

REPORT

Page 1 of 9

SO Number : 85003407375	Reported By : Ridwanulloh Ibnu Purwanto
SO Reference* :	Reported Date : 25.05.2026
Checked by Foreman / Superior : EDI PRAMONO <i>(Name and Signature)</i>	Approved by Service Head : FILIPUS ARNANDA N <i>(Name and Signature)</i>

*Previous Service Order/Sales Order

SIMS Information

DEALER CODE J216	EQUIPMENT NUMBER	CUSTOMER NAME PT.BAROKAH MAPAN JAYA
DATE 25-May-26	TECHNICIAN IDENTIFICATION 10000031	EQUIPMENT LOCATION TELUK BAYUR HARBOR-PADANG
CATERPILLAR MODEL C9.3	CATERPILLAR SERIAL NO. C9300178	INSTRUCTION RERPLACE INJECTOR & ECM
HOURS 19070	KILOMETERS	

PART NUMBER RESPONSIBLE	PART NAME	QTY	DESC.* CODE	GROUP NUMBER CONTAINING PART	GROUP NAME	✓ IF MADE PRODUCT INOPERABLE	✓ IF DURABILITY ISSUE	DESCRIPTIVE COMMENTS (20 SPACES MAXIMUM PER INCIDENT)
417-6017	CONTROL GP-ELECTRONIC	1	42	450-8808	CONTROL GP-ELECTRONIC	☒	☐	ECM MALFUCNTION
460-8213	Injector GP-Fuel	6	42	467-1962	PUMP GP-FUEL INJECTION	☒	☐	Injector combustion is not good
						☐	☐	

DESCRIPTION CODES *
(Refer SIMS Guidelines :
SEBD0850)

A – Structural
B – Surface

C – Leaks
D – Factory Assembly

E – System Malfunction
F – Factory Shipping

G – General Repair
H – Adjustment

K - Serviceability
N - Abuse

X – Operator
Complaint

Component Information

Component Description : CONTROL GP-ELECTRONIC Pn: 417-6017	PCR Schedule Hours : -	<i>Comp. target hours (ex 12,000)</i>
Comp. Serial No. / ID : -	Component Hours : 00	<i>Current hours failed (ex 8,000)</i>
Comp. Arr. / Group No. : 450-8808	Life Remaining : -	<i>Remain of target life (4,000)</i>
Mach. Hours - Installed : Factory	Component New Price : -	
Mach. Hours - Removed : -	Cost To Repair : -	<i>(ex. \$ 10,000)</i>
Date Comp. Installed : 21-May-26	Cost/Hour Remaining : -	<i>(10,000 / 4,000 = 2.5 \$/hr)</i>
Date Comp. Failed : 04.03.2026		

REPORT

Page 2 of 9

Supporting Documentation Required

#	Description	Yes	Comments
1	Installation Check List	☐	
2	Repair & Maintenance History	☐	
3	SOS History	☐	
4	Magnetic Plug Inspections	☐	
5	ET/VIMS Data	☐	
6	TPMS / Payload Data	☐	
7	Performance Test Data	☐	
8	Others	☒	

Failure Outline : *Brief outline of what the Customer reported*

Engine condition can not to syncron because condition engine hunting if the engine for the running

Background / Research : *Write down all the brief backgrounds of failure (includes the taken actions)*
When and on what condition customer reported the failure :

- The engine unit is used for the crane box generator
- Engine operate by experience operator
- Engine need to syncron but can not to success

What were the immediate actions taken :
BEFORE :

- unit have the repair condition before problem
- after customer report there information engine it's hunting when the need to syncron for the other , and for the fuel system it's not good
- download data PSRPT
- **FOUND THE ECM Or ORYGINAL FOR THE UNIT SN DIFFERENT**
- check solenoid test it's OK
- **RUNNING engine end check condition**
- Cutout system found delivery volume not good condition
- Check active event found no.4,5 and 6 problem
- Check injector no.4 and 5 found active intermittent condition when the engine running
- Check injectvort no6 found **not responsibility indication not original part**
- Remove valve cover for the check harness and condition injector found OK

After :

- Replace 6pcs Injector
- Replace ecm and flash file software
- Test perform engine genset it's OK

