Brandt

Brandt Tractor Ltd.
9500 190th St.
Surrey, BC
V4N 3S2
(604)882-8888

Service Invoice

JOHN DEERE

INVOICE DATE	BRANCH	INVOICE NO.
28APR26	114	114500344

SOLD TO: [redacted]

PAGE 1

SALE TYPE CHARGE

CUSTOMER NO. 14194304

SHIP TO

PURCHASE ORDER NO.	PHONE NUMBER	WORK ORDER NO.	SEG.	DATE OPENED	SALESPRN	
P-11-88258	[redacted]	114500344	01	06FEB26		

MAKE	MODEL	SERIAL NO.	EQUIP. NO.	METER	AUTHORIZED BY
JD	870GLC	1FF870GXAMF890115	FMC839	8612	STAN

DESCRIPTION						AMOUNT
SERVICE CALL/TRAVEL						
SYLVESTER ROAD QUARRY						
* LABOR *						6,480.00
ENVIRONMENTAL FEE					64.80	64.80
>>---> SEG# 01	PRT	.00	LAB	6,480.00	MSC 64.80	6,544.80
* GST/HST *					327.24	
DIAGNOSE & REPAIR INJECTOR #2 CODE 10004.02 & ENGINE RUNNING						
ROUGH						
DIAGNOSTICS						
Check fault codes on machine and for engine running poorly. Found ECM 10004.02 active and engine in derate. Started with the code, looked up ECM fault code on service advisor, service advisor states to inspect injector circuit 2. Open engine hoods to access engine and wiring harness. Disconnect injector harness and interface connector, check harness with meter for opens and or shorts while performing harness wiggle test, ok. Check wiring harness from interface connector to ECM connector for open or shorts while performing harness wiggle test, ok. Remove engine valve cover and visually inspect injector wiring harness. Checked injector harness for resistance, continuity and for opens and/or shorts, ok. Reinstall valve cover. Entered a DTAC case for factory assistance. 6.25HRS						
DTAC advised checking each injector individually and replace the injector harness.						
Remove engine valve cover, remove injector harness from each						

QST # 1226957240

PAST DUE INTEREST 1 1/2% PER MONTH (18% ANNUM). MINIMUM CHARGE OF $1.50.

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X _____ SIGNATURE

_____ DATE

DESCRIPTION	AMOUNT
TOTAL PARTS	
TOTAL LABOR	
MISC. CHARGES	
SALES TAX	
PLEASE PAY THIS TOTAL ▶	**CONTINUED**

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DESCRIPTION	AMOUNT

injector, and remove harness from machine. Check ohms across each injector solenoid, each injector tested at 0.9 ohms. Install new injector harness and tighten to spec on each injector. Install engine valve cover. Check to see if new injector harness fixed fault code. Machine is still faulting for code. Run overlay wires for power supply circuits for each injector on cylinders 4, 5, 6 down to machine interconnect harness at connector x9. Recheck for active codes after running new power supply wires. Codes are still active. Disconnect engine ECM connector and check for damaged and or corroded terminals. Did not see any issues with connector body. Recheck x9 connector bodies for corrosion, water, and/or damaged pins; no issues found on either connector. Update DTAC with findings on machine.
6.25HRS
DTAC advised swapping 4, 5 and 6 injectors with 1, 2 and 3 injectors, this involved a lot of labour, so we modified the old injector harness to swap the injectors electrically. Made jumper wiring harness to swap front injector bank with rear injectors for diagnostics. 2 HRS
Removed several harness clamps on top of engine wiring harness to free up engine wiring harness. Removed valve cover and installed test harness. Checked for fault codes. Found fault code 10004.02 still active. Suspect fault in engine or machine wiring harness. Inspected and tested both harnesses and eventually found faulty grounds for rear three injectors in engine wiring harness. Removed under house pans to gain access to engine wiring harness. Cleaned engine wiring harness connectors and corrected the grounds. Cleaned and reinstalled all harness connectors. I was able to clear

