SERVICE MANUAL

E70-120XL3 (C098)



FORM 1483862 Rev. 02/04

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SERVICE MANUAL CONTENTS

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PROBLEM	POSSIBLE CAUSE	PROCEDURE OR ACTION
Copper drag occurs when copper from the commutator is pulled into the slot between the commutator bars. This problem will cause a short circuit between the commutator bars (see Table 2).	Operation in a dirty or abrasive environment.	Clean commutator more frequently.
	Brush holder is not correctly adjusted electrically for the motor.	Adjust brush holder.
	Wrong type of brushes for this motor and operation.	Replace brushes with correct type.
	Brush pressure is incorrect (too high or too low).	Adjust brush pressure.
Electrical burns on commutator bars on opposite sides of the commutator (see Table 2).	Open armature winding.	Replace armature.
	Motor has been stalled.	Use correct operating techniques.
Copper wears rapidly at the edge of the commutator bars (see Table 2).	Operation in a dirty or abrasive environment.	Clean commutator more frequently.
	Wrong type of brushes for this motor and operation.	Replace brushes with correct type.

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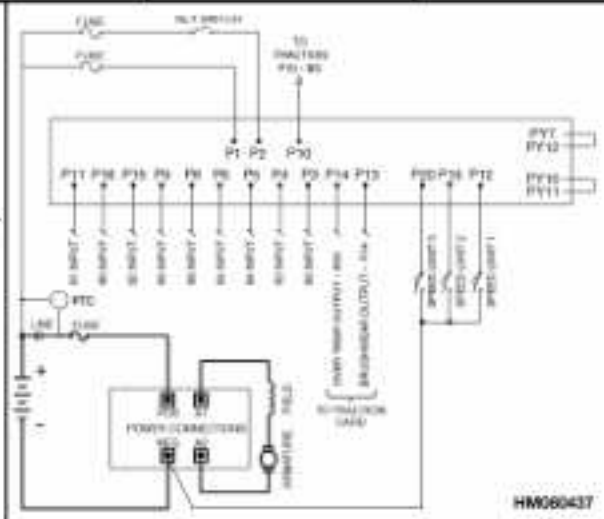
Status Code	Description	Memory Recall	Circuit
141	Pump motor controller over temperature.	No	Pump

Symptom

Lift and auxiliary hydraulic functions are disabled or operate at a reduced rate.

Possible Causes and Test Procedures

- Motor controller is too hot.
  Allow motor controller to cool, status code will disappear.



Cause of Status Indication

This status code is displayed when the voltage at the internal thermal protector is greater than 0.8 volts.

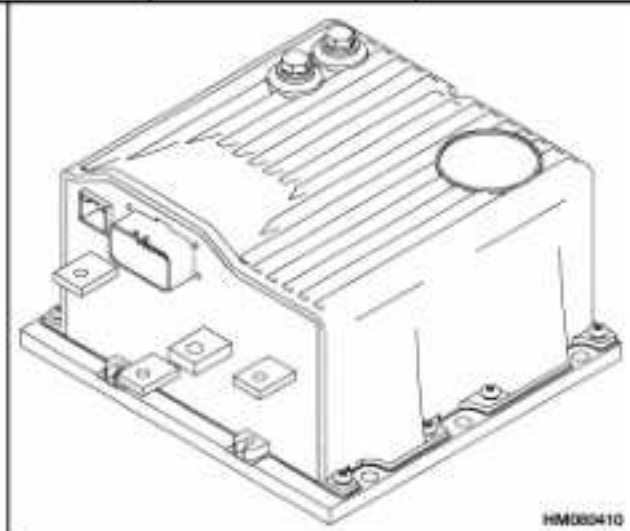
Status Code	Description	Memory Recall	Circuit
142	Pump motor controller "motor current sensor" input is missing.	No	Pump

Symptom

Lift and auxiliary hydraulic functions are disabled.

Possible Causes and Test Procedures

- Malfunction of pump motor controller.
  Replace pump motor controller.



