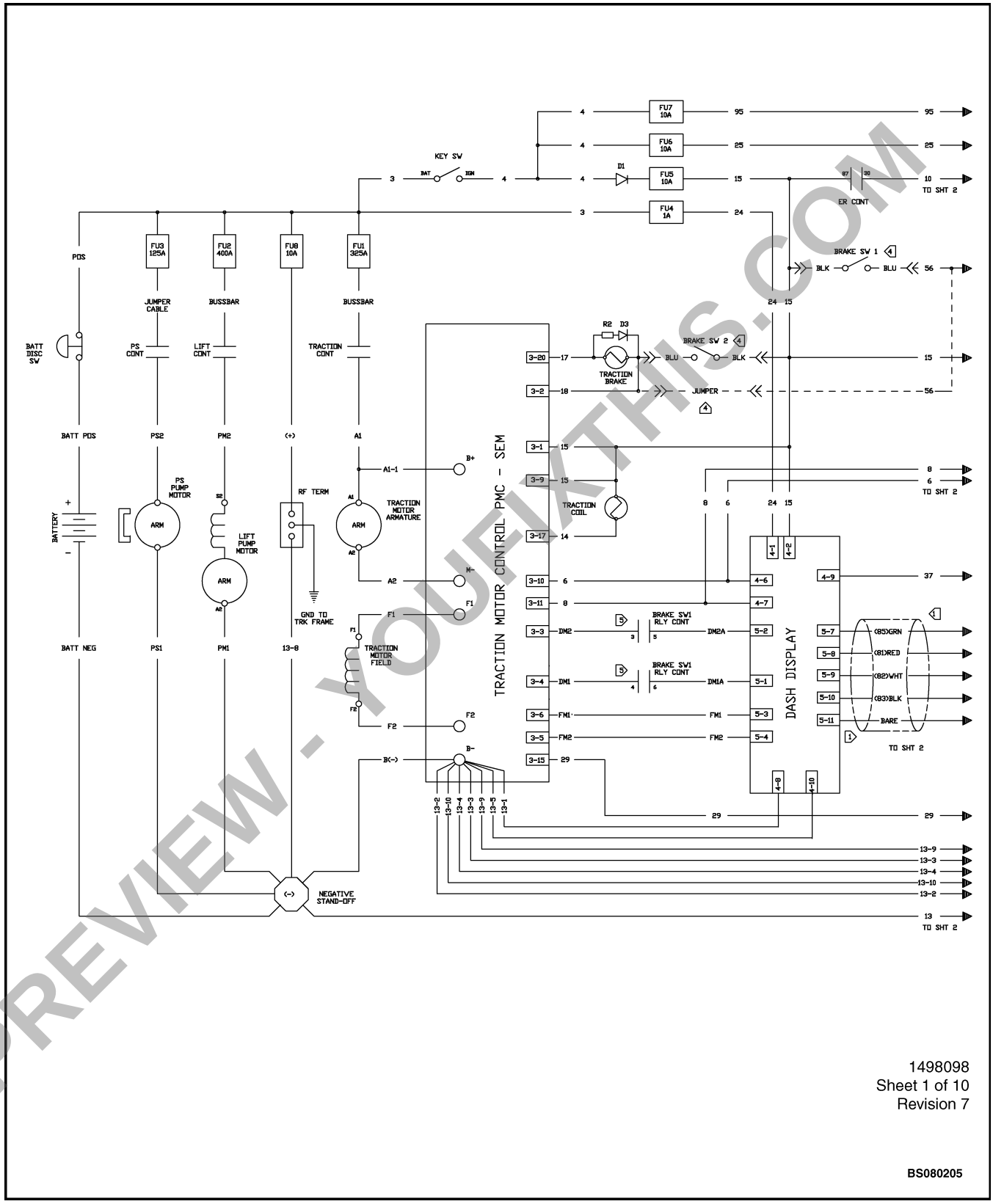


Figure 1. Schematic Diagram - SEM MIB II

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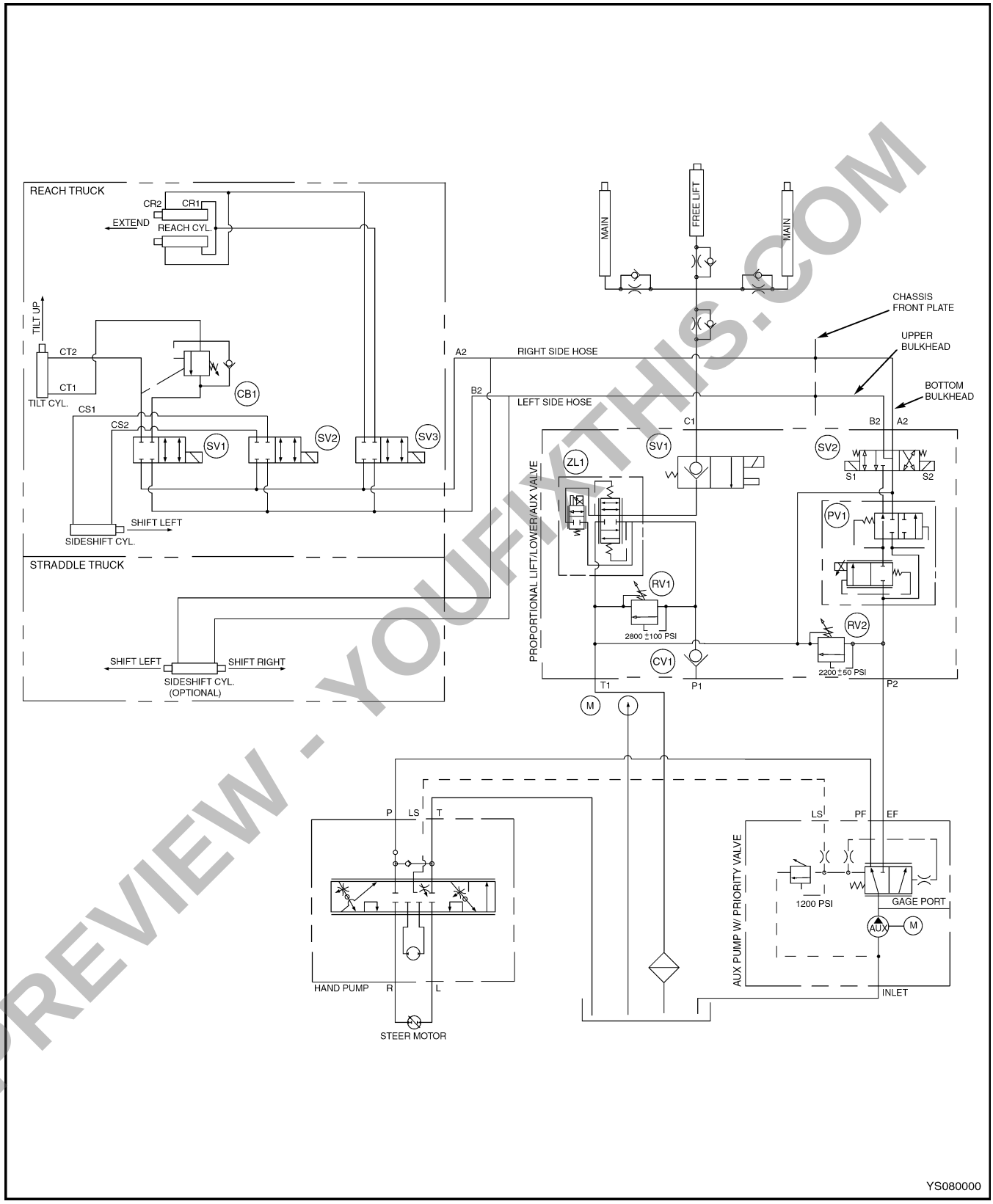


Figure 11. Hydraulic Schematic (Trucks Built Before July 15, 2002)

