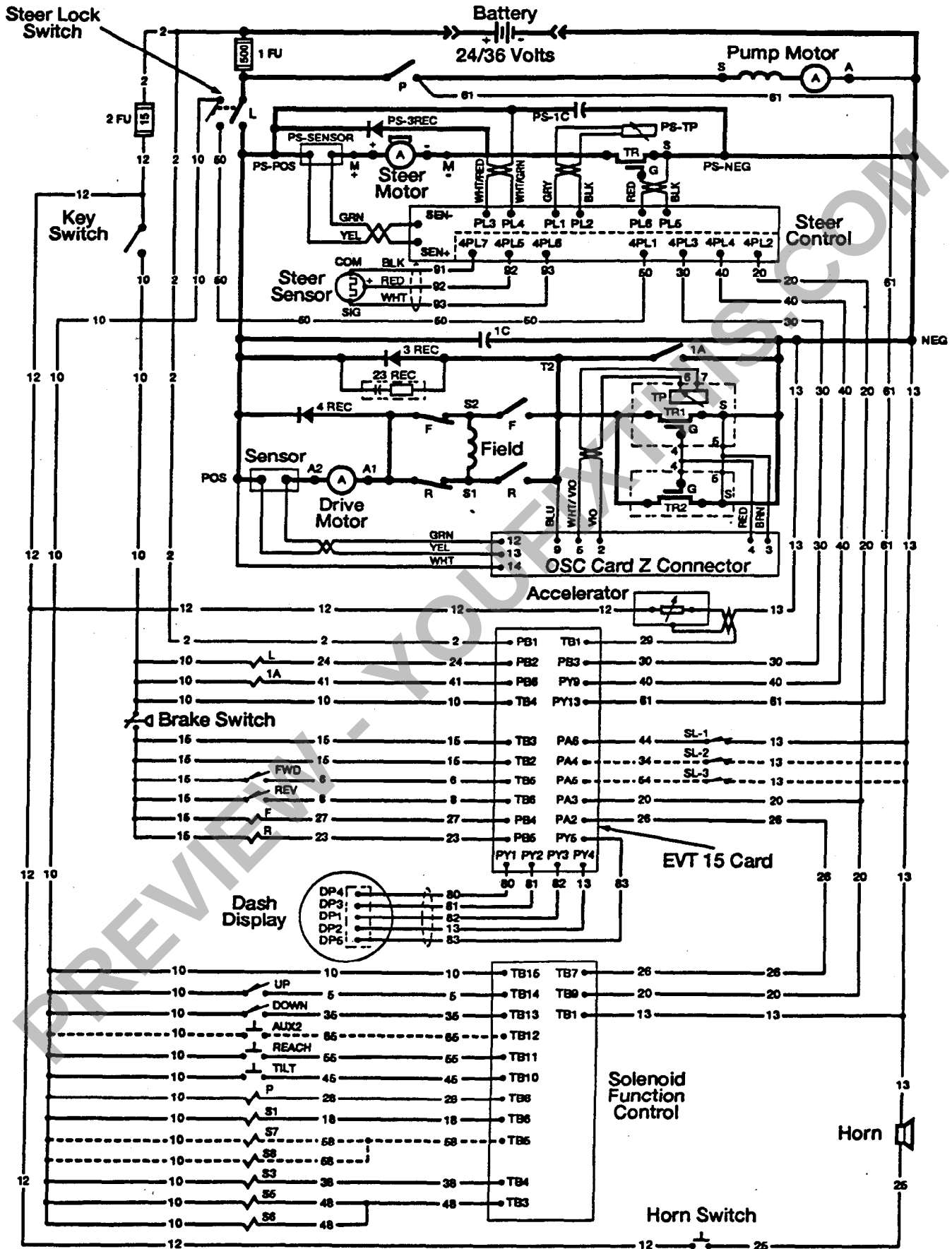
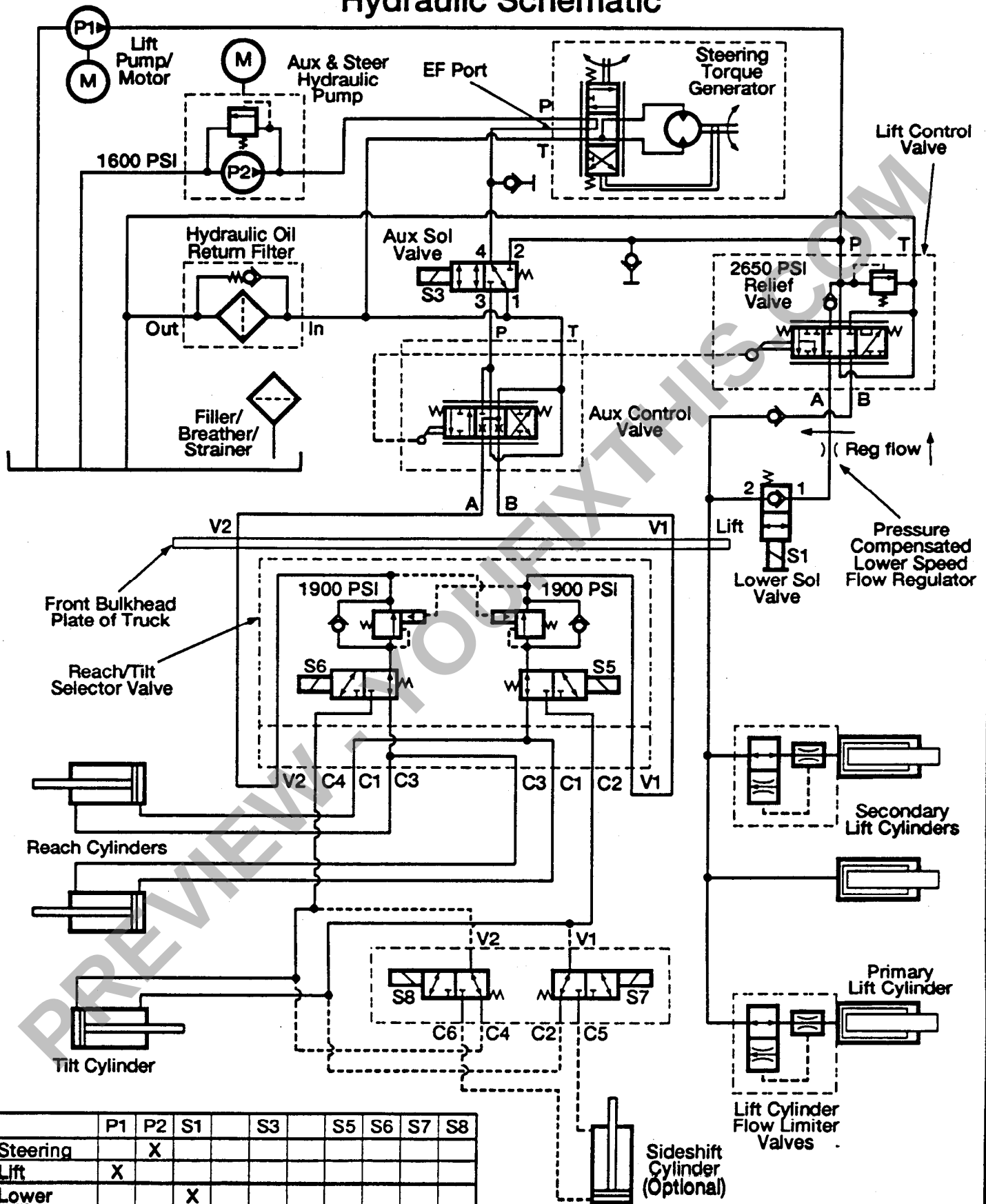


Wiring Diagram



Hydraulic Schematic



	P1	P2	S1	S3	S5	S6	S7	S8
Steering		X						
Lift	X							
Lower			X					
Reach		X		X				
Tilt		X		X	X	X		
Sideshift		X		X	X	X	X	X

Clark Material Handling Co.