Cause of Status Indication

This status code is displayed when the voltage at the internal current sensor of pump motor controller is greater than 0.1 volts with no current flowing in the motor circuit.

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Maintenance Procedures Every 1000 Hours or 6 Months

NOTE: Do these procedures in addition to the Maintenance Procedures Every 500 Hours or 3 Months.

LIFT CHAINS

Wear Check

WARNING

Do not repair worn or damaged lift chain. Replace worn or damaged lift chain with new chain. If a pair of lift chains is used in mast, both lift chains must be replaced.

If a section of chain is 3% longer than a similar section of new chain, the chain is worn and must be replaced. If a chain scale is available, check lift chains as shown in Figure 15. If a chain scale is not available, measure 20 links of chain. Measure from center of a pin to center of another pin 20 links away. Compare length with chart in Figure 15. Replace chain if length of 20 links of worn section is more than the WEAR LIMIT.

Inspect lift chains for edge wear where they pass over the chain sheaves. Make sure chain links are a minimum of 95% (5% wear) of a chain link that is not worn. See Figure 7.

Lubrication

NOTE: Lubrication or cleaning (see Maintenance Procedures Every 2000 Hours or Yearly) can be needed more frequently in very dirty applications. Correct lubrication helps provide normal service life from these parts.

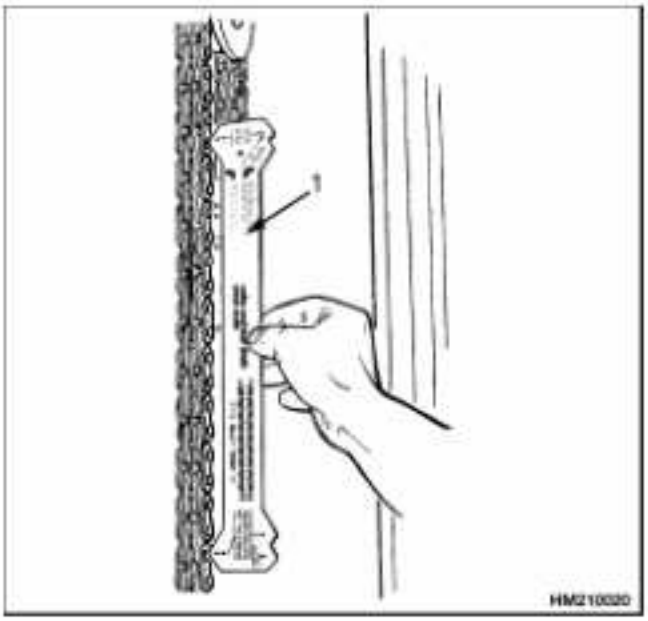
Lubricate lift chains with 30W engine oil or Hyster Chain and Cable Lubricant (Hyster Part No. 171350).

FORKS

WARNING

Never repair damaged forks. Do not heat, weld, or bend forks. Forks are made of special steel using special methods. Replace damaged forks.

1. Check heel and attachment points of forks with a penetrant or magnetic particle inspection. See Figure 6.
2. Measure thickness of forks at a vertical section where there is no wear. This is dimension X. Now measure thickness at heel of fork. If thickness is not more than 90% of dimension X, replace fork.
3. Use clean engine oil as necessary to lubricate guides and locks for forks.



Pitch 	Total Length of 20 Links (pitch) of New Chain	Wear Limit The Maximum Length of 20 Links
12.7 mm (0.50 in.)	254.0 mm (10.0 in.)	261.6 mm (10.3 in.)
15.9 mm (0.63 in.)	317.5 mm (12.5 in.)	327.0 mm (12.9 in.)
19.1 mm (0.75 in.)	381.0 mm (15.0 in.)	392.4 mm (15.6 in.)
25.4 mm (1.00 in.)	508.0 mm (20.0 in.)	523.3 mm (20.6 in.)

NOTE: THE INSTRUCTIONS FOR MEASURING CHAIN WEAR ARE SHOWN ON THE CHAIN WEAR SCALE.

1. CHAIN WEAR SCALE

Figure 15. Lift Chains Check

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