General Safety Instructions

Maintenance and Repair Instructions

Danger!

Observe the safety instructions in the maintenance manual and the truck operator manual.

Failure to do so could result in serious or even fatal injuries to maintenance and other personnel.

Motorised trucks can become hazardous if maintenance and servicing work are neglected. For this reason maintenance and inspections must be performed at sufficiently short intervals. There must be suitably trained personnel and proper guidelines at your place of work.

Maintenance and Repair

- Always carry out work in accordance with the test and maintenance schedule enclosed in these maintenance instructions and any applicable service bulletins.
- Only qualified and authorized personnel may carry out work on the truck.
- Keep fire protection equipment at hand and do not use a naked flame to check fluid levels or to test for leaks.
- Use groundwater neutral, non-flammable solvents for cleaning. Always perform cleaning work over an oil separator. Protect the electrical system against damp.
- Keep the work place and battery charging station clean, dry and well ventilated.
- Do not allow oils to penetrate the ground or the drain system. Used oil must be recycled correctly. Oil filters and dehumidifying inserts must be treated as special waste. Observe the local authority regulations.
- Immediately neutralize and thoroughly rinse any spilled battery fluid.
- Keep the truck clean. This will facilitate tracing loose or faulty components.
- Maintain the legibility of the data capacity plate and data plate, warning and instruction decals.
- Truck modifications and additions may only be performed with Crown's prior written approval.
- The reliability, safety and suitability of Crown trucks can only be ensured by using original Crown parts.

Before Parking the Truck

- Brake until the truck comes to rest.
- Lower the fork carriage fully.
- Apply the parking brake.
- Switch off the truck and remove the key.
- When parking on a slope or incline always chock all wheels.

Before Working on the Truck

- Jack up the truck so that the drive wheel is clear of the ground. Apply the Emergency Disconnect and disconnect the battery.

General

To obtain maximum life of any industrial equipment, a well planned maintenance program (PM), performed by qualified technical personnel should be followed. In conjunction with, and an integral part of, any planned maintenance program should be daily operator input. Operator involvement can greatly reduce truck down time, assist in determining planned maintenance (PM) schedules and ultimately save money.

Before performing maintenance to any unit, it should be taken to an area set aside for maintenance or a section where there is adequate space to perform required work. This is a must to insure the safety of others and to insure that proper maintenance is performed to the unit.

The following is a list of lubricants and maintenance products recommended when doing Planned Maintenance on Crown Lift Trucks.

CHART 1 - LUBE IDENTIFICATION

	TYPE O LUBRICANT	PART NO.	PACKAGE QTY.
A.	Gear Lube 80W-90 (Typical)	063002-003	1 Quart
AA.	Automatic Transmission Fluid Freezer Applications 32° F (0 °C) and Below	063001-010	1 Quart
B.	Grease (Multi-Purpose)	063002-034 063002-045	14.5 oz. Cartridge (40) 14.5 oz. Cartridges
* BB.	Grease (Low Temp.)	063002-017 063002-046	14.5 oz. Cartridge (40) 14.5 oz. Cartridges
C.	Oil (SAE 40)		
D.	Hydraulic Oil	063001-001 063001-015	1 Gallon (6) 1 Gallon
* DD.	Hydraulic Oil (Low Temp.)	063001-006	1 Gallon
DDD.	Hydraulic Oil (Standard for Blending)	063001-021	1 Gallon
E.	Channel Grease	063002-024 063002-022	14.5 oz. Cartridge 35 lb. Pail
F.	Gear Grease	063002-024 063002-022	14.5 oz. Cartridge 35 lb. Pail
G.	Chain and Cable Lube	363107-001 363107-012	15 oz. Can (12) 15 oz. Cans
	Premium Chain and Cable Lube	363115-001 363115-012	12 oz. Can (12) 12 oz. Cans
H.	Rubber & Vinyl Dressing		
I.	Grease (Lift Pump Coupling)	063002-039 063002-040	1 lb. 1 oz.
J.	Brake Fluid — Dot 5	063004-002 063004-003	12 oz. 1 Gallon
K.	Grease (Wheel Bearing)	063002-034 063002-045	14.5 oz. Cartridge (40) 14.5 oz. Cartridges
L.	Metal Assembly Spray	063002-021	11 oz. Spray

LUBRICATION CHART							
Index	**Component**	**Lube Type**	**Qty.**	**60 da. 250 hr.**	**90 da. 500 hr.**	**6 mo. 1000 hr.**	**12 mo. 2000 hr.**
L-12	Steering Gearbox Oil Level	‡ DDD	1 l (1 qt.)	*Chg.		Chg.	
L-13	Steering Gears	F	AR	I			
L-14	Hydraulic Filter			I	*Chg.		Chg.
L-15	Hydraulic Reservoir - Single Pump	D	13.2 l (14 qt.)	I			Chg.
	Hydraulic Reservoir - Dual Pump	D	17.5 l (18.5 qt.)	I			Chg.
L-16	Hydraulic Strainer						Chg.
L-17	Drive Unit Thrust Bearing	B	AR	L			
L-18	Drive Unit Fluid Level	A	0.7 l (0.75 qt.)	I			Chg.