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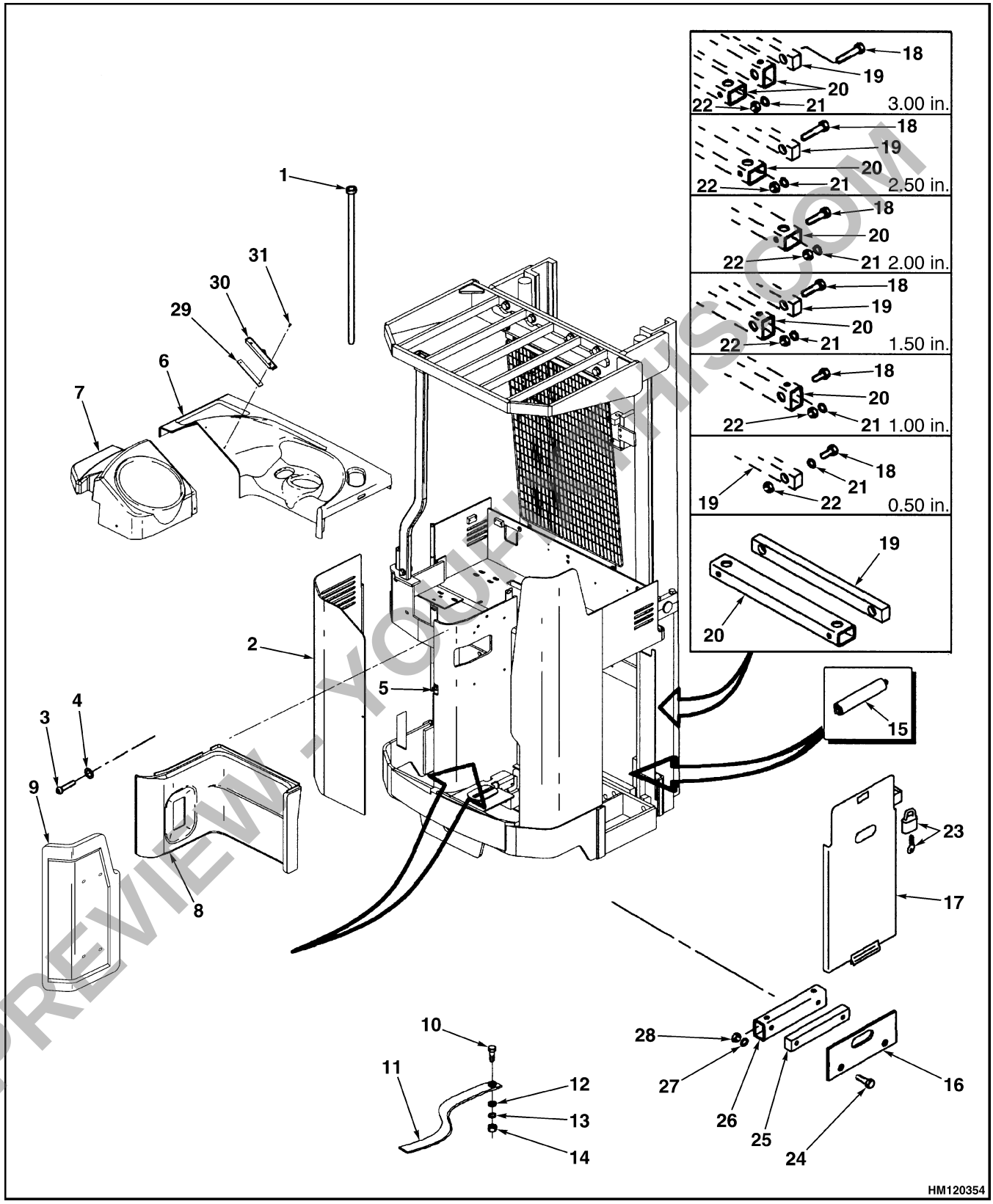


Figure 1. Covers, Panels, and Plates - Small Chassis

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FASTENER TORQUE TABLES

Table 5. Torque Values for Metric Fasteners*

Size and Pitch	Property Class 5.8[1]		Grade 8.8[2]		Grade 10.9[3]	
	N•m	lbf ft	N•m	lbf ft	N•m	lbf ft
M3 × 0.5 M3.5 × 0.6 M4 × 0.7 M5 × 0.8 M6 × 1	0.62 0.97 1.44 2.91 4.94	0.5 0.7 1.1 2.1 3.6	0.99 1.55 2.30 4.65 7.90	0.7 1.1 2.1 3.6 6	1.34 2.11 3.13 6.33 10.8	1.0 1.6 2.3 4.7 8
M8 × 1.25 M8 × 1 M10 × 1.5 M10 × 1.25	12.0 12.8 23.8 25.1	9 9 18 19	19.2 20.5 38.0 40.1	14 15 28 30	26.1 27.9 52 55	19 21 38 41
M12 × 1.75 M12 × 1.25 M14 × 2 M14 × 1.5	41.4 45.3 66 72	31 33 49 53	66 72 105 115	49 53 77 85	90 98 145 155	66 72 105 115
M16 × 2 M16 × 1.5 M20 × 2.5 M20 × 1.5	105 110 200 225	77 81 150 165	165 175 320 355	122 130 235 260	225 240 435 485	165 175 320 360
M24 × 3 M24 × 2 M27 × 3 M27 × 2	345 375 505 550	255 275 370 405	555 605 810 875	410 445 600 645	755 820 1,100 1,190	560 605 810 880
M30 × 3.5 M30 × 3 M30 × 2 M33 × 3.5 M33 × 2	690 715 765 940 1,030	510 530 565 695 760	1,100 1,140 1,220 1,500 1,640	810 840 900 1,100 1,210	1,500 1,550 1,660 2,040 2,240	1,100 1,140 1,230 1,510 1,660
M36 × 4 M36 × 3 M39 × 4 M39 × 3	1,200 1,280 1,560 1,640	885 945 1,150 1,210	1,930 2,040 2,490 2,630	1,430 1,510 1,840 1,940	2,620 2,780 3,390 3,570	1,940 2,050 2,500 2,640
M42 × 4.5 M42 × 3 M45 × 4.5 M45 × 3 M48 × 5 M48 × 3	1,930 2,070 2,410 2,580 2,900 3,160	1,430 1,530 1,780 1,910 2,140 2,330	3,080 3,320 3,850 4,120 4,630 5,040	2,280 2,450 2,840 3,040 3,420 3,720	4,200 4,510 5,240 5,610 6,300 6,860	3,100 3,330 3,870 4,140 4,650 5,060

* Unless otherwise specified [1] Approximately equal to Grade 2 [2] Approximately equal to Grade 5 [3] Approximately equal to Grade 8

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Table 2. Test Menu (Continued)

Test Menu Display	Description
FORWARD INPUT	Forward signal input from MIB: ON or OFF
REVERSE INPUT	Reverse signal input from MIB: ON or OFF
INTERLOCK INPUT	Brake switch input: ON or OFF
MAIN CONT	Traction contactor: OPEN or CLOSED
FAULT 1 OUTPUT	Fault 1 driver status: ON (low) or OFF (high)
FAULT 2 OUTPUT	Fault 2 driver status: ON (low) or OFF (high)
MODSEL 1	Mode select inputs 1 and 2 together define the operating mode from the dash display to the controller. Refer to Table 3.
MODSEL 2	

Table 3. Dash Display Drive Mode Inputs

Test Menu	Drive Mode		
	Turtle	Middle	Rabbit
Mode Select Input 1	OFF	ON	OFF
Mode Select	ON	OFF	ON

Diagnostics Menu

Press the DIAGNOSTIC key to enter the DIAGNOSTIC mode. The LED in the corner of the DIAGNOSTIC key illuminates to indicate that the programmer has been placed in the DIAGNOSTIC mode. The DIAGNOSTICS menu displays all currently active faults detected by the controller. It is capable of displaying 19 different faults, four at a time.

NOTE: The DIAGNOSTICS and DIAGNOSTIC HISTORY display shown in Table 4 is not a menu as such, but simply a list of the possible messages displayed when the programmer is operating in the DIAGNOSTICS or DIAGNOSTIC HISTORY modes. The messages are listed in alphabetical order for easy reference.

Table 4. Diagnostics and Diagnostic History Display

Diagnostics Menu Display	Definition
ARM SENSOR	Armature sensor fault
CONT DRVR OC	Contactor driver overcurrent
FIELD OPEN	Field winding open or disconnected
FLD SENSOR	Field sensor fault
HPD	High Pedal Disable activated
HW FAILSAFE 1	Power-on self test fault
HW FAILSAFE 2	External watchdog fault
HW FAILSAFE 3	Internal watchdog fault
LOW BATTERY VOLTAGE	Battery voltage too low
M− SHORTED	M− output (Controller M− Terminal) shorted to B−
MAIN CONT DNC	Traction contactor did not close
MAIN CONT WELDED	Traction contactor welded
MISSING CONTACTOR	Missing Contactor
NO KNOWN FAULTS	No known faults have occurred
OVERVOLTAGE	Battery voltage too high
SRO	Static Return to Off activated
THERMAL CUTBACK	Cutback, due to over/undertemperature
THROTTLE FAULT 1	Throttle out of range
THROTTLE FAULT 2	Throttle low fault

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Covers, Panels, and Plates

The covers that protect the parts can be removed by removing the screws that fasten them. See Figure 1 and Figure 2. The door must be open to remove the cover over the drive unit compartment. Turn the screw that retains the drive unit compartment door 1/4-turn and open the door. Remove the screws, nuts, and washers that retain the cover and cushions to the lift truck frame. Remove the cover and cushions.

The instrument panel cover over the hydraulic tank can be removed without removing any other covers or panels. Remove the capscrews retaining the panel to the frame to remove the panel.

The electrical compartment cover, used to protect the contactors and the PMC controller, can be removed after removing the three capscrews that retain the panel to the frame in the operator's compartment.

The battery retainer panels at each end of the battery compartment can be removed by lifting them out of the frame.

