Introduction

This manual is intended for the service technician who is seeking information about maintenance and service replacement parts. It contains a section on trouble-shooting which enables a qualified technician to locate and solve problems that can occur.

Operator instructions

This manual does not contain operator instructions. The operator instructions in tag or booklet form are sent with each pallet truck. Additional copies can be ordered if required. These booklets are for you and your personnel to ensure years of safe, trouble-free operation of your Crown pallet truck. For operator instructions, see the Crown publication: Operator Manual PC 4500 Series.

Operator training

Crown produces a complete series of operator training programs available through a local Crown dealer. A complete listing of these and other available programs can also be found under Training on

Service training

Complete service training is available for the lift truck technician for all Crown lift trucks, module systems, wire guidance, hydraulic, and electrical systems. To obtain more information concerning service training, contact your local Crown dealer or under Training on

Replacement parts

When ordering replacement parts from this manual, always specify, along with part number, the model and serial number of the pallet truck. This information further enables Crown to give correct, fast, and efficient service.

For the current part number of service manuals, operator manuals, operator training programs, pallet truck capacities, and technical specifications, contact a local Crown dealer or at

This manual is arranged according to major sections including maintenance and replacement parts. The section descriptions are as follows:

Service and Parts Pages			
Maintenance		Replacement Parts	
Section	Description	Section	Description
MA	Safety	1	Power Unit Parts
M1	Inspection and Lubrication	2	Hydraulic Parts
M1.91	Componentry	3	Drive Unit Parts
M2	Hydraulic	4	Electrical Parts
M3	Drive Unit	5	Brake Parts
M4	Electrical	6	Steering Parts
M5	Brake	7	Lifting Mechanism Parts
M6	Steering	8	Cylinder Parts
M7	Lifting Mechanism	10	Accessories
M8	Cylinders	10	Labels and Decals
M10	Glossary		

Capacitance

Due to capacitance voltage present in traction motor controller, whenever performing maintenance which may permit contact with bus bars and associated power cables, discharge capacitors.

1. Move truck to a secure non traffic maintenance area with a level floor.
2. Lockout/tagout truck as described in Lockout/Tagout in this section.
3. Place a minimum 100 ohm, 2 watt resistor between positive and negative terminals of controller for 15 or more seconds.

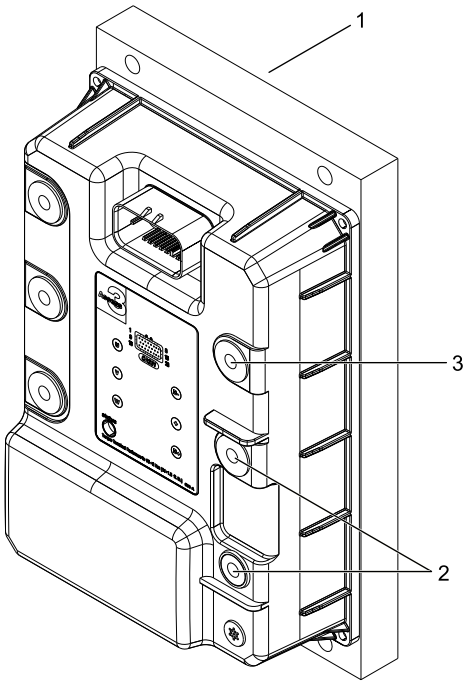


Figure 16325

(1) Traction Control Module (Access 3)

(2) Battery Positive

(3) Battery Negative

Brake

It is necessary to release the electric brake before towing the truck.

WARNING

Extreme care must be taken when using any of the following procedures to release the truck brake. The brake and the truck brake will not function when using the following procedure. The brakes can only be applied when the truck is returned to its original configuration.
During any procedure, lockout and tagout the truck as described in Battery Lockout/Tagout in this manual section.
Remove load from the truck before releasing the brake and towing.
Always perform the brake release procedure on a level surface to prevent the truck from rolling. Chock the drive wheels or make sure truck is secure before releasing the brake.
When towing the truck, make sure all operators know that the truck does not have braking capability.
Move the truck to a maintenance area and secure on a level surface.
If the truck is not returned to normal braking configuration after towing, it must remain in a Lockout/Tagout condition.

Releasing Brakes

When releasing the truck brake use extreme caution and follow the following procedure.

Releasing Brakes Using Screws

- With the truck key switch in the OFF position, insert two M6 screws 30 mm (1.18 in) long, into the brake assembly as shown in Figure 22833. Tighten both screws equally until the brake is released.

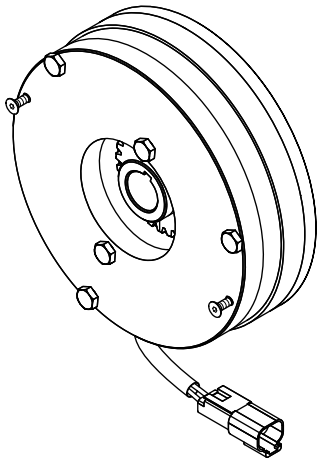


Figure 22833

Alternate Lubricants & Fluids Chart			
Type of Lubricant		Product Name	Manufacturer/ Distributor
L	Metal Assembly Spray	Dow Corning	Dow Corning
M	Silicon Grease (Clear)	Dow Corning 111 Compound	Dow Corning
N	Brake & Parts Cleaner	Crown	Crown
	Low VOC Brake & Parts Cleaner	Crown	Crown
	Non-Flammable Brake & Parts Cleaner	Crown	Crown
O	Penetrating Lubricant	Crown	Crown
P	Premium Formula Multi-Purpose Grease	Crown	Crown
Q	White Lithium Grease	Crown	Crown
R	Choke & Carburetor Cleaner	Crown	Crown
S	Contact Cleaner	Crown	Crown
T	Electrical Connector Oxidation & Corrosion Inhibitor	Nye Grease	NYE Lubricants
U	Battery Cleaner	Crown	Crown
V	Battery Protector	Crown	Crown
W	Food Grade Machinery Lubricant	Crown	Crown
X	Food Grade Silicone Spray	Crown	Crown
Y	Extended Life Coolant		

Chart 2 - Lubrication					
Index	**Component**	**Lube Type**	**Quantity**	**60 days 250 hr**	**12 months 2000 hr**
L-1	Door Hinges	F	(d)	(a)	
* L-2	ACCEL POT1 Cam & Torsion Spring	BB	(d)	(c)	
* L-3	Upper Fork Carriage Pivot (2 points)	F	(d)	(c)	
L-4	Lift Cylinder (2 points)	F	(d)	(c)	
* L-5	Riser Pivot Points (4 points)	F	(d)	(c)	
* L-6	Load Wheel Axles (4 points)	F	(d)	(c)	
* L-7	Tandem Load Wheel Pivot (4 points)	F	(d)	(c)	
* L-8	Pallet Entry Rollers	F	(d)	(c)	
* L-9	Tension Bars - 230 mm (9 in) Forks (6 points), 180 mm (7 in) Forks (4 points)	F	(d)	(c)	
* L-10	Battery Rollers	B	(d)	(a)	
(a) - Check					
(b) - Change					
(c) - Lubricate					
(d) - As Required					
See Lubrication Identification Chart for explanation and capacity. Lubrication intervals for Freezer/Corrosion trucks must be changed to a frequency that will minimize corrosion and wear on moving shafts and parts.					
* Freezer/Corrosion trucks - use low temperature (BB) grease on load wheels, caster wheels and battery rollers. Use type F grease on all other lift linkage and caster pivot points.					

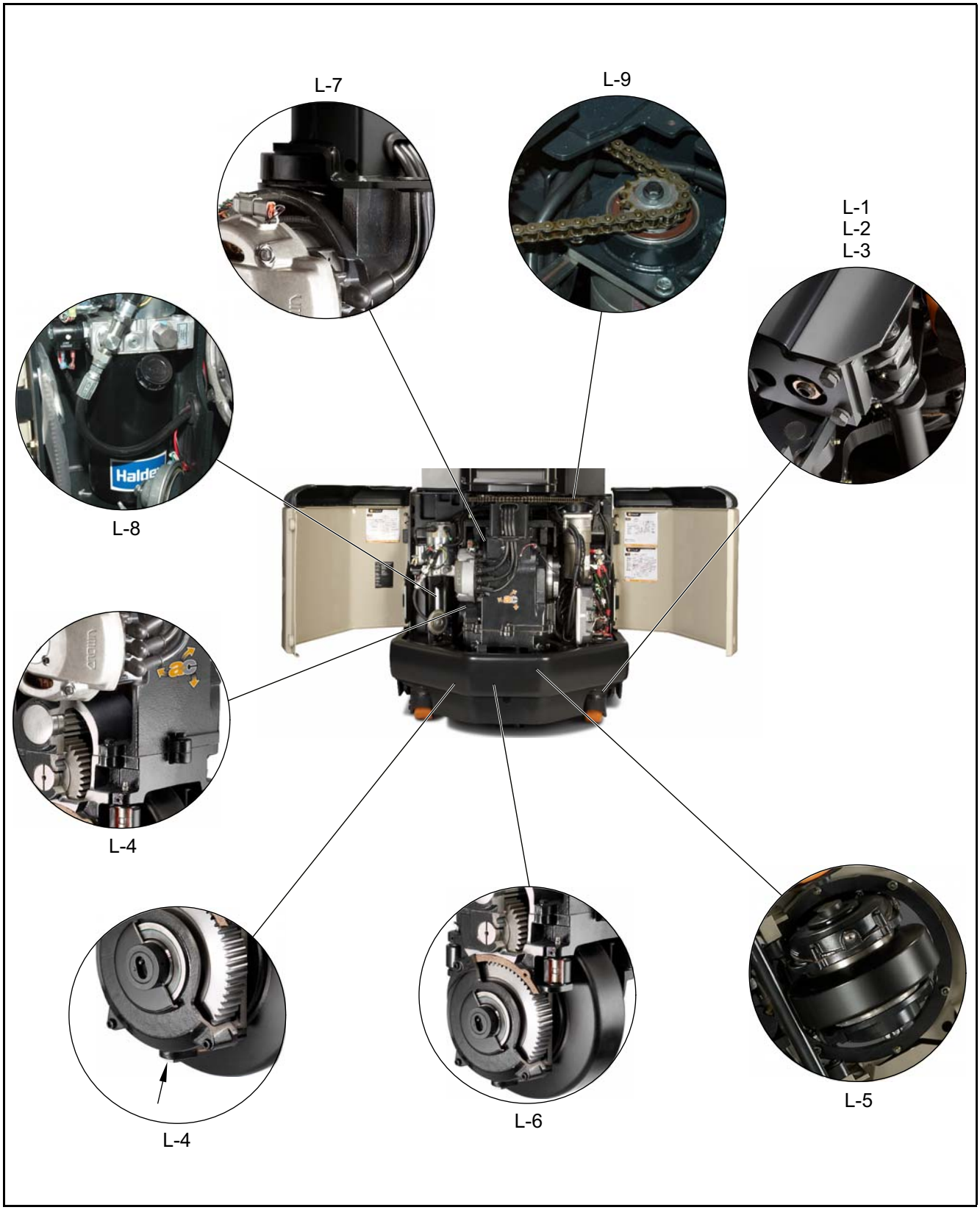


Fig. 2 (20870-01)

Fig. 7 (34769)

FU4

Control Circuitry Fuse (E-Steer)

Location: right hand side of power unit floor near ACCESS 5 (SCM)

Purpose: protect ACCESS 5 (SCM) from over current

Data: 50 A

Adjustment: N/A

Diagrams: DIA-6645-010 (A-2)
DIA-6645-019 (C-3)

Parts Breakdown: N/A

FU6

Control Circuitry Fuse (E-Steer)

Location: steer column, part of harness 145470

Purpose: protect BRK2 from over current

Data: 4 A

Adjustment: N/A

Diagrams: DIA-6645-013 (B-4)

Parts Breakdown: N/A

Miscellaneous

BRK1

Parking Brake

Location: side of drive unit, mounted to traction motor (M1)

Purpose: automatic park brake

Data: 24 VDC

Adjustment: see Brake

Diagrams: DIA-6645-002 (B-2)
DIA-6645-005 (B-3)
DIA-6645-009 (B-2)
DIA-6645-010 (B-3)
DIA-6645-012 (B-1)
DIA-6645-016 (B-3)

Parts Breakdown: 05.3-6645-001 (1)

BRK2

Handle Brake (E-Steer)

Location: steer column in steer head

Purpose: tactile feedback to operator

Data: 12 or 24 VDC

Adjustment: N/A

Diagrams: DIA-6645-010 (B-2)
DIA-6645-013 (C-4)

Parts Breakdown: 06.0-6645-100 (7)

PT1

Pressure Transducer

Location: hydraulic lift pump, left hand side of power unit

Purpose: provide approximate weight measurement information on forks

Data: 30 VDC

Adjustment: N/A

Diagrams: DIA-6645-002 (B-2)
DIA-6645-004 (A-1)
DIA-6645-009 (B-2)
DIA-6645-010 (B-1)
DIA-6645-014 (A-1)
DIA-6645-015 (A-1)

Parts Breakdown: 02.0-6645-001 (8)

Resistors

RES8

Freezer/Corrosion Heater (E-Steer)

Location: handle brake (BRK2) in steer column

Purpose: applies heat to handle brake (BRK2)

Data: 40 watts

Adjustment: N/A

Diagrams: DIA-6645-013 (C-4)

Parts Breakdown: 06.0-6645-100 (6)

Solenoid Valves

SV1

Lower Solenoid

Location: left hand side of power unit, mounted to left hand side of reservoir

Purpose: lower forks by providing path for hydraulic fluid to reservoir

Data: 24 VDC

Adjustment: N/A

Diagrams: DIA-6645-002 (C-1)
DIA-6645-004 (C-3)
DIA-6645-009 (C-1)
DIA-6645-010 (C-1)
DIA-6645-014 (C-3)
DIA-6645-015 (C-3)

Parts Breakdown: 02.1-6540-001 (11)

DB1

Travel Alarm (ALM2) Suppressor (Optional)

Location: mounted beneath travel alarm (ALM2) on left hand side of power unit

Purpose: electrical noise suppression

Data: N/A

Adjustment: N/A

Diagrams: DIA-6645-002 (B-2)
DIA-6645-004 (C-3)
DIA-6645-009 (B-2
DIA-6645-010 (B-3)
DIA-6645-014 (B-3)
DIA-6645-015 (B-3)

Parts Breakdown: 04.8-6645-100 (19)

LMS2

Step Height Cut Out Switch with Actuator

Location: left hand side of power unit behind hydraulic pump; actuator mounts to fork weldment

Purpose: cuts out lift at an intermediate height in conjunction with actuator

Data: 24 VDC; wired normally open without metal in detection zone, activated by actuator on left hand side of fork weldment

Adjustment: see Electrical

Diagrams: DIA-6645-002 (B-4)
DIA-6645-004 (C-2)
DIA-6645-009 (C-4)
DIA-6645-010 (C-4)
DIA-6645-014 (C-2)
DIA-6645-015 (C-2)

Parts Breakdown: 04.0-6645-001 (15)
04.0-6645-001 (20)
04.0-6645-102 (34)
04.0-6645-104 (47)

LOS1

Lower Switch 1

Location: control pod

Purpose: lower forks when activated

Data: 24 V; wired normally open, pressing switch closes contacts and opens lower solenoid (SV1)

Adjustment: see Electrical

Diagrams: DIA-6645-002 (B-1)
DIA-6645-005 (B-2)
DIA-6645-009 (B-1)
DIA-6645-016 (B-2)

Parts Breakdown: 04.6-6645-003 (45)
04.6-6645-102 (56)
04.6-6645-202 (40)
04.6-6645-252 (56)

LOS1

Lower Switch 1 (E-Steer)

Location: X10 handle

Purpose: lower forks when activated

Data: 24 V; wired normally open, pressing switch closes contacts and opens lower solenoid (SV1)

Adjustment: N/A

Diagrams: DIA-6645-010 (B-1)
DIA-6645-017 (C-2)

Parts Breakdown: 04.5-6645-100 (10)

LOS2

Lower Switch 2

Location: load backrest switch pod

Purpose: lower forks when activated

Data: 24 V; wired normally open, pressing switch closes contacts and opens lower solenoid (SV1)

Adjustment: N/A

Diagrams: DIA-6645-002 (B-1)
DIA-6645-005 (B-4)
DIA-6645-009 (B-1)
DIA-6645-010 (B-1
DIA-6645-016 (B-4)
DIA-6645-017 (B-4)

Parts Breakdown: 07.9-6645-100 (3)

Lubrication Requirements

Pack the tapered roller and thrust bearings with multi-purpose grease (Crown P/N 063002-024). Coat the wear surfaces of the felt seal with a film of multipurpose grease (Crown P/N 063002-024). Apply a light coating of lubricant to the bearing bore diameter and to the bearing shaft spindle diameter. Fill grease cap with 1/4 cup of multipurpose grease (Crown P/N 063002-024) before installing. All remaining lubrication fittings to be packed with multipurpose grease (Crown P/N 063002-024) after assembly.

Torque Requirements

The nut used to secure the tapered roller bearing and thrust bearing must be torqued to 170 Nm (125 ft lb) to seat the bearings. Rotate the yoke a minimum of three turns in each direction while torquing. Then loosen the nut until free. The bearing setting as adjusted must not be disturbed. Retighten nut to 35 Nm (25 ft lb) of torque. Further tighten the nut until one of the slots in the nut and hole in the end of the spindle are aligned.

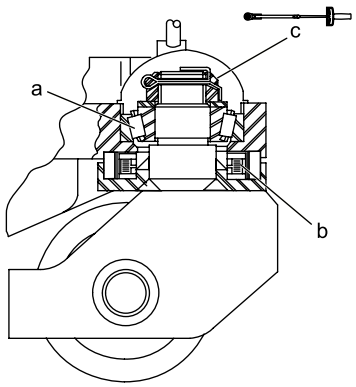


Figure 16713-01

a Tapered Roller Bearing

b Thrust Bearing

c First torque Castle Nut to 170 Nm (125 ft lb), then loosen and re-torque to 35 Nm (25 ft lb)

The spring guide bolt is to be torqued to 82 to 88 Nm (60 - 65 ft lb).