L = Lubricate
I = Check
Chg. = Change
AR = As Required

See CHART 1 - LUBE IDENTIFICATION on page 27 for Lube Type explanation and capacity.

See Illustration 12373 for Lubrication locations.

* Change first time only as noted, thereafter check at 250 hr./60 da. intervals and change at longer interval as noted.

‡ Use "DDD" (see CHART 1 - LUBE IDENTIFICATION , page 27) hydraulic oil in steering gearbox for both normal and low temperature applications.

INSPECTION AND ADJUSTMENT CHART					
Index	**Component**	**60 da. 250 hr.**	**90 da. 500 hr.**	**6 mo. 1000 hr.**	**12 mo. 2000 hr.**
I-27	Contactor Tips	I			
I-28	Steering Gears and Sprockets	I			
I-29	Chain Slack Switch	I			
I-30	Stop Blocks	I			
I-31	Drive Tire	I			
I-32	All Electrical Termination Points	I			

I = Inspect and/or Adjust.

See Illustration 12373 for component locations.

Refer to appropriate section of service manual for additional information concerning inspection and/or adjustment.

KYS
Key Switch

Location: control module.

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

Data: key operated selector switch. Energizes K1+K2+ED1 with start position and maintains K1 with on position.

Adjustment: none required.

LCS1
Lower Cutout Switch

Location: right, lower portion, mast side of platform.

Purpose: prevents lowering at set height.

Data: wired normally closed held open with mast channel.

Adjustment: loosen mounting bolts and adjust so switch actuates when roller contacts actuating channel and resets when roller loses contact.

LGS1
Dome Light Switch

Location: switch panel.

Purpose: allows operator to turn on/off dome light.

Data: two position, on-off, rocker switch

Adjustment: none required.

LGS2
Work Light Switch

Location: switch panel.

Purpose: allows operator to turn on/off work light.

Data: two position, on-off, rocker switch.

Adjustment: none required.

LGS3
Spot Light Switch

Location: switch panel

Purpose: allows operator to turn on/off spot light.

Data: two position, on-off, rocker switch.

Adjustment: none required.

LGT1
Strobe or Flashing Light

Location: power unit.

Purpose: visual warning of lift truck presence.

Data: 24 V.

Adjustment: none required.

LGT2, 5
Work Lights

Location: overhead console or mast.

Purpose: provide work area light outside operator compartment.

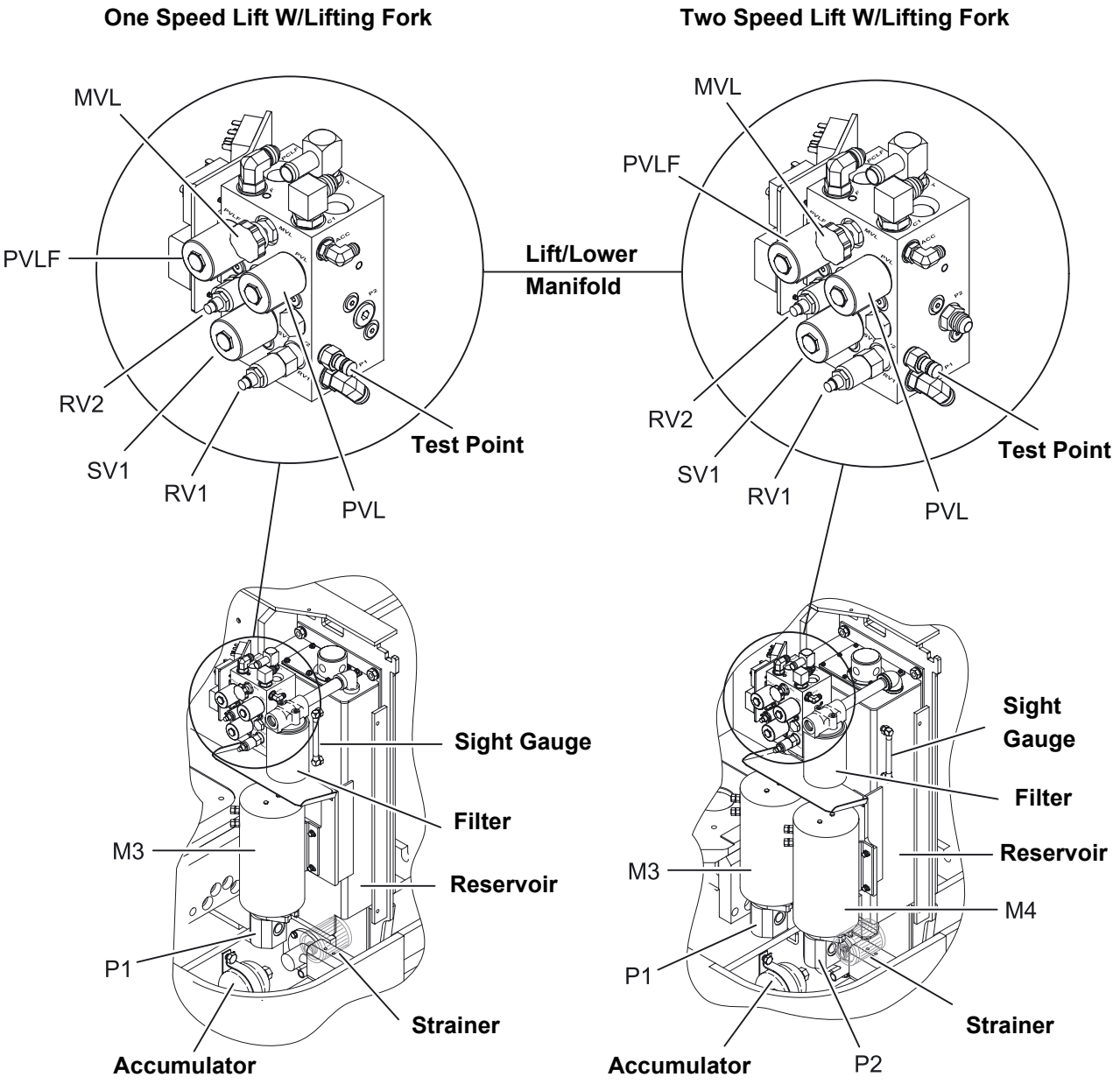
Data: 12 V.

