

MAN Diesel PrimeServ Academy

New Displays ECS 0905



Engine: Process Adjustment Auto Tuning



Optional, only applicable
with PMI Online

Engine ▶ Process Adjustment 2010-07-29 12:52:12

Auto Tuning | Cylinder Load | Cylinder Press. | Fuel Quality

All | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12

	Mean	Deviation																
Pmax [Bar]																		
Ordered	117																	
Current	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Deviation	---																	
Offset Auto/Cont.	0 0.0	0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Pcomp [Bar]																		
Ordered	98																	
Current	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Deviation	---																	
Offset	0.0	0.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Pi [Bar]																		
Ordered	---																	
Current	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Deviation	---																	
Offset	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Info

STATUS: Tuning not available

- ✓ Index stable
- ✓ Sufficient index
- ⚠ Sensor values

Alarms...
Engine ▶
Operation
Status
Process Information
Process Adjustment
Chief Limiters
Auxiliaries...
Maintenance...
Admin...
Power Off ⓘ
Access
Chief

Engine: Cylinder Load



0 0 0 0

Engine ▶ Process Adjustment 2010-08-11 12:48:47

Auto Tuning Cylinder Load Cylinder Press. Fuel Quality

1 2 3 4 5 6 7 8 9 10 11 12

High Load Offset [%]

0	0	0	0	0	0	0	0	0	0	0	0
---	---	---	---	---	---	---	---	---	---	---	---

Low Load Offset [%]

0	0	0	0	0	0	0	0	0	0	0	0
---	---	---	---	---	---	---	---	---	---	---	---

Alarms...
Engine ▶
Operation
Status
Process Information
Process Adjustment
Chief Limiters
Auxiliaries...
Maintenance...
Admin...
Power Off ⓘ
Access ⓘ

Engine: Cylinder Pressure



0 0 0 0

Engine ▶ Process Adjustment 2010-08-11 12:51:11

Auto Tuning Cylinder Load **Cylinder Press.** Fuel Quality

All 1 2 3 4 5 6 7 8 9 10 11 12

Pmax Offset [Bar]

0	0	---	---	---	---	---	---	---	---	---	---	---
-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20
0	0	0	0	0	0	0	0	0	0	0	0	0
-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20

Pcomp/Pscav Offset [-]

0.0	0.0	---	---	---	---	---	---	---	---	---	---	---
2	2	2	2	2	2	2	2	2	2	2	2	2
0	0	0	0	0	0	0	0	0	0	0	0	0
-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2

Exhaust Valve Open Timing Offset [DEG]

0.0	0.0	---	---	---	---	---	---	---	---	---	---	---
0	0	0	0	0	0	0	0	0	0	0	0	0
-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2

Alarms...

Engine ▶

Operation

Status

Process Information

Process Adjustment

Chief Limiters

Auxiliaries...

Maintenance...

Admin...

Power Off ⓘ

Access

Chief

Engine: Fuel Quality



Engine ▶ Process Adjustment
2010-08-11 13:01:21

Auto Tuning
Cylinder Load
Cylinder Press.
Fuel Quality

Calorific Reference Value

36000 MJ/m3

$(\frac{\text{Lower Calorific Value} \times \text{Density @ 15°C}}{\text{Calorific Reference Value}} - 1) \times 100 =$

Lower Calorific Value
40.00 MJ/kg

×

Density @ 15°C
900.0 kg/m3

Calculated Fuel Quality Offset

+0 %

↓

Applied Fuel Quality Offset

+3 %

INSTRUCTION:

1. Set and save *Lower Calorific Value*.
2. Set and save *Density @ 15°C*.
3. Set and apply *Applied Fuel Quality Offset*.

Apply Fuel Quality Offset

Current	New	▼	▼	▲	▲	Fetch Calculated Offset	Apply	✕
3	3							

Alarms...

Engine ▶

Operation

Status

Process Information

Process Adjustment

Chief Limiters

Auxiliaries...

Maintenance...

Admin...

