Crown Manual of Responsibility For The User

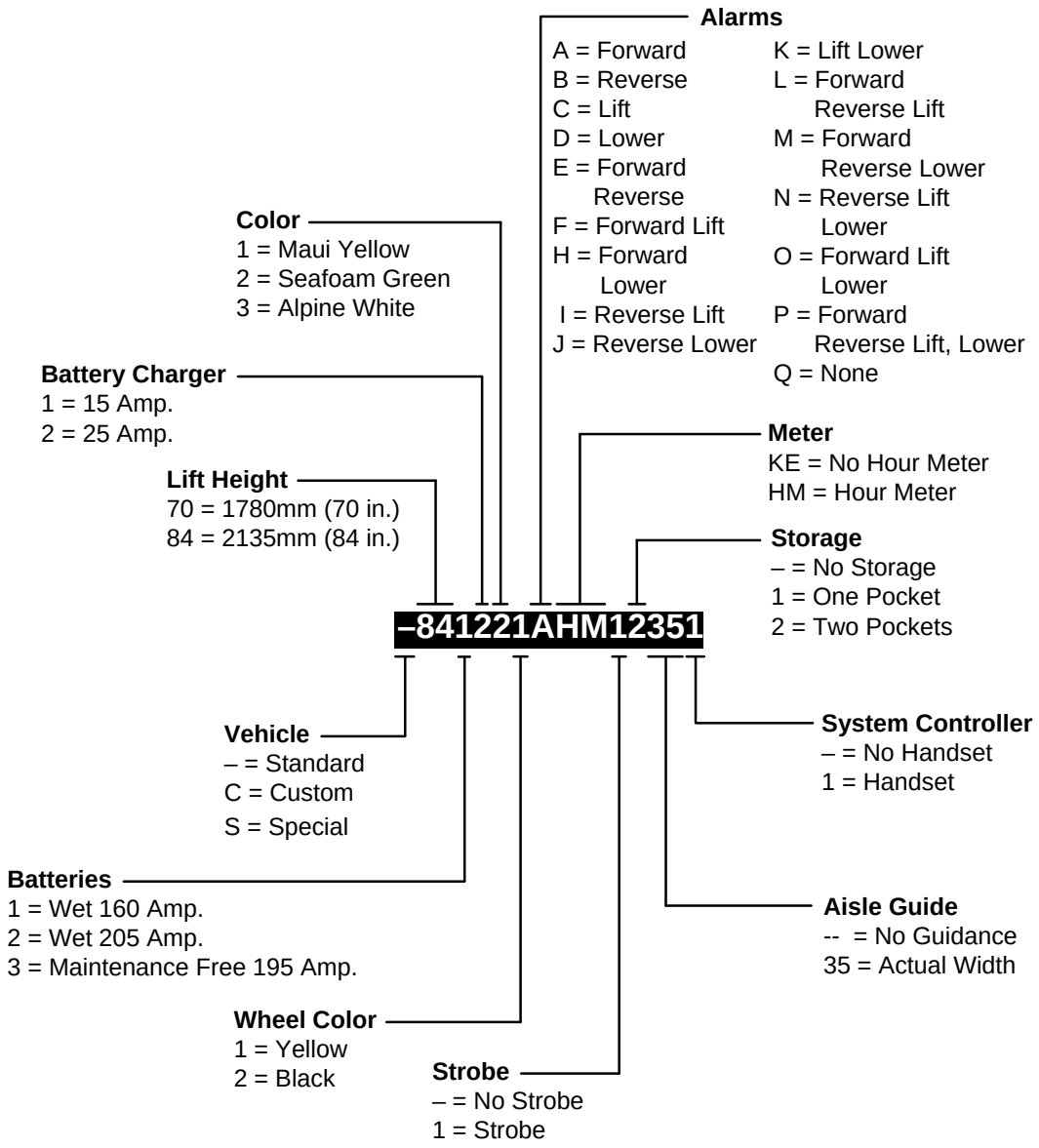
wave®

WORK ASSIST VEHICLE®

CROWN 2000 PF11782-1 Rev. 3/01

The vehicle data number provides you and your dealer with a wealth of information to ensure the selection of proper parts for your vehicle. You may simply provide this number to your dealer, or use the following breakdown if selecting your own part numbers or service information from this manual.

VEHICLE DATA NUMBER EXAMPLE



6202-02

The example of the vehicle data number shown above is a standard vehicle with a 2135 mm (84 in.) lift height, 160 Amp. wet cell batteries, with a 25 Amp. battery charger, vehicle color of Seafoam Green, yellow wheels, with a forward travel alarm, equipped with; an hour meter, strobe light, one (1) storage pocket, aisle guidance and system controller with a handset.

Hydraulic

WARNING

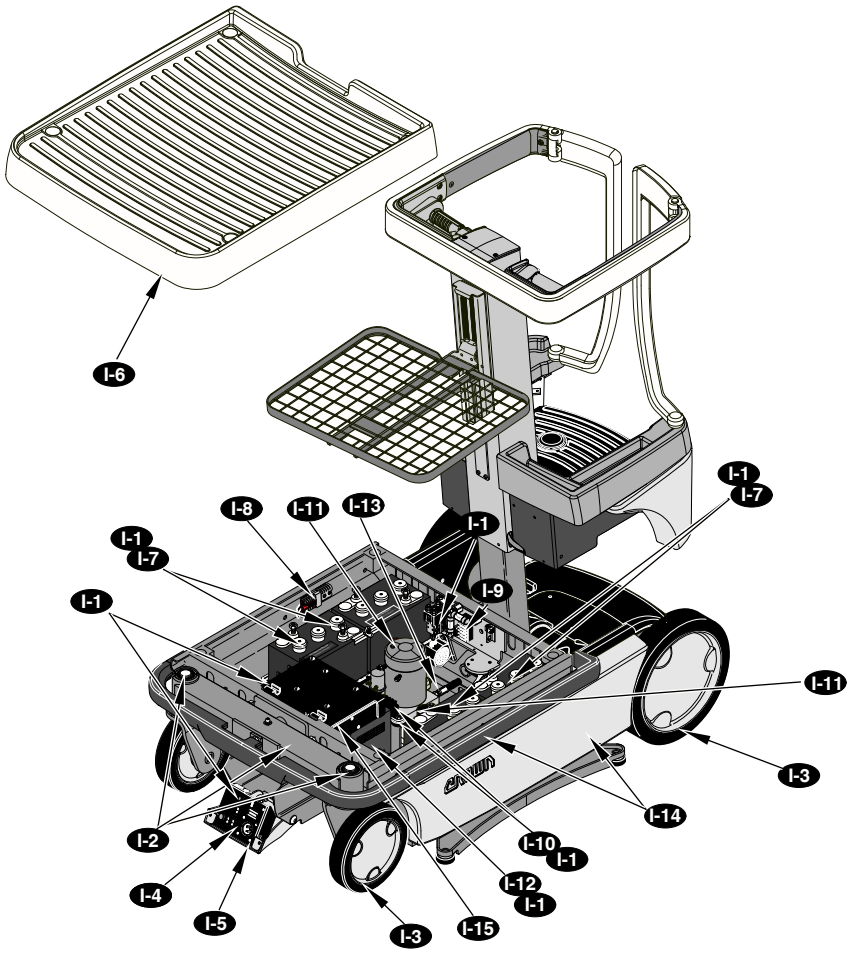
AVOID HIGH PRESSURE FLUIDS—Escaping fluid under pressure can penetrate the skin causing serious injury. Relieve pressure before disconnecting hydraulic lines. Tighten all connections before applying pressure. Keep hands and body away from pin holes which eject fluids under high pressure. Use a piece of cardboard or paper to search for leaks. Do not use your hand.

Any fluid injected into the skin under high pressure should be considered as a serious medical emergency despite an initial normal appearance of the skin. There is a delayed onset of pain, and serious tissue damage may occur. Medical attention should be sought immediately by a specialist who has had experience with this type of injury.

When maintenance is to be performed on the hydraulic system, make sure the hydraulic system is not under pressure:

1. Move vehicle to a secure non-traffic maintenance area with a level floor.
2. No load on load tray or load deck.
3. Completely lower load engaging means or, if required for maintenance, block vehicle at appropriate height as described in Lifting and Blocking of this section.
4. Actuate the hydraulic switch to remove any hydraulic pressure that may be present.
5. Lockout or tagout vehicle as described in Lockout - Tagout in this section.

Figure 17607



NOTE: Platform Shown Partially Elevated and Service Panel Open For Illustration Purposes.