The floor plate is removed by lifting the corner of the floor plate to raise it above the lip of the frame.

The drive unit compartment door can be replaced by opening the door and removing the hinge pin.

The front compartment cover is held in place by four spring clips. See Figure 1. To remove the cover, pull it up and out of the clips.

To remove the steer compartment cover, first remove the screw from the hinged door and swing the door open. Remove the front compartment cover as previously described. Remove three screws and washers securing the steer compartment cover to the frame. Remove the cover by lifting it up and over the steering disk.

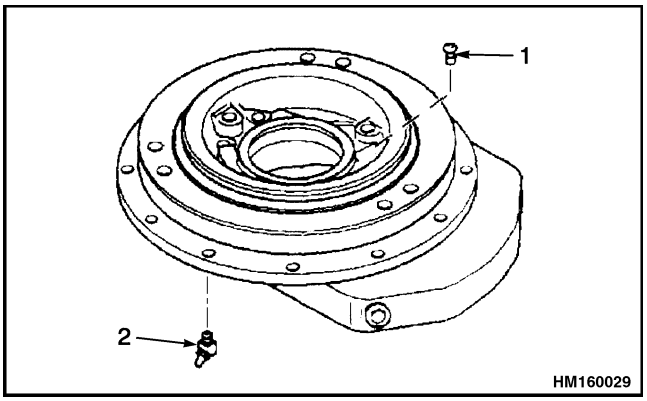
To remove the front operator cushion, first remove the front and steer compartment covers as previously described. Remove two screws, lockwashers, and flat washers, located in the front compartment beneath the control handle, from the cushion. Release the cushion from two s-clips by grasping it beneath the steering dish and pulling it straight up and out.

To remove the top operator cushion, lift up on the cushion and pull it straight up and out to release it from two s-clips.

To remove the bottom operator cushion, first remove the top operator cushion as previously described. Remove one screw, lockwasher, and flat washer from the underside of the cushion. Lift up on the cushion and pull it straight up and out to release it from two s-clips.

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1. DRIVE VENTING FILTER
2. GREASE FITTING

Figure 16. Drive Venting Filter and Grease Fitting Installation

49. Use Loctite® 574 to install the upper housing on the lower housing. Make sure the upper housing is aligned correctly and use a punch to install the two dowels if removed. Install the capscrews. Tighten the 8 mm capscrews to 23 N•m (17 lbf ft). Tighten the 10 mm capscrews to 46 N•m (34 lbf ft). Install the socket head capscrews, the washers, and the nuts. Tighten the nuts to 23 N•m (17 lbf ft).

50. Install the wheel and the lug nuts. Tighten the nuts in a cross pattern to one-half the torque value specified in Section 2. Tighten the lug nuts again using the cross pattern to obtain the proper torque.

51. Lubricate trunnion bearing using the recommended grease listed in Section 2. Add the grease through both fittings. Slowly rotate the MDU while filling the fittings with grease. A dry bearing will take approximately 55 grams (0.12 lb) of grease to fill the bearing completely.

52. Fill the MDU to the level/fill plug using the recommended oil listed in Section 2. Add the oil slowly. The oil must go through the bearings to the lower part of the MDU. Fill until the oil just starts to run out. Install the plug and tighten to 22 N•m (16 lbf ft).

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	PROCEDURE OR ACTION
Lift truck will not move.	Traction motor not operating.	Repair or replace traction motor.
	Damaged gears or bearings.	Replace gears or bearings.
MDU makes noise.	Insufficient lubricant or incorrect lubricant.	Lubricate as needed.
	Dry, damaged, or incorrect bearings.	Lubricate as needed.
	Bearing preload or backlash not properly adjusted.	Adjust backlash.
	Worn or damaged gears.	Replace gears.
Oil leaks at the housing cover.	Housing cover is not sealed or properly seated.	Seal properly.
	Capscrews not sealed off or not tightened to specified torque.	Tighten to appropriate torque.

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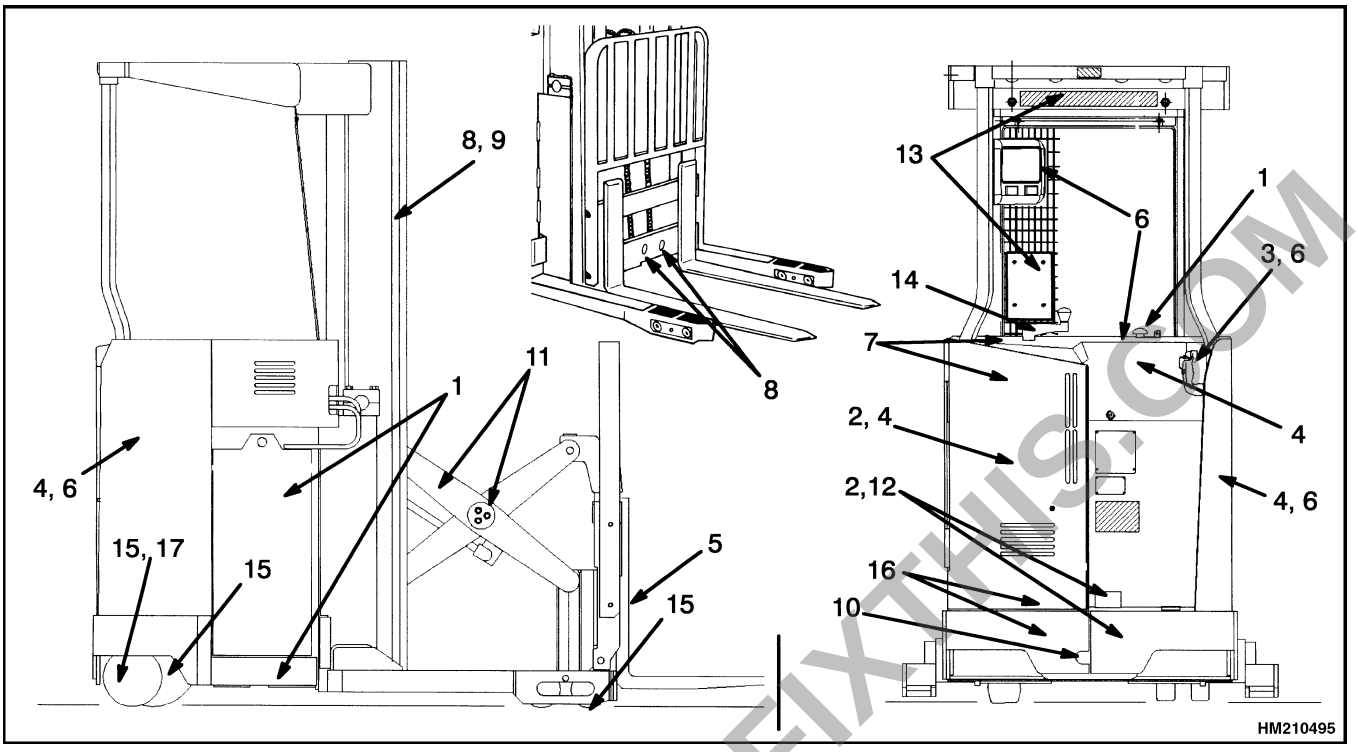


Figure 4. Maintenance Points

Table 1. Maintenance Schedule

Item No.	Item	8 hr/ 1 day[4]	350 hr/ 2 mo[4]	2000 hr/ 1 yr[4]	Procedure or Quantity	Specification
1	Battery	X[5]			Check Level	See Specifications
	Restraint Panels	X			Check Condition	
	Power Disconnect	X			Check Operation	
2	Brake	X			Check Operation	
	Fluid		X		0.45 liter (0.12 gal)	SAE J-1703 Brake Fluid
	Rods and Drum Splines		L		As Required	Antiseize Lubricant[3]
	Master Cylinder			C	Drain, Flush, Fill	SAE J-1703 Brake Fluid
3	Control Handle	X			Check Operation	
4	Electrical Circuits	X			Check Operation	
	Contactors		X		Check Condition	
	Motor Brushes		X		Check Condition	
	Traction Motor		X[9]	X, C[8, 4]		Bearings Seal
X=Check C=Change L=Lubricate						