NPR 15D, 17, 20, 22

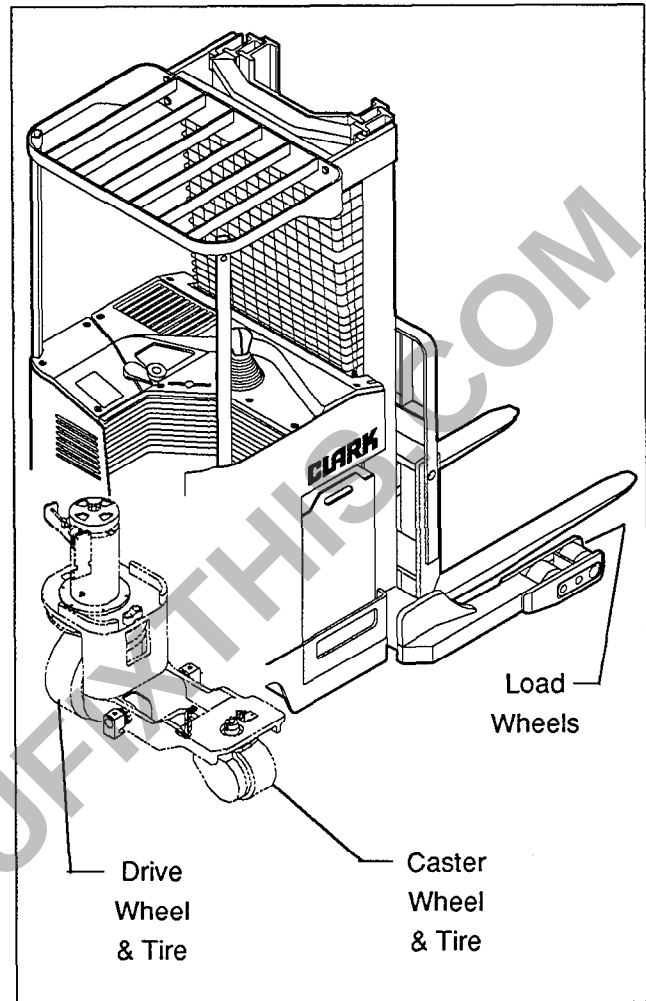
2791868

Planned Maintenance Procedures

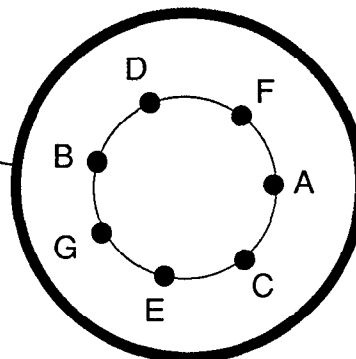
6. Inspect Wheels & Tires

- Check for obvious damage to tires on the load, caster and drive wheels.
- Look for excessive tire wear, cuts, breaks, "chunking" or bond failure between the tires and wheels.
- Remove objects that are embedded in the tire.
- Make sure grease fittings are not damaged and none are missing.
- Be sure drive wheel fasteners are secure and none are missing. If they are loose, torque them to specifications. Fasteners must be tightened using a diagonal sequence as shown below (lettered A through G).

Retorque drive wheel fasteners after the first 200 hours of operation.

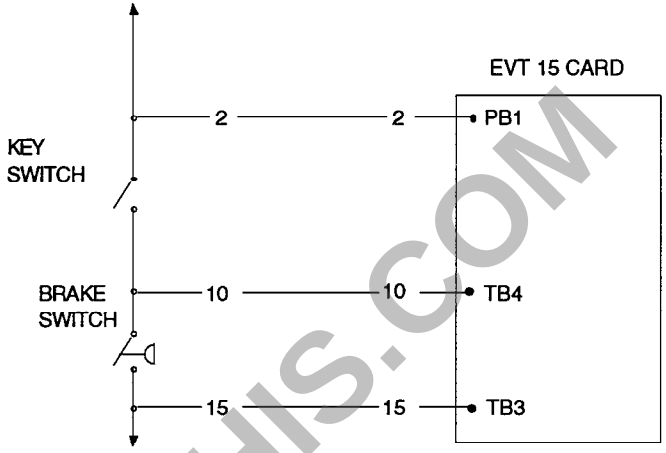


Fastener Tightening Sequence

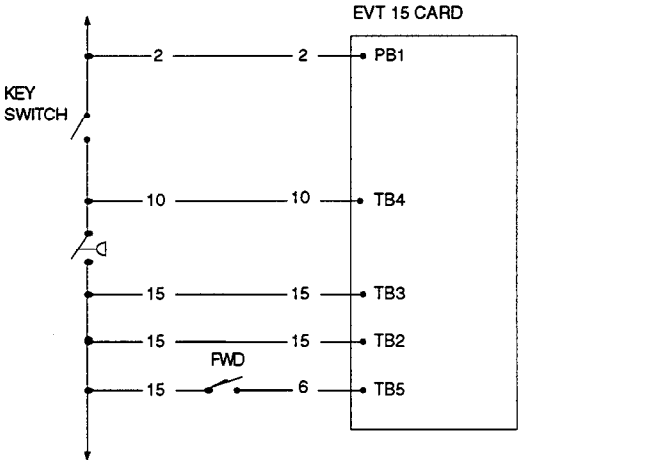


TORQUE FASTENERS
TO:
124 - 139 LB. FT.
(168 - 188 N•M)

STATUS CODE -01	DESCRIPTION No brake switch input.	MEMORY RECALL	No
		CIRCUIT	Traction

<p>SYMPTOM Forward or reverse contactor will not pick up.</p> <p>POSSIBLE CAUSE</p> <ul style="list-style-type: none"> •Defective brake switch or no brake line pressure. <ul style="list-style-type: none"> - Check brake switch to insure proper closure. •Open circuit between battery positive and terminal TB3. <ul style="list-style-type: none"> - Check for loose connections or broken wire between brake switch and terminal TB3. - Check for loose connections or broken wire between key switch and positive side of the brake switch. •Defective brake system. <ul style="list-style-type: none"> - Check that the brakes are releasing and no air in the brake system. - Check for hydraulic leaks in the brake system. - Check for mechanical interference in the foot pedal assembly. 	 <p>STATUS INDICATION CRITERIA This Status Code will be displayed when TB3 is less than 50% battery volts.</p>
---	---

STATUS CODE -02	DESCRIPTION Forward directional switch is closed on initial power up.	MEMORY RECALL	No
		CIRCUIT	Traction

<p>SYMPTOM Forward contactor will not pick up, static return to off (SRO) lock out.</p> <p>POSSIBLE CAUSE</p> <ul style="list-style-type: none"> •Forward directional switch closed on initial power up (closure of battery receptacle, key switch or brake switch). <ul style="list-style-type: none"> - Return directional handle to neutral and then select forward direction. •Forward directional switch is welded closed or misadjusted to be held closed. <ul style="list-style-type: none"> - Replace or adjust forward directional switch to insure that it opens when directional handle is returned to neutral. •Short circuit between TB2 and TB5. <ul style="list-style-type: none"> - Disconnect wire #6 from TB5 and check for short circuit between TB2 and wire #6. •Defective oscillator card. <ul style="list-style-type: none"> - Disconnect wire #6 at TB5. Measure voltage at TB5, should be less than 60% of battery volts. 	 <p>STATUS INDICATION CRITERIA This Status code will be displayed when voltage at TB5 is greater than 60% battery volts at initial power up.</p>
--	---

