



Chris Stadler

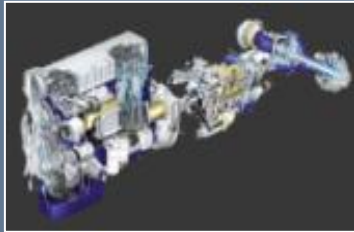
Manager, Product Marketing

Volvo Trucks

OEM Looking Forward



Environmental regulations will drive product **complexity**



Vertical integration necessary to meet regulatory, customer, dealer and stakeholder demands



Quest for the perfect **alternative fuel(s)** will continue



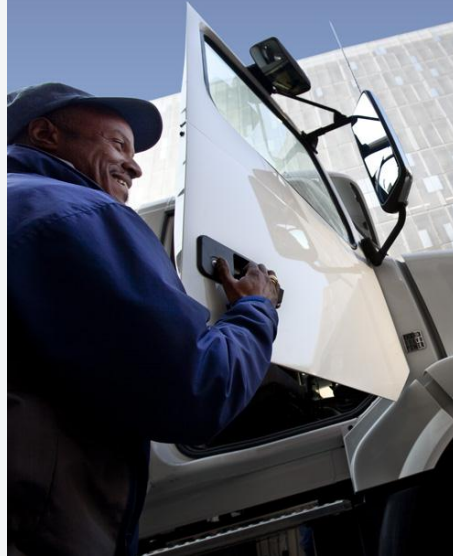
Telematics will evolve until no truck is ever “offline”

Customers' Top Priorities

**Fuel
Efficiency**



**Driver
Productivity**



Safety



**Vehicle
Uptime**



Uptime - Telematics



Remote Diagnostics

A major service innovation from Volvo



Remote Diagnostics process change

TIME



Fault Code

Uptime Center

Breakdown

Tow

Diagnostics

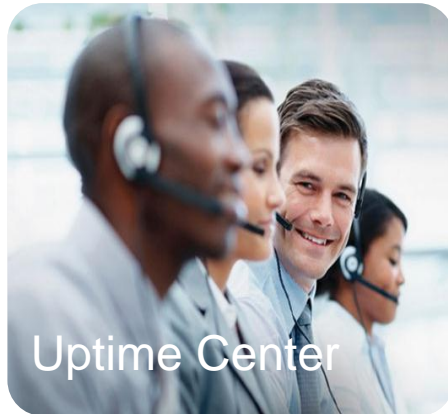
Repair

The Volvo Uptime Center uses the data delivered in **real time** to communicate the vehicle issue **before** the truck comes in for service.

Repair instructions and parts list are sent to the dealer via ASIST **before** the vehicle arrives for service.



ASIST - Service Communication Tool



ASIST



Remote Diagnostics Service Event

Yellow cases:

Triggered by fault codes that do not interrupt the truck operation but need to be addressed. These repairs can be performed at a later date.

- Schedule appointment – eliminates unplanned stop

Red cases:

These fault codes disrupt the truck operation, causing an engine de-rate or even a shut down. These repairs are required to be performed immediately.

Remote Diagnostics Service Event

- Fault code information is captured as soon as code becomes active.
- Information sent directly to ASIST and a Remote Diagnostic case is created.

Posted to Fleet Open Links Faults VMRS Attachments Billing Notes

CUSTOMER INFO	
COMPANY :	Volvo Trucks Marketing - Parma#:
ADDRESS :	7900 National Service Road Greensboro, NC 27409
PHONE :	(336) 393-2459
PAY TERMS :	
PAY STATUS :	
BILL TO :	Volvo Trucks Marketing - Parma#:
NOTES :	<input type="checkbox"/> Contacts: Rob Simpson <input type="checkbox"/> Email: rob.simpson@volvo.com <input type="checkbox"/> Remote Diagnostics: Rob Simpson 336-393-2459 r...

STATUS INFORMATION	
PROGRAM TYPE :	Volvo Telematics
CREATED :	01/04/2013 at 10:00 am EST (EMS Team)
CLOSED :	01/23/2013 at 01:37 pm EST
FOLLOW UP :	01/04/2013 at 18:00 EST
DOWNTIME :	01/04/2013 at 10:00 EST
UPTIME :	01/04/2013 at 14:23 EST
TOTAL DOWNTIME :	4:23 hours
STATUS :	17: VL - Case Created
PRIORITY :	High
SEVERITY :	YELLOW
FN. GROUP :	<input type="text"/> Save

ASSET INFO	
ASSET :	2013 Volvo VNL
VIN :	4V4N99EH4DN143691
MILEAGE :	23,678 Miles <input type="text"/> Save
ENGINE :	727 Hours <input type="text"/> Save
LOCATION :	

BREAKDOWN INFO	
LOCATION :	34.27167, -84.811787, Cartersville, GA
COMPLAINT :	01/04/2013 at 10:00 AM EST SPN 3226 Aftertreatment Outlet N Ox FMI 13 Calibration Value Out Of Range.
CORRECTION :	replaced the Nox sensor for post cat with the updated scr pipe and gaskets needed for spn fault 3226 fmi 13

ADDITIONAL INFORMATION	
REPAIR ORDER NUMBER :	none...
PURCHASE ORDER NUMBER :	none...
INVOICE AMOUNT :	none...
INVOICE NUMBER :	none...
AUTH NUMBER :	none...
TAG# :	none...