6151-01

ILLUSTRATION 4
INSPECTION AND ADJUSTMENT CHART 1-4
CHASSIS FRONT

INDEX	COMPONENT	90 da. 150 hr.	180 da. 300 hr.	270 da. 450 hr.	360 da. 600 hr.
I-1	Electrical i.e.: Connectors, Cables and Wiring	Check			
I-2	Front Axle and Casters	Check			
I-3	Wheels, Front & Rear	Check			
I-4	Service Panel	Check			
I-5	Front Strobe Light (Optional)	Check			
I-6	Load Deck	Check			
I-7	Batteries i.e.; For Leakage, Cracks & Corrosion	Check			
I-8	Battery Connector	Check			
I-9	Contactor Panel	Check			
I-10	Hydraulic Assembly i.e.; Pump, Motor (M3)	Check			
I-11	Hydraulic Accumulator, and Reservoir Filler Cap	Check			
I-12	Battery Charger	Check			
I-13	Dynamic Cable Tension Area	Check			
I-14	Chassis Side Covers	Check			
I-15	MRC Controller	Check			

Refer to appropriate section of service manual for additional information concerning inspection and/or adjustment.
Note: Hours are based on traction hours which is accessible by using Curtis handset.

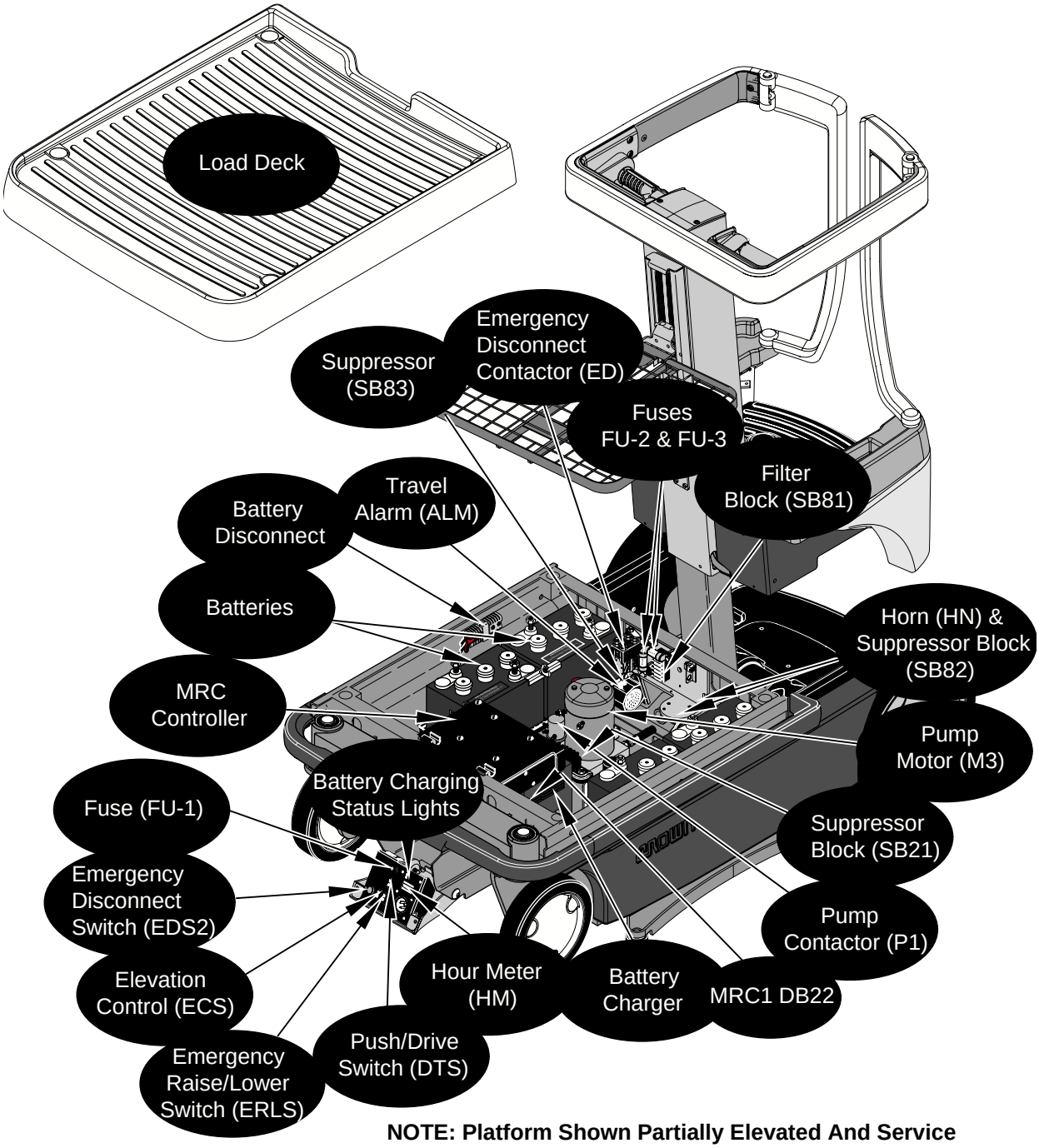
Symptom	Probable Cause	Remedy
No cushion during raise or lower	Accumulator malfunction	Charge accumulator properly. Refer to section M2.6.
Will not lift capacity load	Relief valve not adjusted properly Mast binding Hydraulic component(s) malfunction	Adjust relief valve. Inspect mast for damage, misalignment, etc. Refer to hydraulic system M2.0.
Platform drifts down	Debris in solenoid valve Lift cylinder packings leaking	Cycle through lift/lower to free possible debris. Refer to cylinder information section M2.6.
Accumulator loses charge	Accumulator valve leaking, cracked, deformed, etc.	Repair. Refer to accumulator maintenance section M2.6.
Abnormal hydraulic oil usage	External leak	Check plumbing, cylinder, other hydraulic components.
Lift pump & motor overheating *	Exceeding capacity load Worn or damaged pump & motor Fluid level low	Check load weight. Inspect pump & motor. Repair or replace. Inspect fluid level. Fill system to proper level. Refer to section M2.0.
Failure of platform to raise and lower smoothly	Lift chains not adjusted properly Mast and/or platform binding Hydraulic component malfunction Accumulator malfunction Air trapped in cylinder	Adjust chains. Inspect mast & platform for damage, wear, etc. Inspect pump, motor, valve, cylinder, etc. for damage, leaks, wear, etc. Refer to section M2.6. Bleed.

* Be sure the vehicle has been performing its normal duty cycle at this time.

Component Accessability

Chassis (under load deck) Components

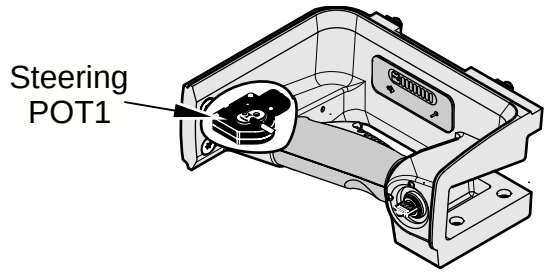
- Lift load deck from vehicle.



NOTE: Platform Shown Partially Elevated And Service Panel Open For Illustration Purposes

6153-01

ILLUSTRATION 1



6176-01 ILLUSTRATION 1

POT1 Steering Potentiometer

- Located in steering control pod.
- Provides command signal to system controller for steering function.
- When replaced or instructed by service codes, potentiometer requires calibration. Reference Controller Settings in this manual and perform Calibration 4, 5 and 6.

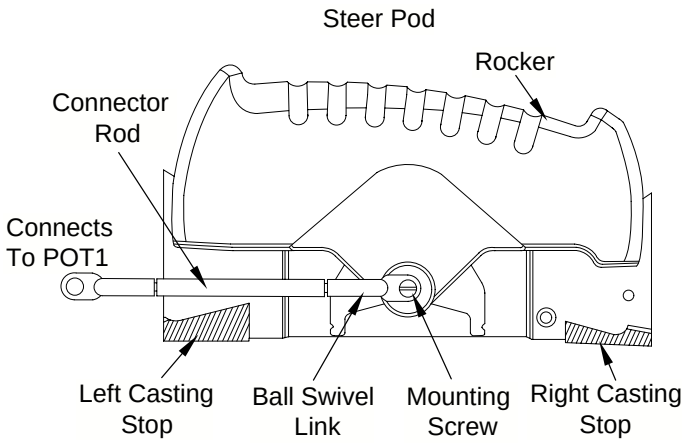
POT1 Steering Potentiometer Linkage Adjustment

When the pot cam, connector arm assembly and the rocker are assembled and functionally correct, the rocker will freely rotate in both directions. The casting will be the only physical stop to prevent the rocker from rotating. Refer to Illustration 2.