Power Off ⓘ

Access Chief

Engine: Chief Limiters

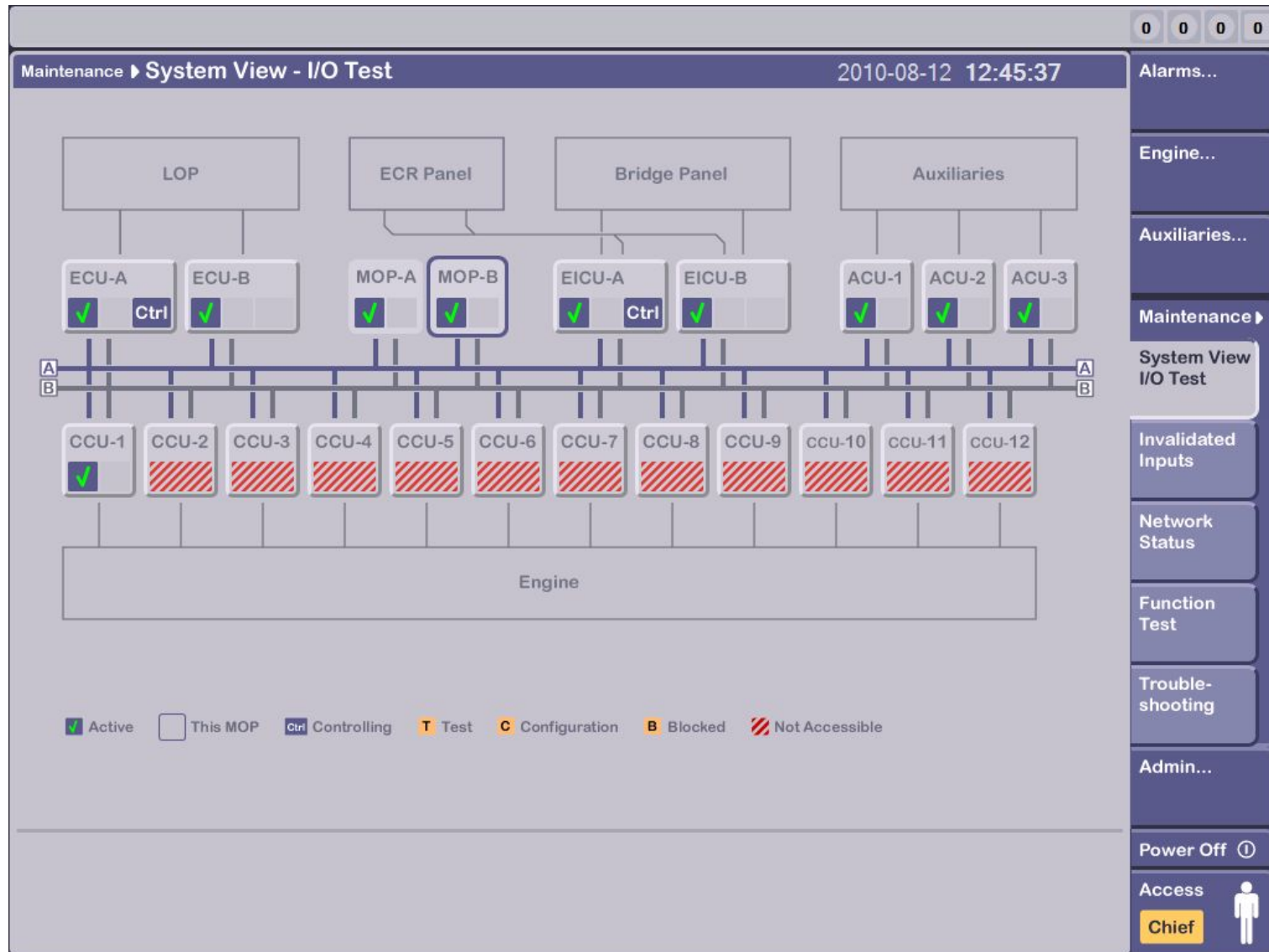


The screenshot displays the 'Chief Limiters' control panel. At the top, it shows 'Engine Chief Limiters' and the date/time '2010-07-29 12:50:01'. Two speed limiters are visible: 'Chief Max Speed' set to 90.0 RPM and 'Engine Max Speed' set to 116.0 RPM. Below these are 12 'Chief Index Limit [%]' sliders, all set to 110%. The 'Exhaust Valve operation' section shows 12 'Enabled' buttons. The 'HCU status and reset' section shows a 'Normal' button. A right-hand sidebar contains various system functions like 'Alarms...', 'Engine Operation', 'Status', 'Process Information', 'Process Adjustment', 'Chief Limiters', 'Auxiliaries...', 'Maintenance...', 'Admin...', 'Power Off', and 'Access'.