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DESCRIPTION	AMOUNT

active fault codes after this step. Attempted to start the machine but the engine would not start, cranking speed is very slow. Used Rock Truck on site to boost batteries. Found cranking speed got a little better but still no start. Left charger on for a while but no success. Drove back to our store and grabbed two new batteries. Returned and replaced batteries. Found cranking speed much better now but still no start. Connect MPDR and monitor engine parameter while cranking machine. Noticed rail pressure not increasing above 40 MPA. Bled fuel system but still no start. Installed mechanical gauge and monitored supply pump pressure. Verified supply pump pressure within spec. Eventually I managed to get the engine to start, it was running rough, connect MPDR to machine and run engine. Perform injector cutout test on all injectors and notice when each injector is cutout engine runs even rougher and can barely stay running, performed compression test and found low compression on #5 cylinder. 10HRS
The glow plug for #5 cylinder looked like it had a portion missing from it, suspect a failure in this cylinder. Removed engine wiring harness from top and removed valve cover. Removed injector wiring harness and fuel return lines. Removed injector #5. Inspected suspect cylinder with borescope. Found damaged piston and burn hole in exhaust valve. Installed all removed parts. Removed engine oil filter and cut apart to inspect, found material in filter. Engine requires removal for further inspection and repair. Returned parts. 4HRS
REMOVAL OF ENGINE
Gathered engine lifting tooling at our shop for engine

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DESCRIPTION	AMOUNT
removal. Removed under house pans to gain access to bottom of hydraulic reservoir and engine. Drained engine coolant and plugged hydraulic reservoir suction with proper cap. Drained hydraulic oil out of pumps and suction hoses. Removed all hydraulic lines and suction hoses from pumps. Removed fuel lines, coolant lines and engine air tubes from turbo and aftercooler. Removed engine hood and all panels. Removed exhaust filters assembly. Noticed several brackets had cracked so brought them with me to our shop for repairs. Removed engine and hydraulic pumps and help secure on lowbed. Capped and plugged all openings. 22HRS DISASSEMBLE ENGINE IN SHOP Removed engine from the transport truck and set up for disassembly Removed all exhaust and intake components, removed all fuel system components, pinned engine at #1 TDC and removed valve train and camshaft, removed riser and injectors, removed head bolts and head from the block. Found #5 exhaust valve damaged and piston picking up on cylinder wall. Sent injectors out for testing, all injectors tested ok. Removed oil pan and removed all piston and rod assemblies for inspection, found cylinder liner in #5 damaged and the other liners in rough condition. Removed rod caps and main caps to inspect bottom end, crankshaft has damage, engine requires complete rebuild. Priced out rebuild vs replace and it was more economical to replace. Reached out to Deere for participation due to the hours on the engine, Deere agreed to participate and cover the engine, customer responsible for all labour. 20HRS	

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DESCRIPTION	AMOUNT

SWAP COMPONENTS, INSTALL PUMPS AND GEARBOX
Moved new engine into shop bay. Removed engine from shipping stand to jack stands. Installed pump drive coupling to engine flywheel. Installed gearbox assembly and pumps to rear of engine. Swapped all required components from the old engine to new engine. Repaired cracked brackets for exhaust assembly. Ordered parts for new engine install. 13.25HRS
ENGINE INSTALL
Loaded engine on flat deck. Worked with the crane company to rig and install the engine into the machine. Installed the engine and torqued engine mounts, installed all removed parts on new engine. Connected hydraulic hoses to hydraulic pumps. Filled pump drive gearbox with gear oil. Bled hydraulic pumps. Replaced ECU and turbocharger controller. Attached all electrical, coolant lines, exhaust piping, hydraulic lines, fuel lines, brackets, and harnesses. Filled engine with oil. Filled cooling system with fresh coolant. Installed all remaining covers and panels above engine, installed exhaust filter assembly, and all panelling around hydraulic pumps. Took engine oil sample. Installed under house pans. Cleaned area around machine. 26HRS
FUEL SYSTEM CLEANUP
Noticed metal contamination in final fuel filters (old filters) while changing them before firing up the new engine. Found fuel tank was full of fuel, need to inspect the bottom of the tank for any metal contamination so it can be cleaned before running the new engine. Had Stan come out and suck fuel out of fuel tank and clean bottom of fuel tank. Flushed all fuel hoses from tank to engine and return hose from engine through both fuel coolers and back to tank.

