

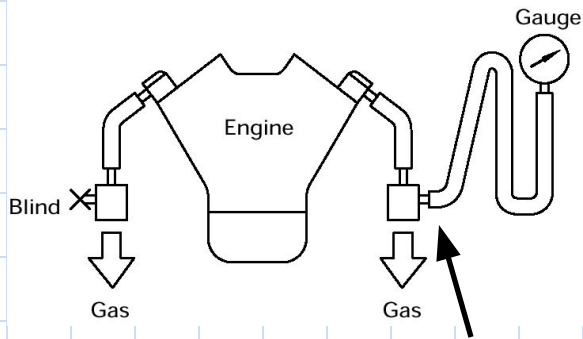
What is VHMS?

Measuring

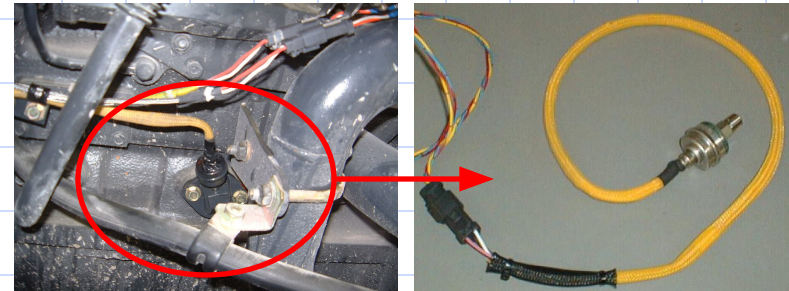
Example of measurement of Engine blow-by pressure

Current (once)

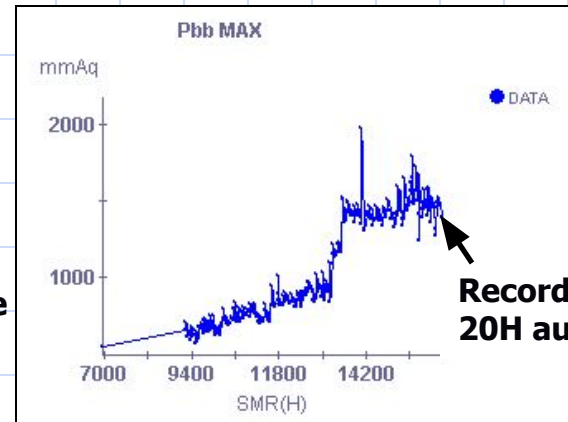
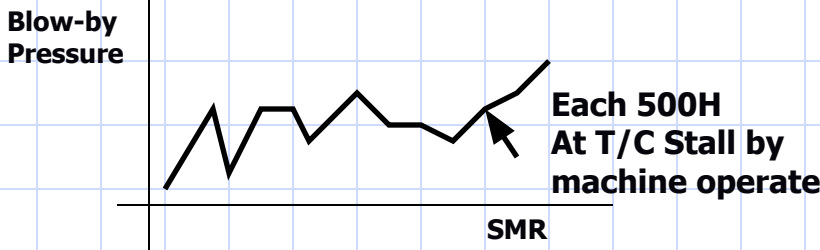
➔ **VHMS (Vehicle Health Monitoring System)**



Measuring gauge must be installed each time.



On board blow-by sensor



WebCARE (Trend) display on your PC

Record max. pressure each 20H automatically.