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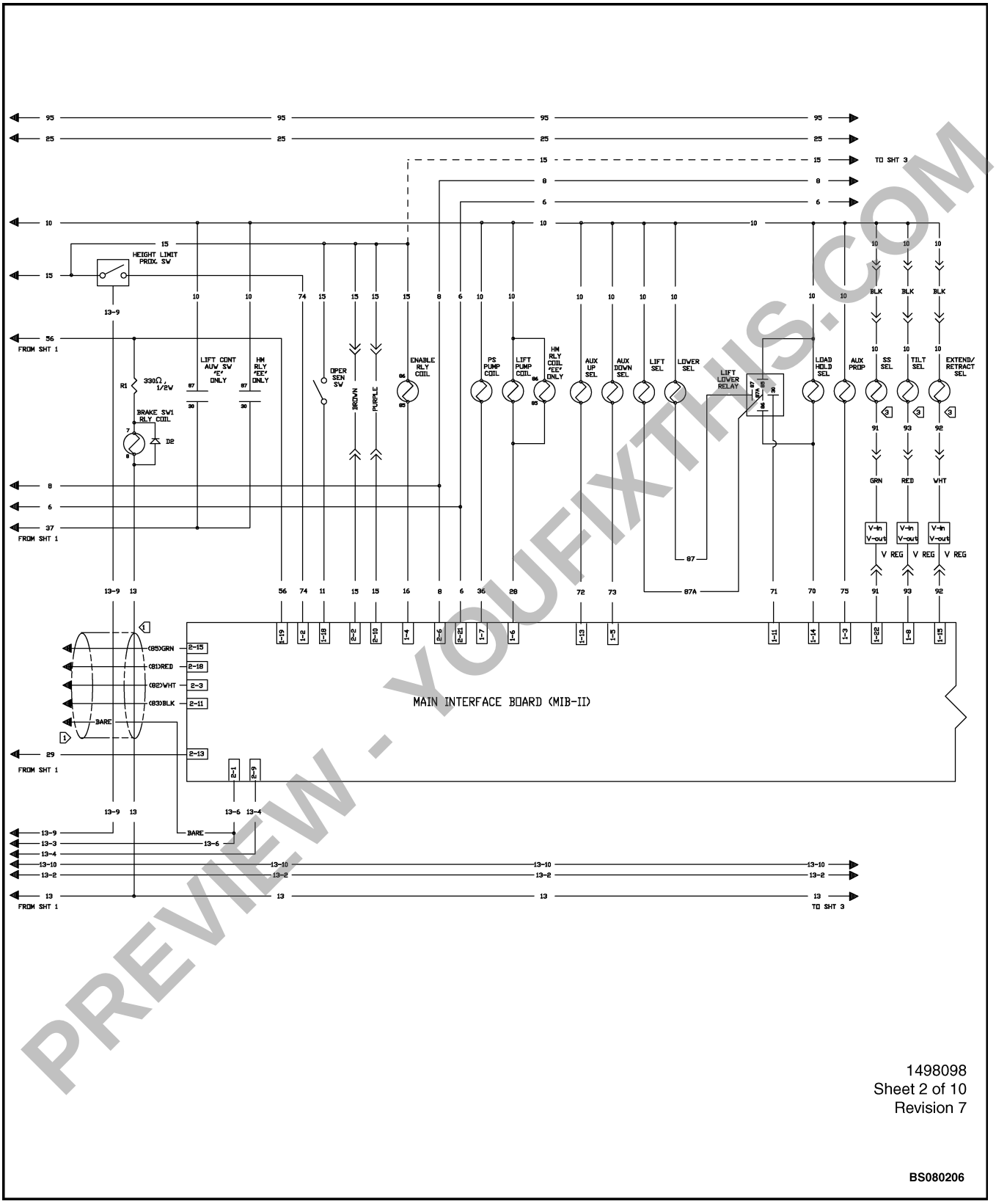
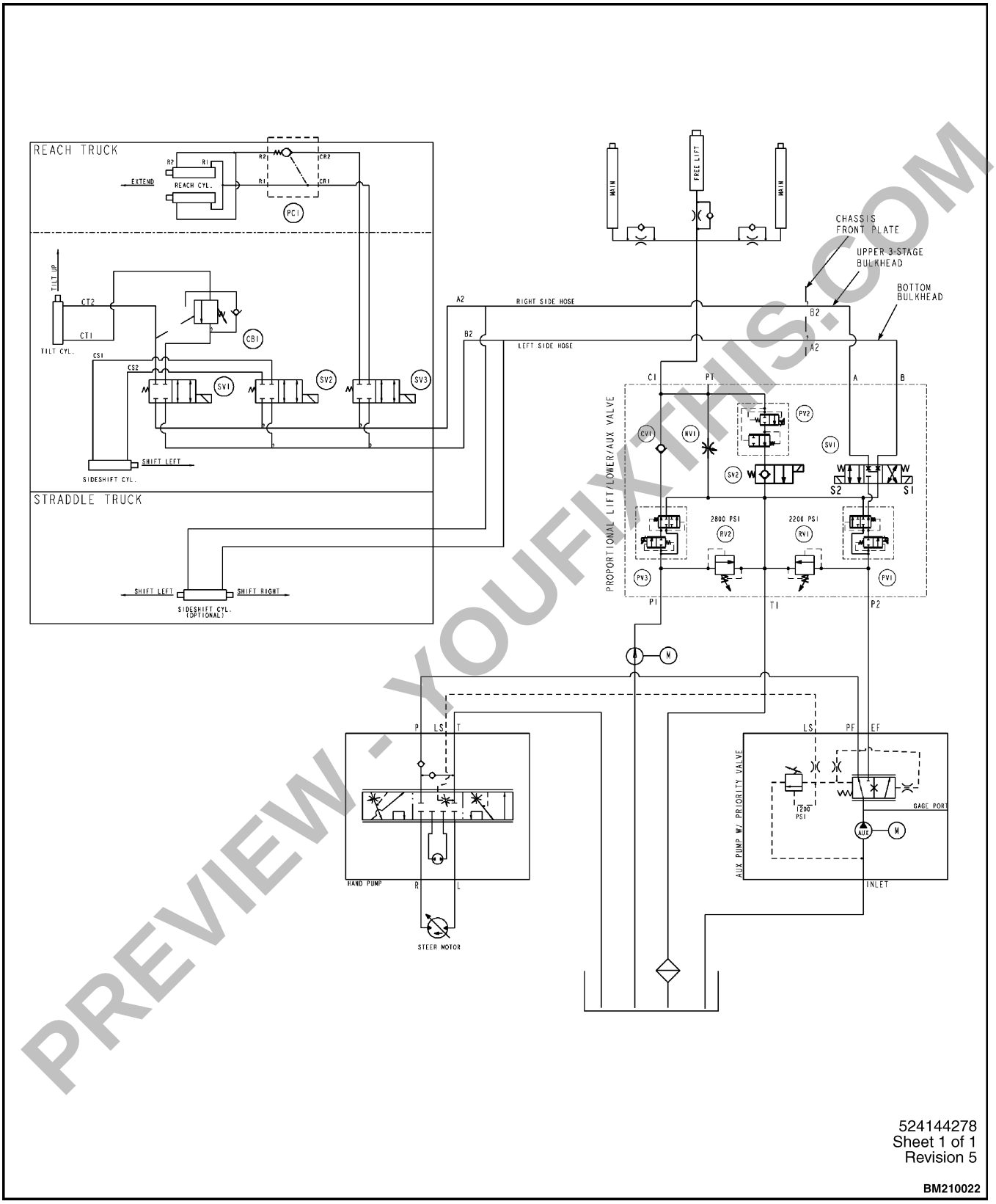


Figure 2. Schematic Diagram - SEM MIB II

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Figure 12. Hydraulic Schematic (Trucks Built After July 15, 2002)

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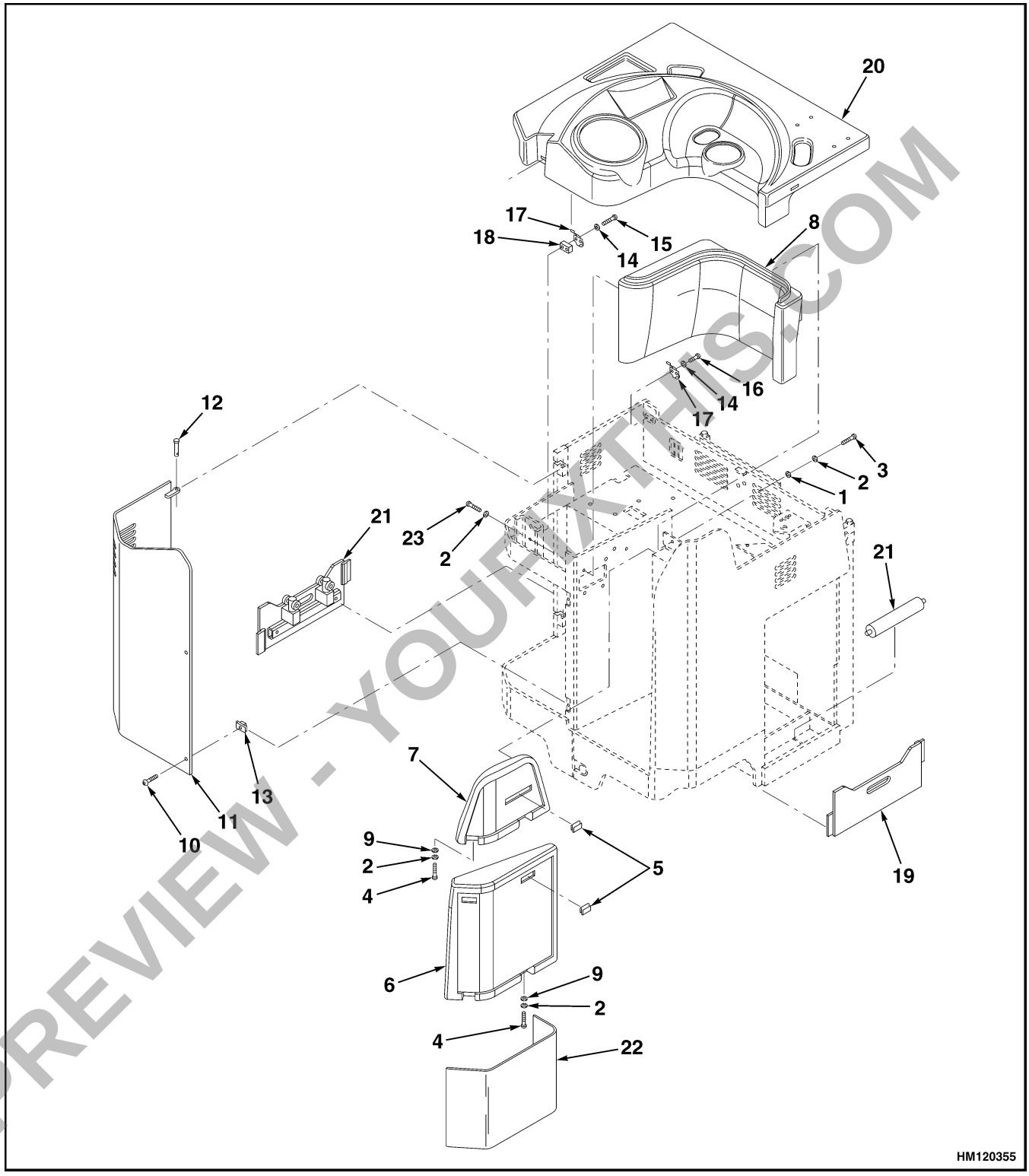