Chief Max Speed is acting as a speed modifier

“Reset” is similar to resetting the CCU, or, invalid/valid ch 30 & ch 31 on the CCU

Maintenance: System View, I/O Test



0 0 0 0

- Alarms...
- Engine...
- Auxiliaries...
- Maintenance ▶
- System View I/O Test
- Invalidated Inputs
- Network Status
- Function Test
- Trouble-shooting
- Admin...
- Power Off ⓘ
- Access Chief

Maintenance: Network Status



Maintenance ▶ Network Status
2010-08-12 12:47:33
0 0 0 0

Observer →	MOP		EICU		ECU		ACU			SCU	CCU												
Observed ↓	A	B	A	B	A	B	1	2	3	1	1	2	3	4	5	6	7	8	9	10	11	12	
MOP	A	█	✓	✓	✓	✓	✓	✓	✓	✓	█	✓	✓	█	█	█	█	█	█	█	█	█	█
EICU	A	✓	✓	█	✓	✓	✓	✓	✓	✓	█	✓	✓	█	█	█	█	█	█	█	█	█	█
ECU	A	✓	✓	✓	✓	█	✓	✓	✓	✓	█	✓	✓	█	█	█	█	█	█	█	█	█	█
ACU	1	✓	✓	✓	✓	✓	✓	█	✓	✓	█	✓	✓	█	█	█	█	█	█	█	█	█	█
SCU	1	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!
CCU	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	█	✓	✓	█	█	█	█	█	█	█	█	█	█
	2	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!
	3	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!
	4	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!
	5	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!
	6	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!
	7	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!
	8	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!
	9	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!
	10	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!
	11	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!
	12	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!

Cabling Map		MOP		EICU		ECU		ACU			SCU	CCU											
Net	Reconfigs	A	B	A	B	A	B	1	2	3	1	1	2	3	4	5	6	7	8	9	10	11	12
A	3	✓	A	✓	✓	✓	✓	✓	✓	✓	█	✓	█	█	█	█	█	█	█	█	█	█	█
B	3	✓	B	✓	✓	✓	✓	✓	✓	✓	█	█	█	█	█	█	█	█	█	█	█	█	█

✓ OK
⬇ This MOP
! No Reply Single Channel
! No Communication
█ Not Accessible
▒ Not Relevant
█ Online but No Information
A Reference
B Cross Connection

Alarms...

Engine...

Auxiliaries...

Maintenance ▶

System View
I/O Test

Invalidated
Inputs

Network
Status

Function
Test

Trouble-
shooting

Admin...

Power Off ⓘ

Access

Chief

Maintenance Function Test HCU



Maintenance ▶ Function Test 2010-07-29 12:58:20

HCU Tacho HPS

Cylinder: 1 2 3 4 5 6 7 8 9 10 11 12

A. Preparation of HCU Test

Start	Action/Message	Test Values
1	Press 'OK' if Hydraulic- and Fuel Pressure are present	OK
2	Press 'OK' if an assistant is stand by for listening to fuel injection and shockwave	OK

B. Test of FIVA-valve and calibration of Fuel Plunger

Start	Action/Message	Reference	Test Values
1	Press 'Reboot' to set the CCU in Test Mode	-	Normal
2	Press 'OK' to make an injection	-	
3	FIVA Position Feedback, CH-30	15.0 - 19.0 mA	
	Fuel Pump Plunger Position, CH-31	8.0 - 20.5 mA	
	Exhaust Valve Position, CH-34	3.5 - 9.0 mA	
4	Evaluate sound. Press 'OK' to continue	-	
5	Press 'OK' to open Exhaust Valve	-	
6	FIVA Position FeedBack, CH-30	3.0 - 7.0 mA	
	Fuel Pump Plunger Position, CH-31	3.5 - 10.0 mA	
	Exhaust Valve Position, CH-34	10.0 - 20.5 mA	

Reboot in Test Mode or Abort Test

WARNING!
 Changing to TEST mode will STOP the MPC from controlling the system.

Start with Preparation of HCU Test

Maintenance Function Test HCU



! Hyd. press. deviates from setpoint Normal ECUA_5131 12:51:06 10 2 0 0

Maintenance ▶ Function Test 2010-08-12 12:55:26 Alarms...