Remote Diagnostics service event

- Additional engine information is captured to better support fault code diagnostics...

	FAULT DATE/TIME	SEVERITY	TIMER	ECU ID	COMPONENT ID	FAILURE MODE	STATUS	REPAIR INSTRUCTIONS
Show/Hide Details	01/04/2013 at 10:00 am EST	YELLOW	0	0	SPN 3226 Aftertreatment Outlet N Ox	FMI 13 Calibration Value Out Of Range	Active	RP_3226_13
-		LOCATION DATE/TIME	LOCATION	ODOMETER	HEADING			
	01/04/2013 at 10:00 am EST	34.27167, -84.811787	23679	E				
-		SNAPSHOT DATA	VALUE					
		Fuel Pressure	50.5					
		Engine Oil Temperature	192.2					
		Ambient Air Pressure (Barometric Pressure)	14.2					
		Total Engine Hours	727.1					
		Road Speed	0					
		Load Percent	7					
		Boost Pressure	0					
		Oil Pressure	39					
		Percent Accelerator Pedal Position	0					
		Total Vehicle Distance	23679					
		Intake Air Pressure	14.2					
		Engine Speed	599					
-		FAULT DATE/TIME	ECU ID	COMPONENT ID	FAILURE MODE	STATUS		
	01/04/2013 at 10:00 am EST	140	PID 158 Ecu Battery Potential	FMI 4 Voltage Below Normal Or Shorted To Lower Voltage	Inactive			
	01/04/2013 at 10:00 am EST	140	PSID 235 Data Link, Mid232 (Vbc)/ Voltage Module A46 (Prev)	FMI 12 Faulty Device Or Component	Inactive			

Remote Diagnostics Service Event

- Primary Fault code is easily identified.
- Repair instructions are automatically attached to the case.

	FAULT DATE/TIME	SEVERITY	TIMER	ECU ID	COMPONENT ID	FAILURE MODE	STATUS	REPAIR INSTRUCTIONS
Show/Hide Details	01/04/2013 at 10:00 am EST	YELLOW	0	0	SPN 3226 Aftertreatment Outlet N Ox	FMI 13 Calibration Value Out Of Range	Active	RP_3226_13

Remote Diagnostics Service Event

Conditions for fault code SPN 3226 FMI 13:

- Calibration value out-of-range
- NOx sensor (post cat) failure
- No fault tracing is necessary.
- NOX Sensor (Post cat) needs to be replaced

Probable cause(s):

- Internal fault in component

Possible (observable) Symptoms:

- None

Recommended parts list:

Part Number	Description
21567763	NOx Sensor
See Table 1	SCR Outlet Pipe (used for sensor relocation)
See Table 2	SCR Outlet Pipe gasket and clamp (used for sensor relocation)

SCR Outlet Pipe Part Numbers			
Item	P/N	Quantity	Description
Stanchion-Mounted Exhausts			
1	21660572	1	VN Day Cabs, D11H and D13H
2	21660573	1	VN Sleepers, D11H and D13H
3	21660574	1	All VNL, D16H
Cab-Mounted Exhausts			
4	21672456	1	VHD and VAH, D11H and D13H

Table 1

SCR Outlet Pipe Gasket and Clamp Part Numbers			
Item	Clamp	Gasket	Description
Stanchion-Mounted Exhausts			
1	25172497, 21021850 (1 ea)	21095726 (1 ea)	VN Day Cabs, D11H and D13H
2	25172497, 21021850 (1 ea)	21095726 (1 ea)	VN Sleepers, D11H and D13H
3	25172497, 21021850 (1 ea)	21095726 (1 ea)	All VNL, D16H
Cab-Mounted Exhausts			
4	21021850 (2 ea)	21095726 (2 ea)	VHD and VAH, D11H and D13H

Table 2

Repair Instructions:

You must read and understand the precautions and guidelines in Service Information, group 20, "General Safety Practices, Engine" before performing this procedure. If you are not properly trained and certified in this procedure, ask your supervisor for training before you perform it.