Repair & Maintenance History : *State all the previous repair and maintenance history related to the current events*

Unit there is recondition before but not for the dealer (customer by self)

LIST POSSIBLE CAUSES

Make a list of failure's possible causes

- Component part not original part install
- Condition material deffect
- Problem form the ECM and system

OBSERVATIONS

Write down all the observations made during your Failure Analysis investigation including the good and bad findings

Part Number– Name– modifier Code (RH/LH/Upper/Lower etc.) – Detail Explanation	To Help Explain Progression/Stage of Failure, Use Photos/Parts Book Illustration. Identify Type, Amount, Location of Wear, Deposits, Damage, Fractures etc.
MODEL : C9.3 SN UNIT : C9300178 HM UNIT : 19070	  
Before : Check condition by ET Found : Active event :	

REPORT

Page 4 of 9

- 654-2 (ENGINE INJECTOR CYLINDER #4 : Erratic, Intermitten or incorrect)
- 655-2 (ENGINE INJECTOR CYLINDER #5 : Erratic, Intermitten or incorrect)
- 656-7 (ENGINE INJECTOR CYLINDER #6 : **Not responding poperly**

Code	Description
C9.3 Marine EPG #1 (CG900175)	
-101.3	Engine Crankcase Pressure : Voltage Above Normal
-654.2	Engine Injector Cylinder #04 : Erratic, Intermittent, or Incorrect
-655.2	Engine Injector Cylinder #05 : Erratic, Intermittent, or Incorrect
-656.7	Engine Injector Cylinder #06 : Not Responding Properly

Before

Check actual :

Part Name	:	Injector
P/N	:	460-8213
Quantity	:	6
Failure Mode	:	Malfunction

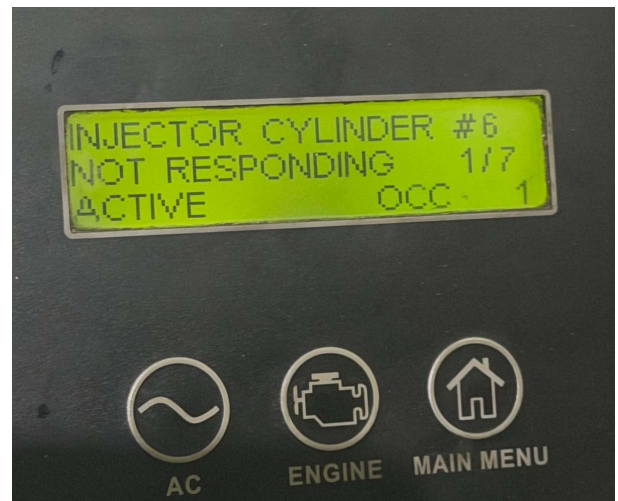
Note :
Codition after found on test by ET we are check actual condition

Check actual

ECM test :

Part Name	:	ECM (Control GP -electronic)
P/N	:	417-6017
Quantity	:	1
Failure Mode	:	Malfunction

Note : After we checked and tested the engine, we found that the ECM was also damaged because previously we found an injector that was not an original component, causing the ECM function not to function properly.





REPORT

After

Replace for the part injector 6pcs with the new condition

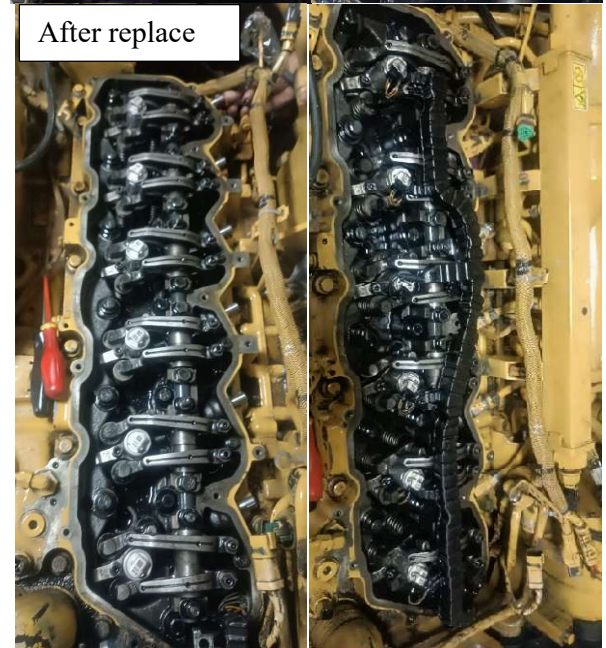
Part Name	: Injector
P/N	: 460-8213
Quantity	: 6
Failure Mode	: Malfunction