Shown adjusted for a Rubber Tire Equipped Truck

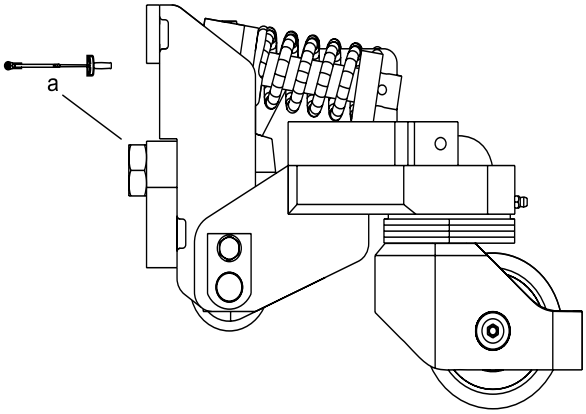


Figure 16714-01

a Torque locknut to 82 - 88 Nm (60 - 65 ft lb)

Laser

LSR1

Scanning Laser (Electronic Power Steering with QuickPick Remote Advance)

Location: top of power unit beneath laser cover

Purpose: primary detection system

Data: receives +BV from key switch (KYS) and BNEG from negative bus bar; view LSR1 input from Analyzer A2.8.3 menu

Adjustment: N/A

Diagrams: DIA-6645-029 (B-4)
DIA-6645-038 (C-3)

Parts Breakdown: 04.0-6645-500 (19)

LSR2 and LSR3

Point Lasers (Electronic Power Steering with QuickPick Remote Advance)

Location: beneath power unit, mounted to race roller

Purpose: secondary detection system

Data: receives +BV from key switch (KYS) and BNEG from negative bus bar; view LSR2 and LSR3 input from Analyzer A2.8.4 and A2.8.5 menu

Adjustment: N/A

Diagrams: DIA-6645-029 (B-3, B-4)
DIA-6645-038 (B-1, C-1)

Parts Breakdown: 04.0-6645-550 (3, 11)

SLGT1 and SLGT2

Strobe Lights (Electronic Power Steering with QuickPick Remote Advance)

Location: top of power unit beneath laser cover

Purpose: visual warning of lift truck presence when moving in a remote object sense or steer mode

Data: receives positive from key switch (KYS) and negative from ACCESS 8 (OCM); view SLGT1 and SLGT2 output from Analyzer A3.8.2 menu

Adjustment: N/A

Diagrams: DIA-6645-029 (C-3)
DIA-6645-038 (C-3)

Parts Breakdown: 04.0-6645-500 (16)

Strobe

Strobe Light Driver (Electronic Power Steering with QuickPick Remote Advance)

Location: mounted to power unit wall next to hydraulic pump motor (M2)

Purpose: provides power to strobe lights (SLGT1 and SLGT2)

Data: supplies +BV and BNEG to strobe lights (SLGT1 and SLGT2)

Adjustment: N/A

Diagrams: DIA-6645-029 (C-3)
DIA-6645-038 (C-3)

Parts Breakdown: 04.0-6645-154 (34)

Resistors

RES1

Freezer/Condition Heater

Location: control pod

Purpose: applies heat to FS switch

Data: 120 ohm, 10 watts

Adjustment: N/A

Diagrams: DIA-6645-036 (C-2

Parts Breakdown: 04.6-6645-102 (53)
04.6-6645-252 (55)

RES1

Freezer/Condition Heater (Electronic Power Steering)

Location: X10 handle, main PC board

Purpose: applies heat to main PC board

Data: N/A

Adjustment: N/A

Diagrams: DIA-6645-037 (B-1)

Parts Breakdown: 04.5-6645-100 (9)

RES2

Freezer/Condition Heater

Location: control pod

Purpose: applies heat to RS switch

Data: 120 ohm, 10 watts

Adjustment: N/A

Diagrams: DIA-6645-036 (C-2)

Parts Breakdown: 04.6-6645-102 (53)
04.6-6645-252 (55)

RES2

Freezer/Condition Heater (Electronic Power Steering)

Location: X10 handle, hydraulic PC board

Purpose: applies heat to hydraulic PC board

Data: N/A

Adjustment: N/A

Diagrams: DIA-6645-037 (B-2)

Parts Breakdown: 04.5-6645-100 (10)

RES3

Freezer/Condition Heater (Electronic Power Steering)

Location: X10 handle

Purpose: applies heat to traction accelerator potentiometer (ACCEL POT1)

Data: N/A

Adjustment: N/A

Diagrams: DIA-6645-037 (C-2)

Parts Breakdown: 04.5-6645-100 (26)

RES4

Freezer/Condition Heater (Electronic Power Steering)

Location: X10 handle

Purpose: applies heat to high speed switch (HSS)

Data: N/A

Adjustment: N/A

Diagrams: DIA-6645-037 (B-3)

Parts Breakdown: 04.5-6645-100 (11)

HSS

High Speed Switch (Electronic Power Steering)

Location: center of X10 handle

Purpose: used for operator to select *turtle* or *rabbit* speed

Data: wired normally open, held closed when turned to *rabbit*; supplies +BV input signal to ACCESS 3 (TCM); view HSS input from Analyzer A2.3.7 menu

Adjustment: N/A

Diagrams: DIA-6645-027 (A-4)
DIA-6645-028 (A-4)
DIA-6645-037 (B-3)

Parts Breakdown: 04.5-6645-100 (11)

KYS

Key Switch

Location: middle of power unit

Purpose: allows operator to power truck up and power truck down

Data: wired normally open, turning key to IGN actuates switch and applies power to appropriate circuitry; supplies +BV input signal to ACCESS 3 (TCM)

Adjustment: N/A

Diagrams: DIA-6645-026 (A-4)
DIA-6645-033 (B-2)

Parts Breakdown: 04.8-6645-100 (11)

KYS

Key Switch (Electronic Power Steering)

Location: ACCESS 1 (DM)

Purpose: allows operator to power truck up and power truck down

Data: wired normally open, turning key to IGN actuates switch and applies power to appropriate circuitry; supplies +BV input signal to ACCESS 3 (TCM)

Adjustment: N/A

Diagrams: DIA-6645-027 (A-4)
DIA-6645-028 (A-4)
DIA-6645-034 (C-2)
DIA-6645-035 (C-2)

Parts Breakdown: 06.0-6645-100 (10)

LMS1

Lift Limit Switch

Location: mounted to power unit wall next to drive unit

Purpose: cuts out lift when forks reach maximum lift

Data: supplies +BV input signal to ACCESS 3 (TCM)

Adjustment: see Electrical Switches section

Diagrams: DIA-6645-026 (B-3)
DIA-6645-027 (B-3)
DIA-6645-028 (B-3)
DIA-6645-033 (C-2)
DIA-6645-034 (C-2)
DIA-6645-035 (B-2)

Parts Breakdown: 04.0-6645-025 (3)
04.0-6645-100 (3)
04.0-6645-150 (3)

Notes:

FU6

Control Circuitry Fuse (Electronic Power Steering)

Location: steer column

Purpose: protects handle brake BRK2 from overcurrent

Data: 4 A

Adjustment: not applicable

Diagrams: DIA-6645-047 (A-2)
DIA-6645-048 (A-2)
DIA-6645-052 (B-4)

Parts Breakdown: not applicable

FU7

Control Circuitry Fuse (Electronic Power Steering with QuickPick® Remote)

Location: mounted to the power unit deck next to the horn (HN1)

Purpose: protects Access 8 from overcurrent

Data: 4 A

Adjustment: not applicable

Diagrams: DIA-6645-049 (A-2)
DIA-6645-058 (B-2)

Parts Breakdown: 04.1-6645-102

FU8

Control Circuitry Fuse (Electronic Power Steering with QuickPick® Remote)

Location: mounted to the power unit deck next to the horn (HN1)

Purpose: protects scanning laser (LSR1) from overcurrent

Data: 4 A

Adjustment: not applicable

Diagrams: DIA-6645-049 (A-2)
DIA-6645-058 (B-3)

Parts Breakdown: 04.1-6645-102

FU11 (Not Shown, Optional)

Control Circuitry Fuse (Electronic Power Steering with QuickPick® Rapid)

Location: inline fuse in the Access 6 steer head harness

Purpose: protects Access 6 from overcurrent

Data: 15 A

Adjustment: not applicable

Diagrams: DIA-6645-059 (B-3)

Parts Breakdown: not applicable

FU EWS (Not Shown, Optional)

Lithium-ion Fuse

Location: in the EWS wiring harness

Purpose: protects the EWS circuit from overcurrent

Data: 2 A

Adjustment: not applicable

Diagrams: DIA-6645-050 (C-3)
DIA-6645-051 (C-3)

Parts breakdown: not applicable

Potentiometers

ACCEL POT1

Traction Accelerator Potentiometer

Location: control handle

Purpose: provide input to Access 3™ for travel speed

Data: 5 kΩ; Access 3™ provides 12 V and negative to ACCEL POT1; 0 V DC (pedal released) to 11.4 V DC (pedal fully depressed); view ACCEL POT1 input from Analyzer A2.3.10 menu

Adjustment: see the Electrical section

Diagrams: DIA-6645-046 (C-3)
DIA-6645-056 (B-1)

Parts Breakdown: 04.6-6645-001
04.6-6645-100
04.6-6645-200
04.6-6645-250

ACCEL POT1

Traction Accelerator Potentiometer (Electronic Power Steering)

Location: X10® Handle, assembly includes forward (FS) and reverse (RS) switches

Purpose: provide input to Access 3™ for travel speed

Data: 5 kΩ; Access 3™ provides 12 V and negative to ACCEL POT1; 0 V DC (pedal released) to 11.4 V DC (pedal fully depressed); view ACCEL POT1 from Analyzer A2.3.10 menu

Adjustment: see the X10® Handle section

Diagrams: DIA-6645-047 (C-4)
DIA-6645-048 (C-4)
DIA-6645-057 (C-1)

Parts Breakdown: 04.5-6645-100

POT2 and POT3

Steer Command Potentiometers 1 and 2 (Electronic Power Steering)

Location: part of the handle brake (BRK2) located in the steer column

Purpose: provides redundant input to Access 5 for steer controls

Data: 1 kΩ; Access 5 provides 5 V and negative to POT2 and POT3; view POT2 and POT3 inputs from Analyzer A2.5.4 and A2.5.5 menus

Adjustment: not applicable

Diagrams: DIA-6645-047 (B-2)
DIA-6645-048 (B-2)
DIA-6645-052 (C-4)

Parts Breakdown: 06.0-6645-100

POT4

Steer Tire Position Potentiometer (Electronic Power Steering)

Location: drive unit above the traction motor (M1) inside the knuckle

Purpose: provide input to Access 5 for steer feedback

Data: 5 kΩ; Access 5 provides 5 V and negative to POT4; view POT4 input from Analyzer A2.5.6 menu

Adjustment: not applicable

Diagrams: DIA-6645-047 (B-2)
DIA-6645-048 (B-2)
DIA-6645-052 (C-3)

Parts Breakdown: 06.0-6645-001

Relays

K EWS (Optional)

Lithium-ion Relay

Location: on the left door hinge

Purpose: provides a path for the EWS signal to be applied to the applicable access module

Data: 24 V DC

Adjustment: not applicable

Diagrams: DIA-6645-046 (A-2)
DIA-6645-047 (A-1), (A-2)
DIA-6645-050 (B-4)
DIA-6645-051 (B-3)

Parts breakdown: 04.0-6645-025
04.0-6645-100
04.0-6645-150

HNS1

Horn Switch 1

Location: control handle

Purpose: allows the operator to sound the horn

Data: wired normally open, pressing the switch closes the contacts and sounds the horn (HN1); supplies battery positive to HN1

Adjustment: not applicable

Diagrams: DIA-6645-046 (B-1)
DIA-6645-056 (B-2)

Parts Breakdown: 04.6-6645-003
04.6-6645-102
04.6-6645-202
04.6-6645-252

HNS1 and HNS2

Horn Switches 1 and 2 (Freezer Condition)

Location: control handle

Purpose: allows the operator to sound the horn

Data: wired normally open, pressing the switch closes the contacts and sounds the horn (HN1); supplies battery positive to HN1

Adjustment: not applicable

Diagrams: DIA-6645-046 (B-1)
DIA-6645-056 (B-2)

Parts Breakdown: 04.6-6645-102
04.6-6645-252

HNS1 and HNS2

Horn Switches 1 and 2 (Electronic Power Steering)

Location: X10® Handle in both travel twist grips

Purpose: allows the operator to sound the horn

Data: wired normally open, pressing the switch closes the contacts and sounds the horn (HN1); supplies battery positive to HN1

Adjustment: not applicable

Diagrams: DIA-6645-047 (B-1)
DIA-6645-048 (B-1)
DIA-6645-057 (C-1)

Parts Breakdown: 04.5-6645-001

HNS3 and HNS4

Horn Switches 3 and 4

Location: load backrest switch pod

Purpose: allows the operator to sound the horn

Data: 24 V; wired normally open, pressing the switch closes the contacts and sounds the horn (HN1); supplies battery positive to HN1

Adjustment: not applicable

Diagrams: DIA-6645-056 (B-4)
DIA-6645-057 (B-4)

Parts Breakdown: 07.9-6645-027

HSS

High Speed Switch

Location: control handle

Purpose: used for operator to select turtle or rabbit speed

Data: wired normally open, held closed when turned to rabbit speed; supplies battery positive input signal to Access 3™; view HSS input from Analyzer A2.3.7 menu

Adjustment: not applicable

Diagrams: DIA-6645-046 (B-3)
DIA-6645-056 (B-2)

Parts Breakdown: 04.6-6645-003
04.6-6645-102
04.6-6645-202
04.6-6645-252

Access 3™

Traction Control Module

Location: mounted to the power unit wall beneath the line contactor (L)

Purpose: controls traction motor (M1) operation, hydraulic lift pump motor (M2) operation via pump contactor (P) coils and parking brake (BRK1)

Data: input from Access 1 2 3® modules, operator presence switch (DMS), raise switches (RAS1 and RAS2), lift limit switch (LMS1), step switches (STPS1 and STPS2), battery retainer switches (BRES1 and BRES2), forward switch (FS), reverse switch (RS), high speed switch (HSS), brake switches (BRS1 and BRS2), key switch (KYS), step height cutout switch (LMS2), traction accelerator potentiometer (ACCEL POT1), travel speed encoder (ENC1) and traction motor temperature sensor (TS1)

Adjustment: non serviceable

Diagrams: DIA-6645-046 (B-2)
DIA-6645-047 (B-2)
DIA-6645-048 (B-2)
DIA-6645-050 (B-1)
DIA-6645-051 (B-1)
DIA-6645-060 (B-2)
DIA-6645-061 (B-2)

Parts Breakdown: 04.1-6645-001
04.1-6645-050
04.1-6645-102

Access 5

Steer Control Module (Electronic Power Steering)

Location: power unit floor in front of Access 3™

Purpose: controls the steer motor (M3) and handle brake (BRK2)

Data: input from Access 1 2 3® modules, steer command potentiometers (POT2 and POT3), handle mount switch (HMS), key switch (KYS), steer tire position potentiometer (POT4), steer motor position sensor (RPS1) and steer motor temperature sensor (TS2)

Adjustments: not serviceable

Diagrams: DIA-6645-047 (B-2)
DIA-6645-048 (B-2)
DIA-6645-052 (B-2)
DIA-6645-061 (B-3)

Parts Breakdown: 04.1-6645-052
04.1-6645-100

Access 6

Charger Module (Electronic Power Steering with QuickPick® Rapid)

Location: on the left side of the steer head

Purpose: charges the QuickPick® Rapid Fast-Charge Ring, and provides wireless communication between the pallet truck and the Fast-Charge Ring

Data: input from Access 1 2 3® modules, key switch (KYS), QuickPick® Rapid Fast-Charge Ring

Adjustments: not serviceable

Diagrams: DIA-6645-059 (C-2)

Parts Breakdown: 04.9-6645-156

Access 8

Operator Control Module (OCM) (Electronic Power Steering with QuickPick® Remote or QuickPick® Rapid)

Location: top of the Work Assist® pole

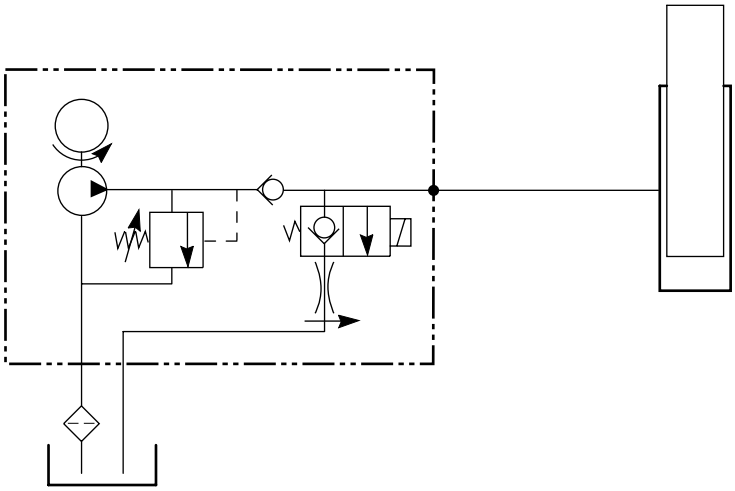
Purpose: controls horn (HN1) and strobe lights (SLGT1 and SLGT2)

Data: input from Access 1 2 3® modules, key switch (KYS), scanning laser (LSR1), point lasers (LSR2 and LSR3), and horn switches (HNS1 and HNS2)

Adjustments: not serviceable

Diagrams: DIA-6645-049 (B-2)
DIA-6645-058 (C-2)

Parts Breakdown: 04.9-6645-150



6357-01

General Installation

Tools used to install hydraulic seals should be of soft metal or suitable plastic, free of burrs and sharp edges. Screwdrivers and other similar tools should not be used as they may damage the sealing edges.

The area in contact with the seal should be free of burrs, sharp edges and nicks. If necessary to force seal over sharp edges, slots or undercuts, protective devices should be used. Light lubrication should be applied to the seal and installation groove prior to installation. The same oil as will be used later in the cylinder should be applied.

