



DESCRIPTION	QTY	RATE	AMOUNT
22879256 Camshaft Bearing D13	2		
21613426 Thermostat D13	1		
21409435 Head Gasket SET D13	1		
22879256 Camshaft Bearing D13	4		
22879257 Camshaft Thrust Washer KIT D13	1		
replaced cylinder head replaced broken rocker tune up replaced fuel and oil filters filled with fresh oil	39		
5020889 Cylinder Head	1		
637226 Rocker	1		
21021925 Connection Pipe WP	1		
1547254 O-Ring Connection Pipe WP D13	2		
21298915 Water Pump Inlet Sealing Strip Gasket D13	1		
1547253 Sealing Ring D13	2		
471708 Grommet Coolant EGR	1		
1547252 Grommet Coolant	2		
21383310 Seal Timing Upper D13	1		
20755169 V-Band Clamp EGR Valve	1		
21007187 Gasket Diffuser Pipe D13	1		
1675066 Sealing Ring Intercooler Piping	1		

SIGNATURE

---

DESCRIPTION	QTY	RATE	AMOUNT
LF17502 Oil Filter VOLVO	1		
LF17503 Volvo Oil Filter	2		
5W-40 Motor Oil Full Synthetic	10		
FS19729 Davco Fuel Filter	1		
Antifreeze Red NAPS Free 50/50	3		
Misc Shop Supplies	1		

#####

WATER PUMP LEAKING

CODES FOR TURBO VGT

#####

RETORQUE WHEEL NUTS AFTER 100 MILES FROM  
 INSTALL  
 THE REPAIRS ON THIS VEHICLE ARE WARRANTED FOR  
 30 DAYS - NO WARRANTY ON LABOR IF PARTS ARE  
 SUPPLIED BY THE OWNER  
 PARTS ARE SUBJECT TO PARTS MANUFACTURER'S  
 STANDARDS. THE PARTS MUST BE PAID AGAIN AND THE  
 REFUND FROM THE DISTRIBUTOR / DEALER TAKES  
 ANYWHERE FROM 3 TO 6 MONTHS. WARRANTY MAY BE  
 REJECTED WITHOUT PRESENTING ANY REASONS NOR  
 EXPLANATIONS.

SUBTOTAL  
 TAX (0%)  
 TOTAL

TOTAL DUE **\$11,587.27**

SIGNATURE

<b>Konstantin Borisov</b>		<b>Unit #: 2701</b>	
<b>Phone:</b>	<b>Asset:</b> 2017 Volvo VNL	<b>Miles</b>	564,692
<b>Fax:</b>	<b>Serial #:</b> HN976144	<b>In Service:</b>	6 Years 7 Months
<b>Cust #: 91</b>	<b>VIN:</b> 4V4NC9EHXHN976144	<b>Engine:</b>	D13
	<b>Engine Hours:</b> 19221		

Operation	Operation	Labor	Parts	Core Charge	Total
1	<p>Preliminary Diagnostics SPM--NEXDIAG</p> <p><b>Complaint:</b> CEL is on, Burns alot of fuel</p> <p><b>Cause:</b> 1200131 10.27.22 (Charles) Pulled truck into shop. noticed engine sounds abnormal under load on takeoff. pulled codes and attached to case. unit only has a P24af in the ecm for the pm sensor being faulty. started inspecting the engine, exhaust, intake and fuel system. checked air filter and found it clogged up severely. performed injector cut out test and all make a difference though injector 6 and 3 make a less difference when shut off. performed cylinder compression test and all test above 90 percent with 6 being the lowest. Checked cylinder balance and number 6 is above 89 percent. reset it and the balance number returned to above 80 percent in less than a minute showing we have compesating cylinder and we will need to remove the injectors for inspection. checked oil level and is only about 1 to 2 quarts overfill and does not smell of diesel. next tested the turbo charger and it passed on all steps including the learned step. function tested the egr valve and turbo speed only dropped to 24 k from 45k showing the valve is working but there is a restriction in the egr cooler that will need to be pulled and pressure tested, checked soot level and its above 100 percent and needs to be dropped and cleaned as well. adapt factor is only at 1.08 showing the ahi system is working as it should. inspected the sensors down stream of the egr coolerr and found the boost sensor clogged up which also affects fuel ratio and the venturi assy is out of date by 3 generations and has to be replaced. the high hydrocarbons introduced from the compensating injectors is the root cause for all other issues on this truck. Parts list attached for inspecting injectors, pressure test egr cooler, clean dpf, engine air filter, pm sensor, boost sensor, and venturi update. pics of all tests performed are attached to case as well.</p>				