HCU	Tacho	HPS	Cylinder: 1 2 3 4 5 6 7 8 9 10 11 12											
1	Press 'Reboot' to set the CCU in Test Mode		-	OK										
2	Press 'OK' to make an injection		-	OK										
3	FIVA Position Feedback, CH-30		15.0 - 19.0 mA	7.1										
	Fuel Pump Plunger Position, CH-31		8.0 - 20.5 mA	Invalid										
	Exhaust Valve Position, CH-34		3.5 - 9.0 mA	3.8										
4	Evaluate sound. Press 'OK' to continue		-	OK										
5	Press 'OK' to open Exhaust Valve		-	OK										
6	FIVA Position FeedBack, CH-30		3.0 - 7.0 mA	7.1										
	Fuel Pump Plunger Position, CH-31		3.5 - 10.0 mA	Invalid										
	Exhaust Valve Position, CH-34		10.0 - 20.5 mA	3.8										
7	Evaluate sound. Press 'OK' to continue		-	OK										
8	Press 'Save' (if allowed) to calibrate Fuel Plunger Feedback Sensor		-	Failed										

C. Cyclic Test of Exhaust Valve and/or make single fuel injections

Start	Action/Message	Status
1	Press 'Reboot' to set the CCU in Test Mode	
2	Start/Stop of cyclic test of Exhaust Valve and make single injections	

Calibrate Fuel Plunger Feedback Sensor

ERROR: One or more values are outside measuring range (4-20 mA or +/- 10 V) **WARNING: One or more values are outside reference range** Save Done Abort Test

Alarms... Engine... Auxiliaries... Maintenance ▶ System View I/O Test Invalidated Inputs Network Status Function Test Troubleshooting Admin... Power Off ⓘ Access Chief

Follow the instructions
Step by step

Maintenance Function Test HCU



! Hyd. press. deviates from setpoint Normal ECUA_5131 12:51:06 10 0 0 0

Maintenance ▶ Function Test 2010-08-12 12:59:54 Alarms...

HCU	Tacho	HPS														
Cylinder:	1	2	3	4	5	6	7	8	9	10	11	12				
3	Fuel Pump Plunger Position, CH-31							0.0	20.5 mA					^		
	Exhaust Valve Position, CH-34							3.5	9.0 mA							
4	Evaluate sound. Press 'OK' to continue												-			
5	Press 'OK' to open Exhaust Valve												-			
6	FIVA Position FeedBack, CH-30							3.0	7.0 mA					≡		
	Fuel Pump Plunger Position, CH-31							3.5	10.0 mA							
							Exhaust Valve Position, CH-34							10.0	20.5 mA	
7	Evaluate sound. Press 'OK' to continue												-			
8	Press 'Save' (if allowed) to calibrate Fuel Plunger Feedback Sensor												-			
C. Cyclic Test of Exhaust Valve and/or make single fuel injections																
Start Action/Message Status																
1 Press 'Reboot' to set the CCU in Test Mode																
2 Start/Stop of cyclic test of Exhaust Valve and make single injections																
D. Reboot of CCU																
Start Action/Message Status																
1 Reboot in Test Mode to make further tests or reboot in Normal Mode																

Engine...
Auxiliaries...
Maintenance ▶
System View
I/O Test
Invalidated Inputs
Network Status
Function Test
Trouble-shooting
Admin...
Power Off ⓘ
Access
Chief

Maintenance Function Test Tacho



Maintenance ▶ Function Test 2010-08-12 13:14:10

HCU Tacho HPS

Pre-Start Test

Start	Action/Message	Reference	Test Value
1	Turn engine to 10 D/G before 1 DC at Cyl. 1	All D/G	
2	Reboot OCUs and LCU's	-	
3	Turn engine in ahead direction to 2 D/G after 1 DC at Cyl. 1	All D/G	
4	Turn engine in ahead direction to 4/ D/G after 1 DC at Cyl. 1	All D/G	
5	Turn engine in ahead direction to 8/ D/G after 1 DC at Cyl. 1	All D/G	
6	Turn engine in ahead direction to 10/ D/G after 1 DC at Cyl. 1	All D/G	

Setting Of Fine Adjust Parameters

Start	Action/Message	Reference	Test Value
1	Perform PMI 0-diagram	-	
2	Minimum speed required for valid measuring Delta Tacho B	>55.0 Rpm	
	Delta Tacho-B max measured	-1.00 - 1.00	
3	Enter trig offset ahead and setting of ECS parameters	-	

Support

Details Delta Tacho-B 0.00 Tacho Alignment Deviation 0.00

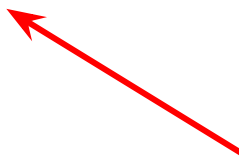
1. Perform PMI 0-digram

TIP: Press Done when the PMI 0-Diagram is finished.