Adjustment: minimal manual directional adjustment.

The hydraulic system in your truck is powered by gear type pumps. These pumps, P1 & P2, supply oil flow for lift and accessory functions.

Maximum pressure is limited by an adjustable relief valve, RV1, (refer to section M2.4). The setting for RV1 is noted on the hydraulic schematics. Refer to the service manual index for pump, valve and manifold information.

The Figure 13836 shows hydraulic component location in the power unit.



13836

Hydraulic Circuits

Event Code 208

Steering module (SCM) selftest detects no movement.

Steering and traction disabled.

Step 1: Check steering relay K5 power circuit. Check for poor or loose connections of wires #2941 between FU10 and CA407-2, wire #2912 between CA407-3 and K5, wire #291 between CA407-1 and K5, wire #052 between CA407-4 and negative bus, wire #2981 and #2943 between K5 and steer motor.

- **If**: Wiring problem exists.
  Then repair wiring.

- **If**: Wiring is OK.
  Then visually check K5 relay for closure.

- **If**: Relay K5 closes and there is no power through the tips.
  Then proceed to step 2.

- **If**: Relay K5 closes and there is power through the tips.
  Then proceed to step 3.

- **If**: Relay K5 does not close.
  Then check K2 tips.

- **If**: K2 tips are OK.
  Then check wires #5938 between CA406-8 and K5 coil also wire #2961 between CA213-9 and K5 coil.

- **If**: Wire connections are good and the event code persists.
  Then proceed to step 2.

Step 2: Check steer motor (M2) brushes.

- **If**: Brushes worn.
  Then replace both brushes and brush springs.

- **If**: Brushes are OK.
  Then check wiring and connections between M2 and K5.

- **If**: Wiring is OK.
  Then proceed to step 3.

Step 3: Check for B+ at CA405-3 and B- at CA405-4 of SCM.

- **If**: B+ is not present.
  Then check wiring between CA405-3 and K2.

- **If**: B- is not present.
  Then check wiring between CA405-4 and K2.

- **If**: Wiring is OK and event code persists proceed to step 4.

Step 4: Check steering relay K5 tips.

- **If**: K5 relay tips are worn or burnt.
  Then replace relay.

- **If**: K5 relay tips are good.
  Then check the SCM for power output. Connect DVOM positive lead to TB407-2 and negative lead to TB407-4. Power up the truck within a few seconds the meter should indicate battery volts.

- **If**: There is power output.
  Then proceed to step 5.

- **If**: There is no power output.
  Then check FU10.

- **If**: FU10 is good.
  Then replace SCM.

Step 5: With the truck powered down jack up the power unit until the steer wheel is off the floor (block the power unit). By hand, check the drive unit for movement left to right. Drive unit should be able to be moved.

Event Code 326

Access 3 module (MRC1) internal fault.

Steering, traction and lift disabled.

Step 1: Check power and control wiring connection to module.

- **If**: No wiring issues exists and event code persists.
  Then replace MRC1.

Event Code 327

Access 3 module (MRC1) voltage present at CA402-18 and/or CA402-19 when ED2 contactor is not energized.