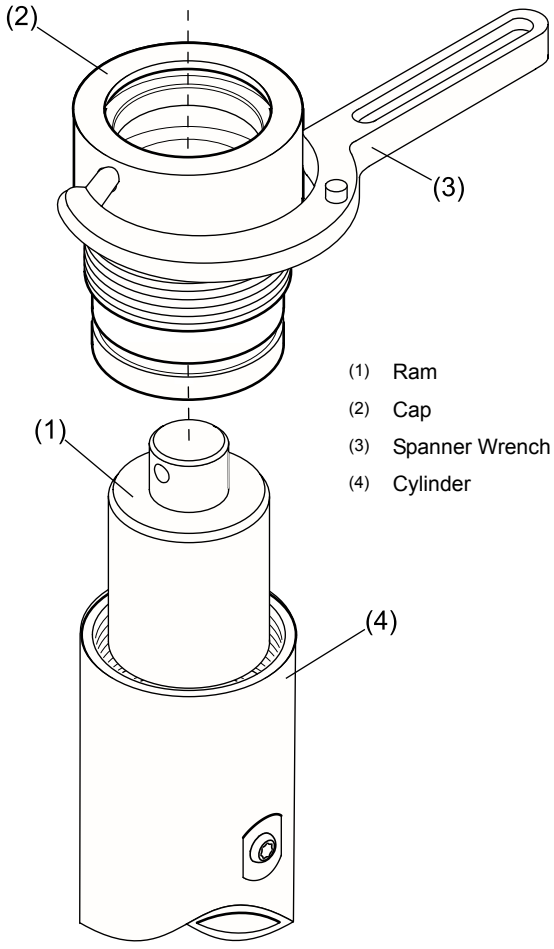


Figure 16889

11. Before installing the axle (90), lubricate with anti-seize compound (P/N 065005-007).

12. Place the slinger (89) in position over the inner axle seal. Position the wheel assembly in the housing. Install the outer slinger (89) onto the axle (90) and slide the axle through left side the bore. Align the axle splines and install the axle.
13. Make sure that the washers (92) are installed opposing each other.
14. Install the castle nut (93) on the axle (90). Torque the castle nut (93) to 68 N m (50 ft lb). Loosen the castle nut and torque to 95–122 N m (70–90 ft lb).
15. Place the wheel assembly in the housing.

Final Assembly

1. After the upper and lower drive unit halves have been assembled, insert the dowel pins (85 and 86, Figure 2) into the lower housing.
2. Lubricate the mounting surface where the housings join with the gasket sealer (P/N 065005-002).
3. Place the shims and the gasket (87 and 88, Figure 2) on the mounting surface of the lower housing and then connect the two halves together. The drive tire may need rotated to finish mating the gears.
4. Install the six lock washers and the screws (46 and 47, Figure 4) and torque the screws to 34–40 N m (25–30 ft lb).
5. Install and tighten the drain plugs (69, Figure 2) and fill the plugs with lubricant. Test the traction motor assembly for tight bearings by rotating the traction motor shaft with a torque wrench. Rotating torque must be 0.9–1.8 N m (8–16 in lb).
6. Reinstall the drive unit into the power unit by reversing the six steps described in the Drive Unit Removal section. Fasten the thrust plate (5, Figure 3) to the power unit bracket with three screws and torque to 108–122 N m (80–90 ft lb).

RAS1 and LOS1

Raise and Lower Switches

These switches are mounted on the control pod cover, and, when manually actuated, energize lift motor (in the raise mode) or the lower solenoid (in lower mode). Access to these switches is made after removing control pod cover. For adjustment procedures, see Control Pod.

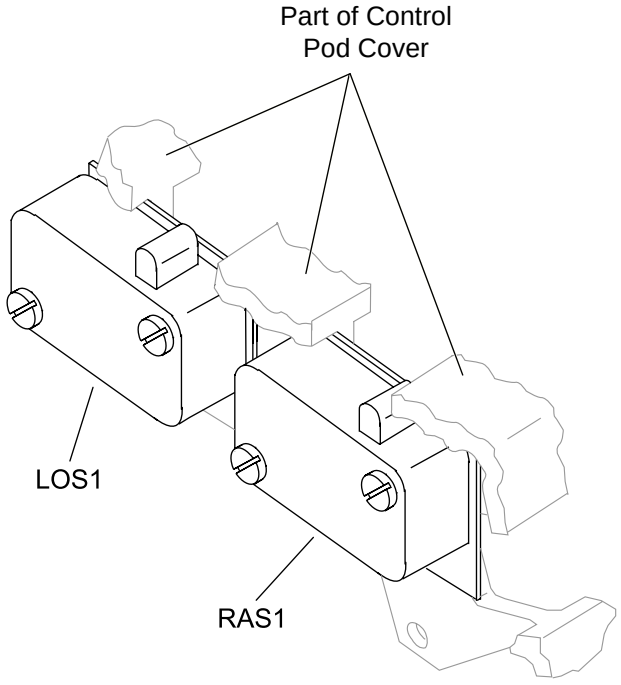


Figure 19007

RAS1 and LOS1 (E-Steer)

Raise and Lower Switches

The raise and lower switches are mounted to main bracket in X10 handle, and, when manually actuated, energize lift motor (in the raise mode) or the lower solenoid (in lower mode). They do not require adjustments.

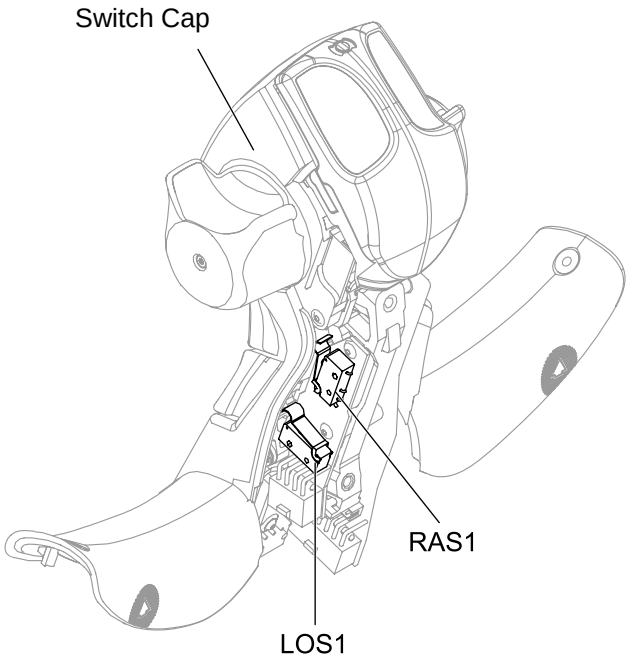


Figure 20815

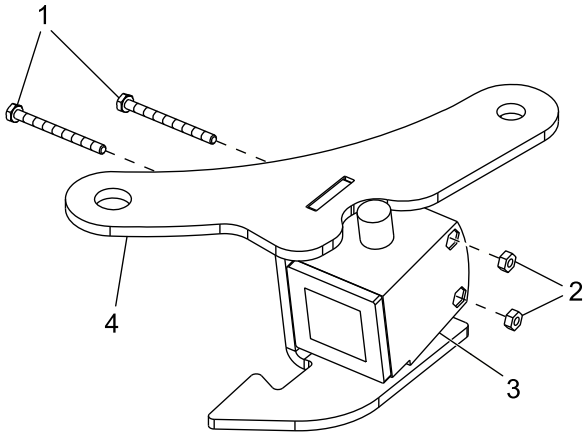


Figure 25133-01

3. Repeat the alignment procedures detailed above for LSR3.

Scanning Laser Alignment

1. With the scanning laser cover removed and the alignment tool in the same position, use the LEDs on the front of the scanning laser to facilitate alignment. Refer to Figures 25056 and 25057.

Figure 25056

1 Scanning Laser Lens
2 STOP LED
3 Q1 LED
4 Error LED
5 OK LED
6 Q2 LED
7 Seven Segment Display

Specialty Switches

Pressure Switch

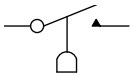


Figure 8127

Reed Switch

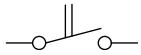


Figure 8128

Temperature Switch

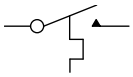


Figure 8129

Brake Fluid Switch

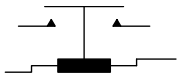


Figure 8130

Three Position Key Switch

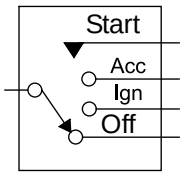


Figure 8131-01

Analyzer Menus

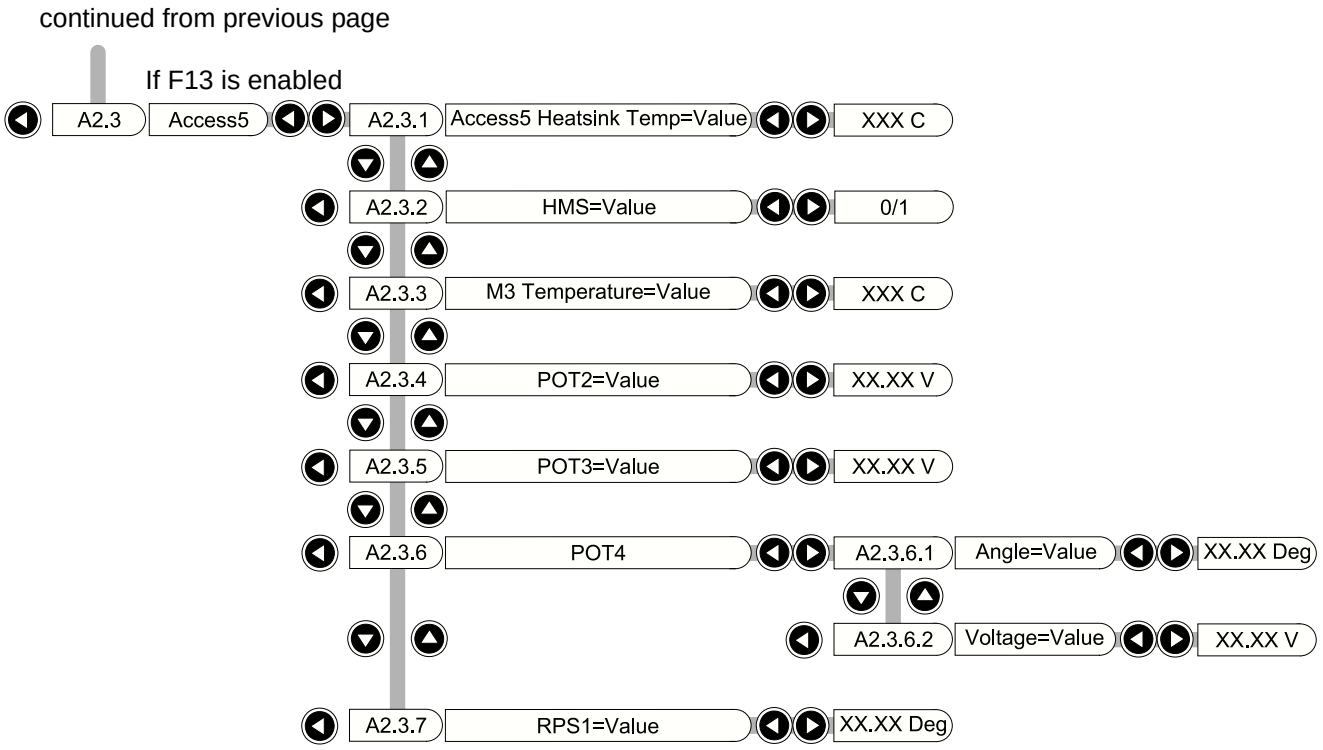


Figure 18516-01

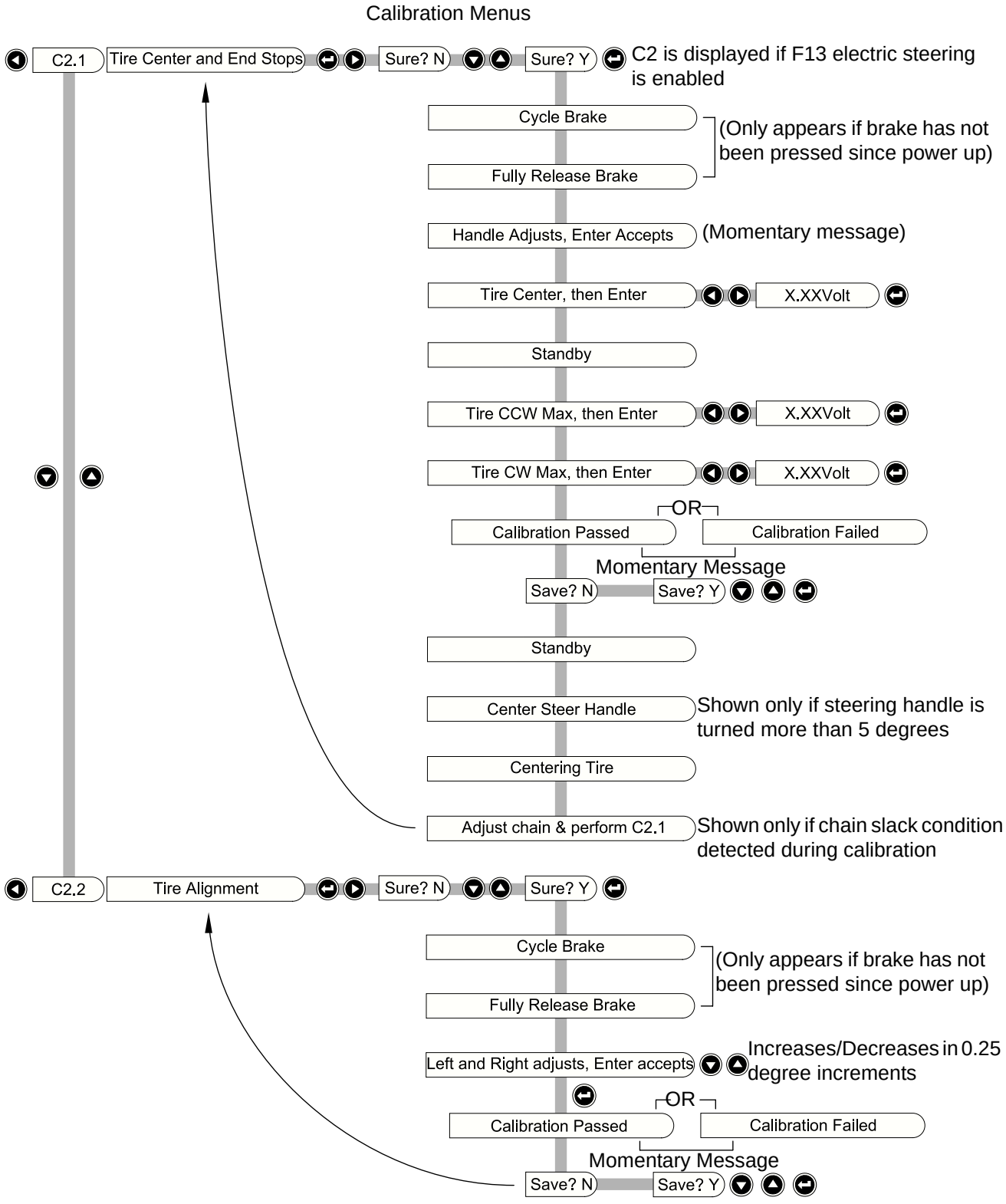


Figure 18525-01

NOTE

Do not let go of handle while turning during steering handle calibration or else calibration fill fail.

3. "Handle Fully CCW Max, then Enter" - Turn the steering handle fully counterclockwise and hold in place. Press enter/return to confirm calibration.
4. "Handle Fully CW, then Enter" - Turn the steering handle fully clockwise and hold in place. Press enter/return to confirm calibration.
5. "Handle Center, then Enter" - Ensure handle is centered in original position. Press enter/return to confirm calibration.
6. "Calibration Passed" or "Calibration Failed" - If failed, repeat process listed above and be sure to follow exact directions. If passed, go to step 7.
7. "Save? N" - Press enter/return to confirm, or press up/down arrow.
8. "Save? Y" - Press enter/return to confirm save.
9. "Calibration Accepted" - Proper calibration complete.

Press enter/return to return to C1.

C2 Drive Unit Pot - Press right arrow.

C2.1 Tire Center and End Stops - Press right arrow.

The following are descriptions of messages displayed during calibration:

1. "Sure? N" - Press up/down arrow.
2. "Sure? Y" - Press enter/return to continue.

NOTE

Steps 3 and 4 will only appear if brake has not been pressed since power up.

3. "Cycle Brake" - Cycle brake.
4. "Fully Release Brake" - Fully release brake.
5. "Handle Adjusts, Enter Accepts" - Timed message; go to step 6.
6. "Tire Center, then Enter" - Press right/left arrows to move drive tire to desired center position. Press enter/return to confirm.
7. "Tire CCW Max, then Enter" - Use the left arrow to turn the drive tire fully counterclockwise. Press enter/return to confirm.
8. "Tire CW Max, then Enter" - Use the right arrow to turn the drive tire fully clockwise. Press enter/return to confirm.
9. "Calibration Passed" or "Calibration Failed" - If failed, repeat process listed above and be sure to follow exact directions. If passed, go to step 10.
10. "Save? N" - Press enter/return to confirm, or press up/down arrow.
11. "Save? Y" - Press enter/return to confirm save.
12. "Calibration Accepted" - Proper calibration complete.

NOTE

If chain is broken, message will appear to perform C2.1. Adjust chain and perform steps listed above.

Press enter/return to return to C2.

C2.2 Tire Alignment - To fully calibrate truck when not tracking properly. Press right arrow.

The following are descriptions of messages displayed during calibration:

1. "Sure? N" - Press up/down arrow.
2. "Sure? Y" - Press enter/return to continue.

NOTE

Steps 3 and 4 will only appear if brake has not been pressed since power up.

3. "Cycle Brake" - Cycle brake.
4. "Fully Release Brake" - Fully release brake.
5. "Left and Right Adjusts, Enter Accepts" - Test tracking on truck. Press up/down arrow to increase/decrease angle in 0.25 degree increments. Press enter/return to confirm.
6. "Calibration Passed" or "Calibration Failed" - If failed, repeat process listed above and be sure to follow exact directions. If passed, go to step 7.
7. "Save? N" - Press enter/return to confirm, or press up/down arrow.
8. "Save? Y" - Press enter/return to confirm save.
9. "Calibration Accepted" - Proper calibration complete.

Press enter/return to return to C2.