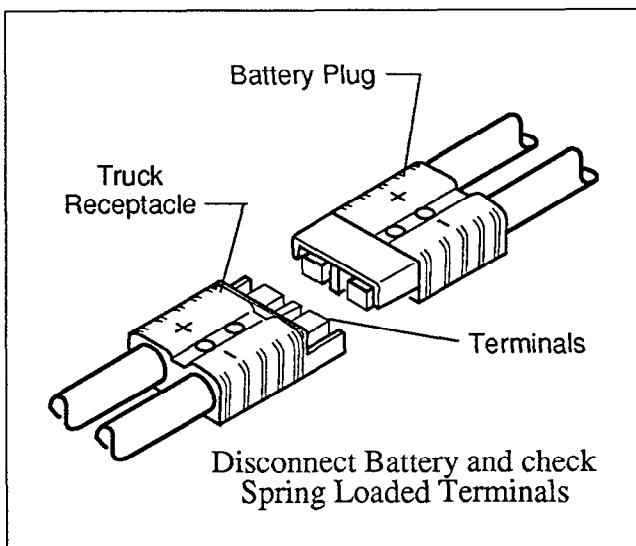
Walk Around Visual Inspection Summary

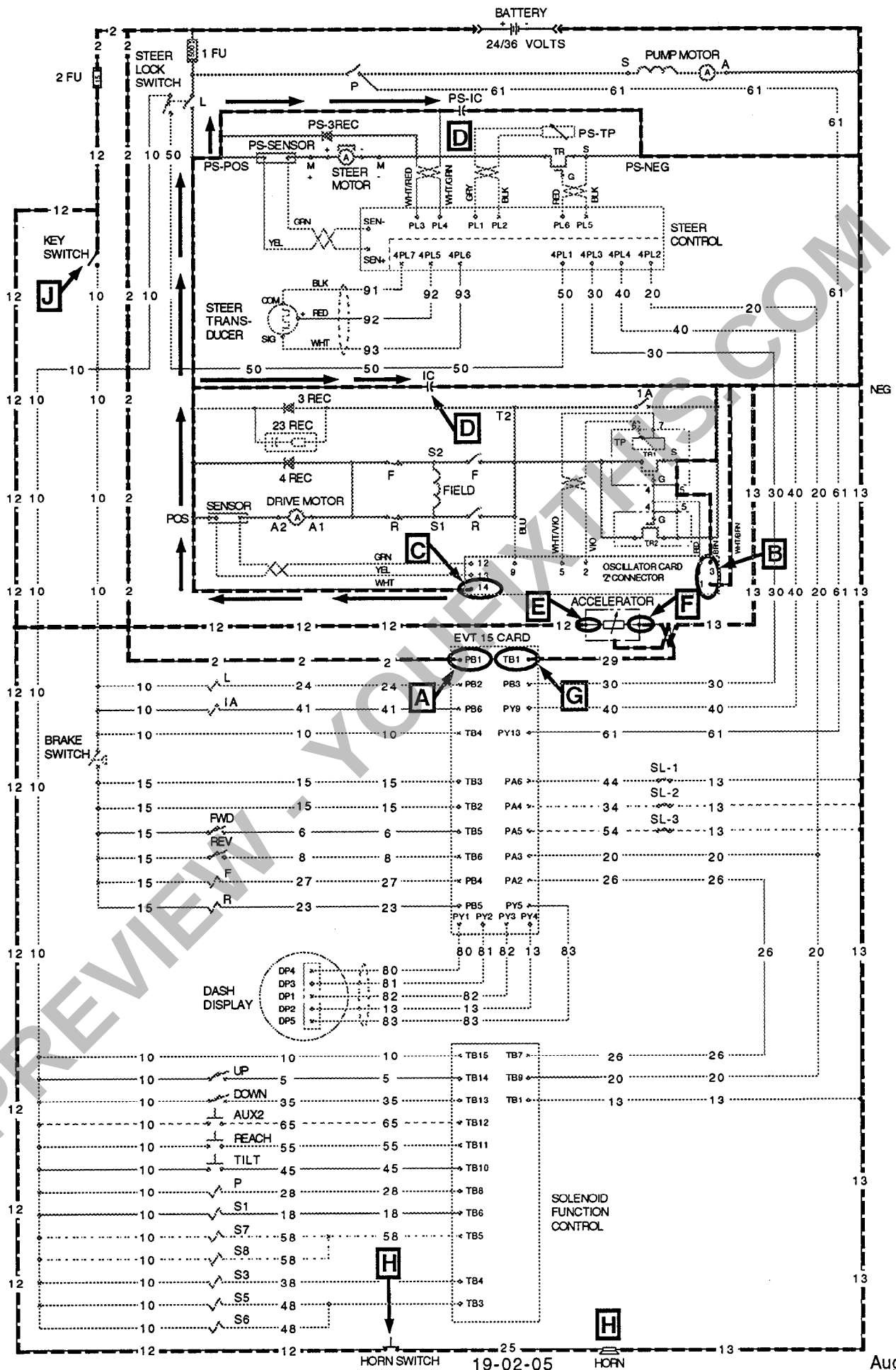
- Visible frame damage.
- Tire Wear and/or lodged foreign objects in tire tread and/or badly damaged side walls.
- Overhead Guard for security of mounting (loose or missing fasteners) and damage.
- Visible fluid leaks.
- Presence and condition of covers, pads, floor mat, decals and truck data plate.
- Safety Screen and/or Glass for security of mounting and damage.
- Visible signs of wear and/or damage to upright.
- Load Back Rest for security of mounting and damage.
- Check that "ground chain link" is touching the floor.

Visual Inspection

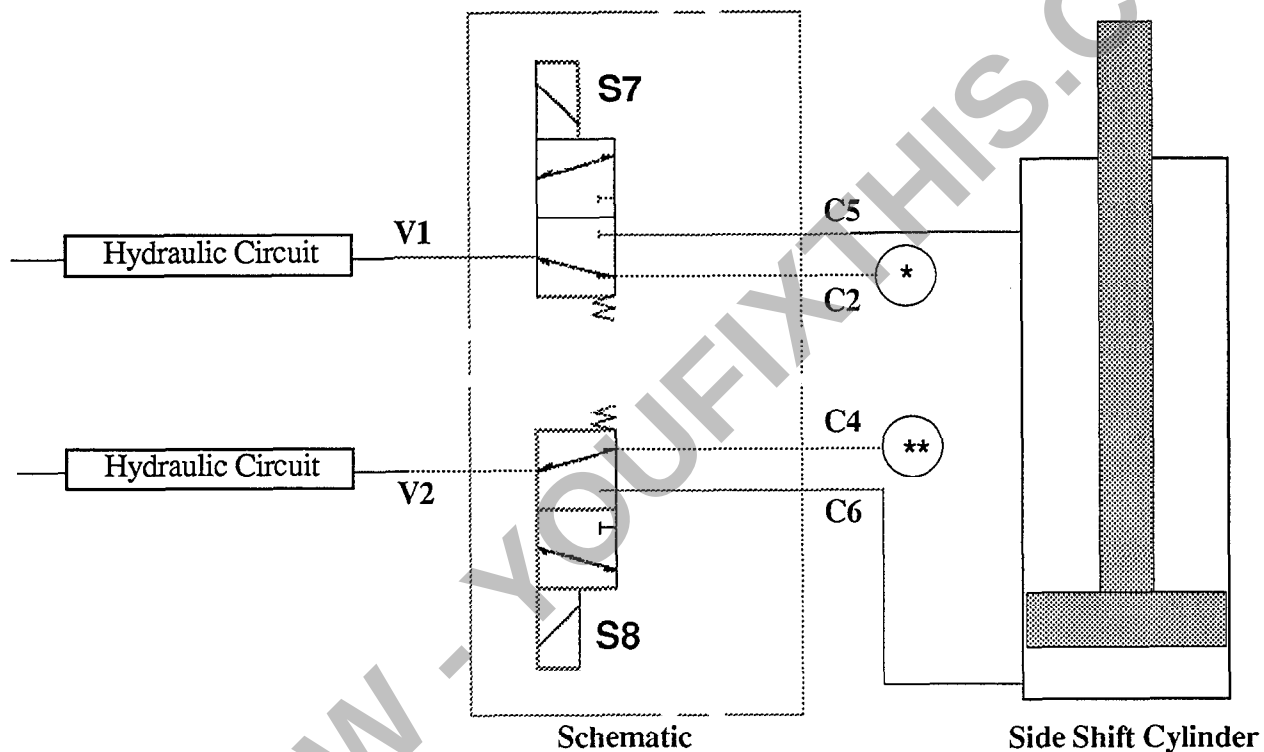
1. Inspect Battery Plug & Truck Receptacle

- Disconnect battery from truck. Pull back on the battery disconnect lever located at the right front corner of the console.
- Inspect the spring loaded terminals in the truck battery receptacle and check the battery plug terminals. Burned or pitted terminals should be noted on the P.M. check sheet.





