically reconnected by means of the Connection Beam and Inner (A section) & Outer (B section) Slewing Rings.

3 ARTICULATION SECTION

- Clean both the Pins (and relevant hardware) connecting the Articulation Section Dome Structure with the Truck Bolster Beam using recommended agent and cleaning rags.

- Apply a light coat of rust preventative oil.

- From outside the Vehicle install both the Pins.

- From inside the Vehicle, through the Art Sect Floor Central Part Opening, proceed as follows:

- For each Pin, install the Spacers, the new Washer, Lock Washers, and Nuts, retaining the Pins in proper position.
- Torque the Nuts to **25 ft-lb**.

NOTE: When finished with the above steps the Trailer Truck is fully mechanically connected to the Carbody.

- Carefully fully lower and remove both the Hydraulic Jacks used to support the Articulation Section.

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-00-00/R-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

24/26

Subsystem/Assy:

TRAILER TRUCK

Unit:

Component:

Man Hours:

3

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

PNEUMATIC CONNECTIONS

a Air Suspension System and Brakes System (refer to previous Fig 8)

1. Remove the Caps (previously installed) from the (Flexible Hose) Connections Nipples.
2. Apply recommended sealant to relevant (Flexible Hose) Connections Thread Nipples.
3. Restore (Flexible Hose) Connections by tightening the relevant Nipples.

ELECTRICAL CONNECTIONS

a. LV System (refer to previous Fig 5).

1. Remove Caps (previously installed) from Plug and (Fixed) Speed Sensors and Track Brake Power Supply Connectors.
2. Clean mating surface of Plugs and (Fixed) Speed Sensors and Track Brake Power Supply Connectors of using recommended cleaner and cleaning rags.
3. Check for damage/deformation the O-rings installed on the (Male) Plug. Replace as per check result.

CAUTION: TO AVOID DAMAGE / MALFUNCTIONS TO THE PROPULSION AND TRACK BRAKES SYSTEM, DAMAGED O-RING(S) MUST BE REPLACED.

4. Reconnect Speed Sensors Mating Connector.
5. Reconnect Track Brake Power Supply Mating Connector.

b Ground Braids (refer to previous Figures 6 & 7).

1. Remove Caps (previously installed) from the Ground Braids Terminals.
2. Clean the contact surface of Ground Braid Terminals (on Terminal and on the Truck) using recommended cleaner and cleaning rags.
3. Check the Ground Braid Terminals for damage/deformation (on Terminal and on the Truck Connection). Replace/adjust as per check result.
4. Reconnect Ground Braid Terminals by installing and tightening the relevant Hardware connecting the Ground Braids to the Truck.

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-00-00/R-00

System:

Sheet:

TRUCKS AND SUSPENSIONS

25/26

Subsystem/Assy:

Unit:

TRAILER TRUCK

Component:

Man Hours:

3

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

- 11** Once Mechanical, Pneumatic and Electrical reconnections were completed and successfully verified proceed as follows:

NOTE: In order to prevent/reduce noise level in the Vehicle, perform the following procedure with extreme care.

- a. Install the Articulation Section Floor Central Part as follows(refer to fig 11):

- 1 Check the Floor Central Part for damage/deformation. Replace as per check result.
- 2 Check for correct installation the Gasket on the Floor Central Part As per check result use recommended product to restore design installation.
- 3 Clean the Floor Central Part Seat, using recommended product.
- 4 Position the Floor Central Part.
- 5 Install Moldings.
- 6 Install Screws and lock them with LOCTITE 242.
- 7 Check that there are no level differences between the Vehicle Floor and the Floor Central Part. Adjust as per check result.

12 FINAL OPERATIONS

- a. Raise the truck hoist first and then lower the Body Stands just to have the Vehicle Load completely supported by means of all the three Truck Hoists by operating the "LOWER BODY Stands" Pushbutton on the Transit Car Hoist and Support System-Master Panel.
- b. Once the Vehicle load is in charge of the three Truck Hoists, fully lower the Body Stands.
- c. Operate the Car Hoist and Support System in "ALL TRUCKS HOIST" mode to lower the Vehicle by operating the "LOWER TRUCK HOIST" Pushbutton on the Transit Car Hoist and Support System-Master Panel.
- d. Inspect Truck and Vehicle to verify that the operation was successful.
- e. Switch ON the Battery Disconnect Circuit Breaker (3F01 Battery Circuit Breaker Box) located in the Battery Box (B Section Rh Side) to restore Battery Power (refer to previous Fig 1).
- f. Operate as follows to restore operating conditions of the following Systems of the Truck installed.

1 PNEUMATIC SYSTEM

Open Air Suspension System (Vented) Cut-Out Cock to restore Pneumatic Pressure to Air Suspension System (refer to previous Fig 2).

2 BRAKES SYSTEM

Open the Disc Brakes (Vented) Cut-Out Cocks located in the BCU Box) to restore Pneumatic Pressure to Brakes System (refer to previous Fig 3).

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-00-00/R-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

26/26

Subsystem/Assy:

TRAILER TRUCK

Unit:

Component:

Man Hours:

3

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

- g.** Restore Electrical Power.
- h.** Enable the "A" Cab by keying ON the Transfer Switch.
- i.** Check, on the Duplex Air Pressure Gauge (A Cab) that Pneumatic Pressure build up.
- j.** Check Carbody-Truck Pneumatic Connections, previously restored, (refer to previous Fig 8) for air leakage. Adjust as per check result.
- k.** Check, on IDU "A", - System Status Screen -, that all the Vehicle Systems are clear of troubles (OK-green).

Particularly check for the following Systems involved in the re-trucking operations:

- 1.** Brake System.
- 2.** APS/LVPS.
- l.** If faults are found, first access the Maintenance Menu and then to the Faults Screen by selecting, in sequence, the relevant icons..
- m.** Check, through the list of the current active faults shown in the Faults Screen, for any Fault relevant to the re-trucked Truck and/or to the Systems previously listed.
- n.** As per Fault Check Results remove the Fault Causes to restore Systems Operational Conditions.
- o.** Perform Vehicle Leveling Procedure (Refer to Sheet R-P 01-01-00-00 / LL-00).
- p.** Remove wheel chocks.
- q.** Record the Truck Re-Trucking and the Vehicle Leveling results on the Defect Report Cards to allow the planning of Maintenance Operations.

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-01-01/RP-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

1/6

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

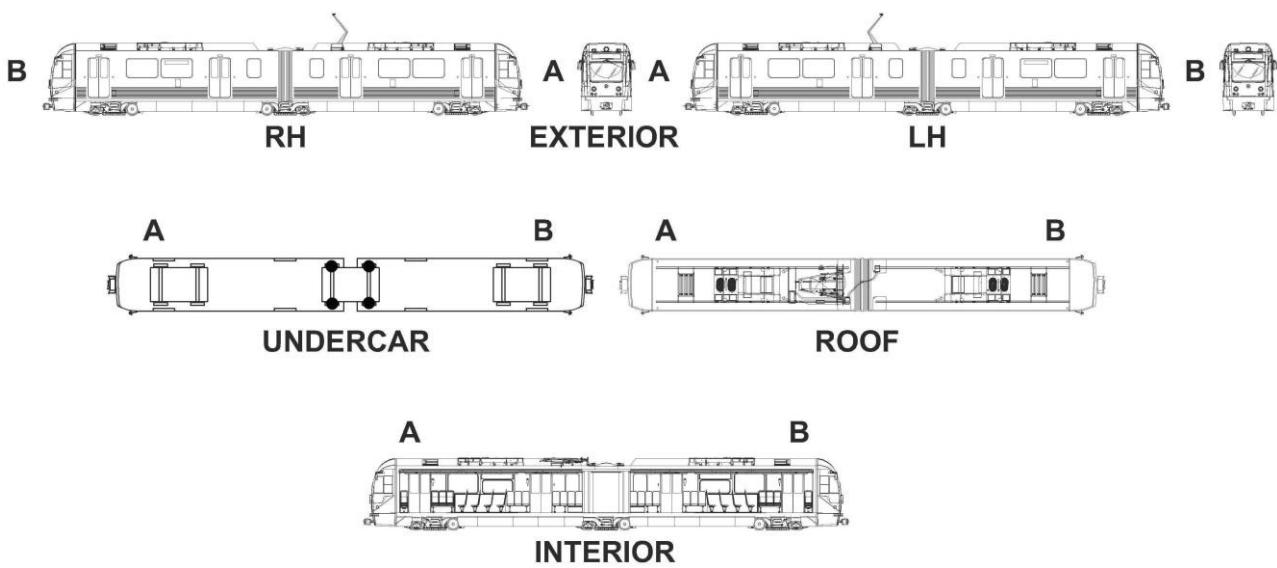
Component:

WHEEL

Man Hours:

2

Maintenance Task:

RE-PROFILING
LOCATION:

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-01-01/RP-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

2/6

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

2

Maintenance Task:

RE-PROFILING

SAFETY PRECAUTIONS:

WARNING: BLUE FLAG THE VEHICLE IN ACCORDANCE WITH ALL LACMTA BLUE FLAG POLICIES, RULES, & PROCEDURES IN ORDER TO WARN THAT MAINTENANCE PERSONNEL ARE WORKING ON, UNDER, OR NEAR ROLLING EQUIPMENT.

WARNING: APPLY WHEEL CHOCKS TO PREVENT THE VEHICLE FROM MOVING.

WARNING: WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.

CAUTION: DURING THE RE-PROFILING, THE TEMPERATURES GENERATED BY THE PROCESS SHOULD NOT EXCEED 212°F.(100°C). HIGHER TEMPERATURES MAY CAUSE DAMAGE TO THE RUBBER BLOCKS, THUS REDUCING THE LIFE OF THE BLOCKS

TOOLS:

Pi Tape 24 to 36 inch range (AAR Tool for Wheel Diameter check)

AAR Steel Wheel Gauge (AAR Tool for Wheel Profile check)

MTA Wheel Truing Machine

CONSUMABLES:

N/A

SPARE PARTS:

N/A

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-01-01/RP-00

System:

Sheet:

TRUCKS AND SUSPENSIONS

3/6

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

2

Maintenance Task:

RE-PROFILING

PROCEDURE:

PRELIMINARY OPERATIONS

Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop Regulations:

1. Place the Vehicle over the Pit (or Stand Up Rail) provided with Wheel Truing Machine.
2. Set the Master Controller Handle to FSB position.
3. Make sure that all Parking Brakes are applied (by checking on the IDU "Parking Brake A and B Not Released" and on Indicator Panel "A" "Park / Friction Brake" ON).
4. Remove Electrical Power from Vehicle by lowering the Pantograph.
5. Turn the Transfer Switch to OFF.
6. Set the Pantograph Control Motor Switch (5F02 CB LV Locker "A" Section) to OFF.
7. Lock out and tag out the Switch in accordance with all LACMTA Safety Rules, Regulations, Policies, and Procedures

NOTE The tag must indicate the name of the person who removed Power.

That person knows why the Power was removed and when it safe to restore it.

Only the individual whose name appears on the tag or a person with his approval should remove the tag and restore Power.

8. Apply wheel chocks to prevent the Vehicle from moving.

WHEEL RE-PROFILING PROCEDURE

NOTE It is assumed that:

- a. The Truck involved in the Wheel Truing is positioned on the Wheel Truing Machine according to MTA Regulations.
- b. The Wheel to be re-profiled is adjusted and set on the Wheel Truing Machine.
- c. All Parking Brakes are applied.
- d. Wheel Chocks to prevent the Vehicle from moving are applied to the (wheels) trucks not involved in the Wheel Truing.

To perform the task proceed as follows:

WARNING: THE FOLLOWING STEPS MUST BE PERFORMED ONLY FOR THE TRUCK INVOLVED IN THE WHEEL TRUING.

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-01-01/RP-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

4/6

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

2

Maintenance Task:

RE-PROFILING

PROCEDURE (CONT'D):

1. Release the Friction Brakes as follows :
 - a. Cut out the Friction Brakes Cylinders by rotating the Friction Brakes Cut -Out Cock(ORANGE) to CUT OUT position.

NOTE: To do so, the Maintainer must open the Underframe Skirt in correspondence with the Cut-Out Cock and turn the valve (ORANGE) as indicated in the Figure 1.
 2. Make sure that the Wheel Set is free to rotate.
 3. Operate the Wheel Truing Machine according to:
 - a. MTA Wheel Truing Regulations.
 - b. Wheel Dimensional Data and Wheel Dimensions shown in the Fig 2,
 - c. New wheel diameter value to meet (determined as per Wheel Diameter and Profile measurements previously done, according to Sheets R-P-12-02-01-01/I-00 and R P-12-02-01-01/I-01).

CAUTION: DURING THE RE-PROFILING, THE TEMPERATURES GENERATED BY THE PROCESS SHOULD NOT EXCEED 212°F (100°C).
HIGHER TEMPERATURES MAY CAUSE DAMAGE TO THE RUBBER BLOCKS, THUS REDUCING THE LIFE OF THE BLOCKS.
 4. Measure /check the re-profiled Wheels for New Diameter and Profile, according to the condemning limits shown in Wheel Dimensional Data in Fig 2.
 5. Upon completing the re-profiling, remove the Friction Brakes Cut out status by rotating the Friction Brakes Cut -Out Cock (ORANGE) to WORK position.
 6. Restore Electrical Power.
- NOTE:** For Trailer Truck Wheels re-profiling, the input of the new diameter is not necessary because it is calculated comparing the A1R /A1L reference diameter with the speed sensors frequencies and considering the ratio between them.
The wheel diameter calculation is executed only when both the following conditions are met:
- a. The car speed is in the range between 5mph and 25mph.
 - b. The car mode is coasting for at least 3 seconds.
7. Upon completing the re-profiling it is recommended to perform the External Shunt Resistance Test on all Wheels re-profiled, according to Sheet R P 12-02-01-01/T-00.
 8. Perform the Vehicle Leveling procedure according to Sheet R-C-01-01-00-00/LL-00:
 9. Remove wheel chocks.
 10. Record Inspection and Test results on the Defect Report Card for administrative and maintenance planning.

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-01-01/RP-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

5/6

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

2

Maintenance Task:

RE-PROFILING

PROCEDURE (CONT'D):

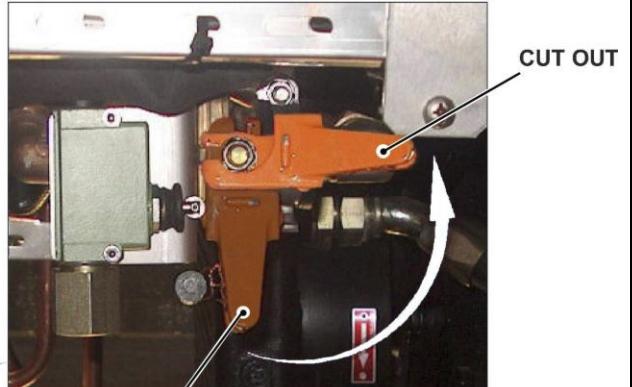
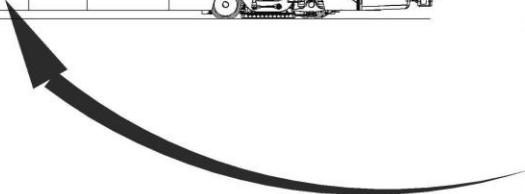
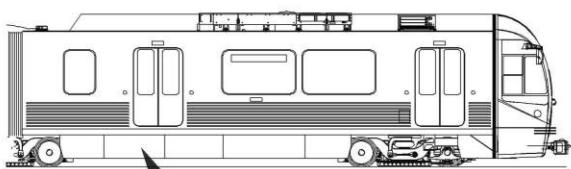


Figure 1 - "C" TRUCK FRICTION BRAKE CUT OUT

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-01-01/RP-00

System:

TRUCKS AND SUSPENSIONS

Sheet:

6/6

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEEL SET TRAILER TRUCK

Component:

WHEEL

Man Hours:

2

Maintenance Task:

RE-PROFILING

PROCEDURE (CONT'D):

WHEEL - DIMENSIONAL DATA

Wheel diameter (new).....	28.00 in
Wheel wear before replacement on diameter.....	2.00 in
Difference between the diameter of the wheels	(same axle <.080 in)
Difference between the diameter of the wheels.	(same truck .38 in)
Difference between the diameter of the wheels.	(same vehicle ± 2 in)

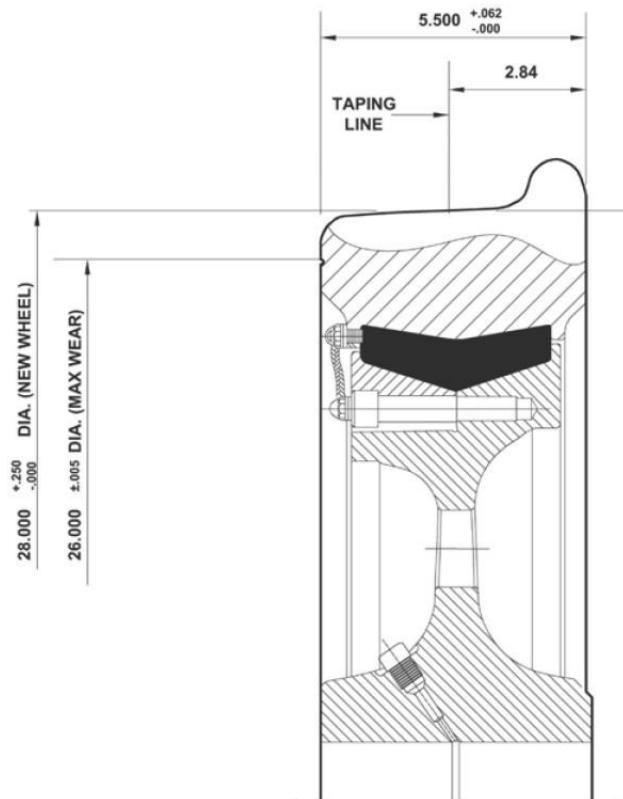


Figure 2 - TRUCK WHEEL PROFILE

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-01-04/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

1/6

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEELSET

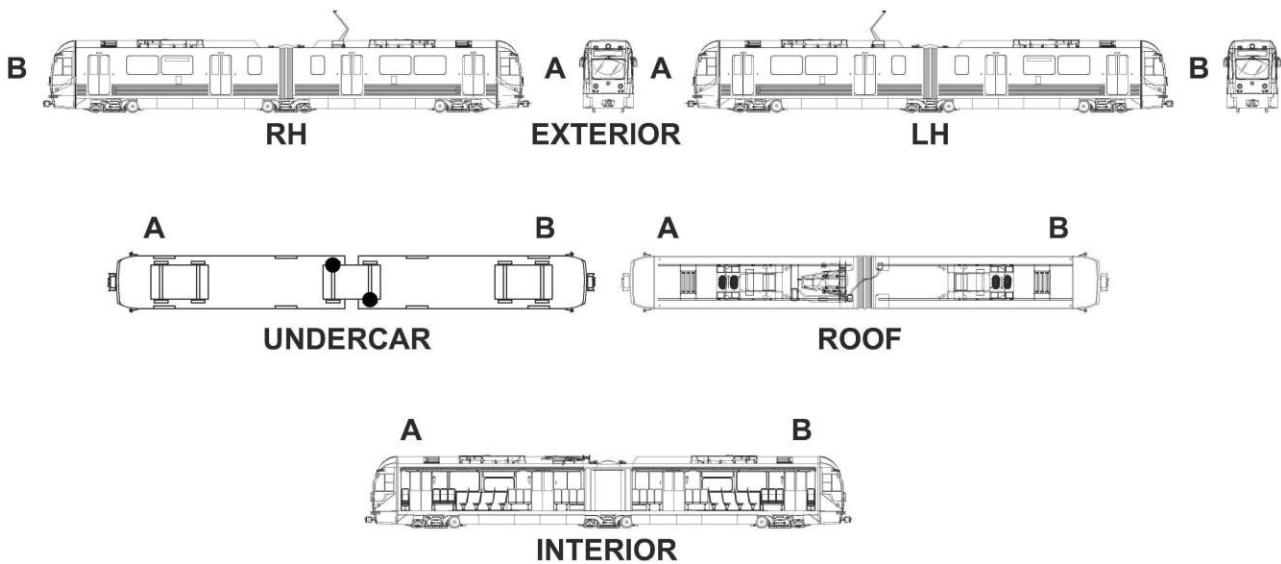
Component:

SPEED SENSOR DEVICE

Man Hours:

1

Maintenance Task:

REPLACEMENT
LOCATION:

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-01-04/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

2/6

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEELSET

Component:

SPEED SENSOR DEVICE

Man Hours:

1

Maintenance Task:

REPLACEMENT**SAFETY PRECAUTIONS:**

WARNING: BLUE FLAG THE VEHICLE IN ACCORDANCE WITH ALL LACMTA BLUE FLAG POLICIES, RULES, & PROCEDURES IN ORDER TO WARN THAT MAINTENANCE PERSONNEL ARE WORKING ON, UNDER, OR NEAR ROLLING EQUIPMENT.

WARNING: APPLY WHEEL CHOCKS TO PREVENT THE VEHICLE FROM MOVING.

WARNING: WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.

TOOLS:

LACMTA Maintenance Shop Standard Tools Kit.

CONSUMABLES:

CRC Industrial - Precision Cleaner M3 PN 147535

Dry Compressed Air for Electronic Equipment (commercial)

SPARE PARTS:

Propulsion Speed Sensor - PN AA04A95

Adapter - PN AA05J4C

Mating Connector - PN AA04A96 (IT 3106A-10SL-4S)

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-01-04/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

3/6

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEELSET

Component:

SPEED SENSOR DEVICE

Man Hours:

1

Maintenance Task:

REPLACEMENT

PROCEDURE:

PRELIMINARY OPERATIONS

Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop Regulations:

1. Place the Vehicle over the Pit (or Stand Up Rail).
2. Set the Master Controller Handle to FSB position.
3. Make sure that all Parking Brakes are applied (by checking on the IDU "Parking Brake A and B Not Released" and on Indicator Panel "A" "Park / Friction Brake" ON).
4. Remove Electrical Power from Vehicle by lowering the Pantograph.
5. Turn the Transfer Switch to OFF.
6. Set the Pantograph Control Motor Switch (5F02 CB LV Locker "A" Section) to OFF.
7. Lock out and tag out the Switch in accordance with all LACMTA Safety Rules, Regulations, Policies, and Procedures.

NOTE The tag must indicate the name of the person who removed Power.

That person knows why the Power was removed and when it safe to restore it.

Only the individual whose name appears on the tag or a person with his approval should remove the tag and restore Power.

8. Apply wheel chocks to prevent the Vehicle from moving.

REPLACEMENT

1. REMOVAL

To perform the task proceed as follows (Refer to Figures 1 and 2):

- a. Disconnect the Electrical Connector.
- b. Remove the Screws (1) and Washers (2), then remove the Adapter (3) with the Speed Sensor Device.
- c. Remove Speed Sensor (5) and Nut (4) from Adapter (3).

2. INSTALLATION

To perform the task proceed as follows (Refer to figures 1 and 2):

- a. Install Speed Sensor (5) and Nut (4) on Adapter (3) as per Figure 2.
- b. Adjust for the proper specification, (**0.96"±0.008**) and torque the Nut (4) to **20 ft-lb**.
- c. Mark the nut and the adapter with a continuous line by means of a marker pen.
- d. Install the Adapter (3) with the Speed Sensor Device and fasten it with the Screws (1) and Washers (2).
- e. Torque the Screws (1) to **7 ft-lb**.
- f. The clearance between the Speed Sensor Device and the Speed Sensor Gear is **0.02"±0.008**.
- g. Restore Electrical Connections.
- h. Restore Electrical Power.