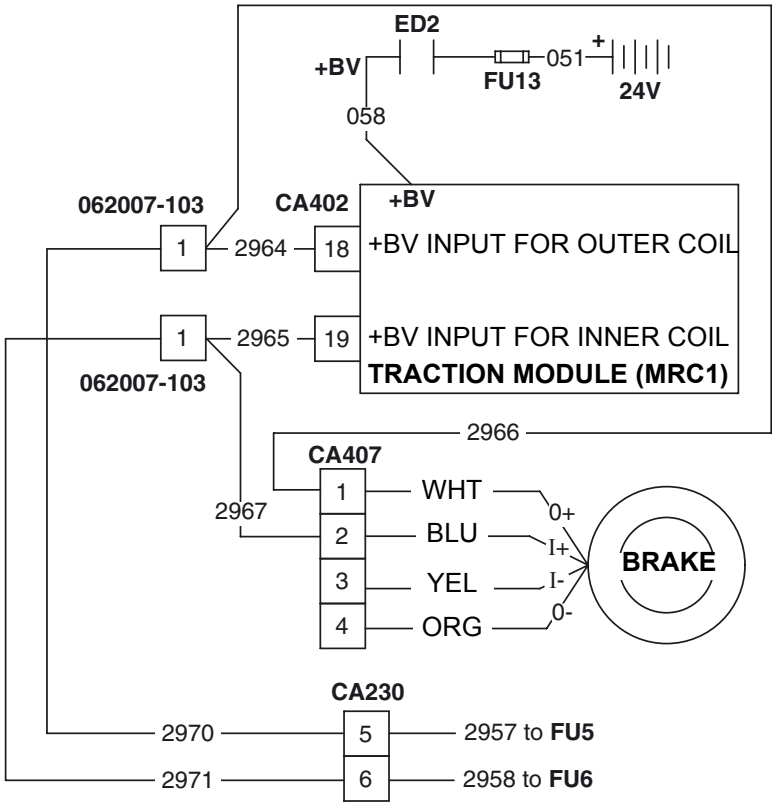
Steering, traction and lift disabled. Should be 0 volts at CA402-18, -19 when ED2 is open.

Step 1: With a DVOM check for positive voltage at CA402-18 and CA402-19 without depressing the brake pedal.

- **If**: Event code clears.
  Then truck is operation ready.

- **If**: Event code persists.
  Then with a DVOM check resistance of PVL coil, should be approximately 28 ohms.

- **If**: PVL coils ohms are correct and event code persists.
  Then replace MRC1.



12207

Event Code 374

Traction motor (M1) armature open circuit.

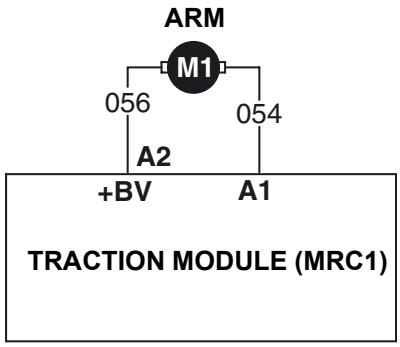
Traction disabled.

Step 1: Check M1 armature for an open circuit.

Step 2: Check lead condition/connections at M1 A1/A2 and Access 3 module (MRC1) +BV/A1. Also brushes, brush holder, brush springs and armature.

- **If**: Open exists due to one of the above.
  Then repair or replace M1.

- **If**: M1 and lead connections OK and the event code persists.
  Then replace Access 3 module (MRC1).



12360

Event Code 375

Traction motor (M1) sensed field input exceeds limits for off condition.

Steering, traction and lift disabled.

Step 1: If truck does not operate check wiring.

- **If**: Wiring OK.
  Then check motor field at F1/F2 for a short.

- **If**: No short exists and event code persists.
  Then replace MRC1.