Hydraulic Schematic



* Return to VI/C2/S5 Circuit

** Return to V2/C4/S6 Circuit

Typical Illustration

Planned Maintenance Procedures

Lift Chain Adjustment

Step 1: Adjustment Check

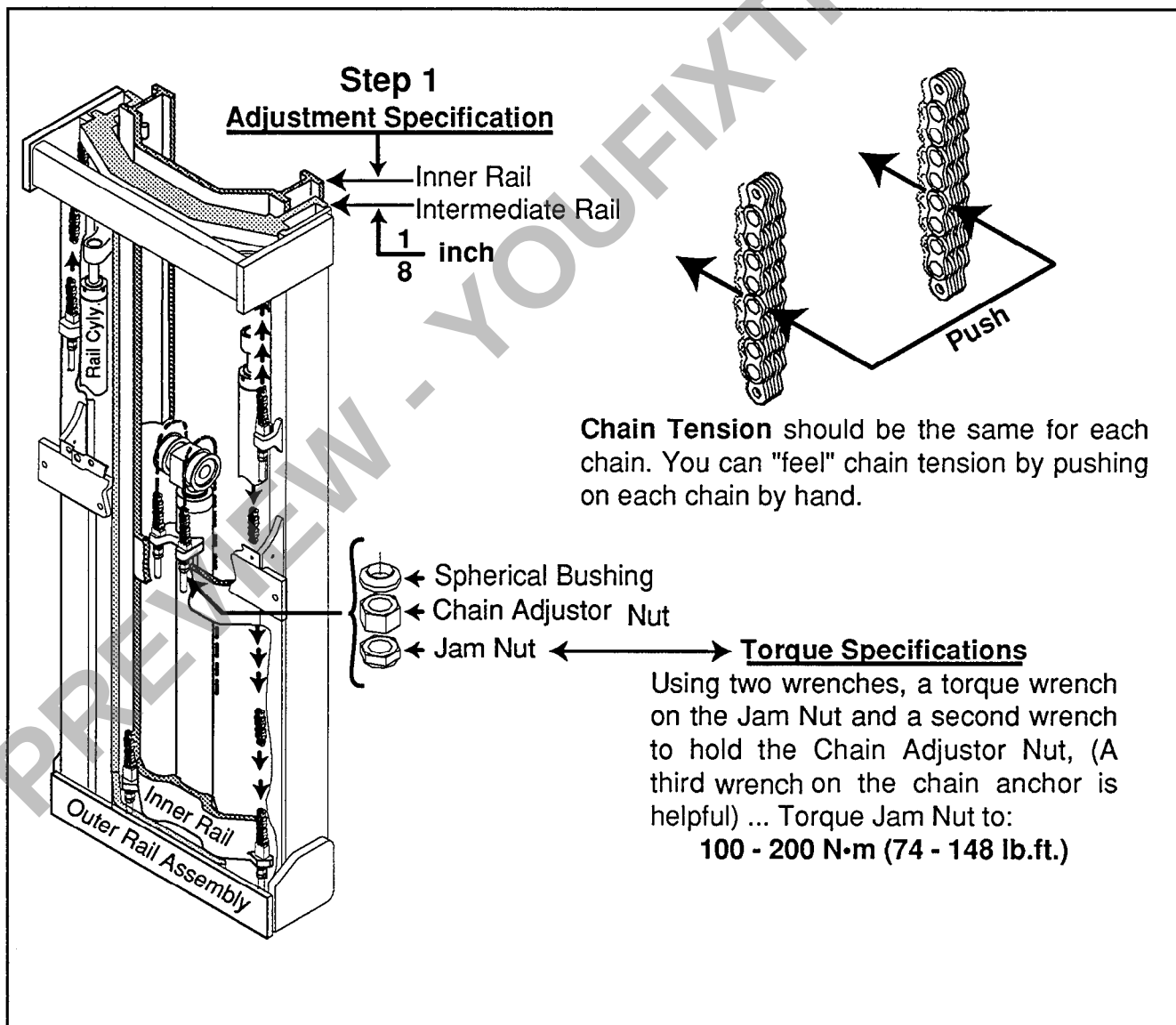
- With the upright fully lowered, check to see if the inner rails protrude 1/8 inch above the intermediate rails (both sides).
- If they do, check tension of both chains on the longest span. Chain tension should be the same.

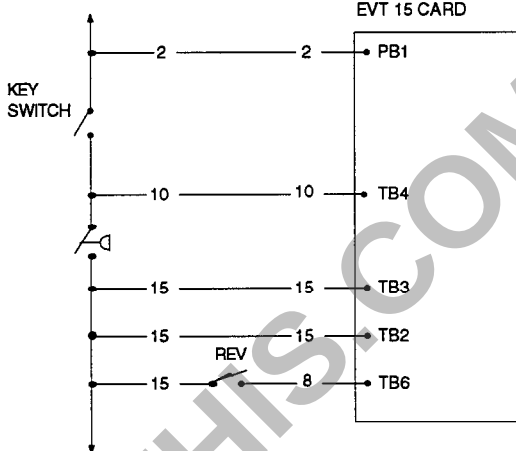
If the above checks are as specified, the Inner Rail Chains do not require adjustment. Check the carriage chains as outlined on the following page.

If any one of the above checks are not as specified, adjust the chains as instructed on this page.

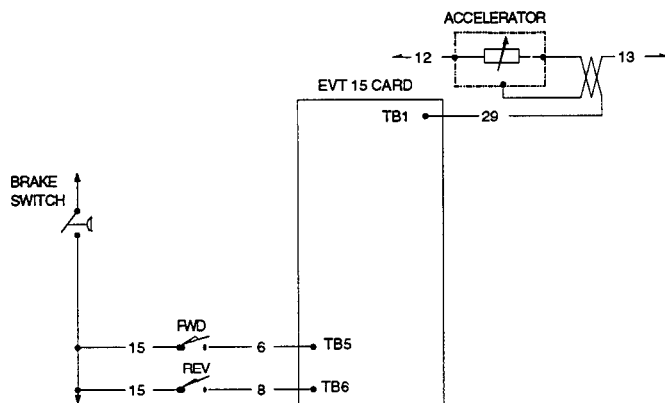
Step 2: Adjustment Procedure

1. Loosen jam nut on each chain anchor.
2. Rotate chain adjustor nut on each chain anchor the same number of turns to position the Inner Rail 1/8-inch above the Intermediate Rail.
3. After completing adjustment, check for equal chain tension ... they should be the same. If not, make a minor adjustment to the chain that has the least tension.
4. Finger tighten jam nuts against chain adjustor nuts. Make sure the chains are not twisted and torque jam nuts as instructed in illustration below. Again, check to be sure chains are straight and not twisted.



