

Invoice

Date	Invoice #
11/3/2022	13007

Unit Info

Vin: 1XKYDP9X5XJ245524
 Make: Kenworth
 Model: T-680
 Miles: 1
 Unit #: 19

Terms	P.O. No.	ID #
NET 10th	775073 <i>Milage</i>	KJ245524 (#19)

Quantity	Description	Rate	Amount
86.12	<p>A) Inspect engine for damage</p> <p>Turbo is already removed off engine. Remove engine valve cover, remove injector harness with integrated bracket assembly. Remove rocker assemblies and valve bridges. Disconnect everything that is hooked to head that will have to stay with the truck and set it all aside. Remove head bolts. Remove head. Inspect cylinder liners, pistons, and head. Found compression leaking by the rings bad on multiple cylinders. Found cylinder head #5 exhaust valve broken in half at the flat part of the valve that seals to the head. Also found head cracked between each valve in the head at each cylinder. Would need a new head. Don't see the piece of the valve anywhere. Could be in the exhaust manifold or it may have gone through the turbo exhaust veins. Turbo is being rebuilt by another shop the customer took it to. Removed the lifters at #5 cylinder. Found exhaust lifter roller is hammered bad and ruined. Camshaft is also ruined and will need replaced. Looking into a different options other than a rebuild. Will have to talk to customer for a final decision. Pick up tools and bay area. Guy that knows owner stopped by and said turbo was not re-buildable and we needed to order a new turbo. Ordered engine. Had to lift truck to be able to get under it for repairs. Support transmission with jack and jack stand. Remove old engine. Had to recover a/c system freon, removed hood and front bumper, remove radiator, CAC, a/c condenser. Drain engine coolant and oil. Drain power steering fluid when unhooking lines. Make parts list of items needed. Clean up around truck. NOTE: I found one unit fuel pump plugged up with rust from line nut being loose. Pump is ruined and line needs ordered as well if it doesn't come with new engine. Engine harness lock lever on ECM snapped off when unplugging it from BCM because of dirt and gunk in the moving mechanism-replaced with new lock and retaining washers. Order new Long-Block Engine. Swap all hard parts over to new engine (exhaust manifold, coolant module, oil module, fuel module, EGR cooler, fuel rail and lines, and all misc nuts, bolts, and brackets. Replace all seals, gaskets, and o-rings as needed. Replaced both thermostats, both oil filters, one fuel filter (the other one was new already), water filter, and air filter. Install new clutch on new engine and</p>		10,937.24T

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	remove old clutch off old engine. Clean up input shaft on tranny and install new clutch brake. Replaced engine oil cooler with a new cooler as it was leaking externally. Installed head back onto old engine that we removed and put rocker assemblies back together. Put molded injector harness cover and valve cover back on old engine. Sealed up old engine as required for core return shipping purposes and fastened it to engine shipping rack/pallet assembly.		

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Quantity	Description	Rate	Amount
1	Clutch		1,043.59T
1	Clutch Installation Kit		680.41T
1	Turbo		7,324.01T
6	Brake Clean		51.18T
1	Filter Kit (Bin 8)		202.84T
1	#500 clamp		16.77T
1	Clutch Brake		24.95T
44	15/40 bulk oil		223.29T
1	#16 clamp		8.41T
2	ATF (Bin 13)		16.56T
4	Clamp (Bin 11)		34.48T
2	CAC Hose (Bin 1)		53.30T
2	Brake Fluid (Bin 13)		20.64T
4	Bolt (Bin 11)		14.44T
2	Unit Pump Kit		100.62T
1	EGR Valve Kit		194.48T
1	Coupling		11.54T
1	Connector		3.32T
12	Ext Life Antifreeze		189.70T
1	Ring		4.01T
1	Air Filter		150.22T
2	Clamp		44.66T
1	Seal		29.71T
2	Gasket		24.58T
1	Clamp		58.03T
2	Fuel pump		1,372.64T
2	Pipe		431.82T
1	Bearing		16.18T
1	O-ring		27.57T
1	Pipe		27.67T
1	Coolant pipe		17.80T
1	Gasket Set		18.22T
1	Gasket set		27.24T
1	Gasket set		27.16T