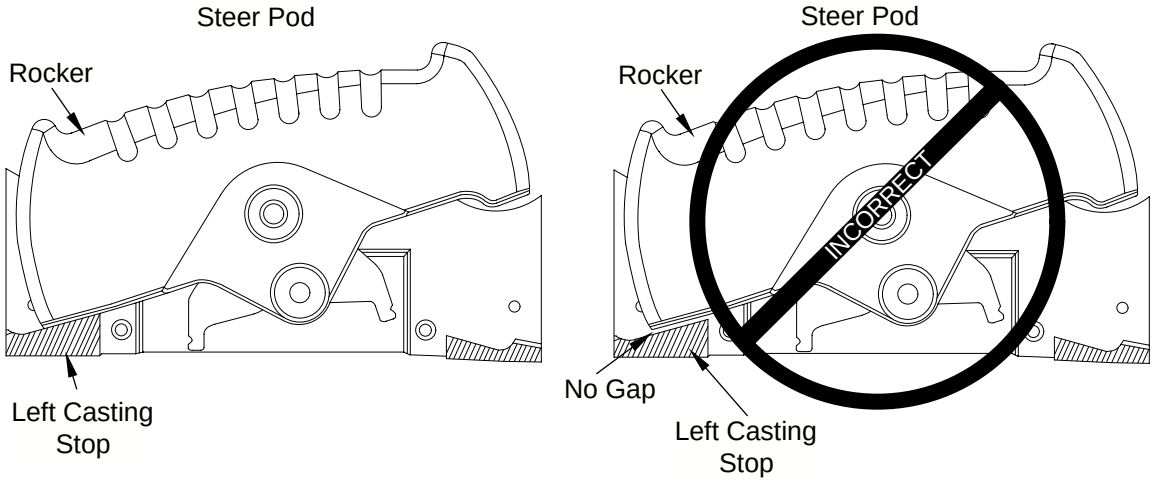
If the rocker is unable to reach the stop of the casting, it is being halted by the internal stop of the pot module, which is incorrect. Adjustment is needed to allow the rocker to rotate freely. This can be accomplished by increasing or decreasing the length of the connector arm assembly.

A. Unable to rotate rocker to the left casting stop:

- Remove screw that fastens connector arm to the rocker. Refer to Illustration 2.
- The length of the connector arm needs to to be increased. Hold the steel connector rod and rotate the swivel ball link counterclockwise (CCW) one (1) revolution.
- Connect connector arm to rocker.
- Re-inspect rocker rotation. If only the casting prevents rocker from rotating, no further adjustment is needed. If not, connector arm needs to be longer. Refer to Illustration 3.



6362 ILLUSTRATION 2



6363 ILLUSTRATION 3

SYMBOLS

Momentary Contact Switches Mechanically Operator Actuated


Normally Open


Held Closed


Held Open


Normally Closed

Momentary Contact Switches Mechanically Actuated

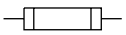

Normally Open


Normally Open
Held Closed


Normally Closed
Held Open

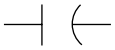

Normally Closed

Basic Symbols

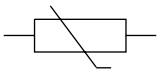

Fuse

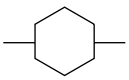

Battery

Inductor


Non-Polarized Capacitor


Potentiometer

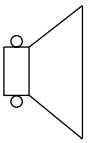

Mov or Transzorb

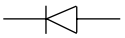

Power Termination

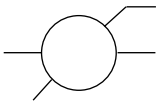
Basic Symbols Cont'd

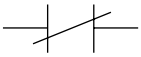

Connection Point

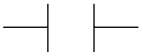

Mast Cable


Horn

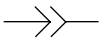

Diode


Solenoid Valve or Relay
With Suppression

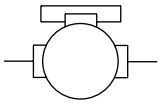

Normally Closed

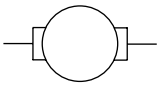

Normally Open


Plug PC


Connector CA

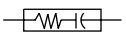

Jack JC


PM Motor


Wound Motor
Armature

Motor Field


Lamp


Suppressor

Remote Negative

CURTIS 1703

The System Controller is a solid state electronic control for vehicle operation. All vehicle functions are controlled by this unit except for brake release when the Push/Drive switch is in the Push position.

- As a vehicle control, the 1703 Controller processes inputs from operator controls and vehicle monitoring devices to provide the desired vehicle action.
- During power up of the vehicle, a system self-test is performed by the controller to make sure system integrity is present for operation.
- As a speed control, the 1703 enables the energy from the batteries to be fed to the electric motors smoothly through the use of power transistors.
- Specific functions of the speed control are adjustable by using a plug-in handset. These are covered in the Electrical - System Settings section of this manual.
- The speed control portion of the control is also the steering control of the vehicle. By powering the drive motors at different levels, the vehicle will steer in the direction requested by the operator input.
- The controller also contains the ability of performing diagnostics on the vehicle. Through the status code interface (display or handset), status codes will be displayed and by using the status code descriptions in this manual, the maintenance technician will be directed to the problem area for repair. More information on this feature is located in the Electrical - Trouble-shooting section of this manual.

MAINTENANCE

There are no user-servicable parts inside the Curtis PMC 1703 controller. No attempt should be made to open the controller. Opening the controller may damage it and will void the warranty.

However, it is recommended that the controller exterior be cleaned periodically, and - if a handset is available - this periodic cleaning provides a good opportunity to check the controller's diagnostic history file.

Safety

The 1703 controller is inherently a high power device. When working around any battery powered vehicle, proper safety precautions should be taken. These include, but are not limited to: proper training, wearing eye protection, avoiding loose clothing and jewelry, and using insulated wrenches.

Cleaning

Although the 1703 controller requires virtually no maintenance if properly installed, the following minor maintenance is recommended in certain applications:

1. Remove power by disconnecting the battery.
2. Discharge the capacitors in the controller by connecting a load (such as a contactor coil or a horn) across the controller's B+ and B- terminals.
3. Remove dirt or corrosion from the bus bar area. The controller should be wiped clean with a moist rag. Allow it to dry before reconnecting the battery.
4. Make sure the connections to the bus bars are tight. Use two well insulated wrenches for this task in order to avoid stressing the bus bars.

Decel Rate
Deceleration Rate, secs

- Amount of time required to decelerate from maximum speed to minimum forward speed.
- Adjustment range is 1.0 to 2.3 seconds.
- Decreasing the number displayed on the handset will increase the force of deceleration.

*** THRTL Deadband**
Throttle Deadband

- Adjusts the amount of rotation of potentiometers before out of neutral condition is realized by the controller (neutral window). Parking brake releases when out of window condition is realized.
- Adjustment range is 10% to 50%.
- Increasing number value increases amount of potentiometer rotation required before out of neutral condition is realized.

Low Speed
Low Speed, %

- Maximum allowable forward speed when the platform lift height is below 510 mm (20 inches) and the platform gates are not fully open.
- Adjustment range is 35% to 52%. The maximum speed of Speed Limit 1 is 75% of Forward Maximum Speed.
- Decreasing the percentage, decreases the speed.

Low Speed (2)
Low Speed (2), %

- Maximum allowable forward speed when the platform lift height is above 510 mm (20 inches) and the platform gates are fully closed.
- Adjustment range is 0 to 35%. The maximum speed of Speed Limit 2 is 50% of Forward Maximum Speed.
- Decreasing the percentage, decreases the speed.

Reverse Speed
Reverse Speed, %
Reverse Maximum Speed

- Maximum allowable reverse speed.
- Adjustment range is 0 to 35%. The maximum reverse speed is 50% of the Maximum Forward Speed.
- Decreasing number displayed decreases the maximum allowable speed.

Anti-Rollback
Anti-Rollback

- Sets the minimum voltage motors are supplied when traction command is given.
- Adjustment range is 0 to 1.0 volts.
- Increasing number value increases voltage.

*** H/S Turn Rate**
High Speed Turn Rate

- Sets turn radius with truck travelling at maximum speed.
- Adjustment range is 18.6% to 37.4%.
- Higher the number setting the smaller the turn radius.

*** L/S Turn Rate**
Low Speed Turn Rate

- Sets the speed of a turn with no traction command.
- Adjustment range is 8.4% to 19.6%.
- Higher the number the faster the turn.

*** Acc Turn Rate**
Accel Turn Rate, secs

- Rate (time) required to reach the requested turn speed.
- Adjustment range is 0.5 to 5.2 seconds.
- Higher the number the lower the rate of reaching the requested turn speed. Setting too high will increase weaving and setting too low will increase jerking.

*** Accessable with OEM handset only. Do Not adjust without first obtaining factory authorization. Failure to do so will result in Warranty being Voided.**

*** Opposite Steer**
Opposite Steer Enable

- Reverses turn direction of input for reverse travel steering.
- Selectable feature, on/off.
- Selecting on causes reverse steering.

Perf Select
Perf Select (1/2/3)

- Selects different performance levels for vehicle operation when switching to the turtle mode. Level 1 is highest performance, level 2 is decreased performance and level 3 is lowest performance.
- Selectable feature, 1, 2 or 3.

Battery Rate
Battery Rate

- Adjusts battery charge level obtained before lift cutout.
- Adjustment range is 1 to 15.
- Selecting a higher number increases the rate of battery discharge.

Guidance
Guidance Enable

- Sets controller to accept rail guidance input signals.
- Selectable feature, on/off.
- Selecting on enables rail guidance feature.

Tilt
Tilt Enable

- When enabled and tilt sensor present, lift is disabled when truck is on an incline, above 510 mm (20 in.) with gates closed.
- Selectable feature, on/off.
- Selecting on enables feature.

SRO Alarm
SRO Alarm Enable

- When enabled, alarm is sounded whenever operator attempts to operate vehicle using an improper sequence of controls.
- Selectable feature, on/off.
- Selecting on enables alarm feature.