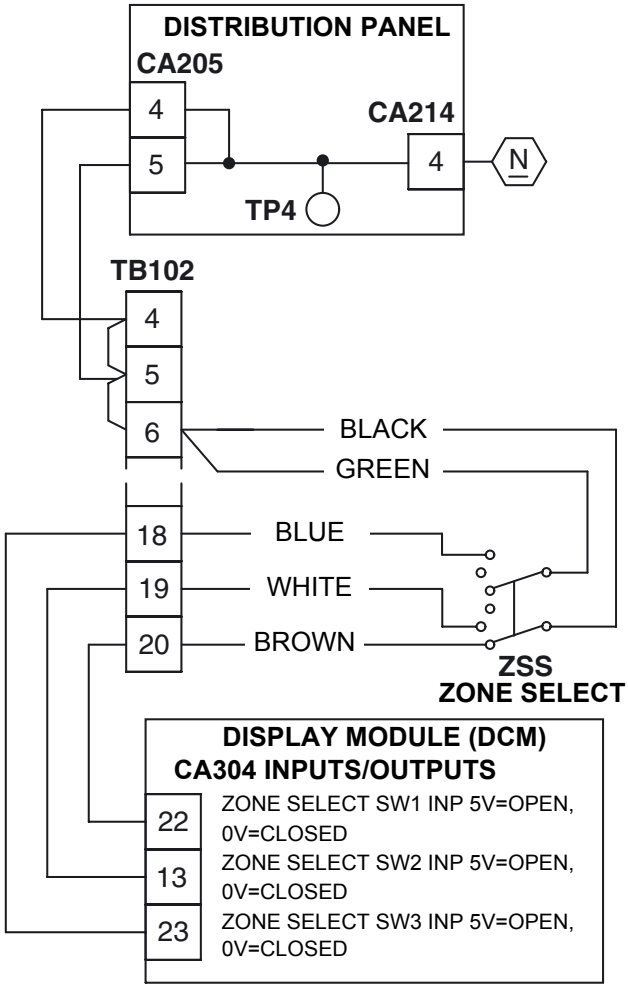
Event Code 376

Access 3 module (MRC1) internal fault.

Steering, traction and lift disabled.

Step 1: If truck does not operate check power and control wiring.

- **If**: Wiring OK and event code persists.
  Then replace MRC1.



12158

Event Code 810

Display module (DCM) lift setups are not detected by steering module (SCM).

Lift disabled.

Step 1: Turn the key “off” then “on”.

- **If**: Event code clears.
  Then truck is operation ready.

- **If**: Event code persists.
  Then replace display module (DCM).

Event Code 811

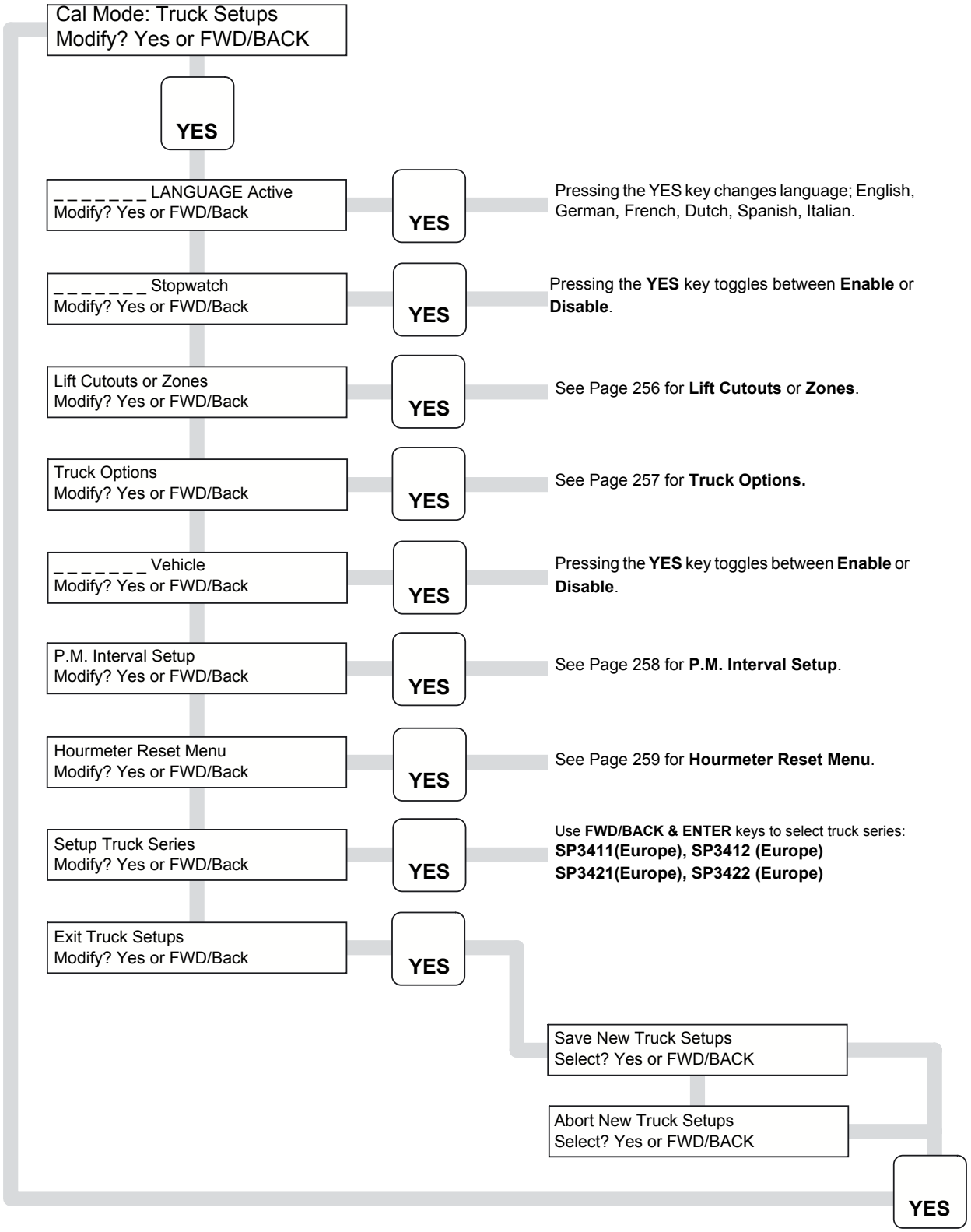
Display module (DCM) invalid zone select switch (ZSS) setup is detected.