STATUS CODE <div>-03</div>	DESCRIPTION Reverse directional switch is closed on initial power up.	MEMORY RECALL	No
		CIRCUIT	Traction
<div>SYMPTOM</div> <p>Reverse contactor will not pick up, static return to off (SRO) lock out.</p> <div>POSSIBLE CAUSE</div> <ul style="list-style-type: none">•Reverse directional switch closed on initial power up (closure of battery receptacle, key switch or brake switch).<ul style="list-style-type: none">- Return directional handle to neutral and then select reverse direction.•Reverse directional switch is welded closed or misadjusted to be held closed.<ul style="list-style-type: none">-Replace or adjust reverse directional switch to insure that it opens when directional handle is returned to neutral.•Short circuit between terminals TB2 and TB6.<ul style="list-style-type: none">- Disconnect wire #8 from TB6 and check for short circuit between TB2 and wire #8.•Defective oscillator card.<ul style="list-style-type: none">- Disconnect wire #8 at TB6. Measure voltage at TB6, should be less than 60% of battery volts.		<div>EVT 15 CARD</div>  <div>STATUS INDICATION CRITERIA</div> <p>This status code will be displayed when voltage at TB6 is greater than 60% battery volts at initial power up.</p>	

STATUS CODE -06	DESCRIPTION Accelerator input voltage is below threshold before the FWD or REV directional switch closes.	MEMORY RECALL	No
		CIRCUIT	Traction

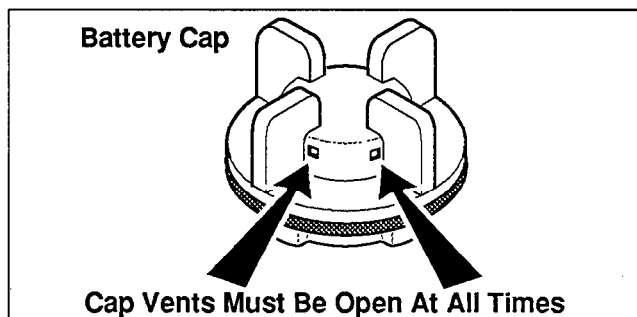
<p>SYMPTOM</p> <p>Forward or Reverse contactor will not pick up.</p> <p>POSSIBLE CAUSE</p> <ul style="list-style-type: none"> •Accelerator (transducer / pot) is misadjusted or defective. Status code disappears when directional handle is moved away from neutral to close directional switch. <ul style="list-style-type: none"> - Check accelerator input voltage at terminal TB1, should be approximately 3.7 volts with directional handle in neutral. Adjust or replace accelerator. •Defective directional switch. <ul style="list-style-type: none"> - Check forward or reverse switch to insure closure when direction is selected. •Open circuit between directional switch(s) and battery positive or between directional switch(s) and TB5 or TB6. <ul style="list-style-type: none"> - Check all control wires and connections shown in Figure. 	
---	--

<p>STATUS INDICATION CRITERIA</p> <p>This status code will be displayed when voltage at TB5 and TB6 are less than 60% of the battery volts, and TB1 is less than 2.5 volts.</p>
--

Planned Maintenance Procedures

a. Remove Battery

- Disconnect battery from truck receptacle.
- Remove battery retainers and inspect them for damage.
- Remove battery from truck. Refer to Group 12 for removal and safety instructions.
- Clean off deposits of corrosion on the battery.
- Check battery cables for fraying and damage. A frayed or damaged cable can cause a short. Report condition on P.M. Check List.



- Check battery vents for obstruction. The cap vents must be open at all times. If any are found to be plugged, they may be washed in a solution of baking soda and water.

b. Access Internal Components

- Remove fasteners securing front console cover to truck.

Slip boot off cover lip and tuck bottom of boot into cover hole.

Carefully lift cover a little forward and upward until the cover is free of the control.

Remove console cover from truck.

- Remove fasteners securing the side cover to the truck.

Lift cover off truck.

- Remove fasteners securing floor plate to truck.

Lift floor plate upward and over the brake pedal.

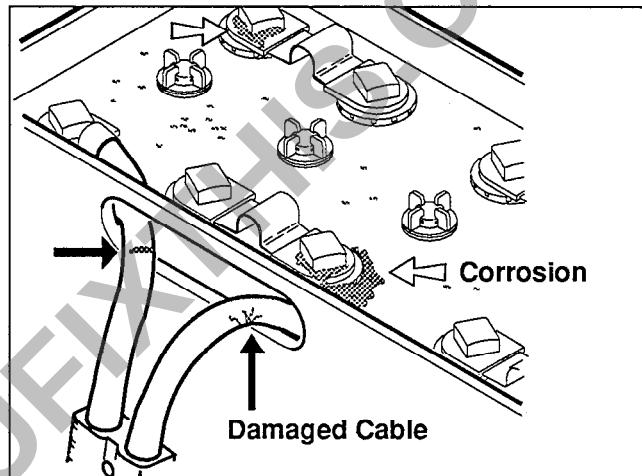
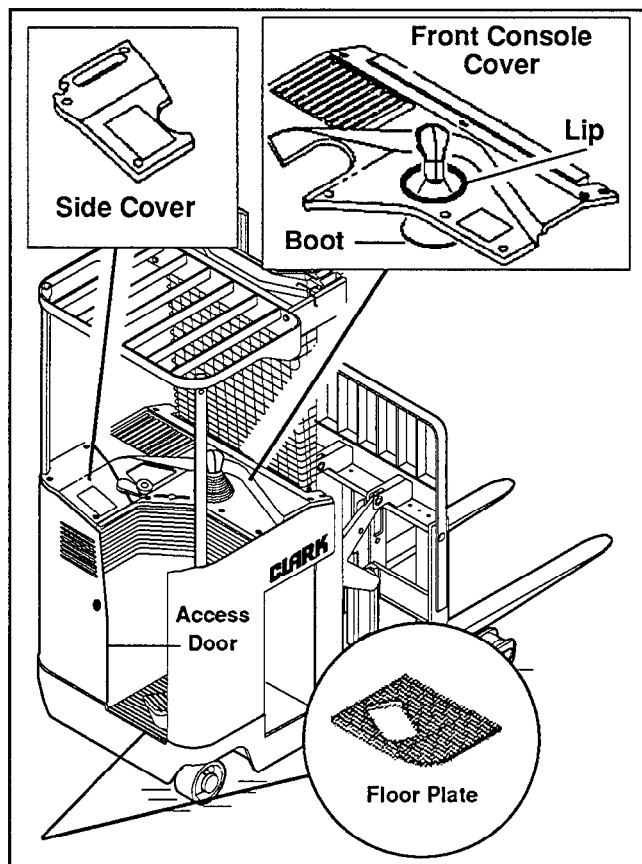
- Open Access Door. Loosen door fasteners until the door is free to open exposing internal components.