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DESCRIPTION					AMOUNT
Flushed both high-pressure hoses from final fuel filters to injection pump. Replaced both final fuel filter bases and fuel filters. Replaced primary fuel filters after flushing system. Bled fuel system. Pre-lubed lubrication system before engine start-up. Run machine and check for leaks, no leaks. Run machine and check operation, okay. Found previous pump drive gearbox oil smelled really burnt. Drained and refilled pump drive gearbox after short operation to further flush the gearbox. Checked and topped up all fluids. 10HRS					
CLEANUP AFTER REPAIR					
Disposed waste oil/fuel and filters at our shop. Completed write up and put away tooling 1.5HR					
ASSEMBLED ENGINE CORE					
Assembled engine and placed in shipping crate for credit 10HRS					
2		HPN120H	N120BATT	414.73	829.46
1	N	AT346594	Fluid Ki	25.71	25.71
1	N	AT315231	Test/Mea	3.44	3.44
1	N	8983020750R	Filter E	83.95	83.95
3	N	TY27845	HYDRAULI	167.84	503.52
80	N	WDF	WASTE DI	.01	.80
5	N	TY26815	LUBRICAN	40.27	201.35
		* LABOR *			34,733.75
1		FREIGHT-TAXABLE		45.26	45.26
ORIGINAL SN IZU6WG1 656984					
REPLACEMENT ENGINE SN 1)6WG1-674418					
1		SERVICE ACCESSORIES		500.00	500.00
1		CHARGE FOR CRANE TO REMOVE, INSTALL & TRANSPORT ENGINE		2,400.00	2,400.00
		ENVIRONMENTAL FEE		347.34	347.34

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DESCRIPTION				AMOUNT
>>--> SEG# 02 PRT 1,648.23 LAB 34,733.75 MSC			3,292.60	39,674.58
* GST/HST *			1,983.73	
RESEAL HYDRAULIC PUMPS				
Removed all the hydraulic pumps from the gearbox. Removed gearbox from engine and blocked engine with jack stands. Cleaned gearbox and ordered parts. Disassembled and resealed gearbox. Installed gearbox on old engine to provide a secure mount for final assembly of pumps to the gearbox. Installed all hydraulic pumps with new sealant and torqued hardware to spec. Removed gearbox and pump assembly from old engine so they are ready to install onto the new engine when it arrives.				
2	4445928	O-Ring	40.01	80.02
1	4153552	O-Ring	36.22	36.22
1	CH11436	O-Ring	3.41	3.41
1	AT264324	O-Ring	1.09	1.09
1	4443632	O-Ring	66.41	66.41
1	4641671	Seal	197.19	197.19
2	4637148	O-Ring	71.13	142.26
1	4153532	O-Ring	13.51	13.51
2	AT318035	O-Ring	5.28	10.56
1	PM38628	SEALANT	75.39	75.39
1	4722534	Breather	107.15	107.15
1	4153544	O-Ring	29.57	29.57
8	M342050	Cap ScreXY	13.30	106.40
1	4311619	Plug	582.57	582.57
1	40M7117	Snap Rin	31.73	31.73
* LABOR *				4,506.25

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DESCRIPTION							AMOUNT
	1	FREIGHT-TAXABLE				15.26	15.26
		SERVICE ACCESSORIES				405.56	405.56
		ENVIRONMENTAL FEE				45.06	45.06
>>--->	SEG# 03	PRT	1,483.48	LAB	4,506.25	MSC 465.88	6,455.61
		* GST/HST *				322.78	
		REMOVE EXHAUST FILTER & HAVE CLEANED					
		Picked up exhaust assembly from jobsite to disassemble for cleaning. Disassembled exhaust filters and sent out for cleaning. Once the filters returned assembled the filters into the assembly. Installed exhaust filter assembly in rear frame and connected sensors. Installed large brackets which were repaired due to cracks.					
	5	8981184211	Gasket			102.53	512.65
		* LABOR *					2,350.00
	1	1472251S CLEAN EXH FILTERS				1,376.66	1,376.66
		SERVICE ACCESSORIES				211.50	211.50
	1	1472194S BRACKET REPAIRS				470.00	470.00
		ENVIRONMENTAL FEE				23.50	23.50
>>--->	SEG# 04	PRT	512.65	LAB	2,350.00	MSC 2,081.66	4,944.31
		* GST/HST *				247.22	
		* TOTAL GST/HST * - GST No. 899544779					2,880.97

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DESCRIPTION	AMOUNT
TOTAL PARTS	3,644.36
TOTAL LABOR	48,070.00
MISC. CHARGES	5,904.94
SALES TAX	0.00
PLEASE PAY THIS TOTAL ▶	60,500.27

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