Lift disabled.

Step 1: Connect the service terminal and access calibration “Truck Setups”. Press forward until “Lift Cutouts or Zones” appear, enter the correct lower cutout configuration setups.

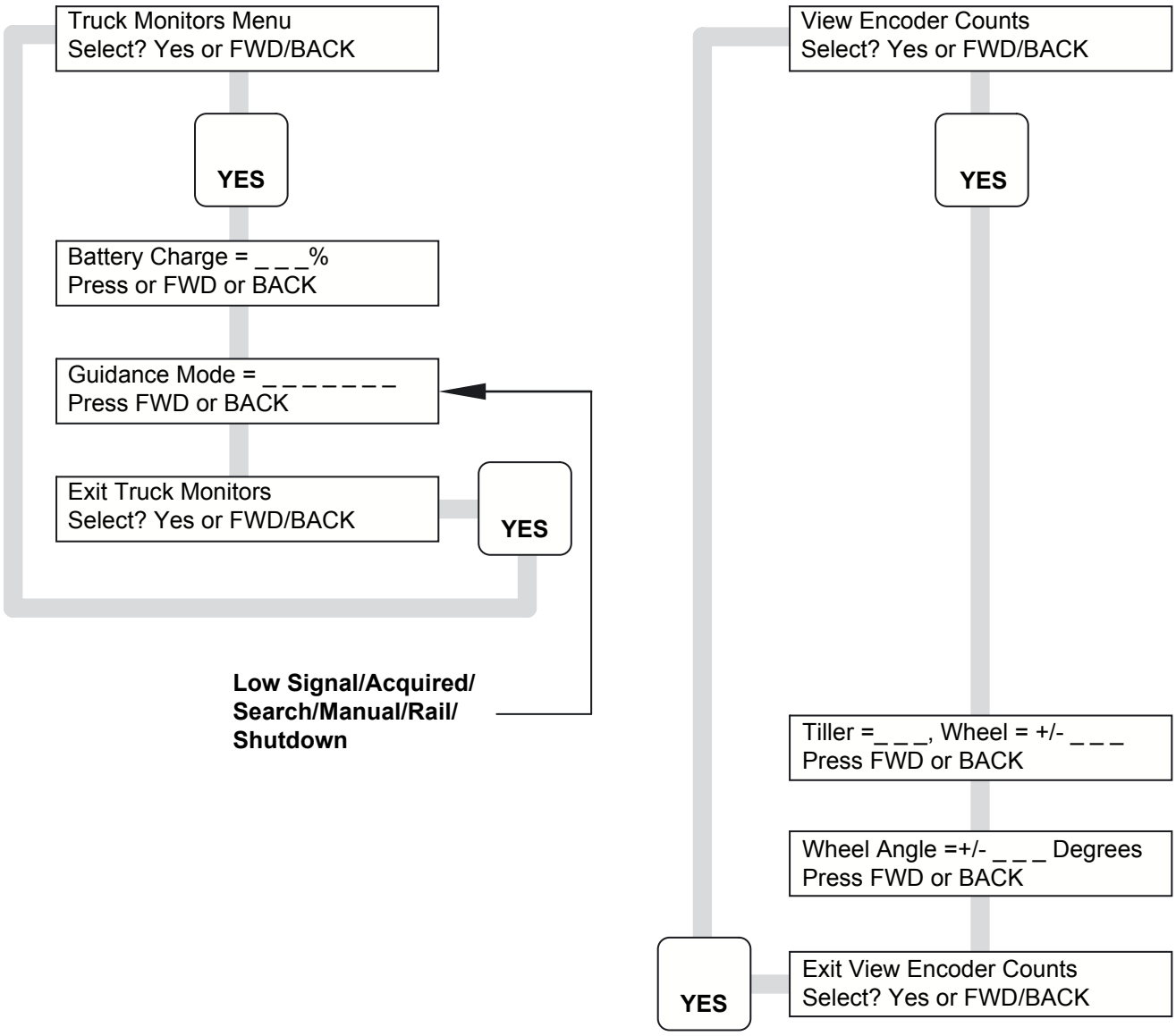
- **If**: Event code persists.
  Then replace DCM.