Cost: Labor 30min. + Travel



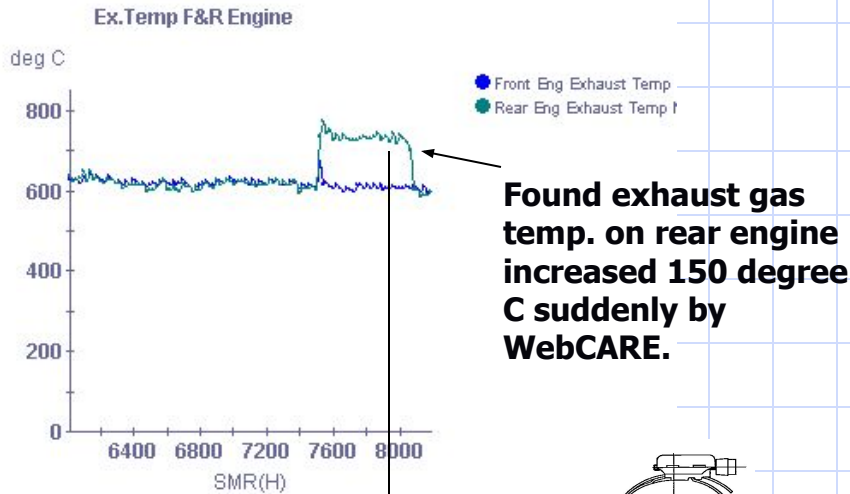
0 (Zero)

What is Preventive & Proactive Action ?

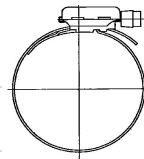
Example 1,

Failure

PC1800-6 #10007 (Tanzania)



Found damaged clamp on air to air hose,
And replace to new one.



Repair only 1H, and cost \$100-

If without VHMS...

Leave failure as it is



Catastrophic failure



Machine down for 2,3 days



Repair cost \$25,000-

(SAA6D140 Engine Reman Price)

What is Preventive & Proactive Action ?

Example 2,

Abuse

HD785-5 #4006 & #4007 (Japan)

If did not take proactive action...

Error code "Engine overrun" with High frequency was recorded.



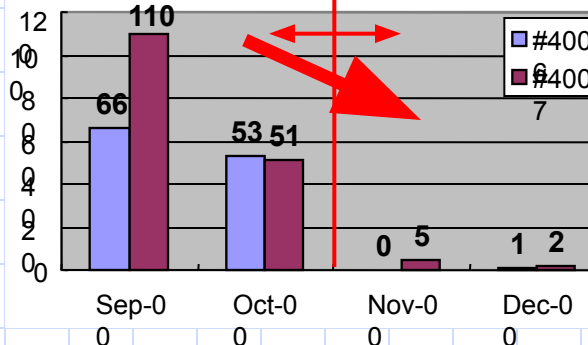
Carried out Operator training, Operation improvement and Change of T/M controller logic.



Number of error code got sharply decreased. (Almost zero)

of error code "Engine overrun"

Before action | After action



Machine down for 1 week

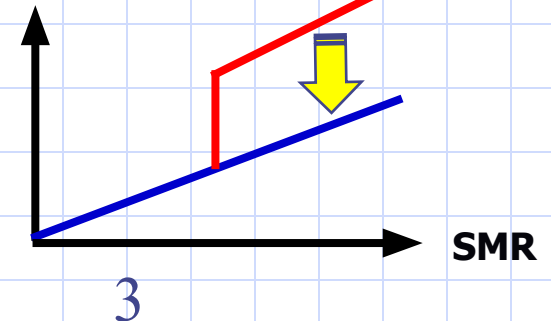
&

Repair cost \$25,000-

#4007 Brake Disc broken.



Repair Cost



What is Preventive & Proactive Action ?

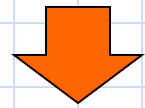
Example 3,

Bad Maintenance

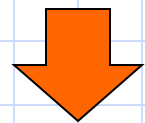
PC1800-6 #11006 (Japan)
Machine under R&M contract