- 1 Apply parking brake and place shift lever in neutral.
- 2 Disconnect the battery cables.
- 3 Remove heat shield or side faring depending on model.
- 4 Remove Nitrous Oxide (NOX) sensor.
- 5 Remove V-Band clamp at the Selective Catalytic Reduction (SCR) outlet elbow for the cab-mounted and stanchion exhausts.
- 6 Remove the band clamp securing SCR outlet elbow to flex-pipe for cab-mounted exhausts or remove the flat-band clamp for stanchion exhausts.
- 7 Remove SCR outlet pipe from flex-pipe.
- 8 Clean all gasket sealing surfaces on SCR outlet and flex-pipe for Cab-mounted exhausts.

Note: Cab mounted application shown in all illustrations for assembly purposes.

Proven Service

- Industry-leading solution
 - 2013 Best Telematics Service for Commercial Vehicles
- Validated by real customers on real routes
- More than 25,000 vehicles equipped
- Standard on all Volvo-powered models



Proven Benefits

Benefits achieved:

- Reduced average diagnostic time for targeted faults by 71%
- Reduced average repair times for targeted faults by 25%

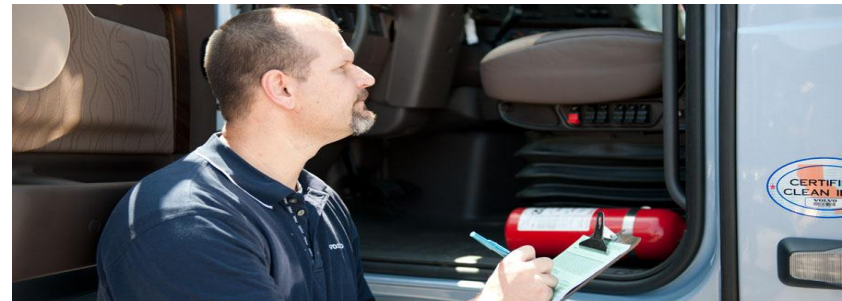
Average uptime improvement =
1 day per event



Customer Benefits

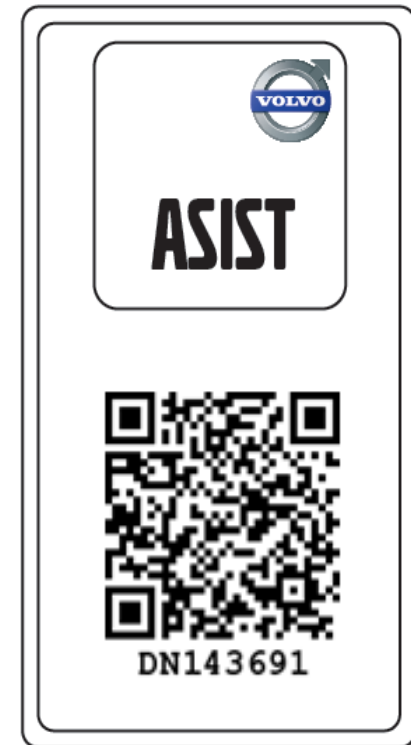
Customers can count on uptime management and downtime protection

- Reduces diagnostic time
- Manages event urgency based on priority
- Enhances repair efficiency
- Improves repair scheduling
- Improves communications
 - Expedites decision process
 - Provides repair instructions
- Reduces total dwell time of repair process



Service Management: QR Code Reader

- Standard on all Volvo vehicles but can be printed out in ASIST for all vehicles
- Efficient, consistent and accurate check-in throughout Volvo dealer network
- Enables inspections to be performed from vehicle using any smart device
- Dealers and customers can open repair orders right from the truck



Afternoon Session





Connected Vehicle Services

Uptime Center

A building of Class 8 professionals dedicated to keeping trucks running

- Volvo Action Service
- Remote Diagnostics & ASIST
- Dealer afterhours support
- Parts inventory access & expedited deliveries



World Class Support

Truck Diagnostic System

Light diagnostic tool designed for Fleets

Sold by Noregon

www.truckdiagnosticsystem.com

Onboard Tests

- Vehicle information test
- Read & clear fault codes
- DPF service regen
- Sensors and parameter monitoring
- Learned data reset
- Injector cut out, manual



Customer Parameters

- Customer Road Speed Limiter
- Cruise control
- Idle shutdown

Password protection is same as Premium Tech Tool

Warranty work requires PTT

Connected Vehicle Services: Next Steps

Develop best in class connected diagnostics and repair services leveraging our integrated hardware and WirelessCar connectivity

- Enhanced Diagnostics
- Dynamic service planning
- Future ?



Connected Vehicle Services: Next Steps

Partner with best in class telematics service providers to deliver robust fleet management, compliance and ERP integration.

- Options for customers to have 3rd party services leveraging our standard hardware
- Eliminate the expense to buy and install 3rd party telematics hardware
- OEM designed and installed hardware



Thank you