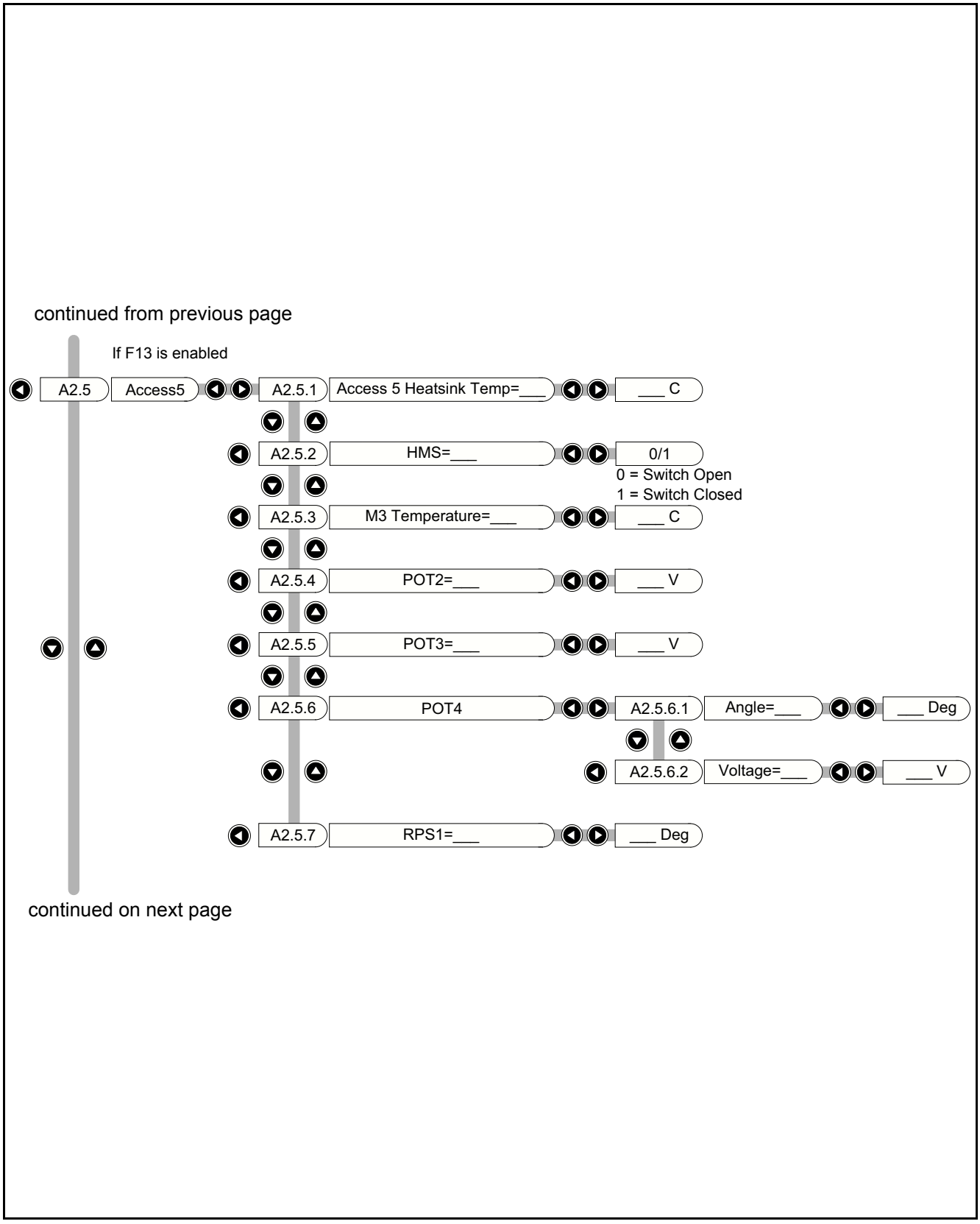
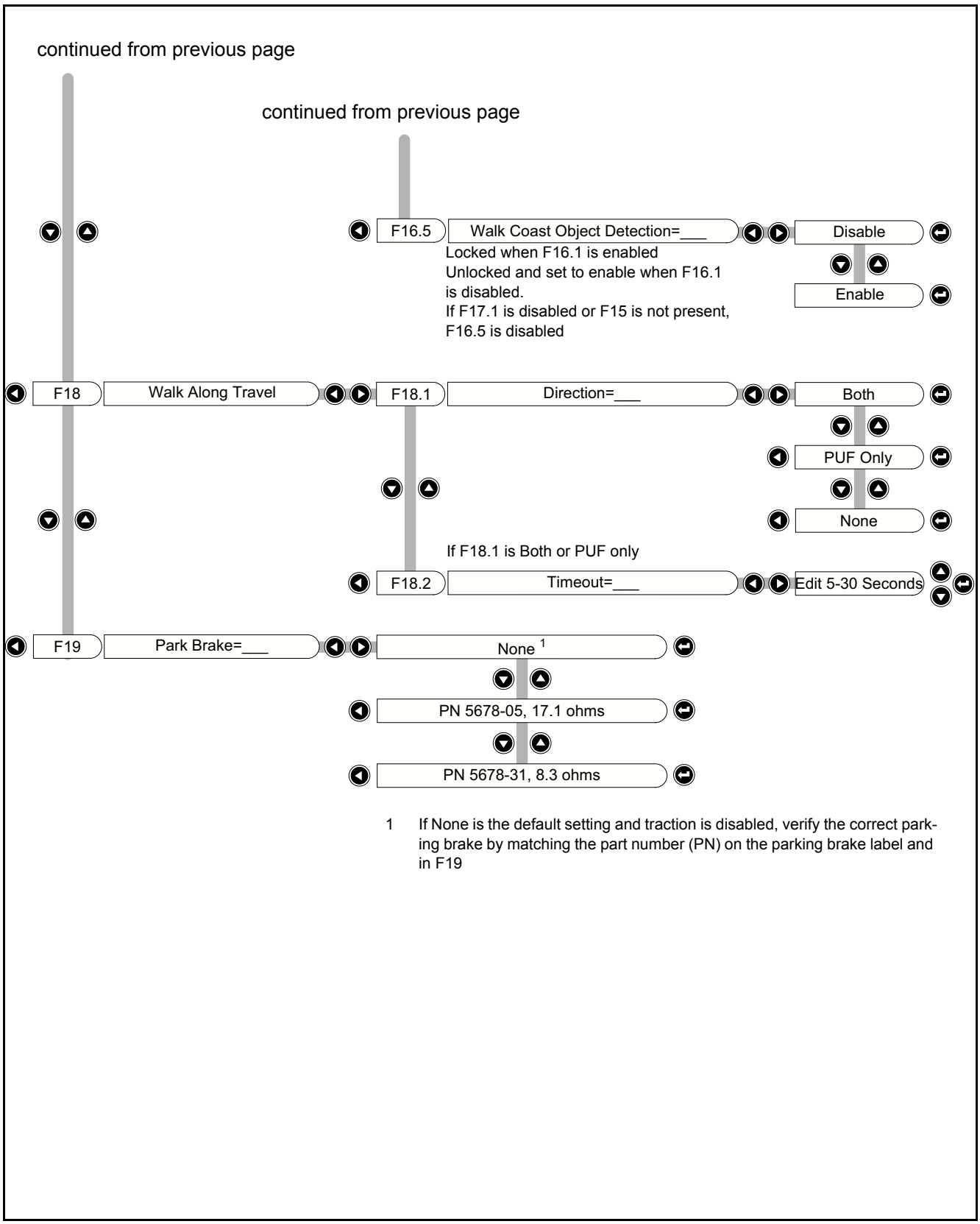

continued from previous page
If F13 is enabled
A2.5
Access5
A2.5.1
Access 5 Heatsink Temp=___
___ C
A2.5.2
HMS=___
0/1
0 = Switch Open
1 = Switch Closed
A2.5.3
M3 Temperature=___
___ C
A2.5.4
POT2=___
___ V
A2.5.5
POT3=___
___ V
A2.5.6
POT4
A2.5.6.1
Angle=___
___ Deg
A2.5.6.2
Voltage=___
___ V
A2.5.7
RPS1=___
___ Deg
continued on next page

Fig. 6 (24268)



1 If None is the default setting and traction is disabled, verify the correct parking brake by matching the part number (PN) on the parking brake label and in F19

Fig. 16 (24276-03)

Utilities Menus

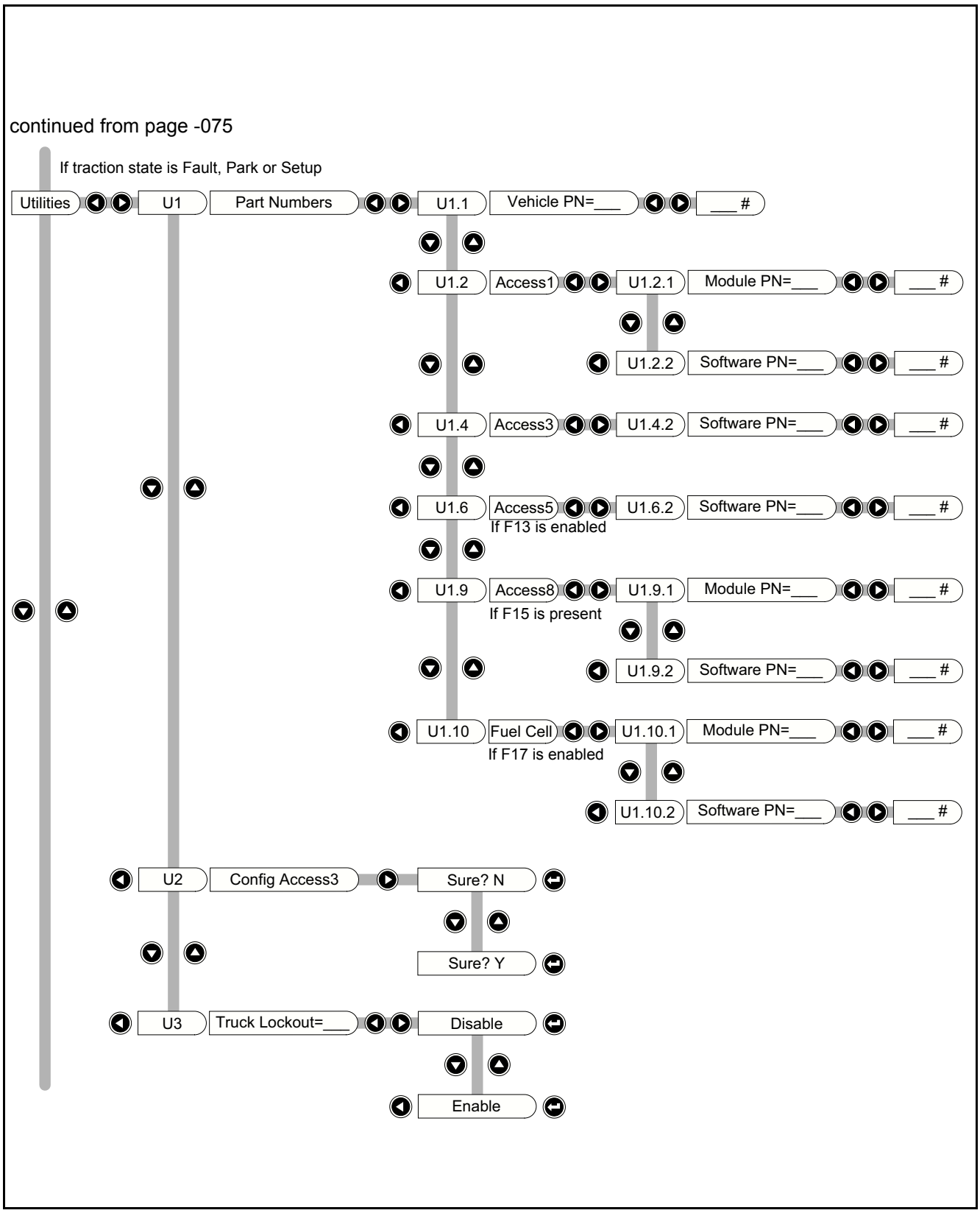


Fig. 26 (24284-01)

Use the up and down arrows to scroll to Calibration. Press the right arrow and C1 Steering Handle will be displayed.

Calibration Procedures

A full explanation of calibration procedures for each menu level follows.

C1 Steering Handle - Press the right arrow.

The following are descriptions of messages displayed during calibration:

1. "Sure? N" - Use the up and down arrow to continue.
2. "Sure? Y" - Press the enter button to continue.

Note: Do not let go of the handle while turning during the steering handle calibration or else calibration will fail.

3. "Handle Fully CCW Max, then Enter" - Turn the steering handle fully counterclockwise and hold in place. Press the enter button to confirm calibration.
4. "Handle Fully CW, then Enter" - Turn the steering handle fully clockwise and hold in place. Press the enter button to confirm calibration.
5. "Handle Center, then Enter" - make sure that the steering handle is centered in the original position. Press the enter button to confirm calibration.
6. "Calibration Passed" or "Calibration Failed" - Timed message; if failed, repeat the process listed above and be sure to follow the exact directions. If passed, go to step 7.
7. "Save? N" - Press the enter button to confirm, or use the up and down arrows to continue.
8. "Save? Y" - Press the enter button to confirm.
9. "Calibration Accepted" - Proper calibration complete.

Press the enter button to return to C1. Use the down arrow to continue.

C2 Drive Unit Pot - Press the right arrow.

C2.1 Tire Center and End Stops - Press the right arrow.

The following are descriptions of messages displayed during calibration:

1. "Sure? N" - Use the up and down arrows to continue.
2. "Sure? Y" - Press the enter button to continue.

Note: Steps 3 and 4 will only appear if the brake has not been pressed since power-up.

3. "Cycle Brake" - Cycle the brake.
4. "Fully Release Brake" - Fully release the brake.
5. "Handle Adjusts, Enter Accepts" - Timed message; go to step 6.
6. "Tire Center, then Enter" - Press the right and left arrows to move the drive tire to the desired center position. Press the enter button to confirm.
7. "Tire CCW Max, then Enter" - Press the left arrow to turn the drive tire fully counterclockwise. Press the enter button to confirm.
8. "Tire CW Max, then Enter" - Press the right arrow to turn the drive tire fully clockwise. Press the enter button to confirm.
9. "Calibration Passed" or "Calibration Failed" - Timed message; if failed, repeat the process listed above and be sure to follow the exact directions. If passed, go to step 10.
10. "Save? N" - Press the enter button to confirm, or use the up and down arrows to continue.
11. "Save? Y" - Press the enter button to confirm.
12. "Calibration Accepted" - Proper calibration complete.

Note: If a chain slack condition was detected during calibration, a message will appear to perform C2.1. Adjust the chain and perform the steps listed above.

Press the enter button to return to C2.

C2.2 Tire Alignment - To fully calibrate the lift truck when not tracking properly. Press the right arrow.

The following are descriptions of messages displayed during calibration:

1. "Sure? N" - Use the up and down arrows to continue.
2. "Sure? Y" - Press the enter button to continue.

Note: Steps 3 and 4 will only appear if the brake has not been pressed since power-up.

3. "Cycle Brake" - Cycle the brake.
4. "Fully Release Brake" - Fully release the brake.
5. "Left and Right adjusts, Enter accepts" - Test the tracking on the lift truck. Use the right and left arrows to increase or decrease the angle in 0.25 degree increments. Press the enter button to confirm.
6. "Calibration Passed" or "Calibration Failed" - Timed message; if failed, repeat the process listed

- P1 - the maximum achievable performance level with balanced productivity and energy consumption.
- P2 - reduced performance and energy; consistent performance over the battery state of charge.
- P3 - used where operational conditions require the lowest lift truck performance (for example, slick floors, novice operators, and traffic areas).

To enter this menu, turn on the lift truck. Use the up and down arrows to scroll to Performance. Press the right arrow and P1, P2, or P3 are displayed. Use the up and down arrows to view a different performance level. Once the desired level is displayed, press the enter button to select.