Truck Setup Menus



13341

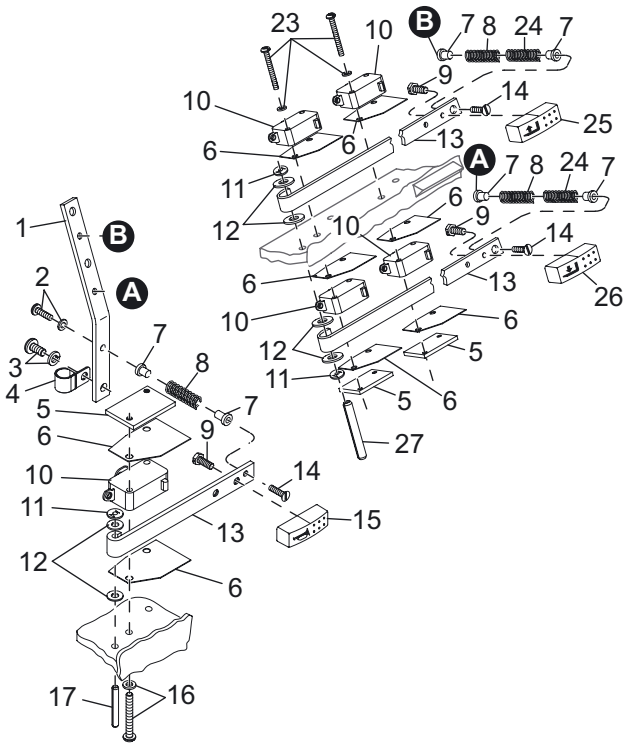
Truck Monitors Menus / View Encoder Counts Menu



12510-01

RAS1, RAS2, LOS1, LOS2, HNS, EDS

Switch replacement is accomplished by using the parts breakdown in Illustration 3236-01 for component location.



3236-01

When replacing HNS, the keyswitch will need to be removed to allow access to the mounting screws.

Switch terminals are to be tightened within 3.8 - 4.6 Nm (55 - 65 inch ounces).

Button Return Springs

To replace Raise, Lower and Horn button return springs proceed as follows (Refer to Illustration 3236-01):

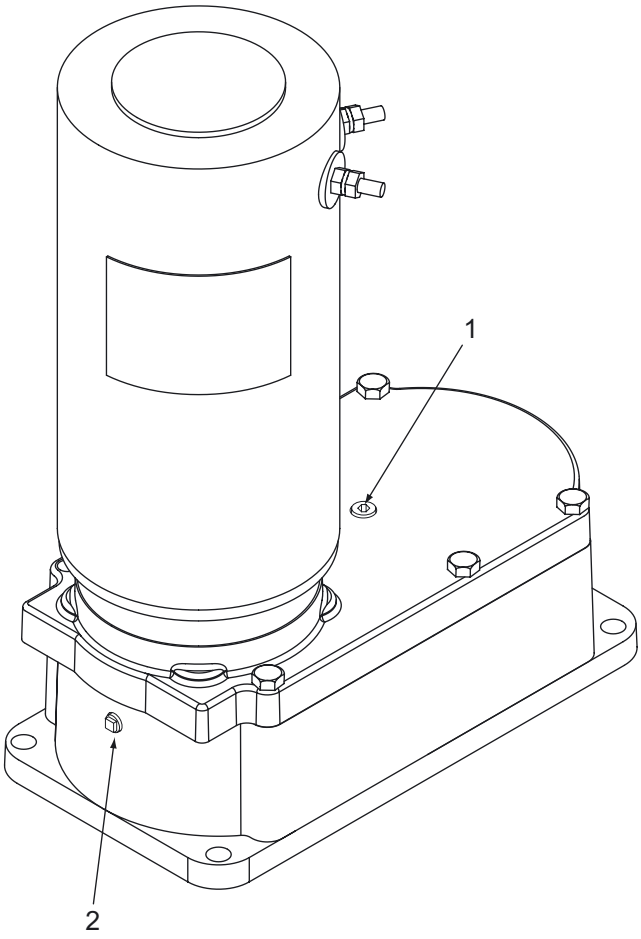
- Secure the control module with a wire, between the top mounting bolt hole of the control module and the platform wall.
- Remove three mounting screws (23) from spring plate (22).
- Lift spring plate from assembly.
- The raise and lower buttons require two compression springs (16, 17) and the horn button requires one spring (17).
- Replace spring(s) in question and assemble on respective actuator lever spring guide (15).
- Position spring plate so spring guides locate springs.
- Start mounting screws. Mounting screw closest to keyswitch also holds wiring harness clamp.
- When screws are started and harness clamp is in place, tighten screws.
- Remove wire securing control module.

Buttons

(Refer to Illustration 3236-01)

- To replace buttons, remove two (2) screws (14) from button and remove.
- Position replacement button correctly and secure in place with screws.