<p>2</p>	<p>QM - Injector (3 or more)_11 &amp; 13lt. 044--XXX237005  <b>Parts:</b> (1.0) A/F RED EXT LIFE 50/50 GALLON JUG, (1.0) OVERFLOW VALVE 2349, (1.0) SEALANT (342SX33), (1.0) SEALING RING, (1.0) SEALING RING 2539, (1.0) UNIT INJECTOR KIT 2374 Core: \$1,980.00, (10.0) TIE WRAP HI TEMP MP8, (15.0) TY STRAP 48RU2313P2, (2.0) BRAKE CLEAN NON-CHLORINATED, (2.0) GASKET V/C INTERMEDIATE PLATE, (2.0) GSKT FUEL BANJO MP7, (2.0) O-RING EGR PIPE MP7, (2.0) SEALING RING 2659</p> <p><b>Complaint:</b>                  Remove and Inspect Injectors</p> <p><b>Correction:</b>                  1200166 xy42524 11.4.22 pulled unit into shop, locked out tagged out and chocked wheels, Drained coolant, Removed air box, Removed egr and air compressor crossover pipes. Removed valve covers, Removed exhaust springs, Removed fuel injectors and inspected, #6, #5, and #2 injectors were worn unevenly and recommend installing a six pack injectors, Also noticed whoever previously installed injectors installed two orings and these style injectors only call for one which could be the reason why injectors are loose.</p>				
<p>3</p>	<p>QM - EGR Cooler_11 &amp; 13lt. 035--XXX293004  <b>Parts:</b> (1.0) CLAMP 2527, (1.0) CONNECTION PIPE 2629, (1.0) CONNECTION PIPE 2629, (1.0) EGR COOLER Core: \$275.00, (1.0) GASKET, (1.0) INSTALLATION KIT, (1.0) O-RING EGR/COOLANT MP8, (1.0) PAINT VOLVO ENG GREEN, (1.0) SEALING STRIP 2627, (10.0) CABLE TIE 1162, (10.0) TY STRAP 48RU2313P2, (2.0) A/F RED EXT LIFE 50/50 GALLON JUG, (2.0) O-RING BYPASS MP7, (3.0) GASKET, FOR M18 THREAD BANJO, (4.0) SEALING RING</p> <p><b>Complaint:</b>                  Remove and replace EGR Cooler</p> <p><b>Correction:</b>                  1200166 xy42524 11.7.22 removed cac pipe, When removing noticed blue hoses on pipe have rubbed through and will cause a boost leak, Removed turbo, Removed egr cooler, When removing cooler noticed piston cooling actuator, oil thermostat, and pipe coming from filter stand to oil cooler are leaking, Turned in parts list.</p>				
<p>4</p>	<p>QM - Removed Dpf And Sublet Cleaning_11 &amp; 13lt. 043--XXX254002  <b>Parts:</b> (1.0) DPF Clean, (1.0) HOSE CONNECTION 2549, (1.0) HOSE DPF MUFFLER 2586, (1.0) KIT DPF GASKET &amp; CLAMP, (1.0) REPAIR KIT 2589, (1.0) SEALING PLATE 2585, (1.0) SENSOR DPF Pressure, (15.0) CABLE TIE 1162, (20.0) TY STRAP 48RU2313P2, (3.0) HEX. SOCKET SCREW 1124, (4.0) CLAMP EXHAUST "V" 5", (4.0) GASKET EXH/PIPE CXU</p> <p><b>Complaint:</b>                  Remove DPF Sublet cleaning</p> <p><b>Correction:</b>                  1200166 xy42524 11.4.22 removed passenger step, When removing step one of handles were crisp and broke, Added to additional parts list, Removed heat shields, noticed flex pipe going into doc and flex pipe going into catalyst were both cracked, Alot of crystal was built up, Removed dpf assembly from truck, Disassembled and brought dpf to front of shop to get sent off for cleaning, Blew out doc and cleaned gasket surfaces, Finished.</p>				