Done Abort Test

Power Off Access Chief

Press Details to see grid with markers and quadratur sensors



Maintenance Function Test Tacho



Maintenance ▶ Function Test
2010-08-12 13:11:18

HCU

Tacho

HPS

Test Details

Tacho:	A				B				
Target:	MM	MS	Quad.	Angle	MM	MS	Quad.	Angle	
CCU	1	?	?	?	136	?	?	?	136
	2	?	?	?	---	?	?	?	---
	3	?	?	?	---	?	?	?	---
	4	?	?	?	---	?	?	?	---
	5	?	?	?	---	?	?	?	---
	6	?	?	?	---	?	?	?	---
	7	?	?	?	---	?	?	?	---
	8	?	?	?	---	?	?	?	---
	9	?	?	?	---	?	?	?	---
	10	?	?	?	---	?	?	?	---
	11	?	?	?	---	?	?	?	---
	12	?	?	?	---	?	?	?	---

ECU	A	?	?	?	124	?	?	?	124
	B	?	?	?	126	?	?	?	126

? Not yet tested	Test OK	Test failed	--- Not available
------------------	---------	-------------	-------------------

0 0 0 0
Alarms...

Engine...

Auxiliaries...

Maintenance ▶

System View
I/O Test

Invalidated
Inputs

Network
Status

Function
Test

Trouble-
shooting

Admin...

Power Off ⓘ

Access

Chief

Maintenance Function Test HPS



Maintenance ▶ Function Test
2010-08-12 13:08:58

HCU
Tacho
HPS

Alarms...

Pump: 1
2
3

Engine...

Preparation

	Action/Message	Reference	Test Value
1	Start one HPS Start-up Pump in local control	-	OK

Test

	Action/Message	Reference	Test Value
1	Set ACU1 into test mode	Test	Normal
2	Order Swash Plate to full ahead	Ahead	
3	Verify Swash Plate feedback (CH-34) and inspect Swash Plate angle visually	19.8-20.0 mA	
	Verify Proportional Valve (CH-30) feedback	19.8-20.0 mA	
4	Order Swash Plate to full astern	Astern	
5	Verify Swash Plate feedback (CH-34) and inspect Swash Plate angle visually	4.0-4.2 mA	
	Verify Proportional Valve (CH-30) feedback	4.0-4.2 mA	
6	Save calibration	-	
7	Start ACU1 in normal mode	Normal	

Reboot in Test Mode or Abort Test

WARNING!
Changing to TEST mode will STOP
the MPC from controlling the system.

Reboot

Abort Test

Maintenance ▶

System View I/O Test

Invalidated Inputs

Network Status

Function Test

Trouble-shooting

Admin...

Power Off ⓘ

Access

Chief

Maintenance Troubleshooting HCU



Maintenance ▶ Troubleshooting
2010-07-29 13:04:52

HCU	HPS		HCU Events			HPS Events						
Cylinder:	1	2	3	4	5	6	7	8	9	10	11	12

MPC Mode
Normal

Fuel Plunger Position		
CH-31	Max. - Min.	Stroke
---	0.0 mA	0.0 mm

Exhaust Valve Position		
CH-34	Max. - Min.	Stroke
3.8 mA		

MPC CCU-1

J34 J70

J31 J30

FIVA Position FB

CH-30 7.1 mA

FIVA Valve Control

CH-70 N/A

Fuel Plunger		Exhaust Valve		
Inject	Return	Open	Close	Cyclic Test

Hyd. Oil

194 Bar

ATTENTION:
Stopped Engine
Only!

INSTRUCTION:
Change CCU Mode
to 'Test' to activate.

Power Off ⓘ

Access

Chief

Maintenance Troubleshooting HPS



Maintenance ▶ Troubleshooting
2010-07-29 13:06:06

HCU
HPS
HCU Events
HPS Events

Alarms...