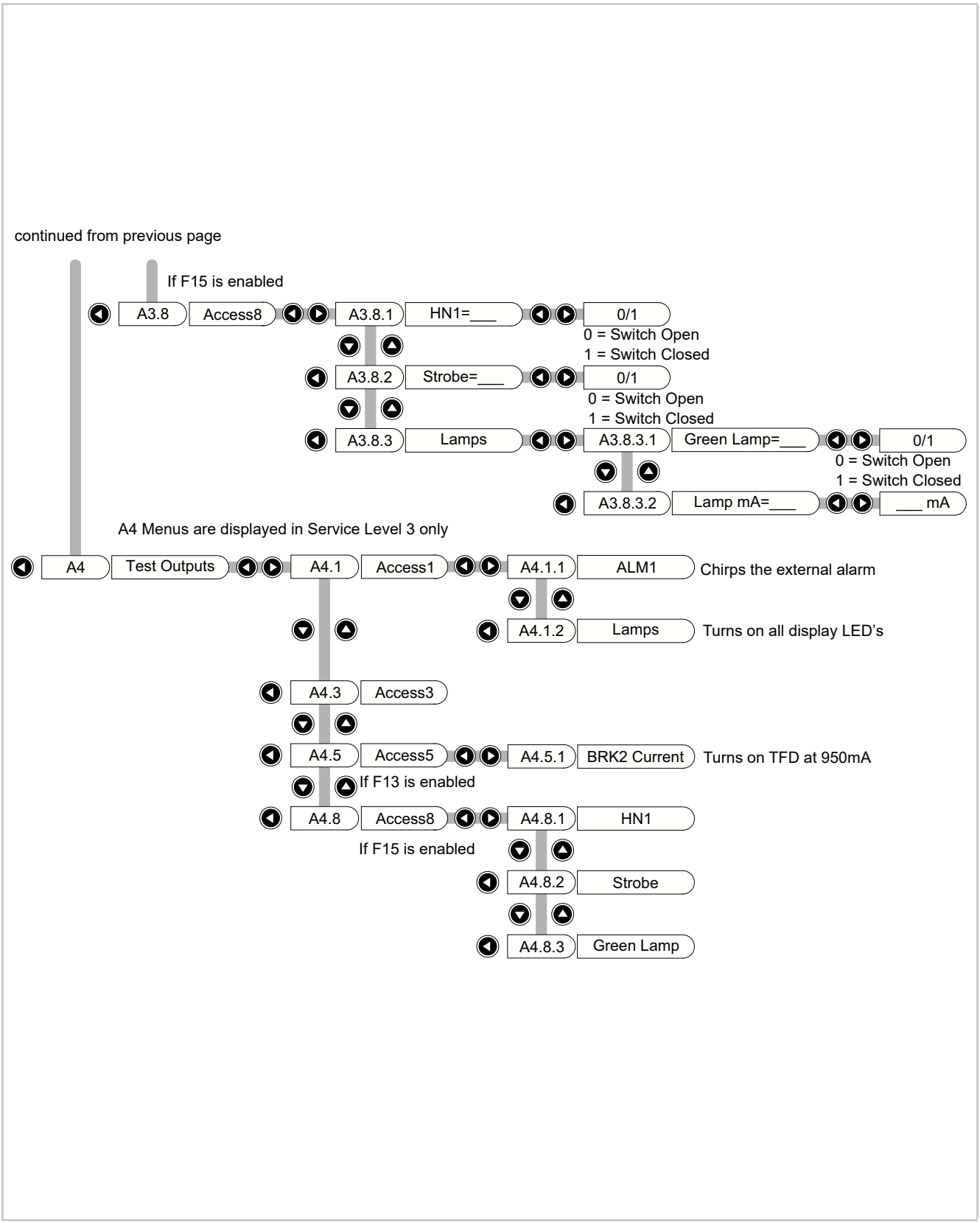

continued from previous page
If F15 is enabled
A3.8
Access8
A3.8.1
HN1=___
0/1
0 = Switch Open
1 = Switch Closed
A3.8.2
Strobe=___
0/1
0 = Switch Open
1 = Switch Closed
A3.8.3
Lamps
A3.8.3.1
Green Lamp=___
0/1
0 = Switch Open
1 = Switch Closed
A3.8.3.2
Lamp mA=___
___ mA
A4 Menus are displayed in Service Level 3 only
A4
Test Outputs
A4.1
Access1
A4.1.1
ALM1
Chirps the external alarm
A4.1.2
Lamps
Turns on all display LED's
A4.3
Access3
A4.5
Access5
A4.5.1
BRK2 Current
Turns on TFD at 950mA
If F13 is enabled
A4.8
Access8
A4.8.1
HN1
If F15 is enabled
A4.8.2
Strobe
A4.8.3
Green Lamp

Fig. 11 (34995)

Calibration Menus

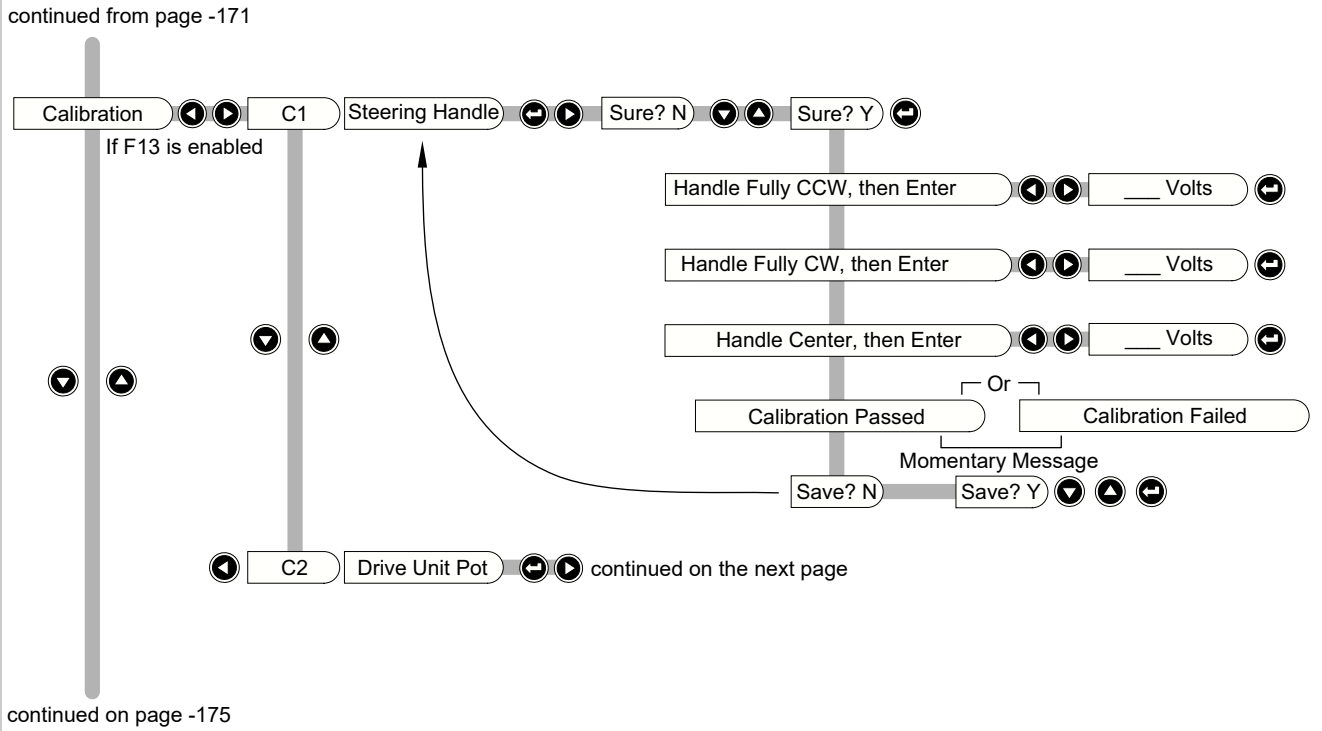


Fig. 21 (35005)

A3.3 Access 3 - View the outputs from Access 3™. Press the right arrow to view the outputs.

A3.3.1 Battery Voltage = _____ V - Current battery voltage. Use the down arrow to continue.

A3.3.2 SOC = _____ % - This menu is only available if F17.2 Level is not Level 0. Percent of battery charge remaining. Use the down arrow to continue.

A3.3.3 BRK1 = On/Off - (Parking Brake) On = parking brake is active; off = parking brake is off. Use the down arrow to continue.

A3.3.4 L = On/Off - (Line Contactor) On = contactor is energized; off = contactor is not energized. Use the down arrow to continue.

A3.3.5 M1 Amps = _____ A - (Traction Motor) Current present in the traction motor in amperes. Use the down arrow to continue.

A3.3.6 P = _____ On/Off - (Pump Contactor) On = contactor is energized; off = contactor is not energized. Use the down arrow to continue.

A3.3.7 Speed Command = _____ mph - Overall lift truck travel speed in mph. Use the down arrow to continue.

A3.3.8 Traction State = _____ - Traction system response based on traction inputs (switches and potentiometers). Traction states are: Off = 0, Fault = 1, Park = 2, PrePark = 3, Neutral = 4, LoSpdRev = 5, HiSpdRev = 6, LoSpdFwd = 8, HiSpdFwd = 9, BrakeMot = 10, BrakeAst = 11 and Setup = 12. Press the left arrow once to return to A3.3, or twice to return to A3.

A3.5 Access 5 - This menu is only available if F13 is enabled. View the outputs from Access 5. Press the right arrow to view outputs.

A3.5.1 BRK2 Current = _____ mA - (Handle Brake) Current present in the handle brake in milliamperes. Use the down arrow to continue.

A3.5.2 M3 Amps = _____ A - (Steer Motor) Current present in the steer motor in amperes. Press the left arrow once to return to A3.5 or twice to return to A3.

A3.8 Access 8 - This menu is only available if F15 is present. View the outputs from Access 8. Press the right arrow to view the outputs.

A3.8.1 HN1 = 0/1 - (Horn) 0 = horn is off; 1 = horn is on. Use the down arrow to continue.

A3.8.2 Strobe = 0/1 - 0 = strobe is off; 1 = strobe is on. Use the down arrow to continue.

A3.8.3 Lamps - Press the right arrow to view A3.8.3.1.

A3.8.3.1 Green Lamp = 0/1 - 0 = green lamp is off; 1 = green lamp is on. Use the down arrow to continue.

A3.8.3.2 Lamp mA = _____ mA - Current present in lamp in milliamperes. Press the left arrow once to return to A3.8.3, twice to return to A3.8 or three times to return to A3.

A4 Test Outputs - This menu is only available in Service Level 3. Test the outputs of monitored lift truck components. Press the right arrow to test the outputs.

A4.1 Access 1 - Test the outputs from Access 1. Press the right arrow to test the outputs.

A4.1.1 ALM1 - (Operator Alarm) Press the enter button to sound the operator alarm. Use the down arrow to continue.

A4.1.2 Lamps - Press the enter button to turn on all display LEDs. Press the left arrow once to return to A4.1 or twice to return to A4.

A4.3 Access 3 - Test the outputs from Access 3™. There are no outputs to test. Use the down arrow to continue.

A4.5 Access 5 - This menu is only available if F13 is enabled. Test the outputs from Access 5. Press the right arrow to test the outputs.

A4.5.1 BRK2 Current - (Handle Brake) Press the enter button to turn on the tactile feedback device (TFD) at 950 mA. Press the left arrow once to return to A4.5 or twice to return to A4.

A4.8 Access 8 - This menu is only available if F15 is present. Test the outputs from Access 8. Press the right arrow to test the outputs.

A4.8.1 HN1 - (Horn) Press the enter button to sound the horn. Use the down arrow to continue.

A4.8.2 Strobe - Press the enter button to turn on the strobe light. Use the down arrow to continue.

A4.8.3 Green Lamp - Press the enter button to turn on the green lamp. Press the left arrow once to return to A4.8, twice to return to A4, or three times to return to the Analyzer Menu.

Features

The following Features Menu descriptions describe how to activate available lift truck hardware and, often, sets up parameters as to when to use that hardware.

Features Access

Turn on the lift truck. Use the up and down arrows to scroll to Service. Press the right arrow to enter Level 2.

U1.10.2 Software PN = ____ - Displays the software part number of the fuel cell. Press the left arrow once to return to U1.10 or twice to return to U1. Use the down arrow to continue.

U1.11 Laser - This menu is only available if F15 is present. This menu displays the software part number of the scanning laser.

U1.11.2 Software PN = ____ - Displays the software part number of the scanning laser. Press the left arrow once to return to U1.11 or twice to return to U1. Use the down arrow to continue.

U1.12 QuickPick Rapid - This menu is only visible if the Fast-Charge Ring is paired with the lift truck. View the BLE firmware, BLE address, ring firmware, and ring address. Press the right arrow to view the part numbers.

U1.12.1 BLE Firmware = ____ - Displays the BLE firmware number. Use the down arrow to continue.

U1.12.1 BLE Address = ____ - Displays the BLE address number. Use the down arrow to continue.

U1.12.1 Ring Firmware = ____ - Displays the Fast-Charge Ring firmware number. Use the down arrow to continue.

U1.12.1 Ring Address = ____ - Displays the Fast-Charge Ring firmware number. Use the down arrow to continue.

U2 Config Access 3 - Configures the Access 3™ module. If an Access 3™ module is replaced by another, the previously configured settings are not retained. This menu allows the settings to be sent from the Access 1 module to the Access 3™ module. To modify, press the right arrow and use the up and down arrows to select Sure? Y to configure, or Sure? N to keep the factory default settings. Press the enter button to accept. The menu returns to U2; use the down arrow to continue.

U3 Lift Truck Lockout = ____ - Disables or enables the lift truck lockout to prevent or allow lift truck usage. To modify, press the right arrow and use the up and down arrows to select between Disable and Enable. Press the enter button to accept. The menu returns to U3; press the left arrow to return to the Utilities Menu.

U6 Truck Serial Number - View the serial number of the lift truck. Press the down arrow to continue.

U6.1 Characters 1-2 = ____ - Displays either 6A or Not 6A. Use the down arrow to continue.

U6.2 Enter Characters 1-2 = ____ - Displayed if U6.1 = Not 6A. The range is 00–99. Press the enter button to accept. Use the down arrow to continue.

U6.3 Characters 3-4 = ____ - The range is 00–99. Press the enter button to accept. Use the down arrow to continue.

U6.4 Characters 5-8 = ____ - The range is 0000–9999. Press the enter button to accept. Use the down arrow to continue.

- While pressing horn button, pull horn switch assembly out of handle. Disconnect switch connector from harness.

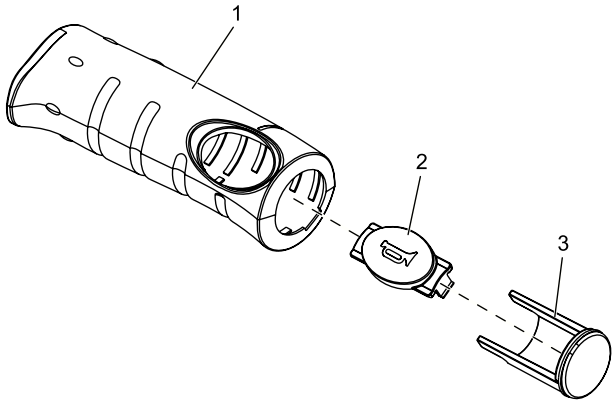


Figure 20726

1 Handle
2 Horn Switch
3 Cap

- Remove internal M5 Torx® screws and pull handles from shell.

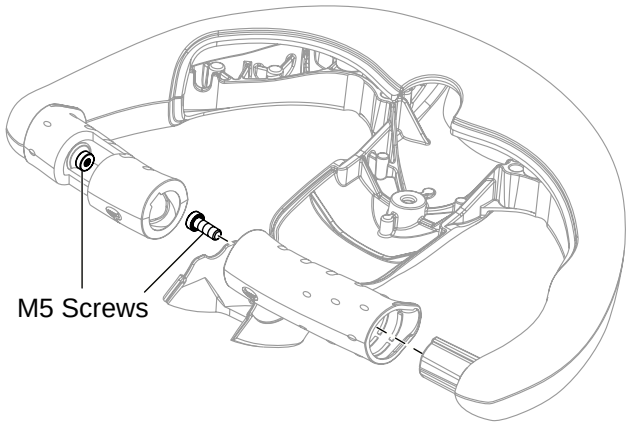


Figure 20727

- Remove the two M5 Torx® screws and the six M8 Torx® screws. Remove shells from tiller tube.

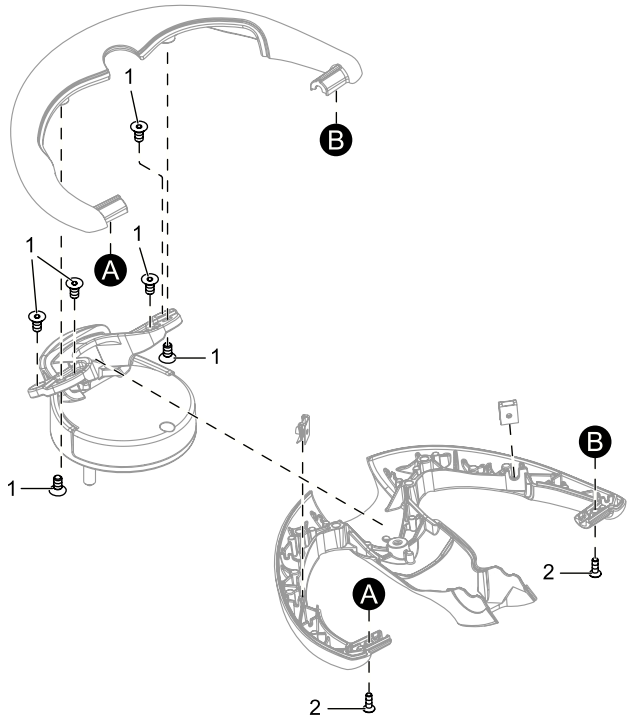


Figure 20728

1 M8 Screw
2 M5 Screw

To install shells, reverse removal steps. Be careful not to damage wiring during installation.

Motor

Check motor for shorts between terminals and motor frame by use of an ohmmeter on a high resistance scale such as R x 10,000. If a reading of less than 50,000 ohms is observed, the source of trouble should be repaired before unit is placed into operation to prevent further damage.

Traction Motor Removal - For ease of turning drive unit, place truck on blocks to remove weight of truck from drive unit.

1. Disconnect battery.
2. Remove all electrical connections from motor.
3. Remove electric brake assembly.
4. Remove two bolts accessible from motor side in drive unit.
5. Support motor and remove two bolts from brake side.
6. Remove motor.

To Install Motor

1. Lubricate seal in drive unit housing.
2. Install new gasket on motor end bell (use gasket sealer as required).
3. Install motor and secure with mounting bolts.
4. Install electric brake assembly. Torque electric brake bolts to 11 to 14 Nm (8 to 10 ft lb).

Lift Motor and Brush Inspection

1. Disconnect battery.
2. Clean brush band area and remove brush band.
3. Clean dirt and carbon dust from winding and brush holder with low pressure air. Use a clean, dry cloth to clean commutator. (Do not use emery cloth.)
4. Brushes should be replaced when they reach a length of 10 mm (0.375 in) or will reach that length before the next scheduled inspection.
5. Check brush springs to see they maintain tension against the commutator equally on all brushes.

Typical Current Readings (Amps)

Amp readings should be taken under the following conditions:

Travel - empty; take reading at full travel speed.

Lift - empty; take reading while raising.

Lift Relief - take reading while lift pump is at relief.

Power Steering Idle - take reading while truck is stopped and no other functions are operating.

Power Steering Relief - take readings while turning the steering tight against the stops and holding it there.

PC 4500 Series Current Amp Readings			
Capacity	Travel	Lift-Empty	Lift Relief
2720 kg (6000 lbs)	85-110	85-105	180-210
3630 kg (8000 lbs)	85-110	90-110	195-225

Event Code 125

ACCESS 1 Lost Communication with ACCESS 5

ACCESS 1 has lost communication with ACCESS 5. This can occur at power up, or while in operation.

Step 1: Key truck OFF and verify integrity of all CAN wiring, including termination resistances, shorts to +B V, B- and frame.

Step 2: Check that ACCESS 5 is staying powered by checking for +B V at pin CA202-1. Key truck ON.

- If: Issue still exists.
  - Then replace ACCESS 5.

Step 3: Issue continues.

- If: Issue still exists.
  - Then replace ACCESS 1.