5	<p>NX - Engine Air Filter  <b>Parts:</b> (1.0) AIR FILTER VOLVO VN  <b>Complaint:</b>                      Remove and replace Engine Air Filter  <b>Correction:</b>                      1200166 xy42524 11.7.22 removed and replaced engine air filter. Finished.</p>				
6	<p>Replace PM Sensor w/Monitor Test 043--043010003  <b>Parts:</b> (1.0) PM SOOT SENSOR 12V, (10.0) TY STRAP 48RU2313P2  <b>Complaint:</b>                      Remove and replace PM Sensor</p>				
7	<p>NX - Venturi Update  <b>Parts:</b> (1.0) SPARE PARTS KIT 2861  <b>Complaint:</b>                      Install Venturi Update</p>				
8	<p>Replace Boost Pressure Sensor 035--035010004  <b>Parts:</b> (1.0) SENSOR; BOOST PRESSURE 21097978  <b>Complaint:</b>                      Remove and replace Boost Pressure Sensor  <b>Correction:</b>                      1200166 xy42524 11.7.22 Removed and replaced boost sensor. Finished.</p>				
9	<p>QM - Oil Filter Pedestal_11 &amp; 13lt. 045--XXX222002  <b>Parts:</b> (1.0) FILTER OIL BYPASS MP 20843764, (1.0) GASKET, (1.0) OIL FILTER HOUSING 2222, (1.0) PIPE OIL SUPPLY, (2.0) FILTER OIL FULL FLOW, (2.0) HOSE 2651, (4.0) HOSE CLAMP 1163, (6.0) MACK ENGINE OIL EOS-4.5 15W-40 QT, (7.0) O-RING OIL/COOL MP7  <b>Complaint:</b>                      Remove and replace Oil filter pedestal</p>				
10	<p>NX - Passenger Fairing Handles  <b>Parts:</b> (1.0) HANDLE 8915  <b>Complaint:</b>                      Remove and replace Passenger fairing handles</p>				
11	<p>NX - Exhaust Pipe  <b>Parts:</b> (1.0) BELLOWS-EXHT 5X12.4, (1.0) CLAMP EXHAUST "V" 5", (1.0) FLEX BELLOW KIT, (1.0) GASKET EXH/PIPE CXU, (1.0) HEAT SHIELD 2522, (1.0) STRAP 2527, (1.0) STRAP 2527  <b>Complaint:</b>                      Remove and replace Exhaust pipe, flex Pipe, clamps</p>				

**Notes:** [10/26/2022 at 01:05 pm EDT] - Unit was checked in at Nextran Corporation - Auburndale (Volvo), arrival time: . NOTE: unit has been checked in, we will update you as we proceed with unit  
 Repair status set to Checked-in.

[10/27/2022 at 04:57 pm EDT] - Unit has been Assessed, your service advisor is working on an estimate, Pulled truck into shop. noticed engine sounds abnormal under load on takeoff. pulled codes and attached to case. unit only has a P24af in the ecm for the pm sensor being faulty. started inspecting the engine, exhaust, intake and fuel system. checked air filter and found it clogged up severely. performed injector cut out test and all make a difference though injector 6 and 3 make a less difference when shut off. performed cylinder compression test and all test above 90 percent with 6 being the lowest. Checked cylinder balance and number 6 is above 89 percent. reset it and the balance number returned to above 80 percent in less than a minute showing we have compensating cylinder and we will need to remove the injectors for

**TOTAL: \$22,148.13**