*** Presence**
Presence Enable

- Requires the hands to be on grips during truck operation.
- Selectable feature, on/off.
- Feature enabled when on selected.

Reverse Alarm
Reverse Alarm Enable

- Alarm sounds whenever reverse direction of travel or spin is selected.
- Selectable feature, on/off.
- Operational when on is selected.

Forward Alarm
Forward Alarm Enable

- Alarm sounds whenever forward direction of travel or spin is selected.
- Selectable feature, on/off.
- Operational when on is selected.

Lift Alarm
Lift Alarm Enable

- Alarm sounds whenever lift function is selected.
- Selectable feature, on/off.
- Operational when on is selected.

Lower Alarm
Lower Alarm Enable

- Alarm sounds whenever lower function is selected.
- Selectable feature, on/off.
- Operational when on is selected.

*** Accessable with OEM handset only. Do Not adjust without first obtaining factory authorization. Failure to do so will result in Warranty being Voided.**

Service Code 17

DISPLAY INFORMATION: **BDI Light Code:** □□□■□□□■
BDI Display: Blinking
Wrench Light: Blinking

HANDSET INFORMATION

Message: THERMAL HIGH

VEHICLE INFORMATION: **Alarm:** Repeatedly two quick beeps
Effect on Vehicle: Normal stop with shutdown

CODE INFORMATION

Explanation: Temperature limit on heatsink exceeded

Possible Cause

- Overtemperature > 80°C during operation
- Overtemperature > 70°C at startup
- Excessive load on vehicle
- Improper mounting of controller

Service Code 18

DISPLAY INFORMATION: **BDI Light Code:** □□□■□□■□
BDI Display: Blinking
Wrench Light: Blinking

HANDSET INFORMATION

Message: INHIBIT

VEHICLE INFORMATION: **Alarm:** Repeatedly two quick beeps
Effect on Vehicle: Normal stop with shutdown

CODE INFORMATION

Explanation: Function inhibited when chager connected

Possible Cause

- Charger connected
- Wire to INHIBIT pin of controller is open
- Charger unit defective

Service Code 39

DISPLAY INFORMATION: **BDI Light Code:** □□■□□■■■
BDI Display: Blinking
Wrench Light: Blinking

HANDSET INFORMATION

Message: MOTOR SHORT

VEHICLE INFORMATION: **Alarm:** Repeatedly two quick beeps
Effect on Vehicle: – Shutdown

CODE INFORMATION

Explanation: Motor short fault

Possible Cause

- Motor is shorted
- Busbar connections battery negative and battery positive on controller are wired backwards
- Controller failure
- Open ED Contacts
- Shorted Lift Solenoid Contacts

Service Code 40

DISPLAY INFORMATION: **BDI Light Code:** □□■□■□□□
BDI Display: Blinking
Wrench Light: Blinking

HANDSET INFORMATION

Message: LEFT POWER FAULT

VEHICLE INFORMATION: **Alarm:** Repeatedly two quick beeps
Effect on Vehicle: – Shall not Power Up

CODE INFORMATION

Explanation: Left power fault at Power Up

Possible Cause

- One motor lead of left motor is shorted to battery positive
- Controller failure

Service Code 6

DISPLAY INFORMATION: **BDI Light Code:** □□□□□■■□
BDI Display: Blinking three seconds
Wrench Light: Off

HANDSET INFORMATION

Message: – No Known Faults

VEHICLE INFORMATION: **Alarm:** Three quick beeps
Effect on Vehicle: – Toggles Drive mode from "Out of Rail" to "In Rail"

CODE INFORMATION

Explanation: Guided rail aisle has been entered or exited

Possible Cause

- Rail guidance switches actuated or deactuated

Service Code 7

DISPLAY INFORMATION: **BDI Light Code:** □□□□□■■■
BDI Display: Blinking three seconds
Wrench Light: Off

HANDSET INFORMATION

Message: SRO

VEHICLE INFORMATION: **Alarm:** One quick beep
Effect on Vehicle: – No travel allowed

CODE INFORMATION

Explanation: Static return to off (SRO) during operation

Possible Cause

- Attempted to move vehicle without hands and feet in place

- Open ED-B contact or related circuit wiring

Service Code 35

DISPLAY INFORMATION: **BDI Light Code:** □□■□□□■■
BDI Display: Blinking
Wrench Light: Blinking

HANDSET INFORMATION

Message: SFW

VEHICLE INFORMATION: **Alarm:** Repeatedly two quick beeps
Effect on Vehicle: Fast stop with shutdown

CODE INFORMATION

Explanation: Controller software failure

Possible Cause

- Controller (software) failure. Try to restart (power up) again

Service Code 36

DISPLAY INFORMATION: **BDI Light Code:** □□■□□■□□
BDI Display: Blinking
Wrench Light: Blinking

HANDSET INFORMATION

Message: MAIN CONT DRVR

VEHICLE INFORMATION: **Alarm:** Repeatedly two quick beeps
Effect on Vehicle: – Shall not Power-up

CODE INFORMATION

Explanation: Main contactor driver

Possible Cause

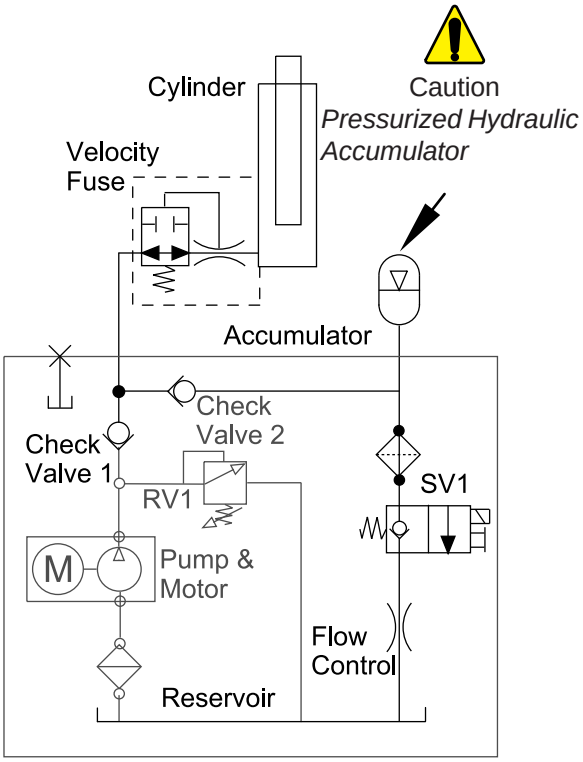
- Controller failure

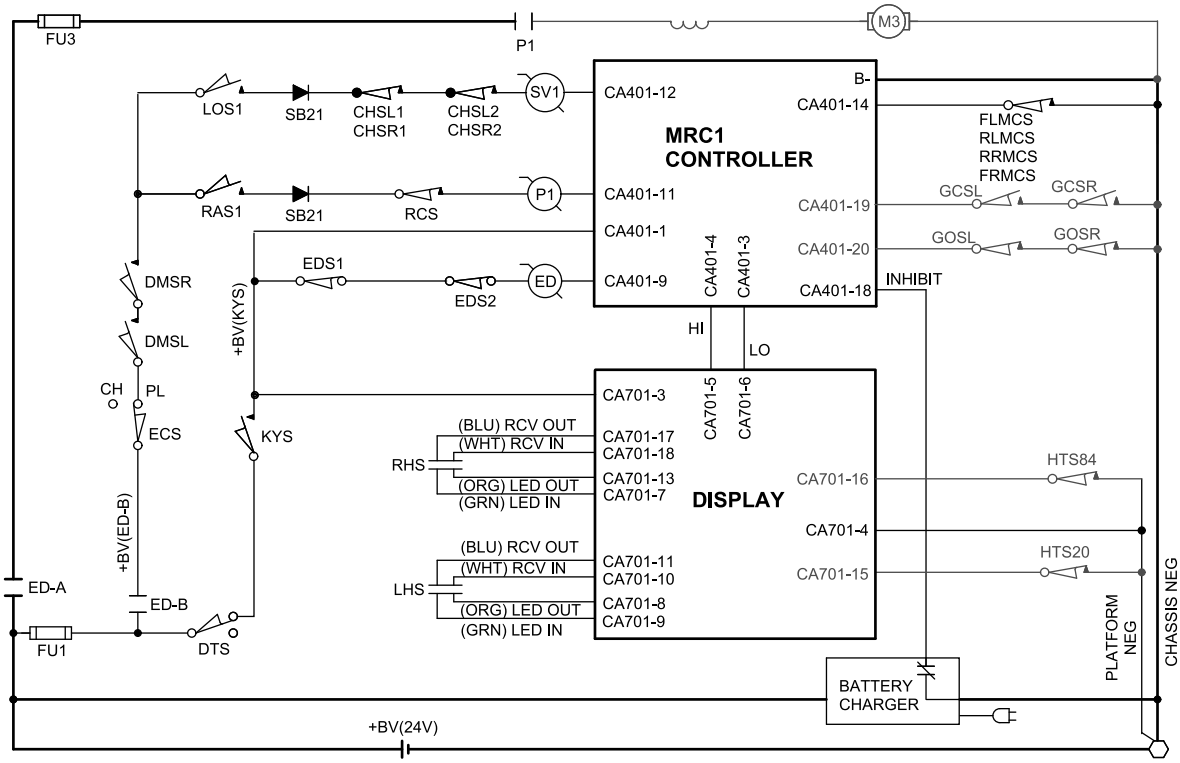
- Miswiring in ED Circuit

- Failed ED Contactor

Platform Lower occurs when static conditions are met and the operator requests lower by actuating the lower button.