Figure 2. Covers, Panels, and Plates - Large Chassis

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Table 6. Torque Values for Inch Fasteners*

Size and Pitch		Grade 2[1]		Grade 5[2]		Grade 8[3]	
		lbf ft	N•m	lbf ft	N•m	lbf ft	N•m
1/4 1/4	20 UNC 28 UNF	4 5	6 6	6 7	9 10	9 10	12 14
5/16 5/16	18 UNC 24 UNF	8 9	11 13	13 14	18 20	18 20	25 28
3/8 3/8	16 UNC 24 UNF	15 17	20 23	23 26	31 36	33 37	44 50
7/16 7/16	14 UNC 20 UNF	24 27	33 36	37 41	50 56	52 58	71 79
1/2 1/2	13 UNC 20 UNF	37 41	50 56	57 85	77 115	80 90	110 120
9/16 9/16	12 UNC 18 UNF	53 59	72 80	82 91	110 125	115 130	155 175
5/8 5/8	11 UNC 18 UNF	73 83	99 110	115 130	155 175	160 180	215 245
3/4 3/4	10 UNC 16 UNF	130 145	175 195	200 225	270 300	280 315	380 425
7/8 7/8	9 UNC 14 UNF	125 140	170 185	320 355	435 480	455 500	615 680
1 1	8 UNC 14 UNF	185 210	255 285	485 540	655 735	680 765	925 1,040
1-1/8 1-1/8	7 UNC 12 UNF	265 300	360 405	595 670	805 905	965 1,080	1,310 1,470
1-1/4 1-1/4	7 UNC 12 UNF	375 415	510 565	840 930	1,140 1,260	1,360 1,500	1,850 2,050
1-3/8 1-3/8	6 UNC 12 UNF	490 560	665 760	1,100 1,250	1,490 1,700	1,780 2,040	2,420 2,760
1-1/2 1-1/2	6 UNC 12 UNF	650 735	885 995	1,460 1,650	1,980 2,230	2,370 2,670	3,210 3,620

* Unless otherwise specified [1] Approximately equal to metric Property Class 5.8 [2] Approximately equal to metric Property Class 8.8 [3] Approximately equal to metric Property Class 10.9

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Table 7. Status LED Fault Codes

LED Code	Explanation
OFF (no flashes)	No Power or defective controller
ON (continuously)	Controller or microprocessor fault
0,1	Controller operational, no faults
1,2	Hardware failsafe fault
1,3	M−, current sensor, or motor fault
2,1	Throttle fault
2,2	Static return to off (SRO) fault
2,3	High pedal disable (HPD) fault
3,1	Contactor driver overcurrent

Table 7. Status LED Fault Codes (Continued)

LED Code	Explanation
3,2	Welded contactor
3,4	Missing contactor, or traction contactor did not close
4,1	Low battery voltage
4,2	Overvoltage
4,3	Thermal cutback; over/undertemperature

NOTE: Only one LED fault code is indicated at a time, and faults are not queued up. Operational faults, such as a fault in SRO sequencing, are cleared by cycling the key switch.

DIAGNOSTICS MENU

LED Code	Dash Display Message	Programmer Handset Display Message
0, 1	"Any Message"	COMMUNICATION ERROR WITH CONTROLLER. PRESS SCROLL DOWN TO ATTEMPT TO RESTART.
		PROGRAMMER FAULT

Condition

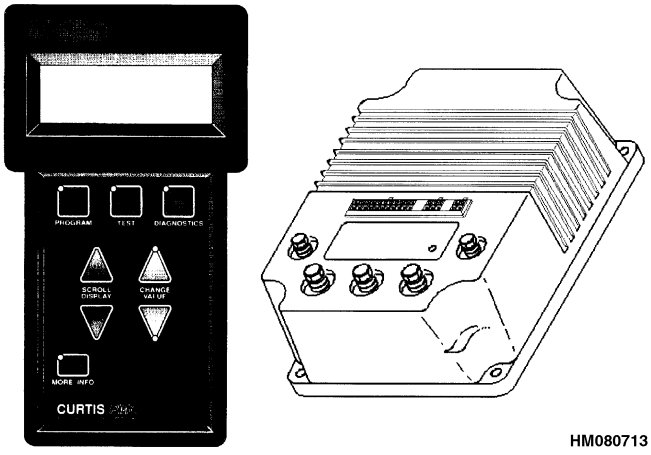
Handset is plugged into the traction motor controller. Key switch is in the **ON** position.

Truck Response

Traction may or may not function properly.

Possible Causes and Test Procedures

- Brake pedal is pressed when programmer handset is connected.
  Turn key switch to the **OFF** position. Release the brake pedal. Turn the key switch to the **ON** position.
- Interface cable between traction motor controller and programmer handset is defective.
  Replace the interface cable.



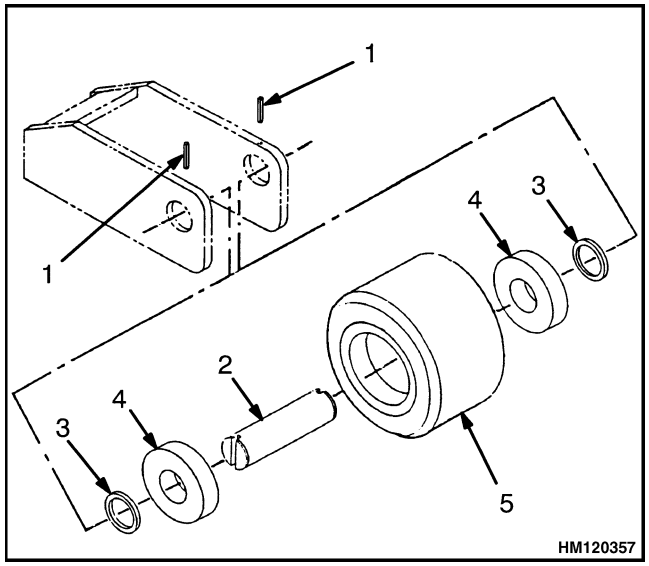
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Logic

Initial communication between the traction motor controller and the programmer handset is not valid.

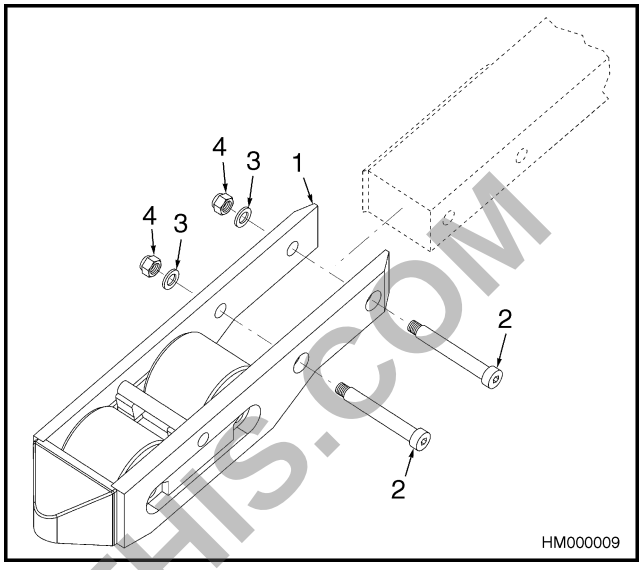
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1. ROLL PIN
2. AXLE
3. SPACER
4. BEARING
5. LOAD WHEEL ASSEMBLY

Figure 4. Single Load Wheel



1. BOLT-ON WHEEL HANGER
2. BOLT
3. WASHER
4. LOCK NUT

Figure 5. Bolt-ON Load Wheels -B264

Overhead Guard Repair

The overhead guard consists of the overhead guard weldment and either one or two supporting posts, depending on truck model. See Figure 1 and Figure 6. The overhead guard weldment is attached to the mast with six capscrews and hardened washers. The posts are attached to the lift truck frame with capscrews and washers in the drive unit compartment. The top of the posts fit into a retainer in the overhead guard weldment.