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-01-04/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

4/6

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEELSET

Component:

SPEED SENSOR DEVICE

Man Hours:

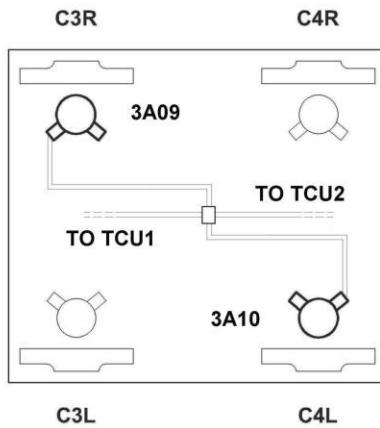
1

Maintenance Task:

REPLACEMENT

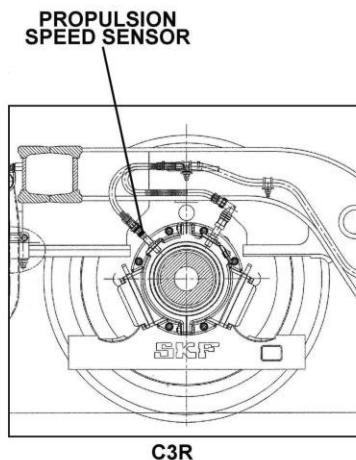
PROCEDURE (CONT'D):

TRAILER TRUCK

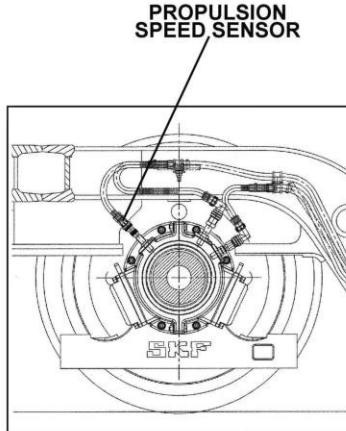


C3L

C4L



C3R



C4L

Figure 1 - SPEED SENSOR DEVICES - LOCATION

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-01-04/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

5/6

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEELSET

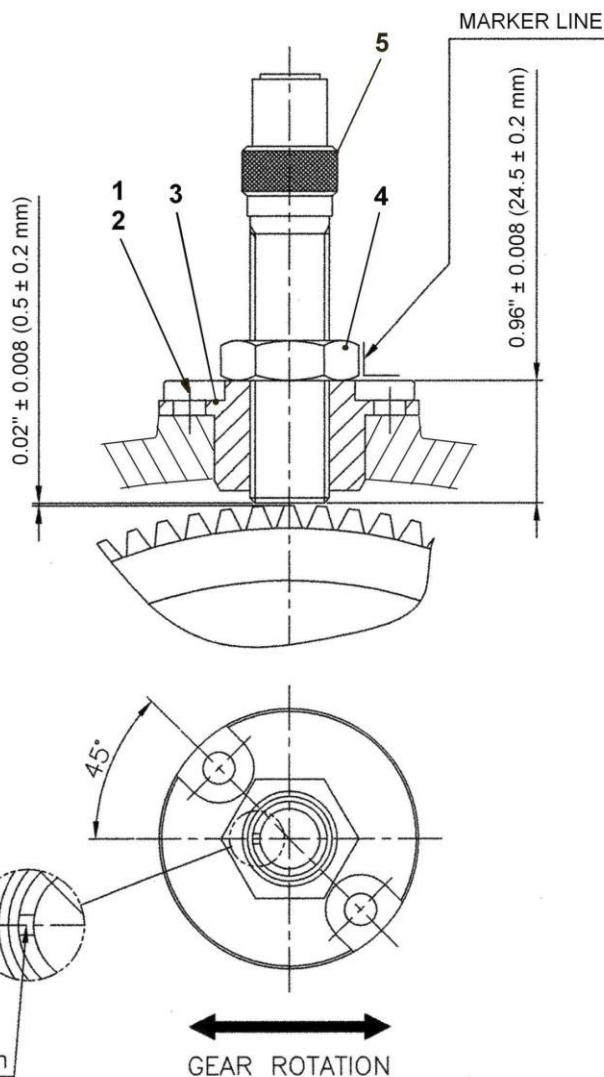
Component:

SPEED SENSOR DEVICE

Man Hours:

1

Maintenance Task:

REPLACEMENT**PROCEDURE:**
Figure 2 - SPEED SENSOR DEVICE INSTALLATION

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-01-04/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

6/6

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEELSET

Component:

SPEED SENSOR DEVICE

Man Hours:

1

Maintenance Task:

REPLACEMENT

**INTENTIONALLY
LEFT BLANK**

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-01-06/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

1/8

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEELSET

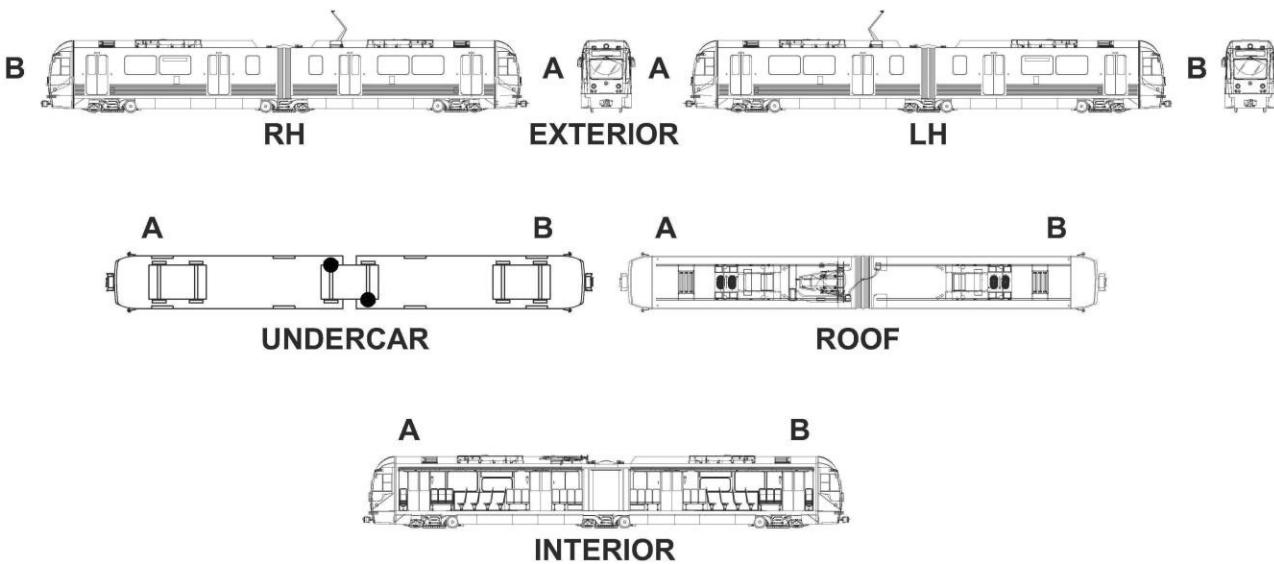
Component:

GROUND CONTACT DEVICE

Man Hours:

1

Maintenance Task:

REPLACEMENT
LOCATION:

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-01-06/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

2/8

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEELSET

Component:

GROUND CONTACT DEVICE

Man Hours:

1

Maintenance Task:

REPLACEMENT

SAFETY PRECAUTIONS:

- WARNING:** BLUE FLAG THE VEHICLE IN ACCORDANCE WITH ALL LACMTA BLUE FLAG POLICIES, RULES, & PROCEDURES IN ORDER TO WARN THAT MAINTENANCE PERSONNEL ARE WORKING ON, UNDER, OR NEAR ROLLING EQUIPMENT.
- WARNING:** APPLY WHEEL CHOCKS TO PREVENT THE VEHICLE FROM MOVING.
- WARNING:** WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.
- WARNING:** ALWAYS WEAR EYE PROTECTION AND GLOVES WHILE PERFORMING THIS MAINTENANCE TASK.
- WARNING:** ELECTRICAL HAZARD IS PRESENT THROUGHOUT THE PROPULSION SYSTEM AND CAUTION MUST BE TAKEN WHILE WORKING ON OR NEAR THE EQUIPMENT. REMOVE ALL ELECTRICAL POWER BEFORE PERFORMING MAINTENANCE TO THE SYSTEM.
- WARNING:** BEFORE PERFORMING MAINTENANCE PROCEDURES AND TOUCHING ANY COMPONENT, USE A RELIABLE HIGH VOLTAGE TEST PROBE TO VERIFY THAT NO VOLTAGE IS PRESENT.
- WARNING:** HIGH VOLTAGE IS PRESENT ON THE INVERTER GROUP. AFTER REMOVING ALL POWER FROM THE VEHICLE, WAIT A MINIMUM OF 1 MINUTE PRIOR TO REMOVING OR OPENING MAIN INVERTER GROUP, SINCE THE CAPACITORS DISCHARGE TIME IS 10 SECONDS FAILURE TO COMPLY WITH SAFETY REGULATIONS COULD RESULT IN SERIOUS INJURY OR EVEN DEATH IF NOT FOLLOWED.
- CAUTION** IT IS IMPERATIVE THAT NO OIL, GREASE OR DIRT IS LEFT ON THE GROUND RING / CURRENT RETURN BRUSHES. RESIDUE OF ANY KIND WILL CAUSE FAILURE TO THE GROUNDING CONTACT. CLEAN GROUND RING / CURRENT RETURN BRUSHES WITH A CLEAN CLOTH USING WHITE ALCOHOL SPIRITS ONLY.

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-01-06/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

3/8

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEELSET

Component:

GROUND CONTACT DEVICE

Man Hours:

1

Maintenance Task:

REPLACEMENT
TOOLS:

LACMTA Maintenance Shop Standard Tools Kit.

CONSUMABLES:

Cleaner / Degreaser,	as needed.
White Alcohol Spirits	as needed.
Anti-Oxidant Joint Compound Korp - Shield,	as needed.

SPARE PARTS:

Ground / Return Brushes	(PN 06.21.0076.13)
Housing LH	(PN 06.50.0151.00)
Housing RH	(PN 06.50.0151.01)
Housing LH Gasket	(PN tbd)
Housing RH Gasket	(PN tbd)

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-01-06/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

4/8

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEELSET

Component:

GROUND CONTACT DEVICE

Man Hours:

1

Maintenance Task:

REPLACEMENT**PROCEDURE:****PRELIMINARY OPERATIONS**

Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop Regulations:

1. Place the Vehicle over the Pit (or Stand Up Rail).
2. Set the Master Controller Handle to FSB position.
3. Make sure that all Parking Brakes are applied (by checking on the IDU "Parking Brake A and B Not Released" and on Indicator Panel "A" "Park / Friction Brake" ON).
4. Remove Electrical Power from Vehicle by lowering the Pantograph.
5. Turn the Transfer Switch to OFF.
6. Set the Pantograph Control Motor Switch (5F02 CB LV Locker "A" Section) to OFF.
7. Lock out and tag out the Switch in accordance with all LACMTA Safety Rules, Regulations, Policies, and Procedures

NOTE The tag must indicate the name of the person who removed Power.

That person knows why the Power was removed and when it safe to restore it.

Only the individual whose name appears on the tag or a person with his approval should remove the tag and restore Power.

8. Apply wheel chocks to prevent the Vehicle from moving

"C" TRAILER TRUCK

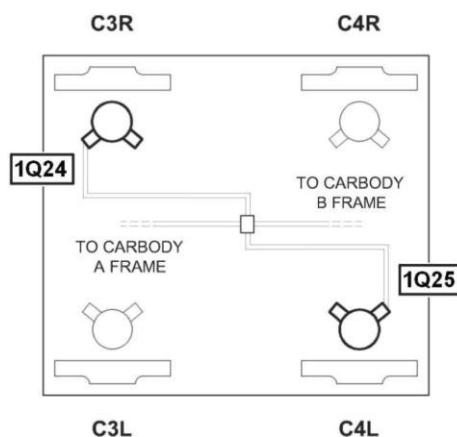


Figure 1 - GROUND CONTACT DEVICES - LOCATION

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-01-06/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

5/8

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEELSET

Component:

GROUND CONTACT DEVICE

Man Hours:

1

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

REPLACEMENT

REMOVAL

To perform the task proceed as follows (Refer to figures 2 and 3):

1. Remove Terminals and Cables of Ground / Current Return Brushes.
2. Disconnect the Electrical Connectors and remove Sensors and Cables.
3. Remove Screws (E), Washers (F) and Lock-washers (G), then remove Brush Housings Cover (A) and Gasket (B).
4. Slide Out the Pressure Device (C) from the slot in the Brush Guide (D) to disengage the Brush Terminals.
5. Separate Ground Brush Housing (1 and 2) by removing Screws (8), Washers (9), Lock-washers (10) and Hex Nuts (11).
6. Remove the Ground Brush Housings (1 and 2) with Gaskets (13) from the Junction Box by removing Screws (14), Lock-washer (10) and Washers (9).

INSTALLATION

To perform the task proceed as follows (Refer to figures 2 and 3):

CAUTION: IT IS IMPERATIVE THAT NO OIL, GREASE OR DIRT IS LEFT ON THE GROUND RING / CURRENT RETURN BRUSHES.

RESIDUE OF ANY KIND WILL CAUSE FAILURE TO THE GROUNDING CONTACT.
CLEAN GROUND RING / CURRENT RETURN BRUSHES WITH A CLEAN CLOTH
USING WHITE ALCOHOL SPIRITS ONLY.

1. Speed Sensor Ring (5) and Ground Ring (4) are in position.
2. If necessary:
 - a. Separate Ground Brush Housing (1 and 2) by removing Screws (8), Washers (9), Lock-washers (10) and Hex Nuts (11).
 - b. Remove Cover (A), Gasket (B) and Pressure Devices (C) from Contact Assembly.
3. Place Ground Brush Housings (1 and 2) over Ground Ring (4). Install Gaskets (13) between the Housings.

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-01-06/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

6/8

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEELSET

Component:

GROUND CONTACT DEVICE

Man Hours:

1

Maintenance Task:

REPLACEMENT

PROCEDURE (CONT'D):

4. Mount the Ground Brush Housings (1 and 2) to the Junction Box using Screws (14), Lock-washer (10) and Washers (9) and hand tighten.
5. Install Screws (8), Washer (9), Lock-washers (10) and Hex Nuts (11) into Ground Brush Housings (1 and 2) and hand tighten. Use LOCTITE 232 on threads.
6. Gradually tighten Screws (8 and 14) with an alternating crisscross pattern in 1/4 turn increments to minimize distortion of the housings.
Final torque Screws (8) to **22 ft-lb** and Screws (14) to **36 ft-lb**.
7. Slide Pressure Devices (C) into slot in the Brush guide (D) until it "clicks" into place.
8. Check Pressure Devices for correct working.
9. Install Cover (A) and Gasket (B). Install Screws (E), Washers (F) and Lock-washers (G). Torque to **11 ft-lb**.
10. Install Cables and Terminals of Ground / Current Return Brushes. Torque Terminal connections to **30 ft-lb**.
11. Install Sensors and Electrical Connectors, then tighten as required.
12. Restore Electrical Power.

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-01-06/R-00

System:

Sheet:

TRUCKS & SUSPENSIONS**7/8**

Subsystem/Assy:

Unit:

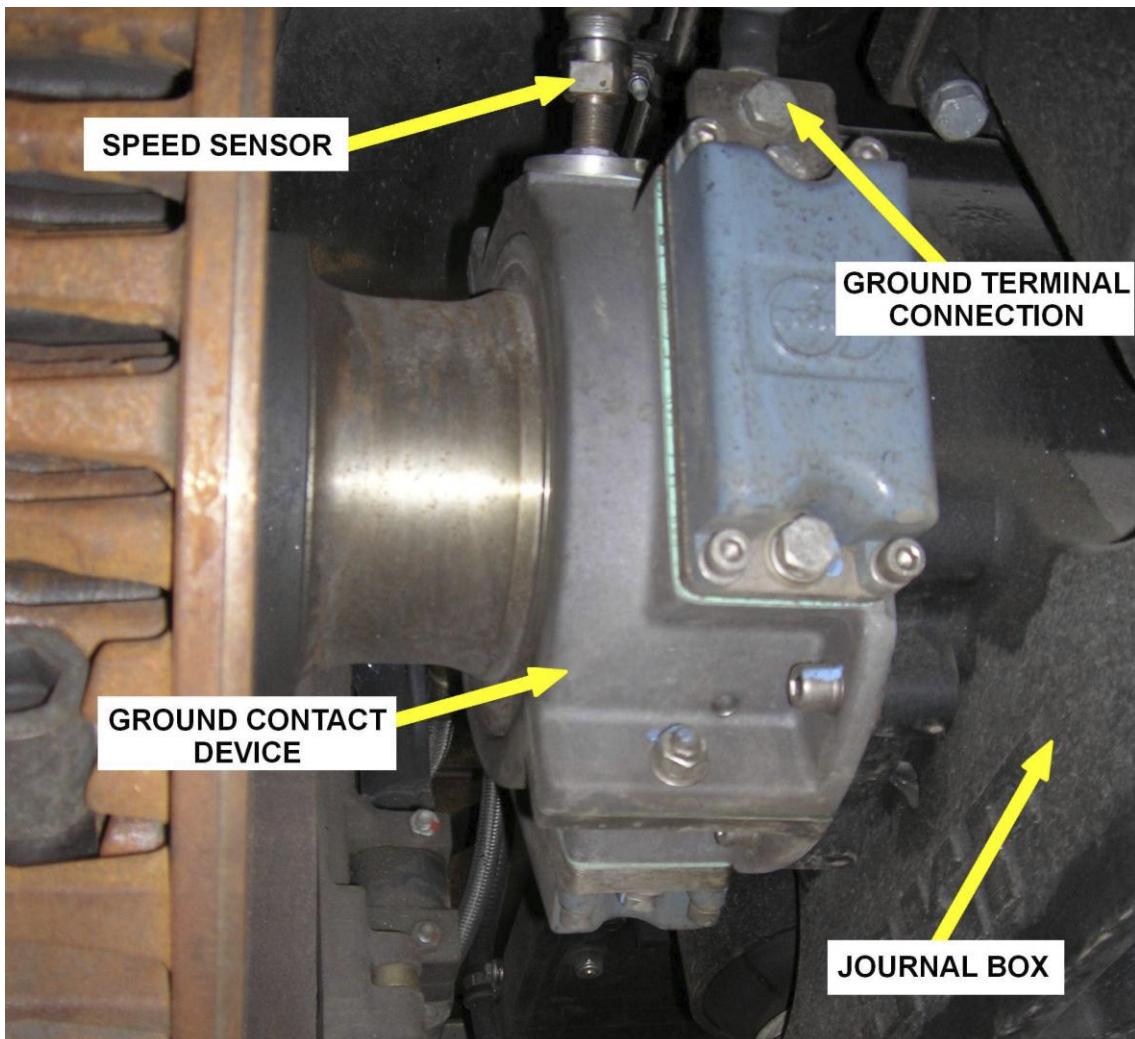
TRAILER TRUCK**WHEELSET**

Component:

Man Hours:

GROUND CONTACT DEVICE**1**

Maintenance Task:

REPLACEMENT**PROCEDURE:**
Figure 2 - GROUND CONTACT DEVICE

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-02-01-06/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

8/8

Subsystem/Assy:

TRAILER TRUCK

Unit:

WHEELSET

Component:

GROUND CONTACT DEVICE

Man Hours:

1

Maintenance Task:

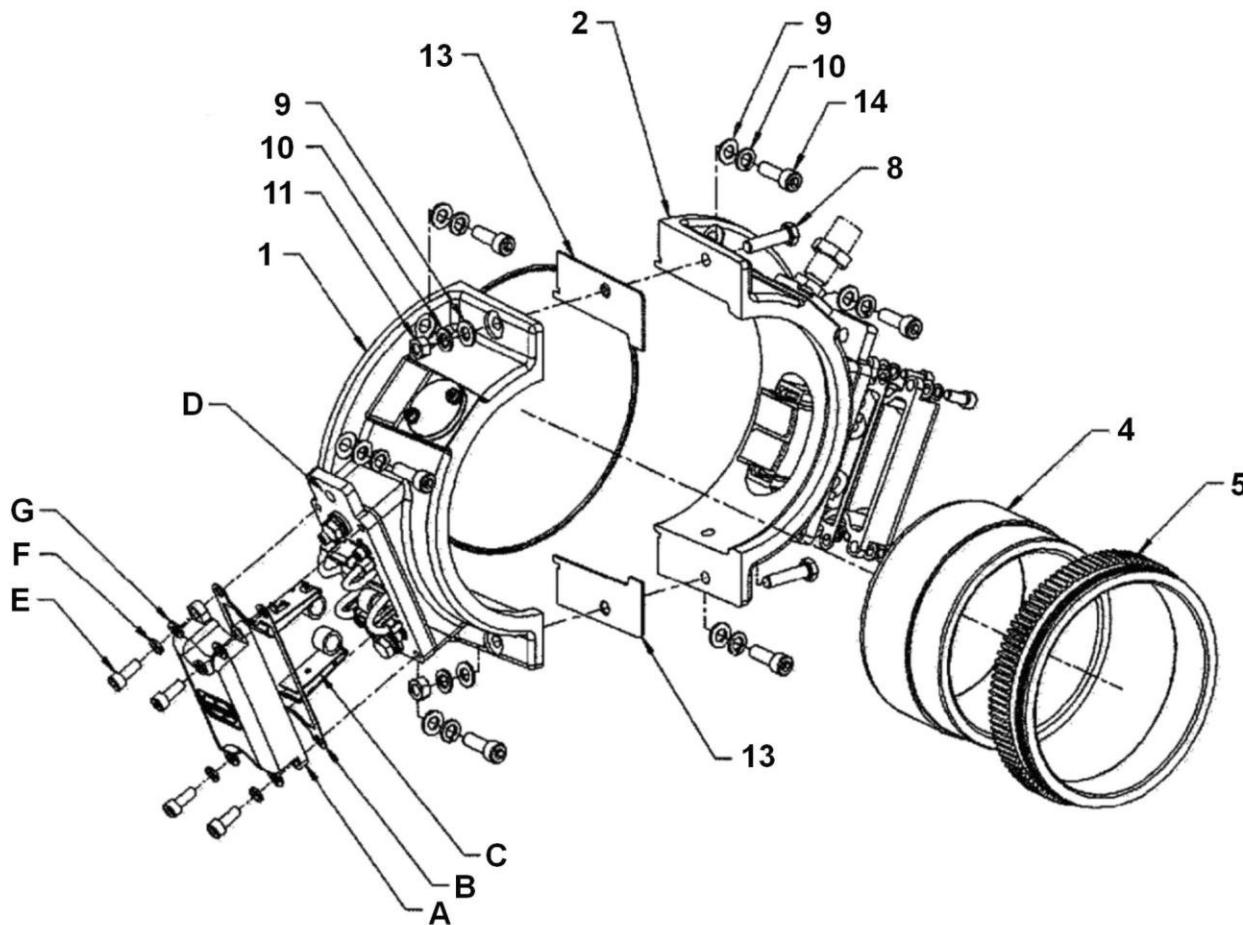
REPLACEMENT**PROCEDURE:**

Figure 3 - GROUND CONTACT DEVICE REPLACEMENT

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-01-01/R-00

System:

Sheet:

TRUCKS & SUSPENSIONS

1/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

PNEUMATICS EQUIPMENT

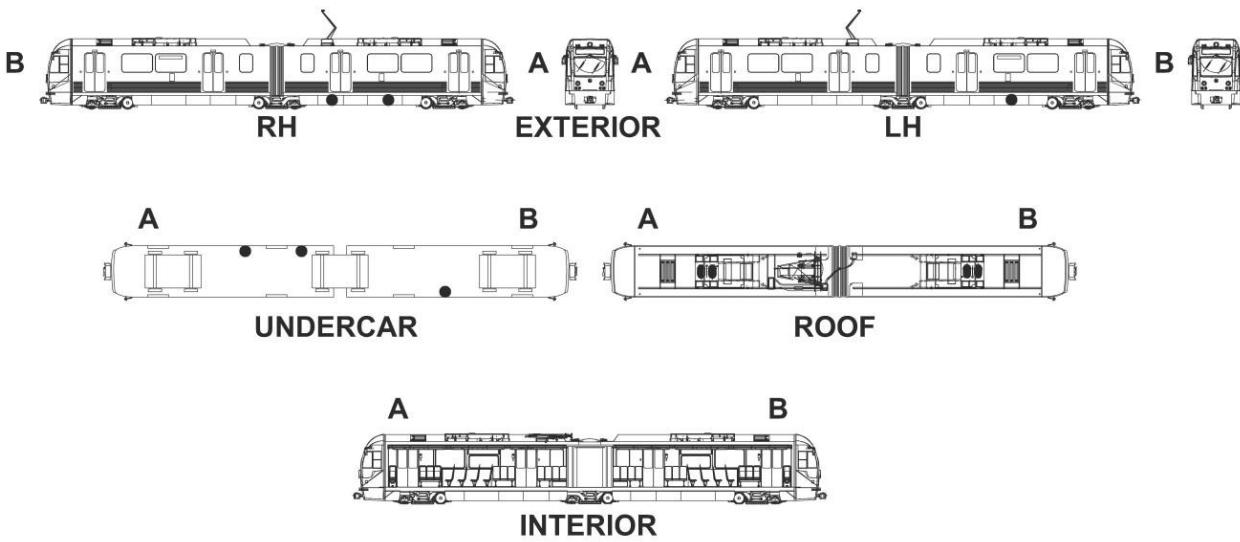
Component:

CUT-OUT COCK

Man Hours:

1.5

Maintenance Task:

REPLACEMENT
LOCATION:


P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-01-01/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

2/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

PNEUMATICS EQUIPMENT

Component:

CUT-OUT COCK

Man Hours:

1.5

Maintenance Task:

REPLACEMENT**SAFETY PRECAUTIONS:**

- WARNING:** BLUE FLAG THE VEHICLE IN ACCORDANCE WITH ALL LACMTA BLUE FLAG POLICIES, RULES, & PROCEDURES IN ORDER TO WARN THAT MAINTENANCE PERSONNEL ARE WORKING ON, UNDER, OR NEAR ROLLING EQUIPMENT.
- WARNING:** APPLY WHEEL CHOCKS TO PREVENT THE VEHICLE FROM MOVING.
- WARNING:** WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.
- WARNING:** HIGH PRESSURE IS VENTED WHEN CUTOUT COCK IS CLOSED. WEAR SAFETY GOGGLES AND EAR PROTECTION AND EXERCISE CAUTION. FAILURE TO COMPLY MAY RESULT IN INJURY.
- WARNING:** FILTER CONTAINS A SPRING LOADED FILTER ELEMENT. EXERCISE CAUTION WHEN DISASSEMBLING PLUG CAP. FAILURE TO COMPLY CAN LEAD TO INJURY.
- WARNING:** SOLVENTS AND SOLVENT FUMES CAN BE HARMFUL TO HEALTH. WHEN USING SOLVENTS, WEAR EYE, SKIN, AND RESPIRATORY PROTECTION AS REQUIRED. WORK IN WELL VENTILATED AREA. AVOID REPEATED OR PROLONGED CONTACT. KEEP SOLVENT CONTAINER CLOSED. KEEP SOLVENT AWAY FROM SPARKS, FLAMES, AND HEAT. FAILURE TO OBSERVE THESE SAFETY PRECAUTIONS CAN LEAD TO INJURY OR INTOXICATION.
- WARNING:** CLEANING USING COMPRESSED AIR CAN CAUSE DIRT PARTICLES TO BECOME AIRBORNE. WEAR EYE PROTECTION WHEN CLEANING WITH COMPRESSED AIR TO AVOID INJURY. DO NOT EXCEED 30 PSI. FAILURE TO COMPLY CAN LEAD TO INJURY.

TOOLS:

LACMTA Maintenance Shop Standard Tools Kit.

CONSUMABLES:

Mineral Spirit	
Aeroshell # 6 grease	(PN 2275094)
Leak Detector	(commercial)

SPARE PARTS:

Cut-out cock	(P/N AA03DTL)
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P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-01-01/R-00

System:

Sheet:

TRUCKS & SUSPENSIONS**3/6**

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

PNEUMATICS EQUIPMENT

Component:

CUT-OUT COCK

Man Hours:

1.5

Maintenance Task:

REPLACEMENT**PROCEDURE:****PRELIMINARY OPERATIONS**

Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop Regulations:

1. Place the Vehicle over the Pit (or Stand Up Rail).
2. Set the Master Controller Handle to FSB position.
3. Make sure that all Parking Brakes are applied (by checking on the IDU "Parking Brake A and B Not Released" and on Indicator Panel "A" "Park / Friction Brake" ON).
4. Remove Electrical Power from Vehicle by lowering the Pantograph.
5. Turn the Transfer Switch to OFF.
6. Set the Pantograph Control Motor Switch (5F02 CB LV Locker "A" Section) to OFF.
7. Lock out and tag out the Switch in accordance with all LACMTA Safety Rules, Regulations, Policies, and Procedures.

NOTE The tag must indicate the name of the person who removed Power.

That person knows why the Power was removed and when it safe to restore it.

Only the individual whose name appears on the tag or a person with his approval should remove the tag and restore Power.

8. Apply wheel chocks to prevent the Vehicle from moving.
9. Vent pressure at Main Reservoirs by opening 1/2-inch drain valve.

REMOVAL (Refer to Fig 1 and 2)

1. Locate the Air Suspension Cut-out Cock (L1.1) or the Maintenance Cut Out Cock (L1.4) to be removed and open related movable skirt.
2. Make sure that pneumatic pressure is released by closing and opening Cut Out Cocks several times.

WARNING: HIGH PRESSURE IS VENTED WHEN CUTOUT COCK IS CLOSED.**WEAR SAFETY GOGGLES AND EAR PROTECTION AND EXERCISE CAUTION.
FAILURE TO COMPLY MAY RESULT IN INJURY.**

3. Unscrew related pipeline Adapters and remove the Air Suspension Cut-out Cock (L1.1) or the Maintenance Cut Out Cock (L1.4) from pipeline.
4. Install protection Caps on pipeline openings.

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-01-01/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

4/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

PNEUMATICS EQUIPMENT

Component:

CUT-OUT COCK

Man Hours:

1.5

Maintenance Task:

REPLACEMENT**PROCEDURE:****INSTALLATION**

(Refer to Fig 1 and 2)

1. Check that pneumatic pressure is released.
2. Clean the Cut-out Cocks end fittings.
3. Remove protection Caps from pipeline openings.
4. Install and tighten Air Suspension Cut-out Cock (L1.1) or Maintenance Cut Out Cock (L1.4) on the pipelines.
5. Pressurize Air Piping by closing Main Reservoirs 1/2-inch drain valve.
6. Apply Leak Detector and test Air Suspension Cut-out Cock (L1.1) or Maintenance Cut Out Cock (L1.4) for leakage around the Air Piping connections.
7. Tighten joints where bubbles form.
8. Remove, using water, all traces of leak detector immediately after test
9. Restore Electrical Power.
10. Remove wheel chocks.
11. Record Service and Test results on the Defect Report Card for administrative and maintenance planning.

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-01-01/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

5/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

PNEUMATICS EQUIPMENT

Component:

CUT-OUT COCK

Man Hours:

1.5

Maintenance Task:

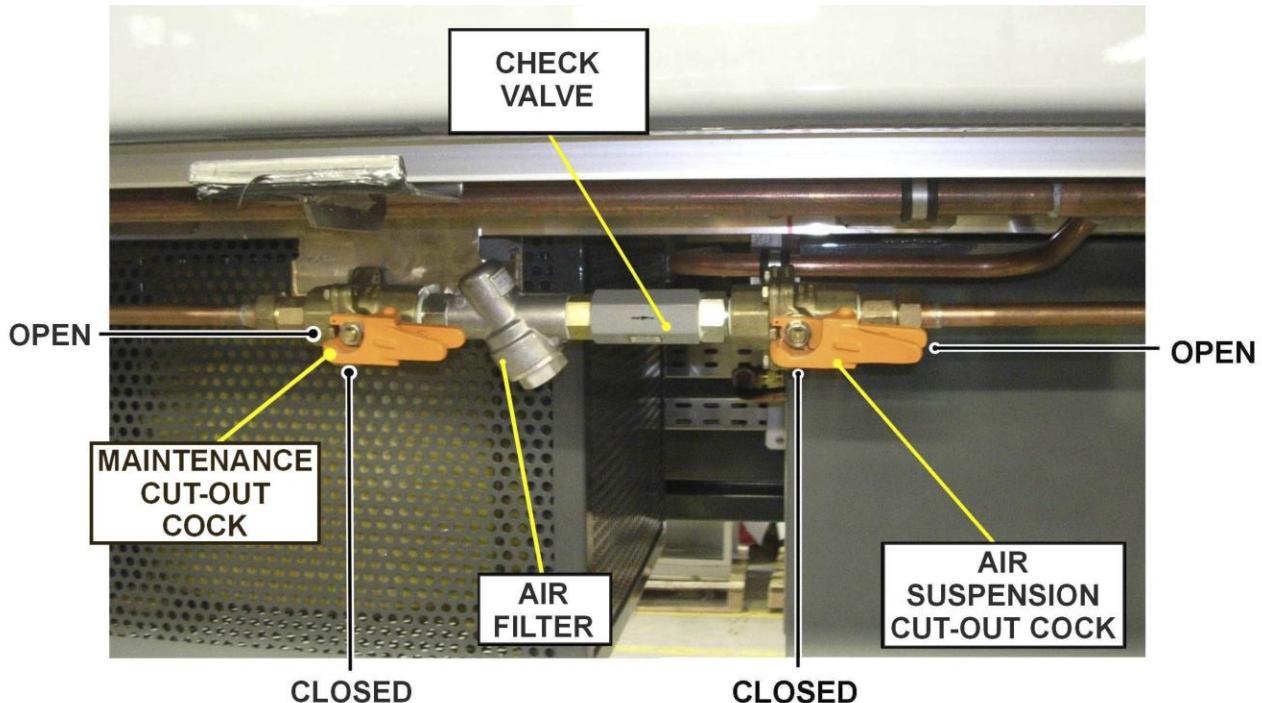
REPLACEMENT
PROCEDURE:


Figure 1 - SUSPENSION AIR FILTER, CHECK VALVE AND CUTOUT COCKS

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-01-01/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

6/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

PNEUMATICS EQUIPMENT

Component:

CUT-OUT COCK

Man Hours:

1.5

Maintenance Task:

REPLACEMENT

PROCEDURE:

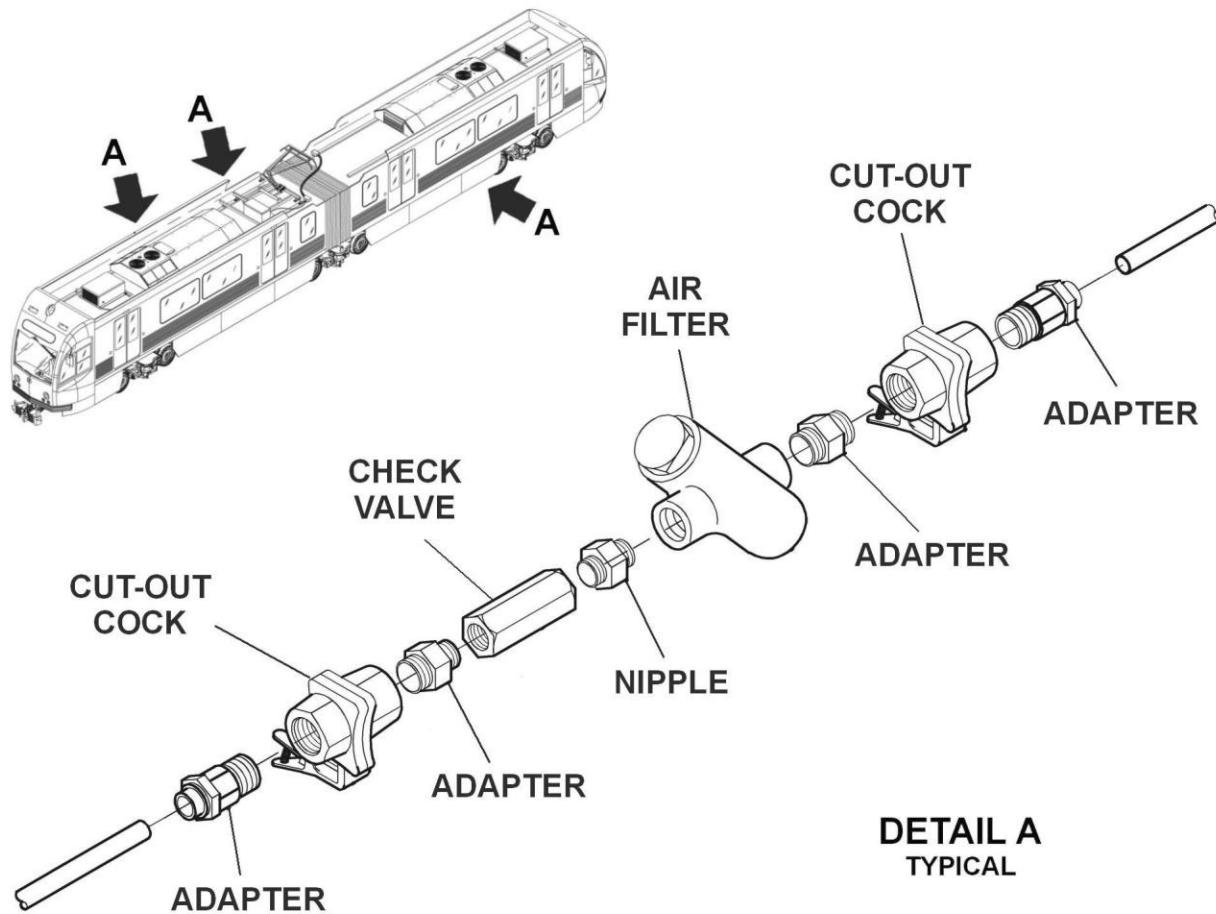


Figure 2 - CUT-OUT COCK REPLACEMENT

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-01-02/R-00

System:

Sheet:

TRUCKS & SUSPENSIONS**1/6**

Subsystem/Assy:

Unit:

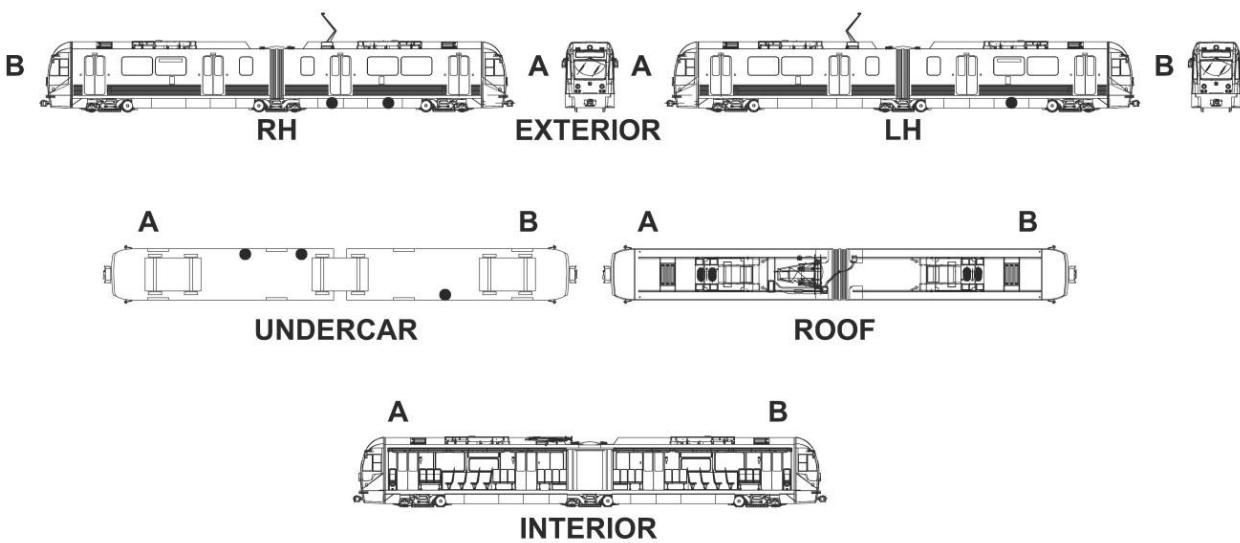
AIR SUSPENSION SYSTEM**PNEUMATICS EQUIPMENT**

Component:

Man Hours:

AIR FILTER**1**

Maintenance Task:

REPLACEMENT**LOCATION:**

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-01-02/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

2/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

PNEUMATICS EQUIPMENT

Component:

AIR FILTER

Man Hours:

1

Maintenance Task:

REPLACEMENT**SAFETY PRECAUTIONS:**

- WARNING:** BLUE FLAG THE VEHICLE IN ACCORDANCE WITH ALL LACMTA BLUE FLAG POLICIES, RULES, & PROCEDURES IN ORDER TO WARN THAT MAINTENANCE PERSONNEL ARE WORKING ON, UNDER, OR NEAR ROLLING EQUIPMENT.
- WARNING:** APPLY WHEEL CHOCKS TO PREVENT THE VEHICLE FROM MOVING.
- WARNING:** WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.
- WARNING:** HIGH PRESSURE IS VENTED WHEN CUTOUT COCK IS CLOSED. WEAR SAFETY GOGGLES AND EAR PROTECTION AND EXERCISE CAUTION. FAILURE TO COMPLY MAY RESULT IN INJURY.
- WARNING:** FILTER CONTAINS A SPRING LOADED FILTER ELEMENT. EXERCISE CAUTION WHEN DISASSEMBLING PLUG CAP. FAILURE TO COMPLY CAN LEAD TO INJURY.
- WARNING:** SOLVENTS AND SOLVENT FUMES CAN BE HARMFUL TO HEALTH. WHEN USING SOLVENTS, WEAR EYE, SKIN, AND RESPIRATORY PROTECTION AS REQUIRED. WORK IN WELL VENTILATED AREA. AVOID REPEATED OR PROLONGED CONTACT. KEEP SOLVENT CONTAINER CLOSED. KEEP SOLVENT AWAY FROM SPARKS, FLAMES, AND HEAT. FAILURE TO OBSERVE THESE SAFETY PRECAUTIONS CAN LEAD TO INJURY OR INTOXICATION.
- WARNING:** CLEANING USING COMPRESSED AIR CAN CAUSE DIRT PARTICLES TO BECOME AIRBORNE. WEAR EYE PROTECTION WHEN CLEANING WITH COMPRESSED AIR TO AVOID INJURY. DO NOT EXCEED 30 PSI. FAILURE TO COMPLY CAN LEAD TO INJURY.

TOOLS:

LACMTA Maintenance Shop Standard Tools Kit.

CONSUMABLES:

Mineral Spirit	
Aeroshell # 6 grease	(PN 2275094)
Leak Detector	(commercial)

SPARE PARTS:

Air Filter	(P/N AA03DTK)
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P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-01-02/R-00

System:

Sheet:

TRUCKS & SUSPENSIONS
3/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

PNEUMATICS EQUIPMENT

Component:

AIR FILTER

Man Hours:

1

Maintenance Task:

REPLACEMENT

PROCEDURE:

PRELIMINARY OPERATIONS

Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop Regulations:

1. Place the Vehicle over the Pit (or Stand Up Rail).
2. Set the Master Controller Handle to FSB position.
3. Make sure that all Parking Brakes are applied (by checking on the IDU "Parking Brake A and B Not Released" and on Indicator Panel "A" "Park / Friction Brake" ON).
4. Remove Electrical Power from Vehicle by lowering the Pantograph.
5. Turn the Transfer Switch to OFF.
6. Set the Pantograph Control Motor Switch (5F02 CB LV Locker "A" Section) to OFF
7. Lock out and tag out the Switch in accordance with all LACMTA Safety Rules, Regulations, Policies, and Procedures.

NOTE The tag must indicate the name of the person who removed Power.

That person knows why the Power was removed and when it safe to restore it.

Only the individual whose name appears on the tag or a person with his approval should remove the tag and restore Power.

8. Apply wheel chocks to prevent the Vehicle from moving.

REMOVAL (Refer to Fig 1 and 2)

1. Locate the Air Filter to be removed and open related movable skirt.
2. Vent pneumatic pressure from Air Piping by closing the Maintenance Cut Out Cock.

**WARNING: HIGH PRESSURE IS VENTED WHEN CUTOUT COCK IS CLOSED.
WEAR SAFETY GOGGLES AND EAR PROTECTION AND EXERCISE
CAUTION. FAILURE TO COMPLY MAY RESULT IN INJURY.**

3. Unscrew related pipeline Adapters and remove the Air Filter from pipeline.
4. Install protection Caps on pipeline openings.

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-01-02/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

4/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

PNEUMATICS EQUIPMENT

Component:

AIR FILTER

Man Hours:

1

Maintenance Task:

REPLACEMENT**PROCEDURE:****INSTALLATION**

(Refer to Fig 1 and 2)

1. Check that pneumatic pressure is released.
2. Clean the Air Filter end fittings.
3. Remove protection Caps from pipeline openings.
4. Install and tighten Air Filter on the pipelines.
5. Pressurize Air Piping by opening Maintenance Cut Out Cock.
6. Apply Leak Detector and test Air Filter for leakage around the Air Piping connections.
7. Tighten joints where bubbles form.
8. Remove, using water, all traces of leak detector immediately after test.
9. Restore Electrical Power.
10. Remove wheel chocks.
11. Record Service and Test results on the Defect Report Card for administrative and maintenance planning.