- LOS1 closes providing current path to CHSL and CHSR.
- MRC1 controller providing current path to FLMCS, RLMCS, RRMCS and FRMCS.
- When the lift chain is not slack, CHSL and CHSR are closed and allow current flow.
- When the controller does not have any restrictions or service conditions preventing lower (e.g. controller failure, vehicle monitoring switches open etc.), the controller will close the current path to battery negative, energizing SV1.
- When SV1 is energized, the valve moves and replaces the check valve with free flow.
- Hydraulic pressure from the weight of the platform on the cylinder keeps check valve 1 seated. This pressure does unseat check valve 2 allowing flow to SV1.
- Since the check valve in SV1 was replaced with free flow, flow continues to the flow control valve and on to the reservoir.
- The flow control valve limits the hydraulic flow to provide a controlled decent of the platform.
- If a hose were to break, bypassing the flow control valve, the high volume flow through the velocity fuse at the cylinder will move the valve from free flow to flow block thus preventing uncontrolled decent.
- When the lower button is released, causing SV1 check valve to again block flow, the hydraulic pressure increase caused by this sudden change is dampened by the accumulator.





6118-03

Elevation Control Switch - ECS

Place this switch in the "Base" position and the emergency raise/lower switch (ERLS) on the service panel is active. Platform raise, lower switches and steer/traction pots are disabled at this time. Traction, steering, lifting and lowering is not possible with switch at base position. For normal operation, return switch to the "Platform" position. This switch does not require adjustment.

Emergency Disconnect Switch - EDS2

Pushing the button depresses the EDS2 switch plunger. Power is removed from the emergency disconnect contactor coil which opens its contact and removes power from the lift, lower and traction circuit. To power the truck backup, push button again to release EDS2 switch plunger. The keyswitch must then be cycled "OFF" and back to "ON". This switch requires no adjustment. Also see Switches, section M4.0.

Emergency Raise/Lower Switch - ERLS

When the elevation control switch is in the "Base" position, platform raise and lower can be controlled by this switch. This switch does not require adjustment.

Fuse - FU1

FU1 is the control fuse. If it fails, the truck can not be powered-up. Replace with an ABC-15A fuse. Also see Fuses, section M4.0.

Hour Meter (Optional) - HM

The Hour Meter is used to accurately record the operator-in-position time (feet on brake release pedals). This instrument serves as an aid in determining a lubrication and maintenance schedule.

CAUTION

Never smoke or bring flame near the battery. Gas formed during charging is highly explosive and can cause serious injury.

- Charger will go through a diagnostic self-test. All LED's will flash 3 times, then each LED will flash individually.
- After a 3 to 5 second delay the charger will turn on. Both the yellow "Charger On" and red "Incomplete" LED will illuminate. A flashing red "Incomplete" LED prior to the yellow "80% Charge" LED illuminating indicates sealed (maintenance free) batteries have been selected. Be sure this is the correct selection.
- When battery voltages reach 2.35 to 2.38 volts per cell, the yellow LED "80% Charge" will illuminate.
- When a charge cycle is terminated, both the yellow "80% Charge" and the yellow "Charger On" LED will turn off. The green "Complete" LED will then illuminate.

To stop the charger at anytime during charging, unplug charger.

Abnormal Charge Sequence

If for any reason charging is not complete within 16 to 20 hours or if an over-current condition occurs, the "red" LED will illuminate. Unplug charger to clear and plug-in charger again to restart.

If shorted battery cells are detected during a charge cycle, the "red" LED will flash on for 2 seconds and off for 1 second.

BATTERY TESTING

Following is a testing procedure for verifying the integrity of the batteries.

1. Fully charge batteries.
2. After charge is complete, again, plug-in charger. The 80% charge light on the battery charger should come "on" within 5 minutes. Measure the overall battery voltage while charger is "on". Should be greater than 28.2 volts.

   If the 80% charge light does not come "on", continue charging until light comes "on".

   If the abnormal light comes "on", the charger is malfunctioning and should be replaced.
3. Turn charger "off" and measure the battery voltage. Should be 25.3 volts to 26.0 volts.
4. Measure and record the voltage across each battery. Each battery should be between 6.3 volts and 6.5 volts.
5. Replace any battery that measures less than 6.0 volts. If there are batteries which are 0.3 volts lower than associated batteries, the batteries could be showing signs of undercharging.
6. Return vehicle to service.

Event Code 25

Display Code = 
Handset Message = RIGHT MOTOR OPEN
Audible Alarm = Two quick beeps repeating
Wrench Light = Blinking

Indicates right drive motor (M2) open at start up.

Step 1: Verify motor connections and motor brush condition.

NOTE

New brush length is 15 mm (0.59 in). Brushes should be replaced when they reach a length of 6.0 mm (0.25 in).

- If connections and brushes are OK
  - Then proceed to Step 2.

Step 2: Disconnect both motors from truck harness. Connect CA602-1 of right motor harness to black lead of left motor and CA602-2 to red lead of left motor. Connect CA601-1 of left motor harness to red lead of right motor and CA601-2 to black lead of right motor; power up truck.

- If event changes to Event 24
  - Then replace right motor.
- If event does not change
  - Then replace traction controller (MRC1).

Event Code 26

Display Code = 
Handset Message = C/L
Audible Alarm = Two quick beeps repeating
Wrench Light = Blinking

Drive motor over current.

NOTE

This event may be caused by operating the truck on a ramp with low battery charge or stalling the drive motors.

Step 1: Verify motor connections and motor brush condition.

- If connections and brushes are OK
  - Then proceed to Step 2.

Step 2: Disconnect one motor from truck harness, isolate leads from truck frame.

- If event changes to 24 or 25
  - Then replace disconnected motor.
- If event does not change
  - Then replace traction controller (MRC1).

Event Code 27

Display Code = 
Handset Message = HARDWARE FAILSAFE 1
Audible Alarm = Two quick beeps repeating
Wrench Light = Blinking

Step 1: Rekey truck

- If event does not clear or returns frequently
  - Then replace traction controller (MRC1).

Event Code 28

Display Code = 
Handset Message = CONFIG LOST
Audible Alarm = Two quick beeps repeating
Wrench Light = Blinking

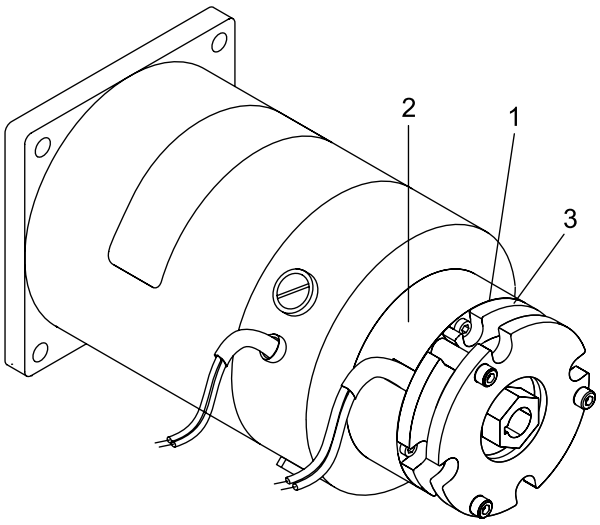
Step 1: Enter the Program Menu with the handset, scroll to FACTORY VALUES. Select ON to restore factory determined values; re-key truck.

- If event does not clear
  - Then replace traction controller (MRC1).

Parking Brake Wear

1. The parking brake is not normally applied when the vehicle is moving so wear will be minimal.

2. If there is question of the brake's functionality, the air gap should be checked (refer to Figure 16313).



1 Air Gap Between Coil Body and Armature Plate
2 Coil Body
3 Armature Plate

Figure 16313

3. Measure when no power is supplied and brake is applied.

4. Using a feeler gauge, make sure gap does not exceed 0.20 mm (0.008 in). Wear in excess of this requires replacement of the brake.