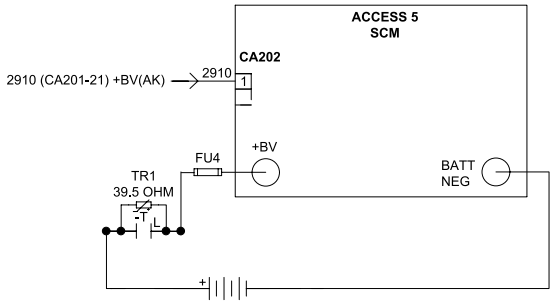


Figure 21168

Event Code 129

Handle Brake (BRK2) Sensor Error

Steer potentiometers (POT2 or POT3) voltage for steer command in the tactile feedback device (TFD) for the handle brake (BRK2) were detected to be out of range from the calibrated values.

Step 1: Key truck OFF and check wiper wire integrity to ACCESS 5 pin CA202-7. An open on this wire will cause Event Code 123 (in combination with Event Code 129).

Step 2: Check logic negative wire integrity to ACCESS 5 pin CA202-4. An open on this wire will cause Event Code 123 (in combination with Event Code 129 and Event Code 124).

- If: Event Code 129, 123 and 124 thrown in combination with each other.
  - Then check +5 V logic supply at CA421.
- If: No wiring issues found with steer potentiometer (POT2) and Event Codes 123 and 129 are the only faults being logged (no Event Code 124).
  - Then switch wiper wires (pins CA202-10 and CA202-11) of steer potentiometers (POT2 and POT3) and see if steer potentiometer (POT2) now reads in Analyzer.
- If: Steer potentiometer (POT2) reads in Analyzer.
  - Then replace tactile feedback device (TFD) in handle brake (BRK2) and switch wiper wires back to original locations.
- If: No wiring issues found, and switching steer potentiometers (POT2 and POT3) wipers does not cause steer potentiometer (POT2) to start reading in Analyzer.
  - Then ACCESS 5 input is damaged; replace ACCESS 5.

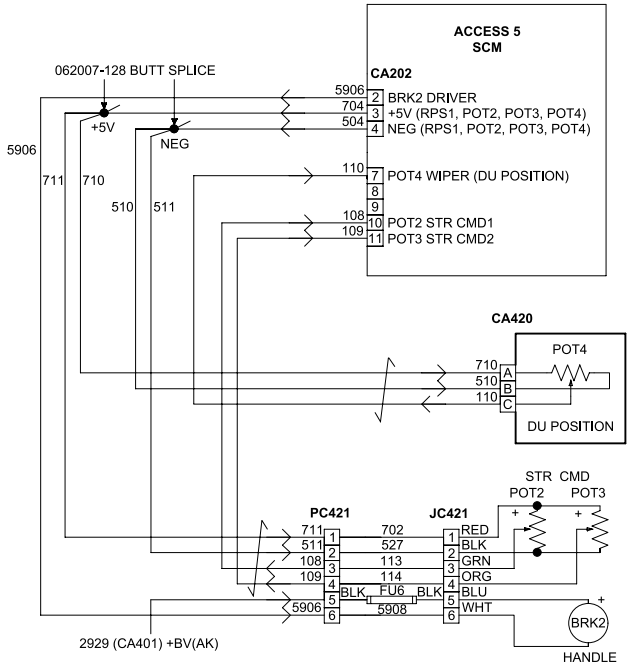


Figure 21157

Step 7: Using the ACCESS 1 Service menu (level 2 only), check for excessive current in traction motor (M1) Analyzer menu A3.2.5 due to mechanical condition of traction motor (M1), drive unit, and brakes dragging. Follow the recommendations in front of Service and Parts Manual to lift and block truck frame so that drive tire is off ground.

- If: With drive tire off the ground applying full throttle in walkie speed mode (not high speed), results in motor current above 65 A.
  - Then problem is with mechanical condition of traction motor (M1), drive unit, brakes, etc. Repair as necessary.
- If: With drive tire off the ground applying full throttle in walkie speed mode (not high speed), results in traction motor (M1) current less than 65 A.
  - Then proceed to Step 8.

Step 8: Replace ACCESS 3 (configure ACCESS 3 replacement in Analyzer menu U2).

Event Code 346

DC Bus Charging Timeout

Occurs on start-up when the software in ACCESS 3 detects that the DC Supply voltage (as measured at + and B- terminals) is too low to ensure reliable operation. If voltage is less than 23 V, this fault will log. DC Bus is normally precharged through key switch (KYS) input (CA201-1). After key ON, DC Bus must be precharged to full voltage within three seconds. Thermistor (TR1) across the line contactor (L) contacts helps to precharge the DC Bus.

Step 1: Check voltage at battery terminals with battery disconnected.

- If: Voltage is less than 23 V.
  - Then recharge or replace battery.
- If: Voltage is above 23 V.
  - Then proceed to Step 2.

Step 2: Check the condition of the battery terminals.

- If: Connections are loose or corroded.
  - Then replace the terminals.
- If: Connections are tight.
  - Then proceed to Step 3.

Step 3: Key truck OFF and check the condition of connections at line contactor (L), traction motor fuse (FU1), and B+, +, and B- terminals. Ensure terminals are torqued to 9.6 Nm (85 in lb) and threads are in good condition.

Step 4: Key truck ON and check voltage loss of traction motor fuse (FU1). Measure DC voltage between B- and B+ terminals. Measure DC voltage between B- and + terminals and calculate the voltage difference between the two measurements.

- If: Traction motor fuse (FU1) voltage loss is 0.5 V or greater.
  - Then replace with a new fuse.

Step 5: Key truck OFF and measure continuity across pump raise contactor (P) power terminals with battery disconnected.

- If: Resistance measured is less than 10 ohm.
  - Then replace pump raise contactor (P).
- If: Resistance measured is greater than 10 ohm.
  - Then plug in battery, key truck ON, check the pump raise contactor (P) coil driver by checking voltage at CA201-18 using B- on the ACCESS 3 for negative reference.
- If: Voltage is less than 5 V without a raise input on CA201-10.
  - Then check wiring for pinched or shorted wires.
- If: Wires are shorted or pinched.
  - Then repair or replace wires.
- If: Wires are OK.
  - Then replace ACCESS 3. Ensure ACCESS 3 is programmed for the truck as described in Service and Parts Manual.
- If: Voltage is greater than 5 V but less than 20 V.
  - Then check wires for short to frame.
- If: Wires are shorted to frame.
  - Then repair or replace harness.
- If: Wires are not shorted to frame.
  - Then proceed to Step 6.
- If: Voltages are above 20 V and pump motor (M2) continues to run.
  - Then look for short to frame or miswire.

Step 6: Measure voltage between ACCESS 3 B- and + terminals.

- If: Voltage is above 23 V.
  - Then replace ACCESS 3 (configure ACCESS 3 replacement in Analyzer menu U2).
- If: Voltage is below 23 V.
  - Then proceed to Step 7.

Step 7: Check thermistor (TR1) (39.5 ohm) (see Figure 21186).

Event Code 525

ACCESS 5 DC Bad Random Access Memory (RAM) Cell

The software has detected a bad cell in the random access memory (RAM) internal to ACCESS 5.

Step 1: Key truck ON and reload ACCESS 5 Software.

- If: Issue still exists.
  - Then replace ACCESS 5.

Event Code 528

Steer Motor (M3) Temperature High

Steer motor (M3) temperature is above 180° C (356° F). Thermal sensor (TMP) is embedded in the motor windings and the analog input is brought into ACCESS 5.

Step 1: Check steer motor (M3) temperature in ACCESS 1 Service menu (level 2 or 3), located in Analyzer menu A2.3.3.

- If: 180° C (356° F) or above.
  - Then steer motor (M3) overheating. Proceed to Step 2.
- If: Below 180° C (356° F).
  - Then skip to Step 8.
- If: Steer motor (M3) temperature is below 180° C (356° F) but was allowed time to cool before performing service.
  - Then proceed to Step 2.

Step 2: Using the ACCESS 1 Service menu (level 2 only), check for excessive current in steer motor (M3) (Analyzer menu A3.3.2) due to mechanical condition of steer motor (M3), and steer motor (M3) gear box. Follow the recommendations in front of Service and Parts Manual to jack up and support truck frame so that drive tire is off ground.

- If: With drive tire off the floor, slowly turning the X10® handle results in a steer motor (M3) current above 10 A.
  - Then problem is with mechanical condition of steer motor (M3). Repair as necessary.
- If: With drive tire off the floor, slowly turning the X10 handle results in a steer motor (M3) current below 10 A.
  - Then proceed to Step 3.

Step 3: With battery disconnected and ACCESS 5 capacitors discharged, check for loose or bad terminal connections in three phase cables. Check at steer motor (M3) terminals and ACCESS 5 terminals.

- If: Connections are loose.
  - Then tighten to a torque of 15 Nm (11 ft lb ± 1.5 ft lb).
- If: Connection terminals are bad.
  - Then replace cables.
- If: Terminals are OK.
  - Then proceed to Step 4.

Step 4: Check for excess wear of steer motor (M3) cables. Trace the path of each three-phase steer motor (M3) cable (U, V, and W) and verify that all cables are free of abrasion or excess wear.

- If: Cables show signs of excess wear.
  - Then repair cables.
- If: Cables are OK.
  - Then proceed to Step 5.

Step 5: Check for loose connections and broken wires at ACCESS 5 connector. Visually inspect ACCESS 5 connector to ensure pins are fully seated.

- If: Bad connection found.
  - Then replace harness.
- If: No bad connections.
  - Then proceed to Step 6.

Messages After Power-Up and During Operation	
Display	**Description**
Release GO (2) (3)	Appears if one of the following occurs: BRES1 or BRES2 is open and GO is pressed. Steer column is not locked and GO is pressed. Control handle is turned more than 15° in either direction and GO is pressed. QuickPick® Remote and QuickPick® Rapid is locked out and GO is pressed. Travel twist grip is rotated and GO is pressed. Braking voltage is low and GO is pressed. Operator has exited platform and GO is pressed.
Release remote BRAKE button (2)	Appears if the travel twist grip is rotated or GO is pressed while BRAKE is also pressed
Return grip to neutral	Appears if the travel twist grip is not in neutral at start-up. If the travel twist grip is in the neutral position mechanically, check the FS and RS circuit.
Select F19 parking brake	Select parking brake in Features Menu F19.
Truck Lockout	Appears if the pallet truck has been placed in Truck Lockout (Utilities Menu U3), disabling the pallet truck operation.
xx inch Max Load Width-Press Enter (2)	Appears if the pallet truck is turned on and the operator remote has been paired. Confirm that the value shown matches the maximum load width and press Enter to confirm.
####? Y (2)	Appears if the pallet truck is turned on and operator remote has not been paired. If pairing is not desired, rotate the travel twist grip or press BRS1 to bypass the pairing process.

(1) Appears on electronic power steering pallet trucks
(2) Appears on QuickPick® Remote pallet trucks
(3) Appears on QuickPick® Rapid pallet trucks

Step 1: Turn off then turn on the pallet truck to clear the code and perform the brake test again.

- **If:** The code clears.
  - Then proceed with normal pallet truck operations.
- **If:** The code does not clear.
  - Then continue to Step 2.

Step 2: Inspect the park brake for wear or damage. See M5.0-6645-001 for park brake information.

- **If:** The brake does not meet specifications or is damaged.
  - Then replace the brake.
- **If:** An issue is not found with the brake.
  - Then inspect the ENC1 wiring.
- **If:** An issue with the ENC1 circuit is found.
  - Then repair or replace as necessary.
- **If:** No issue with the ENC1 circuit is found.
  - Then replace Access 3™.

Event Code 133

Access 1 Lost Communication with Access 6

Step 1: Turn off the pallet truck and check CAN HI and CAN LO terminals to make sure that they are fully inserted into the connectors on the back of Access 1 and Access 6.

Step 2: Check CAN lines for opens within the option harness between connectors CA430 (CAN HI: CA340-1, CAN LO: CA430-2) and CA627, and between Access 1 and Access 6.

- CAN HI =
  CA401-8 on Access 1
  CA627-10 on Access 6
- CAN LO =
  CA401-9 on Access 1
  CA627-6 on Access 6

Step 3: Connect all connectors, connect battery, turn on the pallet truck, and verify if issue still exists.

- **If:** Issue still exists.
  - Then verify Access 6 is being powered. Check for battery positive between pins CA627-2 and CA627-1.
- **If:** < Battery positive.
  - Then find open circuit.
- **If:** Battery positive, continue to Step 4.

Step 4: Check resistance between CAN HI and CAN LO terminals. With CA202 and CA401 connected and fully seated, resistance must be 59–61 Ω between CA202-15 and CA202-23, or CA401-8 and CA401-9.

- **If:** Resistance is not 59–61 Ω.
  - Then disconnect Access 1 connector (CA401) and check resistance between pins 8 and 9 on harness connector CA401. Resistance (with both CA201 and CA401 disconnected) must be 119–121 Ω.
- **If:** Resistance is not 119–121 Ω.
  - Then replace main wiring harness.
- **If:** Resistance is 119–121 Ω.
  - Then replace Access 6.

Event Code 134

Access 1 Lost Access 6 PDO2

Step 1: See Event Code 133 procedures.

Event Code 135

Access 1 Lost Access 6 PDO3

Step 1: See Event Code 133 procedures.

Event Code 136

Access 1 to Access 6 Software Mismatch

This is usually caused by incompatible software.

Step 1: Turn off then turn on the pallet truck to clear the code.

- **If:** The code clears.
  - Then proceed with normal pallet truck operations.
- **If:** The code does not clear.
  - Then install compatible software.

Event Code 138

Ring Communication Error

There is a communication error between the QuickPick® Rapid ring and the Access 6 module.

Step 1: Turn off then turn on the pallet truck to clear the code.

- **If:** The code clears.
  - Then proceed with normal pallet truck operations.
- **If:** The code does not clear.
  - Then proceed to Step 2.

Step 2: Make sure that the QuickPick® Rapid ring is fully charged.

Event Code 321

Supply (12 V) Low or High Voltage

Voltage supplied at Access 3™ pin CA201-1 is too low or supply output at Access 3™ pin CA201-3 voltage is too low.

Step 1: Check voltage at battery with battery disconnected.

- **If:** Voltage is < 17 V.
  - Then recharge or replace battery.
- **If:** Issue still exists.
  - Then check condition of battery or adjust Access 1 Performance Menu P4 again.
- **If:** Voltage is > 17 V.
  - Then proceed to Step 2.

Step 2: Check the condition of the battery terminals on both ends of battery connector.

- **If:** Connections are bad.
  - Then replace the terminals.
- **If:** Connections are OK.
  - Then proceed to Step 3.

Step 3: Check the condition of both connections at the line contactor (L). Make sure that nuts are torqued 10 N m (7 ft lb) and threads are in good condition.

Step 4: Connect the battery, turn on the pallet truck, and check voltage at Access 3™ pin CA201-1.

- **If:** Voltage is > 17 V.
  - Then proceed to Step 5.
- **If:** Voltage is < 17 V.
  - Then proceed to Step 5.

Step 5: Check condition of FU2.

- **If:** FU2 shows any damage to the element, viewing glass or terminals.
  - Then replace with a new fuse.
- **If:** No damage visible.
  - Then proceed to Step 6.

Step 6: Check voltage at Access 3™ pin CA201-3. It must be 12 V.

- **If:** Issue still exists.
  - Then proceed to Step 7.

Step 7: Connect the battery, turn on the pallet truck, and attach negative DVOM lead to battery negative on Access 3™ and positive on both sides of FU2. Check for battery positive on both sides of FU2.

- **If:** There is a difference in voltage of 0.5 V or greater.
  - Then replace with a new fuse.
- **If:** Battery positive or more on both sides of FU2.
  - Then replace Access 3™ (configure Access 3™ replacement in Analyzer Menu U2) and check battery condition.

Event Code 322

Heatsink Temperature High

Access 3™ heatsink temperature is > 115 °C (239 °F).

Step 1: Check the heatsink temperature in Access 1 Service menu (level 2 or 3), which is located in Analyzer Menu A2.3.1.

- **If:** 115 °C (239 °F) or greater.
  - Then Access 3™ is overheating. Proceed to Step 2.
- **If:** < 115 °C (239 °F).
  - Then proceed to Step 7.
- **If:** Access 3™ temperature is < 115 °C (239 °F), but was allowed time to cool before performing service.
  - Then proceed to Step 2.

Step 2: Turn off the pallet truck, disconnect battery, and discharge Access 3™ capacitors (to discharge Access 3™ capacitors, place a minimum 100-Ω, 2-W resistor between positive and negative terminals of controller for 15 or more seconds). Check for bad terminal connections on Access 3™. Check the battery positive, battery negative, U, V, W, and M1 cables. Check the FU1 terminals.

- **If:** Connections are bad.
  - Then torque the nuts to 13–17 N m (10–13 ft lb).
- **If:** Connection terminals are bad.
  - Then replace cables.
- **If:** Terminals are OK.
  - Then proceed to Step 3.

Step 3: Check for excess wear of power cables. Trace the path of each three-phase M1 cable (U, V, and W) and verify that all cables are free of excess wear. Trace the path of the battery positive and battery negative cables and verify that all cables are free of excess wear.

- **If:** Cables show signs of excess wear.
  - Then replace cables.
- **If:** Cables are OK.
  - Then proceed to Step 4.

Step 4: Check the mounting screws on Access 3™. The screws are located in each of the four corners of

Step 1: Check heatsink temperature in Access 1 Service menu (level 2 or 3), located in Analyzer Menu A2.5.1.

- **If:** 125 °C (259 °F) or greater.
  - Then Access 5 is overheating. Proceed to Step 2.
- **If:** < 125 °C (259 °F).
  - Then proceed to Step 6.
- **If:** Access 5 temperature is < 125 °C (259 °F), but was allowed time to cool before performing service.
  - Then proceed to Step 2.

Step 2: Turn off the pallet truck, disconnect battery, and discharge Access 5 capacitors (to discharge Access 5 capacitors, place a minimum 100-Ω, 2-W resistor between positive and negative terminals of controller for 15 or more seconds).

Step 3: Check for bad terminal connections on Access 5. Check the battery positive, battery negative, and U, V, W M3 cables. Check the FU4 terminals.

- **If:** Connections are bad.
  - Then torque the screws to 13–17 N m (10–13 ft lb).
- **If:** Connection terminals are bad.
  - Then replace cables.
- **If:** Terminals are OK.
  - Then proceed to Step 3.

Step 4: Check for excess wear of power cables. Trace the path of each three-phase M3 cable (U, V, and W) and verify that all cables are free of excess wear. Trace the path of the battery positive and battery negative cables and verify that all cables are free of excess wear.