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-01-02/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

5/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

PNEUMATICS EQUIPMENT

Component:

AIR FILTER

Man Hours:

1

Maintenance Task:

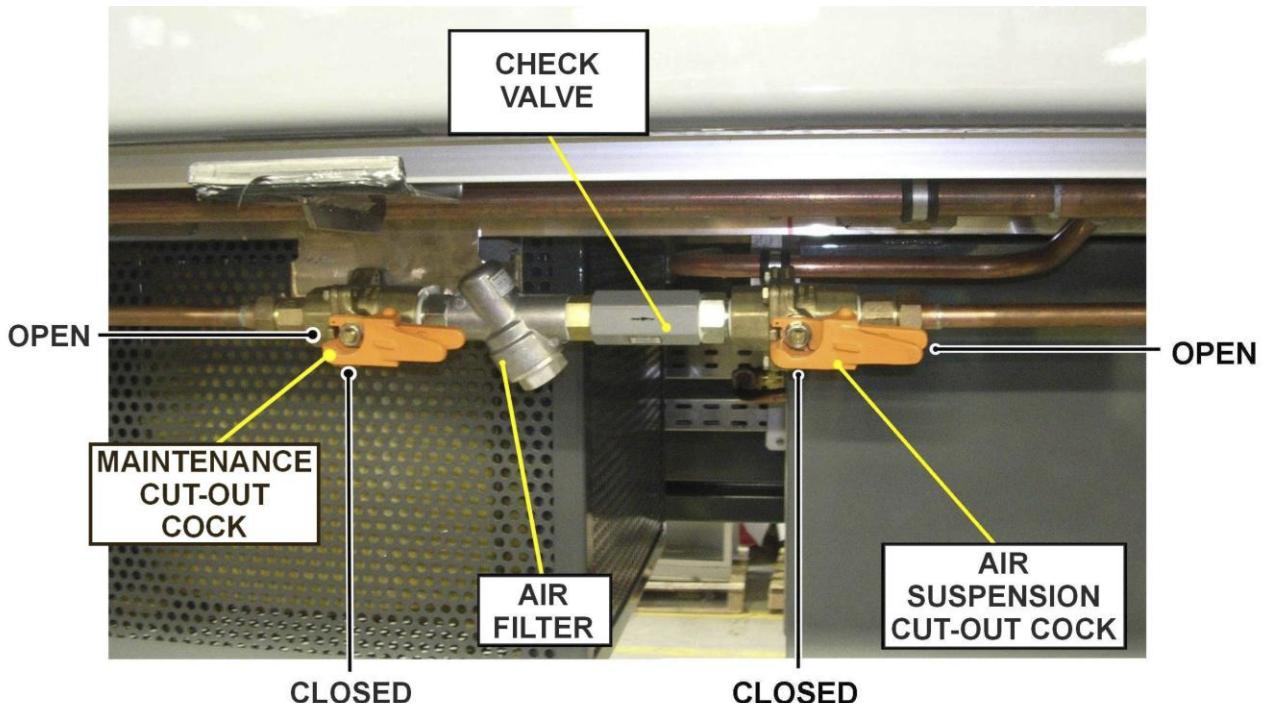
REPLACEMENT**PROCEDURE:**

Figure 1 - SUSPENSION AIR FILTER AND CUTOUT COCKS

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-01-02/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

6/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

PNEUMATICS EQUIPMENT

Component:

AIR FILTER

Man Hours:

1

Maintenance Task:

REPLACEMENT

PROCEDURE:

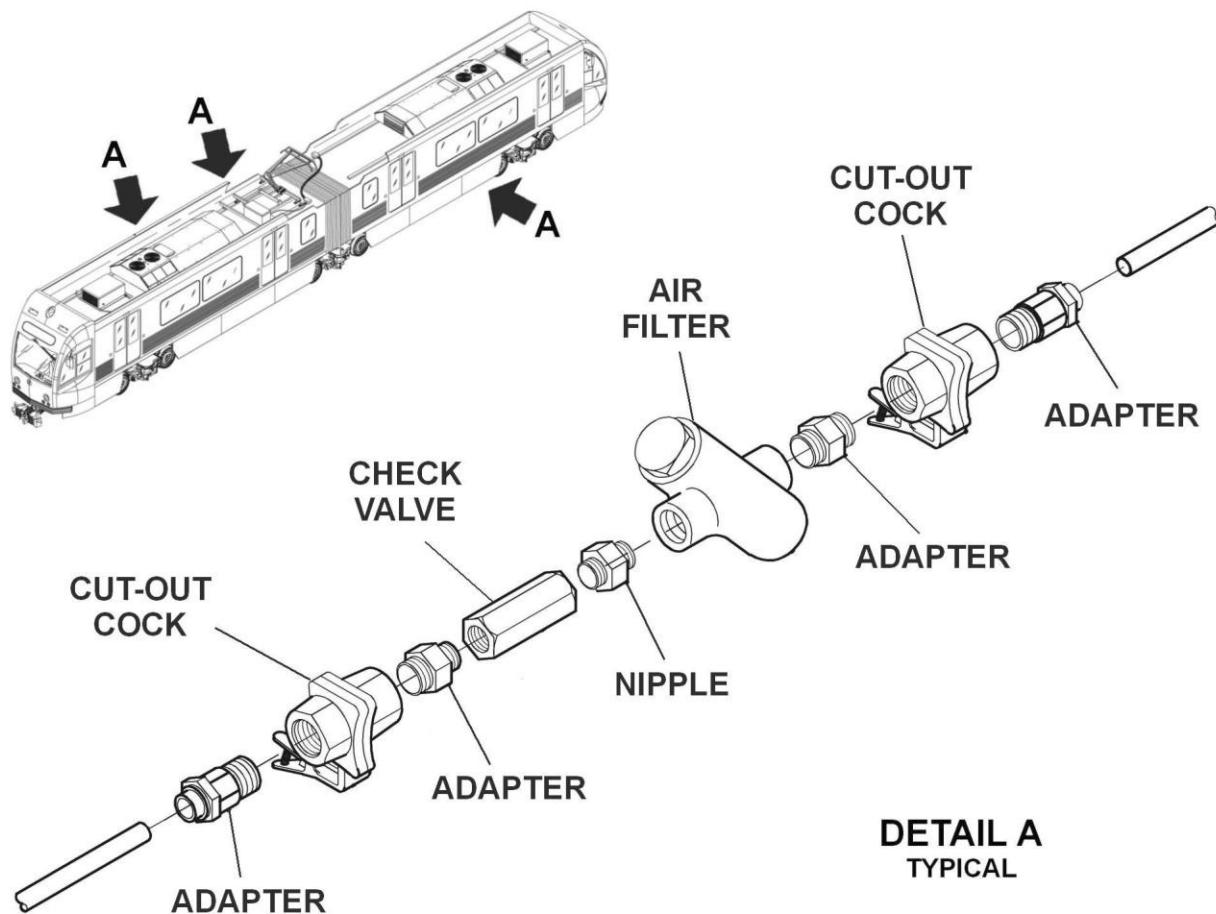


Figure 2 - AIR FILTER REPLACEMENT

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-01-03/R-00

System:

Sheet:

TRUCKS & SUSPENSIONS

1/6

Subsystem/Assy:

Unit:

AIR SUSPENSION SYSTEM

PNEUMATICS EQUIPMENT

Component:

Man Hours:

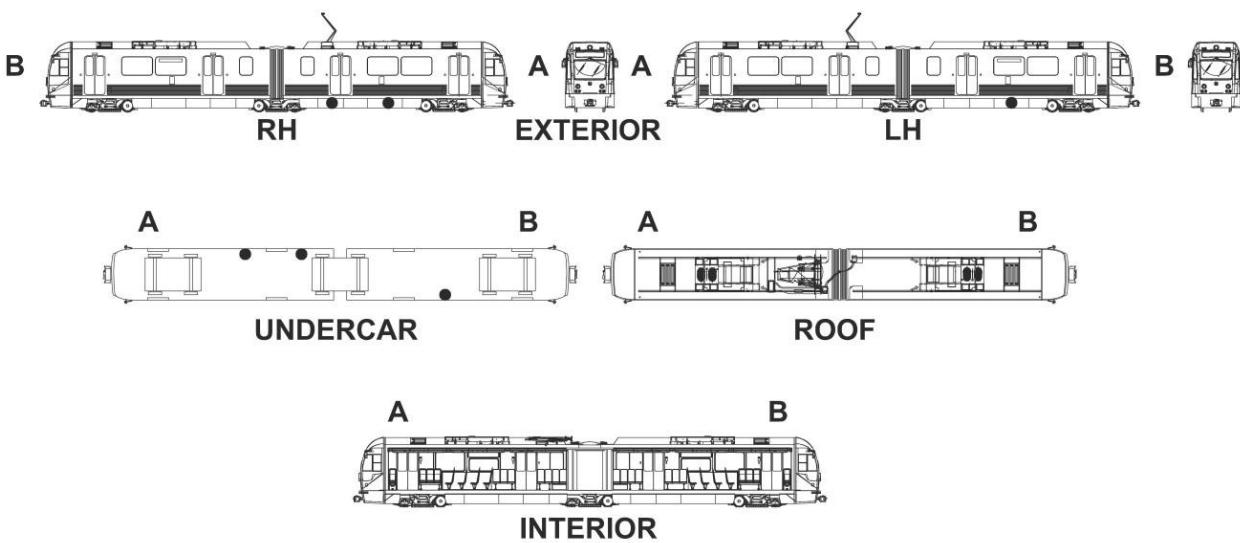
CHECK VALVE

1.5

Maintenance Task:

REPLACEMENT

LOCATION:



P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-01-03/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

2/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

PNEUMATICS EQUIPMENT

Component:

CHECK VALVE

Man Hours:

1.5

Maintenance Task:

REPLACEMENT**SAFETY PRECAUTIONS:**

- WARNING:** BLUE FLAG THE VEHICLE IN ACCORDANCE WITH ALL LACMTA BLUE FLAG POLICIES, RULES, & PROCEDURES IN ORDER TO WARN THAT MAINTENANCE PERSONNEL ARE WORKING ON, UNDER, OR NEAR ROLLING EQUIPMENT.
- WARNING:** APPLY WHEEL CHOCKS TO PREVENT THE VEHICLE FROM MOVING.
- WARNING:** WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.
- WARNING:** HIGH PRESSURE IS VENTED WHEN CUTOUT COCK IS CLOSED. WEAR SAFETY GOGGLES AND EAR PROTECTION AND EXERCISE CAUTION. FAILURE TO COMPLY MAY RESULT IN INJURY.
- WARNING:** FILTER CONTAINS A SPRING LOADED FILTER ELEMENT. EXERCISE CAUTION WHEN DISASSEMBLING PLUG CAP. FAILURE TO COMPLY CAN LEAD TO INJURY.
- WARNING:** SOLVENTS AND SOLVENT FUMES CAN BE HARMFUL TO HEALTH. WHEN USING SOLVENTS, WEAR EYE, SKIN, AND RESPIRATORY PROTECTION AS REQUIRED. WORK IN WELL VENTILATED AREA. AVOID REPEATED OR PROLONGED CONTACT. KEEP SOLVENT CONTAINER CLOSED. KEEP SOLVENT AWAY FROM SPARKS, FLAMES, AND HEAT. FAILURE TO OBSERVE THESE SAFETY PRECAUTIONS CAN LEAD TO INJURY OR INTOXICATION.
- WARNING:** CLEANING USING COMPRESSED AIR CAN CAUSE DIRT PARTICLES TO BECOME AIRBORNE. WEAR EYE PROTECTION WHEN CLEANING WITH COMPRESSED AIR TO AVOID INJURY. DO NOT EXCEED 30 PSI. FAILURE TO COMPLY CAN LEAD TO INJURY.

TOOLS:

LACMTA Maintenance Shop Standard Tools Kit.

CONSUMABLES:

Mineral Spirit	
Aeroshell # 6 grease	(PN 2275094)
Leak Detector	(commercial)

SPARE PARTS:

Check valve	(P/N AA03DTH)
-------------	---------------

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-01-03/R-00

System:

Sheet:

TRUCKS & SUSPENSIONS
3/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

PNEUMATICS EQUIPMENT

Component:

CHECK VALVE

Man Hours:

1.5

Maintenance Task:

REPLACEMENT

PROCEDURE:

PRELIMINARY OPERATIONS

Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop Regulations:

1. Place the Vehicle over the Pit (or Stand Up Rail).
2. Set the Master Controller Handle to FSB position.
3. Make sure that all Parking Brakes are applied (by checking on the IDU "Parking Brake A and B Not Released" and on Indicator Panel "A" "Park / Friction Brake" ON).
4. Remove Electrical Power from Vehicle by lowering the Pantograph.
5. Turn the Transfer Switch to OFF.
6. Set the Pantograph Control Motor Switch (5F02 CB LV Locker "A" Section) to OFF.
7. Lock out and tag out the Switch in accordance with all LACMTA Safety Rules, Regulations, Policies, and Procedures.

NOTE The tag must indicate the name of the person who removed Power.

That person knows why the Power was removed and when it safe to restore it.

Only the individual whose name appears on the tag or a person with his approval should remove the tag and restore Power.

8. Apply wheel chocks to prevent the Vehicle from moving.

REMOVAL (Refer to Fig 1 and 2)

1. Locate the Check Valve to be removed and open related movable skirt.
2. Vent pneumatic pressure from Air Piping by closing the Maintenance Cut Out Cock

WARNING: HIGH PRESSURE IS VENTED WHEN CUTOUT COCK IS CLOSED. WEAR SAFETY GOGGLES AND EAR PROTECTION AND EXERCISE CAUTION. FAILURE TO COMPLY MAY RESULT IN INJURY.

3. Unscrew related pipeline Adapters and remove the Check Valve from pipeline.
4. Install protection Caps on pipeline openings.

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-01-03/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

4/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

PNEUMATICS EQUIPMENT

Component:

CHECK VALVE

Man Hours:

1.5

Maintenance Task:

REPLACEMENT**PROCEDURE:****INSTALLATION**

(Refer to Fig 1 and 2)

1. Check that pneumatic pressure is released.
2. Clean the Check Valve end fittings.
3. Remove protection Caps from pipeline openings.
4. Install and tighten Check Valve on the pipelines.
5. Pressurize Air Piping by opening the Maintenance Cut Out Cock.
6. Apply Leak Detector and test Check Valve for leakage around the Air Piping connections.
7. Tighten joints where bubbles form.
8. Remove, using water, all traces of leak detector immediately after test.
9. Restore Electrical Power.
10. Remove wheel chocks.
11. Record Service and Test results on the Defect Report Card for administrative and maintenance planning.

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-01-03/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

5/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

PNEUMATICS EQUIPMENT

Component:

CHECK VALVE

Man Hours:

1.5

Maintenance Task:

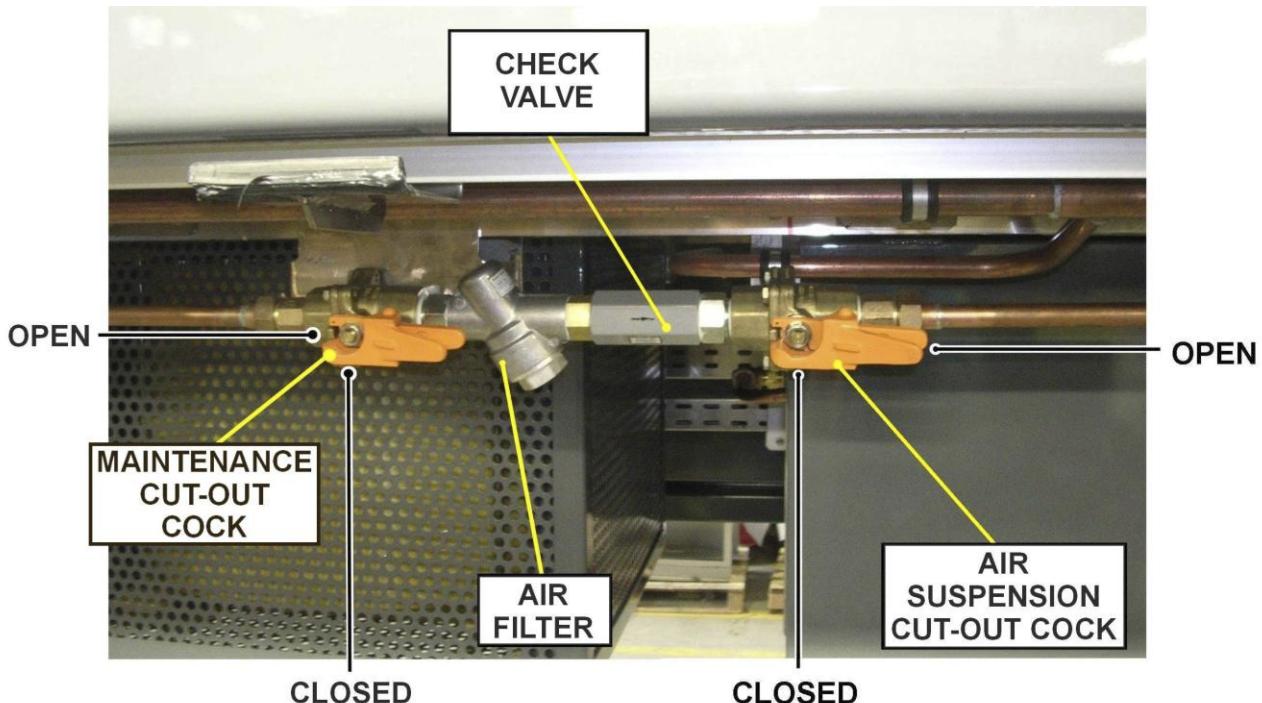
REPLACEMENT
PROCEDURE:


Figure 1 - SUSPENSION AIR FILTER, CHECK VALVE AND CUTOUT COCKS

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-01-03/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

6/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

PNEUMATICS EQUIPMENT

Component:

CHECK VALVE

Man Hours:

1.5

Maintenance Task:

REPLACEMENT

PROCEDURE:

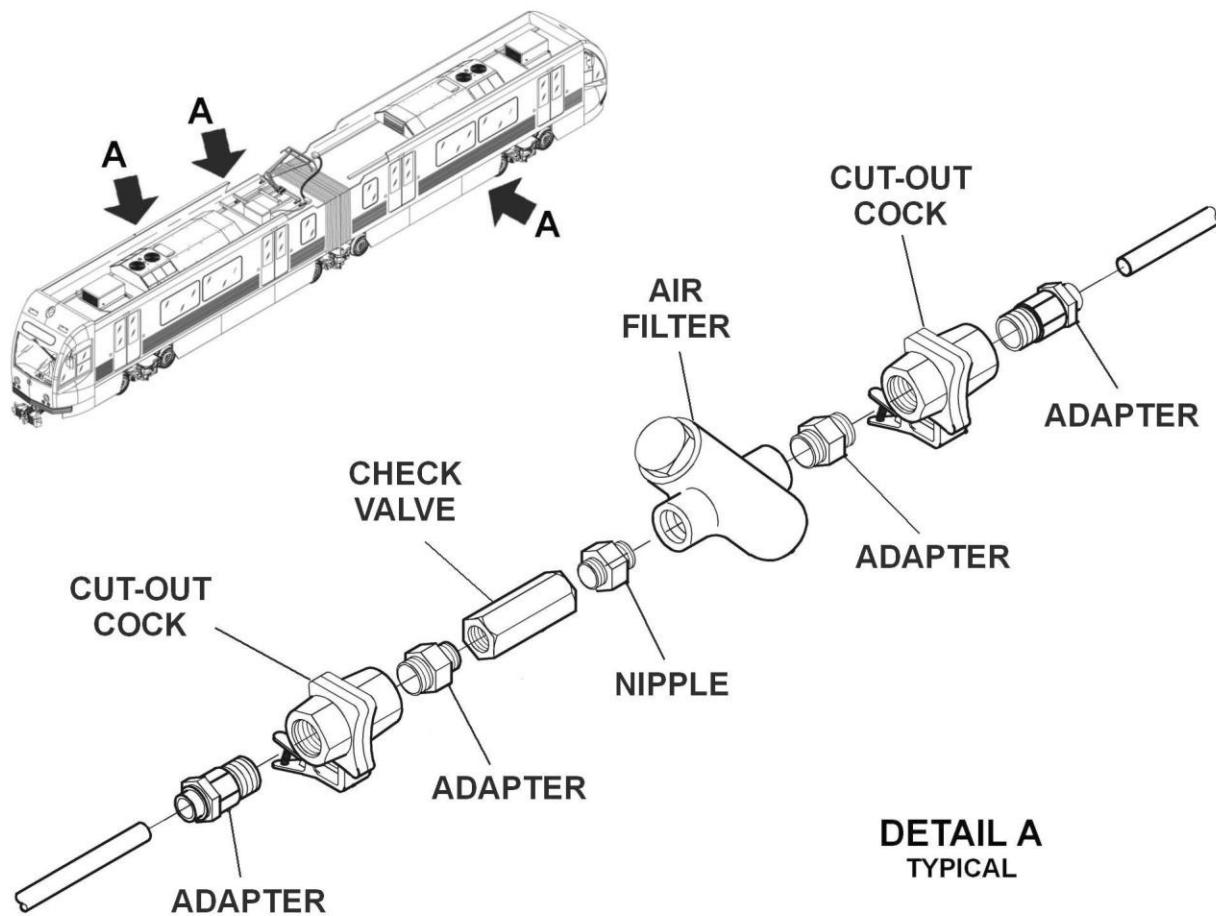


Figure 2 - CHECK VALVE REPLACEMENT

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-02-00/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

1/8

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

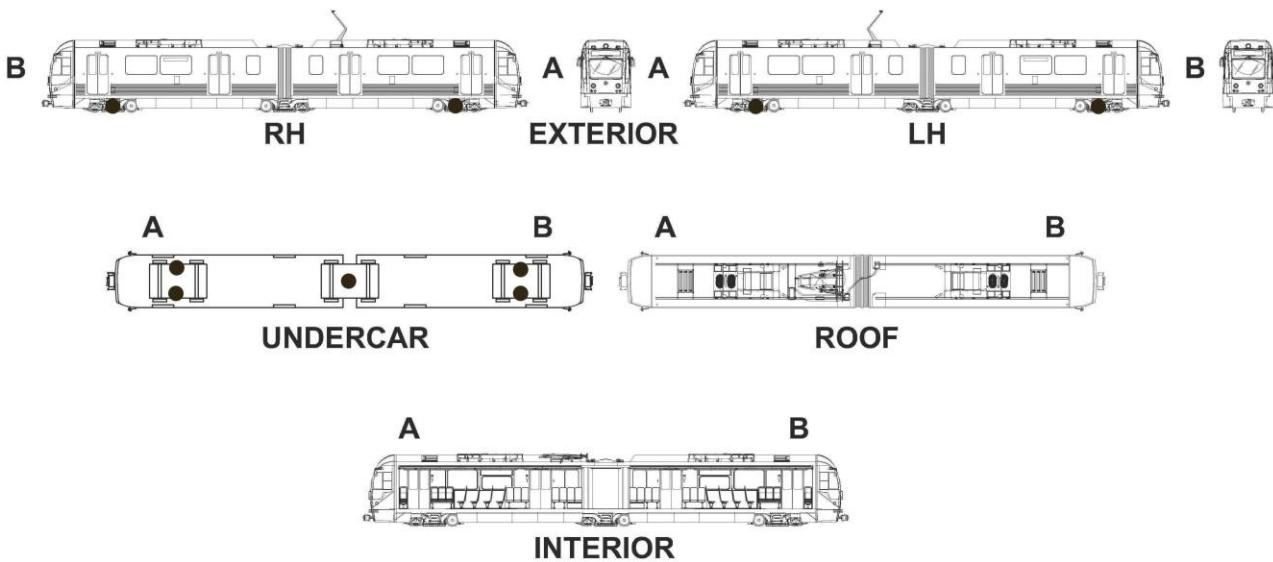
LEVELING VALVE

Component:

Man Hours:

1.5

Maintenance Task:

REPLACEMENT
LOCATION:


P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-02-00/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

2/8

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

LEVELING VALVE

Component:

Man Hours:

1.5

Maintenance Task:

REPLACEMENT**SAFETY PRECAUTIONS:**

- WARNING:** BLUE FLAG THE VEHICLE IN ACCORDANCE WITH ALL LACMTA BLUE FLAG POLICIES, RULES, & PROCEDURES IN ORDER TO WARN THAT MAINTENANCE PERSONNEL ARE WORKING ON, UNDER, OR NEAR ROLLING EQUIPMENT.
- WARNING:** APPLY WHEEL CHOCKS TO PREVENT THE VEHICLE FROM MOVING.
- WARNING:** WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.
- WARNING:** HIGH PRESSURE IS VENTED WHEN CUTOUT COCK IS CLOSED. WEAR SAFETY GOGGLES AND EAR PROTECTION AND EXERCISE CAUTION. FAILURE TO COMPLY MAY RESULT IN INJURY.
- WARNING:** FILTER CONTAINS A SPRING LOADED FILTER ELEMENT. EXERCISE CAUTION WHEN DISASSEMBLING PLUG CAP. FAILURE TO COMPLY CAN LEAD TO INJURY.
- WARNING:** SOLVENTS AND SOLVENT FUMES CAN BE HARMFUL TO HEALTH. WHEN USING SOLVENTS, WEAR EYE, SKIN, AND RESPIRATORY PROTECTION AS REQUIRED. WORK IN WELL VENTILATED AREA. AVOID REPEATED OR PROLONGED CONTACT. KEEP SOLVENT CONTAINER CLOSED. KEEP SOLVENT AWAY FROM SPARKS, FLAMES, AND HEAT. FAILURE TO OBSERVE THESE SAFETY PRECAUTIONS CAN LEAD TO INJURY OR INTOXICATION.
- WARNING:** CLEANING USING COMPRESSED AIR CAN CAUSE DIRT PARTICLES TO BECOME AIRBORNE. WEAR EYE PROTECTION WHEN CLEANING WITH COMPRESSED AIR TO AVOID INJURY. DO NOT EXCEED 30 PSI. FAILURE TO COMPLY CAN LEAD TO INJURY.