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Quantity	Description	Rate	Amount
1	<p> Replaced both fuel-high pressure unit pumps with new ones. Replaced oil pressure and intake manifold sensors as needed for rescaling purposes. Installed new turbo on engine. Installed new engine and bolt up to transmission. Hook up clutch slave cylinder housing to tranny. Noticed clutch fluid is low in reservoir-fill reservoir to top with specified brake fluid it requires. Check for leaks in clutch master solenoid and slave solenoid valves-no leaks-ok. Pressurize engine oil system throughout complete engine for proper new engine start-up procedures. Install radiator, CAC, and a/c condenser. Install hood and bumper. Hook exhaust back up to engine. Fill system with new coolant. Connect fuel lines and prime fuel system before start-up. Fill power steering system with required ATF fluid. Double check fluid levels then try to start engine. Batteries dead-let them charge over night on low amperage to bring them back to life. Started truck up in the morning. Engine fired right up on second crank attempt. Runs smooth with no check engine lights. Watch for fluid leaks-found two small coolant leaks which were repaired later. No other leaks. Test drive truck-runs great and has plenty of power. No check engine lights. CECU not configured to this engine message is in display on dash info panel. Hooked up Davie and checked for codes. Will not connect to ECM at all. Hooked up to ESA and checked for faults-all old faults. Clear all old faults. Tried programming dash to current parameters-does not change message on dash. Advised customer that we can not change programming in CECU to match engine. Engine operation is not effected by this issue and there are no safety concerns with proper operation either. Monitor for any leaks after test drive-no leaks. NOTE: TC light is on in dash. Drive says it was on previously and it goes out any time the wheels slip... so the dash light is programmed backwards and is not effecting the TC system-ok. Recheck fluid levels-all fluids are full to spec marks. Checked clutch operation on test drive-it is working properly as well. </p>		32,706.63T

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Quantity	Description	Rate	Amount
1	oil cooler		741.02T
1	O-ring		3.42T
1	Sensor		117.00T
1	Sensor oil		74.01T
1	Gasket turbo		5.82T
1	Gasket air intake		26.18T
1	Coolant Thermostat		66.90T
1	O-ring		3.17T
2	Ring-seal		29.28T
1	Latch		13.66T
1	Gasket		14.02T
1	Gasket		15.46T
1	Coolant thermostat		66.90T
1	Tensioner		257.05T
1.12	B) Replace air drier and A/C drier filter Recover system freon, replace old receiver drier with new one. Vacuum, leak check, and recharge freon to full. Spun old air drier filter off and installed a new one.		142.24T
4	134A Refrigerant		40.00T
1	Receiver Drier		72.66T
1	Air Drier Filter (Bin 3)		64.94T
2.47	C) Fuel transfer problem (left tank full & right tank low on fuel) Check tank vents-no plugged-ok. Make test hoses and hook them to return lines at tanks. Check return fuel volume-right side tank is not getting any fuel return to it. Check return line for blockage-ok. Check tee fitting for blockage-ok. Find fuel lines on pass side are routed lower than the lines on the drivers side causing fuel to return to the drivers side tank and not the passengers side. Re-route fuel lines. Test fuel return flow volume to both tanks again-it is even amounts now-ok. Unhook test lines and hook fuel lines back up to tank fittings.		313.69T

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1	D) Set road speed to 72 MPH Can not do this with out program.		127.00T
1.68	E) Check batteries The old batteries were dead when we went to start the truck again the next morning and will not hold the charge. Took the old batteries out and replaced with new batteries. Cleaned and tightened all of the connections.		213.36T
4	950 CCA		680.96T
1.11	F) Coolant leak at filter housing shut-off valve Found that the coolant was leaking out of the coolant filter housing petcock seals. Drained the coolant system again. Removed the filter and took the filter housing off the engine. Replace coolant filter shutoff valve housing assembly with a new one. Filled coolant with new coolant that I drained out and put new filter on. Run engine and burp air from system, then top off with new coolant. Check for leaks-ok. Wash engine, fuel tanks and fittings, and quickly soap and rinse truck off all over.		140.97T
1	Coolant Filter		69.59T
1	Coolant Filter Hold Down		97.36T
1	T-Bolt Clamp		51.14T
1	Shop Supplies		150.00T

Thanks!

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	Total \$63,915.09