- **If:** Cables show signs of excess wear.
  - Then replace cables.
- **If:** Cables are OK.
  - Then proceed to Step 5.

Step 5: Check the mounting screws on Access 5. The screws are located in each of the four corners of Access 5. Access 5 mounting screws must be torqued 9 N m (6 ft lb).

- **If:** The screws are loose.
  - Then completely disconnect Access 5 from power unit and blow or wipe module and wall surfaces clean. Put Access 5 back onto the bracket and torque to above specifications.

Step 6: Does this issue occur when Access 5 is at room temperature (after the pallet truck has been off for some time)?

- **If:** Yes.
  - Then replace Access 5.
- **If:** No.
  - Then proceed to Step 7.

Step 7: Determine if the pallet truck is under a heavy-duty cycle or high ambient temperatures.

- **If:** The pallet truck is overheating due to these conditions and performance is degraded.
  - Then allow the pallet truck to cool down.
- **If:** The pallet truck is not overheating due to the previously listed conditions.
  - Then replace Access 5.

Event Code 523

DC Bus Low-Software Detected (Low battery voltage at Access 5)

Access 5 software detects that the DC Supply voltage (as measured at Access 5 pin CA202-1) is < 12 V.

Step 1: Check voltage at battery terminals with battery disconnected.

- **If:** Voltage is < 17 V.
  - Then recharge or replace battery.
- **If:** Voltage is > 17 V.
  - Then proceed to Step 2.

Step 2: Check the condition of the battery terminals.

- **If:** Connections are bad.
  - Then replace the terminals.
- **If:** Connections are OK.
  - Then proceed to Step 3.

Step 3: Check the condition of both connections at the line contactor (L). Make sure that the nuts are torqued to 10 N m (7 ft lb) and threads are in good condition.

Step 4: Connect battery, turn on the pallet truck, and measure voltage at Access 5 pin CA202-1.

- **If:** Voltage is > 17 V.
  - Then proceed to Step 6.
- **If:** Voltage is < 17 V.
  - Then proceed to Step 5.

Step 5: Check condition of FU4.

- **If:** FU4 shows any damage to the element or terminals.
  - Then replace with a new fuse.
- **If:** No damage visible.
  - Then proceed to Step 6.

Event Code 823

Point laser (LSR3) Signal out of range (< 3.5 mA)

Software detects the signal originating from LSR3 is < 3.5 mA. The normal signal range of LSR3 is from 4–20 mA Typical cause is an open wire.

Step 1: Check connections and continuity at CA620-1, CA620-2, CA620-3, CA621-8 and CA630. Verify that the laser can be seen shining on the floor in front of the pallet truck. If not, check for battery positive supply to LSR3 at CA620-1 and CA620-2.

- **If:** Connections are faulty.
  - Then repair or replace connections.
- **If:** Connections are OK.
  - Then replace LSR3.
- **If:** Issue persists after replacing LSR3.
  - Then replace Access 8.

Event Code 824

Point laser (LSR3) Signal out of range (> 20.6 mA)

Software detects the signal originating from LSR3 is > 20.6 mA. The normal signal range of LSR3 is from 4–20 mA Typical cause is a shorted wire to frame or to battery positive. Access 8 or LSR3 can also be defective.

Step 1: Check connections and continuity at CA620, CA621-8 and CA630.

- **If:** Connections are bad.
  - Then repair or replace connections.
- **If:** Connections are OK.
  - Then proceed to Step 2.

Step 2: Enter Analyzer in the Service menu. Scroll to A2.8.5.1 (LSR3 current output). Check the current output.

- **If:** Current output is > 20.6 mA
  - Then disconnect LSR3 by opening CA620.
- **If:** Current output drops to < 1 mA
  - Then replace LSR3.
- **If:** Current output is still > 20.6 mA with CA620 disconnected.
  - Then replace Access 8.

Event Code 825

Scanning Laser (LSR1) Lost Communication with Access 8

CAN communications were lost between Access 8 and LSR1. Software does not check for this code until laser CAN communications begin, which ≈ 35 s after turning on the pallet truck. This event code will not reoccur when turning off the pallet truck and turning on the pallet truck unless there is an intermittent CAN issue. This event code is typically preceded by Event Code 843.

Step 1: Turn off the pallet truck and turn on the pallet truck. Wait 30–30 s for the start-up sequence to complete. The red STOP LED or the green OK LED on the front of LSR1 must be lit.

- **If:** Start up sequence completes and issue still exists.
  - Then proceed to Step 2.
- **If:** Start up sequence does not complete and no LEDs are lit on the front of LSR1.
  - Then check for seated terminals on both connectors at CA625-1 and check for battery positive between terminals CA625-1 and CA625-2.
- **If:** Battery positive to LSR1 is present and connectors at CA625 are intact.
  - Then replace LSR1.

LSR1 Error Codes

E1	Fatal Error
E2	Motor Error
E3	Reference Target Error

Step 2: Check the LSR1 front panel for error codes.

- **If:** Error codes are present.
  - Then turn off the pallet truck and turn on the pallet truck and check if the error codes have cleared.
- **If:** Error codes are still present after turning off the pallet truck and turning on the pallet truck.
  - Then replace LSR1.

Step 3: Turn off the pallet truck, disconnect battery, and check CAN HI and CAN LO terminals to make sure that they are fully inserted into connectors on back of Access 8 and LSR1. Check CAN lines for opens within the option harness between connectors CA625 (CAN HI: CA625-7, CAN LO: CA625-8) and CA621 (CAN HI: CA621-3, CAN LO: CA621-4). Connect all connectors, connect battery, turn on the pallet truck, and verify if issue still exists.

- **If:** Issue still exists.
  - Then proceed to Step 4.

QuickPick® Remote

WARNING

Operator training is required before using QuickPick® Remote. See the PC 4500 Operator Manual and view the applicable training video before operating the pallet truck.

WARNING

QuickPick® Remote pallet trucks are adjusted for racks with vertical or near vertical lower legs. Operating the pallet truck in a different environment could result in damage to the rack, pallet truck damage, or personal injury.

See Figure 1. The cantilever rack label (1) is on the power unit wall side facing the battery (2).

Technician Tip: To adjust the pallet truck for rack leg types other than vertical or near vertical lower legs, an authorization for modification is required. Consult the factory.

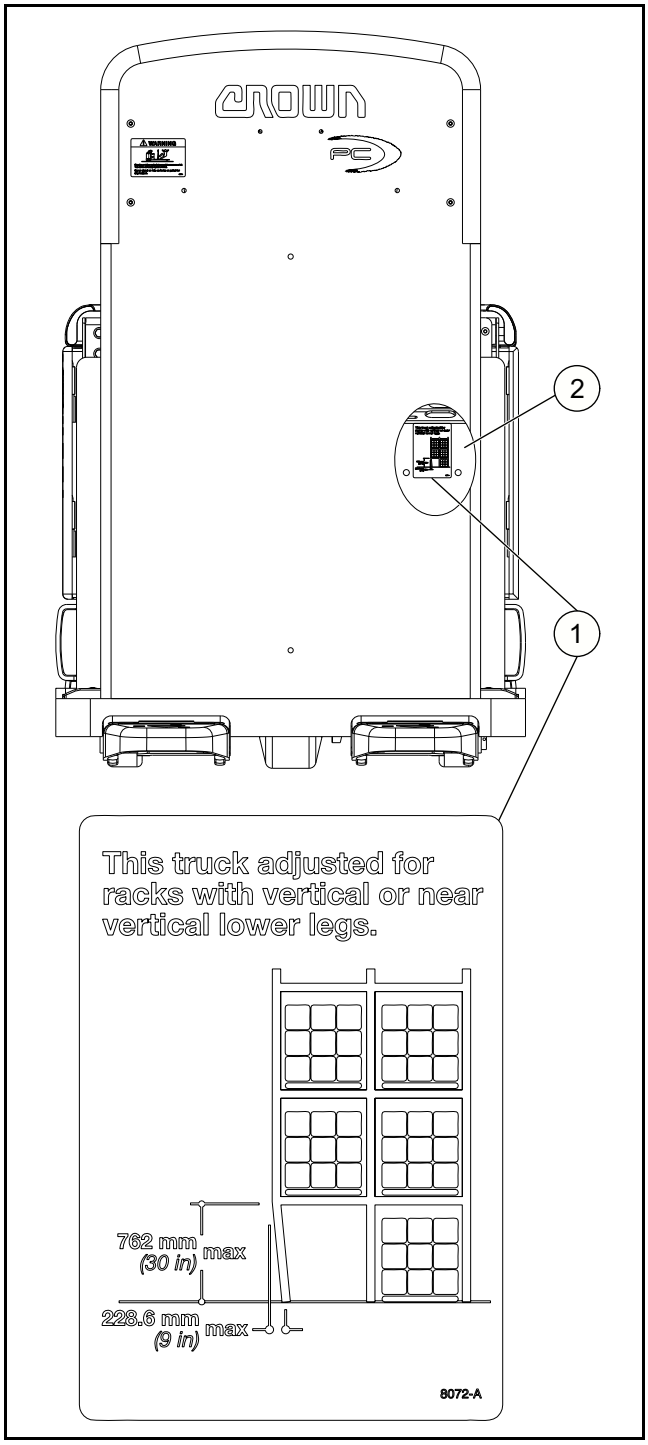


Fig. 1 (34774)

Enabling QuickPick® Rapid

Once the QuickPick® Rapid system has been installed, it must be enabled using Access 1.

1. Turn on the pallet truck.

Technician Tip: Once Service Level 2 or 3 is entered, the pallet truck must be turned off and then on to exit the Service menu.

2. On Access 1, use the up and down arrows to scroll to Service. This menu allows the operator to enter Service Levels 2 and 3. A password is required to enter these levels. Contact a local Crown dealer to obtain this password.
3. Press the right arrow and Level 2 is displayed; press the right arrow again and four blank boxes are displayed.
4. Use the up and down arrows to enter the first digit of the password.
5. Press the right arrow to move to the next digit and continue until the final digit is entered.
6. Press the Enter button to accept the password.
7. Use the up and down arrows to scroll to Features. Press the right arrow and F1 Language is displayed.
8. Use the up and down arrows to scroll to F7 User Codes. Press the right arrow to enter F7.1 Status=_____, and again until Disable is displayed.
9. Use the up and down arrows to select Enable, then press the Enter button to accept. The menu returns to F7.1.

Technician Tip: If the QuickPick® Rapid was installed in the field, F7.2 User Codes must be created and F15 Access 8=_____ must be present. Otherwise, continue to step 18.

10. Use the up and down arrows to scroll to F7.2 Codes. Press the right arrow three times.
11. Use the up and down arrows to scroll to the first digit of the four-digit user code. The range is 0000–9999.
12. Press the right arrow to advance to the next digit and continue until the last digit is entered. Press the Enter button to accept.
13. Use the up and down arrows to select the desired performance level for that user. Press the Enter button to accept.

Technician Tip: P1 is the maximum performance level, P2 is reduced performance and energy and P3 is used where operational conditions require the lowest pallet truck performance.

14. Use the down arrow to continue to the next code if necessary; up to 25 user codes can be entered.
15. Press the left arrow once to return to F7.2, or twice to return to F7.
16. Use the up and down arrows to scroll to F15 Access 8=_____. Press the right arrow.
17. Use the up and down arrows to select Present, then press the Enter button to accept. The menu returns to F15.
18. Use the up and down arrows to scroll to F16 Remote System.
19. Press the right arrow to enter F16.1 Operator Remote=_____, and again until Disable is displayed.
20. Use the up and down arrows to select Enable, then press the Enter button to accept. The menu returns to F16.1.
21. Press the left arrow once to return to F16, or twice to return to the Features menu. When prompted to save, select Save? Y.

Technician Tip: The default user code is 1000. If a different user code or another user code is required, follow steps 10–17 to set them up.

22. Turn off the pallet truck and then turn on the pallet truck.
23. UserCode is displayed. Press the right arrow and four asterisks are displayed.
24. Use the up and down arrows to enter the first digit of the user code. Press the right arrow to advance to the next digit and continue until the last digit is entered. Press the Enter button to accept the user code.

Check the stopping distance

1. With no load on the forks, travel in the power unit first direction until the lift truck speed is 12.07 km/h (7.5 mph). You can monitor the lift truck speed in the A2.3.5 ENC1 menu.
2. Apply the service brake.
3. Measure the stopping distance. The lift truck must stop in 3454.4 mm (136 in) or less. If the lift truck does not stop in 3454.4 mm (136 in) or less, adjust the service brake rate in the P1.7 Service Brake Rate.

Parking Brake Removal

Notice: This procedure is the same on manual steer lift trucks and lift trucks with electronic power steering.

Special Tools and Equipment:

- Thread-locking adhesive (061004-026)

WARNING

Incorrect or missing safety procedures and safety equipment can cause death or injury.
You must use the correct protective equipment and obey all safety procedures to do work on a lift truck. If you do not, injury or death can result.

- ➢ *Read and obey all recommended safety precautions in the SAFETY chapter.*
- ➢ *Use the correct protective items, such as safety glasses, work gloves, and safety-toe shoes.*

WARNING

Risk of accidents.
Be careful when you release the parking brake because the parking brake will not operate and injury or death can result.

- ➢ *Lockout/tagout the lift truck. See the SAFETY / Control of Hazardous Energy section.*
- ➢ *Make sure that all operators know that the parking brake does not operate.*
- ➢ *After the lift truck is in your work area, put chocks against the wheels to prevent movement.*

Replace the parking brake

1. Open the power unit doors.
2. Disconnect the parking brake at CA404 (index 1, Fig. 7).
3. Install two M6 x 1, 30 mm manual release screws (index 2) in the holes (index 3) in the parking brake.
4. Tighten the two M6 x 1, 30 mm manual release screws (index 2) equally to release the parking brake.

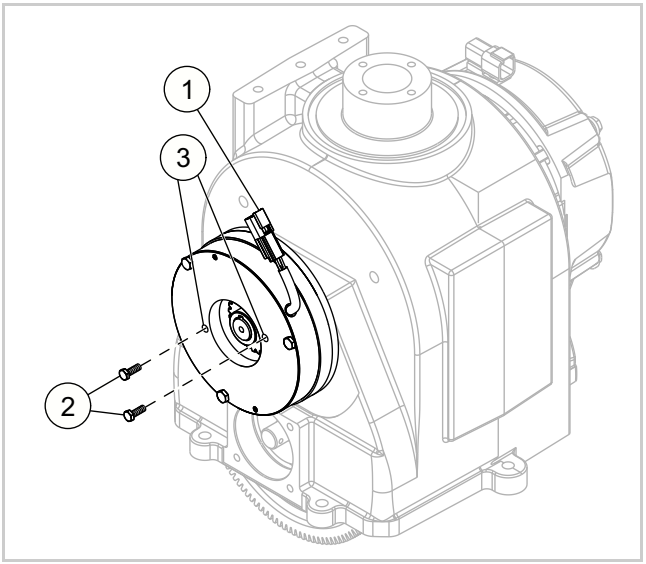


Fig. 7 (23061-01)

5. Remove the three screws (index 1, Fig. 8) that attach the parking brake (index 2) to the adapter plate (index 3).
6. Remove the components that follow:

- Parking brake coil
- Armature plate
- Springs

7. Remove the two M6 x 1, 30 mm manual release screws (index 4) from the holes in the parking brake (index 2). Do not discard the manual release screws.
8. Discard the components that follow:

- Three screws (index 1)
- Parking brake coil
- Armature plate
- Springs

9. Remove and discard the friction disc.

Steer Column Alignment

The steer column (1) is bolted to the fork weldment (2) by four 31.75 mm (1.25 in) round head carriage bolts (3). Guides are built into the steer column to help facilitate proper alignment to the truck. Alignment should be held to within 5° of the vertical line (4). Refer to Figure 24534.

Figure 24534

Steer Column Adjustment

For proper clearance between the bottom of the steer head mount and the battery, the steer head mount will have to be adjusted accordingly along the fork weldment it attaches to. For shorter batteries measuring 593.85 mm (23.38 in) tall, install the mounting hardware in the top two holes along each side of the steer head mount (1). For 803.15 mm (31.62 in) tall batteries, install the mounting hardware in the bottom two holes, leaving the top hole open (2). Refer to Figure 21218-01.

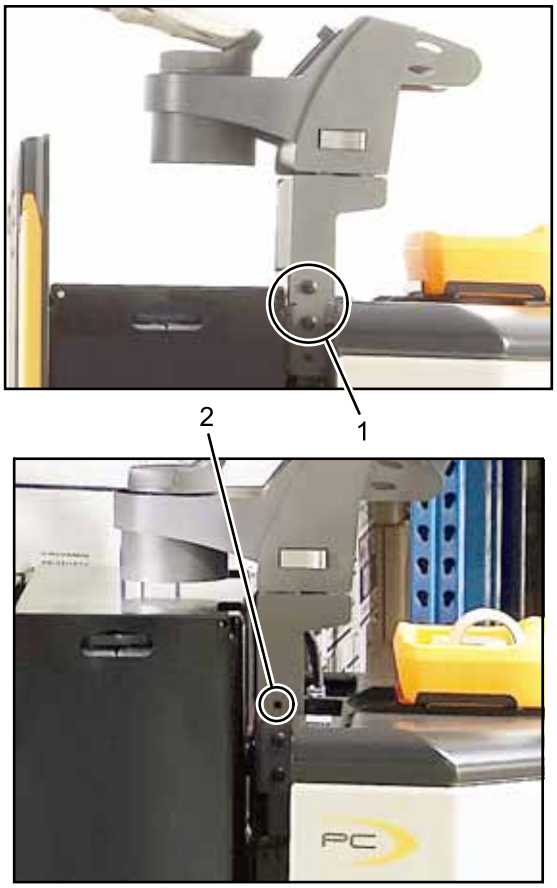


Figure 21218-01

Forks - 230 & 255 mm (9 & 10 in)

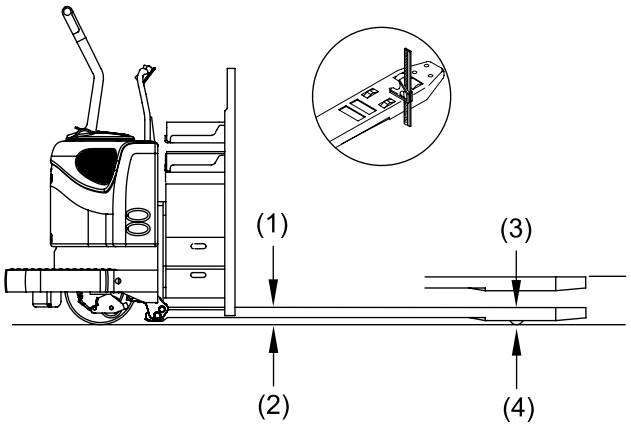
Fork Inspection

Forks Lowered:

- With battery installed, fork heel height should measure 90 to 95 mm (3.62 to 3.75 in) for forks 1525 mm (60 in) and shorter, 95 to 100 mm (3.75 to 3.88 in) for forks longer than 1525 mm (60 in).
- Fork tip height at the load wheel centerline should not exceed 85 mm (3.38 in).
- The risers must contact one stop each.