Note :

After replace afterthat test engine it's good noise OK for the perform condition with load system



Before replace



After replace

REPORT

Page 7 of 9

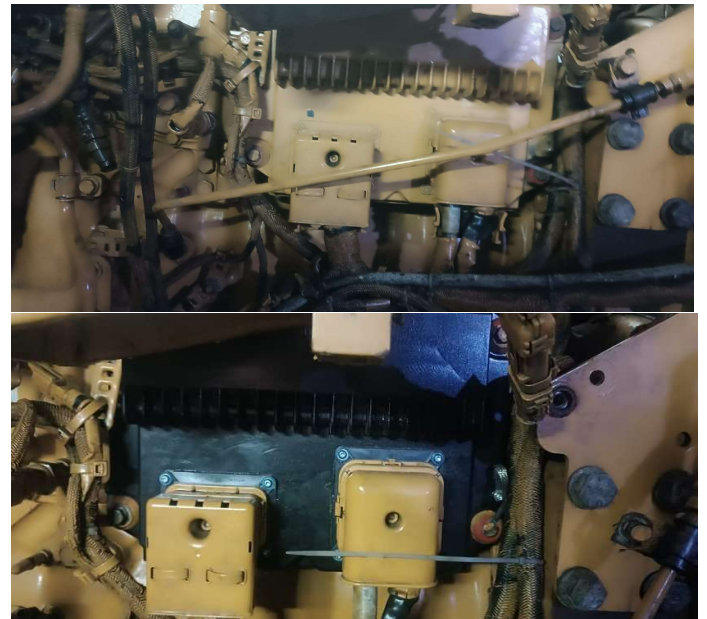
After replace ECM unit

Part Name	: ECM (Control GP -electronic)
P/N	: 417-6017
Quantity	: 1
Failure Mode	: Malfunction

Note : After replace for part and flash the ECM engine it's normal running



Install



Additional found condition

CDVR (CONTROL DIGITAL VOLTAGE REGULATOR) Malfunction

Note : After we are running engine genset it's OK found for the line active

- **System Diagnostic Code #1 : High - most severe (level 3)**
- **Generator Average Line-Line AC RMS Voltage :High - most severe (level 3)**
- **Engine Auxiliary Engine Shutdown Switch**

(Temporary solution Now for the CDVR we are replace with AE-3 so that the AE-1 engine can function properly)



On ET

Logged Event Codes [SHM: 19070 RTC: 22/05

Code	Description	Occ.
2440- 0	Generator Average Line-Line AC RMS Voltage : High - most severe (3)	7
2440-15	Generator Average Line-Line AC RMS Voltage : High - least severe (1)	7
2436-17	Generator Average AC Frequency : Low - least severe (1)	1
168-15	Battery Potential / Power Input #1 : High - least severe (1)	9
2456- 1	Generator Total Reactive Power : Low - most severe (3)	2
2456-15	Generator Total Reactive Power : High - least severe (1)	2

PROBABLE ROOT CAUSES

Describe the probable root causes and the sequence of events that caused it

From the results of the inspection, why the engine cannot be synchronized and experiences unstable engine speed problems, it was found that in the injector area and the combustion delivery volume area there were oddities in the 3 injectors and problems with the ECM. After replacing part injector and ECM the components and

running it's good, **new findings were obtained, the line to line voltage was unstable and when checked, the CDVR was found to be multifunction.**

Solution to Prevent Reoccurrence : *Write the recommendations to prevent future reoccurrence of the same failure*

- Replace condition part and need to original part component CAT

Service Head Decision : *State the Service Head's agreed decision on justification, whether warranty, goodwill, rework, or event revenue*

SUPPORTING DATA

Show SOS History, Magnetic Plug Inspections, ET/VIMS Data, TPMS / Payload Data, Performance Test Data, others

Please attach maintenance history, oil sample results and supporting documents.