Pump:

1

2

3

MPC Mode Normal	Prop. Valve Feedback CH-30 7.7 mA -70 %	Swash Plate Pos. CH-34 --- ---	Hyd. Oil Press. CH-31 14.4 mA 195 Bar
---------------------------	--	--------------------------------------	--

Prop. Valve Amp. OK CH-20 ON	Inlet Oil Press. CH-32 14.9 mA 2.7 Bar	Prop. Valve Amp. SP CH-70 N/A	
--	---	---	--

ATTENTION:
Stopped Engine Only!

INSTRUCTION:
Change MPC Mode to 'Test' to activate.

Current

New

▼

▼

▲

▲

Cal

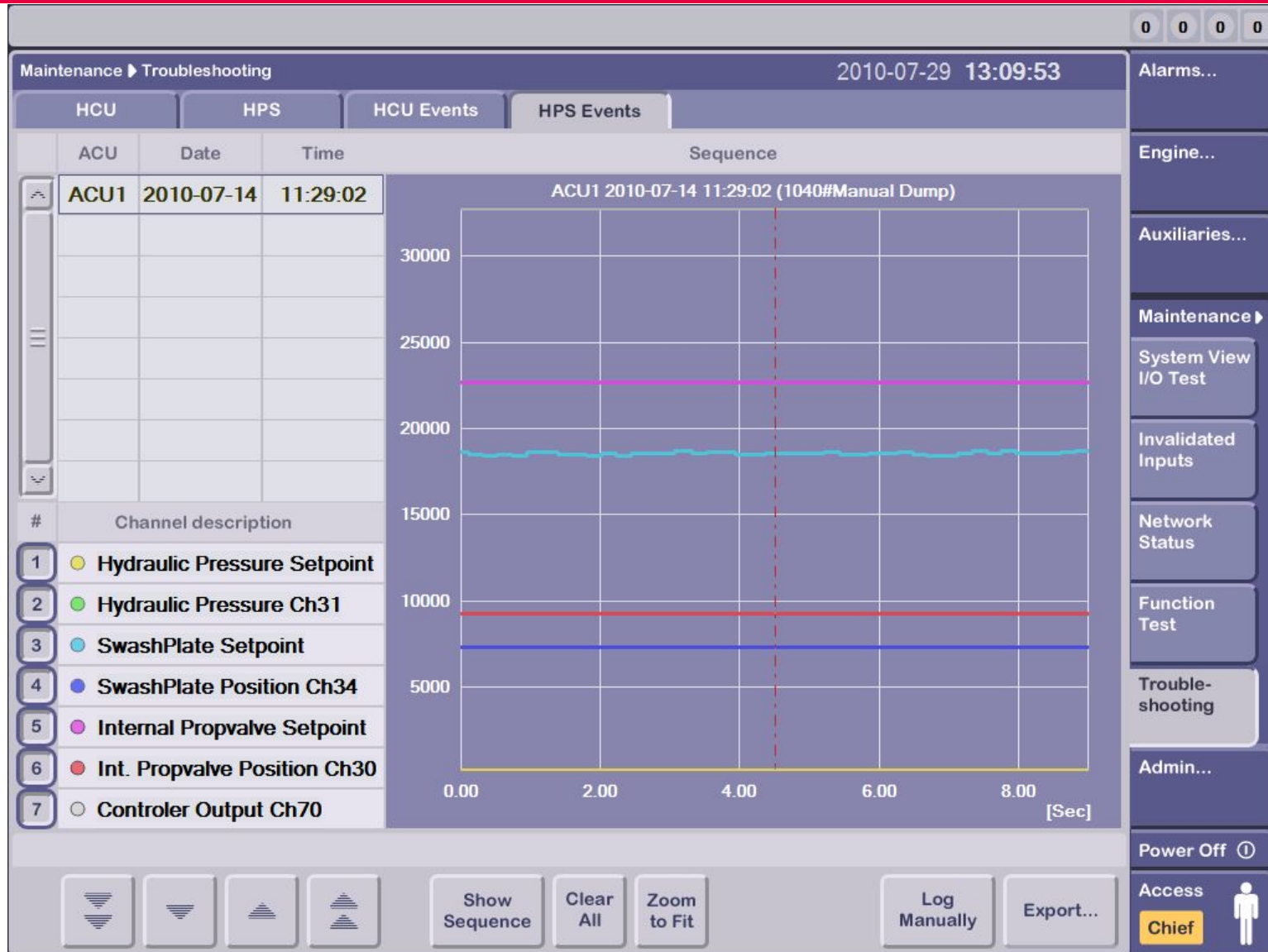
Swash plate position set point

Power Off ⓘ

Access

Chief

Maintenance Troubleshooting HPS Events



Maintenance Troubleshooting HCU Events



Admin.: Version



0 0 0 0

Admin ▸ Version 2010-08-13 12:28:26

Product Name & Version
ME-ECS-SW-0905-6.16

Engine Group No.
Simulator

IMO No.
Sim 8

Engine Builder
MD-CPH

Eng. No.
8

Controller Unit			Parameters Check Sums					
ID	Addr.	Type	User	Chief	Service	Design	IMO Design	IMO Chief
ACU1	224	ACU	0	132	17757	3580	0	0
ACU2	225	ACU	0	131	17757	3582	0	0
ACU3	226	ACU	0	131	17690	3584	0	0
AXU1	222	AXU	0	8	4400	0	0	0
CCU1	240	CCU	0	2	27943	62776	16685	15472
ECUA	208	ECU	0	7406	91064	53613	43433	19852
ECUB	209	ECU	0	7408	91276	53613	43433	19852
EICUA	192	EICU	0	387	93308	496	0	0
EICUB	193	EICU	0	386	93365	496	0	0
ESU	223	EngSim	0	0	10508	0	0	0

Refresh

Export...

☰

☷

Alarms...

Engine...

Auxiliaries...

Maintenance...

Admin ▸

Set Time

Version

Power Off ⓘ

Access

Chief

Alarms: Alarm List



! Startup Pump Ctrl Failed		Normal	ACU1_070210	12:43:59	2	3	1	0
Alarms ▶ Alarm List					2010-08-13 12:54:46		Alarms ▶	
Ack	Description	Status	ID	Time	Alarm List			
!	HCU Oil Leakage	Alarm	CCU1_0227	12:45:41	Event Log			