Forks Raised:

- Fork height, measured at the load wheel cut out, should be 230 mm (9.12 in) minimum.



(1) 90 to 95 mm (3.62 to 3.75 in) for 1525 mm (60 in) or Shorter Forks
(2) 95 to 100 mm (3.75 to 3.88 in) for Forks Longer than 1525 mm (60 in)
(3) 85 mm (3.38 in)
(4) 230 mm (9.12 in) Minimum

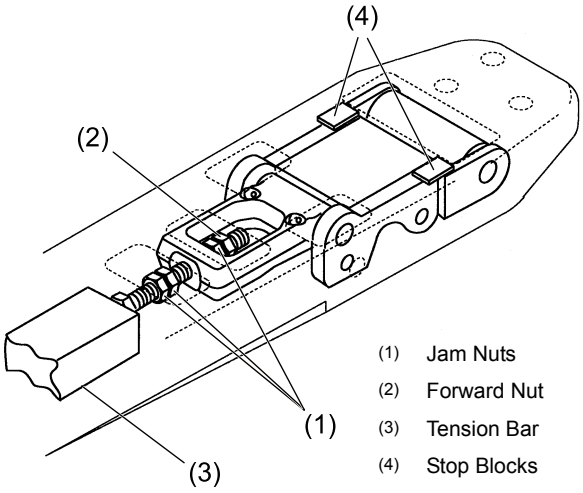
Figure 16924

Lift Linkage Adjustment (Tension Bar Length and Cylinder Adjustment)

After completely lowering the forks (cylinder should be bottomed out), loosen the four nuts on each tension bar end. The riser should be completely lowered so that it contacts the stop blocks in the fork tip.

With the battery installed, adjust lift cylinder length so fork heel height measures:

- 90 to 95 mm (3.62 to 3.75 in) for 1525 mm (60 in) and shorter.
- 95 to 100 mm (3.75 to 3.88 in) for forks longer than 1525 mm (60 in).

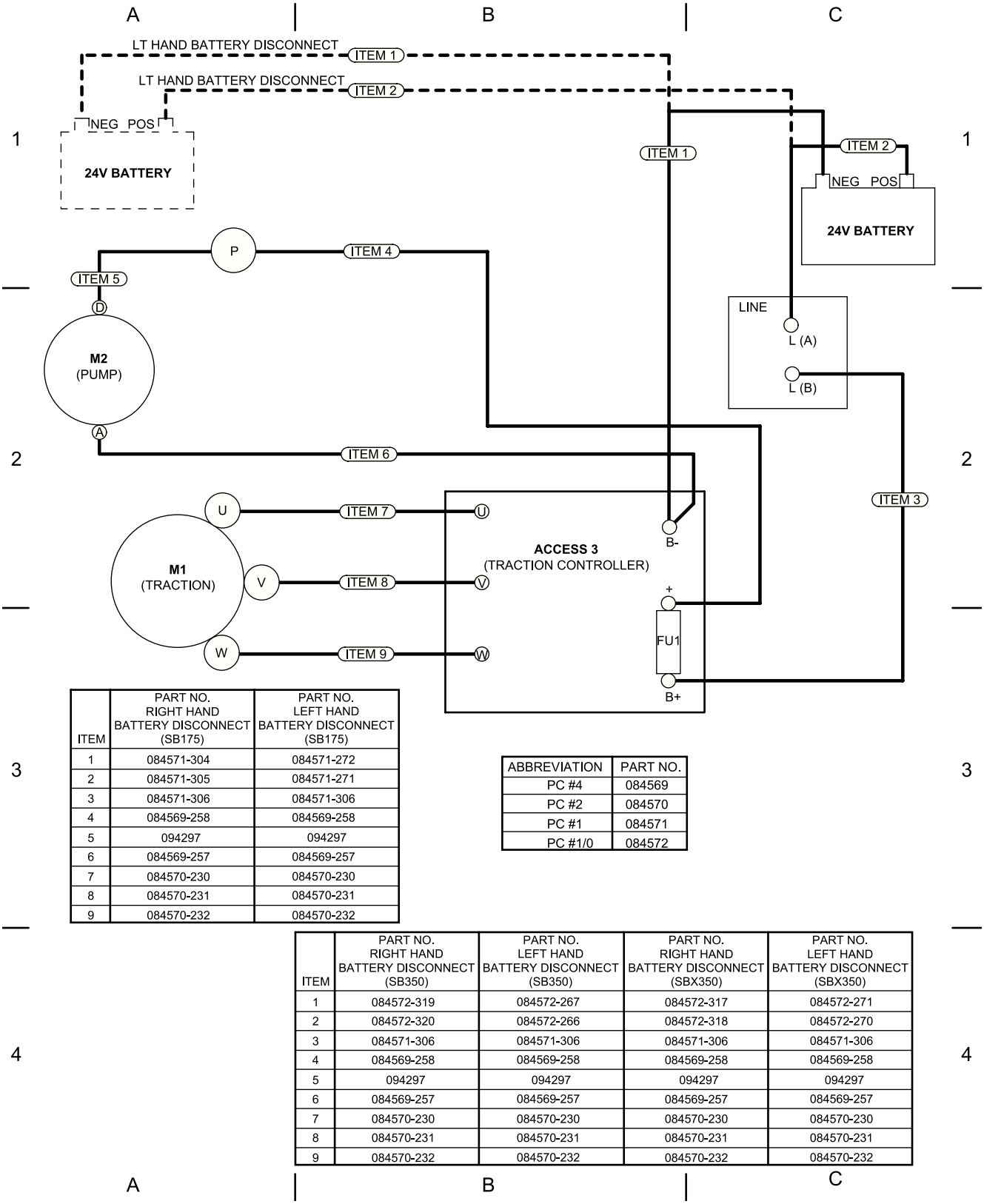


(1) Jam Nuts
(2) Forward Nut
(3) Tension Bar
(4) Stop Blocks

Figure 16741

CONNECTIONS (Continued)				
	Location	**Function**	**Diagram**	**Parts Breakdown**
CA415	X10 Handle Hydraulic PCB	RAS1, LOS1, RES2	DIA-6645-006 (B-2)	04.8-6545-100
CA416	X10 Handle Hydraulic PCB	RES3	DIA-6645-006 (C-2)	04.8-6545-100
CA417	X10 Handle Grip	HNS1	DIA-6645-006 (C-1)	04.8-6545-100
CA419	X10 Handle Grip	HNS2	DIA-6645-006 (C-1)	04.8-6545-100
CA420	Above Traction Motor	POT4	DIA-6645-004 (B-3)	04.8-6545-100
CA421	Steer Column	POT2, POT3	DIA-6645-002 (B-2) DIA-6645-004 (C-3)	04.8-6545-100
CA422	Power Unit LH Side	DMS	DIA-6645-002 (B-3) DIA-6645-003 (C-4)	04.8-6545-100
CA424	Power Unit LH Side	Accessory Power		04.8-6545-100
CA425	Steer Motor	RPS1, TS2	DIA-6645-004 (B-1)	04.8-6545-100
CA426	Steer Column	HMS	DIA-6645-006 (B-3)	04.8-6545-100
CA428	Steer Column	BRK2	DIA-6645-002 (A-2) DIA-6645-004 (C-4)	04.8-6545-100
CA430	Power Unit LH Side	CAN Access	DIA-6645-005 (C-4)	04.8-6545-100
CA601	Control Handle	POT1	DIA-6645-002 (C-4)	04.8-6545-100
CA602	Control Handle	FS/RS, RAS1, LOS1, HNS1/HNS3, RES1, RES2		04.8-6545-100
CA604	Load Backrest	RAS2, LOS2, HNS3/HNS4	DIA-6645-006 (B-4)	04.8-6545-100
CA606	Operator Compartment	STPS1	DIA-6645-002 (B-3) DIA-6645-003 (C-3, C-4)	04.8-6545-100
CA608	Operator Compartment	STPS2	DIA-6645-002 (B-3) DIA-6645-003 (C-4)	04.8-6545-100
CA613	Behind Oil Reservoir	LMS2	DIA-6645-002 (C-4) DIA-6645-005 (C-3)	04.8-6545-100
CA615	Pump LH Side	PT1	DIA-6645-002 (B-1) DIA-6645-005 (A-1)	04.8-6545-100
CA617	Bottom of Handle	BRS1, BRS2	DIA-6645-002 (A-4) DIA-6645-006 (C-1)	04.8-6545-100

MISCELLANEOUS				
	Location	**Function**	**Diagram**	**Parts Breakdown**
CR1	Main Harness	Reverse Polarity	DIA-6645-002 (A-4) DIA-6645-003 (B-3)	



ITEM	PART NO. RIGHT HAND BATTERY DISCONNECT (SB175)	PART NO. LEFT HAND BATTERY DISCONNECT (SB175)
1	084571-304	084571-272
2	084571-305	084571-271
3	084571-306	084571-306
4	084569-258	084569-258
5	094297	094297
6	084569-257	084569-257
7	084570-230	084570-230
8	084570-231	084570-231
9	084570-232	084570-232

ABBREVIATION	PART NO.
PC #4	084569
PC #2	084570
PC #1	084571
PC #1/0	084572

ITEM	PART NO. RIGHT HAND BATTERY DISCONNECT (SB350)	PART NO. LEFT HAND BATTERY DISCONNECT (SB350)	PART NO. RIGHT HAND BATTERY DISCONNECT (SBX350)	PART NO. LEFT HAND BATTERY DISCONNECT (SBX350)
1	084572-319	084572-267	084572-317	084572-271
2	084572-320	084572-266	084572-318	084572-270
3	084571-306	084571-306	084571-306	084571-306
4	084569-258	084569-258	084569-258	084569-258
5	094297	094297	094297	094297
6	084569-257	084569-257	084569-257	084569-257
7	084570-230	084570-230	084570-230	084570-230
8	084570-231	084570-231	084570-231	084570-231
9	084570-232	084570-232	084570-232	084570-232

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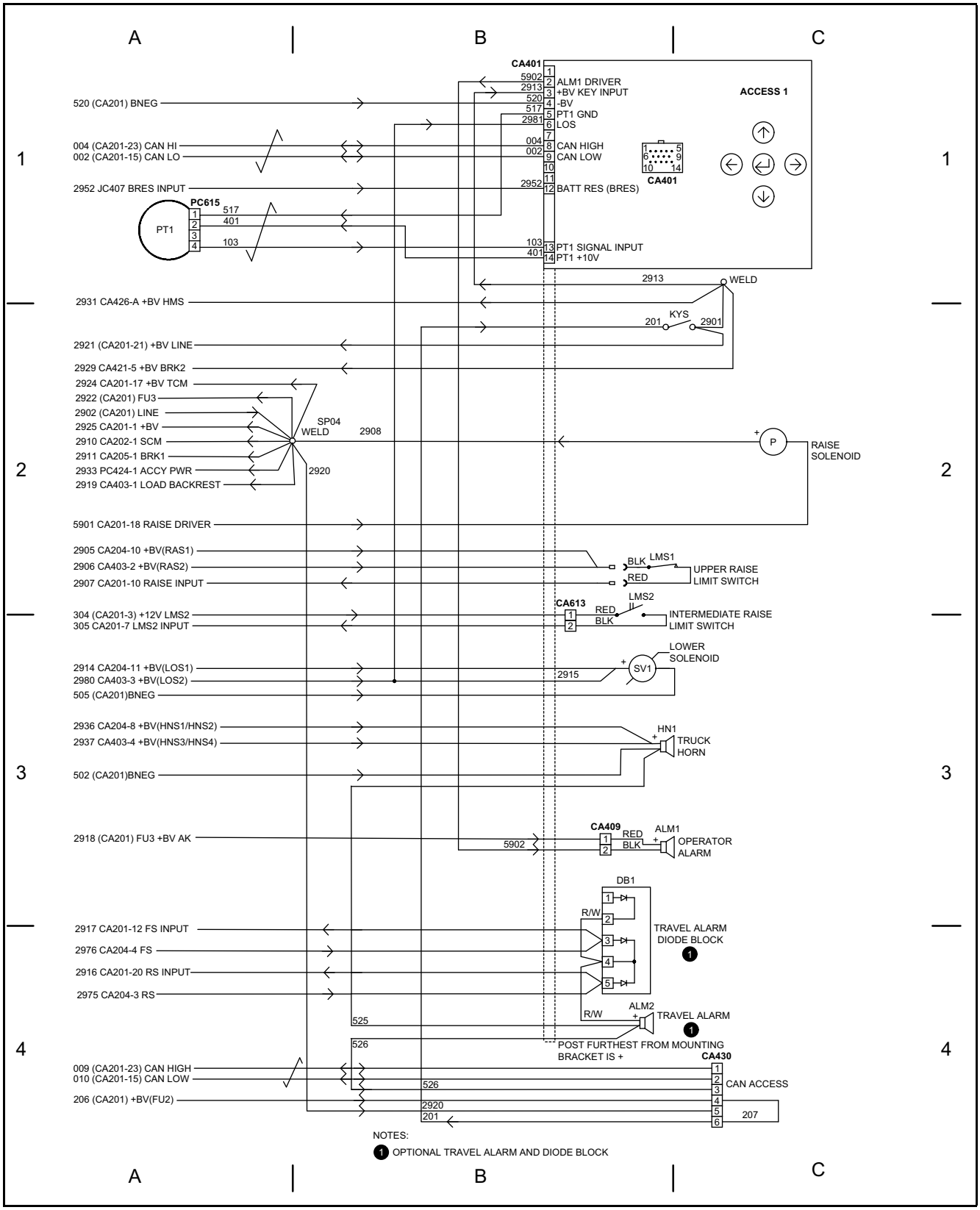
Access 1 - Electronic Power Steering



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Notes:

Access 1 - Electronic Power Steering

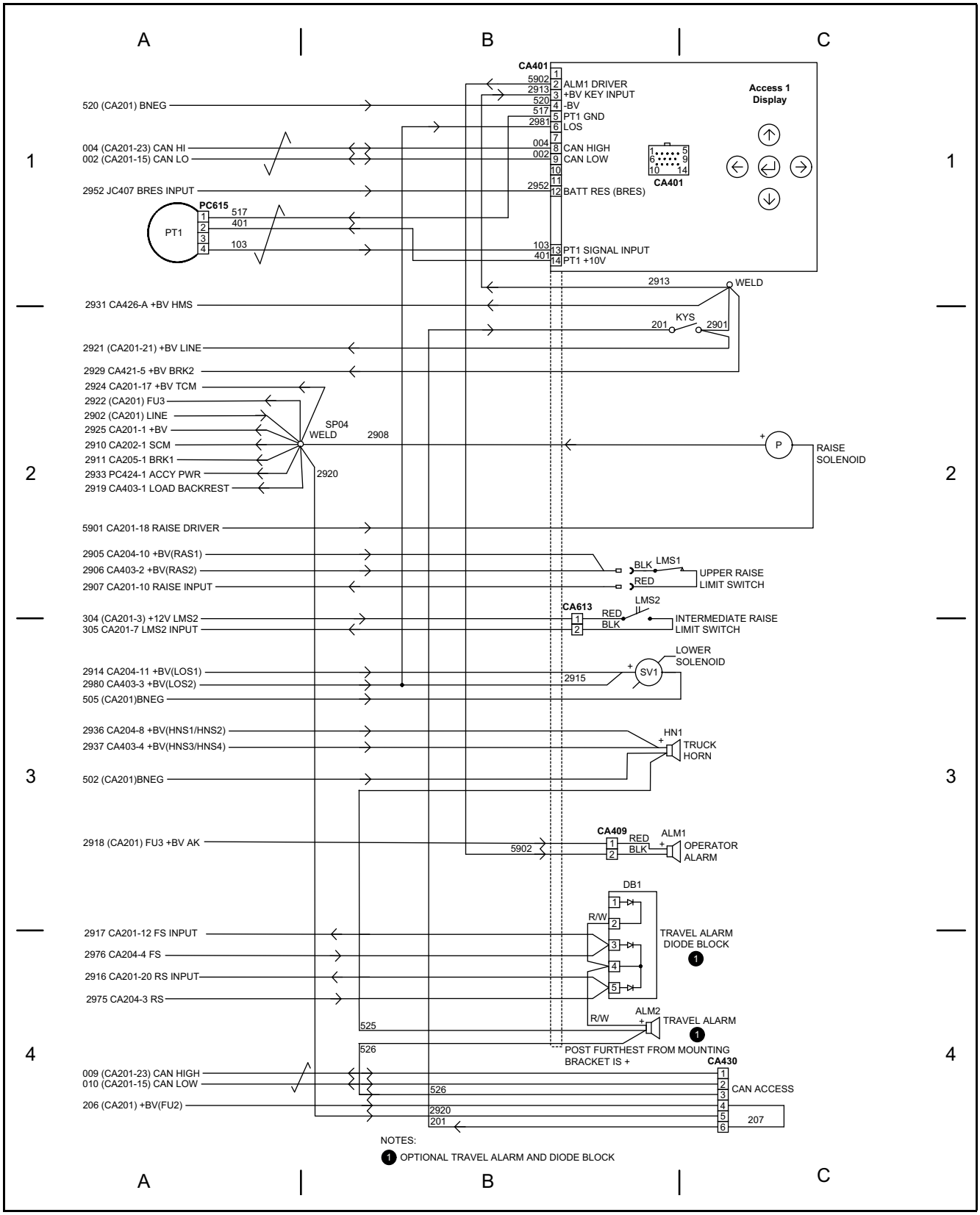

Figure 143384 D