TOOLS:

LACMTA Maintenance Shop Standard Tools Kit.

CONSUMABLES:

Mineral Spirit	
Aeroshell # 6 grease	(PN 2275094)
Leak Detector	(commercial)

SPARE PARTS:

Leveling Valve (P/N AA03E61)

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-02-00/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

3/8

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

LEVELING VALVE

Component:

Man Hours:

1.5

Maintenance Task:

REPLACEMENT

PROCEDURE:

PRELIMINARY OPERATIONS

Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop Regulations:

1. Place the Vehicle over the Pit (or Stand Up Rail) provided with Wheel Truing Machine.
2. Set the Master Controller Handle to FSB position.
3. Make sure that all Parking Brakes are applied (by checking on the IDU "Parking Brake A and B Not Released" and on Indicator Panel "A" "Park / Friction Brake" ON).
4. Remove Electrical Power from Vehicle by lowering the Pantograph.
5. Turn the Transfer Switch to OFF.
6. Set the Pantograph Control Motor Switch (5F02 CB LV Locker "A" Section) to OFF.
7. Lock out and tag out the Switch in accordance with all LACMTA Safety Rules, Regulations, Policies, and Procedures.

NOTE The tag must indicate the name of the person who removed Power.

That person knows why the Power was removed and when it safe to restore it.

Only the individual whose name appears on the tag or a person with his approval should remove the tag and restore Power.

8. Apply wheel chocks to prevent the Vehicle from moving.

9. Vent pneumatic pressure from Air Piping by closing the Air Suspension Cut Out Cock (Refer to Figure 1).

WARNING HIGH PRESSURE IS VENTED WHEN CUTOUT COCK IS CLOSED. WEAR SAFETY GOGGLES AND EAR PROTECTION AND EXERCISE CAUTION. FAILURE TO COMPLY MAY RESULT IN INJURY.

REMOVAL

1. Locate the Leveling Valve to be removed.
2. Remove Screw (1), Self-Locking Nut (4), Washers (2) and Spacers (3) to disconnect the Actuating Lever of Leveling Valve from related connection device (Refer to Figures 2 and 3).
3. Unscrew pipeline Adapters (5, 6, 7, 8) to disconnect the Leveling Valve (1) from pipeline (Refer to Figures 4 and 5).
4. Install protection Caps on pipeline openings.
5. Remove Screw (2), Washers (3), Self-Locking Nut (4) and Leveling Valve (1).

INSTALLATION

1. Check that pneumatic pressure is released.
2. Clean the Leveling Valve end fittings.
3. Remove protection Caps from pipeline openings.
4. Install Leveling Valve (1) with Screw (2), Washers (3), Self-Locking Nut (4) (Refer to Figures 4 and 5).

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-02-00/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

4/8

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

LEVELING VALVE

Component:

Man Hours:

1.5

Maintenance Task:

REPLACEMENT

PROCEDURE:

5. Connect the Leveling Valve (1) to the pipelines by means of Adapters (5, 6, 7, 8).
6. Connect the Actuating Lever of Leveling Valve to related connection device with the Screw (1), Self-Locking Nut (4), Washers (2) and Spacers (3) (Refer to Figures 2 and 3).
7. Pressurize Air Piping by opening Air Suspension Cut Out Cock (Refer to Figure 1).
8. Apply Leak Detector and test Leveling Valve for leakage around the Air Piping connections.
9. Tighten joints where bubbles form.
10. Remove, using water, all traces of leak detector immediately after test
11. Restore Electrical Power.
12. Remove wheel chocks.
13. Record Service and Test results on the Defect Report Card for administrative and maintenance planning.

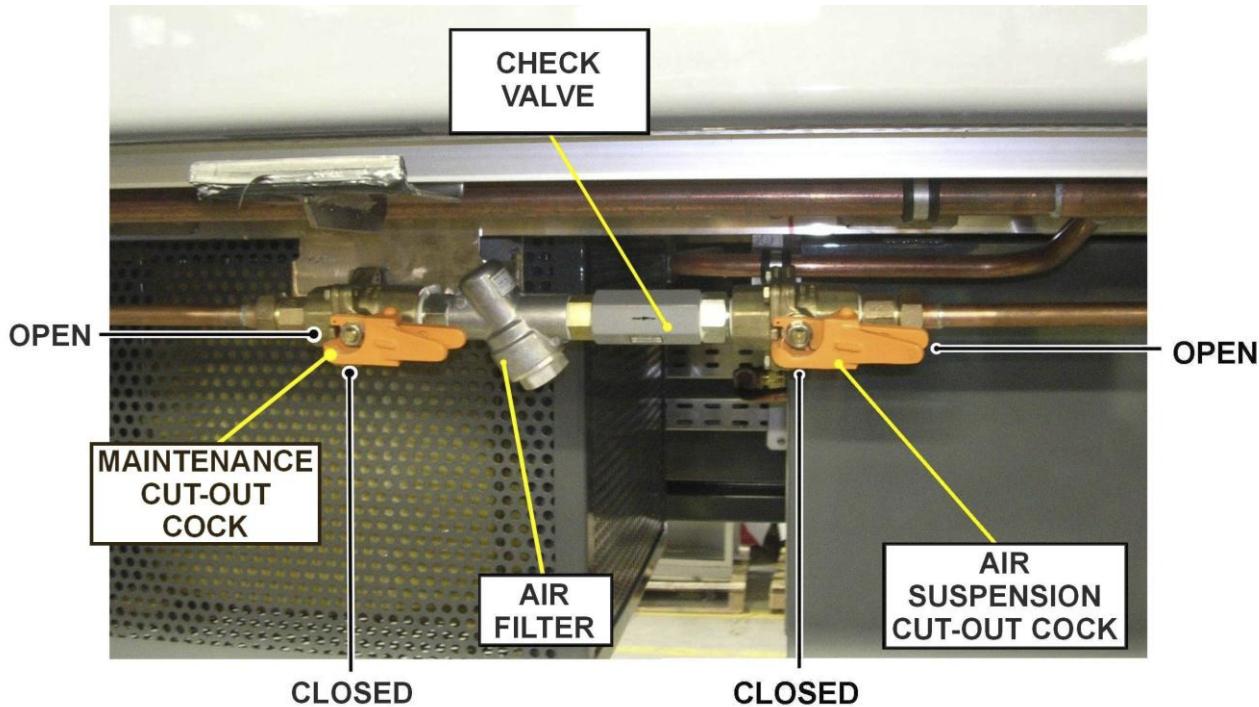


Figure 1 - SUSPENSION MAINTENANCE CUTOUT COCK

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-02-00/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

5/8

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

LEVELING VALVE

Component:

Man Hours:

1.5

Maintenance Task:

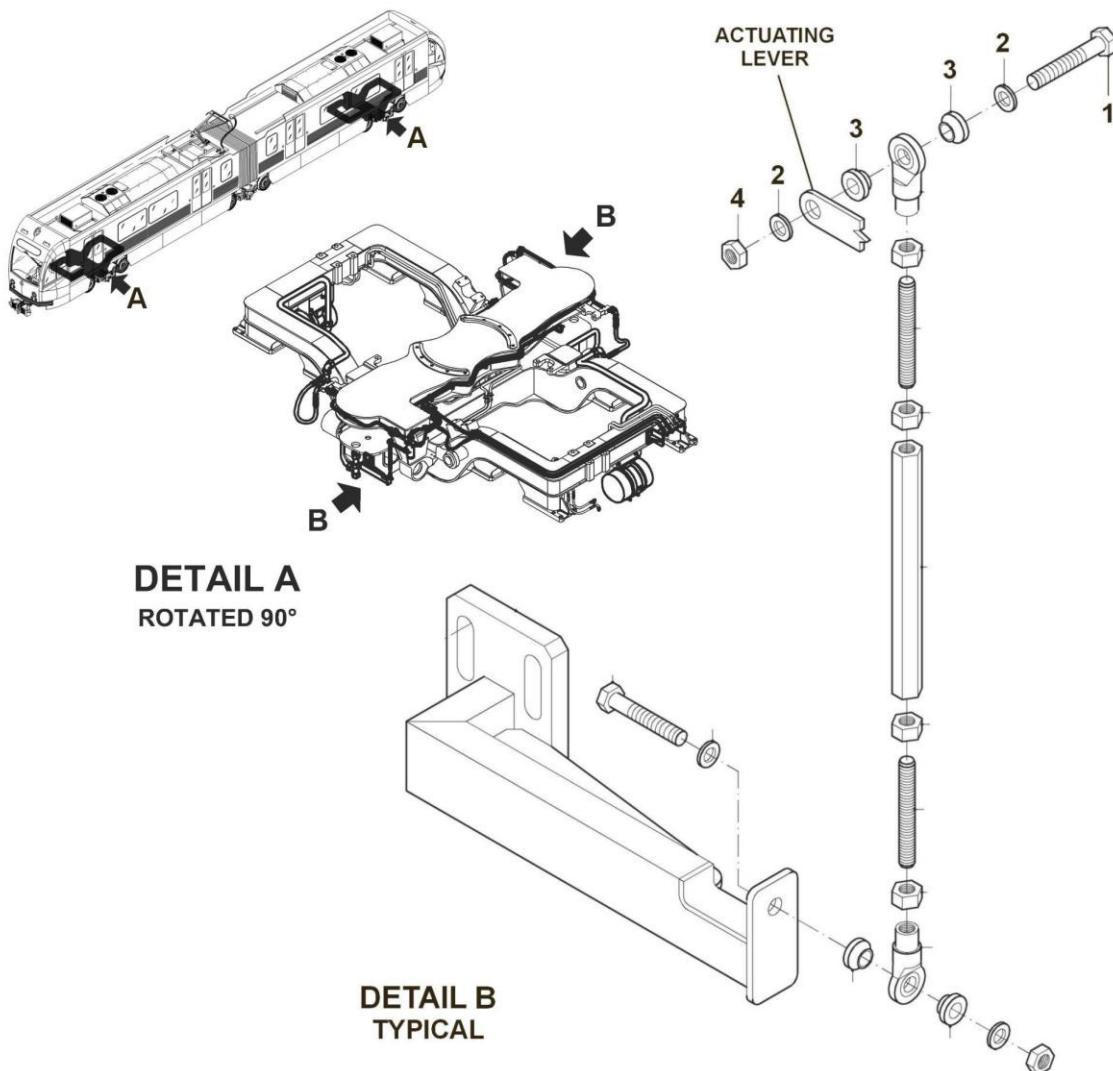
REPLACEMENT
PROCEDURE:


Figure 2 - MOTOR TRUCK, LEVELING VALVE CONNECTION

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-02-00/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

6/8

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

LEVELING VALVE

Component:

Man Hours:

1.5

Maintenance Task:

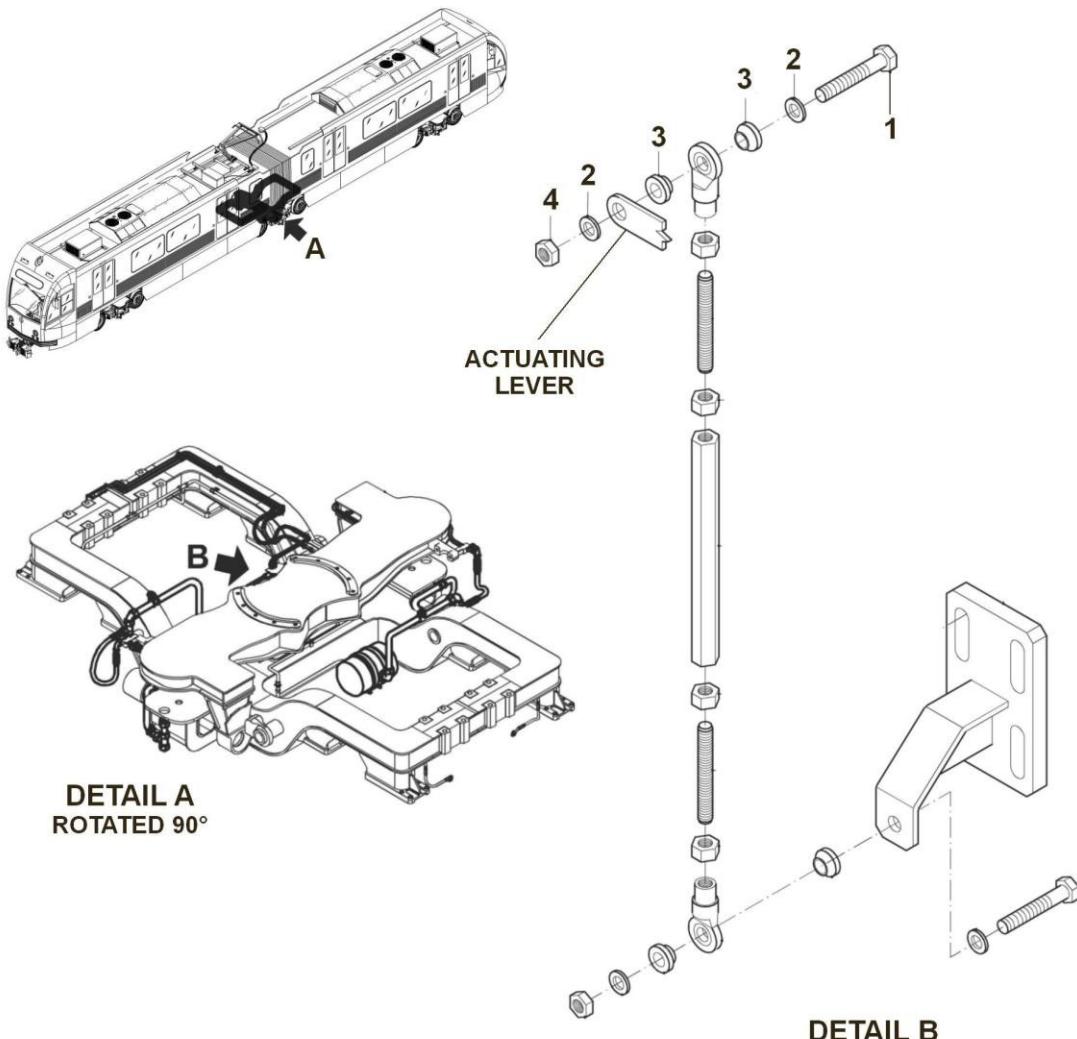
REPLACEMENT**PROCEDURE:**

Figure 3 - TRAILER TRUCK, LEVELING VALVE CONNECTION

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-02-00/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

7/8

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

LEVELING VALVE

Component:

Man Hours:

1.5

Maintenance Task:

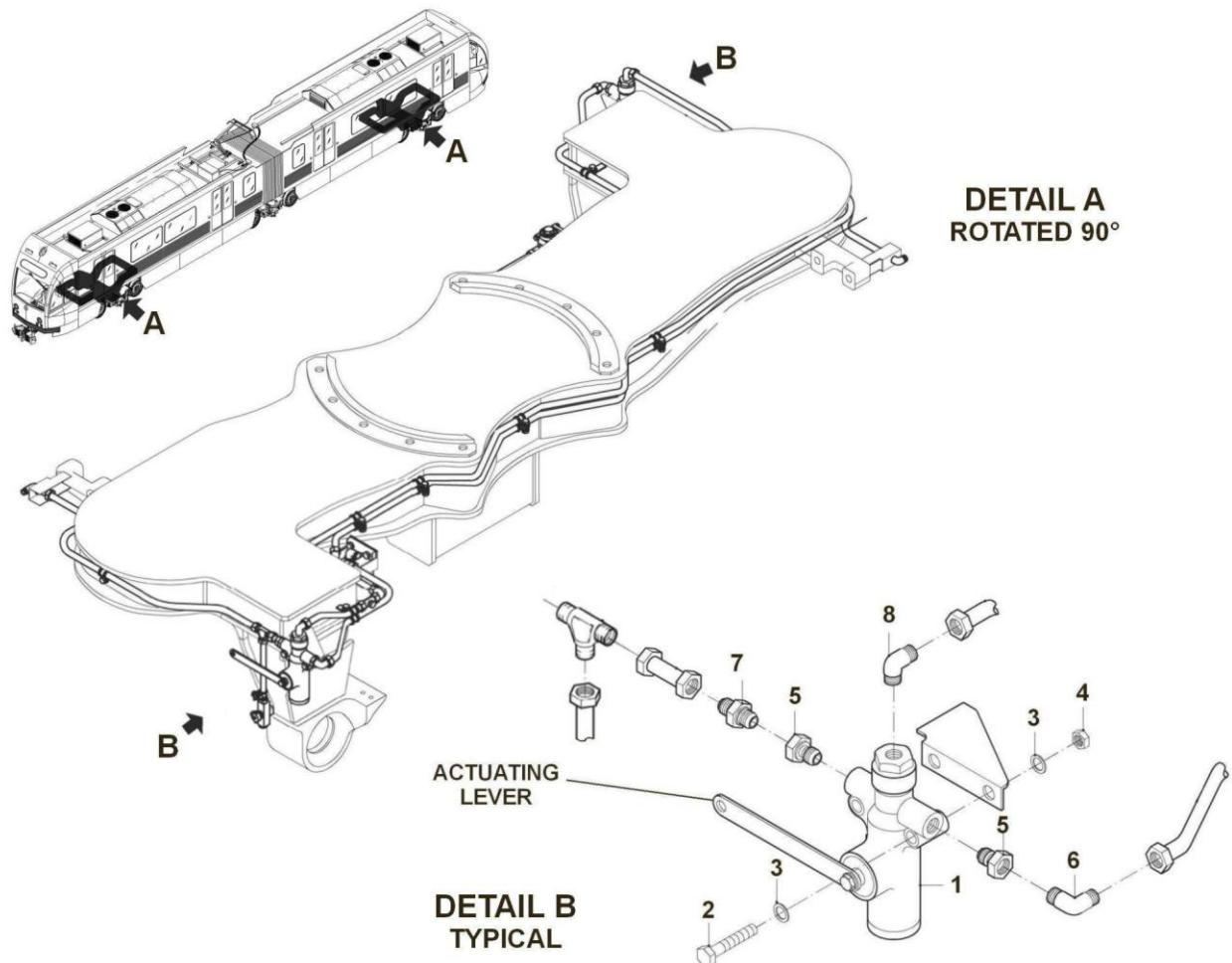
REPLACEMENT
PROCEDURE:


Figure 4 - MOTOR TRUCK, LEVELING VALVE REPLACEMENT

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-02-00/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

8/8

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

LEVELING VALVE

Component:

Man Hours:

1.5

Maintenance Task:

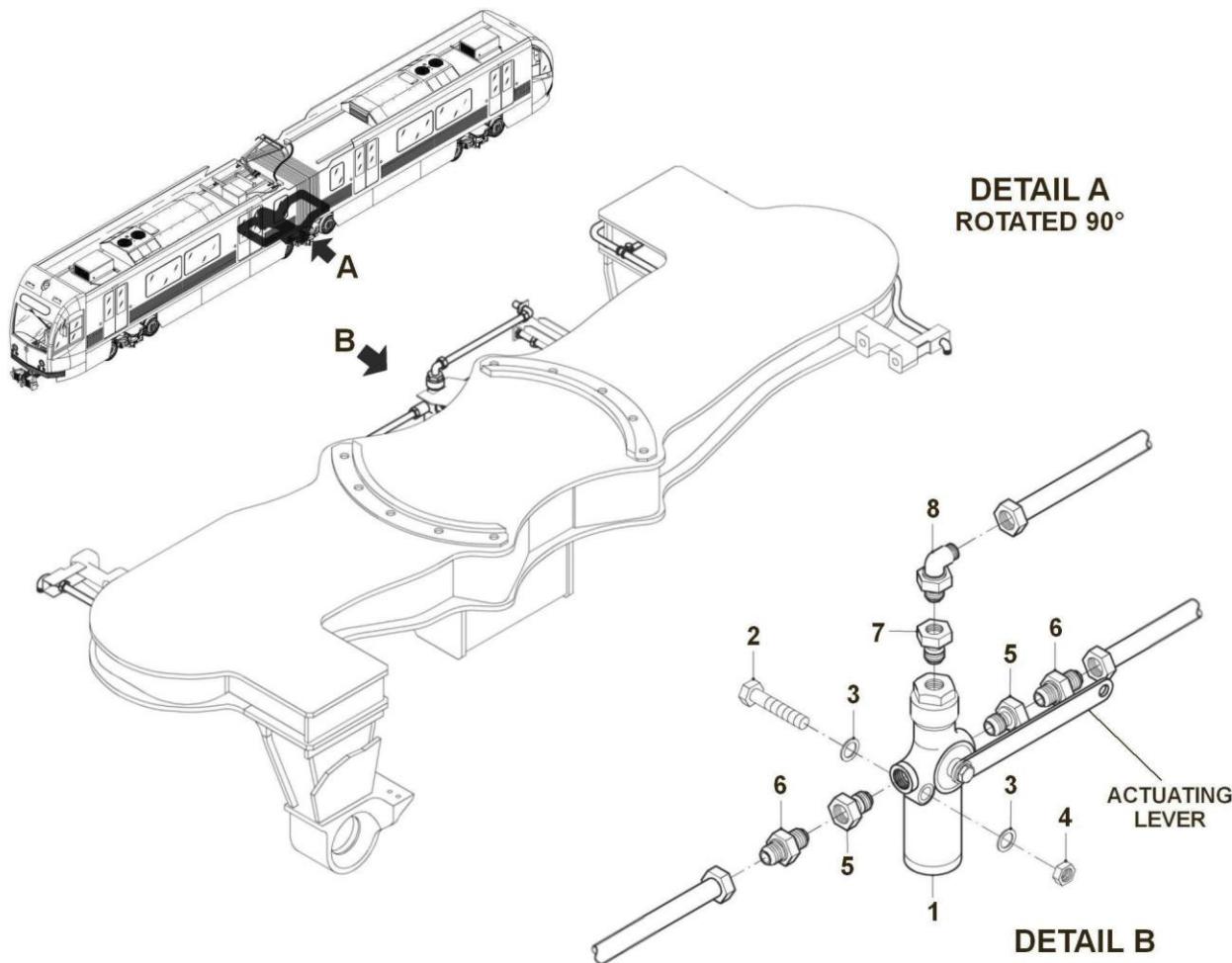
REPLACEMENT**PROCEDURE:**

Figure 5 - TRAILER TRUCK, LEVELING VALVE REPLACEMENT

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-03-00/R-00

System:

Sheet:

TRUCKS & SUSPENSIONS
1/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

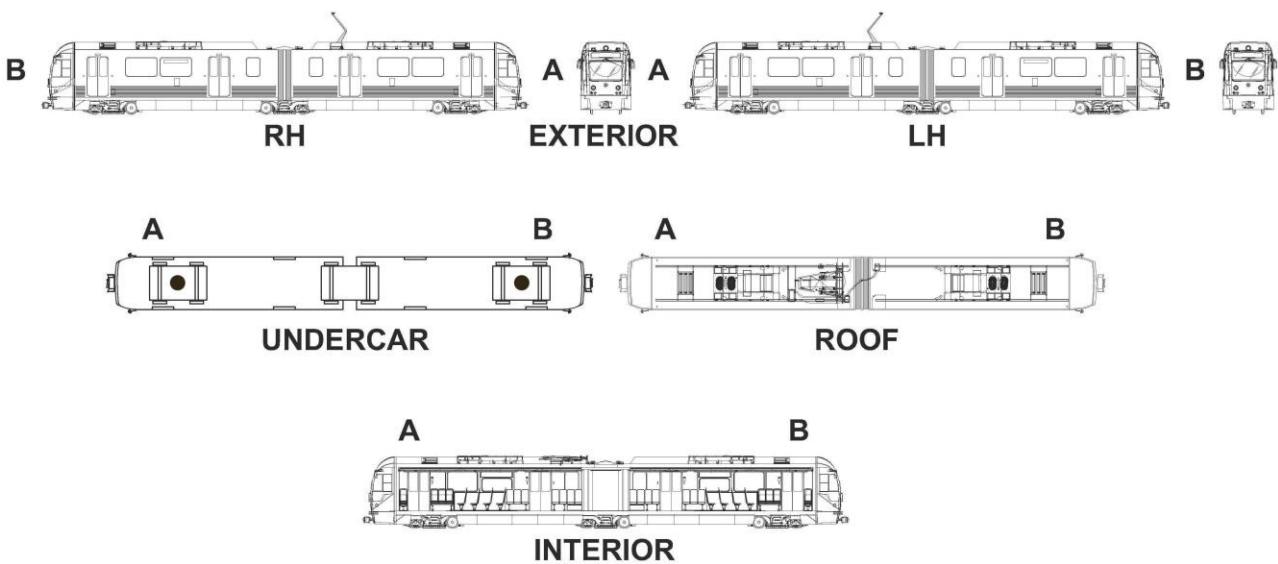
MEAN PRESSURE VALVE

Component:

Man Hours:

1.5

Maintenance Task:

REPLACEMENT
LOCATION:


P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-03-00/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

2/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

MEAN PRESSURE VALVE

Component:

Man Hours:

1.5

Maintenance Task:

REPLACEMENT**SAFETY PRECAUTIONS:**

- WARNING:** BLUE FLAG THE VEHICLE IN ACCORDANCE WITH ALL LACMTA BLUE FLAG POLICIES, RULES, & PROCEDURES IN ORDER TO WARN THAT MAINTENANCE PERSONNEL ARE WORKING ON, UNDER, OR NEAR ROLLING EQUIPMENT.
- WARNING:** APPLY WHEEL CHOCKS TO PREVENT THE VEHICLE FROM MOVING.
- WARNING:** WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.
- WARNING:** HIGH PRESSURE IS VENTED WHEN CUTOUT COCK IS CLOSED. WEAR SAFETY GOGGLES AND EAR PROTECTION AND EXERCISE CAUTION. FAILURE TO COMPLY MAY RESULT IN INJURY.
- WARNING:** FILTER CONTAINS A SPRING LOADED FILTER ELEMENT. EXERCISE CAUTION WHEN DISASSEMBLING PLUG CAP. FAILURE TO COMPLY CAN LEAD TO INJURY.
- WARNING:** SOLVENTS AND SOLVENT FUMES CAN BE HARMFUL TO HEALTH. WHEN USING SOLVENTS, WEAR EYE, SKIN, AND RESPIRATORY PROTECTION AS REQUIRED. WORK IN WELL VENTILATED AREA. AVOID REPEATED OR PROLONGED CONTACT. KEEP SOLVENT CONTAINER CLOSED. KEEP SOLVENT AWAY FROM SPARKS, FLAMES, AND HEAT. FAILURE TO OBSERVE THESE SAFETY PRECAUTIONS CAN LEAD TO INJURY OR INTOXICATION.
- WARNING:** CLEANING USING COMPRESSED AIR CAN CAUSE DIRT PARTICLES TO BECOME AIRBORNE. WEAR EYE PROTECTION WHEN CLEANING WITH COMPRESSED AIR TO AVOID INJURY. DO NOT EXCEED 30 PSI. FAILURE TO COMPLY CAN LEAD TO INJURY.

TOOLS:

LACMTA Maintenance Shop Standard Tools Kit.

CONSUMABLES:

Mineral Spirit
 Aeroshell # 6 grease (PN 2275094)
 Leak Detector (commercial)

SPARE PARTS:

Mean Pressure Valve (P/N AA03E5W)

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-03-00/R-00

System:

Sheet:

TRUCKS & SUSPENSIONS
3/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

MEAN PRESSURE VALVE

Component:

Man Hours:

1.5

Maintenance Task:

REPLACEMENT

PROCEDURE:

PRELIMINARY OPERATIONS

Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop Regulations:

1. Place the Vehicle over the Pit (or Stand Up Rail) provided with Wheel Truing Machine.
2. Set the Master Controller Handle to FSB position.
3. Make sure that all Parking Brakes are applied (by checking on the IDU "Parking Brake A and B Not Released" and on Indicator Panel "A" "Park / Friction Brake" ON).
4. Remove Electrical Power from Vehicle by lowering the Pantograph.
5. Turn the Transfer Switch to OFF.
6. Set the Pantograph Control Motor Switch (5F02 CB LV Locker "A" Section) to OFF.
7. Lock out and tag out the Switch in accordance with all LACMTA Safety Rules, Regulations, Policies, and Procedures.

NOTE The tag must indicate the name of the person who removed Power.

That person knows why the Power was removed and when it safe to restore it.

Only the individual whose name appears on the tag or a person with his approval should remove the tag and restore Power.

8. Apply wheel chocks to prevent the Vehicle from moving.
9. Vent pneumatic pressure from Air Piping by closing the Air Suspension Cut Out Cock (Refer to Figure 1).

WARNING HIGH PRESSURE IS VENTED WHEN CUTOUT COCK IS CLOSED. WEAR SAFETY GOGGLES AND EAR PROTECTION AND EXERCISE CAUTION. FAILURE TO COMPLY MAY RESULT IN INJURY.

REMOVAL (Refer to Figure 2)

1. Locate the Mean Pressure Valve to be removed.
2. Unscrew pipeline Adapters (5) to disconnect the Mean Pressure Valve (1) from pipeline.
3. Install protection Caps on pipeline openings.
4. Remove Screw (2), Washers (3), Self-Locking Nut (4) and Mean Pressure Valve (1).

INSTALLATION (Refer to Figure 2)

1. Check that pneumatic pressure is released.
2. Clean the Mean Pressure Valve end fittings.
3. Remove protection Caps from pipeline openings.
4. Install the Mean Pressure Valve (1) with Screw (2), Washers (3), Self-Locking Nut (4).

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-03-00/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

4/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

MEAN PRESSURE VALVE

Component:

Man Hours:

1.5

Maintenance Task:

REPLACEMENT

PROCEDURE:

5. Connect the Mean Pressure Valve (1) to the pipeline by means of Adapters (5).
6. Pressurize Air Piping by opening Air Suspension Cut Out Cock (Refer to Figure 1).
7. Apply Leak Detector and test the Mean Pressure Valve for leakage around the Air Piping connections.
8. Tighten joints where bubbles form.
9. Remove, using water, all traces of leak detector immediately after test.
10. Restore Electrical Power.
11. Remove wheel chocks.
12. Record Service and Test results on the Defect Report Card for administrative and maintenance planning.

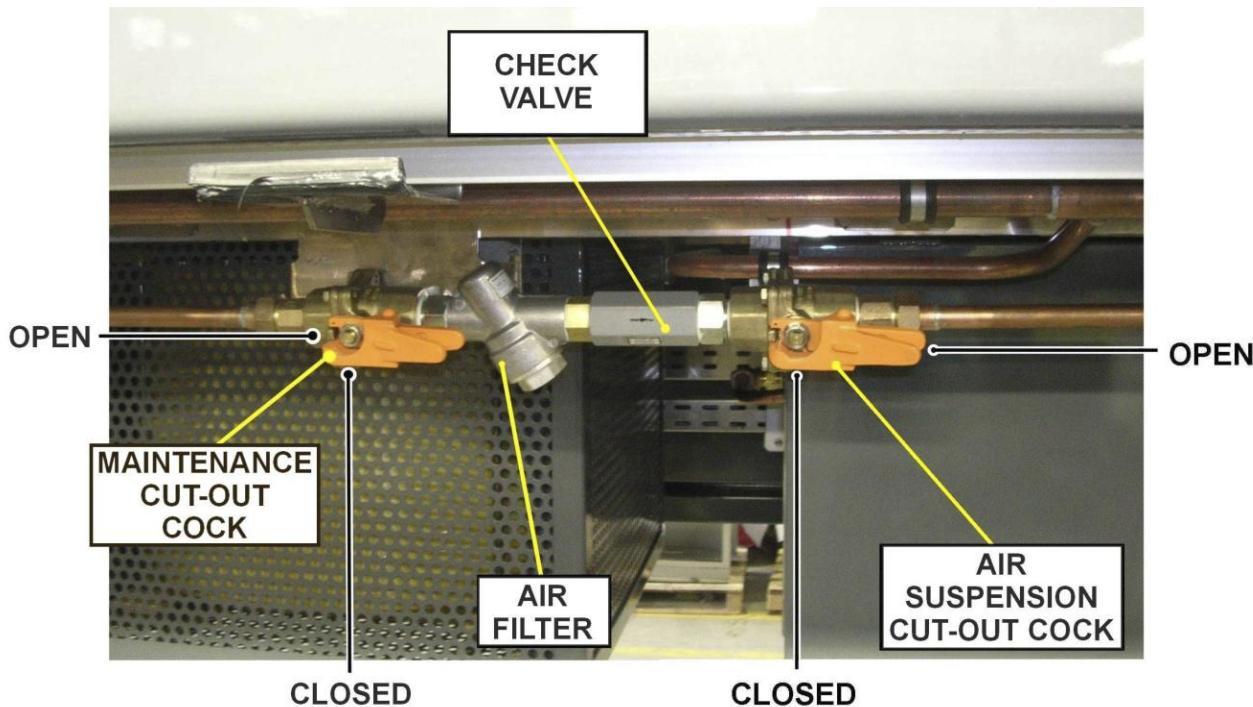


Figure 1 - SUSPENSION MAINTENANCE CUTOUT COCK

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-03-00/R-00

System:

Sheet:

TRUCKS & SUSPENSIONS**5/6**

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

MEAN PRESSURE VALVE

Component:

Man Hours:

1.5

Maintenance Task:

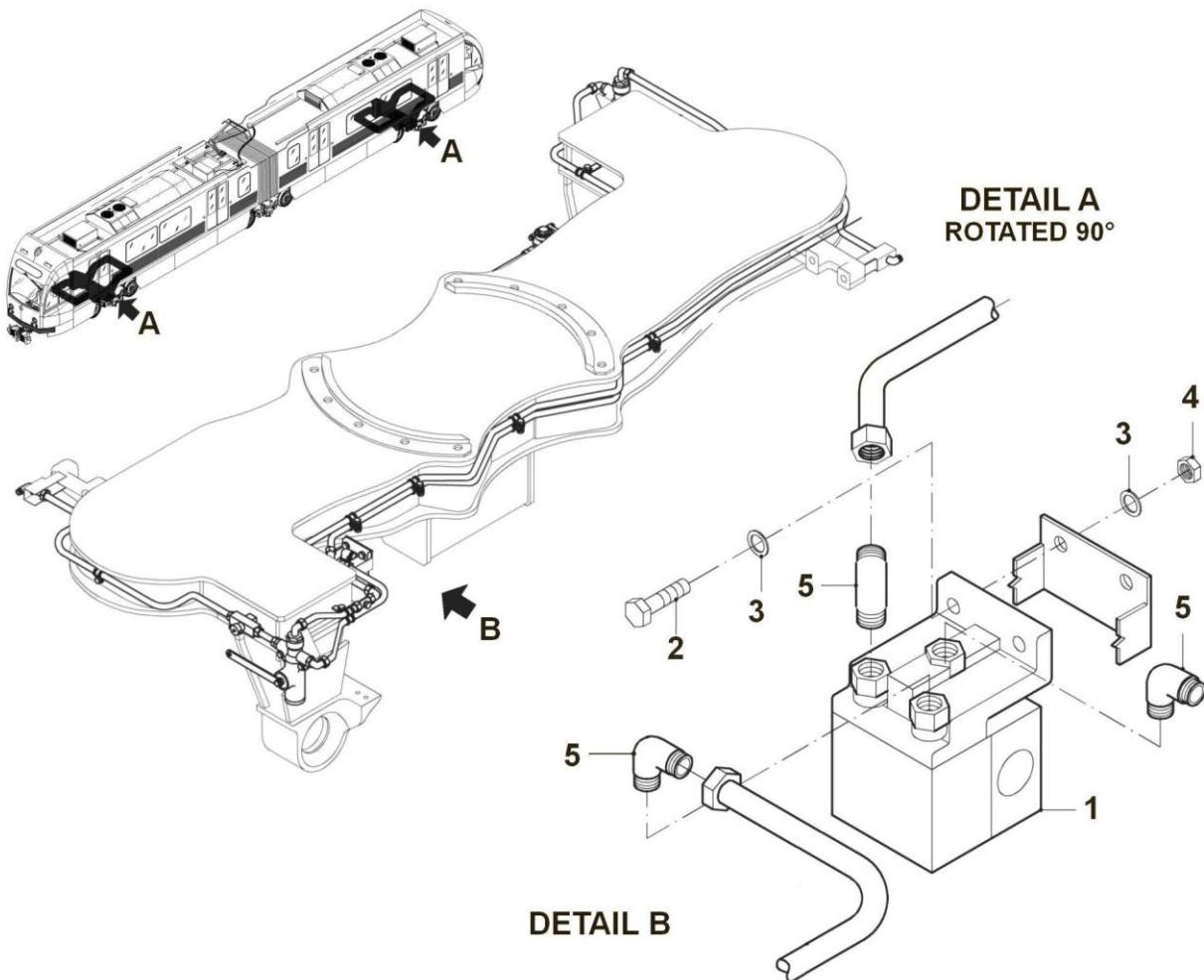
**REPLACEMENT
PROCEDURE:**

Figure 2 - MEAN PRESSURE VALVE REPLACEMENT

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-03-00/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

6/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

MEAN PRESSURE VALVE

Component:

Man Hours:

1.5

Maintenance Task:

REPLACEMENT**INTENTIONALLY LEFT
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P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-04-00/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

1/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

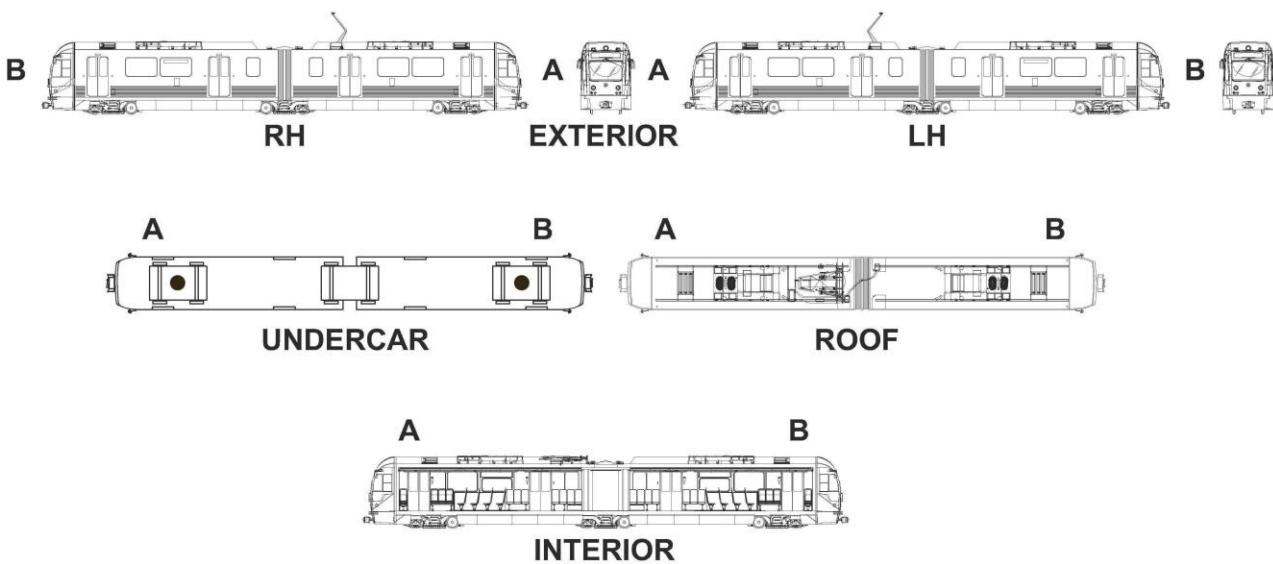
DUPLEX CHECK VALVE

Component:

Man Hours:

1.5

Maintenance Task:

REPLACEMENT
LOCATION:


P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-04-00/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

2/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

DUPLEX CHECK VALVE

Component:

Man Hours:

1.5

Maintenance Task:

REPLACEMENT**SAFETY PRECAUTIONS:**

- WARNING:** BLUE FLAG THE VEHICLE IN ACCORDANCE WITH ALL LACMTA BLUE FLAG POLICIES, RULES, & PROCEDURES IN ORDER TO WARN THAT MAINTENANCE PERSONNEL ARE WORKING ON, UNDER, OR NEAR ROLLING EQUIPMENT.
- WARNING:** APPLY WHEEL CHOCKS TO PREVENT THE VEHICLE FROM MOVING.
- WARNING:** WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.
- WARNING:** HIGH PRESSURE IS VENTED WHEN CUTOUT COCK IS CLOSED. WEAR SAFETY GOGGLES AND EAR PROTECTION AND EXERCISE CAUTION. FAILURE TO COMPLY MAY RESULT IN INJURY.
- WARNING:** FILTER CONTAINS A SPRING LOADED FILTER ELEMENT. EXERCISE CAUTION WHEN DISASSEMBLING PLUG CAP. FAILURE TO COMPLY CAN LEAD TO INJURY.
- WARNING:** SOLVENTS AND SOLVENT FUMES CAN BE HARMFUL TO HEALTH. WHEN USING SOLVENTS, WEAR EYE, SKIN, AND RESPIRATORY PROTECTION AS REQUIRED. WORK IN WELL VENTILATED AREA. AVOID REPEATED OR PROLONGED CONTACT. KEEP SOLVENT CONTAINER CLOSED. KEEP SOLVENT AWAY FROM SPARKS, FLAMES, AND HEAT. FAILURE TO OBSERVE THESE SAFETY PRECAUTIONS CAN LEAD TO INJURY OR INTOXICATION.
- WARNING:** CLEANING USING COMPRESSED AIR CAN CAUSE DIRT PARTICLES TO BECOME AIRBORNE. WEAR EYE PROTECTION WHEN CLEANING WITH COMPRESSED AIR TO AVOID INJURY. DO NOT EXCEED 30 PSI. FAILURE TO COMPLY CAN LEAD TO INJURY.

TOOLS:

LACMTA Maintenance Shop Standard Tools Kit.

CONSUMABLES:

Mineral Spirit	
Aeroshell # 6 grease	(PN 2275094)
Leak Detector	(commercial)

SPARE PARTS:

Duplex Check Valve (P/N AA06E5Z)

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-04-00/R-00

System:

Sheet:

TRUCKS & SUSPENSIONS

3/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

DUPLEX CHECK VALVE

Component:

Man Hours:

1.5

Maintenance Task:

REPLACEMENT

PROCEDURE:

PRELIMINARY OPERATIONS

Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop Regulations:

1. Place the Vehicle over the Pit (or Stand Up Rail) provided with Wheel Truing Machine.
2. Set the Master Controller Handle to FSB position.
3. Make sure that all Parking Brakes are applied (by checking on the IDU "Parking Brake A and B Not Released" and on Indicator Panel "A" "Park / Friction Brake" ON).
4. Remove Electrical Power from Vehicle by lowering the Pantograph.
5. Turn the Transfer Switch to OFF.
6. Set the Pantograph Control Motor Switch (5F02 CB LV Locker "A" Section) to OFF.
7. Lock out and tag out the Switch in accordance with all LACMTA Safety Rules, Regulations, Policies, and Procedures.

NOTE The tag must indicate the name of the person who removed Power.

That person knows why the Power was removed and when it safe to restore it.

Only the individual whose name appears on the tag or a person with his approval should remove the tag and restore Power.

8. Apply wheel chocks to prevent the Vehicle from moving.

9. Vent pneumatic pressure from Air Piping by closing the Air Suspension Cut Out Cock (Refer to Figure 1).

WARNING: HIGH PRESSURE IS VENTED WHEN CUTOUT COCK IS CLOSED. WEAR SAFETY GOGGLES AND EAR PROTECTION AND EXERCISE CAUTION. FAILURE TO COMPLY MAY RESULT IN INJURY.

REMOVAL (Refer to Figure 2)

1. Locate the Duplex check valve to be removed.
2. Unscrew pipeline Adapters (5) to disconnect the Duplex check valve (1) from pipeline.
3. Install protection Caps on pipeline openings.
4. Remove Screw (2), Washers (3), Self-Locking Nut (4) and Duplex check valve (1).

INSTALLATION (Refer to Figure 2)

1. Check that pneumatic pressure is released.
2. Clean the Duplex check valve end fittings.
3. Remove protection Caps from pipeline openings.
4. Install the Duplex check valve (1) with Screw (2), Washers (3), Self-Locking Nut (4).

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-04-00/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

4/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

DUPLEX CHECK VALVE

Component:

Man Hours:

1.5

Maintenance Task:

REPLACEMENT

PROCEDURE:

5. Connect the Duplex Check Valve (1) to the pipeline by means of Adapters (5).
6. Pressurize Air Piping by opening Air Suspension Cut Out Cock (Refer to Figure 1).
7. Apply Leak Detector and test the Duplex check valve for leakage around the Air Piping connections.
8. Tighten joints where bubbles form.
9. Remove, using water, all traces of leak detector immediately after test.
10. Restore Electrical Power.
11. Remove wheel chocks.
12. Record Service and Test results on the Defect Report Card for administrative and maintenance planning.