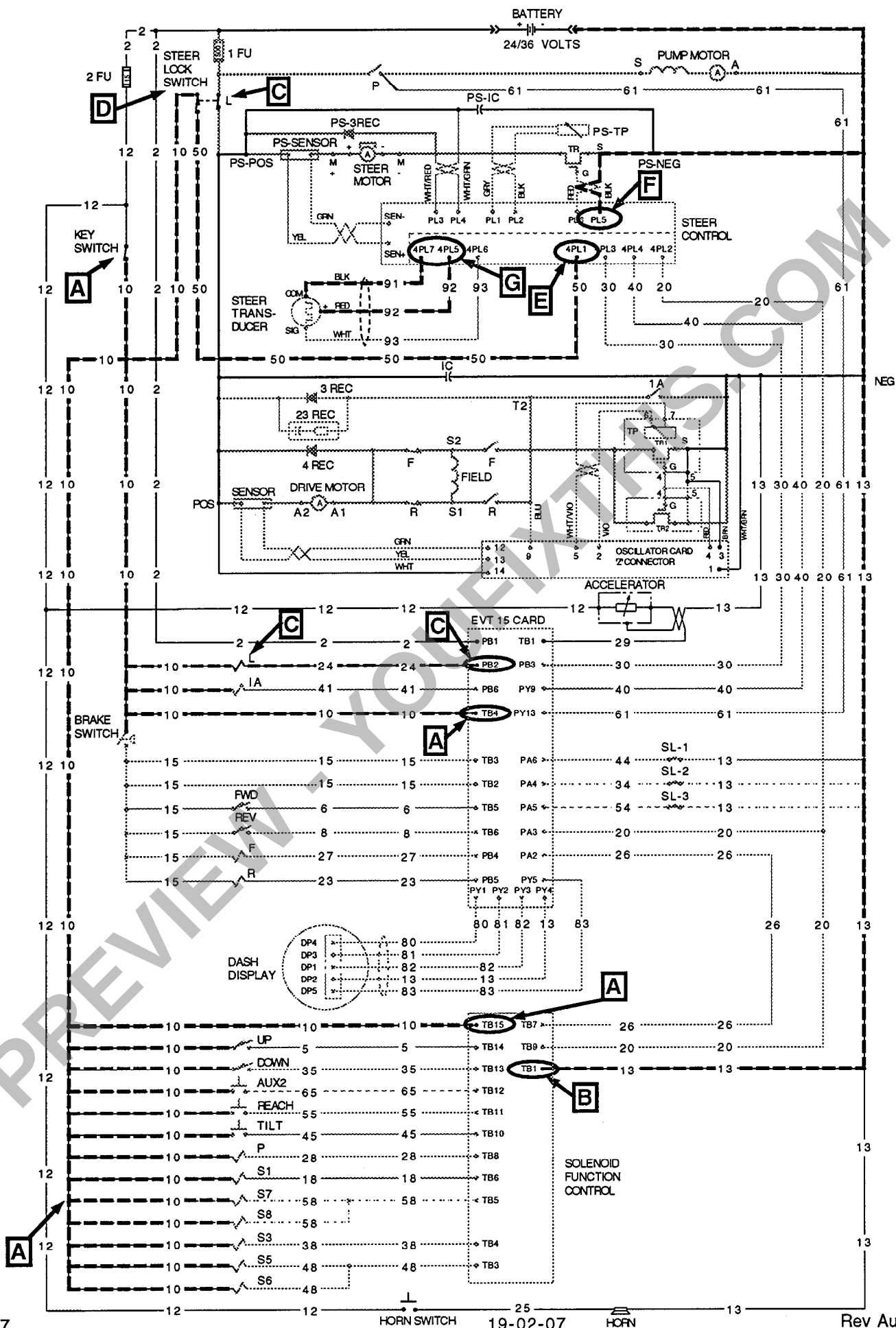
WARNING

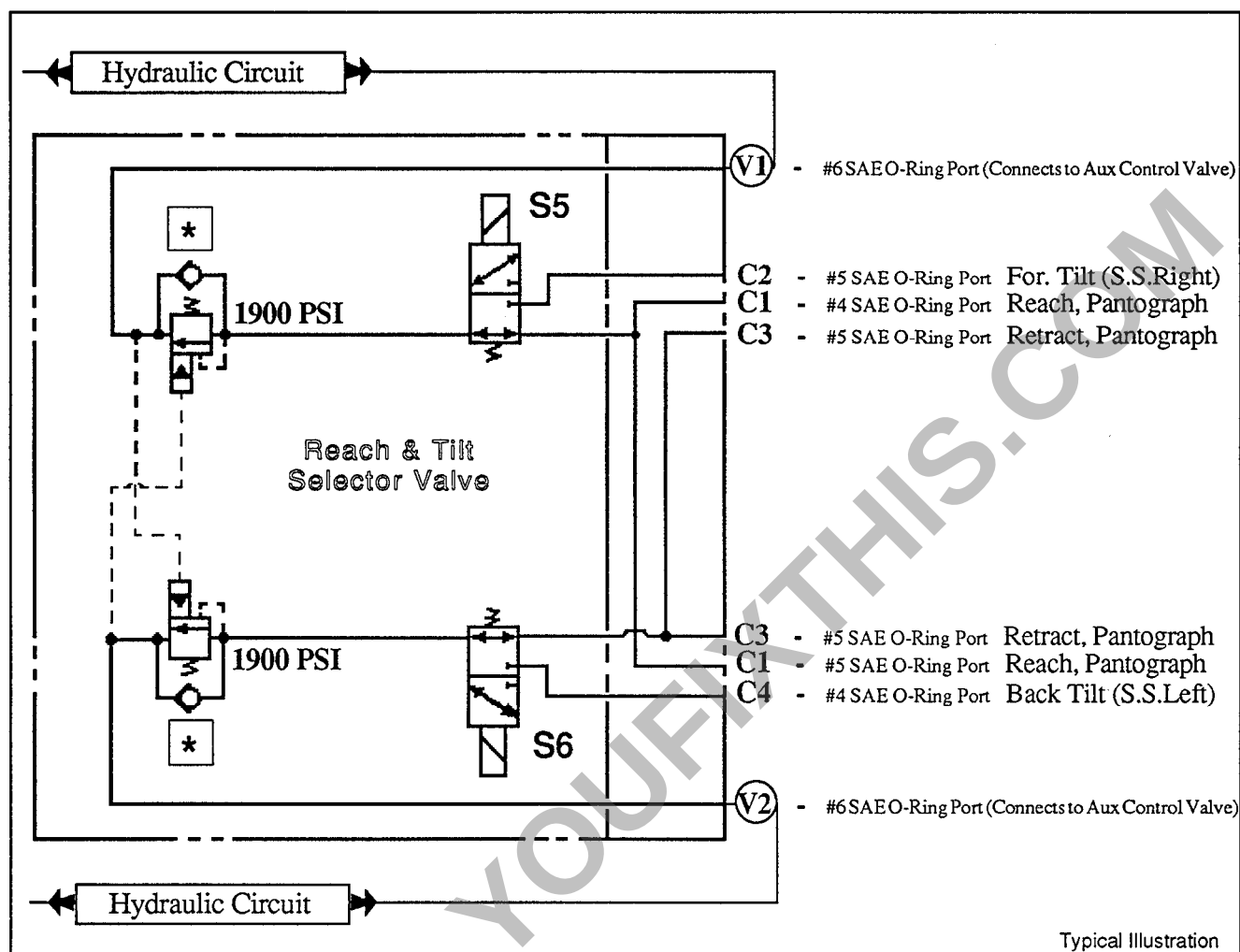
The battery contains corrosive acid which can cause injury. If acid contacts your eyes or skin, flush immediately with water and get medical assistance.



Do not smoke or allow open flame near the battery. Explosive gas is always present around batteries.







= Counterbalance Valves

S5

= Solenoid Valve

S6

= Solenoid Valve

S5 (V1)

C2 Port

= Back Tilt or Side Shift Right control circuit

S6 (V2)

C4 Port

= Forward Tilt or Side Shift Left control circuit

S5 (V1)

C1 Port

= Reach (Pantograph) control circuit

S6 (V2)

C3 Port

= Retract (Pantograph) control circuit

Critical Fastener Torque Specifications**[Tightening Torque WET, SAE 30]****example****Articulating Axle Mounting Bolts** _____ 60 lb.ft. (81 N•m)

(Refer to illustration in Group 22, Section 1, Page 2)

Articulating Axle Stop Bolt Set Screw _____ 35 lb.ft. (47 N•m)

(Refer to illustration in Group 20, Section 1, Page 2)

Brake Assy to Drive Motor Bolts (Diagonal Sequence) 240 - 270 lb. in. (27 - 31 N•m)

(Refer to illustration in Group 23, Section 1, Page 4)

Brake Drum to Drive Motor Shaft Nut _____ (125 - 140 lb.ft. (170 - 190 N•m)

(Refer to illustration in Group 23, Section 1, Page 4)

Drive Motor Mounting Bolts _____ 25 lb.ft. (34 N•m)

(Refer to illustration in Group 20, Section 1, Page 2)

Drive Unit to Axle Mounting Bolts _____ 74 - 81 lb. ft. (100 - 110 N•m)

(Refer to illustration in Group 20, Section 2)

Drive Wheel Mounting Bolts (Diagonal Sequence) _ 124 - 139 lb.ft. (168 - 188 N•m)

(Refer to illustration in Group 22, Section 1, Page 2)

Truck to Upright Mounting Bolts ~ Lower _____ 375 lb.ft. (508 N•m)

(Refer to illustration in Group 34, Section 1, Page 14)

Truck to Upright Mounting Bolts ~ Upper _____ 200 lb.ft. (271 N•m)

(Refer to illustration in Group 34, Section 1, Page 14)

Load Backrest Extension Mounting Bolts _____ 125 - 140 lb.ft. (170 - 190 N•m)

(Refer to illustration in Group 34, Section 2, Page 3)

Oil Filter Assembly _____ Refer to the instructions found in
Group 29, Section 1, Page 6.**Overhead Guard Mounting Bolts** _____ 177 to 199 lb.ft. (240 - 270 N•m)