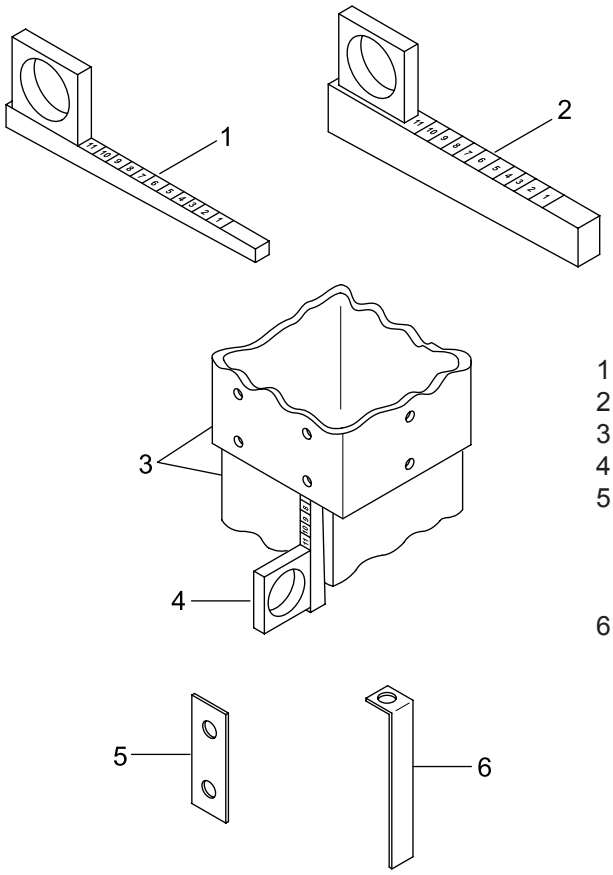
5. Brake is not adjustable.

Stopping Distance

1. Maximum stopping distance of the vehicle on a level, smooth, dry concrete surface is 1270-1780 mm (50-70 in) with load deck and tray empty, traveling in the load deck first direction and at top speed of 6.0 km/h (4 mph), (with platform less than 510 mm [20 in], gates open, in Rabbit Mode, lift foot). This is not for parking brake assisted stops.

2. To adjust stopping distance, refer to "Decel Rate" in Controller Settings. Decreasing the value of this setting increases deceleration force and shortens stopping distance.

3. If stopping distance cannot be achieved due to application conditions, reduce the maximum allowable speed (refer to "Max Speed" in Controller Settings) until stopping distance can be brought into acceptable range.



1 Shim Gage 125535
2 Top Shim Gage 125539 and 133403
3 Mast
4 Gage reading would be 8
5 120284-001 Shim Bottom Black 0.381 mm (0.015 in) Thick
120284-002 Shim Bottom Gold 0.635 mm (0.025 in) Thick
120284-003 Shim Bottom Silver 0.889 mm (0.035 in) Thick
120284-004 Shim Bottom Dark Grey 4.75 mm (0.187 in) Thick
6 120283-001 Shim Top Black 0.381 mm (0.015 in) Thick
120283-002 Shim Top Gold 0.635 mm (0.025 in) Thick
120283-003 Shim top Silver 0.889 mm (0.035 in) Thick

Figure 21264

9. Refer to Figure 21263. Determine the correct amount of shims required, Index 9. Install shims and guides, Index 8, at the bottom right and rear on the second stage mast.

10. Remove hardwood block and lower second stage mast. Position control cables to front of mast.

    • Install two gold shims, Index 5, at top left side of first and second stage mast. They will go between the guides, Index 3 and 4, and the first stage mast with tabs facing in. If two gold shims will not go into place easily, use one black and one gold shim. If that does not fit, then go on up the shim list until proper shim fit is found.

    • Insert gage 125535 into top right side between first and second stage mast, select shims from chart and install as required to guides Index 2 and 4 on top right side of first stage mast.

    • Insert gage 125535 into top rear between first and second stage mast. Select shims from chart and install as required to guides, index 4, at rear. Do not put any shims on index 2 and 3 at front.

16. After chains are tensioned, raise mast at least half way up and check chain tension by pressing on each chain with a finger. Adjust the chain anchor on the loose chain until the tension feels equal. Secure the chain anchor position with the nuts on its back side, index 8, in Illustration 7. Remove temporary shim plates.

17. Replace "H" frame, access covers, floorboard and mast cap. Plug in connector for DMSR and DMSL at lower rear of platform.

18. Run operational check.

SECONDARY CHAIN REPLACEMENT
2995 mm (118 in.) Lift Height Only
Refer to Illustration 8

1. Raise platform from service panel until cable track mounting to third stage is visible. Block mast and remove track from third stage mast. Pull track down slightly so that the studs are below mounting plate.

2. Remove blocks and lower platform to a height of approximately 915 mm (36 in.) above the ground (measured to the top of rear skirt) and re-block the mast. Turn key switch off and disconnect batteries. Disconnect CA101, CA102 and cable clamps on platform. Drop cable down through holes in platform. Remove cable track from platform.

3. Remove chain from platform chain anchors (index 47).

4. Remove guides and shims from lower left and right side of platform. Remove cable clamp from left and right side of 3rd stage mast. Pull cable and track down from in between platform and 3rd stage mast. Lift platform off of 3rd stage mast using straps and a crane.

5. Remove guides and shims between third and second stage masts, top and bottom, including “J” shaped groove cable guides.

6. Attach another equal length section of chain or wire with an object on the end to each chain with a wire.

7. Attach third stage lifting tool or similar across top of the third stage. Lift third stage with a crane and hook attached to lifting tool until secondary chain mounting on second stage mast is visible.

8. Remove cotter pin (index 38) and mounting pin (index 37) from second stage mast for each chain.

9. Attach one end of new chain to the second stage mast using mounting pin and cotter pin from step 8. Attach other end of chain to existing chain with a wire. Pull on object at the end of wire or spare chain until new chain is taunt.

10. Lower third stage mast, making sure new chain feeds over pulleys until third stage comes to rest when primary chain is fully tensioned.

11. Install cable guides and pull cables tight over studs and clamp to third stage, maintaining tension. Refer to section M4.0 for control cable installation and tensioning.

12. Install corner guides at top of third stage mast and place platform back on vehicle.

13. Feed cable track back up in between third stage mast and platform mast. Attach cable track to platform, connect CA101 and CA102. Pull any slack in dynamic cable into platform and install cable clamps to platform.

14. Install shims at lower left and right of platform. Refer to section M7.0 for proper mast alignment.

15. Connect batteries and raise platform from service panel. Block platform and attach cable track to third stage mast mounting plate.

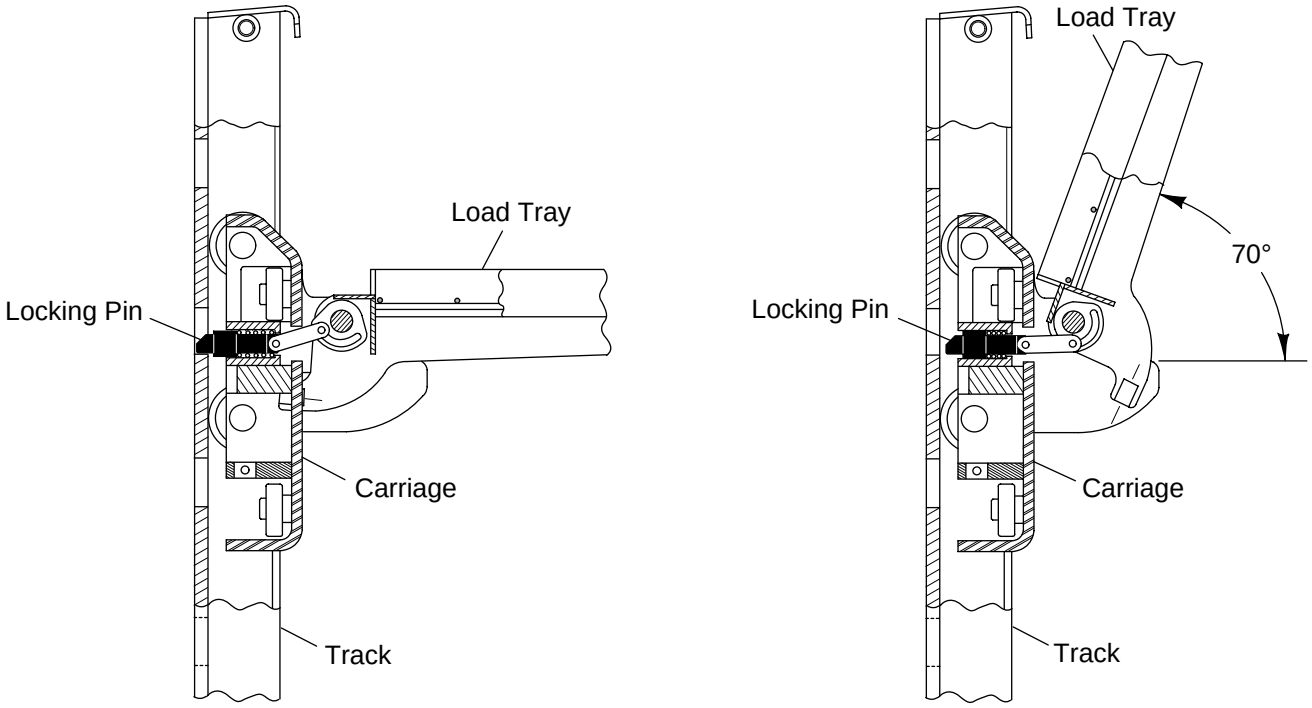
16. Remove blocks, install removed covers and run operational check.