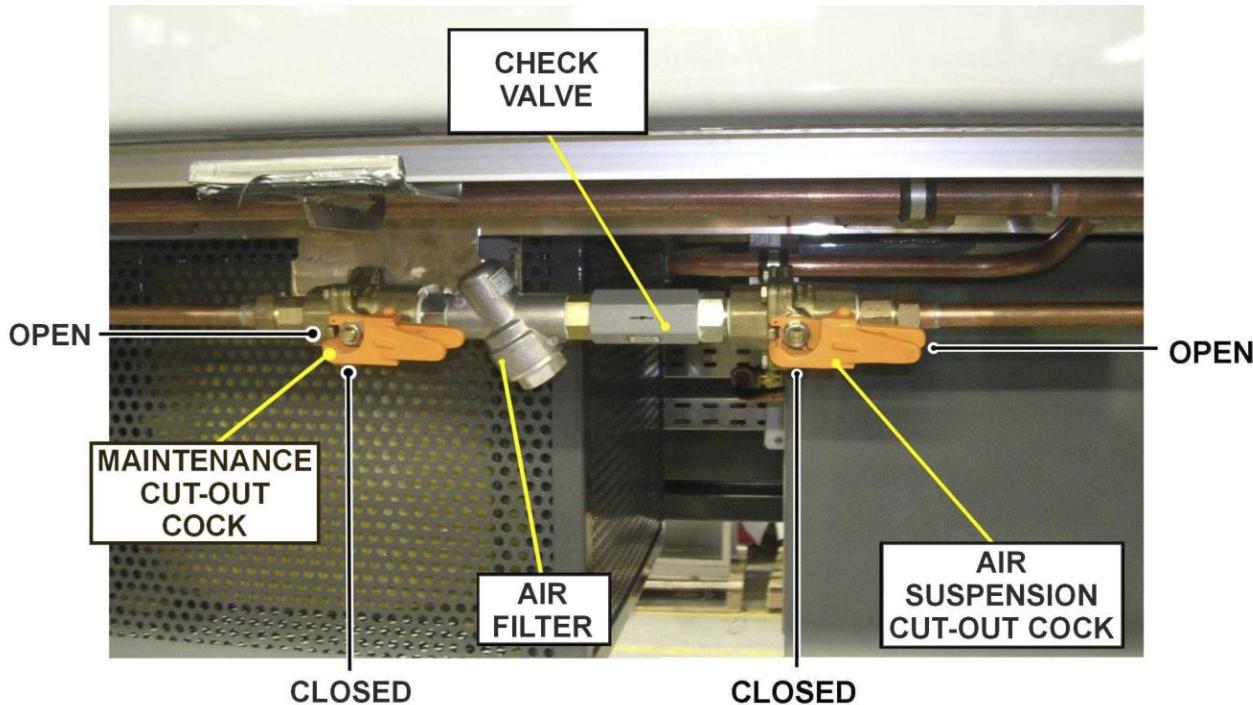


Figure 1 - SUSPENSION MAINTENANCE CUTOUT COCK

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-04-00/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

5/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

DUPLEX CHECK VALVE

Component:

Man Hours:

1.5

Maintenance Task:

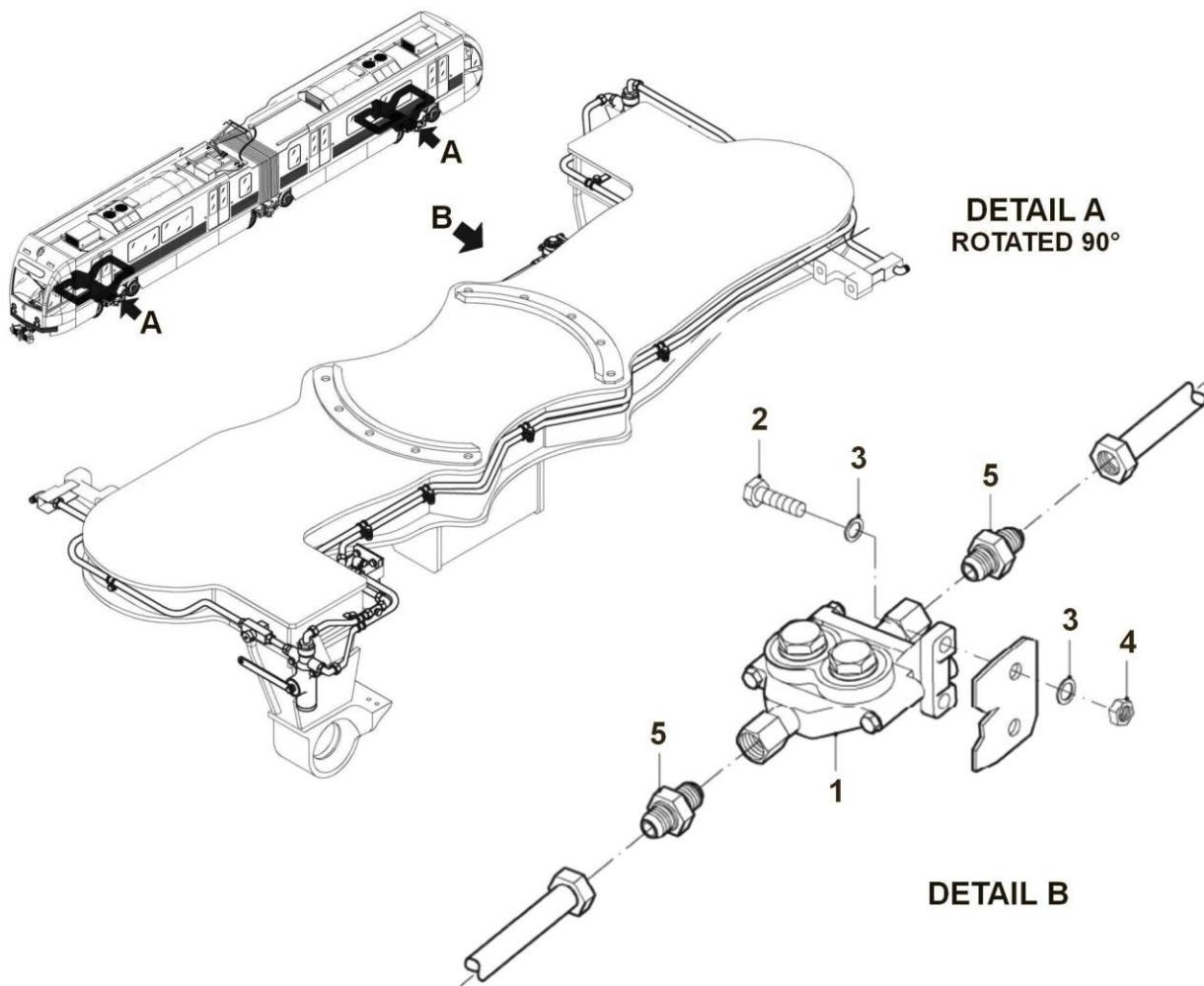
**REPLACEMENT
PROCEDURE:**

Figure 2 - DUPLEX CHECK VALVE REPLACEMENT

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-04-00/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

6/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

DUPLEX CHECK VALVE

Component:

Man Hours:

1.5

Maintenance Task:

REPLACEMENT**INTENTIONALLY LEFT
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P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-05-00/R-00

System:

Sheet:

TRUCKS & SUSPENSIONS
1/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

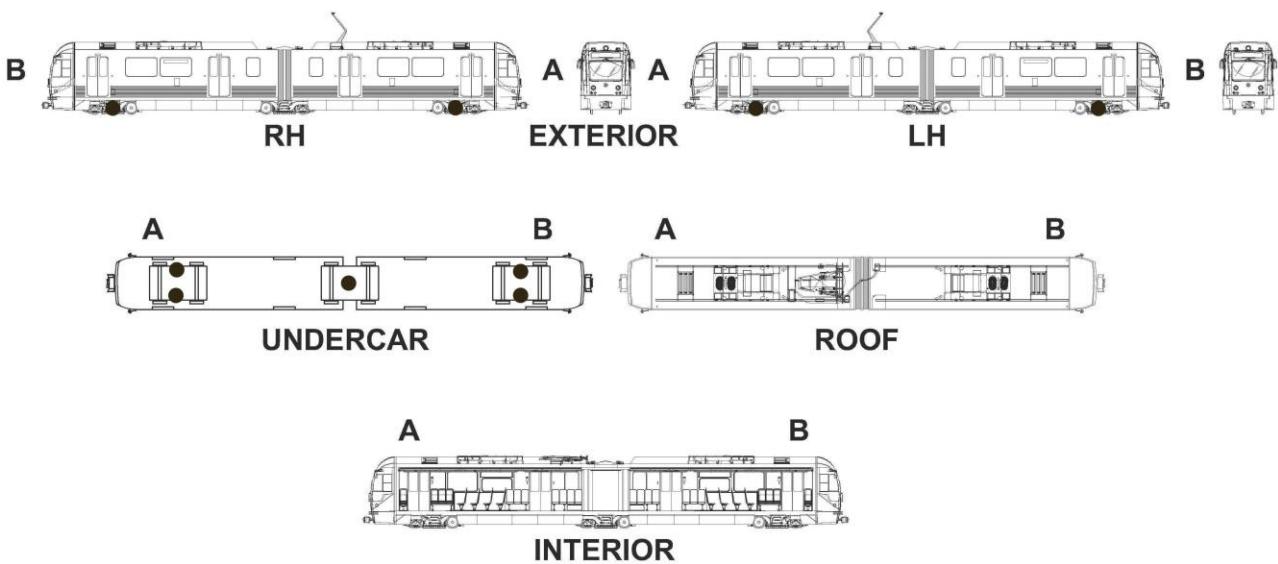
TEST FITTING

Component:

Man Hours:

1.2

Maintenance Task:

REPLACEMENT
LOCATION:


P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-05-00/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

2/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

TEST FITTING

Component:

Man Hours:

1.2

Maintenance Task:

REPLACEMENT**SAFETY PRECAUTIONS:**

- WARNING:** BLUE FLAG THE VEHICLE IN ACCORDANCE WITH ALL LACMTA BLUE FLAG POLICIES, RULES, & PROCEDURES IN ORDER TO WARN THAT MAINTENANCE PERSONNEL ARE WORKING ON, UNDER, OR NEAR ROLLING EQUIPMENT.
- WARNING:** APPLY WHEEL CHOCKS TO PREVENT THE VEHICLE FROM MOVING.
- WARNING:** WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.
- WARNING:** HIGH PRESSURE IS VENTED WHEN CUTOUT COCK IS CLOSED. WEAR SAFETY GOGGLES AND EAR PROTECTION AND EXERCISE CAUTION. FAILURE TO COMPLY MAY RESULT IN INJURY.
- WARNING:** FILTER CONTAINS A SPRING LOADED FILTER ELEMENT. EXERCISE CAUTION WHEN DISASSEMBLING PLUG CAP. FAILURE TO COMPLY CAN LEAD TO INJURY.
- WARNING:** SOLVENTS AND SOLVENT FUMES CAN BE HARMFUL TO HEALTH. WHEN USING SOLVENTS, WEAR EYE, SKIN, AND RESPIRATORY PROTECTION AS REQUIRED. WORK IN WELL VENTILATED AREA. AVOID REPEATED OR PROLONGED CONTACT. KEEP SOLVENT CONTAINER CLOSED. KEEP SOLVENT AWAY FROM SPARKS, FLAMES, AND HEAT. FAILURE TO OBSERVE THESE SAFETY PRECAUTIONS CAN LEAD TO INJURY OR INTOXICATION.
- WARNING:** CLEANING USING COMPRESSED AIR CAN CAUSE DIRT PARTICLES TO BECOME AIRBORNE. WEAR EYE PROTECTION WHEN CLEANING WITH COMPRESSED AIR TO AVOID INJURY. DO NOT EXCEED 30 PSI. FAILURE TO COMPLY CAN LEAD TO INJURY.

TOOLS:

LACMTA Maintenance Shop Standard Tools Kit.

CONSUMABLES:

Mineral Spirit	
Aeroshell # 6 grease	(PN 2275094)
Leak Detector	(commercial)

SPARE PARTS:

Test Fitting (P/N AA03DTU)

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-05-00/R-00

System:

Sheet:

TRUCKS & SUSPENSIONS

3/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

TEST FITTING

Component:

Man Hours:

1.2

Maintenance Task:

REPLACEMENT

PROCEDURE:

PRELIMINARY OPERATIONS

Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop Regulations:

1. Place the Vehicle over the Pit (or Stand Up Rail) provided with Wheel Truing Machine.
2. Set the Master Controller Handle to FSB position.
3. Make sure that all Parking Brakes are applied (by checking on the IDU "Parking Brake A and B Not Released" and on Indicator Panel "A" "Park / Friction Brake" ON).
4. Remove Electrical Power from Vehicle by lowering the Pantograph.
5. Turn the Transfer Switch to OFF.
6. Set the Pantograph Control Motor Switch (5F02 CB LV Locker "A" Section) to OFF
7. Lock out and tag out the Switch in accordance with all LACMTA Safety Rules, Regulations, Policies, and Procedures.

NOTE The tag must indicate the name of the person who removed Power.

That person knows why the Power was removed and when it safe to restore it.

Only the individual whose name appears on the tag or a person with his approval should remove the tag and restore Power.

8. Apply wheel chocks to prevent vehicle moving.

9. Vent pneumatic pressure from Air Piping by closing the Air Suspension Cut Out Cock (Refer to Figure 1).

WARNING: HIGH PRESSURE IS VENTED WHEN CUTOUT COCK IS CLOSED. WEAR SAFETY GOGGLES AND EAR PROTECTION AND EXERCISE CAUTION. FAILURE TO COMPLY MAY RESULT IN INJURY.

REMOVAL

1. Locate the Test fitting to be removed.
2. Unscrew pipeline Adapter (1) to disconnect the Test fitting (2) from pipeline, then remove Plug (3) (Refer to Figures 2 and 3).
3. Install protection Caps on pipeline openings.

INSTALLATION

1. Check that pneumatic pressure is released.
2. Clean the Test fitting end fittings.
3. Remove protection Caps from pipeline openings.

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-05-00/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

4/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

TEST FITTING

Component:

Man Hours:

1.2

Maintenance Task:

REPLACEMENT**PROCEDURE:**

4. Connect the Test fitting (2) with Plug (3) to the pipeline by means of Adapter (1) (Refer to Figures 2 and 3).
5. Pressurize Air Piping by opening Air Suspension Cut Out Cock (Refer to Figure 1).
6. Apply Leak Detector and test the Test fitting for leakage around the Air Piping connections.
7. Tighten joints where bubbles form.
8. Remove, using water, all traces of leak detector immediately after test.
9. Restore Electrical Power.
10. Remove wheel chocks.
11. Record Service and Test results on the Defect Report Card for administrative and maintenance planning.

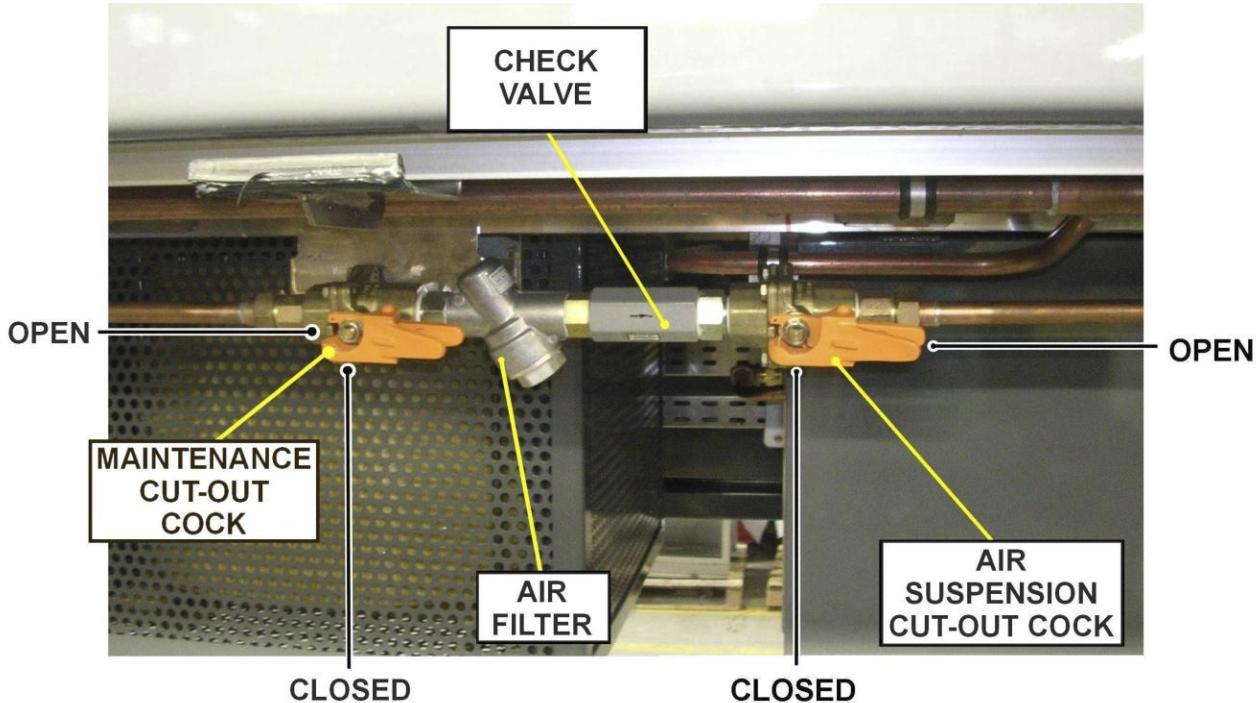


Figure 1 - SUSPENSION MAINTENANCE CUTOUT COCK

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-05-00/R-00

System:

Sheet:

TRUCKS & SUSPENSIONS
5/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

TEST FITTING

Component:

Man Hours:

1.2

Maintenance Task:

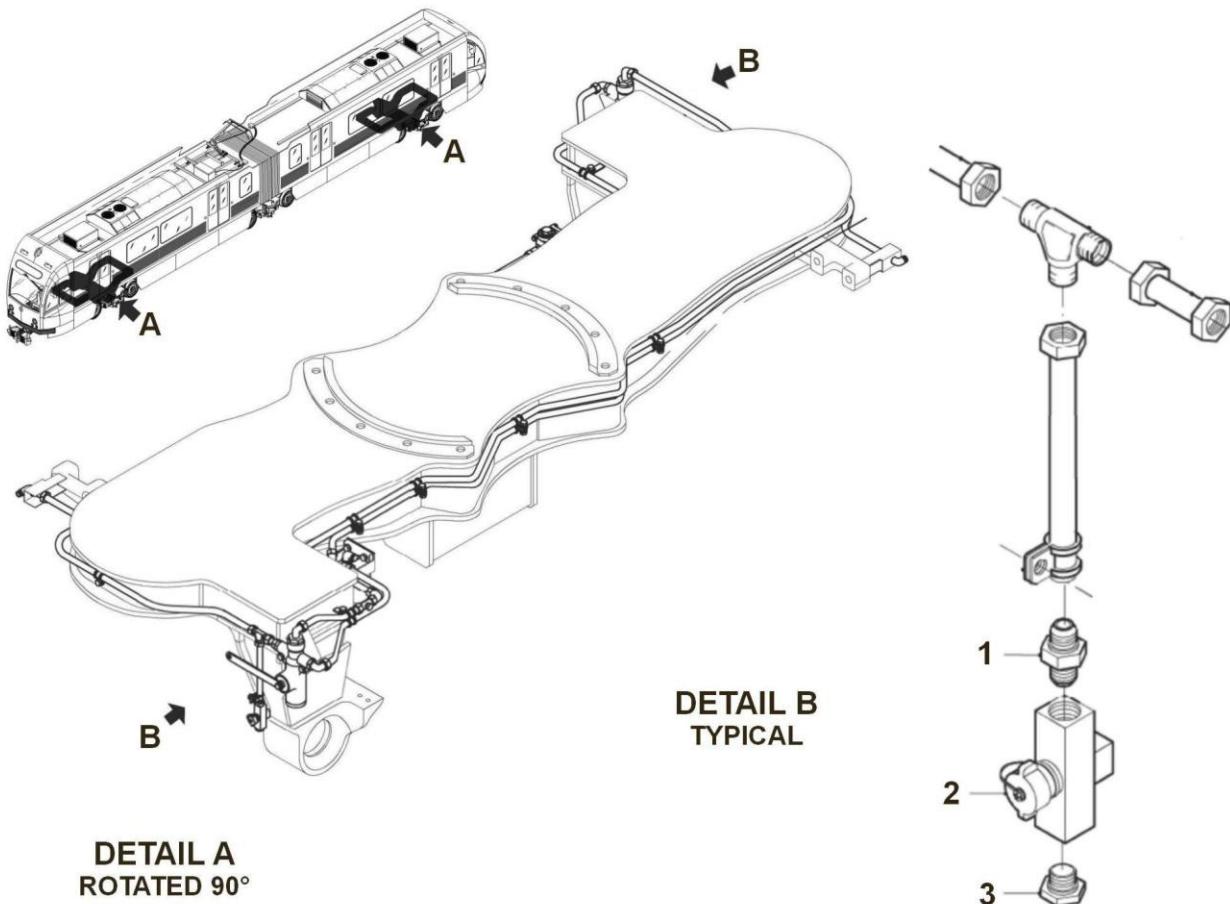
**REPLACEMENT
PROCEDURE:**


Figure 2 - MOTOR TRUCK, TEST FITTING REPLACEMENT

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-05-00/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

6/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

TEST FITTING

Component:

Man Hours:

1.2

Maintenance Task:

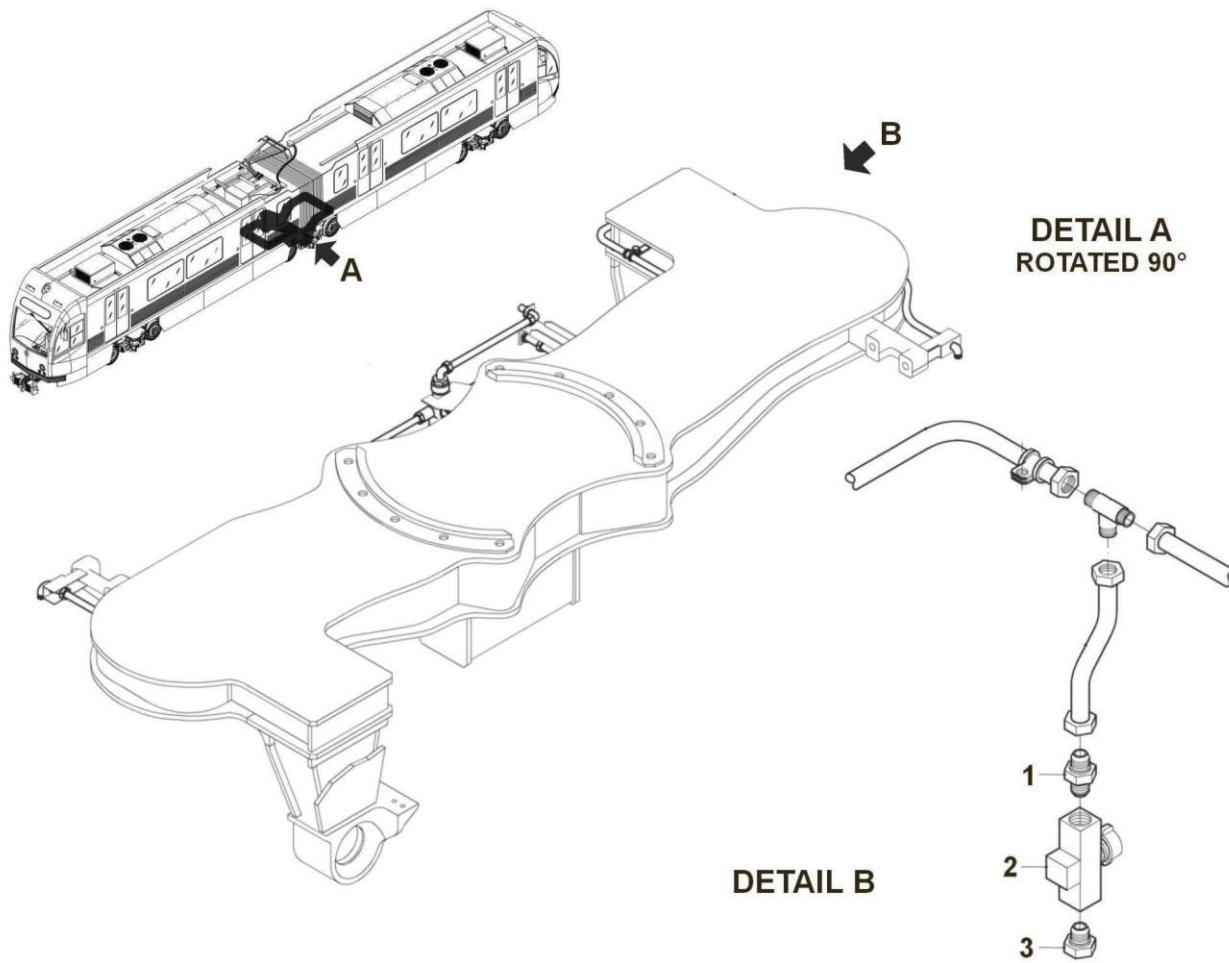
REPLACEMENT**PROCEDURE:**

Figure 3 - TRAILER TRUCK, TEST FITTING REPLACEMENT

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-06-00/R-00

System:

Sheet:

TRUCKS & SUSPENSIONS
1/6

Subsystem/Assy:

Unit:

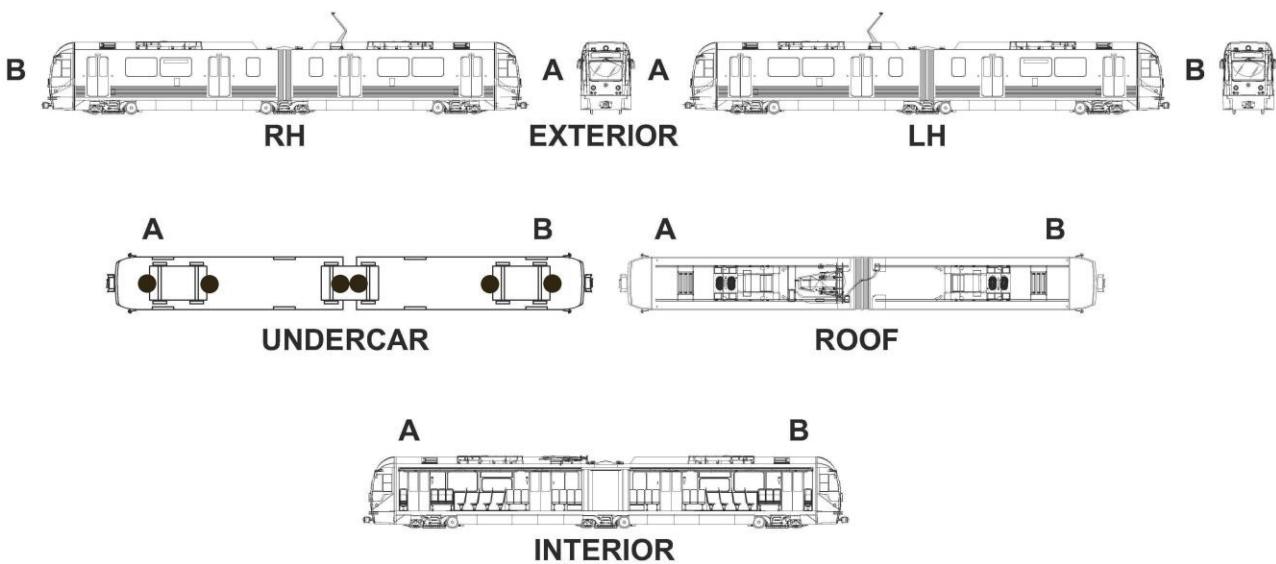
AIR SUSPENSION SYSTEM
AIR RESERVOIR (1.5 LT)

Component:

Man Hours:

1.5

Maintenance Task:

REPLACEMENT
LOCATION:


P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-06-00/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

2/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

AIR RESERVOIR (1.5 LT)

Component:

Man Hours:

1.5

Maintenance Task:

REPLACEMENT**SAFETY PRECAUTIONS:**

- WARNING:** BLUE FLAG THE VEHICLE IN ACCORDANCE WITH ALL LACMTA BLUE FLAG POLICIES, RULES, & PROCEDURES IN ORDER TO WARN THAT MAINTENANCE PERSONNEL ARE WORKING ON, UNDER, OR NEAR ROLLING EQUIPMENT.
- WARNING:** APPLY WHEEL CHOCKS TO PREVENT THE VEHICLE FROM MOVING.
- WARNING:** WORKING AREAS MUST BE WELL VENTILATED, LIGHTED, AND CLEAR OF DEBRIS FOR OBVIOUS SAFETY REASONS.
- WARNING:** HIGH PRESSURE IS VENTED WHEN CUTOUT COCK IS CLOSED. WEAR SAFETY GOGGLES AND EAR PROTECTION AND EXERCISE CAUTION. FAILURE TO COMPLY MAY RESULT IN INJURY.
- WARNING:** FILTER CONTAINS A SPRING LOADED FILTER ELEMENT. EXERCISE CAUTION WHEN DISASSEMBLING PLUG CAP. FAILURE TO COMPLY CAN LEAD TO INJURY.
- WARNING:** SOLVENTS AND SOLVENT FUMES CAN BE HARMFUL TO HEALTH. WHEN USING SOLVENTS, WEAR EYE, SKIN, AND RESPIRATORY PROTECTION AS REQUIRED. WORK IN WELL VENTILATED AREA. AVOID REPEATED OR PROLONGED CONTACT. KEEP SOLVENT CONTAINER CLOSED. KEEP SOLVENT AWAY FROM SPARKS, FLAMES, AND HEAT. FAILURE TO OBSERVE THESE SAFETY PRECAUTIONS CAN LEAD TO INJURY OR INTOXICATION.
- WARNING:** CLEANING USING COMPRESSED AIR CAN CAUSE DIRT PARTICLES TO BECOME AIRBORNE. WEAR EYE PROTECTION WHEN CLEANING WITH COMPRESSED AIR TO AVOID INJURY. DO NOT EXCEED 30 PSI. FAILURE TO COMPLY CAN LEAD TO INJURY.

TOOLS:

LACMTA Maintenance Shop Standard Tools Kit.

CONSUMABLES:

Mineral Spirit	
Aeroshell # 6 grease	(PN 2275094)
Leak Detector	(commercial)

SPARE PARTS:

Air Reservoir	(P/N AA03R7D)
---------------	---------------

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-06-00/R-00

System:

Sheet:

TRUCKS & SUSPENSIONS

3/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

AIR RESERVOIR (1.5 LT)

Component:

Man Hours:

1.5

Maintenance Task:

REPLACEMENT

PROCEDURE:

PRELIMINARY OPERATIONS

Set the Vehicle in safety conditions in accordance with LACMTA Maintenance Shop Regulations:

1. Place the Vehicle over the Pit (or Stand Up Rail) provided with Wheel Truing Machine.
2. Set the Master Controller Handle to FSB position.
3. Make sure that all Parking Brakes are applied (by checking on the IDU "Parking Brake A and B Not Released" and on Indicator Panel "A" "Park / Friction Brake" ON).
4. Remove Electrical Power from Vehicle by lowering the Pantograph.
5. Turn the Transfer Switch to OFF.
6. Set the Pantograph Control Motor Switch (5F02 CB LV Locker "A" Section) to OFF.
7. Lock out and tag out the Switch in accordance with all LACMTA Safety Rules, Regulations, Policies, and Procedures.

NOTE The tag must indicate the name of the person who removed Power.

That person knows why the Power was removed and when it safe to restore it.

Only the individual whose name appears on the tag or a person with his approval should remove the tag and restore Power.

8. Apply wheel chocks to prevent the Vehicle from moving.

9. Vent pneumatic pressure from Air Piping by closing the Air Suspension Cut Out Cock (Refer to Figure 1).

WARNING: HIGH PRESSURE IS VENTED WHEN CUTOUT COCK IS CLOSED. WEAR SAFETY GOGGLES AND EAR PROTECTION AND EXERCISE CAUTION. FAILURE TO COMPLY MAY RESULT IN INJURY.

REMOVAL

1. Locate the Air Reservoir to be removed and remove the Plug (2) (Refer to Figures 2 and 3).
2. Unscrew pipeline Adapter (5) to disconnect the Air Reservoir (1) from pipeline.
3. Install protection Caps on pipeline openings.
4. Remove Clamps (3), then remove the Air Reservoir (1) and the Gasket (4).

INSTALLATION

1. Check that pneumatic pressure is released.
2. Clean the Air Reservoir end fittings.
3. Remove protection Caps from pipeline openings.
4. Install the Air Reservoir (1) and Gasket (4) and fasten them on related Support with Clamps (3) (Refer to Figures 2 and 3).

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-06-00/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

4/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

AIR RESERVOIR (1.5 LT)

Component:

Man Hours:

1.5

Maintenance Task:

REPLACEMENT

PROCEDURE:

5. Install Plug (2) on Air Reservoir (1).
6. Connect the Air Reservoir to the pipeline by means of Adapter (5).
7. Pressurize Air Piping by opening Air Suspension Cut Out Cock (Refer to Figure 1).
8. Apply Leak Detector and test the Air Reservoir for leakage around the Air Piping connections.
9. Tighten joints where bubbles form.
10. Remove, using water, all traces of leak detector immediately after test.
11. Restore Electrical Power.
12. Remove wheel chocks.
13. Record Service and Test results on the Defect Report Card for administrative and maintenance planning.

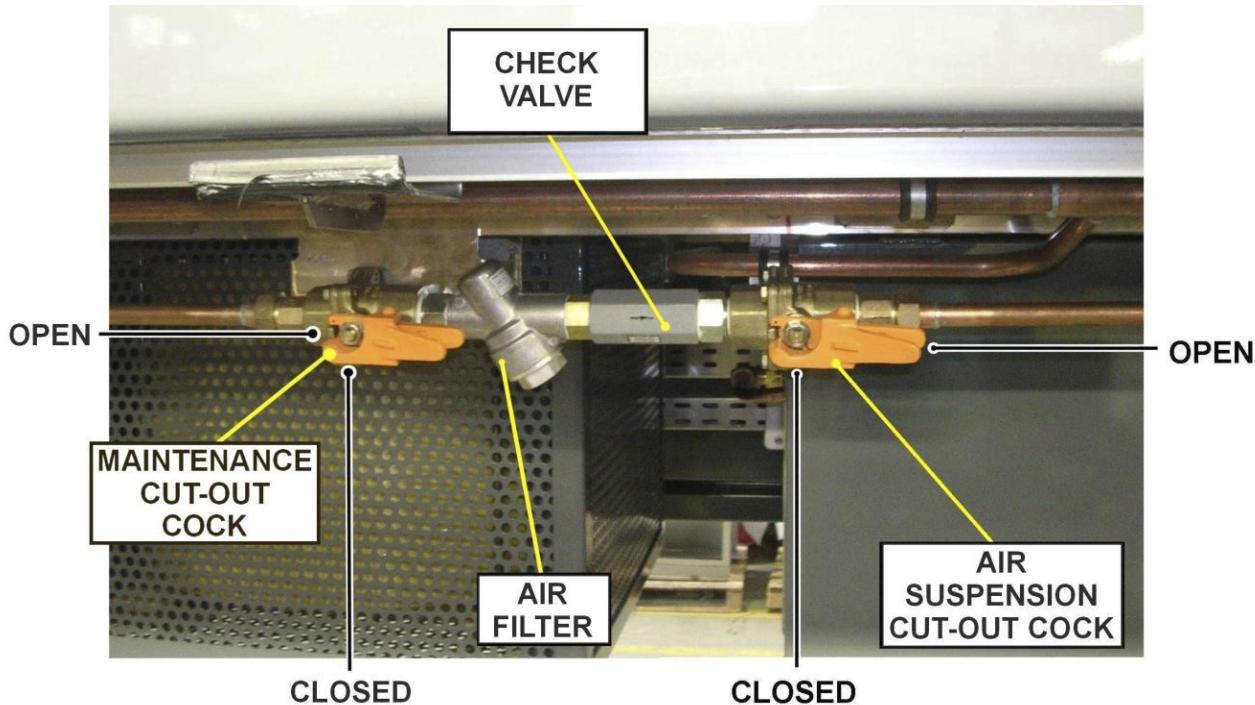


Figure 1 - SUSPENSION MAINTENANCE CUTOUT COCK

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-06-00/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

5/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

AIR RESERVOIR (1.5 LT)

Component:

Man Hours:

1.5

Maintenance Task:

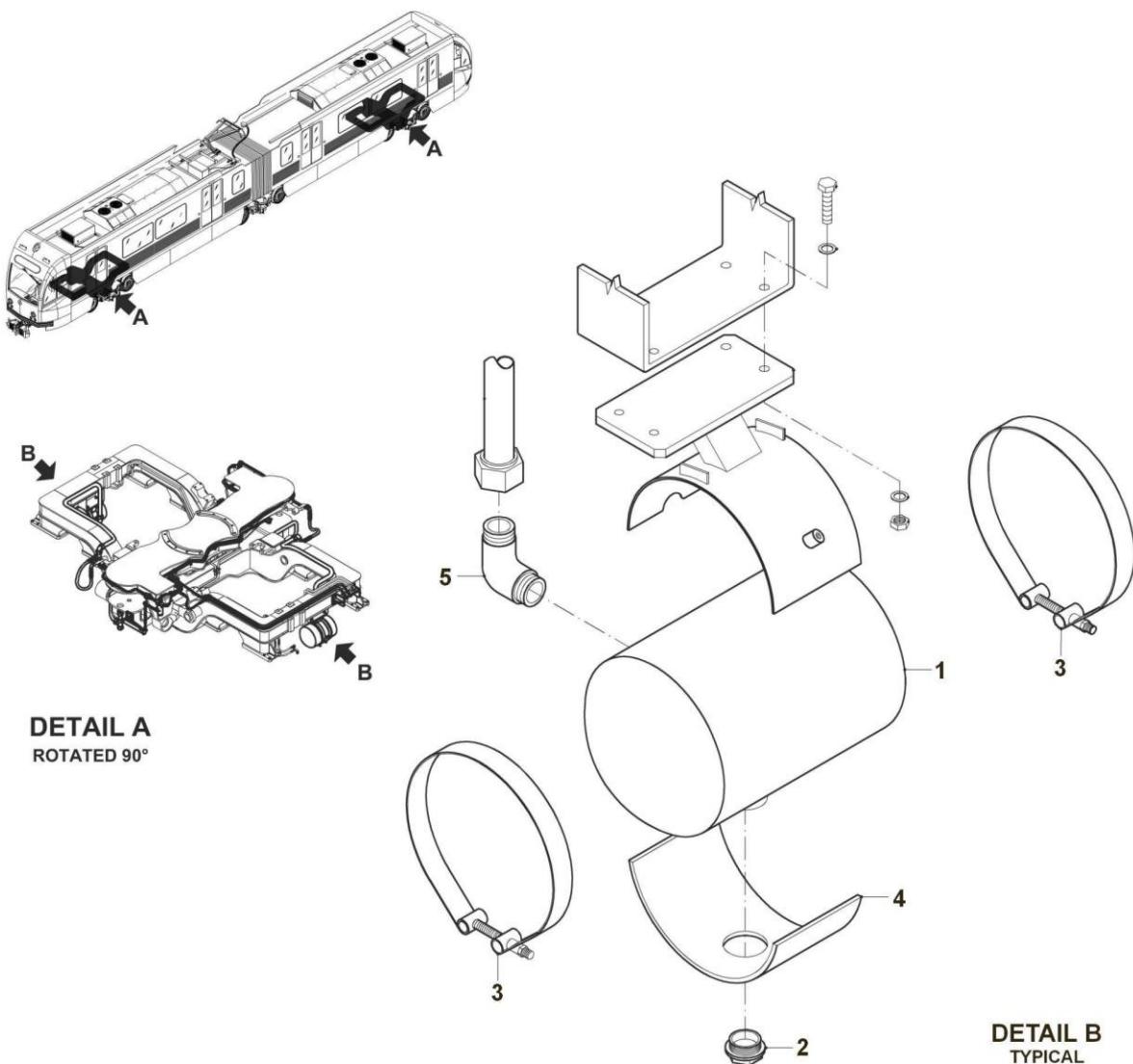
REPLACEMENT
PROCEDURE:


Figure 2 - MOTOR TRUCK, AIR RESERVOIR REPLACEMENT

P2550 CORRECTIVE MAINTENANCE SHEET

Card Code:

R-C-12-03-06-00/R-00

System:

TRUCKS & SUSPENSIONS

Sheet:

6/6

Subsystem/Assy:

AIR SUSPENSION SYSTEM

Unit:

AIR RESERVOIR (1.5 LT)

Component:

Man Hours:

1.5

Maintenance Task:

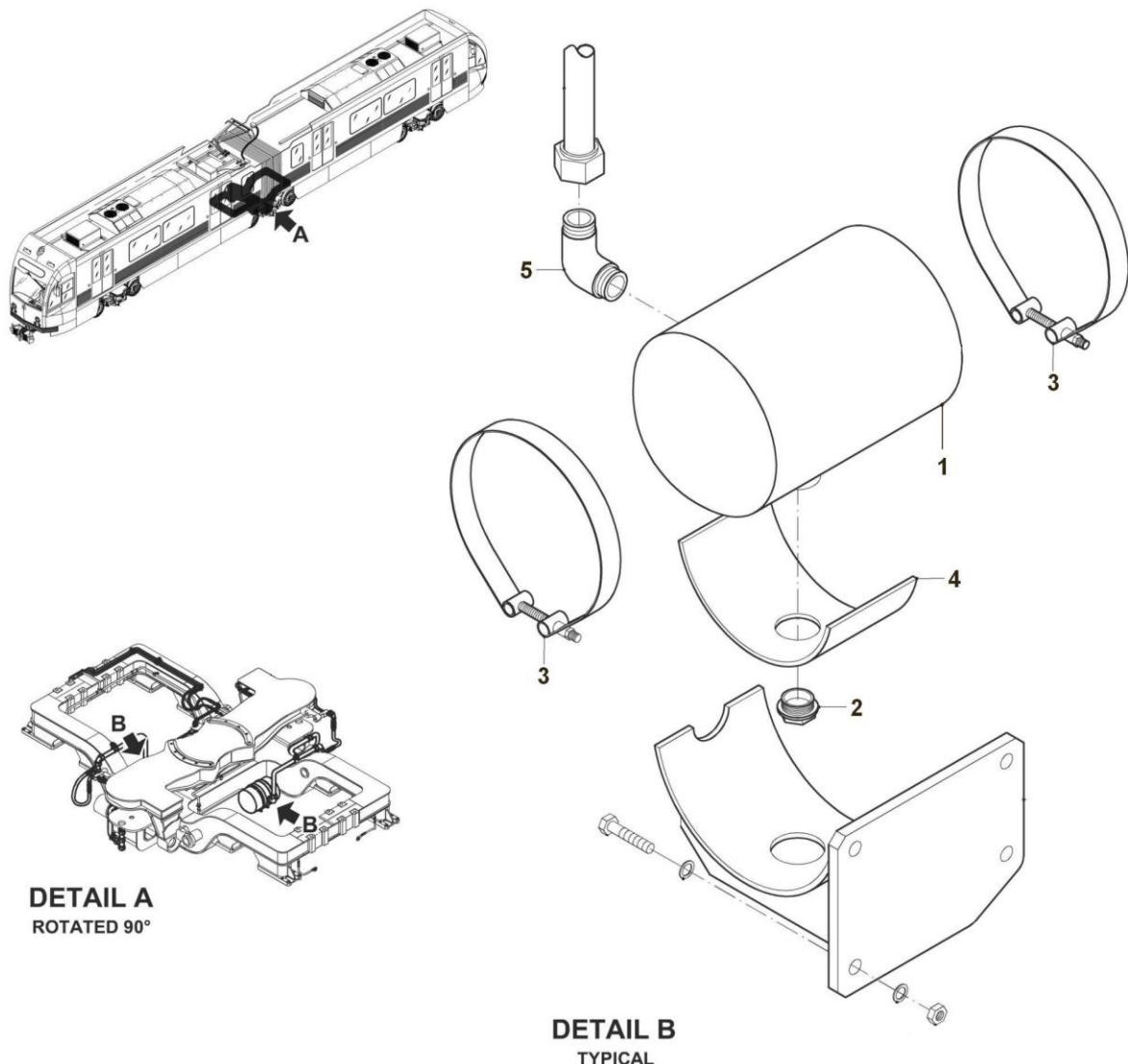
REPLACEMENT**PROCEDURE:**

Figure 3 - TRAILER TRUCK, AIR RESERVOIR REPLACEMENT

12-III-05 CONSUMABLE MATERIALS LIST (R-CML)

The Consumable Materials needed to accomplish the “Trucks & Suspensions” Running Maintenance are listed, sequenced in alphabetical order, by SUBSYSTEM /ASSY -UNIT / COMPONENT, in the following Table 12-III-05.1.

Table 12-III-05.1 Running Maintenance Consumable Materials List (R-CML)

SYSTEM 12		TRUCKS & SUSPENSIONS	
SUBSYSTEM /ASSY - UNIT / COMPONENT	AGENT	PN	MTA PN
AIR SUSPENSION SYSTEM	Mineral Spirit		
	Aeroshell # 6 Grease	2275094	
	Cleaning Rags	(commercial)	
	Leak Detector	(commercial)	
GROUND CONTACT DEVICE	Cleaner / Degreaser	(commercial)	
	White Alcohol Spirits		
	Anti-Oxidant Joint Compound Korp - Shield	AA00FFX	
MOTOR TRUCK	Cleaner/Degreaser	(commercial)	
	Loctite 242	AA0034E	
	Teflon Tape (Threads Sealant)	3M	
	Double Sided Adhesive Tape (Transfer Type)	(3M 950)	
MOTOR TRUCK AXLE	Cleaner/Degreaser	(commercial)	
MOTOR TRUCK SECONDARY SUSPENSION	Cleaner / Degreaser	(commercial)	
	Dow Corning BR2 EP Grease		
TRAILER TRUCK	Cleaner/Degreaser	(commercial)	
	Loctite 242	AA0034E	
	3M Teflon Tape (Threads Sealant)		
	Double Sided Adhesive Tape (Transfer Type)	(3M 950)	
TRAILER TRUCK AXLE	Cleaner/Degreaser	(commercial)	
TRAILER TRUCK SECONDARY SUSPENSION	Cleaner / Degreaser	(commercial)	
	Dow Corning BR2 EP Grease		

(cont 'd)

Table 12-III-05.1 Running Maintenance Consumable Materials List (R-CML)

SYSTEM	12	TRUCKS & SUSPENSIONS		(cont'd)
SUBSYSTEM /ASSY - UNIT / COMPONENT		AGENT	PN	MTA PN
TRAILER TRUCK SPEED SENSOR DEVICE	CRC Industrial - Precision Cleaner		M3 PN 147535	
	Dry Compressed Air for Electronic Equipment		(commercial)	
WHEEL SHUNTS	Rubber Sheets (or similar)			
	Emery cloth 80 grit			
	Cleaning rags		(commercial)	
	Cleaner / Degreaser / Mild Solvent			
	Loctite 242		AA0034E	
	Anti-Oxidant Joint Compound			

12-III-06 TEST EQUIPMENT & SPECIAL TOOLS LIST (R-TESTL)

The Tools and Test Equipment needed to accomplish the “Trucks & Suspensions” Running Maintenance are listed, sequenced in alphabetical order, by SUBSYSTEM /ASSY -UNIT / COMPONENT, in the following Table 12-III-06.1.

Refer to “Tools and Test Equipment Manual” for Special Tools / Test Equipment Description and Maintenance.

Table 12-III-06.1 Running -Test Equipment & Special Tools List (R-TESTL)

SYSTEM 12		TRUCKS & SUSPENSIONS		
SUBSYSTEM /ASSY - UNIT / COMPONENT	LACMTA STANDARD TOOLS KIT	LACMTA WORKSHOP DEVICES	SPECIAL TOOL / TEST EQUIPMENT	PN
AIR SUSPENSION SYSTEM	X			
GROUND CONTACT DEVICE	X			
MOTOR TRUCK	X	Torque Wrench (150-250 ft-lb)		
		Car Hoist and Support System		
		Clamps, Caps, Masks		
MOTOR TRUCK AXLE	X			
MOTOR TRUCK SECONDARY SUSPENSION	X			
STICK LUBRICATOR	X			
TRAILER TRUCK	X	Torque Wrench (150-250 ft-lb)		
		Car Hoist and Support System		
		Clamps, Insulating Caps, Masks		
TRAILER TRUCK AXLE	X			
TRAILER TRUCK SECONDARY SUSPENSION	X			
TRAILER TRUCK SPEED SENSOR DEVICE	X			
WHEEL SET	X	Pi Tape 24 to 36 inch range		
		AAR Steel Wheel Gauge		
		MTA Wheel Truing Machine.		
			Tool Kit Robo Jack	00655651
			Rubber Block Spacing Ring	
WHEEL SHUNTS	X	Thompson Bridge, AEMC Corporation Model # 141.100 or		
			Isotek Corporation M210 Resistance Meter	

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