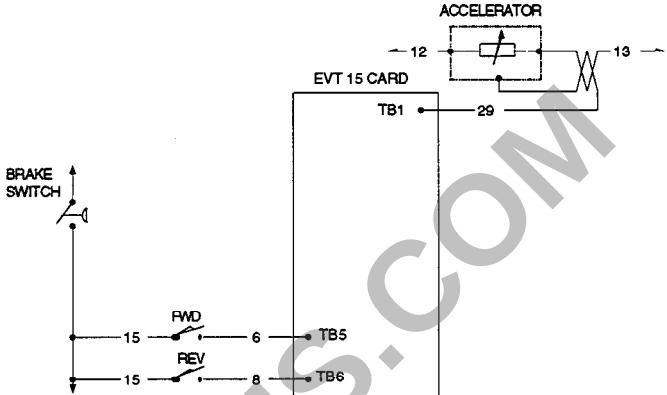
(Refer to illustration in Group 34, Section 1, Page 9)

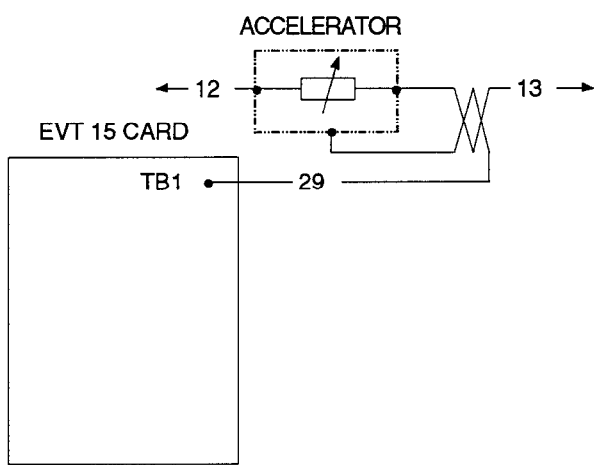
OHG Leg to Overhead Guard Bolt _____ 30 - 33 lb.ft. (40 - 45 N•m)

(Refer to illustration in Group 34, Section 1, Page 9)

OHG Leg to Truck Frame Bolt _____ 75 - 80 lb.ft. (102 - 108 N•m)

(Refer to illustration in Group 34, Section 1, Page 9)

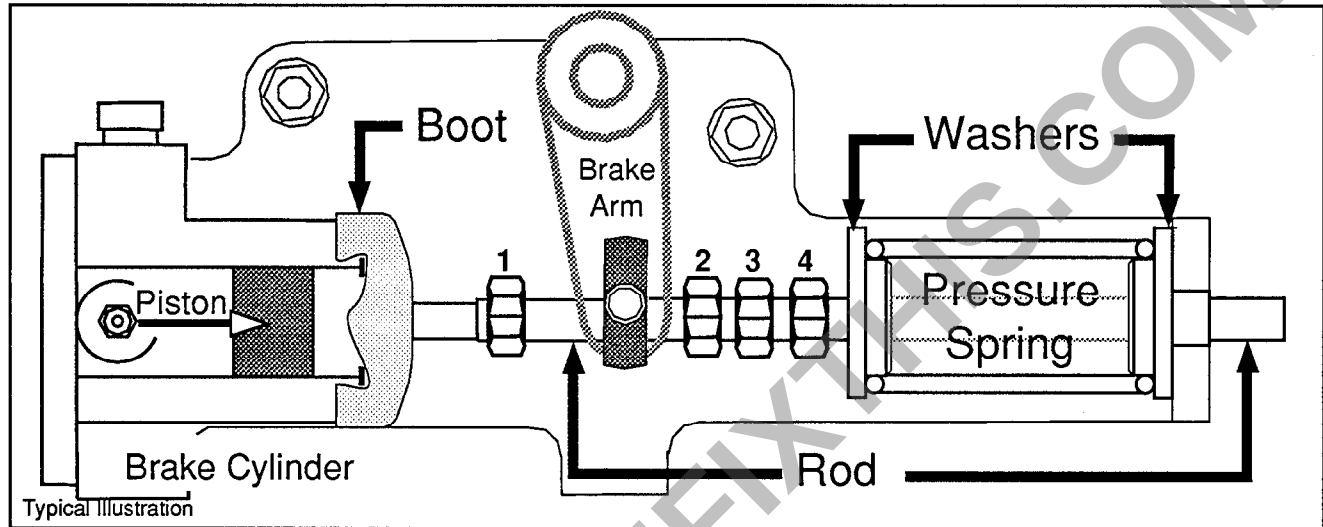
STATUS CODE -07	DESCRIPTION Accelerator input voltage too high.	MEMORY RECALL	No
		CIRCUIT	Traction
<p>SYMPTOM</p> <p>Forward or Reverse contactor picks up but control will not operate when control handle is moved toward high speed or status code -07 is displayed then disappears when the vehicle starts to accelerate.</p> <p>POSSIBLE CAUSE</p> <ul style="list-style-type: none"> •Accelerator misadjusted or defective. <ul style="list-style-type: none"> - Input voltage at TB1 should be less than 3.8 volts. Adjust or replace accelerator to insure that the voltage at TB1 will vary from 3.8 volts to less than 0.2 volts when the control handle is moved into high speed. •Open circuit between battery negative and TB1. <ul style="list-style-type: none"> - Check for broken wires or loose connections or open accelerator / voltage supply in the circuit shown in figure. - Check for broken wire or loose or corroded connection at WHT / BROWN wire to terminal PZ1. •Short circuit from battery positive to TB1. <ul style="list-style-type: none"> - Disconnect wire #29 from TB1 and measure voltage at wire #29 to negative. Should be zero volts for potentiometer type and less than 3.8 volts for transducer type accelerator. 		 <p>STATUS INDICATION CRITERIA</p> <p>This status code will be displayed when the accelerator input voltage at TB1 is higher than 3.8 volts.</p>	

STATUS CODE -08	DESCRIPTION Accelerator input voltage too low on power up after initial key switch closure or on re-closure of brake switch with sufficient time delay to initiate SRO checks.	MEMORY RECALL	No
		CIRCUIT	Traction
<p>SYMPTOM</p> <p>Forward or Reverse contactor does not pick up.</p> <p>POSSIBLE CAUSE</p> <ul style="list-style-type: none"> •Accelerator misadjusted or defective. <ul style="list-style-type: none"> - Check accelerator input voltage at TB1, should be approximately 3.8 volts with handle in neutral. Adjust or replace accelerator. •Short circuit between battery negative and TB1. <ul style="list-style-type: none"> - Disconnect wire #29 from TB1. For transducer, check for open circuit voltage from wire #29 to battery negative. Should be greater than 3.0 volts. When potentiometer is used, resistance should be greater than 4.7K ohms. Replace. •Defective oscillator card. <ul style="list-style-type: none"> - Disconnect wire #29 from TB1. Measure voltage from TB1 to negative. Voltage should be greater than 4.5 volts, if not replace oscillator card. 		 <p>STATUS INDICATION CRITERIA</p> <p>This status code will be displayed when the accelerator input voltage at TB1 is less than 3.0 volts and either the battery receptacle or key switch has been opened.</p>	

Brake Adjustment

Step 1

- Pull boot from cylinder exposing the cylinder piston and rod end, see below.
- Loosen and back-off jam nut (1) freeing brake arm, see below.
- Loosen nuts (2 & 3). Rotate them inward several turns. Now loosen nut (4) releasing spring pressure.



Step 2

- Rotate actuating rod counterclockwise while holding nuts (1, 2, 3 & 4). Rotate rod outward until piston is fully released (there must be some gap between rod end and piston). *Brake are must be free to move in either direction.*
- Now depress brake pedal several times to move piston outward until it is flush with housing
- Pedal will become very firm. Do not force pedal down. While holding light pressure on pedal, loosen bleeder to allow pedal to be depressed to the floor. Do not release brake pedal. Tighten bleeder.

IMPORTANT

The brake arm must be allowed to "float" until adjustment is made.