Serial No.	Event Time	UMP	Error Code	Error Description	Recover Time	SSMP	Completed	Error Count
11006	2002/11/12 14:29:59	362.3	aa10NX	R.air cleaner clogging	2002/11/12 16:42:22	Engine		323
11006	2002/10/05 08:15:18	188.6	dGE3L6	Coolant Sensor(Low) Error	2002/10/05 08:28:08	Engine		1
11006	2002/09/19 16:45:53	76.9	b@BAZK	low R.engine oil level	2002/09/19 17:13:29	Engine		1
11006	2002/09/19 12:47:23	73.4	b@BAZK	low R.engine oil level	2002/09/19 13:10:49	Engine		1
11006	2002/09/10 13:49:20	35.4	dGE3L6	Coolant Sensor(Low) Error	2002/09/10 16:37:09	Engine		9
11006	2002/09/10 10:52:31	33.6	dGE3L6	Coolant Sensor(Low) Error	2002/09/10 11:52:43	Engine		4
11006	2002/09/10 09:12:22	32	dGE3L6	Coolant Sensor(Low) Error	2002/09/10 09:20:02	Engine		1
11006	2002/09/09 19:04:17	31	MFA0	Manual Trigger	2002/09/09 19:04:17	VHMS	!	1
11006	2002/09/09 18:57:15	30.8	MFA0	Manual Trigger	2002/09/09 18:57:15	VHMS		1

Error code appeared
(Rear Air cleaner clogging)



Order to check machine
from Tokyo to Yamanashi
(100km from Tokyo)



Distributor cleaned Air elements (F & R) and then
the error code is not shown any more.



Proper maintenance Recommendation

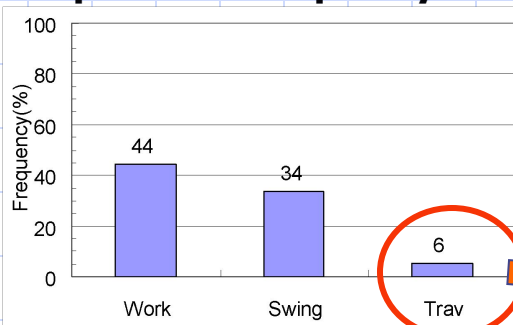
What is Preventive & Proactive Action ?

Example 4,

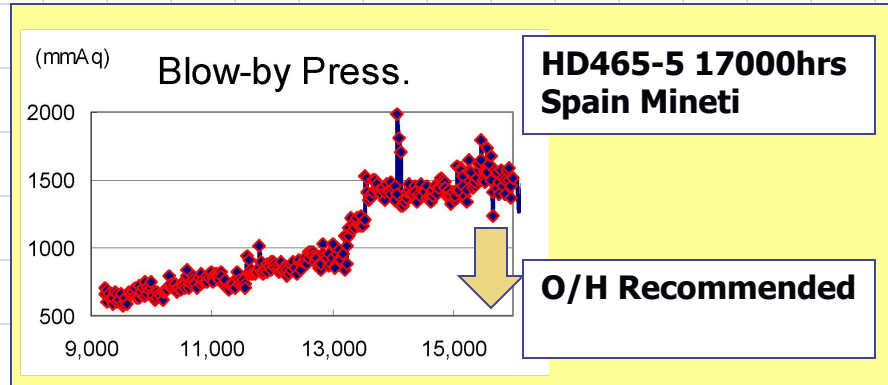
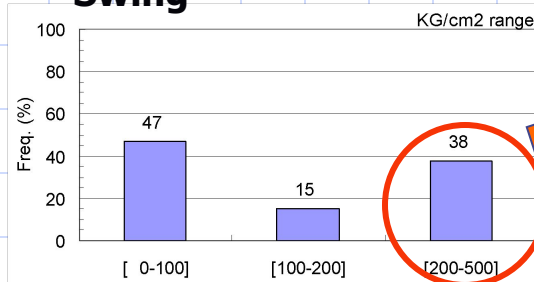
Recommend O/H commodity judgment & Timing

PC1800-6 #10002 (Canada)
SMR 14,060 hours

1. Operation Frequency



2. Pressure Range distribution - Swing



Final Recommendation

- 1) **O/H for Travel motor and Final Drive may not be necessary in this time.**
- 2) **Swing motor hoses should be replaced at proper interval.**
 Due to swing safety relieved oil with the relief pressure energy is converted directly to oil temperature and around swing motor becomes high temperature much different from tank.