LOAD TRAY

1. The load tray is designed to carry a maximum load of 100 lbs. (45 Ka).

2. The load tray can be adjusted up or down to four different horizontal positions.

3. The load tray can be locked in the full vertical position for better access to the load deck.



Load Tray in Locked Position

Load Tray in Un-Locked Position

6095

ILLUSTRATION 9-1

Operation

1. To move the load tray to a different position, rotate it up approximately 70° to release the locking pin as shown in Illustration 9-1 and move it up or down as desired. To lock the load tray in position rotate it back to the horizontal position. Push down at the rear of the tray to insure that the locking pin is at the bottom of the retaining slot.

2. To lock the load tray in the full vertical position. Rotate it up as far as it will go, lower until it comes in contact with the spring cushion, and then push it down to compress the spring cushion. Push the load tray under the lip on top of the track and allow it to spring back up and lock in position.

Components have been listed in chart form to assist the maintenance mechanic in locating these components on the Electrical Diagrams and Parts Breakdown forms.

The chart is in columns: COMPONENT; LOCATION; FUNCTION; DIAGRAM; PARTS BREAKDOWN. The COMPONENT (first) column contains the abbreviation of the component as it appears on the Diagrams in the Maintenance Section. The LOCATION column gives the general location on the truck such as on platform or in chassis. The FUNCTION column then explains the function or circuit of that device. The DIAGRAM column gives the page number of the diagram on which the component can be found. The PARTS BREAKDOWN column includes the parts breakdown page number on which the component is located along with the index number, in parenthesis, if applicable.

AUDIBLE INDICATORS

	Location	Function	Diagram	Parts Breakdown
ALM	Contactor Panel	Warning Alarm	DIA–2350–012 DIA–2350–015	04.1–2350–003 (3)
HN	Contactor Panel	Horn	DIA–2350–012 DIA–2350–015	04.1–2350–003 (4)

BATTERY

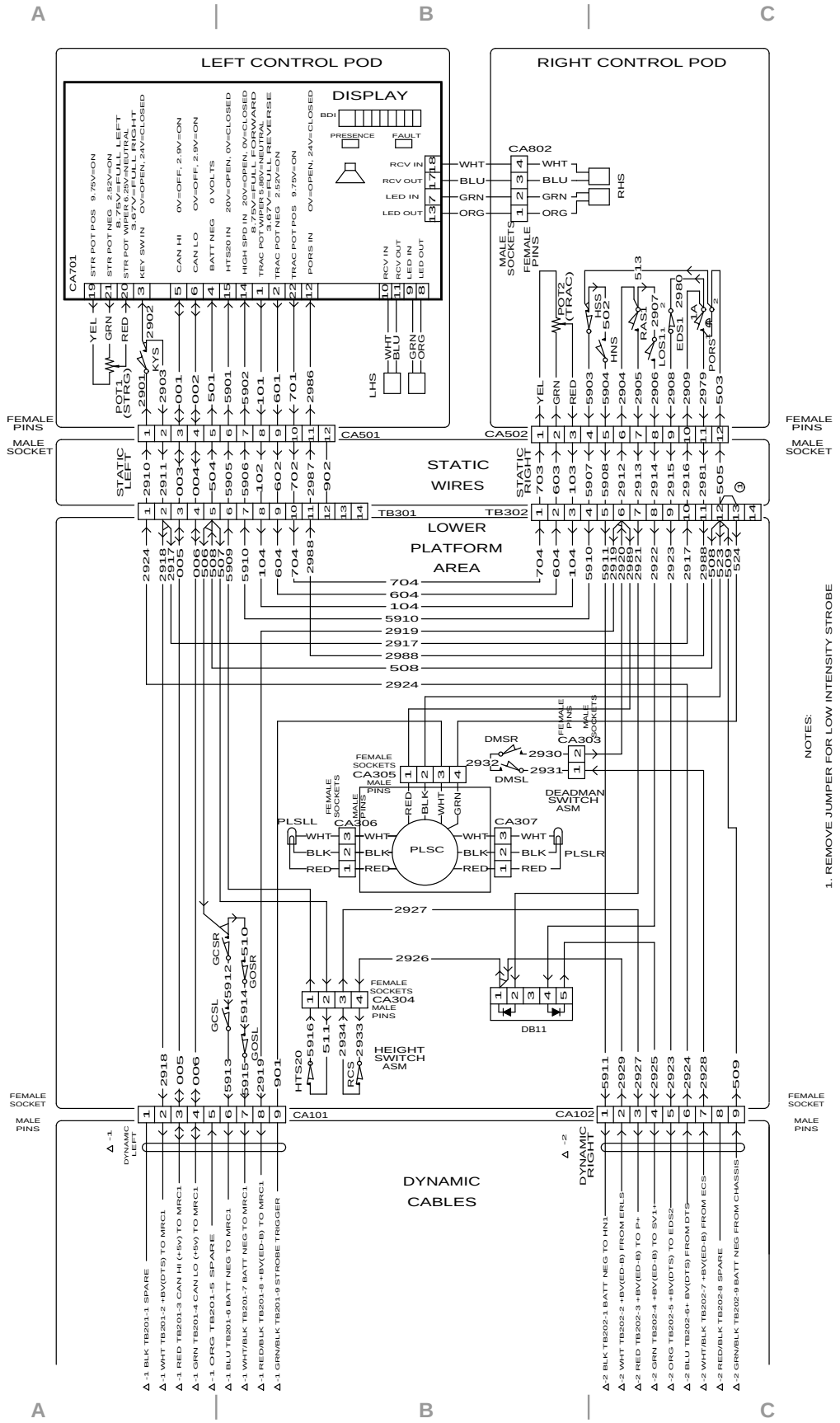
	Location	Function	Diagram	Parts Breakdown
Battery	Chassis	Power (Wet Cell) (Maintenance Free)	DIA–2350–016 DIA–2350–017	01.0–2350–001 (2)