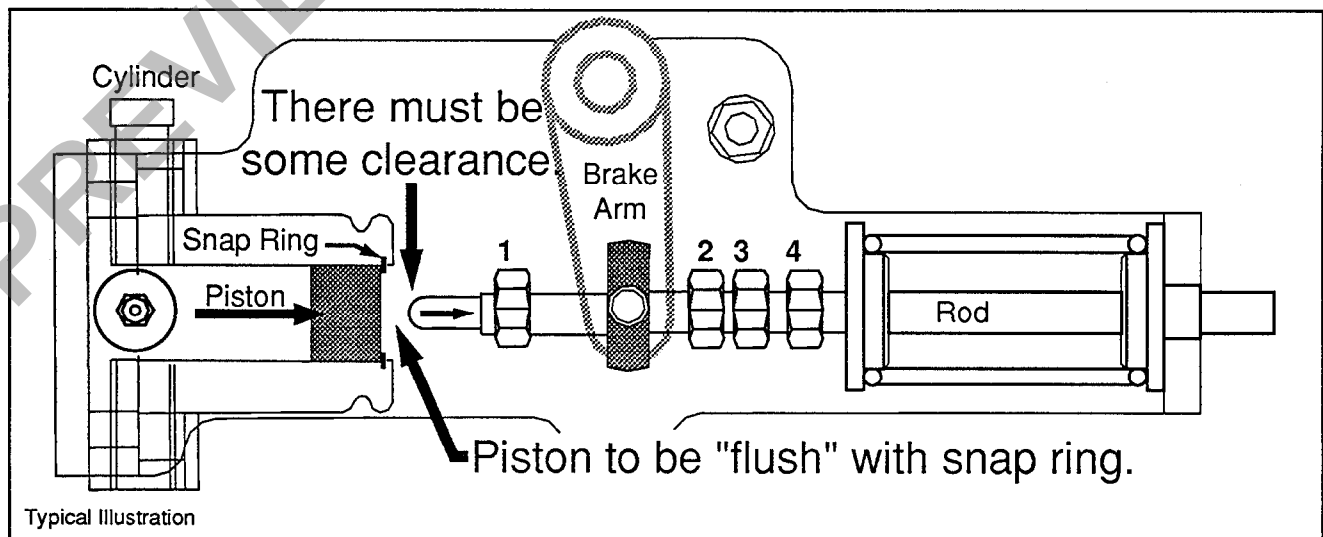


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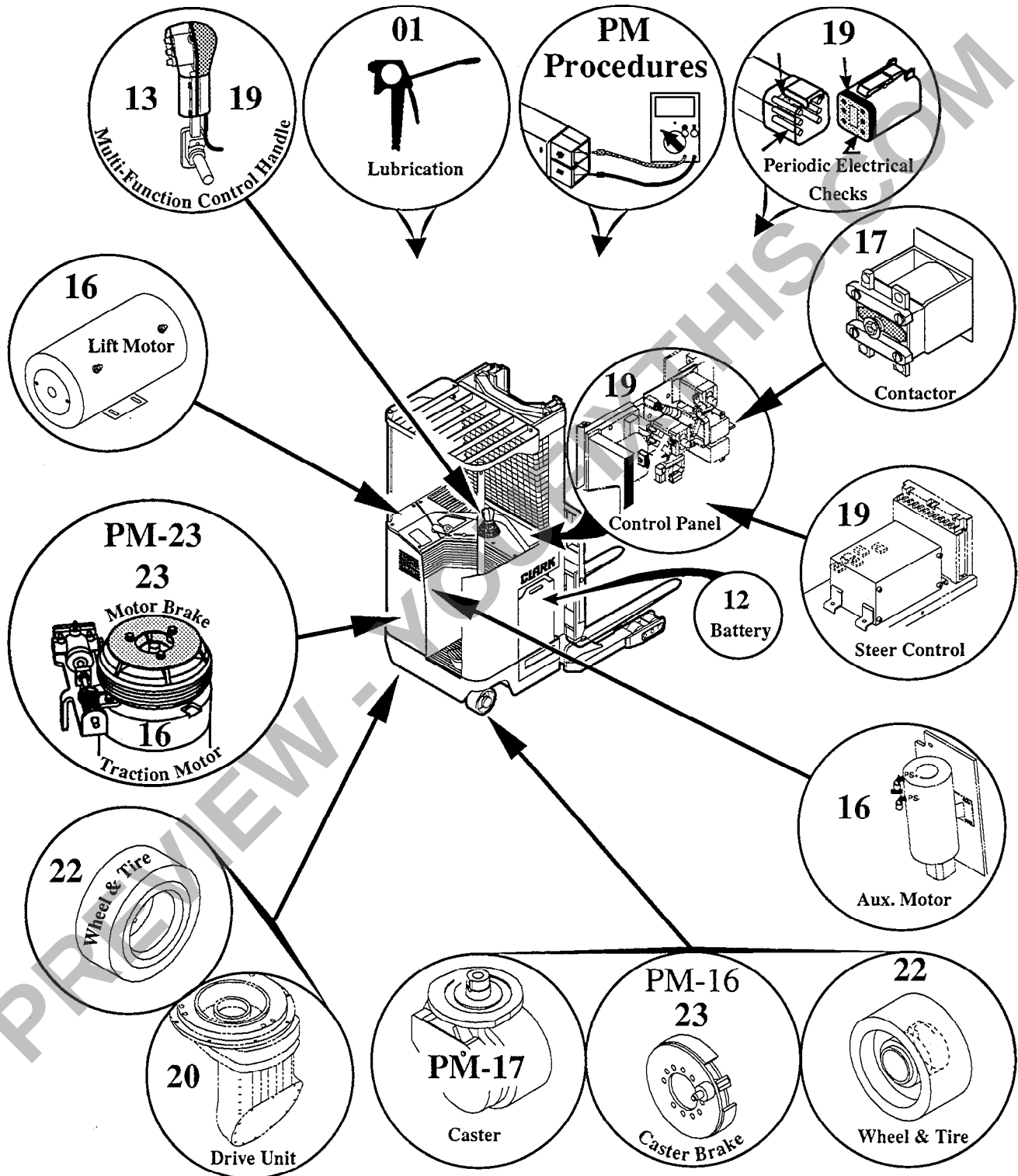
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03 Battery Service	12-1-1	32 Auxiliary Reach & Tilt Valve Overhaul	30-2-1
04 Multi-Function Control Handle Switches	13-1-1	33 Lift Control Valve Overhaul	30-3-1
05 Electric Motor Service -- General	16-2-1	34 Lowering Solenoid Valve	30-4-1
06 Traction Motor Service	16-3-1	35 Auxiliary Solenoid Valve	
07 Pump Motors	16-5-1	(Reach & Tilt Control Valves)	30-5-1
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09 Contactor Service	17-1-1	37 Side Shifter Solenoid Control Valve	30-7-1
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The following is a list of "CAUTIONS" connected with the operation and maintenance of trucks equipped with Solid State Control Panels.

Safety Signs and Safety Messages

SAFETY SIGNS and MESSAGES are placed in this manual and also on the truck to provide instructions and to identify specific areas where potential hazards exist and special precautions must be taken. Be sure you know and understand the meaning of these instructions, signs and messages. Damage to the truck or serious injury to you or other persons may result if these messages are not followed. If warning decals are damaged they must be replaced. Contact your Clark dealer for replacements.

NOTICE This message is used when special information, instructions or identification is required relating to procedures, equipment, tools, pressures, capacities and other special data.

IMPORTANT This message is used when special precautions should be taken to ensure a correct action or to avoid damage to or malfunction of the truck or a component.

 **CAUTION** This message is used as a reminder of safety practices which can result in personal injury if proper precautions are not taken.

 **WARNING** This message is used when a hazard exists which can result in serious personal injury or death, if proper precautions are not taken.

 **DANGER** This message is used when an extreme hazard exists.



WELDING ON TRUCKS

1. Make sure the truck has no grounds.
2. Disconnect truck battery.
3. Protect electrical wiring and components from weld spatter with a shield.
4. Ventilate battery or remove battery from truck.

If the above is not followed, damage can result to wiring and electrical components on a solid state control truck.

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