Steering Motor Gearbox



3246-01_EU

1 Fill Plug
2 Level Indicator Plug

The steering motor gearbox should be filled to the level indicator plug on the end of the gearbox with hydraulic oil (see Figure 3246-01_EU). Refer to Chapter 1, table *Lubricants* for recommended products. Capacity of the gearbox is approx. 1 L (2 pints).

Safety

Warning!

Risk of serious injury from pressurized hydraulic oil.
Pressurized hydraulic oil can penetrate the skin. This is a serious medical emergency which requires immediate medical attention.
The skin will not show any obvious initial damage and the physical effects will not be manifested immediately.
Seek medical assistance if your skin has been affected by pressurized hydraulic oil.

For your personal protection:

- Depressurize the hydraulic system before starting assembly work on the hydraulic system.
- After carrying out assembly work carefully check to see that all ports are tightened before re-pressurising the system.
- Wear protective clothing, safety glasses and safety gloves when tracing leaks or bleeding the system.
- Use a piece of absorbent paper to trace leaks, never use your hands.
- Follow the hydraulic oil manufacturer's safety instructions when handling these oils.

General Instructions for Repairing Hydraulic Components

Hydraulic systems are sensitive to dirt.

Thoroughly clean any hydraulic components you have removed before dismantling them and placing them on a workbench.

Always repair hydraulic components in a clean working environment.

Immediately protect cleaned and de-greased components with a thin coating of hydraulic oil. Use the same grade as is used in the truck.

Protect all components from re-contaminating until they are installed again.

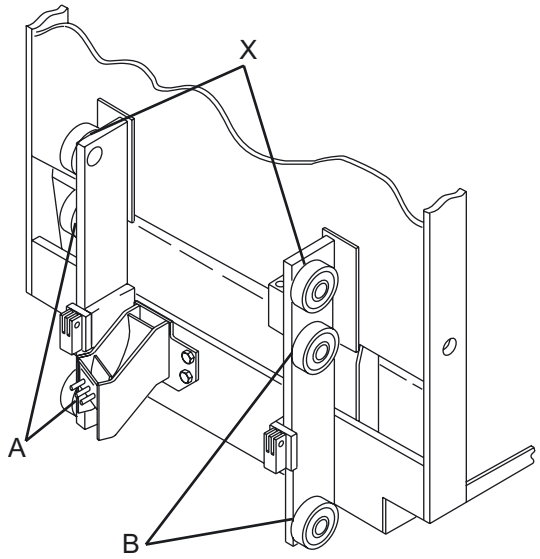
Immediately seal any open hydraulic ports on repaired assemblies with filler plugs. This also applies to the open ports and lines on the truck when you remove any hydraulic components.

Do not refinish any cylinder surfaces! Replace any damaged components.

When carrying out repairs always replace all the seals in the assembly. Never recycle seals which have already been used.

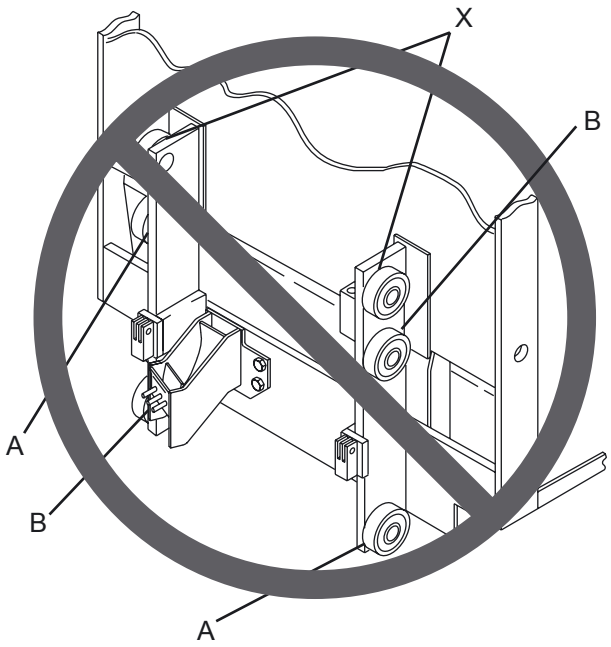
Correct Method Shimming Method

See Figure 3795-A. Two shims on both left side platform rollers (A) and one shim on both of the right side rollers (B). Non adjustable rollers are marked as (X).



3795-A

Incorrect Shimming Method



3795-B

See Figure 3795-B. Let's assume, (A) is a number of one shim and (B) is a number of two shims. In this case the uneven number of shims per side is not wanted. Non adjustable rollers are marked as (X).

Installing the Platform

1. Install platform back into mast carefully. With hoist extend platform to full height and check for tight spots. Make sure that all cables hoses and chains are not pinched, cut, or damaged in any way while hoisting the platform up the mast. If any tight spots are found make corrections to shims as required.

2. If no tight spots are found, lower platform with hoist and reassemble chains, pulleys, etc. in reverse order of removal.

3. Connect battery and check truck operation.