The overhead guard is furnished in different sizes, depending upon the battery compartment size.

CHANGES TO OVERHEAD GUARD

WARNING

Do not weld mounts for lights or accessories to the overhead guard. The strength of the overhead guard can be reduced by welding or heating.

Install lights and accessories or their mounts with clamps. The strength of the overhead guard can be reduced if holes are drilled in the wrong location or are too large. Contact your lift truck dealer before welding or drilling holes in any part of the overhead guard.

Observe previous **WARNING** before performing service to overhead guard.

REMOVE

WARNING

The overhead guard is heavy. Be sure that all lifting devices (lifts, cables, chains, or slings) are suitable and of adeguate capacity to lift the overhead guard. The overhead guard assembly weighs approximately 63.5 kg (140 lb).

To remove the overhead guard from the truck, open the drive unit compartment and remove the capscrew and lockwasher retaining the post to the frame. Hold the post while removing the hardware so that the post does not slide out of the overhead guard retainer. Remove the capscrew and lockwasher retaining the right-hand post (if used) to the overhead guard weldment. Slide the post out of the slot in the lift truck frame. Attach a sling and lifting device to the overhead guard weldment. Remove the six capscrews and hardened washers retaining the overhead guard weldment to the mast and lower the overhead guard weldment to the floor.

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PROBLEM	POSSIBLE CAUSE	PROCEDURE OR ACTION
Oil leaks at the housing cover. (Cont.)		
Oil leaks at the wheel shaft.	Shaft seal incorrectly mounted or damaged.	Replace shaft seal.
	Surface of axle shaft damaged.	Replace axle shaft.
Oil leaks at the filler plug or drain plug.	Dirt between sealing ring and housing.	Clean sealing ring and housing.
	Plugs not tightened to specified torque.	Tighten plugs to appropriate torque.
Oil leakage between lower and upper housings.	Sealing surface not sealed off.	Seal properly.
	Capscrews not tightened to specified torque.	Tighten to appropriate torque.
Oil leaks in motor compartment.	Too much oil in MDU.	Drain excess oil.
	Breather defective.	Clean or replace breather.
	Traction motor seal defective.	Replace motor seal.
Trunnion bearing difficult to turn, binds, or exceeds maximum clearance.	Centering ring separated, allowing dirt to penetrate into bearing.	Torque capscrews holding centering ring to MDU.
	Cage segments are damaged.	Replace cage segments.
	Deformation of the balls or ball races.	Replace balls and ball races.
	Bearing not properly lubricated.	Lubricate as needed.

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Table 1. Maintenance Schedule (Continued)

Item No.	Item	8 hr/ 1 day[4]	350 hr/ 2 mo[4]	2000 hr/ 1 yr[4]	Procedure or Quantity	Specification
5	Forks	X			Check for Damage	
	Hook Fork Guides and Locks	X	L		As Required	Antiseize Lubricant[3]
6	Gauges, Horn, Lights, Fuses	X			Check Operation	
7	Hydraulic Oil Leaks	X			Check for Leaks	
	Hydraulic Oil Level (Full Mark)	X		C	18 liter (4.75 gal)	Ambient Temps 0°C (32°F) and Above[1] Ambient Temps Below 0°C (32°F)[2]
	Dipstick/Breather Cap		X		Clean or Replace	
	Hydraulic Oil Filter		C[10]	C	Replace	See **Parts Manual**
	Hydraulic Oil Strainer			C	Clean or Replace	See **Parts Manual**
	Hydraulic Hoses, Hose Fittings, and Clamps	X			Inspect for Visible Damage and Defects	Adjust, Repair, or Replace if Necessary
			X		Inspect for Kinked, Flattened, Stiff, or Charred Hoses	Replace if Necessary
8	Lift Chains	X	L		Check for Damage	Engine Oil
	Articulating Chain Anchors 3-Stage Mast		L		2 Lube Fittings	Multipurpose Grease[6]
9	Mast and Carriage	X			Check Operation	
	Header Hoses, Hose Fittings, and Clamps	X				
			X			
	Pivots, Sliding Surfaces		L[6]		As Required	Multipurpose Grease[6]
10	Articulation Shaft		L		1 Lube Fitting	Multipurpose Grease[6]
	Articulation Shaft Retaining Bolt		L			Antiseize Lubricant[3]
	Articulation Shaft Ends		L			Antiseize Lubricant[3]
X=Check C=Change L=Lubricate						

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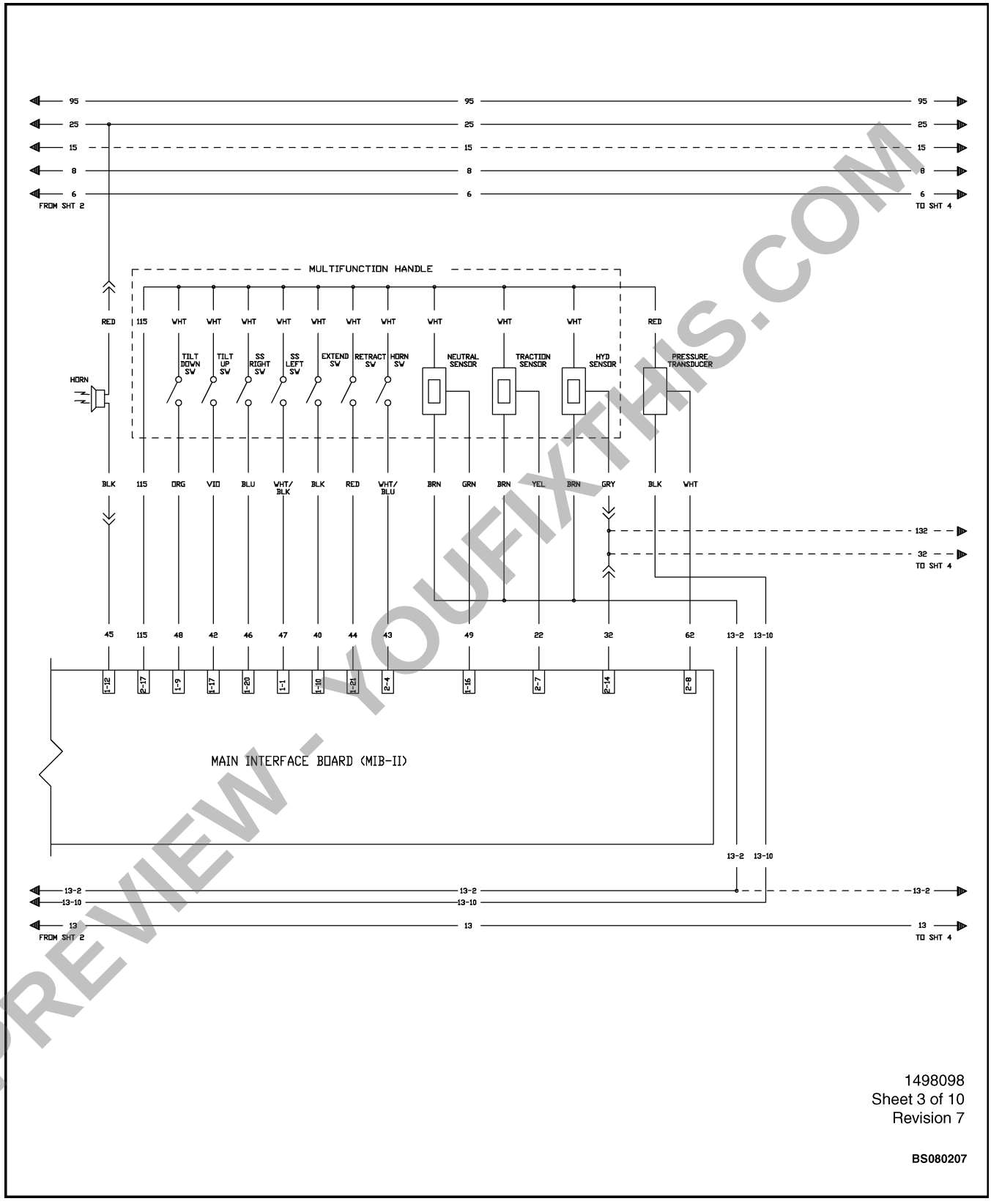