!	Startup Pump Ctrl Failed	Normal	ACU1_070210	12:43:59	Manual Cut-Out List			
✓	GROUP: Standby pump started	Alarm	GROUP-SPS-ECU	12:32:50	Channel List			
✓	Standby pump started	Alarm	ECUA_510212	12:32:50	Engine...			
✓	Standby pump started	Alarm	ECUB_510212	12:32:50	Auxiliaries...			
					Maintenance...			
					Admin...			
					Power Off ⓘ			
					Access			

✓Ack. ✓All Out Out + / - Line/of 3 / 5 ⌵ ⌵ ⌵ ⌴ ⌴ ⌴ Info

Alarms: Alarm List



!	Startup Pump Ctrl Failed	Normal	ACU1_070210	12:43:59	2	3	1	0
---	--------------------------	--------	-------------	----------	---	---	---	---

Alarms ▶ Alarm List 2010-08-13 12:53:53

Ack	Description	Status	ID	Time
!	HCU Oil Leakage	Alarm	CCU1_0227	12:45:41
!	Startup Pump Ctrl Failed	Normal	ACU1_070210	12:43:59
✓	GROUP: Standby pump started	Alarm	GROUP-SPS-ECU	12:32:50

Info

GROUP: Standby pump started - GROUP-SPS-ECU

Description: The Standby startup pump has been started

Cause: Master start-up cannot build hydraulic pressure within time limits or cannot maintain hydraulic pressure, because of:

- HPS electric driven start-up pump failure, or
- Hydraulic leakage

Effect: Engine may not start due to low hydraulic pressure

Action: Check:

- If both start-up pumps are running
- Local pressure gauge on start-up pumps
- For hydraulic leakages

If hydraulic pressure can be maintained when both pumps are running, switch master pump: 'Auxiliaries' -> 'Hydraulic System'

Alarms ▶

Alarm List

Event Log

Manual Cut-Out List

Channel List

Engine...

Auxiliaries...

Maintenance...

Admin...

Power Off ⓘ

Access

✓Ack. ✓All Out Out

+ / - Line/of 3 / 3

⌵ ⌵ ⌵ ⌴ ⌴ ⌴

Info