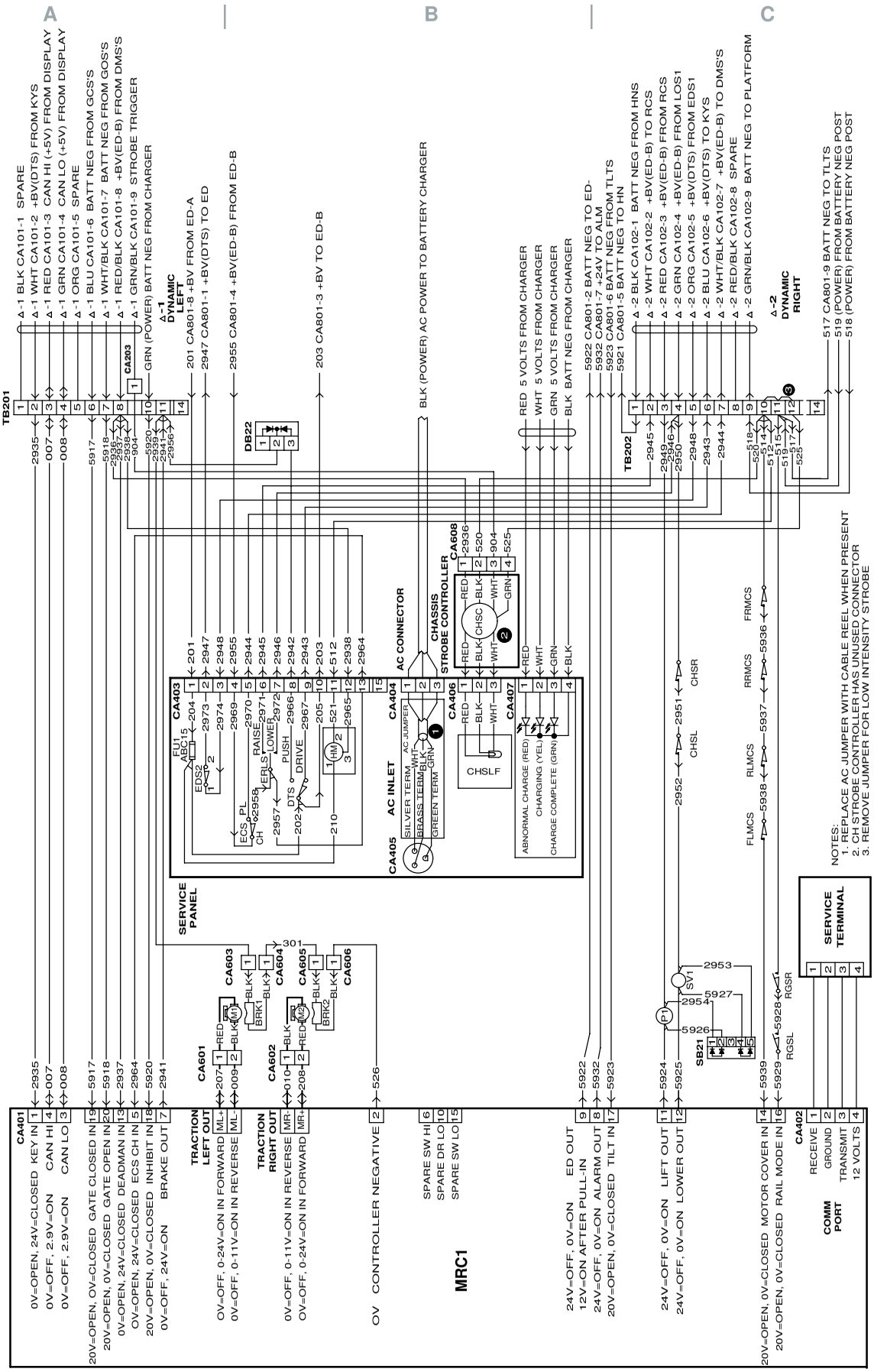
CONNECTIONS

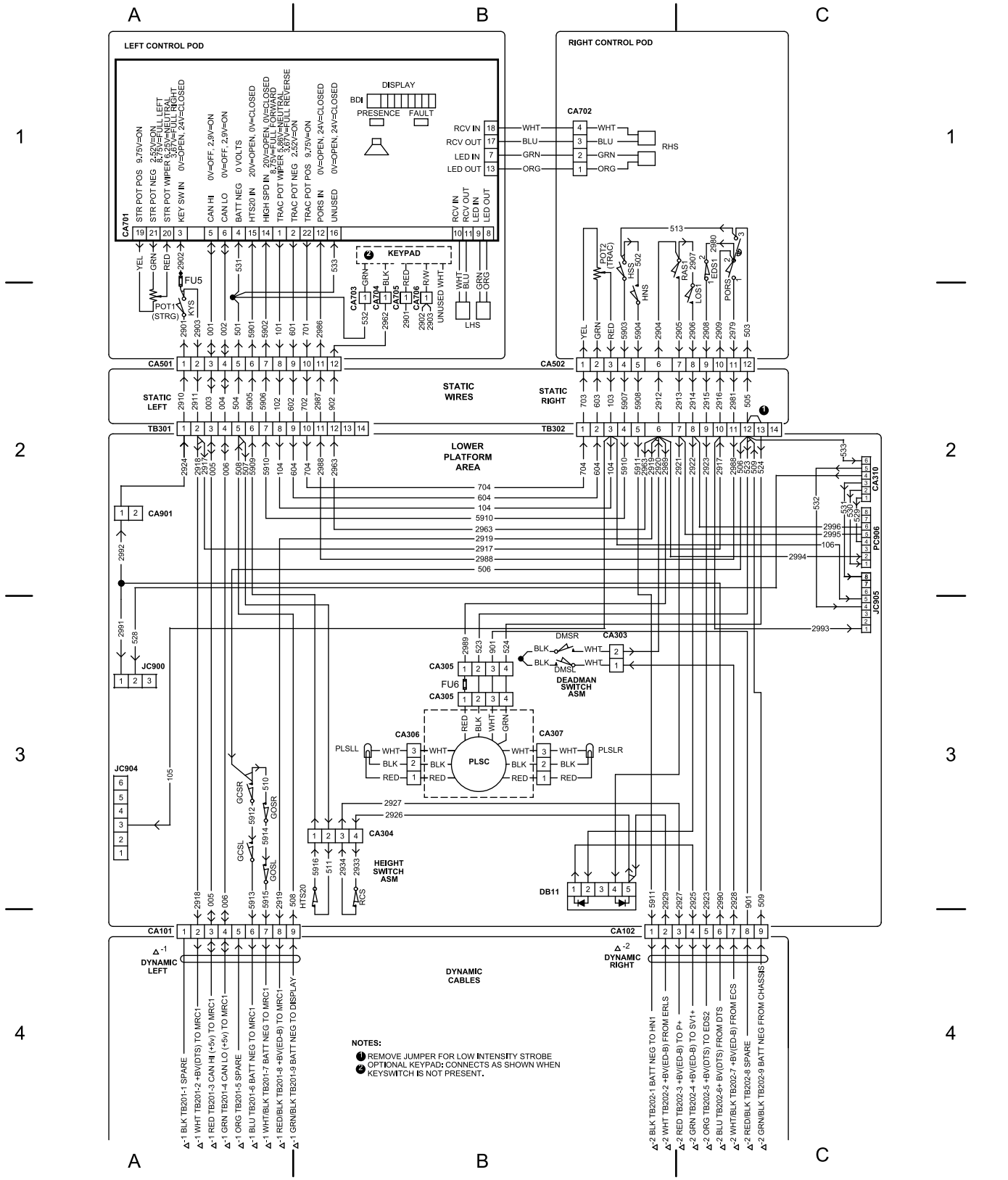
	Location	Function	Diagram	Parts Breakdown
CA101	Platform (Below Floorboard)	Dynamic (Control) Cable Termination	DIA–2350–013	04.8–2350–200 (4)
CA102	Platform (Below Floorboard)	Dynamic (Control) Cable Termination	DIA–2350–013	04.8–2350–200 (4)
CA303	Platform (Floorboard Pedals)	Foot Brake Switches	DIA–2350–013	04.8–2350–200 (4)
CA304	Platform (Directly Above Floorboard on Mast)	Mast Switches	DIA–2350–013	04.8–2350–200 (4)
CA305	Platform (Directly Above Floorboard on Mast)	Strobe Light Control	DIA–2350–013	04.8–2350–200 (4)
CA306	Platform	Strobe Light PLSLL	DIA–2350–013	
CA307	Platform	Strobe Light PLSLR	DIA–2350–013	
CA401	MRC1	System Controller	DIA–2350–014	04.8–2350–200 (1)
CA402	MRC1	CAN Communications Port	DIA–2350–014	04.8–2350–200 (4)
CA403	Service Panel	Service Panel Fuse, Switches	DIA–2350–014	04.8–2350–200 (4)
CA404	Service Panel	Charger	DIA–2350–014	04.8–2350–001 (21)
CA405	Service Panel	AC Inlet Connector	DIA–2350–014	04.8–2350–001 (13)
CA406	Service Panel	Strobe Light CHSLF	DIA–2350–014	04.8–2350–200 (4)
CA407	Service Panel	Charger LEDs	DIA–2350–014	04.8–2350–200 (20)
CA501	Steering Pod	Static Harness Termination	DIA–2350–013	04.8–2350–200 (4)
CA502	Steering Pod	Static Harness Termination	DIA–2350–013	04.8–2350–200 (4)
CA601	Chassis (Below Platform)	Left Traction Motor, M1	DIA–2350–014	04.8–2350–200 (2)
CA602	Chassis (Below Platform)	Right Traction Motor, M2	DIA–2350–014	04.8–2350–200 (2)
CA603	Chassis (Below Platform)			
CA604	Chassis (Below Platform)			
CA605	Chassis (Below Platform)			
CA606	Chassis (Below Platform)			

MISCELLANEOUS				
	Location	**Function**	**Diagram**	**Parts Breakdown**
BRK1	Traction Motor M1	Left Motor Brake	DIA–2350–020 DIA–2350–021 DIA–2350–023 DIA–2350–101 DIA–2350–102 DIA–2350–104	01.0–2350–050 (6)
BRK2	Traction Motor M2	Right Motor Brake	DIA–2350–020 DIA–2350–021 DIA–2350–023 DIA–2350–101 DIA–2350–102 DIA–2350–104	01.0–2350–050 (6)
HM	Service Panel	Truck Hour Meter	DIA–2350–020 DIA–2350–021 DIA–2350–023 DIA–2350–101 DIA–2350–102 DIA–2350–104	04.8–2350–001 (14)
R1	Chassis	Strobe Trigger Noise Supp.	DIA–2350–023 DIA–2350–104	04.8–2350–001 (20)

MOTORS				
	Location	**Function**	**Diagram**	**Parts Breakdown**
M1	Left Drive Unit	Left Traction	DIA–2350–020 DIA–2350–021 DIA–2350–023 DIA–2350–101 DIA–2350–102 DIA–2350–104	01.0–2350–050 (6)
M2	Right Drive Unit	Right Traction	DIA–2350–020 DIA–2350–021 DIA–2350–023 DIA–2350–101 DIA–2350–102 DIA–2350–104	01.0–2350–050 (6)
M3	Hydraulic Unit	Lift	DIA–2350–020 DIA–2350–021 DIA–2350–025 DIA–2350–026 DIA–2350–101 DIA–2350–102 DIA–2350–106 DIA–2350–107	02.0–2350–001 (17)
M4	Platform	Load Tray RaiseLower	DIA–2350–101 DIA–2350–102 DIA–2350–103	






LEFT CONTROL POD
RIGHT CONTROL POD
DISPLAY
KEYPAD
STATIC WIRES
STATIC LEFT
STATIC RIGHT
LOWER PLATFORM AREA
DEADMAN SWITCH ASM
HEIGHT SWITCH ASM
DYNAMIC CABLES
DYNAMIC LEFT
DYNAMIC RIGHT
PLSC
NOTES:
1 REMOVE JUMPER FOR LOW INTENSITY STROBE
2 OPTIONAL KEYPAD; CONNECTS AS SHOWN WHEN KEYSWITCH IS NOT PRESENT.