Figure 3. Schematic Diagram - SEM MIB II

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Legend for Figure 2

1. WASHER
2. LOCKWASHER
3. CAPSCREW
4. CAPSCREW
5. MOUNTING CLIP
6. CUSHION
7. CUSHION
8. CUSHION
9. WASHER
10. CAPSCREW
11. DOOR WELDMENT
12. HINGE PIN
13. CLIPNUT
14. LOCKWASHER
15. CAPSCREW
16. CAPSCREW
17. SPRING CLIP
18. SPRING CLIP MOUNTING BAR
19. BATTERY COMPARTMENT COVER
20. BATTERY SIDE PLATE
21. BATTERY ROLLER ASSEMBLY
22. LINER
23. CAPSCREW

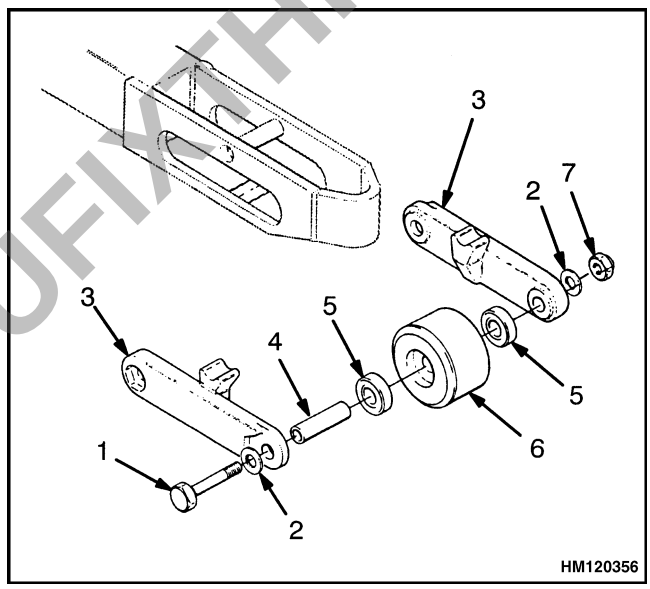
REPLACE LOAD WHEELS

Put the base arms up on blocks as described in the **Operator Manual** or the **Periodic Maintenance** 8000 SRM 970 section for your lift truck. For easier installation, remove and install one load wheel before removing the next load wheel. See Figure 3 or Figure 4. Make sure the base arms and load wheels do not support any weight. If necessary, install blocks under the base arms. The load wheel brackets are held in the load arms by the load wheels. Remove the axle nut, axle, washers, bearings, and load wheel. Remove the axle sleeve from the load wheel. Install the new load wheel, axle, axle sleeve, bearings, washers, and axle nut. Remove the axle nut, axle with washer, and the load wheel. Remove the axle sleeve from the load wheel. Install the bearings in the replacement load wheel. Install the washer on the axle. Install the load wheel, axle, and nut.

NOTE: On lift trucks used in freezer applications, apply anti-seize lubricant to the load wheel axle.

NOTE: An optional 10×4 single load wheel is available on the C470 and C471.

To remove the single load wheel, use a drift to remove the roll pins retaining the load wheel assembly to the axle and base arms. Remove the axle, spacers, and the load wheel. Remove the bearings from the load wheel. Install bearings in the new load wheel. Align the spacers and install the axle through the base arms. Install the drive pins.



1. AXLE SHAFT
2. WASHER
3. BRACKET
4. AXLE SLEEVE
5. BEARING
6. LOAD WHEEL
7. NUT

Figure 3. Tandem Load Wheels

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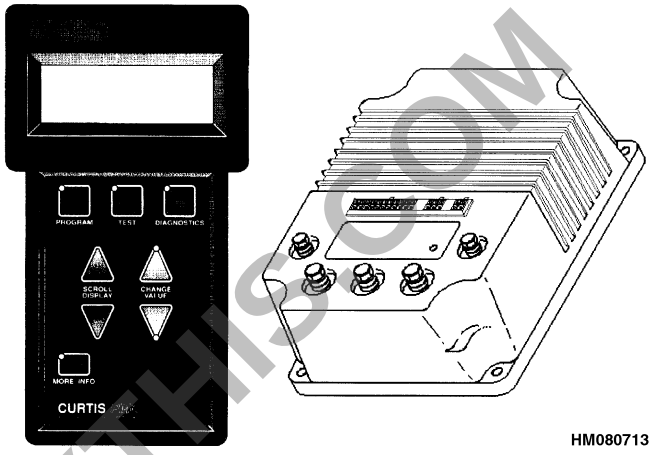
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LED Code	Dash Display Message	Programmer Handset Display Message
0, 1	"Any Message"	NO KNOWN FAULTS NO KNOWN FAULTS HAVE OCCURRED

Condition
Handset is plugged into the traction motor controller. Key switch is in the **ON** position. Diagnostic menu is selected.

Truck Response
Traction functions normally.

Possible Causes and Test Procedures
- No faults that are diagnosable by the traction motor controller exist.



HM080713

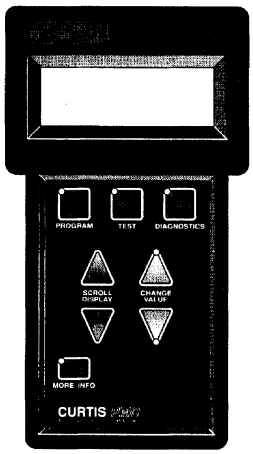
Logic
Displayed when no known faults are present.

LED Code	Dash Display Message	Programmer Handset Display Message
"Any LED Code"	"Any Message"	PROGRAMMER FAULT

Condition
Handset is plugged into the traction motor controller. Key switch is in the **ON** position. Diagnostic menu is selected.

Truck Response
Traction may or may not function normally.

Possible Causes and Test Procedures
- Caused by a defective handset.
  Replace the handset.



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Logic
Displayed when the internal check logic of the traction motor controller does not get the correct communication from the programmer handset.

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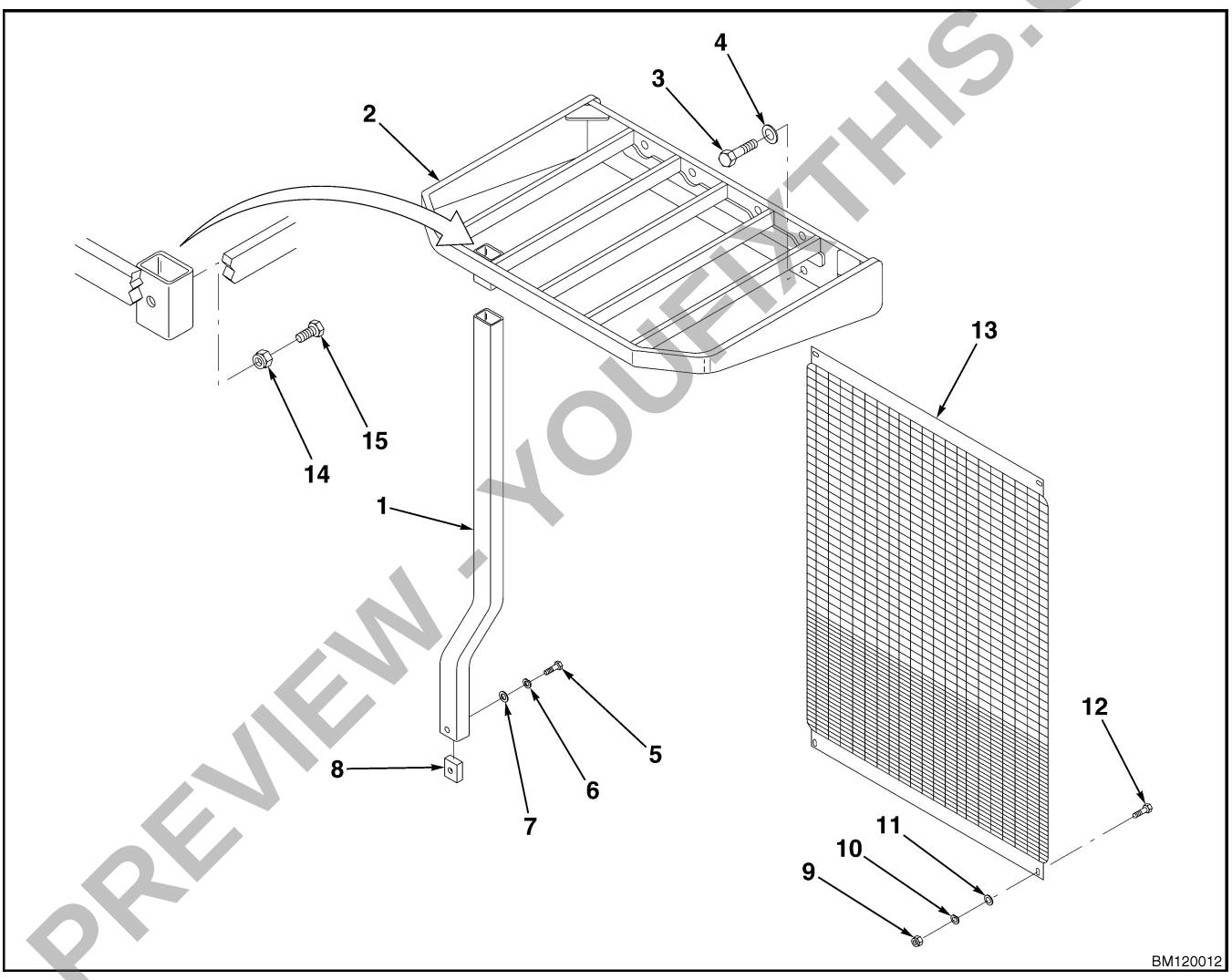
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INSTALL

WARNING

The overhead guard is heavy. Be sure that all lifting devices (lifts, cables, chains, or slings) are suitable and of adeguate capacity to lift the overhead guard. The overhead guard assembly weighs approximately 63.5 kg (140 lb).

To replace the overhead guard weldment, use a sling and lifting device to raise the overhead guard weldment. Align the weldment and the mast and install the six capscrews and hardened washers. Tighten the capscrews to 149 N•m (110 lbf ft). Slide the right-hand post (if used) into the retainer located in the overhead guard. Align the bottom of the post with the frame weldment. Install the capscrew and lockwasher. Align the left-hand post with the slot in the overhead weldment and slide the post into the opening. Align the lower portion of the post with the mounting bracket in the drive unit compartment. Install the capscrew, washer, lockwasher, and nut to retain the left-hand post.



1. POST
2. OVERHEAD GUARD
3. CAPSCREW
4. WASHER
5. CAPSCREW
6. LOCKWASHER
7. WASHER
8. MOUNTING BAR
9. NUT
10. LOCKWASHER
11. WASHER
12. CAPSCREW
13. WIRE GUARD
14. NUT
15. SETSCREW

Figure 6. Overhead Guard

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TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	PROCEDURE OR ACTION
Lift truck will not move.	Traction motor not operating.	Repair or replace traction motor.
	Damaged gears or bearings.	Replace drive unit.
Master drive unit makes noise.	Insufficient lubricant or incorrect lubricant.	Lubricate as needed.
	Dry, damaged, or incorrect bearings.	Lubricate as needed.
	Worn or damaged gears.	Replace drive unit.
Oil leaks at the wheel shaft.	Shaft seal incorrectly mounted or damaged.	Replace drive unit.
	Surface of axle shaft damaged.	Replace drive unit.
Oil leaks at the filler plug or drain plug.	Dirt between sealing ring and housing.	Clean sealing ring and housing.
	Plugs not tightened to specified torque.	Tighten to appropriate torque.
Oil leaks in motor compartment.	Too much oil in MDU.	Drain excess oil.
	Breather defective.	Clean or replace breather.
Trunnion bearing difficult to turn, binds, or exceeds maximum clearance.	Centering ring separated, allowing dirt to penetrate into bearing.	Torque capscrews holding centering ring to MDU.
	Cage segments are damaged.	Replace trunnion bearing.
	Deformation of the balls or ball races.	Replace trunnion bearing.
	Bearing not properly lubricated.	Replace trunnion bearing.

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Table 1. Maintenance Schedule (Continued)

Item No.	Item	8 hr/ 1 day[4]	350 hr/ 2 mo[4]	2000 hr/ 1 yr[4]	Procedure or Quantity	Specification
11	Reach Arms - Single Reach	X	L		6 Lube Fittings	Multipurpose Grease[6]
	Reach Arms - Double Reach		L		12 Lube Fittings	Multipurpose Grease[6]
	Reach Cylinder Pivot Pins		L		4 Lube Fittings	Multipurpose Grease[6]
	Thrust Rollers - Reach Frame		L		2 Lube Fittings	Multipurpose Grease[6]
12	Pedals, Levers, Cables, Hinges, Linkages		L		As Required	Antiseize Lubricant[3]
13	Safety Labels and Operating Man.	X			Replace if Necessary	See **Parts Manual**
14	Steering Operation	X			Check Operation	
15	Tire and Wheels	X			Check Condition	
	Caster Wheel Assembly	X	L		4 Lube Fittings	Multipurpose Grease[6]
	Load Wheel Bolts		L			Antiseize Lubricant[3]
16	Master Drive Unit	X			Check Operation	
	MDU Bearing		L		2 Lube Fittings	Multipurpose Grease[6]
	MDU Chain		L		Apply to Chain	Multipurpose Grease[6]
	MDU Gearbox		X, C[7]		Level With Bottom of Fill Hole	Gear Oil[11]
	Articulation Adjustment Stops		X, L			Antiseize Lubricant[3]
	Adjustment Stop Retaining Bolt		L		Adjust	Antiseize Lubricant[3]
17	Wheel Bolt Torque		X		Tighten if Required	135 N•m (100 lbf ft)
	Drive Wheel Lugs		L			Antiseize Lubricant[3]

[1] ISO VG 46 Antiwear (HCE-140)

[2] Exxon Univis® HVI 26

[3] Antiseize Lubricant

[4] Whichever comes first

X=Check C=Change L=Lubricate

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This section is for the following models:

N25XMDR3, N30/40XMR3, N50XMA3 [C470, C471];
N30XMDR3, N45XMR3 [G138];
N30XMXDR3, N45XMXR3 [B264]

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SAFETY PRECAUTIONS
MAINTENANCE AND REPAIR

- When lifting parts or assemblies, make sure all slings, chains, or cables are correctly fastened, and that the load being lifted is balanced. Make sure the crane, cables, and chains have the capacity to support the weight of the load.
- Do not lift heavy parts by hand, use a lifting mechanism.
- Wear safety glasses.
- DISCONNECT THE BATTERY CONNECTOR before doing any maintenance or repair on electric lift trucks.
- Disconnect the battery ground cable on internal combustion lift trucks.
- Always use correct blocks to prevent the unit from rolling or falling. See HOW TO PUT THE LIFT TRUCK ON BLOCKS in the **Operating Manual** or the **Periodic Maintenance** section.
- Keep the unit clean and the working area clean and orderly.
- Use the correct tools for the job.
- Keep the tools clean and in good condition.
- Always use **HYSTER APPROVED** parts when making repairs. Replacement parts must meet or exceed the specifications of the original equipment manufacturer.
- Make sure all nuts, bolts, snap rings, and other fastening devices are removed before using force to remove parts.
- Always fasten a DO NOT OPERATE tag to the controls of the unit when making repairs, or if the unit needs repairs.
- Be sure to follow the **WARNING** and **CAUTION** notes in the instructions.
- Gasoline, Liquid Petroleum Gas (LPG), Compressed Natural Gas (CNG), and Diesel fuel are flammable. Be sure to follow the necessary safety precautions when handling these fuels and when working on these fuel systems.
- Batteries generate flammable gas when they are being charged. Keep fire and sparks away from the area. Make sure the area is well ventilated.

NOTE: The following symbols and words indicate safety information in this manual:



WARNING

Indicates a condition that can cause immediate death or injury!



CAUTION

Indicates a condition that can cause property damage!

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General

This manual has the description for the parts of the frame. These parts include the frame weldment, door, floor plate, and covers. The base arms are part of the frame weldment. The overhead guard fastens to the mast. Refer to Table 1 for the unit and model numbers affected.

Table 1. Unit and Model Numbers

Unit Code	Truck Model
B264	N45XMXR3
	N30XMXDR3
C470	N30XMR3
	N40XMR3
	N25XMDR3
C471	N50XMA3
G138	N45XMR3
	N30XMDR3

Description

The frame has mounts for the following parts:
- Mast assembly
- Steering system parts
- Electrical system parts
- Hydraulic system parts
- Door, floor plate, access panels, and covers

The overhead guard fastens to the mast. Rear operator guard leg(s) provide protection for the operator and fasten between the overhead guard and the frame. Repair procedures for major components that fasten to the frame are in separate sections. See each section for the system that has the part to be repaired.

Repairs - General

There is very little repair required on the frame. Most repairs can be done by removing the necessary system parts. See the section for the system that has the part that must be removed. To separate the mast weldment from the frame weldment, see **Vista Mast-Repair** 4000 SRM 482 and **Reach Carriages** 4500 SRM 971. To replace the load wheels in the base arms, see **Periodic Maintenance** 8000 SRM 970 or Replace Load Wheels in this section. The caster is part of the steering axle assembly. See **Periodic Maintenance** 8000 SRM 970 or **Steering System** 1600 SRM 974 to replace the caster or caster wheels. To replace the drive wheels or tires, see **Periodic Maintenance** 8000 SRM 970 or **Steering System** 1600 SRM 974.

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